CITY OF COLUMBIA
TENNESSEE

AGENDA

The Columbia Municipal Planning Commission will meet on Wednesday, February 14, 2024 at 4:00 PM in Council Chambers in the basement of City Hall, 700 N. Garden Street. The Planning Commission will consider the following:

I. Organization

1. Call to Order
2. Roll Call
3. Welcome of Visitors/Rules of Conduct
4. Acknowledgement of Official Communications of the Columbia City Council on Annexation and Zoning.
5. Approval of Minutes
6. Review of Bonds and Letters of Credit

II. Consent

III. Discussion Items

1. Request from WES Engineers & Surveyors for Comprehensive Plan amendment to change the future land use classification of two parcels off Morningside Lane, being Tax Map 89E Group F Parcels 1.01 and 1.02, from Urban Neighborhood to Suburban Neighborhood and to Rezone the property from CD-3L (Large Lot Neighborhood Character District) to CD-3 (Neighborhood Character District).
   THIS ITEM WAS REFERRED FROM CITY COUNCIL

   THIS ITEM WAS DEFERRED FROM A PREVIOUS AGENDA

2. Request from Andrew Wiseman to approve partial revocation of the Villages at Carters Creek PUD Master plan with rezoning to CD-4C (General Urban Corridor Character District) at 2425 Nashville Highway.

THIS ITEM WAS DEFERRED FROM A PREVIOUS AGENDA

3. Request from Allen O'Leary for Preliminary and Final Plat approval of three lots at 1485 Bear Creek Pike and Lasea Road.

4. Request from Colton Davis for Preliminary and Final Plat approval for properties at Tax Map 51 Parcels, 19, 20, and 20.01 at Nashville Highway and Greens Mill Road.

5. Request from Greg Gamble for approval of Annexation with a Plan of Services and zoning to PUD-R (Residential Planned Unit Development) under a Preliminary PUD Site Development Plan for an approximate 410 acre portion of property at 400 Bear Creek Pike being Tax Map 90 Parcel 12.01.

6. Request from Greg Gamble for Annexation approval with a Plan of Services, Comprehensive Plan amendment to Urban Neighborhood, and zoning to CD-4 (General Urban Character District) for an approximate three acre portion of Tax Map 90 Parcel 12.01 located at 400 Bear Creek Pike

7. Request from Development Services for consideration and recommendation to City Council regarding revisions to the text of the Zoning Ordinance at 8.5.19 (process and criteria for amendments to the official zoning map), and various sections of Articles 3 and 4 referencing Connect Columbia, the comprehensive plan.
   THIS ITEM WAS REFERRED FROM CITY COUNCIL

IV. Other Business

V. Adjournment

The Planning Commission of the City of Columbia welcomes your presence and participation at this meeting. If you wish to address the Commission regarding any item on the Agenda, please sign the sign-up sheet and indicate which agenda item you would like to comment on. You will have the opportunity to comment on an item when it comes up on the Agenda and before the Commission votes on the item. Once recognized, you may then come to the podium and state your name and address. Anyone requesting accommodation due to disabilities should contact the ADA Coordinator, Wanda McClain, at 931-560-1570 prior to the meeting. For other questions, please contact the Department of Development Services at 931-560-1560.

January 10, 2024 - 4:00 PM

Organization

Item I.1. - **Call to Order**

Chairman Goatz called the January Planning Commission Meeting for the City of Columbia to order at 4:03 p.m. The meeting was held in the Council Chambers at City Hall.

Item I.2. - **Roll Call**

Chairman Goatz called for a verbal roll call. The quorum was established.

Members Present: Planning Commission Chair Charlie Goatz, Planning Commission Member Councilman Danny Coleman, Planning Commission Member Thomas Hutto, Planning Commission Member Dr. Christa Martin, Planning Commission Member Mayor Molder.

Absent Were: Planning Commission Member Ray Pace, and Planning Commission Member James Shannon

Staff Present: Mr. Robert Archibald, Planner II; Mr. Austin Brass, Assistant City Planner; Mr. Ryan Filipkowski, Wastewater Engineer; Mr. Glenn Harper, City Engineer; Nelson Harper, Engineering Inspector; Mr. Paul Keltner, Director of Development Services; Mr. Tony Massey, City Manager; Mr. Kevin McCarthy, City Planner; Mrs. Sandra Richardson, Secretary; Mrs. Melissa Sanders, Planner I; Mr. Tim Tisher, City Attorney; (Zoom); and Mr. Douglas Toney, Assistant City Engineer.

Item I.3. - **Welcome of Visitors/Rules of Conduct**

Chairman Goatz welcomed guests and applicants to the meeting. The Chairman discussed the meeting rules of conduct and the process for speakers to be heard.

Item I.4. - **Acknowledgement of Official Communications of the Columbia City Council on Annexation and Zoning.**

Director Paul Keltner presented the updated status of the Planning items that were presented to the City Council.

Item I.5. - **Approval of Minutes**

Chairman Goatz moved to approve the minutes, and Councilman Coleman seconded. All the Planning Commissioners present voted aye. The motion to approve the minutes passed five to zero.

Item I.6. - **Review of Bonds and Letters of Credit**

City Engineer Glenn Harper stated all letters of credit are in order or in the process of being updated.

Consent

Item II.1. - **Request from T-Square Engineering for final plat approval with surety in the amount of $610,000 for Summit at Carter's Station Phase 3 consisting of 44 lots off Wellwind Drive.**

Mr. Goatz moved to approve this request subject to the staff report, and Councilman Coleman seconded the motion. The motion to approve passed five to zero.

Discussion Items

Item III.1. - **Request from Louis Sloyan for a Comprehensive Plan amendment to change the future land use classification of 200 Oakwood Drive, being Tax Map 89 Parcel 21 and consisting of approximately 57 acres, from Suburban Corridor to Suburban Neighborhood and to Rezone the property from CD-3L (Large Lot Neighborhood Character District) to CD-3 (Neighborhood Character District).**
THIS ITEM WAS DEFERRED FROM A PREVIOUS AGENDA

Mr. Kevin McCarthy gave the details of the staff report. Mr. McCarthy stated that this request will require two motions, one on the future land use amendment, and one for the rezoning.
Mr. Louis Sloyan was present to answer questions. Mr. Rickey Savage, 609 North James Campbell Blvd stated that he is in support of zeroing this request. His concern was to make sure the zoning fits the surrounding neighborhood. Ms. Julie Savage, 609 North James Campbell Blvd, stated that she agrees with her husband's comments. Mr. Goatz requested clarification on the sewer requirements. Mr. Sloyan discussed the pump station. Mr. Ryan Filipkowski, Wastewater Engineer, discussed the goal for the pump station, and the process. The discussion included the cost, motions, the new comp plan, and the request is for the comp plan that is in place right now. Mr. McCarthy explained the zoning processes. Mayor Molder moved to approve the request for the comprehensive plan amendment changing the future land use classification from Suburban Corridor to Suburban Neighborhood and Mr. Goatz second. The motion to approve passed five to zero. The next consideration was rezoning. Mr. Hutto moved to approve the rezoning subject to Technical comments, and Councilman Coleman seconded. The motion to approve passed five to zero.

Item III.2. - **Request from WES Engineers & Surveyors for Comprehensive Plan amendment to change the future land use classification of two parcels off Morningside Lane, being Tax Map 89E Group F Parcels 1.01 and 1.02, from Urban Neighborhood to Suburban Neighborhood and to Rezone the property from CD-3L (Large Lot Neighborhood Character District) to CD-3 (Neighborhood Character**

District).

THIS ITEM WAS REFERRED FROM CITY COUNCIL

Mr. McCarthy gave the details of the staff report. He stated that the Planning Commission is the recommending body and the City Council is the decision-making authority.
Mr. Gerald Vick, WES Engineering, was present to answer questions. Discussion included Wastewater concerns, and pump stations. Mr. Ryan Filipkowski, Wastewater Engineer discussed studying the area, getting numbers together, and the process. Further discussion included the zones, current zone, working with Wastewater, the problems that exist now, this is an identified area, sewer shed, the land between, connecting to the sewer, processes, addressing the wastewater problem regardless, the option, changing the future land use map, and consistency across the City. Mr. McCarthy discussed the processes. Mr. Hutto inquired about deferring and separating the items. Mr. Keltner advised against separating the items if there was going to be a deferral. Additional discussion included down zoning, the updated comp plan, future land use plan, and waiting till the City Council takes its action, that way it will be clearer. Mr. Hutto moved to defer, and Councilman Coleman seconded the motion. Additional discussion included density, similar requests, and different locations. The motion to defer passed five to zero.

Item III.3. - **Request from WES Engineers & Surveyors for Rezoning approval from CD-3 (Neighborhood Character District) to CD-4 (General Urban Character District) at 807 Athenaeum Street.**

Mr. McCarthy gave the details of the staff report. Gerald Vick, WES Engineering, and Cara Lynn, 4027 Bigbyville Road, applicants were present to answer. The discussion included compatibility, historical character, and the property owners' concerns. Mr. Bart Kelley, 1204 Confederate Drive, referred his speaking to Mr. Vick. Additional discussion included preserving the property, parking, grading, accessible ramp to the front door, existing structure, future use, building conformity, modifications, third layer, historic zoning approval, restrictions, range of uses, nonconforming, change of ownership, value modification, grandfathered in of the structure, non-conforming use, future use of this space, location restrictions, and parking agreement requirement. Mr. McCarthy discussed the approval process. Further discussion included the parking agreement, technical responses, gravel driveway, the needed spaces, usable space, the plan is to restore it, conforming to the comp plan, ensuring that the Historical Guidelines are not going to be impacted, and there are some safeguards in place. Mayor Molder moved to approve subject to staff comments, and Dr. Martin seconded. Dr. Martin also discussed the staff report, and Mr. McCarthy confirmed. The motion to approve passed five to zero.

Item III.4. - **Request from Generation 2 Generation, LLC for Site Development Plan and Preliminary and Final Plat approval of four lots located at 1205 E. End Street, being Tax Map 99 Parcel 59.**

Mr. Goatz recused himself. Vice Chairman, Councilman Coleman led the discussion. Mr. McCarthy gave the details of the staff report. Mr. Larry Owens was present to answer questions. Discussion included detailed plans, subdividing, matching the concept, the third layer, and the shared driveway. Dr. Martin moved to approve subject to technical comments, and Mayor Molder seconded the motion. The motion to approve passed four to zero. Mr. Goatz abstained.

Item III.5. - **Request from Michael Williams for Preliminary Plat and Site Development Plan approval of Heritage Village combining four lots and developing 20 multi-family units off Santa Fe Pike and River Heights Drive.**

Mr. Austin Brass provided the details of the staff report.
Mr. Michael Williams was present to answer questions. Discussion included meeting the requirements, civic space, amenities, side walks, accessibility, it conforms to the ordinance, and heritage tree replacement. Mr. Keltner explained the heritage tree replacement process. Further discussion included variance requests, administrative adjustments, requesting the sidewalk circulate around for the adjustment, the best approach, existing drainage, and the walking path. Mayor Molder moved to approve subject to staff comments, technical comments, and the applicant's willingness to fully enclose the sidewalk, and Councilman Coleman second. The motion to approve passed five to zero.

Item III.6. - **Request from Greg Gamble for Preliminary Plat and Site Development Plan approval of 122 units off River Road at Tax Map 90 Parcel 7.08.**

Mr. Austin Brass gave the details of the staff report.
Mr. Greg Gamble was present to answer questions. The discussion included the small buildings, the entrance, pedestrian path, four unit buildings, three stories, and floor plan. Mr. Gamble gave a presentation, and he explained the entrances. Discussion included the doors, the elevations, parking, the garages, amenities, the variance request, ramp, handicap parking, changes in the near future, sharing the rational, modifications, sidewalks, grade change, corridor, windows, shutters, copy the gable, and the window sill height. Mr. Goatz moved to approve subject to the aforementioned concerns with building two, and subject to any other technical comments, and presenting to staff as approved in a timely manner. The motion was seconded by Dr. Martin. The motion to approve with conditions passed five to zero.

Item III.7. - **Request from Andrew Wiseman to approve partial revocation of the Villages at Carters Creek PUD Master plan with rezoning to CD-4C (General Urban Corridor Character District) at 2425 Nashville Highway.**

Mr. McCarthy gave the details of the staff report. He stated that City Council is the decision-making authority, and there were sample motions in the staff report.

Mr. Wiseman was present to answer questions. The discussion included differentiating, connectivity, marketing, layout, requirements, storm water, open space opportunities, revisions, alternatives, previous concerns with commercial, PUD deviations, conflicts, transaction of the property, and the submittal process. Mayor Molder moved to defer. Further discussion included conversations, PUD, commercial, the product, and deed restriction. Mr. Goatz seconded the motion. Additional discussion included the concept, staff concerns, and clarifications. The motion to defer passed four to zero, with Councilman Coleman leaving early.

Item III.8. - **Request from Development Services for consideration and recommendation to City Council regarding revisions to the text of the Zoning Ordinance at 8.3.6 (composition and authority of the Architectural Design Review Team) and 8.5.15 (design review process)as well as corrections to scriveners errors throughout the text of same.**

THIS ITEM WAS DEFERRED FROM A PREVIOUS AGENDA

Mr. McCarthy gave the details of the design review process recommendation. Discussion included alternatives, delegations, consolidations, the ART team looks at special districts, staff suggestions, the ability to administer, modified standards, Planning Commission being that body, staff reports, more or less intensive, delegation to the Zoning Administrator, and there will be an opportunity to review and amend the request. Mayor Molder moved to revise it as to mirror the proposed alternative number two language as presented. Dr. Martin seconded the motion. Mr. Goatz stated for clarification if the Commission adopt this request, this Board will basically be taking the place of the Architectural Review Team. If it is determined that it doesn't work, it means the re-creation of an Architectural Design Review Team, and returning to alternative number one. Mayor Molder stated that the motion would include corrections distributed throughout the day. Mr. McCarthy stated yes. The motion passed four to zero.

Other Business

Mr. McCarthy stated that he spoke with the Chairman, and the Mayor in reference to special meetings, for joint study sessions with the Council and Planning Commission, and for special call voting meetings. He discussed the meetings' details. Mr. Goatz stated that he liked the concept.

Adjournment

Mr. Goatz moved to adjourn, and Mayor Molder seconded. The meeting adjourned at 6:17 p.m. with a vote of four to zero.

_____ _____

Planning Commission Chairman, Date

Charlie Goatz

Active Letters of Credit and Sureties

2/5/2024

DEVELOPMENT/SUBDIVISION	DEVELOPER	AMOUNT	EXP. DATE
Colter Place Subidivison, Section 1 (rds/drainage)	Sterling Martin	$44,502.69	09/09/2016
Armstrong Meadow, Phase 1, Section 3 (roadsd/drainage)	General Homes of Columbia, LLC	$203,500.00	05/05/2019
Honey Farms Subdivision, Phase 2, Section 10	Charles Raines Construction, LLC	$10,300.00	05/23/2020
Greystone Subdivision	LPT, LLC	$16,650.00	03/07/2021
Arlington Heights Subdivision, Phase 2, Section 2	Arlington Heights General Partnership	$105,000.00	04/25/2021
Arlington Heights Subdivision, Phase 1, Section 2	Arlington Heights General Partnership	$106,000.00	05/09/2021
Polk Place PUD Subdivision, Phase 1 (roads & drainage)	Columbia Properties, LLC	$28,000.00	05/23/2021
Independence @Carter's Station, Section 3, Phase 1	Pulte Homes Tennessee Partnership	$390,000.00	09/15/2021
Savannah Cove Subdivision - roads/drainage	Campbell and Lovell Rentals	$45,000.00	09/28/2021
Summerdale, Phase 1 (roads & drainage)	P & L Development	$135,000.00	11/13/2024
Elan Subdivision, Phase 2 (roads and drainage)	Shaw Enterprises	$142,000.00	01/04/2022
Polk Place PUD Subdivsion, Section 2A (roads & drainage)	Columbia Properties, LLC	$55,000.00	02/03/2022
Fieldstone Farms - Section 4 (roads & drainage)	Estate of Cyril Evers	$21,000.00	03/13/2022
Summerdale Subdivision, Phase 4 (roads & drainage)	P & L Development	$64,000.00	03/19/2022
Hatton Hills Subdivision (roads & drainage)	J & B Estate	$32,000.00	03/22/2022
Honey Farms Townhomes , Phase 2, Section 3	Lennar Homes of Tenn, LLC	$50,000.00	04/05/2022
Homestead at Carter's Station, Section 2, Phase 1B	FP TCI CCS, LLC	$6,500.00	03/17/2024
Homestead at Carter's Station, 5.2 and 6.1	Pulte Homes Tennessee Partnership	$254,000.00	04/16/2022
Summerdale Subdivision, Phase 2 (roads & drainage)	P & L Development, LLC	$105,000.00	05/30/2024
Taylor Bend Road - roads & drainage	Meritage Homes of Tenn., Inc.	$120,000.00	06/30/2024
Taylor Landing Subdivision, Phase 5A (roads & drainage)	Meritage Homes of Tenn., Inc.	$48,000.00	06/30/2022
Taylor Landing Subdivision, Phase 5B (roads & drainage)	Meritage Homes of Tenn., Inc.	$72,000.00	06/30/2022
Taylor Landing Subdivision, Phase 4B, (roads & drainage)	Meritage Homes of Tenn., Inc.	$78,000.00	06/30/2022
Cottages at Bear Creek , Phase 1 (roads & drainage)	Riverstone Homes, LLC	$165,000.00	07/19/2022
Homestead @ Carter's Station Section 2 Phase 2B	FP TCI CCS, LLC	$11,100.00	04/20/2024
Summerdale Subdivision, Phase 5 (roads & drainage)	P & L Development, LLC	$55,000.00	10/12/2024
Independence at Carter's Station, Section 6, Phase 2	Pulte Homes Tennessee Partnership	$207,000.00	11/08/2022
Polk Place , Phase 2B (roads & drainage)	Columbia Properties, LLC	$56,000.00	11/12/2022
Homestead at Carter's Station Subm Section2 Phase 3	FP TCI CCS, LLC	$19,000.00	03/17/2024
The Ridge at Carter's Station, Phase 1A	Richmond American Homes of Tenn	$121,000.00	12/03/2022
Independence at Carter's Station, Section 3, Phase 2	Pulte Homes Tennessee Partnership	$372,000.00	12/06/2022
Homestead at Carter's Station Section 2, Phase 1	FP TCI CCS, LLC	$14,100.00	03/17/2024
Homestead at Carter's Station, Section 2, Phase 2A	FP TCI CCS, LLC	$8,700.00	04/20/2024
Armstrong Meadows Subdivision, Section 4	Smith Douglas, LLC	$475,000.00	02/01/2023
Cottages at Bear Creek , Phase II (roads & drainage)	Riverstone Homes, LLC	$156,000.00	03/18/2023
Summerdale Subdivision, Phase 7 (roads & drainage)	P & L Development, LLC	$66,000.00	03/21/2023
Ridge at Carter's Station, Phase 1B (roads & drainage)	Richmond American Homes of Tenn	$260,000.00	03/31/2023
Vesper Court (completion of the work)	P-R Vesper, LLC	$18,500.00	04/18/2023
Morgan Meadow Phase 2 (roads & drainage)	KCS Property, LLC	$13,500.00	12/06/2024
Armstrong Street Subdivision (roads & drainage)	Tennessee Regional Holdings, LLC	$75,500.00	05/14/2023
Polk Place, Phase 3 , (roads and drainage)	Columbia Properties, LLC	$79,000.00	06/17/2023
Independence at Carters Station Section6, Phase 3	Pulte Homes Tennessee Partnership	$197,000.00	07/14/2023
Bear Creek Overlook Place Phase 1 (roads and drainage)	CHR Land, LLC	$203,000.00	07/12/2024
Bear Creek Glen, Phase 1 (roads and drainage)	CHR Land, LLC	$90,000.00	07/12/2024
Homestead at Carters Station, Section 5, Phase 2	Pulte Homes Tennessee Partnership	$149,000.00	07/29/2023
Independence at Carters Section 3, Phase 3	Pulte Homes Tennessee Partnership	$155,000.00	08/05/2024
Quail Run Development, Phase 2 (roads and drainage)	Quail Run Development Co., LLC	$182,000.00	08/01/2024
Quail Run Development, Phase 1B (roads and drainage)	Quail Run Development Co., LLC	$185,000.00	08/01/2024
Drumwright, Phase 1 Townhomes Section (roads & drainage)	Lennar Homes of Tenn, LLC	$275,000.00	08/11/2023
Drumwright, Phase 1 Family Section (roads & drainage)	Lennar Homes of Tenn, LLC	$890,000.00	08/11/2023
Ridgeview Oaks, Phase 1 (roads and drainage)	A1 Home Builders, Inc.	$450,000.00	08/22/2024
Ridge at Carter's Station, Phase 2 (roads & drainage)	Richmond American Homes of Tenn	$645,000.00	10/31/2024
Taylor Landing, Phase 4A (roads & drainage)	Meritage Homes of Tenn., Inc.	$12,100.00	11/30/2024
Summerdale Subdivision, Phase 3 (roads & drainage)	P & L Development	$97,000.00	12/22/2023
Quail Run Development Phase 1 (roads & drainage)	Quail Run Development Co., LLC	$157,000.00	01/03/2024
Summerdale Subdivision, Phase 3B (roads & drainage)	P & L Development, LLC	$17,000.00	01/27/2024
Summerdale Subdivision, Phase 6 (roads & drainage)	P & L Development, LLC	$103,000.00	02/07/2024
Morgan Meadow Phase 3 (roads & drainage)	KCS Property, LLC	$220,000.00	02/10/2024
Morgan Meadows Subdivision (roads & drainage)	KCS Property, LLC	$24,200.00	07/14/2024

Active Letters of Credit and Sureties

2/5/2024

DEVELOPMENT/SUBDIVISION	DEVELOPER	AMOUNT	EXP. DATE
Vulcan Quary Site Restoration	Vulcan Construction Materials, LLC	$62,000.00	03/01/2024
Ridgeview Oaks, Phase 2 (roads and drainage)	A-1 Home Builders, Inc.	$335,000.00	03/10/2024
Summit at Carter's Station Phase 1 (roads & drainage)	Tamarack Land - Carter's Station LLC	$465,000.00	03/17/2024
Baker Creek Place (roads & drainage)	SDH Nashville, LLC	$360,000.00	04/28/2024
Taylor Landing - Phase 2 (roads & drainage)	Meritage Homes of Tenn., Inc.	$18,800.00	04/30/2024
Taylor Landing Subdivision, Phase 3 (roads and drainage)	Meritage Homes of Tenn., Inc.	$11,700.00	07/31/2024
Quail Run Meadows, Phase 3	Quail Run Development Co., LLC	$185,000.00	05/18/2024
Drumwright, Phase 2C	Lennar Homes of Tenn, LLC	$125,000.00	05/23/2024
Drumwright, Phase 2A	Lennar Homes of Tenn, LLC	$200,000.00	05/23/2024
Drumwright, Phase 2B	Lennar Homes of Tenn, LLC	$125,000.00	05/23/2024
Drumwright TH, Phase 2D	Lennar Homes of Tenn, LLC	$265,000.00	05/23/2024
Honey Lakes	Honey Lakes LLC	$295,000.00	06/14/2024
Vesper Court (completion of the work) 2	P-R Vesper, LLC	$10,000.00	06/16/2024
Summit at Carter's Station Phase 2	Tamarack Land - Carter's Station LLC	$175,000.00	06/14/2024
Independence @ Carter's Station, Section 3, Phase 4	Pulte Homes Tennessee Partnership	$140,000.00	07/13/2024
Independence @ Carter's Station, Section 6, Phase 4	Pulte Homes Tennessee Partnership	$160,000.00	07/13/2024
Homestead South @ Carter's Station	Pulte Homes Tennessee Partnership	$125,000.00	07/13/2024
Independence @ Carter's Station, Section 3, Phase 5	Pulte Homes Tennessee Partnership	$35,000.00	07/19/2024
Williamsport Landing, Phase 1	KCS Property LLC	$310,000.00	08/17/2024
Summit at Carter's Station West, Phase 1	Pulte Homes Tennessee Partnership	$315,000.00	10/06/2024
Drumwright Phase 3A	Lennar Homes of Tenn, LLC	$135,000.00	11/22/2024
Drumwright Phase 3B	Lennar Homes of Tenn, LLC	$120,000.00	11/22/2024
Drumwright Phase 3C	Lennar Homes of Tenn, LLC	$190,000.00	11/22/2024
Rutherford Subdivision, Phase 1	Regent Homes, LLC	$400,000.00	12/21/2024
The Summit at Carter's Station, Phase 3	Tamarack Land-Carter's Station, LLC	$610,000.00	12/20/2024
Preserve at Drumwright, Phase 1 and Phase 2	Lennar Corporation	$1,190,000.00	11/14/2024
Hillcrest Village, Phase 1A	M/I Homes of Nashville, LLC	$645,000.00	01/19/2025

Morningside Lane Rezoning

Project #:	23-0379	Location:	Map 89E F Parcel 1.01, 1.02
Applicant:	WES Engineers & Surveyors	Case Type(s):	Rezoning
Staff Planner:	Kevin C. McCarthy, AICP	Proposed Use:	Single Family Homes

PROJECT SUMMARY

The applicant requests to rezone a 4.28-acre property near the current terminus of Morningside Lane from CD-3L (Neighborhood Large-Lot Character District) to CD-3 (Neighborhood Character District). The applicant also requests to amend the future land use map of Connect Columbia, the comprehensive plan, reclassifying the subject property from Urban Neighborhood to Suburban Neighborhood. The map amendment is necessary to make the requested rezoning consistent with the comprehensive plan. In November 2023, the Commission recommended approval of rezoning the property to CD-4 (General Urban Character District). The following month, City Council referred the item back to Planning Commission after the applicant agreed to amend the request. The current zoning permits low density single-family residences. The requested zoning designation accommodates medium density residential uses. The applicant's revised concept depicts development of the site for detached single family homes. The Zoning Ordinance permits two dwelling units per acre in CD-3L and four dwelling units per acre in CD-3. Single-family homes, duplexes, and civic buildings are the permitted structure types in CD-3. Most non-residential uses are prohibited.

- The DRC reviewed this proposal at its October 2023 meeting; the revisions was reviewed by relevant members of the DRC.
- The concept indicates it is possible to develop the site in conformity with CD-3 standards.
- Rezoning simply establishes entitlements under the zoning ordinance, not a vested right to develop the site as depicted in the concept plan; greater detail will be required at the time of any subsequent site development plan and preliminary plat.
- Although the subject property is not located in an Area of Change, the single-family standards of the CD-3 character district are compatible with the established pattern of the surrounding neighborhood.
- The Planning Commission is a **recommending body** for rezoning requests.
- The Planning Commission must make separate motions for the plan amendment and the rezoning.
- Templates are provided at the end of the report to assist the Planning Commission in crafting properly formatted motions.

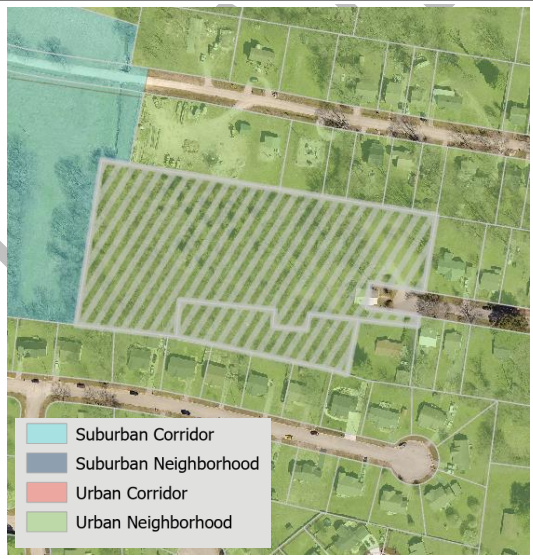
UPDATED 01-07-2024

SITE INFORMATION

CURRENT ZONING	EXISTING USE	EXISTING IMP.	LAND AREA
CD-3L	Single Family	Single Family House	+/- 4.28 Acres



FUTURE LAND USE MAP



ZONING MAP



SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	Urban Neighborhood	CD-3L	Single-Family
North	Urban Neighborhood	CD-3	Utility Facility/Single Family
South	Urban Neighborhood	CD-4	Single-Family
East	Urban Neighborhood	CD-3	Single-Family
West	Suburban Neighborhood	CD-3L	Single-Family

The subject property is currently vacant except for an unoccupied single-family home constructed in 1940. The property is located at the current terminus of Morningside Lane. It sits between a very large residential property to the west and medium density neighborhoods on the east, north, and south. One of the parcels bordering the property on the north contains a utility facility. The area is a mix of CD-3L, CD-3, and CD-4 zoned parcels. The future land use of the subject property and most adjacent properties is Urban Neighborhood. The current zoning in the immediate vicinity of the site is **not consistent** with Connect Columbia, except for the CD-4 section to the south. Although the current zoning of the immediately surrounding Sunset Park Subdivision is CD-3, and therefore inconsistent with the Future Land Use Map, the platted lots are generally 50' wide, conforming to the CD-4 standard.

CONSISTENCY WITH CONNECT COLUMBIA

Urban Neighborhood: The future land use of the subject site is Urban Neighborhood. The Character Area is characterized by residential development and neighborhoods, with intermixed and compatible civic uses. The Future Land Use Plan indicates that "the general development pattern is defined by a single use activity on individual lots with a mixture of lot sizes" (Connect Columbia, p. 24). Future development should focus on context-responsive in-fill development that emphasizes connectivity and housing diversity. (Connect Columbia, p. 25). The future land use classification is implemented by the CD-4 and CD-5 character districts.

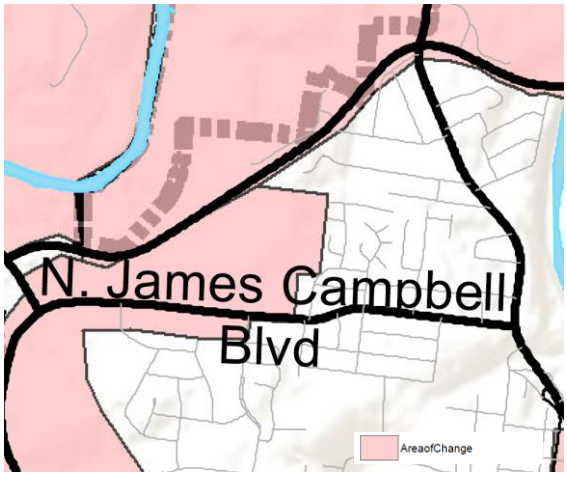
The requested CD-3 zoning is not consistent with the 2018 future land use plan, the applicant has added a request to amend the classification of the property to Suburban Neighborhood. The Suburban Neighborhood future land use is implemented by the CD-3L and CD-3 character districts. The requested zone is consistent with the requested future land use classification.

UPDATED 01-07-2024

CHARACTER AREA MATRIX				
	Development Pattern	**Zoning Category and Uses**	**Infrastructure**	**Design Standard**
URBAN NEIGHBORHOOD	**Is the property in an Area of Change?** **No:** The development pattern is established. Changes to overall character of the area should rarely occur. **Yes:** The development pattern is evolving. Changes to area are likely as development occurs. New development should blend with existing, surrounding neighborhood assets.	**Residential Uses Zoning Category:** Low Density Residential, Medium High Residential, and High Residential Districts **Public and Civic Uses Zoning Category:** Religious Facilities, Government Facilities (low to medium impact), and Educational Facilities	**Not in an Area of Change:** Limited new services, with mostly in-fill enhancements to existing infrastructure. **Within an Area of Change:** Extensions to transportation, water, sewer, and other services should be expected. New service or extensive redevelopment of existing services should be vetted and reviewed by Planning Commission and City Council as a primary element of approval.	Scale: New dwellings and structures should aid in establishing the character of the area. Architecture: New developments or redevelopments should include a mix of architectural styles. Residential garages, if front-facing, should be recessed from the front façade of the structure. Civic use should respect the residential character, while providing architectural interest.

AREA OF CHANGE

The subject site **is not located** in an Area of Change (Connect Columbia Map 3). In 2017 the Planning Commission determined that the development pattern in the area was established and that changes to overall character of the area should rarely occur. The designation does not necessarily mean that any particular development proposal is inconsistent with Connect Columbia. It does mean that the Planning Commission should pause to ensure the context of the area surrounding the subject property is considered in the review process. (Connect Columbia p. 14).

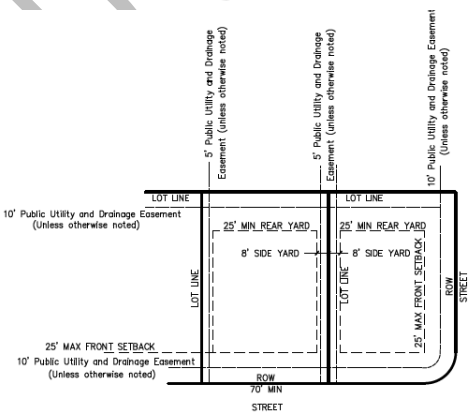


CONFORMITY WITH ZONING ORDINANCE

As required by **§ 8.5.19.F.3** of the Zoning Ordinance, the applicant provided a concept plan (i.e. "Sketch Development Plan") demonstrating that it is possible to develop the property in conformity with the standards applicable to the requested zoning designation. Any site development plan/preliminary plat must conform to Zoning Ordinance 4400, adopted on July 14th, 2022. This request for rezoning simply establishes entitlements under the zoning ordinance, not a vested right to develop the site as depicted in the concept plan.

Lots, Building Sites & Bulk Standards

- **The concept plan depicts single family lots which generally conform to the CD-3 bulk standards listed in Table 4.3.1-C of the Zoning Ordinance.**
    - The Ordinance requires a minimum lot width of 65' for a front-loaded single-family home.
    - The Ordinance prescribes setbacks of:
        - 25' minimum front setback principal and secondary frontages;
        - 8' side setback; and
          25' rear setback.
- The applicant's concept proposes the creation of fourteen lots which conform to the minimum lot width and could accommodate homes conforming to the setbacks.



Conceptual Lots Conform to CD-3 Standards

Other Standards

- Conformity with other requirements of the Ordinance, including tree preservation, Civic Space, and design prescriptions will be reviewed at the time of preliminary plat or building permit as applicable.

UPDATED 01-07-2024

REVIEW PROCESS

The Development Review Committee evaluated the proposed rezoning at its October 2023 meeting, as directed by **§8.3.7** of the Zoning Ordinance. Technical comments are provided in the agenda package. The City Planner, the City Engineer, CPWS, and the designee of the Director of Wastewater reviewed the revised concept in January 2024. Their comments are summarized in the next section.

Section **8.5.19** of the Zoning Ordinance directs the Planning Commission to review and make a recommendation on all proposed changes to the Official Zoning Map. The Planning Commission is the recommending body for rezonings under **§ 8.3.3.B.3** of the Zoning Ordinance.

Section **8.5.19.H.4** of the Zoning Ordinance establishes the review criteria for approval of all changes to the Official Zoning Map:

a. *The Rezoning is consistent and not in conflict with the Comprehensive Plan or other applicable approved local plans for the area;*
b. *It has been determined that the legal purposes for which zoning exists, as set forth in Section 1.5 [, are not contravened];* [1]
c. *It has been determined that there will be no adverse effect upon Adjoining property owners unless such effect can be justified by the overwhelming public good or welfare;*
d. *It has been determined that no one property owner or small group of property owners will benefit materially from the change to the detriment of the general public;*
e. *It has been determined that conditions affecting the area have changed to a sufficient to warrant the Zoning Map Amendment or that the existing zoning of the property was the result of a mistake;*
f. *It has been determined that adequate school, road, parks, wastewater treatment, water supply, and stormwater drainage facilities are available*

Section **8.5.20** of the Zoning Ordinance directs the Planning Commission to review and make a recommendation on all proposed changes to the Future Land Use Map of the Comprehensive Plan. The Planning Commission is the recommending body for amendments of the Future Land Use Map under **§ 8.3.3.B.3** of the Zoning Ordinance. Section **8.5.20.B** allows for concurrent review of Comprehensive Plan Amendments and associated Rezonings; however, "decisions shall be rendered with separate motions."

UPDATED 01-07-2024

[1] Ordinance 4400 contains this incomplete sentence. The previous ordinance contained a nearly identical list of criteria at § 3.18.7.B. The corresponding criterion in Ordinance 3638 read "the legal purposes for which zoning exists are not contravened."

Section **8.5.20.F** of the Zoning Ordinance establishes the review criteria for changes to the Future Land Use Map of Connect Columbia, the Columbia's comprehensive plan:

1. *Whether the proposed change would be consistent with the intent, goals, objectives, policies, guiding principles and programs of all other applicable adopted Land Use Plans;*
2. *Whether the proposed change would be compatible with the existing land use pattern and designated future land uses;*
3. *Whether the proposed change would create substantial adverse impacts in the Adjacent area or the City in general;*
4. *Whether conditions affecting the area have changed to a sufficient extent to warrant the proposed change; and*
5. *Whether the subject parcel is of adequate shape and size to accommodate the proposed change.*

SUMMARY OF DEVELOPMENT REVIEW COMMITTEE COMMENTS

The City Planner, the City Engineer, CPWS, and the designee of the Director of Wastewater reviewed the revised concept in January 2024. (See the November 2023 staff report for a summary of October 2023 DRC comments).

- **Planning** determined it is possible to develop the site in conformity with the requested CD-3 standards.
- Planning also determined the requested zoning is consistent with the requested future land use classification.
- Planning noted that the water availability letter will expire on January 13, 2024.
- **Engineering** noted that any future Site Development Plan must include a cul-de-sac turnaround conforming to the Standard Detail-15 of the City of Columbia Engineering Standards and Specifications rather than the temporary hammerhead style turnaround depicted in the concept plan.
- **Wastewater** noted that sewer upgrades may be required at the time Site Development Plan and Preliminary Plat. Specifically, the Royal Oaks sewershed warrants attention. The extent of the necessary improvements is currently unknown. Any subsequent request for development approval will require will-serve letter from the Director and the Civil Engineer of the Wastewater Department outlining necessary improvements.

UPDATED 01-07-2024

COMMENTARY FROM PROFESSIONAL PLANNING STAFF

The requested CD-3 zoning is not consistent with Connect Columbia. The subject site's future land use classification is Urban Neighborhood. The future land use classification is implemented exclusively by the CD-4C character district, as well as PUDs. The applicant has requested a change to the Future Land Use Map from Urban Neighborhood to Suburban Neighborhood. The Suburban Neighborhood future land use is implemented by the CD-3L and CD-3 character districts.

Conditions affecting the area may have changed to a sufficient degree to warrant the Zoning Map Amendment. The comprehensive plan and the zoning ordinance encourage infill development. Although development of the site may require developer-paid improvements to wastewater infrastructure, the subject property is located well inside the urbanized area of Columbia with existing services.

If the Planning Commission recommends approval, the applicant should provide an updated water availability letter prior to consideration by the City Council. The water availability letter will expire before the City Council could consider the request. If the request advances to the City Council, the applicant should obtain an updated letter prior to publication of the council agenda.

UPDATED 01-07-2024

SAMPLE MOTIONS

Future Land Use Map (Comprehensive Plan) Amendment

Approve: Move to find, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in section **8.5.20.F** of the City of Columbia Zoning Ordinance have been satisfied and recommend approval of the proposed change to the Future Land Use Map of Connect Columbia *[, subject to technical comments and other conditions presented by planning staff*].

Deny: Move to recommend denial of the proposed change to the Future Land Use Map of Connect Columbia having found, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in section **8.5.19.H** of the City of Columbia Zoning Ordinance are not satisfied [*list specific reasons for denial*].

Defer: Move to find that there is insufficient information to decide, defer the matter to the next regularly scheduled meeting of the Planning Commission, and request that the [*applicant/staff*] provide: [*list additional information*] for review at a future meeting.

Zoning Map Amendment

Approve: Move to find, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in section **8.5.19.H** of the City of Columbia Zoning Ordinance have been satisfied and recommend approval of the proposed rezoning *[, subject to technical comments and other conditions presented by planning staff*].

Deny: Move to recommend denial of the requested rezoning having found, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in section **8.5.19.H** of the City of Columbia Zoning Ordinance are not satisfied [*list specific reasons for denial*].

Defer: Move to find that there is insufficient information to decide, defer the matter to the next regularly scheduled meeting of the Planning Commission, and request that the [*applicant/staff*] provide: [*list additional information*] for review at a future meeting.

UPDATED 01-07-2024

Morningside Lane Rezoning

Project #:	23-0379	Location:	Map 89E F Parcel 1.01, 1.02
Applicant:	WES Engineers & Surveyors	Case Type(s):	Rezoning
Staff Planner:	Kevin C. McCarthy, AICP	Proposed Use:	Single Family Homes

PROJECT SUMMARY

The applicant requests to rezone a 4.28-acre property located near the current terminus of Morningside Lane from CD-3L (Neighborhood Large-Lot Character District) to CD-4 (General Urban Character District). The subject site is composed of two existing lots of record. The current zoning designation permits low density single-family residences. The requested zoning designation accommodates a medium density mix of residential and commercial uses. The concept provided by the applicant depicts development of the site for detached single family homes. The Zoning Ordinance permits two dwelling units per acre in CD-3L and twelve dwelling units per acre in CD-4.

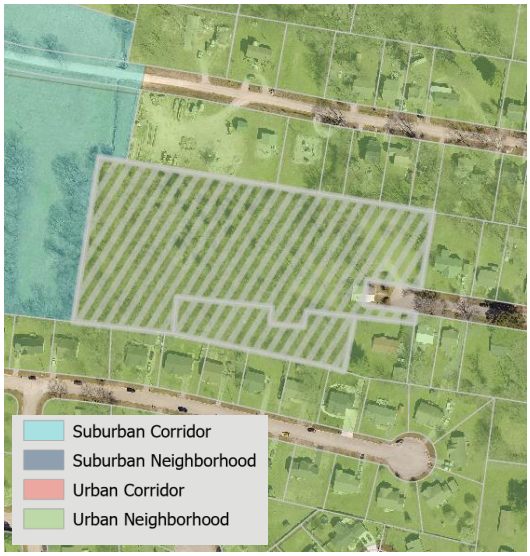
- The DRC reviewed this proposal at its October 2023 meeting.
- The request is consistent with Connect Columbia, the City's comprehensive plan.
- The concept plan generally indicates that it is possible to develop the site in conformity with the requested standards.
- Rezoning simply establishes entitlements under the zoning ordinance, not a vested right to develop the site as depicted in the concept plan; greater detail will be required at the time of any subsequent site development plan and preliminary plat.
- The concept plan depicts development of the infill site with a 550-foot extension of Morningside Lane beyond its current terminus.
- Although the subject property is not located in an Area of Change, the single-family standards of the CD-4 character district are compatible with the established pattern of the surrounding neighborhood. The development depicted in the concept plan effectively extends the Sunset Park Subdivision.
- At the request of staff, the applicant provided specific responses to some of the rezoning criteria.
- The Planning Commission is a **recommending body** for rezoning requests.
- Templates are provided at the end of the report to assist the Planning Commission in crafting properly formatted motions.

SITE INFORMATION

CURRENT ZONING	EXISTING USE	EXISTING IMP.	LAND AREA
CD-3L	Single Family	Single Family House	+/- 4.28 Acres



FUTURE LAND USE MAP	ZONING MAP





SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	Urban Neighborhood	CD-3L	Single-Family
North	Urban Neighborhood	CD-3	Utility Facility/Single Family
South	Urban Neighborhood	CD-4	Single-Family
East	Urban Neighborhood	CD-3	Single-Family
West	Suburban Neighborhood	CD-3L	Single-Family

The subject property is currently vacant except for an unoccupied single-family home constructed in 1940. The property is located at the current terminus of Morningside Lane. It sits between a very large residential property to the west and medium density neighborhoods on the east, north, and south. One of the parcels bordering the property on the north contains a utility facility. The area is a mix of CD-3L, CD-3, and CD-4 zoned parcels. The future land use of the subject property and most adjacent properties is Urban Neighborhood. The current zoning in the immediate vicinity of the site is **not consistent** with Connect Columbia, except for the CD-4 section to the south. Although the current zoning of the immediately surrounding Sunset Park Subdivision is CD-3, and therefore inconsistent with the Future Land Use Map, the platted lots are generally 50' wide, conforming to the CD-4 standard.

CONSISTENCY WITH CONNECT COLUMBIA

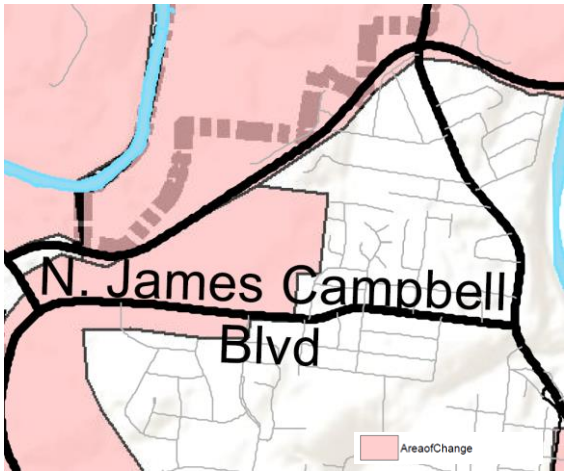
Urban Neighborhood: The future land use of the subject site is Urban Neighborhood. The Character Area is characterized by residential development and neighborhoods, with intermixed and compatible civic uses. The Future Land Use Plan indicates that "the general development pattern is defined by a single use activity on individual lots with a mixture of lot sizes" (Connect Columbia, p. 24). Future development should focus on context-responsive in-fill development that emphasizes connectivity and housing diversity. (Connect Columbia, p. 25). The future land use classification is implemented by the CD-4 and CD-5 character districts.

Urban Neighborhood

CHARACTER AREA MATRIX				
	Development Pattern	**Zoning Category and Uses**	**Infrastructure**	**Design Standard**
URBAN NEIGHBORHOOD	**Is the property in an Area of Change?** **No:** The development pattern is established. Changes to overall character of the area should rarely occur. **Yes:** The development pattern is evolving. Changes to area are likely as development occurs. New development should blend with existing, surrounding neighborhood assets.	**Residential Uses Zoning Category:** Low Density Residential, Medium High Residential, and High Residential Districts **Public and Civic Uses Zoning Category:** Religious Facilities, Government Facilities (low to medium impact), and Educational Facilities	**Not in an Area of Change:** Limited new services, with mostly in-fill enhancements to existing infrastructure. **Within an Area of Change:** Extensions to transportation, water, sewer, and other services should be expected. New service or extensive redevelopment of existing services should be vetted and reviewed by Planning Commission and City Council as a primary element of approval.	Scale: New dwellings and structures should aid in establishing the character of the area. Architecture: New developments or redevelopments should include a mix of architectural styles. Residential garages, if front-facing, should be recessed from the front façade of the structure. Civic use should respect the residential character, while providing architectural interest.

AREA OF CHANGE

The subject site **is not located** in an Area of Change (Connect Columbia Map 3). In 2017 the Planning Commission determined that the development pattern in the area was established and that changes to overall character of the area should rarely occur. The designation does not necessarily mean that any particular development proposal is inconsistent with Connect Columbia. It does mean that the Planning Commission should pause to ensure the context of the area surrounding the subject property is considered in the review process. (Connect Columbia p. 14).

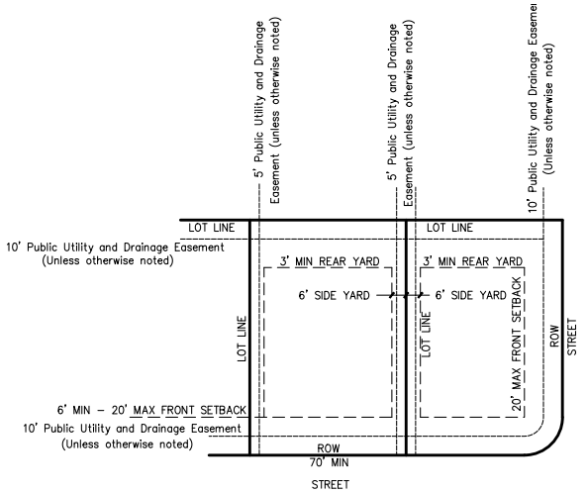


CONFORMITY WITH ZONING ORDINANCE

As required by **§ 8.5.19.F.3** of the Zoning Ordinance, the applicant provided a concept plan (i.e. "Sketch Development Plan") demonstrating that it is possible to develop the property in conformity with the standards applicable to the requested zoning designation. Any site development plan/preliminary plat must conform to Zoning Ordinance 4400, adopted on July 14th, 2022. This request for rezoning simply establishes entitlements under the zoning ordinance, not a vested right to develop the site as depicted in the concept plan.

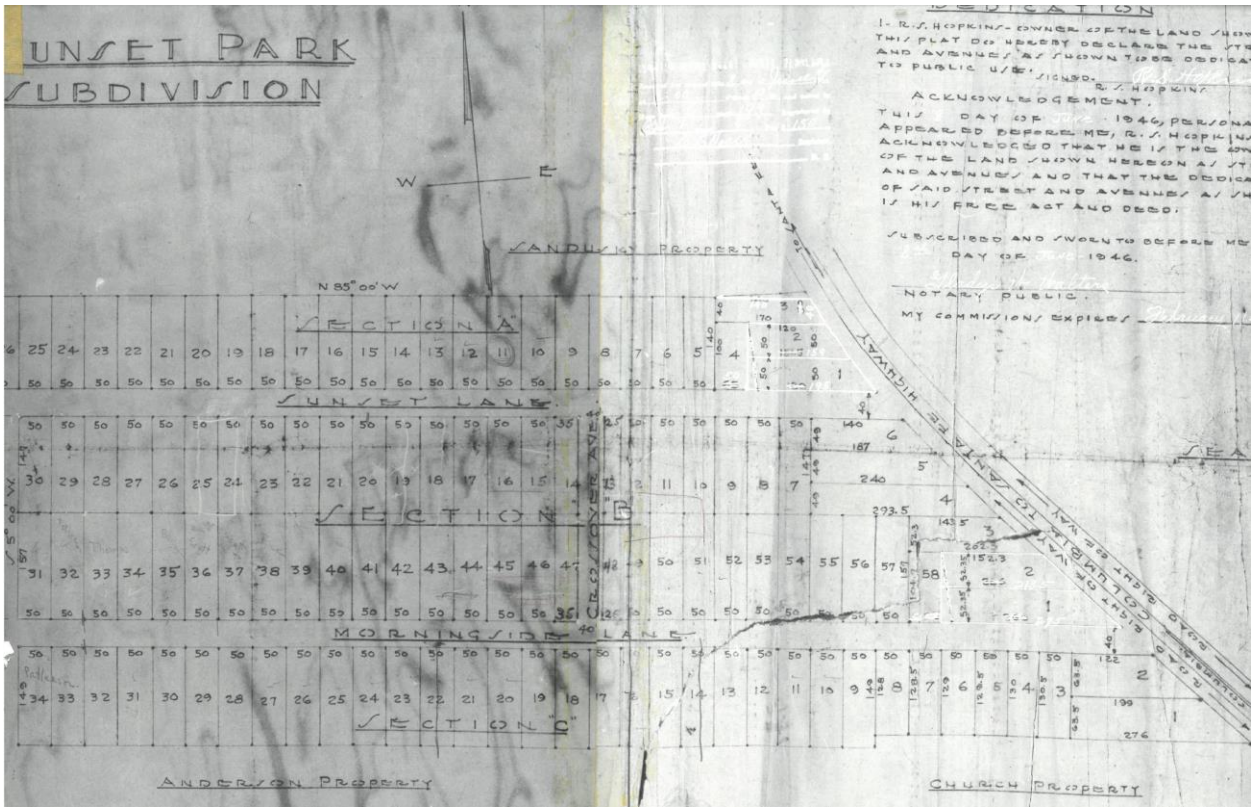
Lots, Building Sites & Bulk Standards

- **The concept plan depicts single family lots which generally conform to the CD-4 bulk standards listed in Table 4.3.1-D of the Zoning Ordinance.**
    - The Ordinance requires a minimum lot width of 50' for a single family home.
    - The Ordinance prescribes setbacks of:
        - 6' minimum and 20' maximum front setback principal and secondary frontages;
        - 6' side setback; and
        - 3' rear setback, measured from the rear property line; or 15' from the centerline of rear alley as applicable.
    - The applicant's concept proposes the creation of eighteen lots which conform to the minimum lot width and could accommodate homes conforming to the setbacks.



Conceptual Lots Conform to CD-4 Standards

- **The CD-4 lot standards extend the established pattern of Columbia**
    - The concept plan depicts development of the infill site with a 550-foot extension of Morningside Lane beyond its current terminus.
    - The Sunset Park Subdivision established 50-foot wide lots enfronting Morningside Lane and Sunset Lane, which run parallel to each other.
    - The single-family standards of the CD-4 character district are compatible with the established pattern of the surrounding neighborhood. The development depicted in the concept plan effectively extends the Sunset Park Subdivision through the subject site.



The standards of the requested zone are compatible with the lot dimensions of the surrounding neighborhood as established by the 1946 Sunset Park Subdivision Plat

Other Standards

- Conformity with other requirements of the Ordinance, including tree preservation, Civic Space, and design prescriptions will be reviewed at the time of preliminary plat or building permit as applicable.

REVIEW PROCESS

The Development Review Committee evaluated the proposed rezoning at its October 2023 meeting, as directed by **§8.3.7** of the Zoning Ordinance. Technical comments are provided in the agenda package.

Section **8.5.19** of the Zoning Ordinance directs the Planning Commission to review and make a recommendation on all proposed changes to the Official Zoning Map. The Planning Commission is the recommending body for rezonings under **§ 8.3.3.B.3** of the Zoning Ordinance.

Section **8.5.19.H.4** of the Zoning Ordinance establishes the review criteria for approval of all changes to the Official Zoning Map:

a. The Rezoning is consistent and not in conflict with the Comprehensive Plan or other applicable approved local plans for the area;
b. It has been determined that the legal purposes for which zoning exists, as set forth in Section 1.5 [, are not contravened]; [1]
c. It has been determined that there will be no adverse effect upon Adjoining property owners unless such effect can be justified by the overwhelming public good or welfare;
d. It has been determined that no one property owner or small group of property owners will benefit materially from the change to the detriment of the general public;
e. It has been determined that conditions affecting the area have changed to a sufficient to warrant the Zoning Map Amendment or that the existing zoning of the property was the result of a mistake;
f. It has been determined that adequate school, road, parks, wastewater treatment, water supply, and stormwater drainage facilities are available

SUMMARY OF DEVELOPMENT REVIEW COMMITTEE COMMENTS

The DRC reviewed this proposal at its October 2023 meeting. A full list of comments, and the applicant's responses, is provided in the agenda packet. Some key comments are noted below.

- **Planning** asked the applicant to provide a narrative response to criterion **8.5.19.H.4(e)** explaining why the applicant believes conditions affecting the area have changed sufficiently to warrant the Zoning Map Amendment. This request is intended to aid the Planning Commission in its analysis of the requested change to zoning map.

[1] Ordinance 4400 contains this incomplete sentence. The previous ordinance contained a nearly identical list of criteria at § 3.18.7.B. The corresponding criterion in Ordinance 3638 read "the legal purposes for which zoning exists are not contravened."

- Planning requested a legal description of the smaller of the two parcels which compose the subject site.
- Planning also made a number of advisory comments. Specifically, planning staff noted that the design of homes for the lots will need to conform to the CD-4 standards at the time of building permit.
- Planning also advised the applicant to prepare to answer questions from the Commission and the community related to compatibility and character.
- **Wastewater** noted that sewer upgrades may be required at the time Site Development Plan and Preliminary Plat.
- Columbia Water System's (**CPWS**) consultant (Inflow) noted that water is available for the site and that a water availability letter was issued on September 15th.

COMMENTARY FROM PROFESSIONAL PLANNING STAFF

The requested CD-4 zoning is consistent with Connect Columbia. The subject site's future land use classification is Urban Neighborhood. The future land use classification is implemented by the CD-4 and CD-5 character districts, as well as PUDs.

Conditions affecting the area may have changed to a sufficient degree to warrant the Zoning Map Amendment. The comprehensive plan and the zoning ordinance encourage infill development. The subject property is located well inside the urbanized area of Columbia with existing services. The lot standards of the requested character district mimic the pattern of residential development established in 1946. The proposed rezoning allows the development of the property in a manner consistent with the comprehensive plan and compatible with adjacent residential properties.

SAMPLE MOTIONS

Approve:

Move to find, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in section **8.5.19.H** of the City of Columbia Zoning Ordinance have been satisfied and recommend approval of the proposed rezoning *[, subject to technical comments and other conditions presented by planning staff*].

Approve Subject to Conditions:

Move to find, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in section **8.5.19.H** of the City of Columbia Zoning Ordinance have been satisfied and recommend approval of the proposed rezoning, subject to the following conditions: [*list conditions of approval crafted by Planning Commission*].

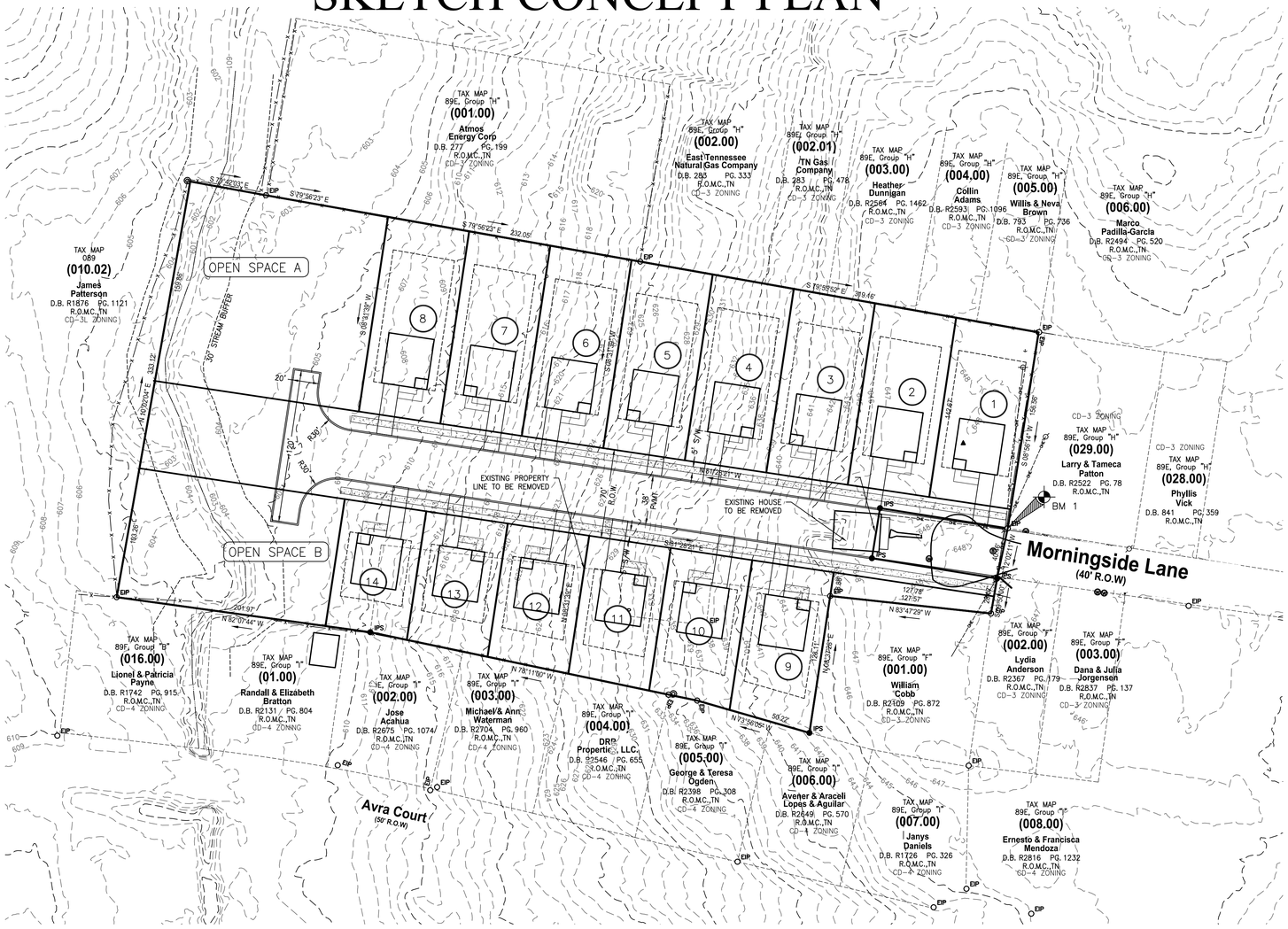
Deny:

Move to recommend denial of the requested rezoning having found, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in section **8.5.19.H** of the City of Columbia Zoning Ordinance are not satisfied [*list specific reasons for denial*].

Defer:

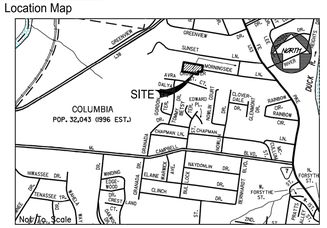
Move to find that there is insufficient information to decide, defer the matter to the next regularly scheduled meeting of the Planning Commission, and request that the [*applicant/staff*] provide: [*list additional information*] for review at a future meeting.

SKETCH CONCEPT PLAN





Location Map



SITE DATA:

OWNER: JACK POGUE, TRUSTEE
P.O. BOX 384
COLUMBIA, TN 38402

PARCEL NUMBER: TAX MAP 89E, GRP F, PARCEL 01.01
DEED BOOK: R2733, PG 1478

SUBJECT PARCEL ZONING: REQUEST CD-3, CURRENT CD-3L

ACREAGE OF SITE: 4.78 ACRES
(PROPOSED 47,745.95 S.F. - 1.10 Ac. RIGHT OF WAY DEDICATION)

MINIMUM REQUIRED BUILDING SETBACKS:
6' MIN - 20' MAX FRONT
3' MIN - REAR
6' MIN - SIDE

UTILITY SERVICES: WATER SERVICE
COLUMBIA POWER & WATER SYSTEMS
201 PICKENS LANE
COLUMBIA, TENNESSEE 38401
(931) 388-4833

ELECTRIC SERVICE
COLUMBIA POWER & WATER SYSTEMS
201 PICKENS LANE
COLUMBIA, TENNESSEE 38401
(931) 388-4833

PURPOSE NOTE: CONSTRUCT 548.54 L.F. OF ROADWAY AND PROVIDE 18 RESIDENTIAL LOTS.

NOTES:

1. INSTALLATION OF HVAC EQUIPMENT IN P.U.D.E.'s WITH BURIED PIPES IS PROHIBITED.
2. ALL DRAINAGE SWALES AND BERMS TO BE MAINTAINED BY INDIVIDUAL HOMEOWNERS.

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RANEY POGUE
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COLUMBIA, TN 38402
931-215-1299

REVISIONS	DATE
ADDRESSED STAFF COMMENTS	10/12/23
Revised to Demonstrate CD-3	1/3/24

BENCHMARK

BENCHMARK #1
IRON PIN
ELEV = 647.69'
N = 474,645.74
E = 1,657,815.38
TENNESSEE COORDINATE
SYSTEM OF 1983
NAVD 88

WARNING! UTILITY LINES!

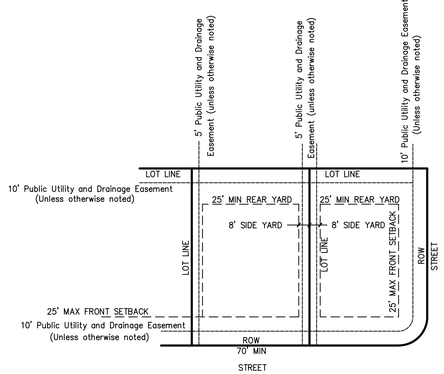
THE CONTRACTOR WILL EXERCISE EXTREME CAUTION IN THE USE OF EQUIPMENT IN AND AROUND OVERHEAD AND UNDERGROUND UTILITY WIRES AND SERVICES. IF AT ANY TIME IN THE PURSUIT OF THIS WORK THE CONTRACTOR MUST WORK IN CLOSE PROXIMITY OF OVERHEAD OR UNDERGROUND SERVICES, THE UTILITY COMPANY SHALL BE CONTACTED PRIOR TO SUCH WORK AND THE PROPER SAFETY MEASURES TAKEN. A THOROUGH EXAMINATION OF THE OVERHEAD WIRES IN THE PROJECT AREA SHOULD BE MADE BY THE CONTRACTOR PRIOR TO THE INITIATION OF CONSTRUCTION. THE UNDERGROUND UTILITY LINES HAVE BEEN SHOWN AS BEST AS CAN BE DETERMINED AT THIS TIME FROM THE INFORMATION OBTAINED FROM THE SURVEY. THE CONTRACTOR SHALL CONTACT EACH OF THESE COMPANIES PRIOR TO BEGINNING CONSTRUCTION AND HAVE THEM DETERMINE THE EXACT LOCATION AND TYPE OF THEIR SERVICES.

Tennessee811
Know what's below
Call before you dig.

LEGEND

	EXISTING	PROPOSED
WATER MAIN		
SANITARY SEWER		
STORM SEWER		
OVERHEAD		
FENCE		
GAS		
DRAINAGE DITCH		
TREE PROTECTION FENCE		
SIGN		
UTILITY POLE		
IRON PIN SET		
EXISTING IRON PIN		
CONCRETE MONUMENT		
DECIDUOUS TREE		
GATE VALVE IN BOX		
LIGHT POLE		
BENCHMARK		

TREE LINE
STORM STRUCTURE LABEL (ST)
ASPHALT
CONCRETE
PARKING SPACES (14)



SUBDIVISION TYPICAL LOT LAYOUT

LOT AREA TABLE

LOT #	AREA S.F.	AREA Ac.
1	7,171.2	0.16
2	7,167.1	0.16
3	7,234.4	0.17
4	7,301.7	0.17
5	7,368.9	0.17
6	7,436.2	0.17
7	7,503.4	0.17
8	7,570.3	0.17
9	7,637.2	0.18
10	7,704.1	0.18
11	7,771.0	0.18
12	6,229.7	0.14
13	5,913.4	0.14
14	5,708.2	0.13
15	5,564.1	0.13
16	5,419.7	0.12
17	5,275.3	0.12
18	5,130.9	0.12

OPEN SPACE

OPEN SPACE	AREA S.F.	AREA Ac.
A	20,608.5	0.47
B	20,931.0	0.48

OPEN SPACE NOTE:

ALL OPEN SPACE AREA IS TO BE MAINTAINED BY THE HOMEOWNERS ASSOCIATION, CREATED FOR THE PURPOSE OF MAINTAINING ALL COMMON OPEN SPACE AND GROUNDS INCLUDING THE DETENTION AREAS SHOWN ON THIS PLAT.

GRAPHIC SCALE

50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

GEOTECHNICAL NOTE:

CONTRACTOR TO COMPLETE A GEOTECHNICAL STUDY CONDUCTED ON THIS SITE PRIOR TO COMINCEMENT OF CONSTRUCTION. THE DESIGN FOR THE SITE IMPROVEMENTS SHOWN ON THIS PLAN HAVE RELIED ON GENERAL INFORMATION FROM FIELD REVIEW OF EXISTING TERRAIN. IF, IN THE PURSUIT OF THIS WORK BY THE CONTRACTOR, CONDITIONS OR CIRCUMSTANCES ARE ENCOUNTERED THAT ARE DIFFERENT THAN REFLECTED IN THESE PLANS OR THAT APPEAR TO IMPACT THE SCOPE OF THE WORK, THE CONTRACTOR WILL IMMEDIATELY NOTIFY THE CIVIL ENGINEER, THE GEOTECHNICAL ENGINEER AND THE OWNER/DEVELOPER. BEFORE ANY REMEDIAL COURSE OF ACTION OR DESIGN CHANGE IS INITIATED, ALL PARTIES TO THE PROCESS (OWNER, CIVIL ENGINEER, GEOTECHNICAL ENGINEER, AND CONTRACTOR) MUST BE IN AGREEMENT AND THE MAGNITUDE OF THE COST/TIME REQUIRED FOR THE MEASURES ESTABLISHED.

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BOUNDARY & TOPOGRAPHIC SURVEY PROVIDED BY:

W.E.S. ENGINEERS AND SURVEYORS
2486 NASHVILLE HWY
COLUMBIA, TENNESSEE 38401
(931) 388-2329

FLOOD STUDY NOTE:

A PORTION OF THE PROPERTY IS LOCATED WITHIN A FLOOD HAZARD AREA AS PER FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAPS (FIRM's) MAP NUMBER 47117C0170E DATED APRIL 16, 2007.

GERALD W. VICK
REGISTERED ENGINEER
AGRICULTURE
NO. 107415
STATE OF TENNESSEE
SURVEYOR
NOT FOR CONSTRUCTION

getalc@wesengineers.com

SUBMITTED FOR MUNICIPAL APPROVAL
NOT FOR CONSTRUCTION

POGUE CONCEPT SKETCH

MORNINGSIDE LANE
COLUMBIA, MAURY COUNTY, TENNESSEE
SKETCH PLAN

Drawn: RP | Checked: GV | Approved: GV | Date: 9/18/23

Job no. 23544 | Scale: Vertical: 1"=50' Horizontal:

MP-1

FILE: J:\ WES_Engineers_Surveyors 2023\23544 – Morningside – Pogue\Dwg\Engineering\23544 Morningside_CD-3.dwg

CITY OF COLUMBIA
TENNESSEE

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, October 10, 2023

ITEM NO.
23-0379

DESCRIPTION: Request rezoning from CD-3L to CD-4 of +/- 4.28 acres.

RECOMMENDATION: For final recommendation please see staff report.

COMMENTS:

Planning

1. The lead staff person for this case is City Planner Kevin McCarthy, AICP; he will prepare the staff report for this item. Please contact kmccarthy@columbiatn.com with question about the development review process or technical comments.
2. Please add the proposed lot widths on the concept.
3. Please provide a narrative response to criterion 8.5.19.H.4(e) explaining why the applicant believes conditions affecting the area have changed sufficiently to warrant the Zoning Map Amendment.
4. Advisory: Consider providing a typical lot layout that includes a typical building footprint, driveway, and parking. It is not required at this point, but it is advisable to confirm that the site can accommodate lots which meet the applicant's goals and conform to the standards of the Zoning Ordinance.
5. Advisory: A current water availability letter is required throughout the entitlement process. The current letter will expire on January 13, 2024. Presuming a timely resubmittal to technical comments and a favorable recommendation from the planning Commission in November, the public hearing for this item will occur on January 11th. Any deferrals or delays will push the timeline beyond the currency of the water availability letter. The lead times for new letters can be long. Please monitor your progress and communicate with IDG and CPWS accordingly.
6. Advisory: Planning staff will place signs on the property and send certified letters to adjacent property owners on or before October 27th. Please be prepared to address any concerns regarding compatibility with the established pattern of the surrounding area.
7. Please provide legal description for TM 89E Group F Parcel 1.02

Fire

8. No comments

Building

9. No comments.

Police

10. No comments provided.

Maury County E911

11. No comment at this time.

Maury County Schools

12. No Comment.

Public Works

13. No comment.

Columbia Power

14. Columbia Power System has an existing power line near your proposed development. We are willing to serve this new development subject to all Columbia Power System policies and procedures in effect at actual time service is rendered provided an approved final plat and complete electrical load information is furnished as soon as possible prior to start of actual construction.
    • Unfortunately, due to current supply chain challenges, no timeframe can be guaranteed regarding the availability of meters or transformers appropriate for your development.

ATT

15. ___ ATT INTENDS TO SERVE. DEVELOPER TO REACH OUT TO ATT REGARDNG PATHWAY AND SUBSTRUCTURE NEEDED FOR PROJECT.

Engineering

16. No comments on rezoning.

Wastewater

17. Since the location of this parcel is in the Royal Oaks pump station sewer shed, upgrades are required for the existing sanitary sewer infrastructure in this basin.

Columbia Water

18. "A water availability letter was issued on September 15, 2023, it remains valid for 120 days. The availability of capacity to serve is based on a determination by the Fire Marshal of fire flow requirements and the information submitted on the Water Service Availability Request application. Any off-site improvements detailed in the availability letter are the responsibility of the developer/owner. All public water system improvements are subject to the preparation and approval of detailed construction plans prepared in accordance with CPWS and Tennessee Department of Environment and Conservation requirements."

Atmos Energy

19. No comments provided.

Duck River Electric Membership Corp

20. No comments provided.

Maury County Highway Dept.

21. No comments provided.

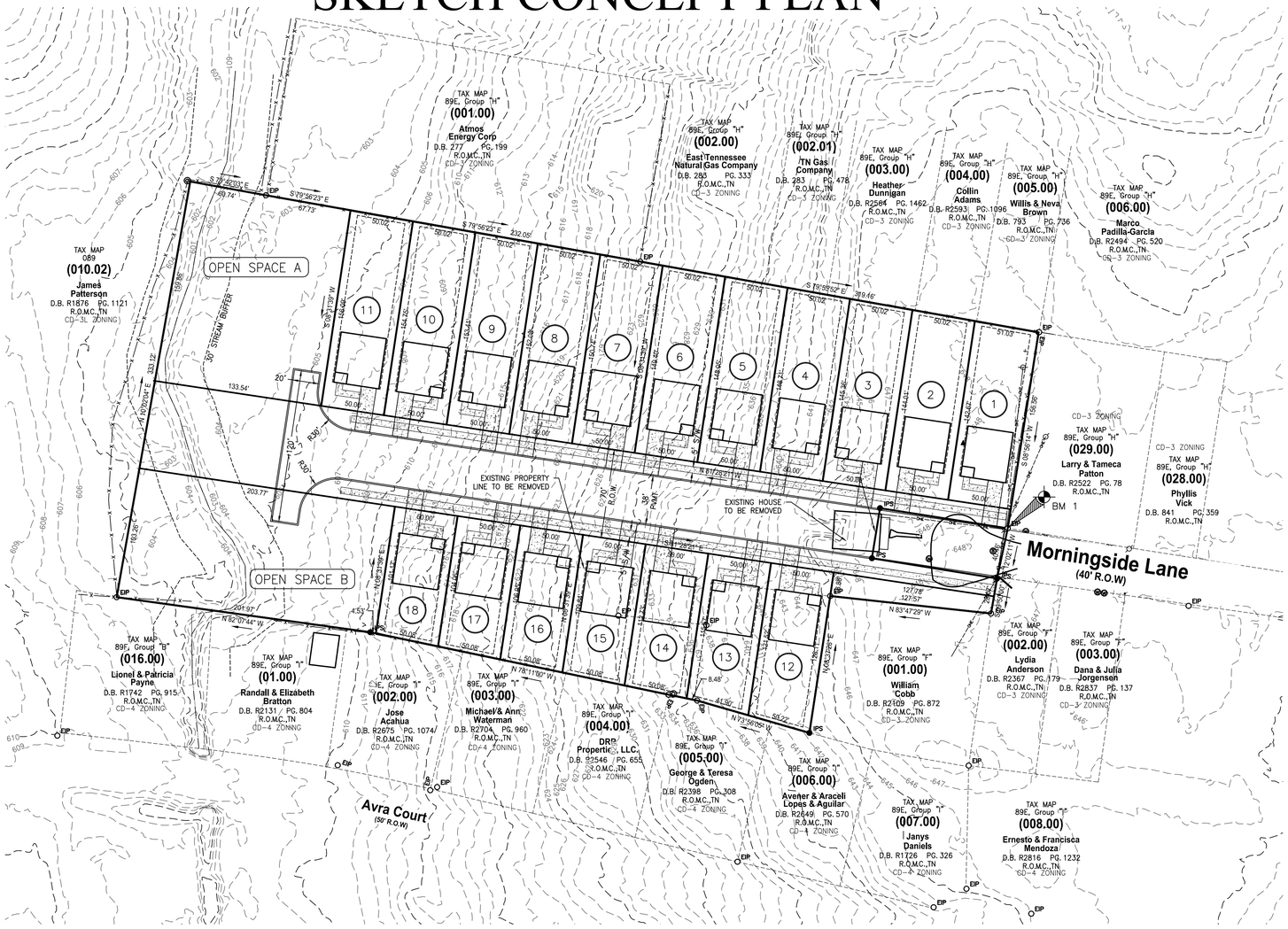
CPWS BB

22. Plan to serve.

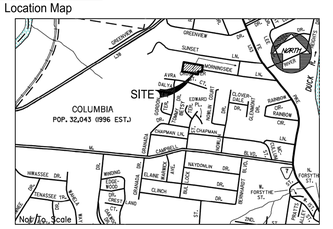
ATTACHMENTS: Concept Plan

NOTE: All submittals shall be compliant with City standards prior to Planning Commission review. Items that are not adhering to the regulations and/or comments for that request will not be forwarded to the next agenda until such items are amended.

SKETCH CONCEPT PLAN



Location Map



SITE DATA:

OWNER: JACK POGUE, TRUSTEE
P.O. BOX 384
COLUMBIA, TN 38402

PARCEL NUMBER: TAX MAP 89E, GRP F, PARCEL 01.01
DEED BOOK: R2733, PG 1478

SUBJECT PARCEL ZONING: REQUEST CD-4, CURRENT CD-3L

ACREAGE OF SITE: 4.78 ACRES
(PROPOSED 47,745.95 S.F. - 1.10 Ac. RIGHT OF WAY DEDICATION)

MINIMUM REQUIRED BUILDING SETBACKS:
6' MIN - 20' MAX FRONT
3' MIN - REAR
6' MIN - SIDE

UTILITY SERVICES: WATER SERVICE
COLUMBIA POWER & WATER SYSTEMS
201 PICKENS LANE
COLUMBIA, TENNESSEE 38401
(931) 388-4833

ELECTRIC SERVICE
COLUMBIA POWER & WATER SYSTEMS
201 PICKENS LANE
COLUMBIA, TENNESSEE 38401
(931) 388-4833

PURPOSE NOTE: CONSTRUCT 548.54 L.F. OF ROADWAY AND PROVIDE 18 RESIDENTIAL LOTS.

NOTES:

1. INSTALLATION OF HVAC EQUIPMENT IN P.U.D.E.'s WITH BURIED PIPES IS PROHIBITED.
2. ALL DRAINAGE SWALES AND BERMS TO BE MAINTAINED BY INDIVIDUAL HOMEOWNERS.

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WES ENGINEERS & SURVEYORS
CIVIL ENGINEERS & LAND SURVEYORS
2486 NASHVILLE HIGHWAY
COLUMBIA, TN 38401
PHONE: (931) 388-2329
www.wesengineers.com
ENGINEERS & SURVEYORS

Client
RAINEY POGUE
P.O. BOX 384
COLUMBIA, TN 38402
931-215-1299

REVISIONS	DATE
ADDRESSED STAFF COMMENTS	10/12/23

Drawn: RP
Checked: GV
Approved: GV
Date: 9/18/23

Job. no. 23544
Scale:
Vertical: 1"=50
Horizontal:

MP-1

POGUE CONCEPT SKETCH

MORNINGSIDE LANE
COLUMBIA, MAURY COUNTY, TENNESSEE
SKETCH PLAN

BENCHMARK

BENCHMARK #1
IRON PIN
ELEV = 647.69'
N = 474,645.74
E = 1,657,815.38
TENNESSEE COORDINATE
SYSTEM OF 1983
NAVD 88

WARNING! UTILITY LINES!

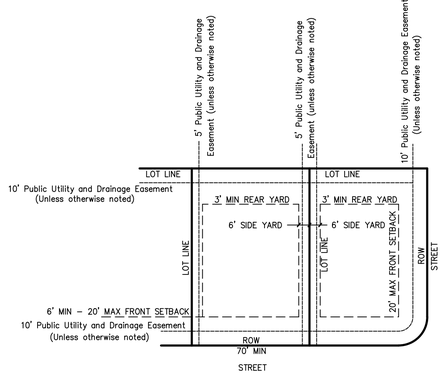
THE CONTRACTOR WILL EXERCISE EXTREME CAUTION IN THE USE OF EQUIPMENT IN AND AROUND OVERHEAD AND UNDERGROUND UTILITY WIRES AND SERVICES. IF AT ANY TIME IN THE PURSUIT OF THIS WORK THE CONTRACTOR MUST WORK IN CLOSE PROXIMITY OF OVERHEAD OR UNDERGROUND SERVICES, THE UTILITY COMPANY SHALL BE CONTACTED PRIOR TO SUCH WORK AND THE PROPER SAFETY MEASURES TAKEN. A THOROUGH EXAMINATION OF THE OVERHEAD WIRES IN THE PROJECT AREA SHOULD BE MADE BY THE CONTRACTOR PRIOR TO THE INITIATION OF CONSTRUCTION. THE UNDERGROUND UTILITY LINES HAVE BEEN SHOWN AS BEST AS CAN BE DETERMINED AT THIS TIME FROM THE INFORMATION OBTAINED FROM THE SURVEY. THE CONTRACTOR SHALL CONTACT EACH OF THESE COMPANIES PRIOR TO BEGINNING CONSTRUCTION AND HAVE THEM DETERMINE THE EXACT LOCATION AND TYPE OF THEIR SERVICES.

Tennessee811
Know what's below
Call before you dig.

LEGEND

	EXISTING	PROPOSED
WATER MAIN		
SANITARY SEWER		
STORM SEWER		
OVERHEAD		
FENCE		
GAS		
DRAINAGE DITCH		
TREE PROTECTION FENCE		
SIGN		
UTILITY POLE		
IRON PIN SET		
EXISTING IRON PIN		
CONCRETE MONUMENT		
DECIDUOUS TREE		
GATE VALVE IN BOX		
LIGHT POLE		
BENCHMARK		

TREE LINE
STORM STRUCTURE LABEL (INT)
ASPHALT
CONCRETE
PARKING SPACES (14)



SUBDIVISION TYPICAL LOT LAYOUT

LOT AREA TABLE

LOT #	AREA S.F.	AREA Ac.
1	7,171.2	0.16
2	7,167.1	0.16
3	7,234.4	0.17
4	7,301.7	0.17
5	7,368.9	0.17
6	7,436.2	0.17
7	7,503.4	0.17
8	7,570.3	0.17
9	7,637.2	0.18
10	7,704.1	0.18
11	7,771.0	0.18
12	6,229.7	0.14
13	5,913.4	0.14
14	5,708.2	0.13
15	5,564.1	0.13
16	5,419.7	0.12
17	5,275.3	0.12
18	5,130.9	0.12

OPEN SPACE

OPEN SPACE	AREA S.F.	AREA Ac.
A	20,608.5	0.47
B	20,931.0	0.48

OPEN SPACE NOTE:

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(IN FEET)
1 inch = 50 ft.

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GERALD W. VICK
REGISTERED
AURICE
ENGINEER
No. 107415
STATE OF TENNESSEE

geraldv@wesengineers.com

SUBMITTED FOR MUNICIPAL APPROVAL
NOT FOR CONSTRUCTION

FILE: J:_WES_Engineers_Surveyors 2023\23544 – Morningside – Pogue\Dwg\Engineering\23544 Morningside_base.dwg

October 16, 2023

City of Columbia
Development Services
700 North Garden Street
Columbia, TN 38401

RE: Project Name: 156 Morningside Lane (Rainey Pogue) 23-0379
City of Columbia Planning Commission Resubmittal

On behalf of Jack H Pogue Living Trust ETAL, c/o Rainey Pogue, the owner for the property proposed for rezoning, WES Engineers & Surveyors would like to request for rezoning and Concept Plan to the City of Columbia for Planning Commission approval. Comments are addressed in green.

Planning

2. Please add the proposed lot widths on the concept.
   Proposed lot widths (proposed dimensions) have been added to the concept.

3. Please provide a narrative response to criterion 8.5.19.H.4(e) explaining why the applicant believes conditions affecting the area have changed sufficiently to warrant the Zoning Map Amendment.
   e. It has been determined that conditions affecting the area have changed to sufficient to warrant the Zoning Map Amendment or that the existing zoning of the property was the result of a mistake.

   It would be the belief of the property owner that this property was mistakenly zoned CD-3L and the appropriate zoning would be CD-4 as requested. This property is a part of an existing neighborhood that includes predominately small residential lots with 50-ft fronts. A proposed zoning of CD-4 allows single family detached lots with 50-ft fronts as established in the neighborhood. Additionally, the properties directly to the south of this property as well as in that portion of the neighborhood community are presently zoned CD-4. The included concept demonstrates the proposed zoning being designed for single family, detached homes on lots that are proposed to be 50-ft in width.

4. Please provide metes and bounds legal description for TM 89E Group F Parcel 1.02.
   The deed for this parcel has been provided as a part of the resubmittal.

5. Advisory: Consider providing a typical lot layout that includes a typical building footprint, driveway, and parking. It is not required at this point, but it is advisable to confirm that the site can accommodate lots which meet the applicant's goals and conform to the standards of the Zoning Ordinance.
   A prototypical lot layout has been applied to the proposed lots as dimensioned on the concept.

6. Advisory: A current water availability letter is required throughout the entitlement process. The current letter will expire on January 13, 2024. Presuming a timely resubmittal to technical comments and a favorable recommendation from the planning Commission in November, the public hearing for this item will occur on January 11th. Any deferrals or delays will push the timeline beyond the currency of the water availability letter. The lead times for new letters can be long. Please monitor your progress and communicate with IDG and CPWS accordingly.
   We will watch the timing of this along with the resubmittal / approval process going forward. Thank you

7. Advisory: Planning staff will place signs on the property and send certified letters to adjacent property owners on or before October 27th. Please be prepared to address any concerns regarding compatibility with the established pattern of the surrounding area.
   Understood, I have shared these comments with the property owner's representative to make them aware of this.

Columbia Power

14. Columbia Power System has an existing power line near your proposed development. We are willing to serve this new development subject to all Columbia Power System policies and procedures in effect at actual time service is rendered provided an approved
    final plat and complete electrical load information is furnished as soon as possible prior to
    start of actual construction. Unfortunately, due to current supply chain challenges, no timeframe can be guaranteed regarding the availability of meters or transformers appropriate
    for your development.
    Noted, thank you.

ATT

15. AT&T INTENDS TO SERVE. DEVELOPER TO REACH OUT TO ATT REGARDNG PATHWAY AND SUBSTRUCTURE NEEDED FOR PROJECT.
    Noted, thank you.

Wastewater

17. Since the location of this parcel is in the Royal Oaks pump station sewer shed, upgrades are required for the existing sanitary sewer infrastructure in this basin.
    Noted, thank you.

Columbia Water

18. "A water availability letter was issued on September 15, 2023, it remains valid for 120 days. The availability of capacity to serve is based on a determination by the Fire Marshal of fire flow requirements and the information submitted on the Water Service Availability Request application. Any off-site improvements detailed in the availability letter are the responsibility of the developer/owner. All public water system improvements are subject to the preparation and approval of detailed construction plans prepared in accordance with CPWS and Tennessee Department of Environment and Conservation requirements." Water availability has been received and a copy has been included with the resubmittal.

If you have any questions or comments with this submittal, please do not hesitate to contact me directly.

Sincerely,
WES Engineers & Surveyors



Gerald W. Vick, PE
Principal

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, October 10, 2023

ITEM NO.
23-0379

DESCRIPTION: Request rezoning from CD-3L to CD-4 of +/- 4.28 acres.

RECOMMENDATION: For final recommendation please see staff report.

COMMENTS:

Planning

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8. No comments

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10. No comments provided.

Maury County E911

11. No comment at this time.

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Duck River Electric Membership Corp

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21. No comments provided.

CPWS BB

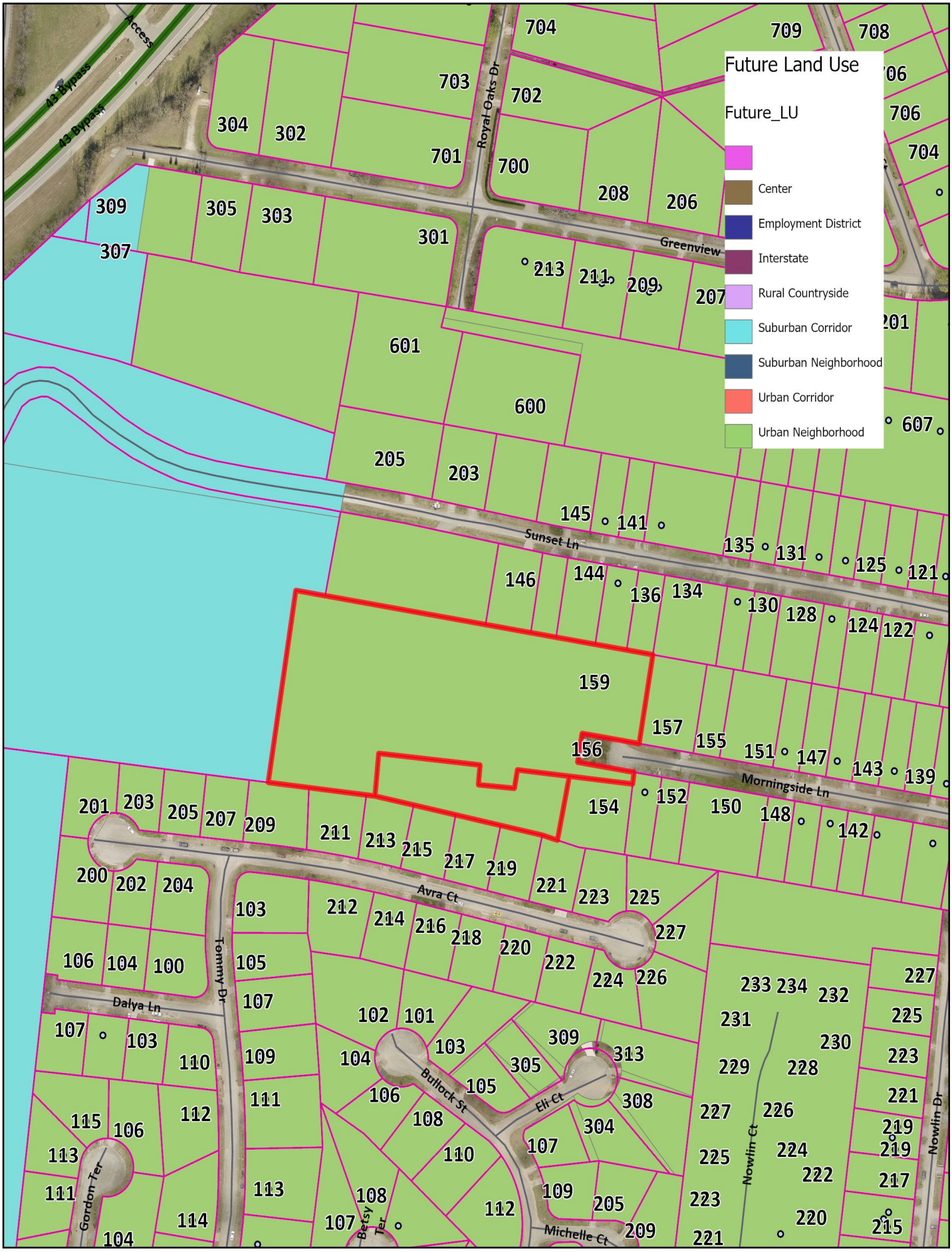
22. Plan to serve.

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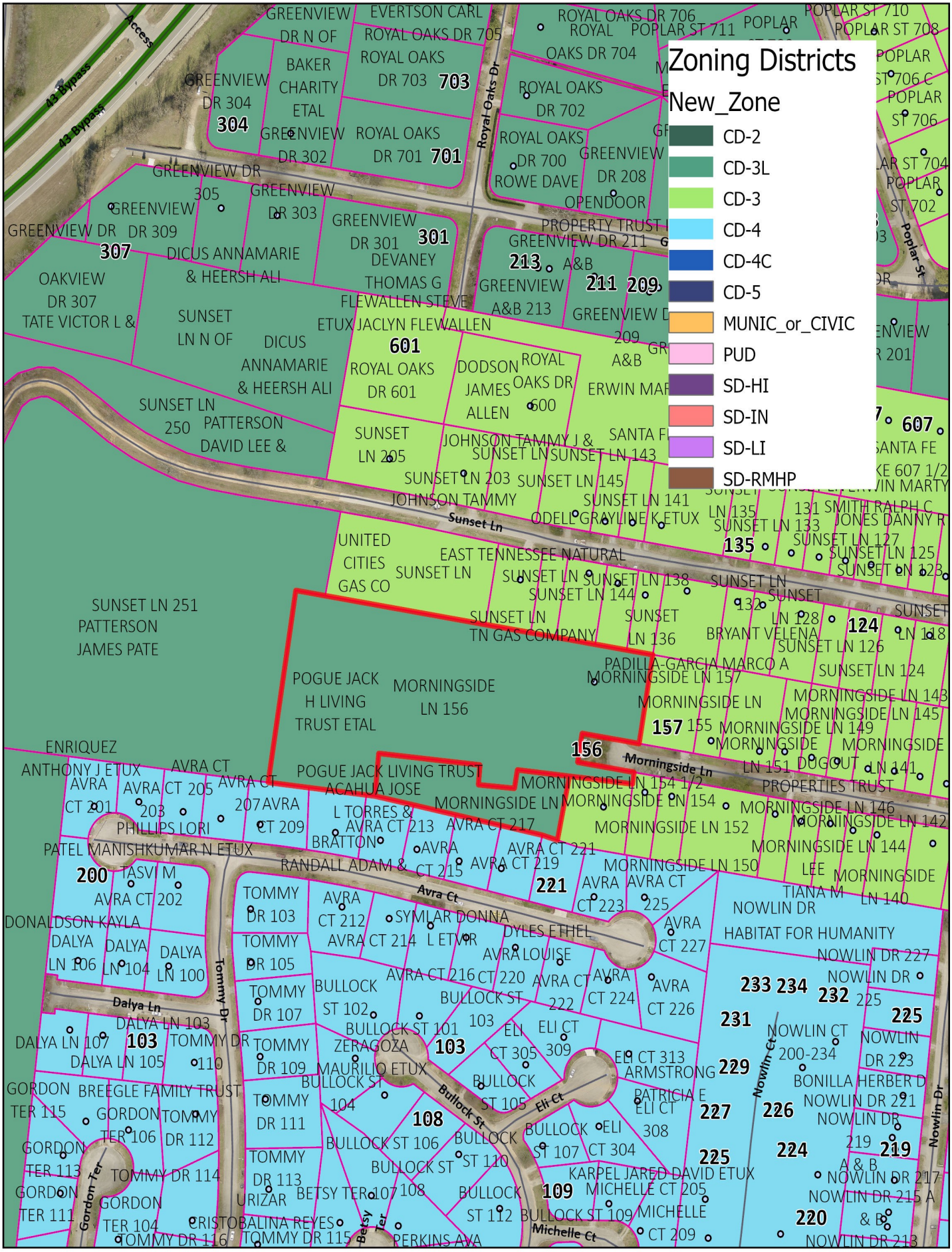
Current Enrollment / Capacity

	Facility Name	Date Constructed	Sq. Ft.	Acreage	Capacity	Current Enrollment	Capacity Used
Elementary	Baker	1960	43,920	12	340	325	95.6%
	Battle Creek	2019	90,000	30	700	609	87.0%
	Brown	1968	56,720	20	405	350	86.4%
	Highland	1986	47,800	4.5	380	303	79.7%
	Howell	1999	81,600	17.5	700	642	91.7%
	Mt. Pleasant	1978	80,021	22	630	565	89.7%
	Riverside	1984	71,150	14	500	414	82.8%
	Spring Hill	1984	69,000	10	540	442	81.9%
	Woodard	1990	76,200	17	600	563	93.8%
	Wright	2005	97,765	18	740	633	85.5%
					5535	***4846***	***87.6%***
Middle	Battle Creek	2019	125,000	45	900	693	77.0%
	Cox	1997	137,200	25	900	647	71.9%
	Mt. Pleasant	2001	113,938	29.2	550	415	75.5%
	Spring Hill	2010	158,106	39.49	950	522	54.9%
	Whitthorne	1979	175,600	17	1050	912	86.9%
					4350	***3189***	***73.3%***
High	Central	2016	296,740	55	1700	1412	83.1%
	Mt. Pleasant	1969	110,759	31	600	400	66.7%
	Spring Hill	1993	181,800	57	1200	1158	96.5%
					3500	***2970***	***84.9%***
Unit	Culleoka	1969	205,800	34	1020	903	88.5%
	Hampshire	1978	83,410	13.12	500	406	81.2%
	Santa Fe	1964	94,225	24	650	532	81.8%
					2170	***1841***	***84.8%***
Other	Central Office	1960	15,400	1.5			
	College Hill	1958	42,211	2.26		139	
	Maintenance	1987	9,400	4.7			
	McDowell		46,165	7			
			2,509,930	**550.27**	**15555**	**12985**	



23-0379
TM 89E Group F Parcels 1.01 & 1.02
Morningside Lane

CITY OF COLUMBIA TENNESSEE
DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

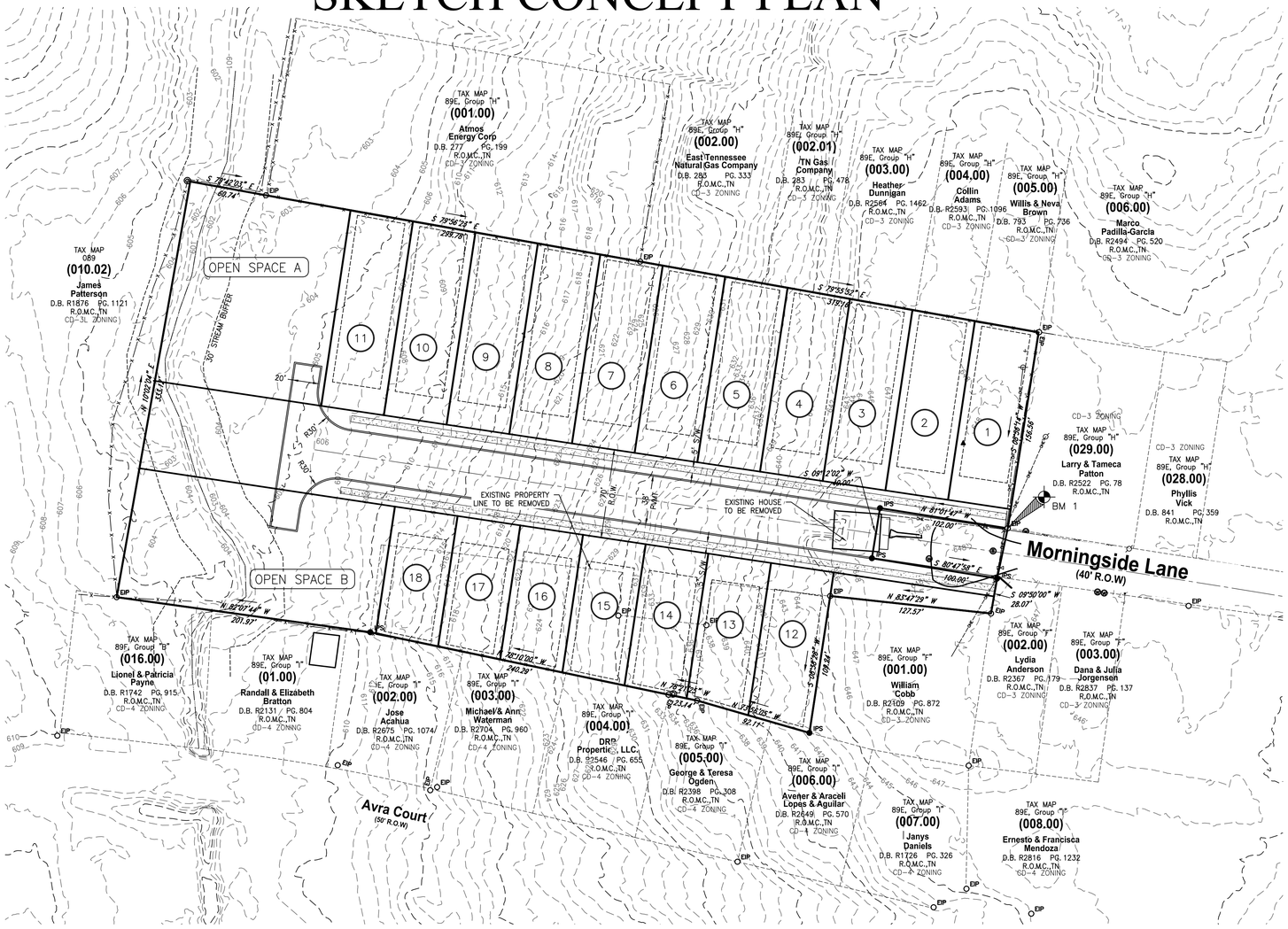


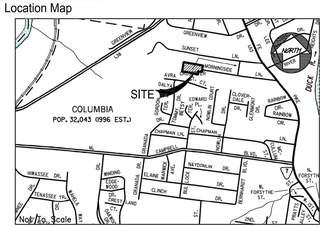
23-0379
TM 89E Group F Parcels 1.01 & 1.02
Morningside Lane

CITY OF COLUMBIA TENNESSEE

DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

SKETCH CONCEPT PLAN





© 2023

SITE DATA:

OWNER: JACK POGUE, TRUSTEE
P.O. BOX 384
COLUMBIA, TN 38402

PARCEL NUMBER: TAX MAP 89E, GRP F, PARCEL 01.01
DEED BOOK: R2733, PG 1478

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(PROPOSED 47,745.95 S.F. - 1.10 Ac. RIGHT OF WAY DEDICATION)

MINIMUM REQUIRED BUILDING SETBACKS:
6' MIN - 20' MAX FRONT
3' MIN - REAR
6' MIN - SIDE

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PURPOSE NOTE: CONSTRUCT 548.54 L.F. OF ROADWAY AND PROVIDE 18 RESIDENTIAL LOTS.

NOTES:

1. INSTALLATION OF HVAC EQUIPMENT IN P.U.D.E.'s WITH BURIED PIPES IS PROHIBITED.
2. ALL DRAINAGE SWALES AND BERMS TO BE MAINTAINED BY INDIVIDUAL HOMEOWNERS.

WES ENGINEERS & SURVEYORS
CIVIL ENGINEERS & LAND SURVEYORS
2486 NASHVILLE HIGHWAY
COLUMBIA, TN 38401
PHONE: (931) 388-2329
www.wesengineers.com

ENGINEERS & SURVEYORS

Client
RAINEY POGUE
P.O. BOX 384
COLUMBIA, TN 38402
931-215-1299

REVISIONS	DATE

BENCHMARK

BENCHMARK #1
IRON PIN
ELEV = 647.69'
N = 474,645.74
E = 1,657,815.38
TENNESSEE COORDINATE
SYSTEM OF 1983
NAVD 88

WARNING! UTILITY LINES!

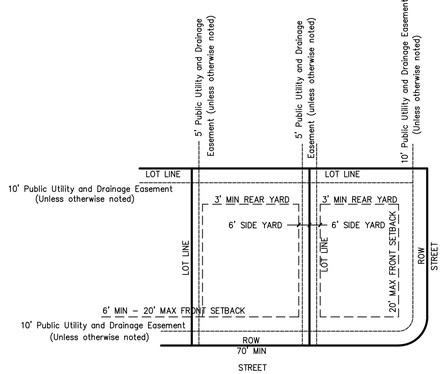
THE CONTRACTOR WILL EXERCISE EXTREME CAUTION IN THE USE OF EQUIPMENT IN AND AROUND OVERHEAD AND UNDERGROUND UTILITY WIRES AND SERVICES. IF AT ANY TIME IN THE PURSUIT OF THIS WORK THE CONTRACTOR MUST WORK IN CLOSE PROXIMITY OF OVERHEAD OR UNDERGROUND SERVICES, THE UTILITY COMPANY SHALL BE CONTACTED PRIOR TO SUCH WORK AND THE PROPER SAFETY MEASURES TAKEN. A THOROUGH EXAMINATION OF THE OVERHEAD WIRES IN THE PROJECT AREA SHOULD BE MADE BY THE CONTRACTOR PRIOR TO THE INITIATION OF CONSTRUCTION. THE UNDERGROUND UTILITY LINES HAVE BEEN SHOWN AS BEST AS CAN BE DETERMINED AT THIS TIME FROM THE INFORMATION OBTAINED FROM THE SURVEY. THE CONTRACTOR SHALL CONTACT EACH OF THESE COMPANIES PRIOR TO BEGINNING CONSTRUCTION AND HAVE THEM DETERMINE THE EXACT LOCATION AND TYPE OF THEIR SERVICES.

Tennessee811
Know what's below
Call before you dig.

LEGEND

	EXISTING	PROPOSED
WATER MAIN		
SANITARY SEWER		
STORM SEWER		
OVERHEAD		
FENCE		
GAS		
DRAINAGE DITCH		
TREE PROTECTION FENCE		
SIGN		
UTILITY POLE		
IRON PIN SET		
EXISTING IRON PIN		
CONCRETE MONUMENT		
DECIDUOUS TREE		
GATE VALVE IN BOX		
LIGHT POLE		
BENCHMARK		

TREE LINE
STORM STRUCTURE LABEL (RT)
ASPHALT
CONCRETE
PARKING SPACES (14)



SUBDIVISION TYPICAL LOT LAYOUT

LOT AREA TABLE

LOT #	AREA S.F.	AREA Ac.
1	7,171.2	0.16
2	7,167.1	0.16
3	7,234.4	0.17
4	7,301.7	0.17
5	7,368.9	0.17
6	7,436.2	0.17
7	7,503.4	0.17
8	7,570.3	0.17
9	7,637.2	0.18
10	7,704.1	0.18
11	7,771.0	0.18
12	6,229.7	0.14
13	5,913.4	0.14
14	5,708.2	0.13
15	5,564.1	0.13
16	5,419.7	0.12
17	5,275.3	0.12
18	5,130.9	0.12

OPEN SPACE

OPEN SPACE	AREA S.F.	AREA Ac.
A	20,608.5	0.47
B	20,931.0	0.48

OPEN SPACE NOTE:

ALL OPEN SPACE AREA IS TO BE MAINTAINED BY THE HOMEOWNERS ASSOCIATION, CREATED FOR THE PURPOSE OF MAINTAINING ALL COMMON OPEN SPACE AND GROUNDS INCLUDING THE DETENTION AREAS SHOWN ON THIS PLAT.

GRAPHIC SCALE

50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

GEOTECHNICAL NOTE:

CONTRACTOR TO COMPLETE A GEOTECHNICAL STUDY CONDUCTED ON THIS SITE PRIOR TO COMINCEMENT OF CONSTRUCTION. THE DESIGN FOR THE SITE IMPROVEMENTS SHOWN ON THIS PLAN HAVE RELIED ON GENERAL INFORMATION FROM FIELD REVIEW OF EXISTING TERRAIN. IF, IN THE PURSUIT OF THIS WORK BY THE CONTRACTOR, CONDITIONS OR CIRCUMSTANCES ARE ENCOUNTERED THAT ARE DIFFERENT THAN REFLECTED IN THESE PLANS OR THAT APPEAR TO IMPACT THE SCOPE OF THE WORK, THE CONTRACTOR WILL IMMEDIATELY NOTIFY THE CIVIL ENGINEER, THE GEOTECHNICAL ENGINEER AND THE OWNER/DEVELOPER. BEFORE ANY REMEDIAL COURSE OF ACTION OR DESIGN CHANGE IS INITIATED, ALL PARTIES TO THE PROCESS (OWNER, CIVIL ENGINEER, GEOTECHNICAL ENGINEER, AND CONTRACTOR) MUST BE IN AGREEMENT AND THE MAGNITUDE OF THE COST/TIME REQUIRED FOR THE MEASURES ESTABLISHED.

SITE BENCHMARK NOTE:

CONTRACTOR SHALL ESTABLISH A BENCHMARK PRIOR TO CONSTRUCTION. EXISTING BENCHMARK MUST BE RE-VERIFIED AND APPROVED BY THE ENGINEER/SURVEYOR PRIOR TO USE.

BOUNDARY & TOPOGRAPHIC SURVEY PROVIDED BY:

W.E.S. ENGINEERS AND SURVEYORS
2486 NASHVILLE HWY
COLUMBIA, TENNESSEE 38401
(931) 388-2329

FLOOD STUDY NOTE:

A PORTION OF THE PROPERTY IS LOCATED WITHIN A FLOOD HAZARD AREA AS PER FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAPS (FIRM's) MAP NUMBER 47117C0170E DATED APRIL 16, 2007.

GERALD W. VICK
REGISTERED
LICENSED
SURVEYOR
No. 107415
STATE OF TENNESSEE
9/18/23
geraldv@wesengineers.com

SUBMITTED FOR MUNICIPAL APPROVAL
NOT FOR CONSTRUCTION

POGUE CONCEPT SKETCH

MORNINGSIDE LANE
COLUMBIA, MAURY COUNTY, TENNESSEE
SKETCH PLAN

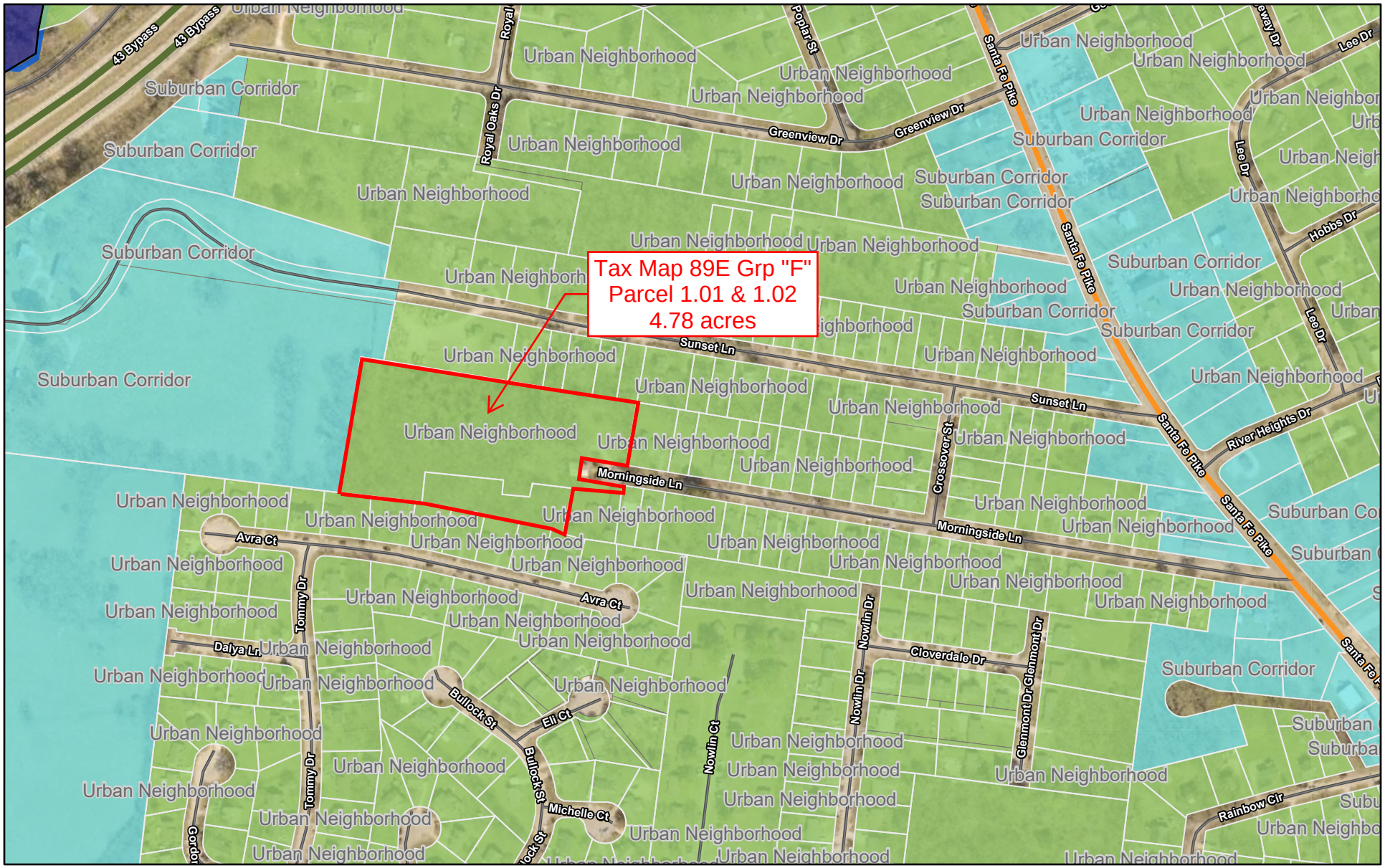
Drawn: RP | Checked: GV | Approved: GV | Date: 9/18/23

Job. no. 23544 | Scale: | Vertical: 1"=50 | Horizontal:

MP-1

FILE: J:_WES_Engineers_Surveyors 2023\23544 – Morningside – Pogue\Dwg\Engineering\23544 Morningside_base.dwg

Morningside Lane Future Land Use



September 15, 2023

1:4,000

0 0.03 0.07 0.13 mi

0 0.05 0.1 0.2 km

Morningside Lane Zoning



September 15, 2023

1:4,000

0 0.03 0.07 0.13 mi

0 0.05 0.1 0.2 km



Location Map



Surveyor's Notes

1. All distances were measured with E.D.M. equipment and have been adjusted for temperature and pressure, portions of the survey were done utilizing a Carlson BRX7, utilizing Base and Rover.
2. The property (Boundary) Line Survey exceeds the minimum requirements of an Urban Land Survey Category IV as per Standards of Practice adopted by the State Board of Examiners for Land Surveyors for the State of Tennessee, and the precision of the unadjusted survey is greater than 1 foot in 10,000 feet.
3. Information concerning site utility services and appurtenances shown hereon is based on visible evidence noted during the survey, information provided by utility representatives or information shown on original construction plans by other. Information and location of service lines on site should be considered approximate and there may be underground utility lines that are not shown on the survey. Owner(s) and contractor(s) should assume responsibility of locating all underground utility service lines prior to any construction, excavation or any disturbance of the existing ground elevation to avoid hazard of unnecessary expense.
4. Information concerning major utilities or appurtenances shown hereon are based on visible evidence noted during the survey or information provided by utility representatives. Verification of existence, size, location, depth and availability of service should be confirmed by local utility agencies.
5. The property shown hereon is located within the City of Columbia, Maury County, TN. All matters pertaining to construction, use location of improvements, signage, parking, noise, vibration, emissions, fire hazards, radiation, illumination, setback provisions, etc., are subject to City of Columbia's Zoning Regulation as interpreted and regulated by the Department of Planning and Codes.
6. The area of the parcel is as shown hereon.
7. This property currently identified as Tax Map No. 89E, Group "F", Parcel No. 001.01, 001.02, Maury County. For designation shown thus ( ) indicates Parcel Numbers for said map.
8. Plat reference: n/a
9. Deed reference: Book R2733, Page 1478, Book R2733, Page 1486
10. Bearings based on: Tennessee State Plane, Fipzone 4100.
11. This drawing was prepared in accordance with our field survey notes. It shows improvements as they exist to the best of our knowledge, but is not guaranteed to be correct in each and every detail.
12. This survey was prepared from current deeds of record and title search as provided by others and noted hereon.
13. This survey was prepared for the exclusive use of the person, persons, or entity, if any, named on the certification hereon. Said certificate does not extend to any unnamed person without an express re-certification by the surveyor naming said person.
14. The certification as provided on this survey, is purely a statement of professional opinion based on knowledge, information and belief, based on existing field evidence and documentary evidence provided by others.
15. The certification is not an expressed or implied warranty or guarantee.
16. The property as shown hereon is not located in a Special Flood Hazard Area as shown on F.E.M.A. Flood Insurance Rate Map, Community Panel No. 47119C0170E, dated April 16, 2007, as scaled graphically.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

Surveyor's Certification (Tennessee)

I hereby certify that this is a Category "IV" survey, meets or exceeds the Minimum Technical Standards for Land Surveyors, and the ratio of precision of the undjusted survey is greater than 1:10,000 as shown hereon, and was done in compliance with the current Minimum Technical Standards.

Allen B. O'Leary, TN RLS #1987 — Date: 7/21/23

I hereby certify this is a true and accurate survey and meets or exceeds the current Minimum Standards adn Applications of a Category IV (Remote Sensing) survey as defined in T.C.A. 0820-03-.07C(5).

Equipment:	Carlson BRX7, Base and Rover
Positional Accuracy:	HRMS =0.04 SD=0.008, VRMS=0.075 SD=0.013
Geoid:	NGS2012B
Date:	June 2023

Legend

EIP Iron Rod Found	Bench Mark	Catch Basin	Electric Riser	Power Pole	Adjoining Property Line	Edge of Water	OHE Overhead Electric Line
IPS Iron Rod Set	Stake Found	Curb Inlet	Telephone Riser	Flag Pole	Subject Property Line	Ditch / Creek Centerline	OHT Overhead Telephone Line
I.P.F. Iron Pipe Found	Fire Hydrant	Storm Pipe	Telephone Booth	Guy Wire	Easement Line	Minor Contour Line	UG Underground Utility Line
AXLE Axle Found	Water Meter	Cable Manhole	Gas Meter	Mailbox	Building Setback Line	Index Contour Line	UGC Underground Cable Line
Fence Post	Water Valve	Electric Manhole	Gas Valve	Parking Block	Centerline	Gas Line	UGE Underground Electric Line
ECM Concrete Monument Existing	Water Reducer	Telephone Manhole	Light Pole	Satellite Dish	Edge of Pavement	Sanitary Sewer Line	UGT Underground Telephone Line
P.K.F. PK Nail Found	Clean Out	Water Manhole	Power Pole	Handicap Parking	Edge of Gravel	Water Line	FM Forced Main Line
P.K.S. PK Nail Set	Sanitary Sewer Manhole	Electric Meter	Telephone Pole	Water Spigot	Fence Line	Storm Sewer Line	
R.R.S.F. Railroad Spike Found	Storm Sewer Manhole	Cable Riser	Guy Pole	Bollard	Landscape	Overhead Utility Line	
R.R.S.S. Railroad Spike Set					Woods / Tree line	Overhead Cable Line	

Evergreen Tree, Deciduous Tree, Bush, Sign

ALLEN B. O'LEARY — REGISTERED LAND SURVEYOR — AGRICULTURE — COMMERCE — TENNESSEE NO. 1987

allen@wesengineers.com

©2023

WES ENGINEERS & SURVEYORS
CIVIL ENGINEERS & LAND SURVEYORS
2486 NASHVILLE HIGHWAY
COLUMBIA, TN 38401
PHONE (931) 388-2329
www.wesengineers.com

Client
Rainey Pogue
P.O. BOX 384
Columbia, TN 38402
(931) 215-1299

PLAT OF SURVEY
Morningside Lane
Maury County, TN

DATE	REVISIONS

Drawn: B.O
Checked:
Approved:
Date: July 23, 2023

Job. no. 23544
Scale:
Vertical:
Horizontal:

FILE:J:\WES_Engineers_Surveyors 2023\23544 - Morningside - Pogue\Dwg\Survey\23544 Morningside Survey.dwg

Plu Rainey Pogue

Prepared by:
Lewis W. Pogue
2201 County Club CT
Plant City, FL. 33566

SEND TAX NOTICE
Rainey Pogue
P.O. Box 384
Columbia TN 38402

QUIT CLAIM DEED

KNOW ALL MEN BY THESE PRESENTS, this indenture made this 12 day of May, 2021, between JACK H. POGUE, TRUSTEE for Eric L. Pogue and Rainey J. Pogue, HEREINAFTER REFERRED TO AS " Grantor" and JACK H POGUE AS Trustee of the JACK H. POGUE LIVING TRUST, HEREINAFTER REFERRED TO AS "Grantee", for and in consideration of the sum of Ten Dollars ($10.00} and other good and valuable considerations, to said Grantor in hand paid by said Grantee, the receipt whereof is acknowledged, have granted, bargained, and sold to Grantee, the Grantees' heirs, assigns, and successors forever, the following described land, situate, lying and being in Maury County, Tennessee, to-wit:

Property Address: Morningside Lane

Subdivision: Sunset Park

Parcel ID/Tax ID: 089E F 001.02

Located in the Ninth (9th) Civil District of Maury County, Tennessee.

This being the same property conveyed by Travis Sargent Patterson and wife, Shirly A. Patterson to Jack H. Pogue, Trustee for Eric L. Pogue and Rainey J. Pogue with the deed recorded on Book 755, Pages 623 and 624, Register's Office County of Maury, Tennessee.

A more complete description of the metes and bounds for the property can be found recorded in Book 755 Pages 623 and 624, Register's Office Maury County, Tennessee.

In Witness Whereof, **the said Grantor has hereunto set his hand the day and year first written above.**

Jack H. Pogue

Jack H. Pogue

BK/PG: R2733/1486-1487
21010387

2 PGS:AL-QUITCLAIM DEED	
JANE BATCH: 248818	05/12/2021 - 03:16 PM
VALUE	0.00
MORTGAGE TAX	0.00
TRANSFER TAX	0.00
RECORDING FEE	10.00
ARCHIVE FEE	0.00
DP FEE	2.00
REGISTER'S FEE	0.00
TOTAL AMOUNT	12.00

STATE OF TENNESSEE, MAURY COUNTY
JOHN FLEMING
REGISTER OF DEEDS

Witness Name: BONNIE G. HICKMAN Witness Signature: Bonnie G. Hickman

Witness Name: Julia A Kirk Witness Signature: Julia A Kirk

CERTIFICATE OF ACKNOWLEDGMENT OF NOTARY PUBLIC

State of Tennessee)

County of MAURY)

On May 12, 2021 before me, a notary public in and for said state, personally appeared Jack H Pogue, personally known to me (or proved on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that she/he executed the same in her/his authorized capacity, and that by her/his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS MY HAND AND OFFICIAL SEAL

Penny C Worley

Notary Public

My commission expires: 1·28·24

(NOTARIAL SEAL)

MAURY COUNTY REGISTER'S STATE OF TENNESSEE
I or we hereby declare the actual Consideration for this transfer or value of property transferred whichever is greater is $ 0 which amount is equal to greater than the amount which the property transferred would command at a fair voluntary sale.
Affiant
Subscribed and sworn before me this 12 day of May 2021

John Fleming
by jj (DR)

OFFICIAL SEAL
JOHN FLEMING
REGISTER OF DEEDS
MAURY CO TN

PENNY C. WORLEY
TENNESSEE NOTARY PUBLIC
My Comm Exp. Jan 28, 2024
COUNTY OF WILLIAMSON

Page 2 of 2

P/k Rainey Pogue

Prepared by:
Lewis W. Pogue
2201 County Club CT
Plant City, FL. 33566

Send TAX Info to;
Rainey Pogue
P. O. Bx 384
Columbia, TN
38402

QUIT CLAIM DEED

KNOW ALL MEN BY THESE PRESENTS, this indenture made this 12 day of May, 2021, between JACK H. POGUE, HEREINAFTER REFERRED TO AS " Grantor" and JACK H POGUE AS Trustee of the JACK H. POGUE LIVING TRUST, HEREINAFTER REFERRED TO AS "Grantee", for and in consideration of the sum of Ten Dollars ($10.00} and other good and valuable considerations, to said Grantor in hand paid by said Grantee, the receipt whereof is acknowledged, have granted, bargained, and sold to Grantee, the Grantees' heirs, assigns, and successors forever, the following described land, situate, lying and being in Maury County, Tennessee, to-wit:

Being a 4.12 acre's track of land located in the 9th Civil District of Maury County, Tennessee.

Property location: Morningside Lane, Columbia, Tennessee

Parcel ID/Tax ID: 089E F 001.01

Being the same property conveyed from James D. Patterson, Travis Sargent Patterson, Johnny D. Patterson and David Lee Patterson, to Jack H. Pogue, a one third undivided interest, and Jack H. Pogue, Trustee for Eric L. Pogue and Rainey J. Pogue a two-third undivided interest as tenants in common. and recorded in BK 753, PG's 110 & 111. Register's Office of Maury County, Tennessee.

A more complete description of metes and bounds for the property can be found as recorded in BK 753, PG' 110 and 111. Register's Office of Maury County, Tennessee.

In Witness Whereof, the said Grantor has set his hand the day and year first written above.

Jack H. Pogue

BK/PG: R2733/1478-1479
21010383

2 PGS:AL-QUITCLAIM DEED	
JANE BATCH: 248818	05/12/2021 - 03:16 PM
VALUE	0.00
MORTGAGE TAX	0.00
TRANSFER TAX	0.00
RECORDING FEE	10.00
ARCHIVE FEE	0.00
DP FEE	2.00
REGISTER'S FEE	0.00
TOTAL AMOUNT	12.00

STATE OF TENNESSEE, MAURY COUNTY
JOHN FLEMING
REGISTER OF DEEDS

Witness Name: BONNIE G. HICKMAN Witness Signature: Bonnie G. Hickman

Witness Name: Julie A Kirk Witness Signature: Julie A Kirk

CERTIFICATE OF ACKNOWLEDGMENT OF NOTARY PUBLIC

State of Tennessee)

County of MAURY)

On May 12, 2021 before me, a notary public in and for said state, personally appeared Jack H Pogue, personally known to me (or proved on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that she/he executed the same in her/his authorized capacity, and that by her/his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS MY HAND AND OFFICIAL SEAL

Penny C Worley

Notary Public

My commission expires: 1-28-24

(NOTARIAL SEAL)

PENNY C. WORLEY
TENNESSEE NOTARY PUBLIC
My Comm Exp. Jan 28, 2024
COUNTY OF WILLIAMSON

MAURY COUNTY REGISTER STATE OF TENNESSEE

I or we hereby affirm that the actual Consideration for this transfer or value of property transferred whichever is greater is $ 0 which amount is equal to greater than the amount which the property transferred would command at a fair voluntary sale.

Barney J Pogue Affiant

Subscribed and sworn before me this 12 day of May 2021

John Fleming by jj (DR)

OFFICIAL SEAL
JOHN FLEMING
REGISTER OF DEEDS
MAURY CO TN

CPWS

September 15, 2023

Mr. Gerald W. Vick P.E.
WES Engineers & Surveyors
2486 Nashville Hwy
Columbia, TN 38401
Sent via email: gerald@wesengineers.com

RE: Water Availability Letter
156 Morningside Lane – 18 Units
Tax Map 089E, Parcel 1.01 and 1.02
Columbia, Maury County, TN

Dear Mr. Vick:

Columbia Power and Water Systems ("the Utility"/CPWS) is a municipal corporation authorized to provide water services in accordance with State law. CPWS has adopted rules, regulations, and standard operation procedures, prescribing the conditions under which CPWS will furnish water service. In addition, certain State laws delegate authority to the Tennessee Department of Environment and Conservation, various Planning Commissions and other authorities in Cities and Counties. These Cities and Counties have also adopted rules and regulations. Subject to the payment of all charges and fees imposed by CPWS and the approval of any and all required governmental agencies, water service will be made available on a first-come, first-served basis, subject to availability of all CPWS furnished equipment and materials appropriate for the development and provided the applicant complies with all rules and regulations of CPWS and conditions set out herein.

The proposed development consists of 18 single-family units. CPWS has evaluated the projected water demands for the proposed residential development in the water system hydraulic model and is able to meet a fire-flow capacity of 1,000 gpm at 20 psi while maintaining the existing level of service and pressures in this portion of the distribution system. CPWS can provide water for the proposed development according to the following requirements:

- Minimum size 8-inch diameter water main must be installed from Santa Fe Pike to the development, to replace the existing 4- and 6-inch mains, with 8-inch mains through the development to Avra Court.

All of the above requirements are to be constructed and paid for by the Applicant and dedicated to CPWS once complete up to and including the meter. No construction of CPWS infrastructure shall be initiated until final construction plans have been approved by TDEC and all parties have fully executed a water service agreement.

Once you have received this Water Availability Letter, next steps in the process to obtain water service from CPWS are as follows:

- Present the attached hydrant analysis report for coordination and approval of development from the Columbia Fire & Rescue Fire Marshall.
- Provide site base CAD files in DWG format, including roads, lot lines, existing and proposed contours, and other existing and proposed utilities, for use in development of water construction drawings.
- Prior to expiration of this water letter in 120 days, remit to CPWS new water service fees:

New Water Service Fee: $1,500 + $370 per SFU (18 SFUs)	$8,160.00

- CPWS will then develop water construction drawings and submit to TDEC for approval. Upon approval by TDEC and receipt by the applicant of any other related permits (TDOT, ARAP, etc), applicant may then request a pre-construction meeting with CPWS. Pre-con meeting will be scheduled for approximately 30 days out. Prior to pre-construction meeting, applicant must make payment of meter and impact fees or provide surety in lieu of full payment. If fees have not been paid 24 hours prior to the scheduled pre-con, meeting will be cancelled and rescheduled another 30 days out. Final meter and impact fees are subject to change based on final design and meter size determination. Meter fees are subject to change based on market costs at time of purchase. Meters will not be set until meter and impact fees are paid.

Meter Fee: $540 per 3/4" meter (18 meters)	$9,720.00
Impact Fee: $4,500 per 3/4" meter (18 meters)	$81,000.00
Total Meter and Impact Fees Due =	**$90,720.00**

- After the pre-construction meeting, CPWS will then issue a formal notice to proceed. No construction of CPWS infrastructure may take place prior to the pre-construction meeting.
- Applicant is then required to construct all public water infrastructure per CPWS standard specifications and provide CPWS personnel unregulated access to the site to inspect the construction of the water infrastructure.

If you have any questions, please feel free to contact me at 423-774-0349 or eric.king@inflodesign.com. This letter is valid for one-hundred twenty (120) days from the date of this letter.

Sincerely,

Eric King, P.E.
Inflo Design Group, LLC
on behalf of Columbia Power and Water Systems

cc: Jonathan Hardin, CPWS
File 23-045

CITY OF COLUMBIA TENNESSEE

DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)*
Fold hard copy submittals larger than 8½"x11"

ADDRESS/LOCATION	156 Morningside Lane		
	TAX MAP: 089E	GROUP: "F"	PARCEL: 1.01 & 1.02
SUMMARY OF NATURE OF REQUEST AND WORK	Requested rezoning of 4.28 acres in two tracts from CD-3L to CD-4.		

DATE OF PRE-APPLICATION CONFERENCE	5/3/2023	*Pre-application meetings are scheduled for Wednesdays.*

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☐ Annexation ☑ Rezoning ☐ Preliminary Plat ☐ Final Plat ☐ PUD Preliminary Master Plan ☐ PUD Final Site Plan ☐ Multi-Family Site Plan ☐ Other: **File naming nomenclature examples:* *Freedom Point Site Plan* *Freedom Point Master Plan* *Freedom Point Final Plat*	**Annexations/Rezoning/PUD's:** ☑ Written Legal Description copy ☑ Requested Zone Listed ☑ Compliance with Comprehensive Plan ☐ Annexation Permission Form ☑ Plans and/or Plats conforming to City standards with check list completed ☑ Columbia Water System Availability Letter **Plats/PUDs:** ☐ Project Name (include Sections & Phases) _____ ☐ Total Number of Lots _____ ☐ Total acreage _____

Rev. 4/14/2022

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	WES Engineers & Surveyors	PHONE	(931) 388-2329
ADDRESS	2486 Nashville Hwy, CLMA	EMAIL	gerald@wesengineers.com

PROPERTY OWNER NAME	Jack H Pogue Living Trust ETAL c/o Rainey Pogue	PHONE	931-215-1299
ADDRESS	P.O. Box 384, CLMA 38402-0384	EMAIL	raineysisk@yahoo.com

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

Gerald Vick		9/18/23
APPLICANT NAME	APPLICANT SIGNATURE	DATE
Rainey Pogue	Rainey Pogue	9/15/23
PROPERTY OWNER NAME	PROPERTY OWNER SIGNATURE	DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	

DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS	
DATE OF PUBLIC NOTICES IN DAILY HERALD	

BOARD ACTION	

Villages at Carters Creek Commercial Rezoning

Project #:	23-0418	Location:	Tax Map 55 Parcel 22.03
Applicant:	Andrew Wiseman	Case Type(s):	Rezoning
Staff Planner:	Kevin C. McCarthy, AICP	Proposed Use:	Retail & Car Wash

PROJECT SUMMARY

The applicant requests to rezone an 3.97-acre portion of the Villages at Carter's Creek development located near the intersection Nashville Highway and Greens Mill Road to CD-4C (Urban Corridor Character District). The property is currently zoned as a Convenience Retail Services Planned Unit Development (CRS-PUD) approved under the previous zoning ordinance. City Council first approved the Master Plan in 2017. A revision was approved in 2021. The Master Plan includes the so-called "Citizen House at Spring Hill" apartment complex, the subject site, and a stormwater pond parallel to Nashville Highway. The Master Plan, approved under the previous ordinance, depicts three commercial buildings with restaurants and office space on the subject site. The multifamily portion of the property has been constructed. The applicant requests partial revocation of the Planned Unit Development Master Plan and rezoning to CD-4C.

- The request is consistent with Connect Columbia, the City's comprehensive plan.
- The concept plan generally indicates that it is possible to develop the site in conformity with the requested standards. Greater detail will be required at the time of any subsequent Site Development Plan.
- The Zoning Ordinance authorizes the Planning Commission to recommend revocation of a Preliminary PUD Master Plan upon a finding that circumstances have changed to such a degree that the landholder is unlikely to develop the site in conformity with the plan.
- If the Planning Commission recommends approval of the requested rezoning, the action should also recommend revocation of the PUD Master Plan for the subject site.
- Subsequent development and division of the property will require review and approval by the Planning Commission or the Zoning Administrator.
- The Planning Commission is a **recommending body** for rezoning requests.
- Templates are provided at the end of the report to assist the Planning Commission in crafting properly formatted motions.

SITE INFORMATION

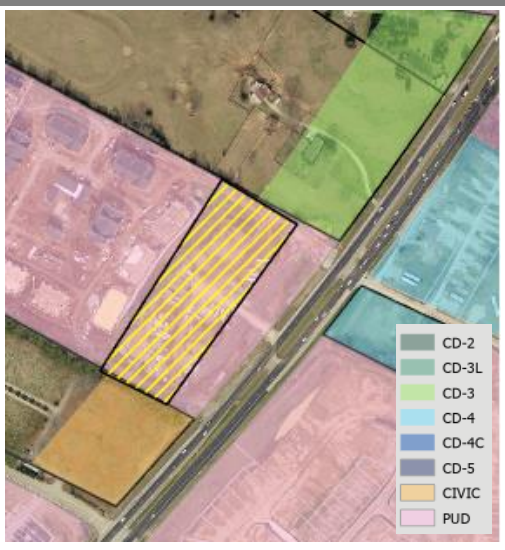
CURRENT ZONING	EXISTING USE	EXISTING IMP.	LAND AREA
OTHER PUD (CRS)	Vacant	Vacant	+/-3.97Acres



FUTURE LAND USE MAP



ZONING MAP



SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	Suburban Corridor	Other PUD (CRS)	Vacant
North	Suburban Corridor	CD-3	Single-Family
South	Suburban Corridor	CIVIC	Cemetery
East	Suburban Corridor	Other PUD (RM-1)	Townhomes
West	Suburban Corridor	Other PUD (CRS)	Multifamily

The subject property is spart of the Villages at Carter's Creek Planned Unit Development. The property enfronts Nashville Highway on the east. There is a single-family residence immediately north of the property. The property to the south is a cemetery. The property to the east across Nashville Highway is currently in development. It includes a mix of townhomes and single-family home sites. The property to the west is subject to the same PUD Master Plan. A multifamily apartment complex was recently constructed on the site.

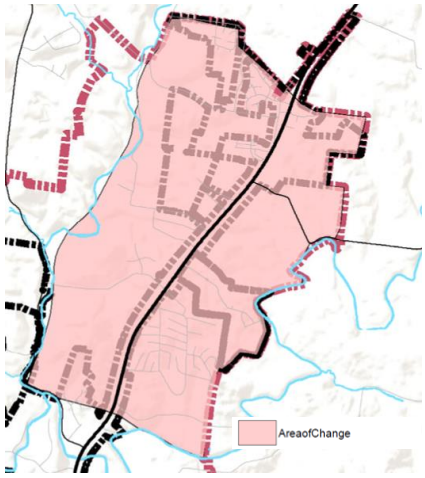
CONSISTENCY WITH CONNECT COLUMBIA

Suburban Corridor: The future land use of the subject site is Suburban Corridor. The Character Area is characterized by a mix of residential and commercial uses with intermixed and compatible civic uses. The Future Land Use Plan indicates that "the general development pattern is largely site specific" (Connect Columbia, p. 26). The specific character of the Corridor relies on the Area of Change determination. Development can take the form of single- and multi-use activity on a variety of lot sizes, depending on the surrounding development pattern (Connect Columbia, p. 26). The Character Area Matrix from page twenty-six of the Future Land Use Plan (excerpted below) is a guide to approving requests for zoning map amendments and Planned Unit Developments. The future land use classification is implemented by the CD-4C character district and PUDs.

CHARACTER AREA MATRIX				
	Development Pattern	**Zoning Category and Uses**	**Infrastructure**	**Design Standard**
SUBURBAN CORRIDOR	**Is the property in an Area of Change?** **No:** The development pattern is established. Changes to overall character of the area should rarely occur. **Yes:** The development pattern is evolving. Changes to area are likely as development occurs. New development should blend with existing, surrounding neighborhood assets.	**Residential Uses:** Low Density Residential, Medium High Residential, and High Residential Districts **Public and Civic Uses:** Religious, Day Care, Government, Medical, and Educational **Commercial Uses:** Hotels, Recreational, Restaurants, Retail, Personal Services, Self-Service Storage, Vehicle Sales and Service, and Wholesale Trade **Office Uses:** All office uses	**Not in an Area of Change:** Limited new services, with mostly in-fill enhancements to existing infrastructure. **Within an Area of Change:** Extensions to transportation, water, sewer, and other services should be expected. New service or extensive redevelopment of existing services should be vetted and reviewed by Planning Commission and City Council as a primary element of approval.	Scale: Buildings should be compatible with the established character of the area. Architecture: New developments should include a mix of architectural styles. Buildings should include quality materials with architectural details and features. Parking: Parking should be contingent on the location of the site along the transect, becoming more subordinate to buildings as urbanity increases.

AREA OF CHANGE

The subject site **is located within an Area of Change** (Connect Columbia Map 3). In 2017 the Planning Commission determined that the development pattern in the area was evolving. Changes to the area are likely, but new development should blend with existing neighborhood assets. The designation does not necessarily mean that any particular development proposal is consistent with Connect Columbia. It does mean that the Planning Commission has previously determined that in this area, the development character is not fixed and change is expected over time (Connect Columbia p. 14).

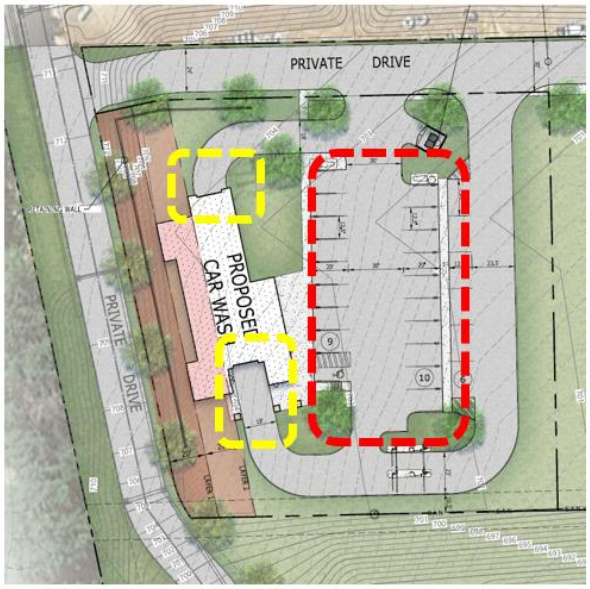


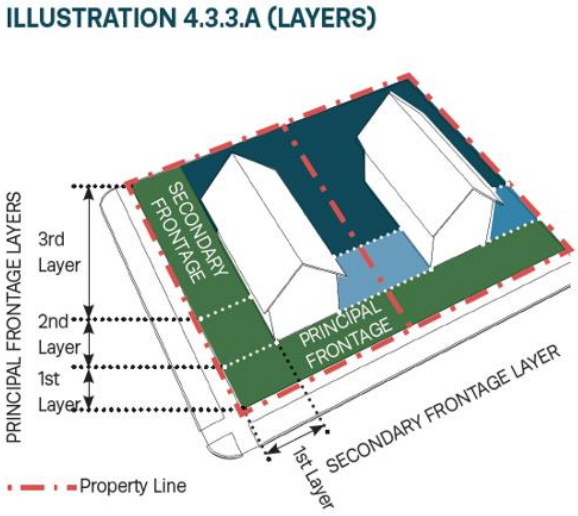
CONFORMITY WITH ZONING ORDINANCE

As required by **§ 8.5.19.F.3** of the Zoning Ordinance, the applicant provided a concept plan (i.e. "Sketch Development Plan") demonstrating that it is possible to develop the property in conformity with the standards applicable to the requested zoning designation. Any development plan/preliminary plat would be required to comply with Zoning Ordinance 4400, adopted on July 14th, 2022. This request for rezoning simply establishes entitlements under the zoning ordinance, not a vested right to develop the site as depicted in the concept plan.

Lots, Building Sites & Bulk Standards

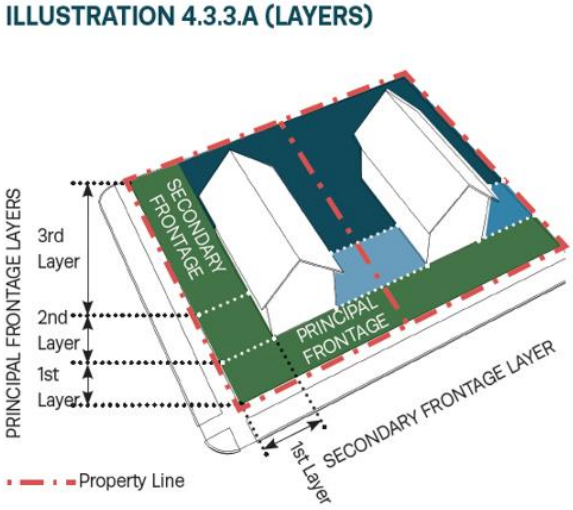
- **The concept plan depitcts building site layouts which generally conform to the CD-4C bulk standards listed in Table 4.3.1-E of the Zoning Ordinance.**
- **The current request establishes the applicable standards for future reviews. The concept plan is not a plan of development and approval of the rezoning request does not establish a vested right.**
- **Planning staff will determine conformity with the limited use standards of §4.3.9.E, the general development standards of Article 4, and the applicable Development Parcel Standards of Article 5 at the time of Site Development Plan approval.**
    - The concept depicts a car wash, and a convenience store with a gas canopy.
    - The Ordinance establishes site and limited use standards for the uses proposed in the concept.
    - Although many details need refinement, the plan demonstrates that it is possible to develop the site in conformity with the standards of the Ordinance.
        - **§ 4.3.9.E.6.f(3)** (p. 245) requires that "no wash bay shall face or be located in the 1st or 2nd Layer or the Frontage."
        - **§ 4.3.9.E.6.i(2)** (p. 246) and **§ 4.3.12.G** (p. 284) require that drive-through facilities, including car wash operations, be located in the third layer of any building site.
        - **§ 4.3.9.E.6.l** (p. 247) requires that fuel pumps be located at least 15' from any property line and in the third layer. The limited use standards also limit each fuel sales operation to a maximum of eight pumps.





The concept plan depicts Car Wash Bays, Drive-through elements and parking in the third layer (provided the "private drive" is not considered an Internal Drive).

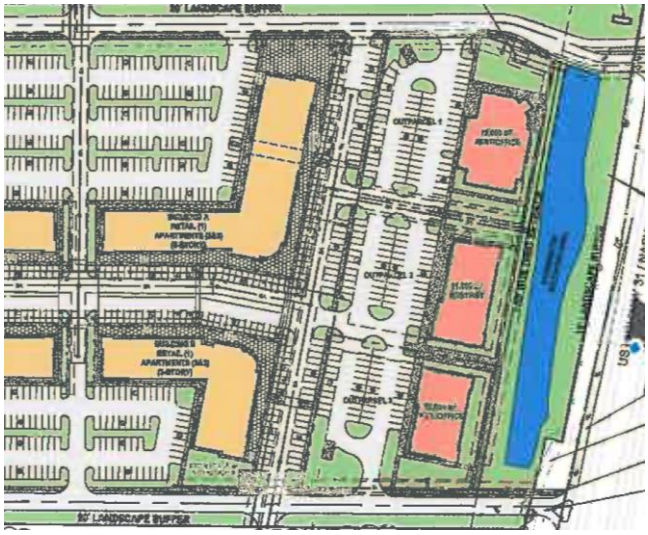




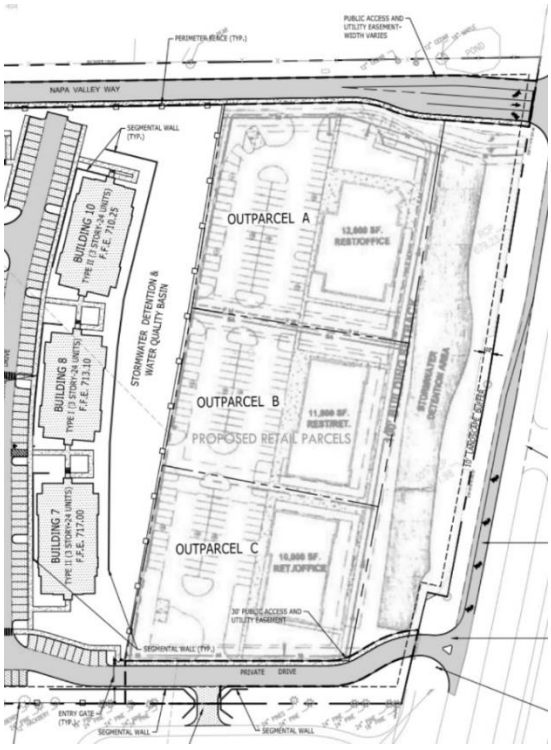
The concept plan depicts the fuel canopy and parking in the third layer (provided the "private drive" is not considered an Internal Drive).

- **The current Master Plan establishes entitlements for the site and provides a detailed predictability in how the property can develop. However, any change in concept requires onerous PUD revisions.**

- **Rezoning the property establishes clear standards for the site under a variety of development scenarios and eliminates the need for the applicant and Planning Commission to repeatedly revisit the Master Plan. However, CD-4C permits a wide range of uses and physical configurations.**



2017 Master Plan



2021 Revised Master Plan



Concept Plan Demonstrating CD-4C Development

REVIEW PROCESS

The Development Review Committee evaluated the proposed rezoning at its December 2023 meeting, as directed by section **8.3.7** of the Zoning Ordinance. Technical comments are provided in the agenda package.

Section **8.5.19** of the Zoning Ordinance directs the Planning Commission to review and make a recommendation on all proposed changes to the Official Zoning Map. The Planning Commission is the recommending body for rezonings under **§ 8.3.3.B.3** of the Zoning Ordinance.

Section **8.5.19.H.4** of the Zoning Ordinance establishes the review criteria for approval of all changes to the Official Zoning Map:

a. *The Rezoning is consistent and not in conflict with the Comprehensive Plan or other applicable approved local plans for the area;*
b. *It has been determined that the legal purposes for which zoning exists, as set forth in Section 1.5 [, are not contravened];* [1]
c. *It has been determined that there will be no adverse effect upon Adjoining property owners unless such effect can be justified by the overwhelming public good or welfare;*
d. *It has been determined that no one property owner or small group of property owners will benefit materially from the change to the detriment of the general public;*
e. *It has been determined that conditions affecting the area have changed to a sufficient to warrant the Zoning Map Amendment or that the existing zoning of the property was the result of a mistake;*
f. *It has been determined that adequate school, road, parks, wastewater treatment, water supply, and stormwater drainage facilities are available*

Section **8.5.21.R** of the Zoning Ordinance authorizes the Planning Commission to recommend revocation of a Preliminary PUD Master Plan upon a finding that circumstances have changed to such a degree that the landholder is unlikely to develop the site in conformity with the plan.

[1] Ordinance 4400 contains this incomplete sentence. The previous ordinance contained a nearly identical list of criteria at § 3.18.7.B. The corresponding criterion in Ordinance 3638 read "the legal purposes for which zoning exists are not contravened."

SUMMARY OF DEVELOPMENT REVIEW COMMITTEE COMMENTS

The DRC reviewed this proposal at its December 2023 meeting. A full list of comments, and the applicant's responses, is provided in the agenda packet. Some key comments are noted below.

- **Planning** directed the applicant to provide a narrative response to criterion at **§ 8.5.19.H.4(e)** explaining why the applicant believes conditions affecting the area have changed sufficiently to warrant the Zoning Map Amendment.
- Planning also advised the applicant that the City Council recently denied a similar request. Staff asked the applicant to distinguish the unique circumstances which support rezoning of the subject parcel.
- Utility providers indicated willingness and capacity to serve . Some included standard caveats about the impact of supply chain disruption on the ability to establish services.

COMMENTARY FROM PROFESSIONAL PLANNING STAFF

The requested CD-4C zoning is consistent with Connect Columbia; removing the PUD designation may facilitate orderly development of the site. The subject site's future land use classification is Suburban Corridor. The classification is implemented by CD-4C and PUDs. The applicant has demonstrated that the site can develop under the only implementing character district. The CD-4C standards are highly prescriptive. The prescriptions of the Ordinance ensure a high-quality appearance of all structures as well as performance standards for uses established on the site. However, the CD-4C zoning permits a wide range of uses which and physical configurations which may differ from the concept provided by the applicant.

The current Master Plan establishes entitlements for the site and provides a detailed predictability in how the property can develop. However, any change in concept requires onerous PUD revisions. Abandoning the Master Plan in favor of a new concept will likely require the Planning Commission to evaluate a long list of deviations from the PUD-MU standards. The discretionary nature of the approval process could delay development of the site and negate the predictability of the PUD.

Rezoning the property establishes clear standards for the site under a variety of development scenarios and eliminates the need for the applicant and Planning Commission to repeatedly revisit the Master Plan. The applicant posits that the highly prescriptive PUD-MU standards remove flexibility. According the applicant, circumstances warrant market-driven uses of the property which differ from the existing entitlement. However, the Planning Commission may determine that the mix of office and restaurant uses arranged in three buildings remains the most appropriate development scenario for the property.

SAMPLE MOTIONS

Approve:

Move to find, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in sections **8.5.19.H** and **8.5.21.R** of the City of Columbia Zoning Ordinance have been satisfied and recommend partial revocation of the existing Master Plan and approval of the proposed rezoning *[, subject to technical comments and other conditions presented by planning staff*].

Approve Subject to Conditions:

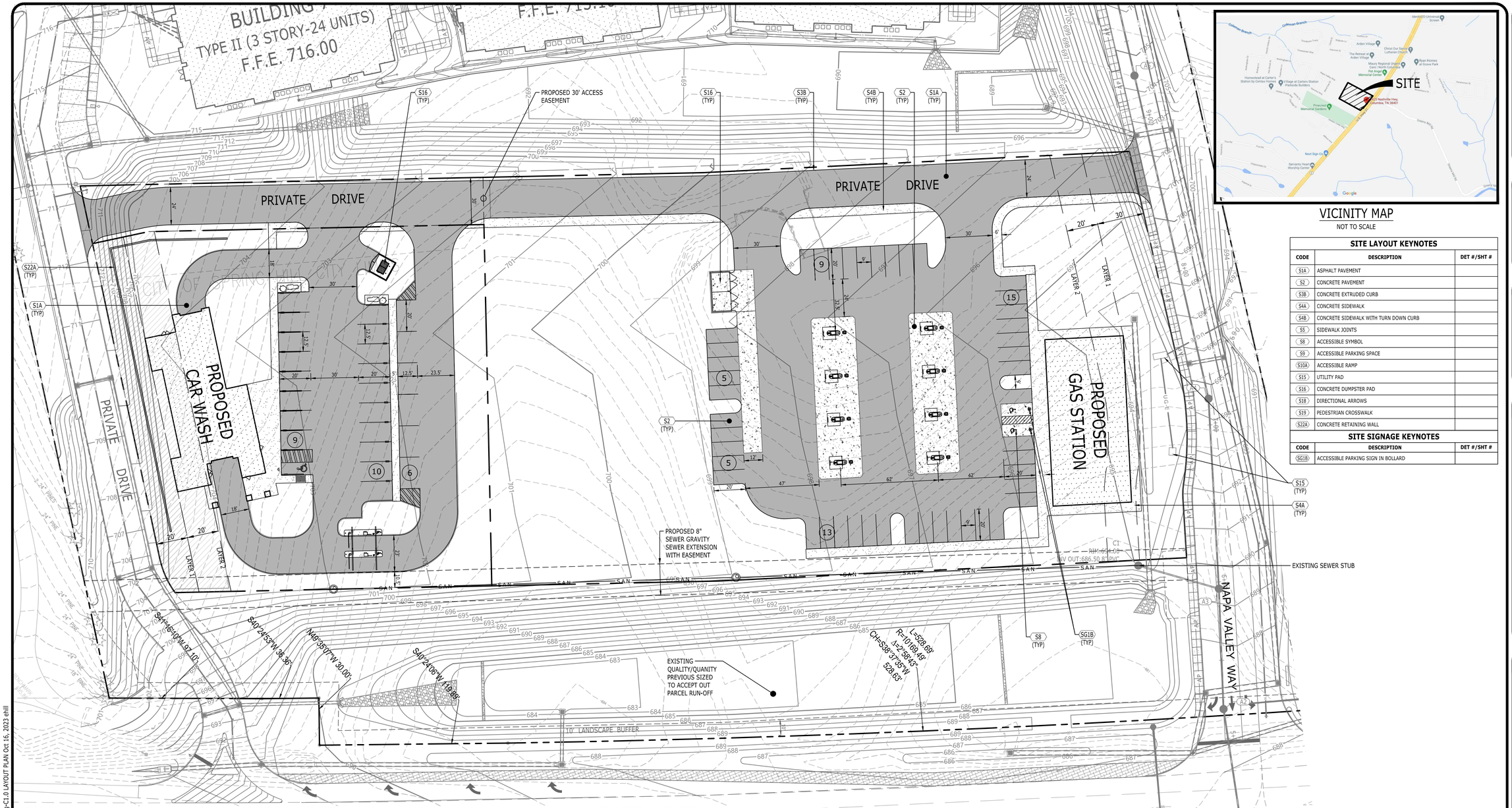
Move to find, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in section **8.5.19.H** and **8.5.21.R** of the City of Columbia Zoning Ordinance have been satisfied and recommend partial revocation of the existing Master Plan and approval of the proposed rezoning, subject to the following conditions: [*list conditions of approval crafted by Planning Commission*].

Deny:

Move to recommend denial of the requested rezoning having found, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in section **8.5.19.H** and **8.5.21.R** of the City of Columbia Zoning Ordinance are not satisfied [*list specific reasons for denial*].

Defer:

Move to find that there is insufficient information to decide, defer the matter to the next regularly scheduled meeting of the Planning Commission, and request that the [*applicant/staff*] provide: [*list additional information*] for review at a future meeting.



VICINITY MAP

NOT TO SCALE

SITE LAYOUT KEYNOTES

CODE	DESCRIPTION	DET #/SHT #
S1A	ASPHALT PAVEMENT	
S2	CONCRETE PAVEMENT	
S3B	CONCRETE EXTRUDED CURB	
S4A	CONCRETE SIDEWALK	
S4B	CONCRETE SIDEWALK WITH TURN DOWN CURB	
S5	SIDEWALK JOINTS	
S8	ACCESSIBLE SYMBOL	
S9	ACCESSIBLE PARKING SPACE	
S10A	ACCESSIBLE RAMP	
S15	UTILITY PAD	
S16	CONCRETE DUMPSTER PAD	
S18	DIRECTIONAL ARROWS	
S19	PEDESTRIAN CROSSWALK	
S22A	CONCRETE RETAINING WALL	

SITE SIGNAGE KEYNOTES

CODE	DESCRIPTION	DET #/SHT #
SG1B	ACCESSIBLE PARKING SIGN IN BOLLARD	

SITE DATA

TAX MAP:	50
PARCEL ID.:	051 02203 000
SITE ADDRESS:	2425 NASHVILLE HIGHWAY COLUMBIA, TN, 38401
SITE AC. PROPOSED GAS STATION:	2.77 AC. (120,510 FT²)
SITE AC. PROPOSED CAR WASH:	1.20 AC. (52,419 FT²)
	3.97 AC. TOTAL
EXISTING ZONING:	PUD
PROPOSED ZONING:	CP-4C SUBURBAN CORRIDOR CHARACTER DISTRICT
LOT OCCUPATION:	HOUSE 38' MIN. IF ALLEY LOADED GARAGE AT REAR, OTHERWISE 50' MIN. DUPLEX: 30' FT MIN. FOR EACH UNIT OF DUPLEX TOWNHOUSE: FOR TOWNHOUSES WITH EACH UNIT ON ITS OWN LOT OR BUILDING SITE: 18 - 36 FT, FOR SINGLE TOWNHOUSE UNIT ATTACHED TO OTHER TOWNHOUSE UNITS X 8 MAX. ATTACHED TOWNHOUSE UNITS FOR MULTIPLE TOWNHOUSES ON A SINGLE LOT OR BUILDING SITE: 18 20 FT PER TOWNHOUSE UNIT X 6 MAX ATTACHED TOWNHOUSE UNITS LARGE SCALE COMMERCIAL: 600 FT. MAX. ALL OTHER BUILDING TYPES: 18 FT MIN. - 200 FT MAX.
FRONT BUILDOUT:	60% MIN. EXCEPT COMMERCIAL 40% MIN.
LOT / BUILDING SITE AREA:	NR
LOT / BUILDING SITE ENFRONTMENT:	MUST ENFRONT A VEHICULAR THOROUGHFARE OR INTERNAL DRIVE, EXCEPT < 20% OF THE LOTS OR BUILDING SITES WITHIN EACH TYPE OF CHARACTER DISTRICT OF A DEVELOPMENT PARCEL MAY ENFRONT A PEDESTRIAN PATH PASSAGE, PEDESTRIAN WALKWAY OR WATER BODY IF SUCH LOTS HAVE LEGAL AND PHYSICAL VEHICULAR ACCESS TO A VEHICULAR THOROUGHFARE VIA DRIVEWAY OR EASEMENT.
LOT / BUILDING SITE ACCESS:	ALL LOTS MUST HAVE LEGAL AND PHYSICAL VEHICULAR ACCESS TO A VEHICULAR THOROUGHFARE VIA DRIVEWAY OR EASEMENT.

SETBACK / YARDS:

SETBACK / YARDS - PRINCIPAL BUILDING	
FRONT SETBACK / YARD PRINCIPAL FRONTAGE:	6 FT. MIN. - 40 FT. MAX.
FRONT SETBACK / YARD SECONDARY FRONTAGE:	6 FT. MIN. - 40 FT. MAX.
SIDE SETBACK / YARD, EACH SIDE:	0 FT. MIN. PER SIDE
REAR SETBACK:	3 FT. MIN.; 15 FT. MIN. FROM CENTER LINE OF REAR ALLEY
SETBACK / YARDS - ACCESSORY BUILDING	
FRONT SETBACK / YARD PRINCIPAL FRONTAGE:	20 FT. MIN. BEHIND PRINCIPAL BUILDING FRONTAGE
FRONT SETBACK / YARD SECONDARY FRONTAGE:	5 FT. MIN.
SIDE SETBACK / YARD, EACH SIDE:	5 FT. MIN.
REAR SETBACK:	3 FT. MIN.; 5 FT. MIN. IF GARAGE DOOR FACES REAR ALLEY

IMPERVIOUS SURFACE AREA GAS STATION:

BUILDINGS:	0.12 AC. (5,302 FT²)
DRIVES/SIDEWALKS:	1.43 AC. (62,582 FT²)
TOTAL PROPOSED IMPERVIOUS AREA:	1.55 AC. (67,384 FT²)
PROPOSED ISR:	0.56 (67,384 FT² / 112,777 FT²)

IMPERVIOUS SURFACE AREA CAR WAS:

BUILDINGS:	0.11 AC. (4,718 FT²)
DRIVES/SIDEWALKS:	0.60 AC. (26,343 FT²)
TOTAL PROPOSED IMPERVIOUS AREA:	0.71 AC. (31,061 FT²)
PROPOSED ISR:	0.59 (31,061 FT² / 52,419 FT²)
ALLOWED ISR:	80% MAX.

OWNER:	ENDEAVOR REAL ESTATE GROUP
ADDRESS:	500 WEST 5TH STREET, STE. 700 AUSTIN, TX, 78701
PHONE NO.:	512.532.2180
CONTACT NAME:	NELSON CROWE
CONTACT E-MAIL ADDRESS:	NCROWE@ENDEAVOR-RE.COM

PROJECT REPRESENTATIVE:	CATALYST DESIGN GROUP
ADDRESS:	5100 TENNESSEE AVENUE NASHVILLE, TN 37209
PHONE NO.:	615.622.7200
CONTACT NAME:	ANDREW WISEMAN
CONTACT E-MAIL ADDRESS:	AWISEMAN@CATALYST-DG.COM

PARKING SUMMARY

PARKING RQD GAS STATION:	1 PER 200 S.F. (5,302 S.F. / 200 S.F.) = 27 SPACES
PARKING REQUIRED CAR WASH:	1 PER 500 S.F. (4,718 S.F. / 500 S.F.) = 10 SPACES

PARKING PROPOSED

GAS STATION	47 SPACES (2 ACCESSIBLE)
CAR WASH	26 SPACES (1 ACCESSIBLE)

LEGEND

BUILDING	
CONCRETE PAVEMENT	
CONCRETE SIDEWALK	
HEAVY DUTY PAVEMENT	
LIGHT DUTY PAVEMENT	
PAINTED STRIPE	
CONCRETE CURB	

CATALYST DESIGN GROUP
5100 TENNESSEE AVENUE, NASHVILLE, TN 37209
(615) 622-7200 | WWW.CATALYST-DG.COM

ENDEAVOR REAL ESTATE GROUP
500 WEST 5TH STREET, ST. 700
AUSTIN, TX 78701
512.532.2180

PRELIMINARY SITE PLAN FOR REZONING

RETAIL PARCEL

2425 NASHVILLE HIGHWAY
COLUMBIA, MAURY COUNTY, TENNESSEE, 38401

NO.	DATE	DESCRIPTION

DRAWING TITLE

SCHEMATIC LAYOUT

PROJECT NUMBER
20210055

DRAWING NUMBER
C1.0

P:\2021\20210055\dwg\Construction\Retail Out Parcels\ref\20210055_C1-0_LAY.dwg-C1.0 LAYOUT PLAN Oct 16, 2023 ehill

BUILDING 1
TYPE II (3 STORY-24 UNITS)
F.F.E. 716.00

F.F.E. 715.10

PROPOSED 30' ACCESS EASEMENT

DUMPSTER PAD

PRIVATE DRIVE

PRIVATE DRIVE

RETAINING WALL

PROPOSED CAR WASH

PROPOSED GAS STATION

DUMPSTER PAD

LAYER 1

LAYER 2

STORMWATER

10' LANDSCAPE BUFFER

NAPA VALLEY WAY

NASHVILLE HIGHWAY
(HIGHWAY 31)
(PUBLIC R.O.W. VARIES)

CURB CUT

GREEN MILLS

N

0 15 30 60 90
GRAPHIC SCALE

P:\2021\20210055\dwg\Construction\Retail Out Parcels\Xref\20210055_C1-0_LAY.dwg-C2.0 RENDER Oct 16, 2023 ehill

Catalyst DESIGN GROUP
5100 TENNESSEE AVENUE, NASHVILLE, TN 37209
(615) 622-7200 | WWW.CATALYST-DG.COM

ENDEAVOR REAL ESTATE GROUP
500 WEST 5TH STREET, ST. 700
AUSTIN, TX 78701
512.532.2180

PRELIMINARY SITE PLAN FOR REZONING

RETAIL PARCEL

2425 NASHVILLE HIGHWAY
COLUMBIA, MAURY COUNTY, TENNESSEE, 38401

NO.	DATE	DESCRIPTION

DRAWING TITLE

RENDERED LAYOUT

PROJECT NUMBER
20210055

DRAWING NUMBER
C2.0

December 15, 2023
Kevin McCarthy
City of Columbia
800 Second Avenue South
Nashville, TN, 37219

Re: Item 23-0418 Project 2425 Nashville Hwy - Villages at Carters Creek at 051 022.03
Comment Response
Columbia, TN

Kevin,

Please see the below responses to your initial technical review comments for the Final Site Plan application for Villages at Carter's Creek, Commercial out parcel rezoning received on December 13th. Please let this letter serve as response as no comments are perceived to require concept plan revisions.

Planning

1. The lead staff person for this case is City Planner Kevin McCarthy, AICP; he will prepare the staff report for this item. Please contact kmccarthy@columbiatn.com with question about the development review process or technical comments.
   Response: Noted.
2. At resubmittal, please provide a response letter addressing each comment along with any revised plans. If the nature of the comment does not warrant a response, please simply not that the information has been acknowledged.
   Response: Provided.
3. Please provide a narrative response to criterion 8.5.19.H.4(e) explaining why the applicant believes conditions affecting the area have changed sufficiently to warrant the Zoning Map Amendment.
   Response: Please find the below reasoning for section 8.5.19.H.4 in its entirety.
   a. The Rezoning is consistent and not in conflict with the Comprehensive Plan or other applicable approved local plans for the area; CD-4C is consistent with the Comprehensive Plan
   b. It has been determined that the legal purposes for which zoning exists, as set forth in Section 1.5; Give the consistency with the Comprehensive Plan and current entitlement we feel that these conditions are met.
   c. It has been determined that there will be no adverse effect upon Adjoining property owners unless such effect can be justified by the overwhelming public good or welfare; With the completion of the apartment complex, we feel that there would be little affect to neighboring property owners given the reduction in scale of the proposed commercial product proposed from the original PUD request and likely to result in a reduction in trips generated. Given the substantial improvements made to site access with new signalization and turn lane improvements the site has presumably increased traffic safety it the main entrance to the property.
   d. It has been determined that no one property owner or small group of property owners will benefit materially from the change to the detriment of the general public; Because the site is already approved for ±30,000 square feet of commercial within the existing PUD it is not perceived

that any material benefit is made by any one property owner, as substantial public street improvements were made based on current approvals.

e. It has been determined that conditions affecting the area have changed to a sufficient to warrant the Zoning Map Amendment or that the existing zoning of the property was the result of a mistake. With the completion of the apartment complex, new signalization and projected proposed projects in the area a different scale of commercial use is being market driven. As an unexpected consequence of the updated zoning ordinance for PUD development that any revision would have to adhere to there is little flexibility in the commercial product to meet the intent of the new PUD standards.

f. It has been determined that adequate school, road, parks, wastewater treatment, water supply, and stormwater drainage facilities are available. Given capacity and will serve letters provided for public water and sewer the proposed development would actually reduce impacts to infrastructure from current entitlements. Also, because this is a commercial intended rezoning, the impact to schools would be minimal. Additionally, with the overall development accounted for the additional stormwater contributed by these retail out parcels and traffic improvements were made.

4. Please be advised that the City Council recently decline a similar rezoning request. The applicant's responses to the criteria at 8.5.19 will need to distinguish the unique circumstances which support rezoning of the subject parcel.
   Response: See above and additional narrative here. After reviewing the video from the Council hearing referenced, we feel that this particular request differs from the scale and location of that request. We are requesting rezoning of ±3 acres (as opposed to 11 acres at the head of a mostly SF residential neighborhood) of a planned commercial development within the existing PUD to a CD-4C as to be more consistent with current market driven scale of desired development. Due to the recent updated to the PUD requirements of the new zoning ordinance, impactful changes would be required under this ordinance for example a 2 story development requirement which is inconsistent with the scale of commercial business that would be attracted to these size properties. The underlying fact remains CD-4C provides flexibility in the design of the commercial nature of the property given its proximity and visibility to Nashville highway as intended by the comprehensive plan and updated accessibility with the improved intersection.

Engineering

5. No comments on rezoning.
   Response: Noted.
6. TIS update will be required for updated uses with development plan.
   Response: Noted.

Columbia Power

7. Columbia Power System has an existing power line near your proposed development. We are willing to serve this new development subject to all Columbia Power System policies and procedures in effect at actual time service is rendered provided an approved final plat and complete electrical load information is furnished as soon as possible prior to start of actual construction.

Response: Noted.

8. Unfortunately, due to current supply chain challenges, no timeframe can be guaranteed regarding the availability of meters or transformers appropriate for your development.
   Response: Noted.

Public Works

9. Please reference attached City of Columbia Dumpster Guidelines & Accessibility
   Response: Noted to be provided at Development Plan.

Columbia Water

10. A water availability letter was issued on November 7, 2023, it remains valid for 120 days. The availability of capacity to serve is based on a determination by the Fire Marshal of fire flow requirements and the information submitted on the Water Service Availability Request application. Any off-site improvements detailed in the availability letter are the responsibility of the developer/owner. All public water system improvements are subject to the preparation and approval of detailed construction plans prepared in accordance with CPWS and Tennessee Department of Environment and Conservation requirements.
    Response: Noted

CPWS BB

11. CPWS plans to serve the site with broadband.
    Response: Noted

Wastewater

12. Wastewater has no concerns.
    Response: Noted

No comments were provided by Atmos Energy, Maury County Highway Dept., ATT, Maury County E911, Building, Fire, Maury County Schools, or Duck River Electric Membership Corp.

Response: Noted

Best Regards,

Catalyst Design Group



Andrew Wiseman, PE
Principal | Project Manager

CITY OF COLUMBIA
TENNESSEE

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, December 12, 2023

ITEM NO.
23-0418

DESCRIPTION: Rezone request to cancel existing PUD and rezone to CD-4C.

RECOMMENDATION: For final recommendation please see staff report.

COMMENTS:

Engineering

1. No comments on rezoning.
2. TIS update will be required for updated uses with development plan.

Building

3. No comments.

Police

4. No comments provided.

Columbia Power

5. Columbia Power System has an existing power line near your proposed development.
   We are willing to serve this new development subject to all Columbia Power System policies and procedures in effect at actual time service is rendered provided an approved final plat and complete electrical load information is furnished as soon as possible prior to start of actual construction.
   • Unfortunately, due to current supply chain challenges, no timeframe can be guaranteed regarding the availability of meters or transformers appropriate for your development

Public Works

6. Please reference attached City of Columbia Dumpster Guidelines & Accessibility Requirements to ensure easy access for front load garbage trucks.

Something Good Around Every Corner
Public Works 110 Santa Fe Pike Columbia, Tennessee 38401 Phone 931.388.8650
This institution is an equal opportunity provider.

PUBLIC WORKS DEPARTMENT

DUMPSTER GUIDELINES AND ACCESSIBILITY REQUIREMENTS

DUMPSTER AND COMPACTOR STANDARDS

GENERAL

All requirements for collection and accessibility to containers apply, regardless of whether collection is public or private.

GUIDELINES FOR DUMPSTERS

The number and capacity of dumpsters must be adequate to serve the disposal needs of the business, development or complex. Collection must occur at least one time per week, with special approval needed for every other week (EOW) collection. Each dumpster must be easily accessible, as determined by the Public Works Department, and of a size compatible with equipment of the department. If the dumpster is in an enclosed area, there must be at least 2 feet
and 6 inches of clearance on each side of the dumpster.

DUMPSTER PAD REQUIREMENTS

1. The concrete dumpster pad shall be at least 12 feet by 12 feet.
2. The pad(s) shall be 8-inch-thick concrete, reinforced with rebar to support a 30-ton loadbearing capacity.
3. A 14-foot-wide by 40-foot-long straight and clear access approach to each dumpster for the truck is required.
4. Clearance at each side of the dumpster must be at least 2 feet and 6 inches.
5. If a gated enclosure is utilized, the gates must be lockable in the open position to prevent the gates from swinging into the path of the truck during servicing.

Something Good Around Every Corner
Public Works 110 Santa Fe Pike Columbia, Tennessee 38401 Phone 931.388.8650
This institution is an equal opportunity provider.

6. Two 6-inch diameter concrete filled steel bollards must be placed in the concrete pad to the rear of each dumpster, 2 feet from the back edge of the dumpster pad, spaced 4 feet apart and centered side to side. The bollards will rise 6 feet above the pad and extend 32 inches below the pad into the concrete footers.
7. If the box is enclosed, it is recommended that there be pedestrian access in addition to service gates.
8. Access area, approach and pad must be level.
9. Standard pads with no drain should be elevated approximately 1-1/2 inches above the surrounding pavement.

ACCESSIBILITY REQUIREMENTS FOR DUMPSTERS AND COMPACTORS

1. Access must accommodate a 40-foot-long truck, with a 45-foot turning radius. Circular through movement through the complex for the vehicles is highly recommended.
2. The collection truck shall not be required to back-up for no more than 200 feet.
3. No backing into or across a public right-of-way.
4. No overhead obstructions at waste handling or access area. Refuse collection trucks need a minimum of a 25-foot vertical clearance to service containers.
5. Heavy duty pavement is required for the collection truck's path through the complex. City of Columbia Public Works will not be responsible for the repair of asphalt or

concrete which has been damaged due to normal usage.
6. Gates must be unlocked and open for collection.

ATT

7. No comment.

Maury County E911

8. No comment.

Planning

9. The lead staff person for this case is City Planner Kevin McCarthy, AICP; he will prepare the staff report for this item. Please contact kmccarthy@columbiatn.com with question about the development review process or technical comments.
10. Please provide a narrative response to criterion 8.5.19.H.4(e) explaining why the applicant believes conditions affecting the area have changed sufficiently to warrant the Zoning Map Amendment.
11. At resubmittal, please provide a response letter addressing each comment along with any revised plans. If the nature of the comment does not warrant a response, please simply not that the information has been acknowledged.

Wastewater

12. Wastewater has no concerns.

Fire

13. No comments

Maury County Schools

14. No Comment

Duck River Electric Membership Corp

15. No comments.

Columbia Water

16. "A water availability letter was issued on November 7, 2023, it remains valid for 120 days. The availability of capacity to serve is based on a determination by the Fire Marshal of fire flow requirements and the information submitted on the Water Service Availability Request application. Any off-site improvements detailed in the availability letter are the responsibility of the developer/owner. All public water system improvements are subject to the preparation and approval of detailed construction plans prepared in accordance with CPWS and Tennessee Department of Environment and Conservation requirements."

Atmos Energy

17. No comments provided.

Maury County Highway Dept.

18. No comments provided.

CPWS BB

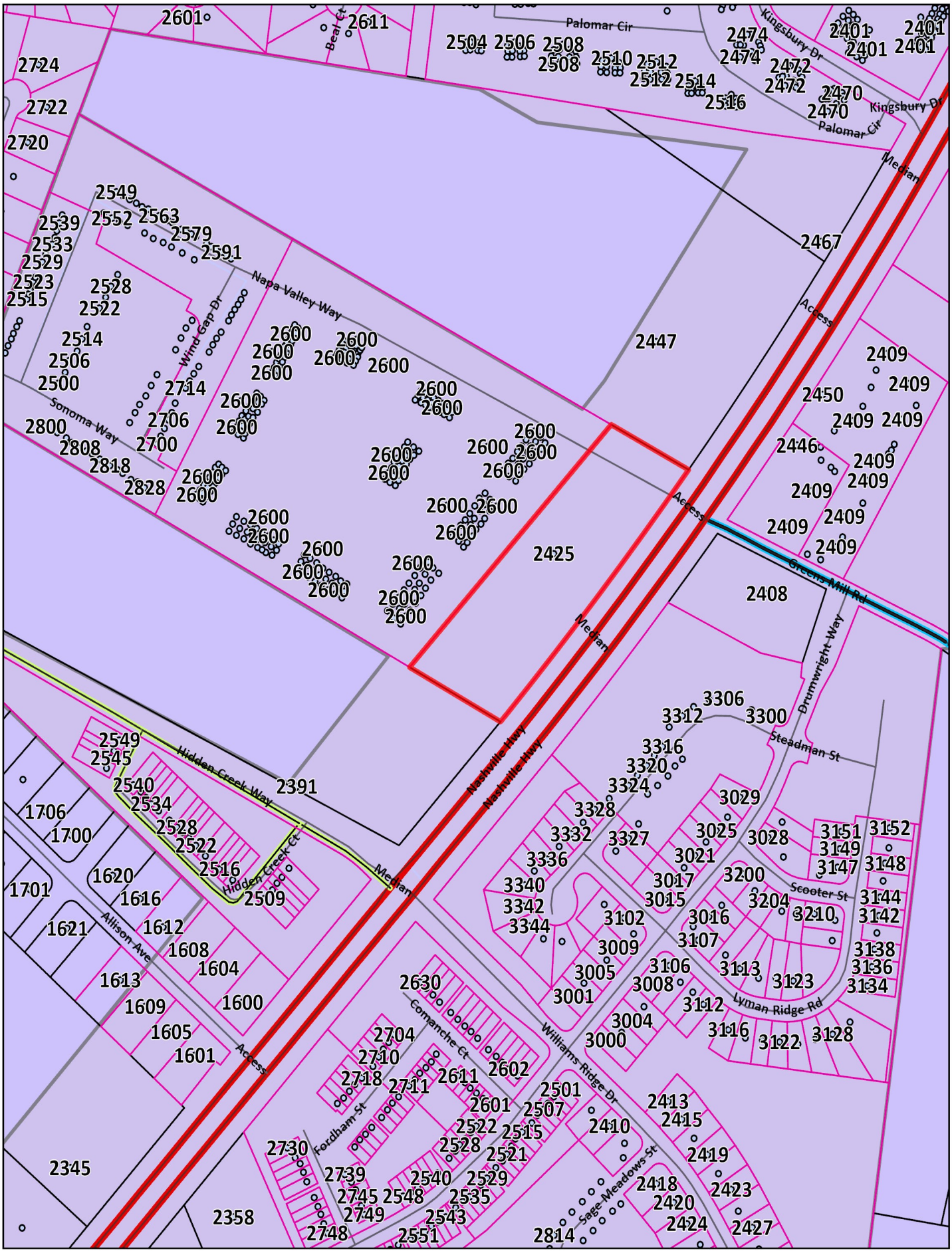
19. Plan to serve.

ATTACHMENTS: PUD Master Plan, Concept Plan

NOTE: All submittals shall be compliant with City standards prior to Planning Commission review. Items that are not adhering to the regulations and/or comments for that request will not be forwarded to the next agenda until such items are amended.

Current Enrollment / Capacity

	Facility Name	Date Constructed	Sq. Ft.	Acreage	Capacity	Current Enrollment	Capacity Used
Elementary	Baker	1960	43,920	12	340	325	95.6%
	Battle Creek	2019	90,000	30	700	638	91.1%
	Brown	1968	56,720	20	405	361	89.1%
	Highland	1986	47,800	4.5	380	301	79.2%
	Howell	1999	81,600	17.5	700	594	84.9%
	Mt. Pleasant	1978	80,021	22	630	583	92.5%
	Riverside	1984	71,150	14	500	407	81.4%
	Spring Hill	1984	69,000	10	540	450	83.3%
	Woodard	1990	76,200	17	600	559	93.2%
	Wright	2005	97,765	18	740	598	80.8%
					5535	***4816***	***87.0%***
Middle	Battle Creek	2019	125,000	45	900	726	80.7%
	Cox	1997	137,200	25	900	655	72.8%
	Mt. Pleasant	2001	113,938	29.2	550	426	77.5%
	Spring Hill	2010	158,106	39.49	950	534	56.2%
	Whitthorne	1979	175,600	17	1050	963	91.7%
					4350	***3304***	***76.0%***
High	Central	2016	296,740	55	1700	1396	82.1%
	Mt. Pleasant	1969	110,759	31	600	389	64.8%
	Spring Hill	1993	181,800	57	1200	1238	103.2%
					3500	***3023***	***86.4%***
Unit	Culleoka	1969	205,800	34	1020	875	85.8%
	Hampshire	1978	83,410	13.12	500	411	82.2%
	Santa Fe	1964	94,225	24	650	509	78.3%
					2170	***1795***	***82.7%***
Other	Central Office	1960	15,400	1.5			
	College Hill	1958	42,211	2.26		167	
	Maintenance	1987	9,400	4.7			
	McDowell		46,165	7			
			2,509,930	**550.27**	**15555**	**13105**	



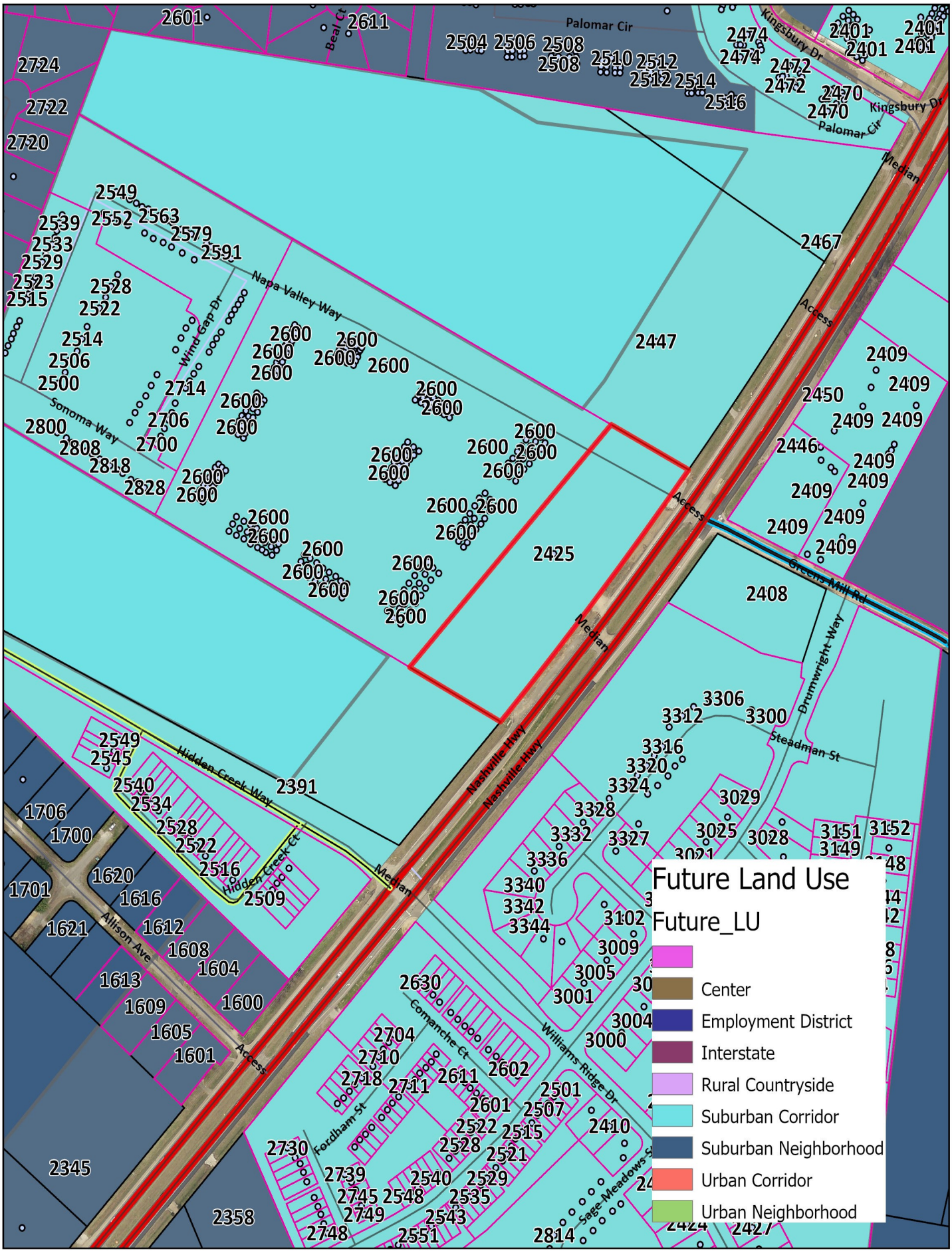
23-0418

2425 Nashville Highway

Area of Change

CITY OF COLUMBIA TENNESSEE

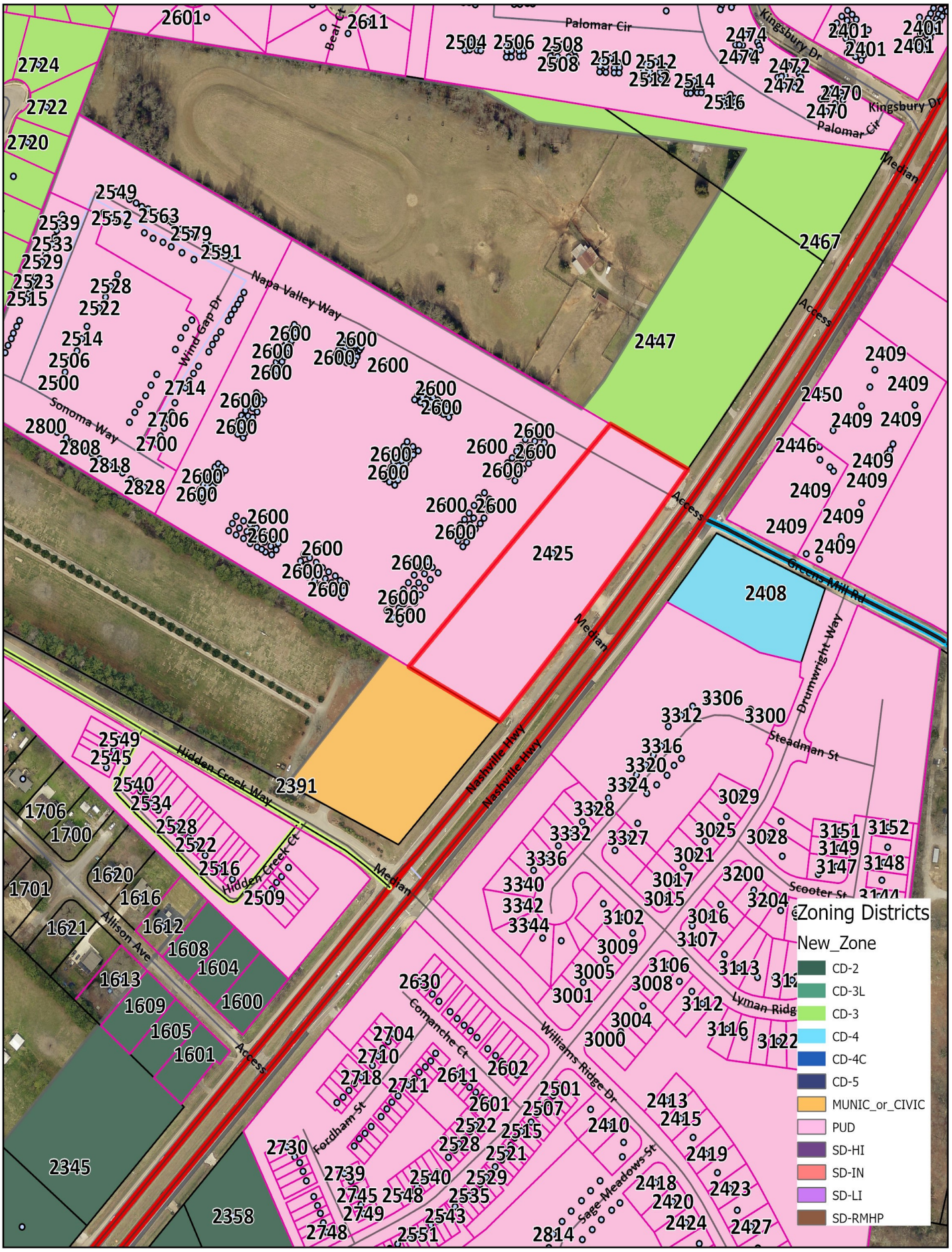
DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541



23-0418
2425 Nashville Highway

CITY OF COLUMBIA TENNESSEE

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23-0418
2425 Nashville Highway

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FAX: (931) 560-1541

MAY 2017

TRAFFIC IMPACT STUDY

VILLAGE AT CARTER'S STATION
NASHVILLE, TENNESSEE

PREPARED FOR:
MARTIN CONSULTING AND ENGINEERING, LLC

Transportation Consultants, LLC

1101 17TH AVENUE SOUTH
NASHVILLE, TENNESSEE 37212

TRAFFIC IMPACT STUDY
VILLAGE AT CARTERS STATION
NASHVILLE, TENNESSEE

PREPARED FOR:
MARTIN CONSULTING AND ENGINEERING, LLC



PREPARED BY:
RPM TRANSPORTATION CONSULTANTS, LLC
1101 17th Avenue South
Nashville, TN 37212
615.370.8410 office 615.370.8455 fax
www.rpmtraffic.net

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EXECUTIVE SUMMARY

Project Description

The proposed Village at Carter's Station mixed-use development is located in Columbia, Tennessee, at the intersection of Nashville Highway and Greens Mill Road. The proposed development is located in an area that is predominately rural and characterized by low density land uses and farmland. According to the civil engineer for the project, Martin Consulting and Engineering, the development consists of approximately 181 apartment units, 108 townhome units, 9,300 square feet of office space, 68,300 square feet of specialty retail space, and 9,300 square feet of restaurant space.

Access to the project will be provided by two accesses on Nashville Highway. The northern proposed Site Access 1 on Nashville Highway is planned to be aligned with Greens Mill Road, and the southern proposed Site Access 2 is planned to be right-in/right-out and located approximately 600 feet south of the Site Access 1. Surface parking is planned to accommodate the development.

Data Collection

In order to provide data for the traffic impact analysis, manual traffic counts were conducted at the following unsignalized intersections:

- Nashville Highway and Greens Mill Road
- Nashville Highway and Arden Village Drive/Grove Park Way
- Nashville Highway and Old Highway 31 North
- Old Highway 31 North and Carters Creek Road

Specifically, RPM Transportation Consultants, LLC, conducted the traffic counts from 7:00 – 9:00 AM and 4:00 – 6:00 PM on a typical weekday in May 2017 while schools were in session. From the counts, it was determined that the peak hours of traffic flow for the study intersections occurred from 7:15 – 8:15 AM and 4:45 – 5:45 PM.

Projection of Future Traffic Volumes

In order to account for the traffic growth prior to the completion of the proposed project, background traffic volumes were established, which includes general background traffic growth. Then the estimated project-generated traffic volumes were

added to the background peak hour traffic volumes in order to obtain the total projected peak hour traffic volumes for the study area intersections.

Conclusions and Recommendations

The analyses presented in this study indicate that the impacts of the proposed Village at Carter's Station mixed-use development on the existing street network will be manageable by providing the recommendations below. These specific recommendations will provide safe and efficient traffic operations within the study area following the completion of the proposed project. The recommendations are as follows:

- Site Access 1 should be designed to include sufficient width for one entering lane and two exiting lanes. The exiting lanes should be striped to provide an exclusive left turn lane and a shared through/right turn lane.

- A traffic signal should be installed at the intersection of Nashville Highway and Site Access 1/Greens Mill Road based on satisfaction of traffic signal warrants. Protected left turn phasing should be implemented for the northbound and southbound approaches. This signal is projected to be warranted upon completion of approximately 60% of the Village at Carter's Station development. Because the warrant analysis is based on projected traffic volumes, it is recommended that updated signal warrant analysis be conducted at approximately the 60% development level of the Village at Carter's Station to determine if actual traffic volumes meet the signal warrants.

- An exclusive right turn lane with approximately 140 feet of storage should be provided on the southbound approach of Nashville Highway at Site Access 1, as shown in the site plan.

- An exclusive left turn lane with approximately 200 feet of storage should be provided on the northbound approach of Nashville Highway at Site Access 1, as shown in the site plan.

- Site Access 2 should be designed as a Right-In-Right-Out (RIRO) access and should include sufficient width for one entering lane and one exiting lane. The eastbound approach should be stop controlled. This access is necessary due to the size of the development.

- Install one Right Turn Only (R3-5R) sign on the south side of Site Access 2 at the eastbound approach of Site Access 2 at Nashville Highway.

- An exclusive right turn lane with approximately 260 feet of storage should be provided on the southbound approach of Nashville Highway at Site Access 2, as shown in the site plan.

- The existing median break, located approximately 150 feet north of Site Access 2, should be closed.

- Due to its proximity, the existing cemetery access on the southeast area of the project site should either be closed or consolidated with the proposed southern Site Access 2

1. INTRODUCTION

The purpose of this study is to analyze the traffic impacts and access plan associated with the proposed Village at Carter's Station development located in the Columbia, Tennessee, at the intersection of Nashville Highway and Greens Mill Road. According to the civil engineer for the project, Martin Consulting and Engineering, the development consists of approximately 181 apartment units, 108 townhome units, 9,300 square feet of office space, 68,300 square feet of specialty retail space, and 9,300 square feet of restaurant space. It was assumed that the development would be completed by 2020, which is a three-year horizon.

The Village at Carter's Station development is planned to be located on the west side of Nashville Highway. The property is bounded on the east by Nashville Highway, on the south by a cemetery, and on the north and west by vacant land.

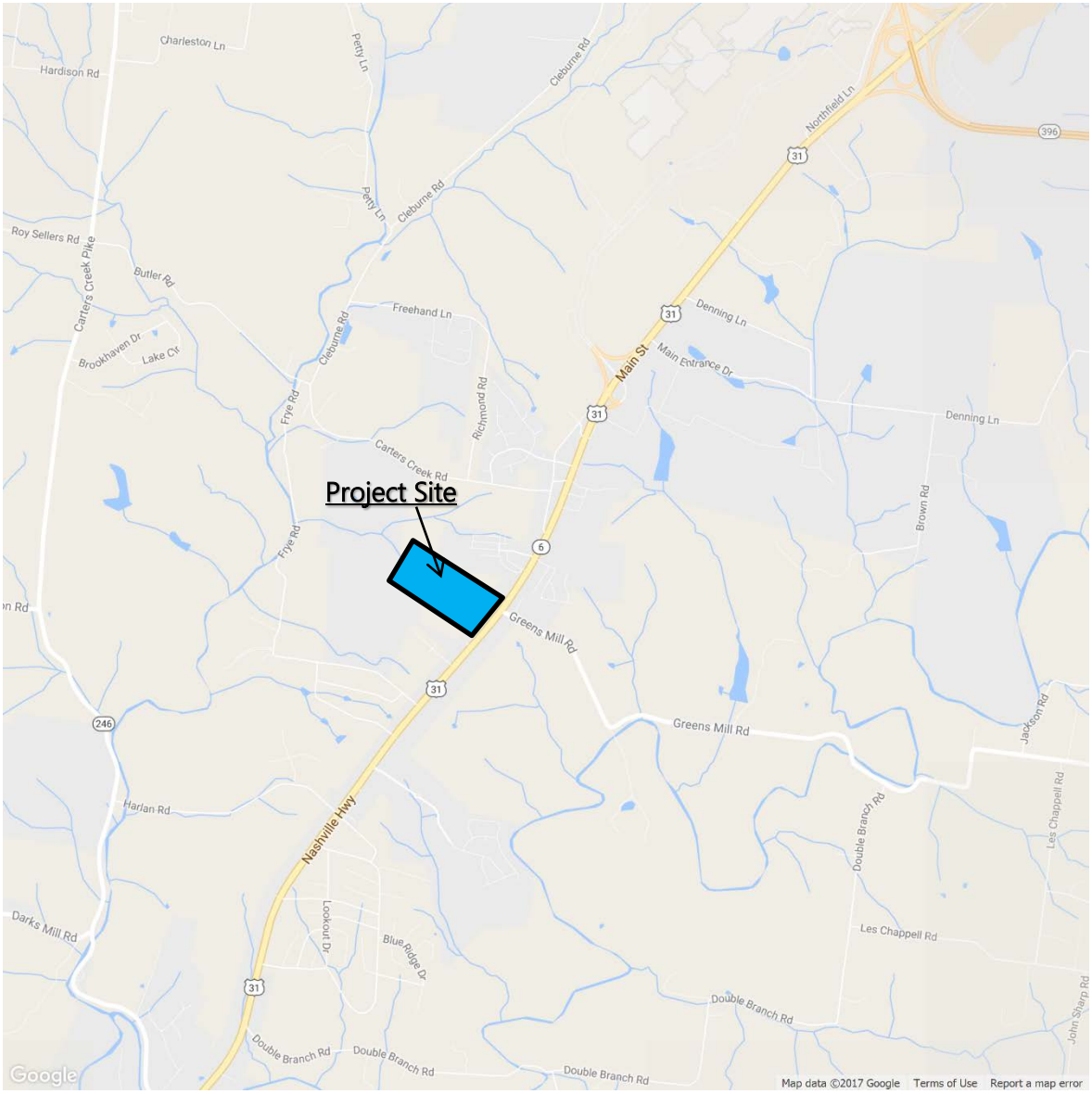
In this study, the current operating characteristics of the adjacent roadways and intersections in the vicinity of the project site are evaluated. The expected trips generated by the proposed development are determined and distributed to the roadway network. The adjacent roadways and intersections are then reevaluated to determine the anticipated traffic impacts of the project. Finally, recommendations are presented, including roadway improvements and/or traffic control improvements that are needed to accommodate the expected traffic.

2. PROJECT DESCRIPTION

The proposed Village at Carter's Station development is located in Columbia, Tennessee, at the intersection of Nashville Highway and Greens Hills Road. The project site is located on the west side of Nashville Highway. As shown in Figure 1, the project site is bounded on the east by Nashville Highway, on the south by a cemetery, and on the west and north by vacant land. The proposed development is within an area that is predominantly rural and characterized by a low density land uses and farmland.

According to the developer, the development consists of approximately 181 apartment units, 108 townhome units, 9,300 square feet of office space, 68,300 square feet of specialty retail space, and 9,300 square feet of restaurant space.

The current concept plan for the Village at Carter's Station site is shown in Appendix A. Surface parking is planned to accommodate the development. Two vehicular access points to the development are planned to be located on Nashville Highway, one northern Site Access 1 aligned with Greens Mill Road, and the second Site Access 2 located approximately 600 feet south of Greens Mill Road.



N

Location of the Project Site
(Not to Scale)

Figure 1.

3. EXISTING CONDITIONS

3.1 Existing Roadway Network

Local access to the site will be provided by Nashville Highway, Greens Mill Road, Old Highway 31 North, Carters Creek Road, Arden Village Drive, and Grove Park Way. A description of these roadways within the project vicinity is as follows:

Nashville Highway (also designated as State Route 6 and US 31) is a two-way roadway that generally travels in the north-south direction with two travel lanes in each direction, separated by a grass median. Nashville Highway provides connection between Columbia, Tennessee, to the south, and Spring Hill, Tennessee, to the north. Nashville Highway is classified as a Principal Arterial by TDOT. The posted speed limit on Nashville Highway is 55 mph. No on-street parking, sidewalk, transit, or bicycle facilities are provided on Nashville Highway.



Nashville Highway Looking South Adjacent to the Project Site

Greens Mill Road is a two-way roadway that generally travels in an east-west direction with one travel lane in each direction. Greens Mill Road provides connection between Nashville Highway to the west and residential streets along Greens Mill Road. Greens Mill Road is classified as a Major Collector by TDOT. The posted speed limit on Greens Mill Road is 40 mph. No on-street parking, sidewalk, transit, or bicycle facilities are provided on Greens Mill Road.



Greens Mill Road Looking East At Nashville Highway

Old Highway 31 North is a two-way roadway that generally travels in a north-south direction with one travel lane in each direction. Old Highway 31 North provides connection between Nashville Highway to the south and Spring Hill High School to the north. The posted speed limit on Old Highway 31 is 25 mph. No on-street parking, sidewalk, transit, or bicycle facilities are provided on Old Highway 31 North.



Old Highway 31 North Looking East To Nashville Highway

Carters Creek Road is a two-way roadway that generally travels in an east-west direction with one travel lane in each direction. Carters Creek Road provides connection between Old Highway 31 to the east and Cleburne Road to the west, which in turn provides connection to Spring Hill Middle School to the north. The posted speed limit is 35 mph. No on-street parking, sidewalk, transit, or bicycle facilities are provided on Carters Creek Road.



Carters Creek Road Looking West At Old Highway 31 North

Arden Village Road is a two-way roadway that generally travels in an east-west direction with one travel lane in each direction. Arden Village Road provides access from Nashville Highway to the Arden Village residential neighborhood to the west. No speed limit is posted on Arden Village Road. No on-street parking, sidewalk, transit, or bicycle facilities are provided on Arden Village Road, except a sidewalk provided on the south side of Arden Village Road.



Arden Village Road Looking West At Nashville Highway

Grove Park Way is a two-way roadway that generally travels in an east-west direction with one travel lane in each direction. Grove Park Way provides access from Nashville Highway to retail buildings and a church to the east. No speed limit is posted on Grove Park Way. No on-street parking, sidewalk, transit, or bicycle facilities are provided on Grove Park Way.



Grove Park Way Looking West To Nashville Highway

The study area includes four existing intersections described as follows:

Nashville Highway and Greens Mill Road is an unsignalized intersection with three approaches. The westbound approach of Greens Mill Road is stop-controlled and includes one shared left turn/right turn lane. The northbound approach of Nashville Highway includes one through lane and one shared through/right turn lane. The southbound approach of Nashville Highway includes two through lanes and one left turn lane. No pedestrian facilities are provided at the intersection.



Greens Mill Road Looking Westbound At Nashville Highway

Nashville Highway and Arden Village Road/Grove Park Way is an unsignalized intersection with four approaches. The westbound approach of Grove Park Way is stop-controlled and includes a left turn lane and a shared through/right turn lane. The eastbound approach of Arden Village Road is stop controlled and includes a right turn lane and a shared through/left turn lane. The northbound approach of Nashville Highway includes a left turn lane, two through lanes, and a right turn lane. The southbound approach of Nashville Highway includes a left turn lane, two through lanes, and a right turn lane. No pedestrian facilities are provided at the intersection, except a sidewalk on the south side of Arden Village Road that ends at the intersection with a curb ramp.



Arden Village Road Looking Eastbound at Nashville Highway

Nashville Highway and Old Highway 31 North is an unsignalized intersection with three approaches. The eastbound approach of Old Highway 31 North is stop controlled and includes a shared right/left turn lane. The northbound approach of Nashville Highway includes one through lane and one shared through/left turn lane via a median crossing. No pedestrian facilities are provided at the intersection.



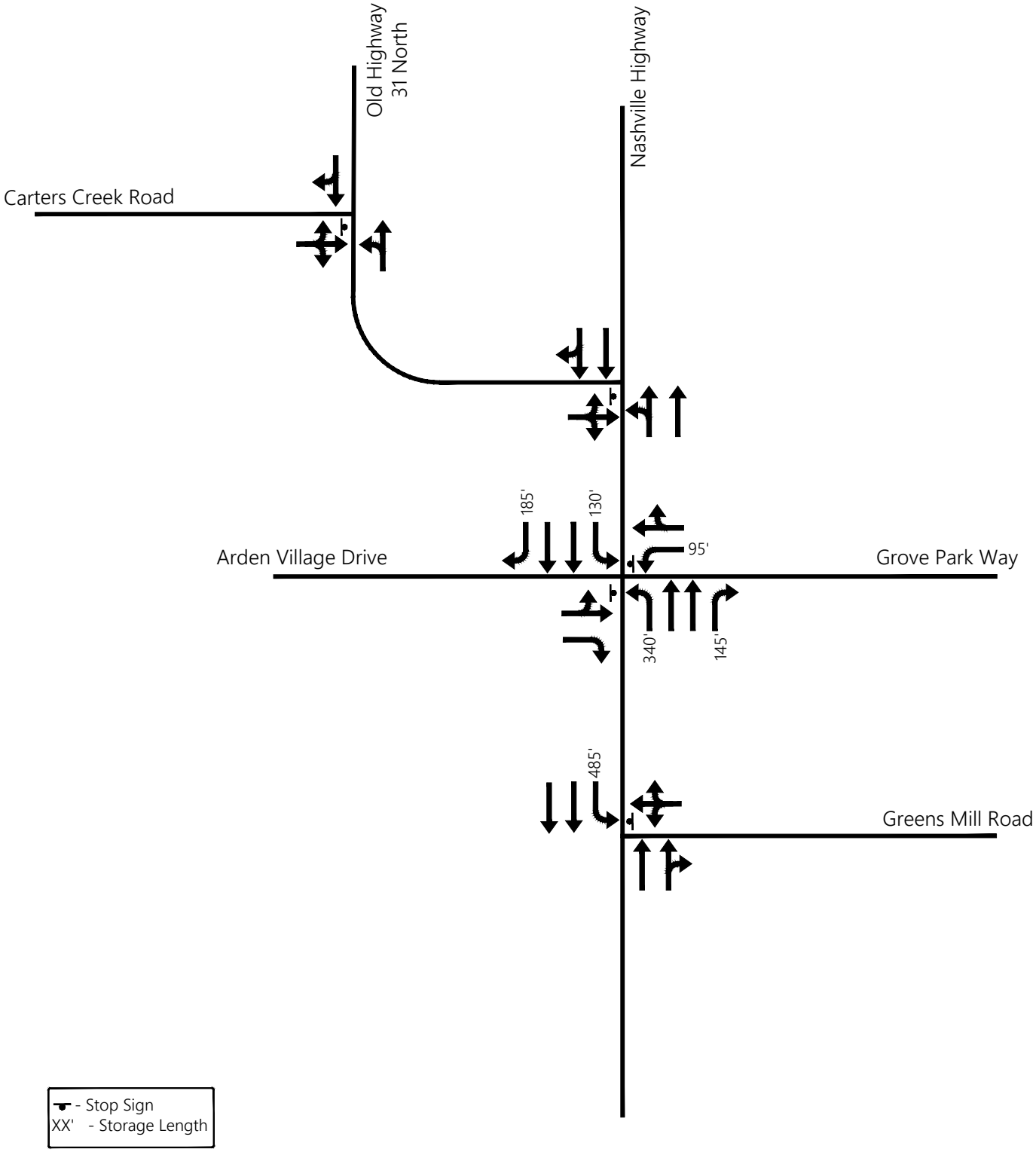
Old Highway 31 Looking Eastbound at Nashville Highway

Old Highway 31 North and Carters Creek Road is an unsignalized intersection with three approaches. The eastbound approach of Carters Creek Road is stop-controlled and includes one shared left/right turn lane. The northbound approach of Old Highway 31 North includes one shared through/left turn lane. The southbound approach of Old Highway 31 North includes one shared through/left turn lane.



Carters Creek Road Looking Eastbound at Old Highway 31

The existing laneage at the study intersections is illustrated in Figure 2.



Existing Laneage
(Not to Scale)

Figure 2.

3.2 Existing Traffic Volumes

In order to provide data for the traffic impact analysis, manual traffic counts were conducted at the following unsignalized intersections:

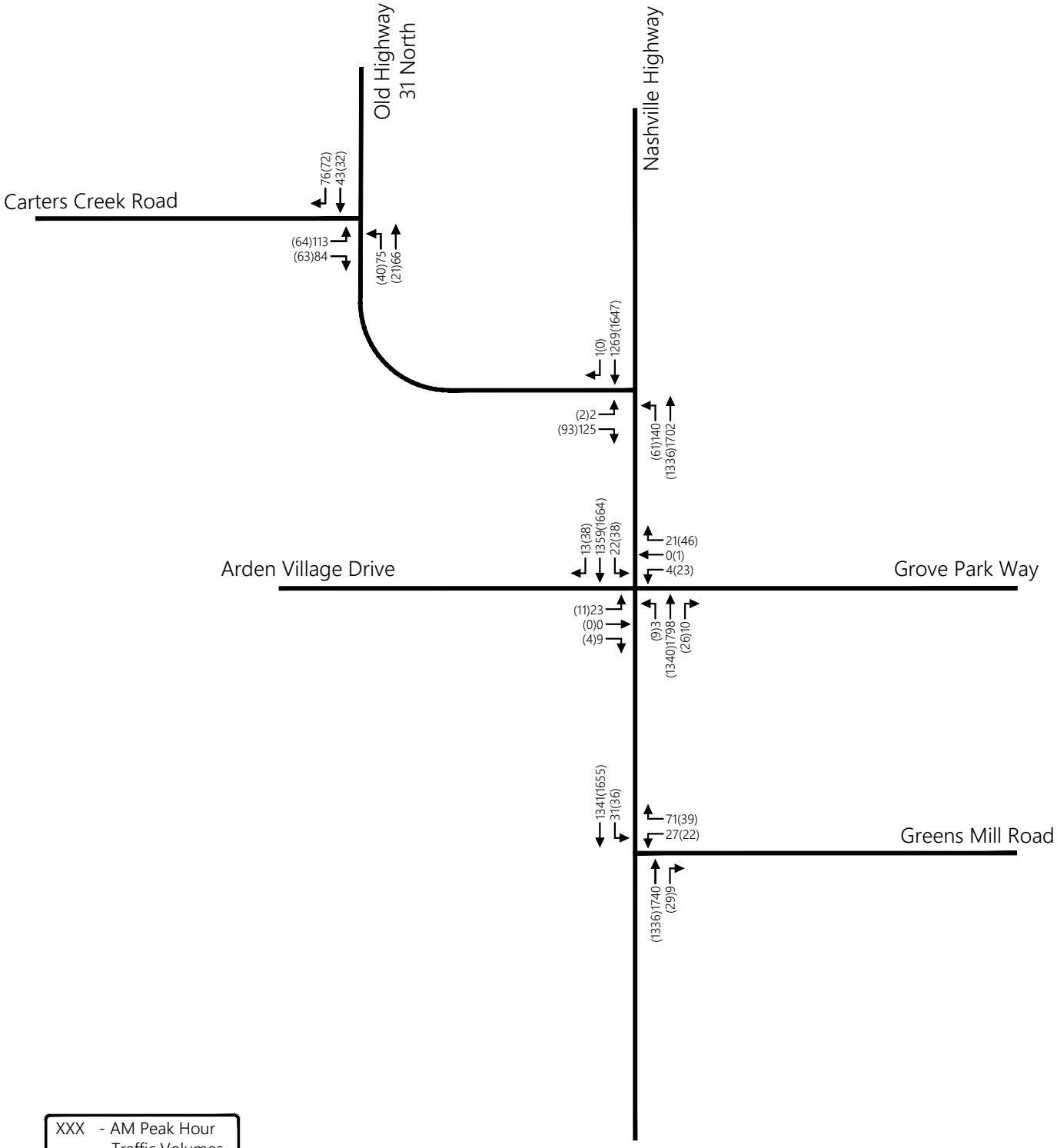
- Nashville Highway and Greens Mill Road
- Nashville Highway and Arden Village Drive/Grove Park Way
- Nashville Highway and Old Highway 31 North
- Old Highway 31 North and Carters Creek Road

Traffic counts for the study intersections were conducted on a typical weekday in May 2017 by RPM Transportation Consultants, LLC (RPM). Specifically, the turning movement counts were conducted from 7:00 – 9:00 AM and 4:00 – 6:00 PM on Wednesday, May 3, 2017, while schools were in session. From the counts, it was determined that the peak hours of traffic flow for the study intersections occurred from 7:15 – 8:15 AM and 4:45 – 5:45 PM. It should be noted that the traffic volumes were balanced between intersections.

The existing peak hour turning movement volumes are presented in Figure 3. A detailed summary of the turning movement counts is included in Appendix B.

In addition to the above information, average daily traffic volumes were obtained from the Tennessee Department of Transportation (TDOT). There are three TDOT count stations located in the vicinity of the project site. There is a count station located on Nashville Highway south of Greens Mill Road. According to TDOT count data, the annual average daily traffic (AADT) in 2015 on Nashville Highway was approximately 34,875 vehicles per day (vpd). There is a count station located on Greens Mill Road east of Nashville Highway. According to TDOT data, the AADT in 2015 on Greens Mill Road was approximately 1,195 vpd. There is a count station located on State Route 396 (the area's primary Interstate access) approximately 3 miles north of the site. According to TDOT data, the AADT in 2015 on State Route 396 was approximately 23,291 vpd.

TDOT Count Station data is included in Appendix C.



Existing Peak Hour Traffic Volumes
(Not to Scale) Figure 3.

3.3 Existing Traffic Operations

To determine the current operation of the study intersections, capacity analyses were performed for the AM and PM peak hours. The capacity calculations were performed according to the methods outlined in the *Highway Capacity Manual*, TRB 2010. The capacity analyses result in the determination of a Level of Service (LOS) for an intersection. The LOS is a concept used to describe how well an intersection or roadway operates. LOS A is the best, while LOS F is the worst. LOS D is typically considered as the minimum acceptable LOS for an intersection in an urbanized area. Table 1A presents the descriptions of LOS for unsignalized intersections, and Table 1B presents the descriptions of LOS for signalized intersections.

TABLE 1A: DESCRIPTIONS OF LEVEL OF SERVICE FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	DESCRIPTION	CONTROL DELAY (sec/veh)
A	Little or no delay	$\leq$ 10.0
B	Short traffic delay	>10 and $\leq$ 15
C	Average traffic delay	>15 and $\leq$ 25
D	Long traffic delay	>25 and $\leq$ 35
E	Very long traffic delay	>35 and $\leq$ 50
F	Extreme traffic delay	> 50.0

Source: *Highway Capacity Manual*, TRB 2010

TABLE 1B: DESCRIPTIONS OF LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	DESCRIPTION	CONTROL DELAY (sec/veh)
A	Operations with very low delay. This occurs when progression is extremely favorable. Most vehicles do not stop at all.	≤ 10
B	Operations with stable flows. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	>10 and ≤ 20
C	Operations with stable flow. Occurs with fair progression and/or longer cycle lengths. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	>20 and ≤ 35
D	Approaching unstable flow. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop.	>35 and ≤ 55
E	Unstable flow. This is considered to be the limit for acceptable delay. These high delays generally indicate poor progression, long cycle lengths, and high V/C ratios.	>55 and ≤ 80
F	Unacceptable delay. This condition often occurs with over saturation or with high V/C ratios. Poor progression and long cycle lengths may also cause such delay levels.	>80.0

Source: *Highway Capacity Manual*, TRB 2010

The results of the capacity analyses for the existing conditions at the study intersections are presented in Table 2. As shown, all movements on Nashville Highway operate at acceptable levels of service. However, several minor streets on Nashville Highway have movements with a LOS of D or worse, which is common for unsignalized approaches to major arterial streets.

TABLE 2: EXISTING PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVEL OF SERVICE	
		AM Peak Hour (Average Approach Delay in sec/veh)	PM Peak Hour (Average Approach Delay in sec/veh)
Nashville Highway and Old Highway 31 North	Northbound Left Turn	C (15.5)	C (18.0)
	Eastbound Left Turn	D (26.7)	C (24.7)
Nashville Highway and Greens Mill Road	Westbound Approach	F (300.0*)	F (271.7)
	Southbound Left Turn	C (18.1)	B (13.8)
Nashville Highway and Arden Village Drive/Grove Park Way	Northbound Left Turn	B (13.0)	C (16.0)
	Eastbound Through/Left Turn	F (300.0*)	F (300.0*)
	Eastbound Right Turn	C (15.3)	C (18.1)
	Westbound Left Turn	F (300.0*)	F (300.0*)
	Westbound Through/Right Turn	C (20.8)	D (33.8)
	Southbound Left Turn	C (18.3)	B (13.6)
Old Highway 31 North and Carters Creek Road	Northbound Left Turn	A (7.6)	A (7.5)
	Eastbound Left Turn	B (11.8)	A (9.9)

Note: For stop-controlled intersections, an LOS is presented for each critical turning movement.
* Indicates delay that exceeds 300 seconds

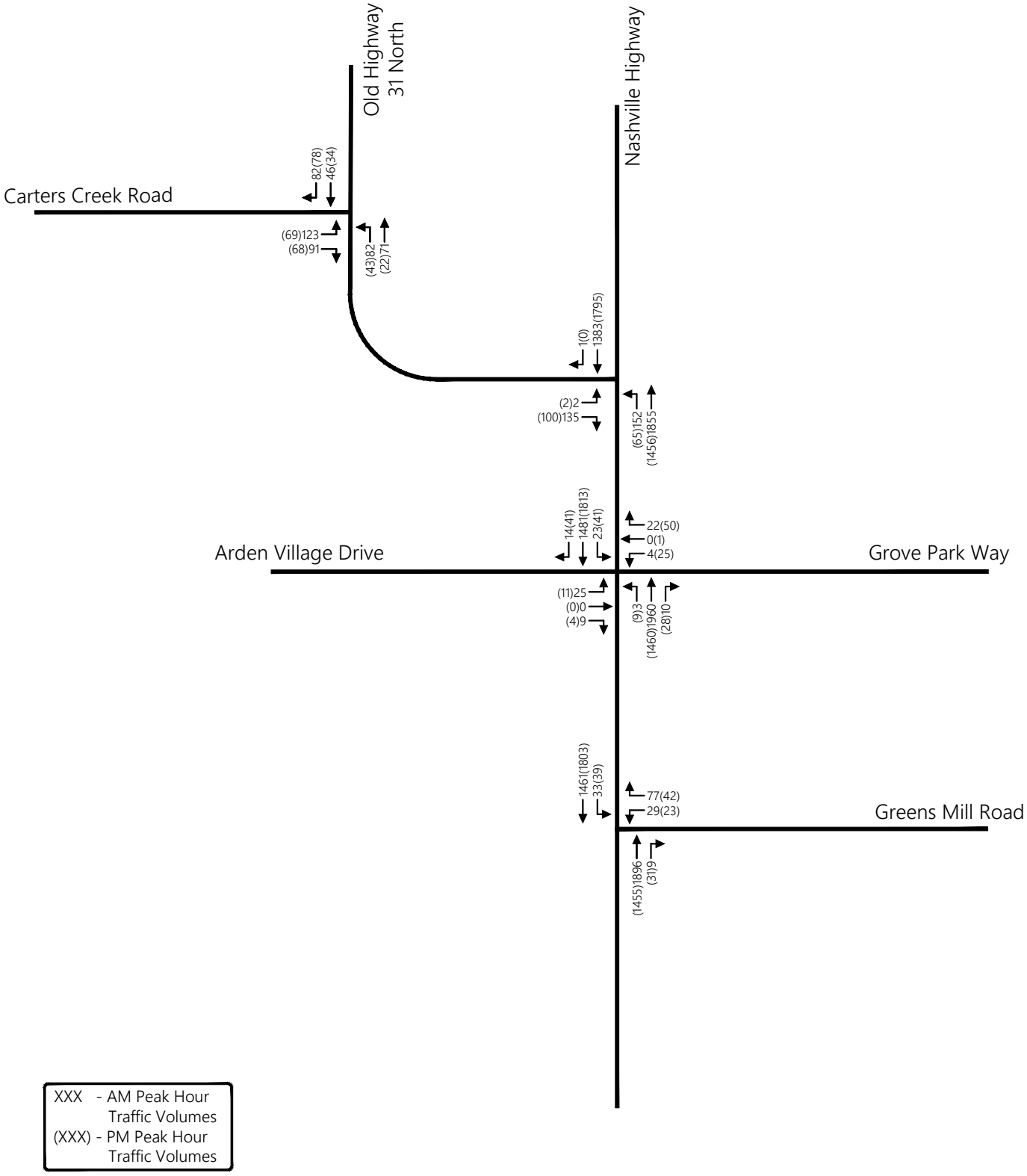
4. BACKGROUND TRAFFIC VOLUMES

4.1 Establishing Background Volumes

In order to account for the traffic growth prior to the completion of the proposed project, background traffic volumes were established. For the purposes of this traffic study, the proposed development was assumed to be completed by the year 2020, which is a three-year horizon. Historical daily traffic volumes were obtained from the TDOT count stations located on Nashville Highway, Greens Mill Road, and State Route 396 in the vicinity of the project site. Since 2010, the combined traffic at these four TDOT count stations has increased by an average of 2.6% per year. The TDOT count station data is included in Appendix C.

A growth factor was applied to the existing peak hour traffic volumes to account for general background growth for the future conditions. The existing peak hour traffic volumes at the study intersections were conservatively increased by 3% per year for three years to account for background traffic growth within the study area. These volumes represent the peak hour traffic that is expected to be on the roadway in 2020 even if the proposed Village at Carter's Station is not completed.

Figure 4 presents the total background AM and PM peak hour traffic volumes expected in the year 2020.



Background Peak Hour Traffic Volumes - Year 2020
(Not to Scale) Figure 4.

4.2 Background Traffic Operations

To determine the operation of the study area intersections under background conditions, capacity analyses were performed for the AM and PM peak hours. The analyses for the background conditions were based on the same lane configurations as the existing conditions.

As shown in Table 3, under background conditions the capacity analyses indicate that the study intersections are expected to continue to operate at similar levels of service as under the existing conditions with minimal increases in vehicular delay, with a few exceptions. The LOS of the westbound through/right turn lane at the intersection of Nashville Highway and Arden Village Drive/Grove Park Way is expected to deteriorate from LOS D to LOS F in the PM peak hour. Also, the LOS of the eastbound left turn at the intersection of Nashville Highway and Old 31 North is expected to deteriorate from LOS D to LOS E in the AM peak hour and from LOS C to LOS D in the PM peak hour. Also, the southbound left turns from Nashville Highway on to Greens Mill Road will drop from LOS B to LOS C during the PM peak hour, and the eastbound left turns at the intersection of Old Highway 31 North and Carters Creek Road will drop from LOS A to LOS B.

TABLE 3: BACKGROUND PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVEL OF SERVICE	
		AM Peak Hour (Average Approach Delay in sec/veh)	PM Peak Hour (Average Approach Delay in sec/veh)
Nashville Highway and Old Highway 31 North	Northbound Left Turn	C (18.0)	C (20.9)
	Eastbound Left Turn	E (35.6)	D (30.2)
Nashville Highway and Greens Mill Road	Westbound Approach	F (300.0*)	F (300.0*)
	Southbound Left Turn	C (20.7)	C (15.1)
Nashville Highway and Arden Village Drive/Grove Park Way	Northbound Left Turn	B (14.0)	C (17.8)
	Eastbound Through/Left Turn	F (300.0*)	F (300.0*)
	Eastbound Right Turn	C (16.4)	C (19.8)
	Westbound Left Turn	F (300.0*)	F (300.0*)
	Westbound Through/Right Turn	C (23.4)	F (53.7)
	Southbound Left Turn	C (20.9)	B (14.8)
Old Highway 31 North and Carters Creek Road	Northbound Left Turn	A (7.7)	A (7.5)
	Eastbound Left Turn	B (12.4)	B (10.1)

Note: For stop-controlled intersections, an LOS is presented for each critical turning movement.
* Indicates delay that exceeds 300 seconds

5. IMPACTS

5.1 Trip Generation

A traffic generation process was used to estimate the amount of traffic expected to be generated by the proposed Village at Carter's Station mixed-use development. Factors for the trip generation were taken from ITE's *Trip Generation*, Ninth Edition. As previously discussed, the development consists of approximately 181 apartment units, 108 townhome units, 9,300 square feet of office space, 68,300 square feet of specialty retail space, and 9,300 square feet of restaurant space.

The development is characterized by a variety of land uses, which will result in internal trips within the site among the various land uses. Conservatively, 15% of the traffic generated by the proposed commercial land uses was assumed to be due to internal trips. The development is located in a predominantly rural setting with low density and farmland land uses, with no transit, pedestrian, and bicycle facilities. Conservatively, no reductions were taken to account for pass-by trips or alternative transportation modes.

The calculations for trip generation are included in Appendix E.

Table 4 presents the daily, AM, and PM peak hour trip generation for the proposed mixed-use development. As shown in Table 4, the development can be expected to generate approximately 5,853 new vehicle trips per day. The AM and PM peak hour trip generations will equal approximately 332 and 420 new trips, respectively. These trips represent the new traffic that will be generated by the proposed Village at Carter's Station development.

TABLE 4: DEVELOPMENT TRIP GENERATION

LAND USE	SIZE	GENERATED TRAFFIC				
		DAILY TRAFFIC	AM PEAK		PM PEAK	
			Enter	Exit	Enter	Exit
Apartments	181 d.u.	1,037	15	63	65	35
Townhomes	108 d.u.	585	8	39	21	10
Office	9,300 s.f.	88	11	2	2	10
Specialty Retail Center	68,300 s.f.	2,960	57	36	81	104
High-Turnover Sit-Down Restaurant	9,300 s.f.	1,183	56	45	55	37
	SUBTOTAL	5,853	147	185	224	196
	NEW TRIPS	5,853	332		420	

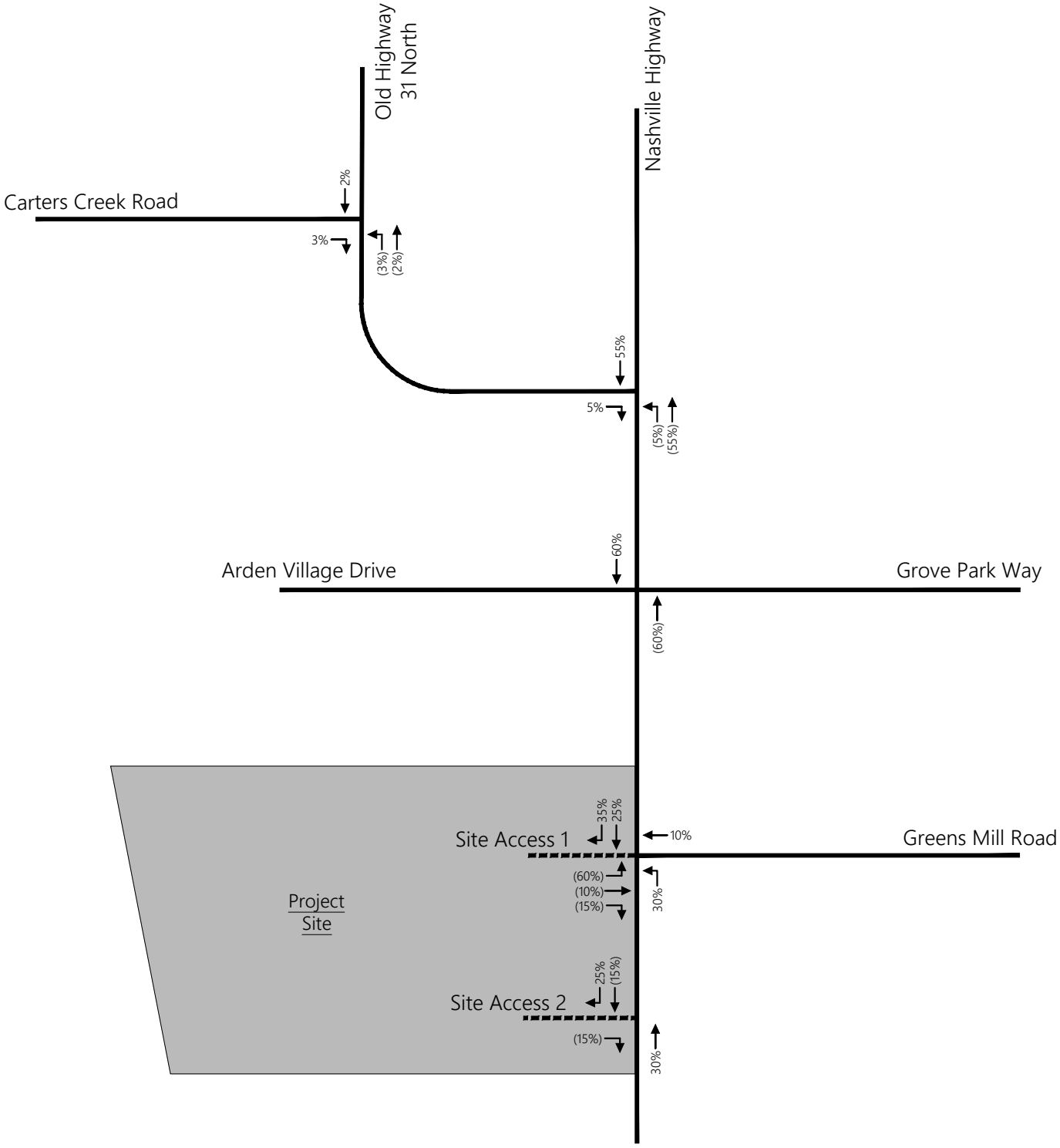
Source: *Trip Generation*, Ninth Edition

5.2 Trip Distribution and Traffic Assignment

A directional distribution of traffic generated by the proposed project was established based on the proposed accesses, the existing roadway network, and the existing travel patterns developed from the existing peak hour traffic counts. As previously discussed, there will be two accesses to the site. The northern Site Access 1 will be aligned with Greens Mill Road, and the southern Site Access 2 will be located approximately 600 feet south.

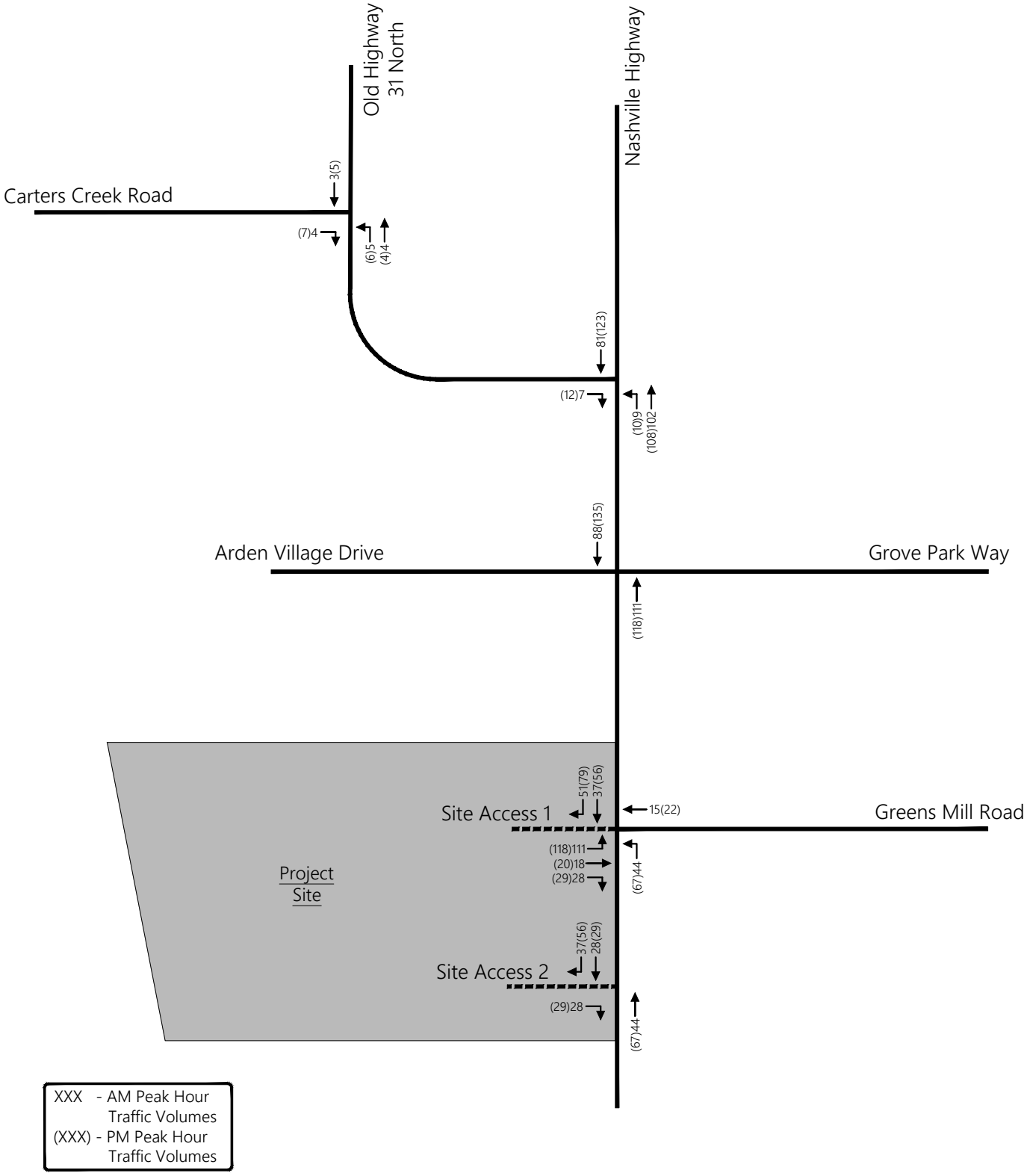
Directional distributions for the proposed development are shown in Figure 5. As shown in the figures, approximately 55% of the traffic generated by the development will be oriented north on Nashville Highway, 2% north on Old Highway 31 North, 3% west on Carters Creek Road, 10% east on Greens Mill Road, and 30% south on Nashville Highway.

Based on these directional distributions, the project-generated traffic was assigned to the roadway network. The total traffic assignment for the proposed mixed-use development is shown in Figure 6.



Distribution of Peak Hour Traffic Volumes Generated by the Project Site

(Not to Scale) Figure 5.



Assignment of Peak Hour Traffic Volumes Generated by the Project Site

(Not to Scale) Figure 6.

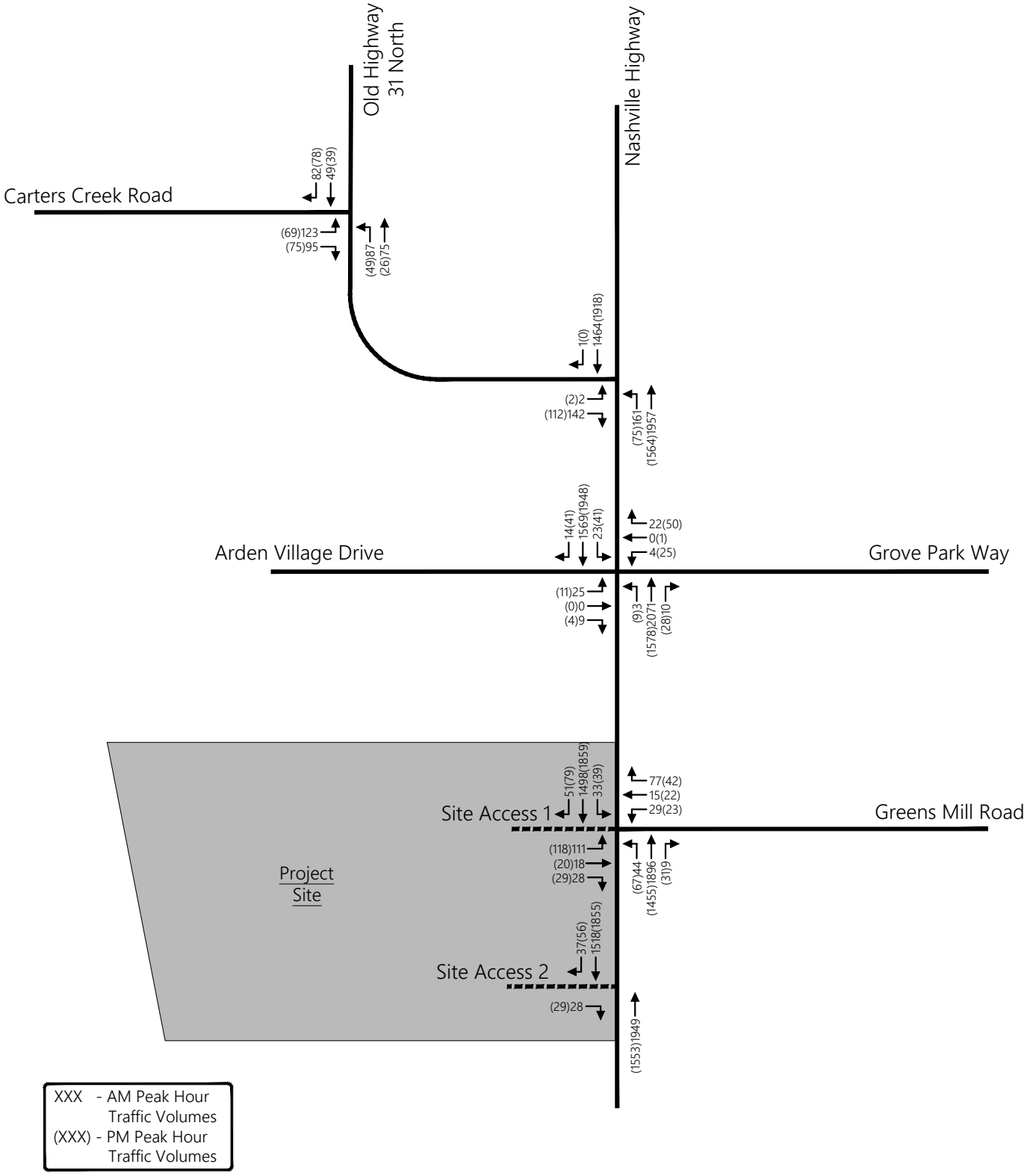
5.3 Capacity / Level of Service Analyses

The total site-generated traffic volumes were added to the background peak hour traffic volumes for the proposed Village at Carter's Station development in order to obtain the total projected traffic volumes for the study intersections. Figure 7 presents the total projected AM and PM peak hour traffic volumes expected at the completion of the proposed development.

Capacity analyses were performed in order to determine the impact of the project on the study intersections. These capacity analyses were also used to evaluate the need for roadway and traffic control improvements at the intersections studied. The capacity calculations were performed according to the methods outlined in the *Highway Capacity Manual*, TRB 2010. The results of the capacity analyses for the projected conditions at the study area intersections are presented in Table 5. For the analyses, the intersection configurations were the same as the existing and background conditions. It was assumed the lane configurations at the site accesses aligned with those shown in the site plan in Appendix A. Capacity analyses worksheets are included in Appendix D.

As shown in Table 5, under the projected conditions the capacity analyses indicate that the study intersections are expected to continue to operate at similar levels of service as under the background conditions, with a few exceptions. The LOS of the eastbound left turn at the intersection of Nashville Highway and Old 31 North is expected to deteriorate from LOS E to LOS F in the AM peak hour, and LOS D to LOS E in the PM peak hour, despite minimal traffic being assigned to Old Highway 31 North. Also, at the intersection of Nashville Highway and Arden Village Drive/Grove Park Way, the westbound through/right turn lane will drop from LOS C to LOS D and the southbound left turn lane will drop from LOS B to LOS C.

Capacity analyses were also conducted under projected conditions with the inclusion of a southbound right turn lane and a northbound left turn lane on Nashville Highway at Site Access 1, and a southbound right turn lane on Nashville Highway at Site Access 2. As shown in Table 5, the turn lanes are expected to improve traffic operations on Nashville Highway. However, a traffic signal will be warranted to improve the LOS of Site Access 1 due to the high turning traffic volumes. As shown in Table 5, the proposed signalized intersection of Site Access 1/Greens Mill Road and Nashville Highway is expected to operate at LOS A at both AM and PM peak hours.



Total Projected Peak Hour Traffic Volumes
(Not to Scale)

Figure 7.

TABLE 5: PROJECTED PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVEL OF SERVICE	
		AM Peak Hour (Average Approach Delay in sec/veh)	PM Peak Hour (Average Approach Delay in sec/veh)
Nashville Highway and Old Highway 31 North	Northbound Left Turn	C (20.3)	C (24.8)
	Eastbound Left Turn	F (78.1)	E (38.7)
Nashville Highway and Site Access 2 *With Recommended Turn Lanes*	Eastbound Right Turn	C (18.1) *C (17.6)*	C (23.4) *C (22.3)*
Nashville Highway and Site Access 1/Greens Mill Road *With Recommended Turn Lanes* ***With Recommended Traffic Signal***	Northbound Left Turn	C (16.0) *C (15.4)*	C (24.5) *C (22.5)*
	Eastbound Through/Right Turn	F (300.0*)	D (26.1)
	Southbound Left Turn	C (20.7)	C (15.1)
	Overall Intersection	***B (14.5)***	***B (13.1)***
Nashville Highway and Arden Village Drive/Grove Park Way	Northbound Left Turn	B (14.8)	C (19.7)
	Eastbound Through/Left Turn	F (300.0*)	F (300.0*)
	Eastbound Right Turn	C (17.3)	C (21.6)
	Westbound Left Turn	F (300.0*)	F (300.0*)
	Westbound Through/Right Turn	D (25.5)	F (76.1)
	Southbound Left Turn	C (23.0)	C (16.2)
Old Highway 31 North and Carters Creek Road	Northbound Left Turn	A (7.7)	A (7.6)
	Eastbound Left Turn	B (12.7)	B (10.2)

Notes: For signalized and all-way stop-controlled intersections, an overall LOS is presented. For two-way stop-controlled intersections, an LOS is presented for each critical turning movement.
* Indicates delay that exceeds 300 seconds

6. ANALYSIS OF SITE PLAN

6.1 Site Access Review

The proposed development consists of approximately 181 apartment units, 108 townhome units, 9,300 square feet of office space, 68,300 square feet of specialty retail space, and 9,300 square feet of restaurant space.

Two site access points are planned to serve the site. The northern Site Access 1 is shown in the site plan to have one left turn lane and one shared through/right turn lane. The southern Site Access 2 is shown in the site plan to be right turn in/right turn out, and to have one right turn lane. The two site driveways will have spacing of approximately 600 feet and these driveways are well spaced from adjacent access points on Nashville Highway. Site Access 2 is necessary due to the traffic generated by the size of the proposed development. These driveway accesses will be adequate to provide good traffic flow and operations once the traffic signal is installed.

There is an existing cemetery access on the southeast area of the project site. Due to its proximity, this cemetery access should either be closed or consolidated with the proposed Site Access 2

Surface parking is planned to accommodate the development.

6.2 Turn Lane Analysis

Both site access were evaluated for the need to provide turn lanes on Nashville Highway. According to the Intersection Channelization Design Guide (NCHRP 279), a right turn lane is warranted on both the southbound approaches of Nashville Highway at Site Access 1 and Site Access 2.

The northern Site Access 1 was also evaluated using Harmelink Methodology for the need to install a northbound left turn lane on Nashville Highway. Based on the projected traffic volumes in both the AM and PM peak hours, a left turn lane is warranted on the northbound approach of Nashville Highway at Greens Mill Road/Site Access 1. Details of the Harmelink analysis are included in Appendix G.

6.3 Signal Warrant Analysis

Under projected conditions, the eastbound approach of the proposed northern Site Access 1 operates at poor LOS; therefore, the intersection of Nashville Highway

and Greens Mill Road/Site Access 1 was evaluated for the need to provided traffic signal control.

As previously mentioned, access to the development will be provided by two site access driveways, only one of which is a full access driveway. A traffic signal should not normally be installed at an intersection unless specific warrants are satisfied. Therefore, traffic signal warrant analyses were performed with available data for the intersection of Nashville Highway and Site Access 1 based on the anticipated traffic conditions with completion of the development.

The Manual on Uniform Traffic Control Devices (MUTCD) sets forth nine different warrants that have been developed by the traffic engineering profession to facilitate the determination of whether a signal is warranted. These warrants include minimum conditions that normally indicate when a traffic signal is justified at a particular location. The MUTCD states that "traffic control signals should not be installed unless one or more signal warrants as in the manual are met." A complete description of the relevant traffic signal warrants, as presented in the MUTCD, is included in Appendix F.

The 70% reduced warrants were used to analyze the intersection because the posted speed limit on Nashville Highway exceeds 40 mph. For the intersection of Nashville Highway and Greens Mill Road/Site Access 1, traffic signal warrant analyses were based on estimates of the eighth highest hour of a typical day. The method for this estimation is described in the Manual of Traffic Signal Design, by Iris Fullerton and James H. Kell. The results of these analyses are shown in Appendix F.

The results of the warrant analyses indicate that at the completion of the development, the projected traffic volumes at the intersection of Nashville Highway and Greens Mill Road/Site Access 1 will satisfy Signal Warrant 1B, Interruption of Continuous Traffic, Signal Warrant 2, Four-Hour Vehicular Volume, and Warrant 3, Peak Hour Volume. Additional analyses were conducted to determine whether a traffic signal would be needed at the intersection of Nashville Highway and Greens Mill Road/Site Access 1 before the development is completed. The results of these analyses indicate that the traffic signal at this intersection will be warranted upon completion of approximately 60% of the development.

8. CONCLUSIONS AND RECOMMENDATIONS

The analyses presented in this study indicate that the impacts of the proposed Village at Carter's Station mixed-use development on the existing street network will be manageable by providing the recommendations below. These specific recommendations will provide safe and efficient traffic operations within the study area following the completion of the proposed project. The recommendations are as follows:

- Site Access 1 should be designed to include sufficient width for one entering lane and two exiting lanes. The exiting lanes should be striped to provide an exclusive left turn lane and a shared through/right turn lane.

- A traffic signal should be installed at the intersection of Nashville Highway and Site Access 1/Greens Mill Road based on satisfaction of traffic signal warrants. Protected left turn phasing should be implemented for the northbound and southbound approaches. This signal is projected to be warranted upon completion of approximately 60% of the Village at Carter's Station development. Because the warrant analysis is based on projected traffic volumes, it is recommended that updated signal warrant analysis be conducted at approximately the 60% development level of the Village at Carter's Station to determine if actual traffic volumes meet the signal warrants.

- An exclusive right turn lane with approximately 140 feet of storage should be provided on the southbound approach of Nashville Highway at Site Access 1, as shown in the site plan.

- An exclusive left turn lane with approximately 200 feet of storage should be provided on the northbound approach of Nashville Highway at Site Access 1, as shown in the site plan.

- Site Access 2 should be designed as a Right-In-Right-Out (RIRO) access and should include sufficient width for one entering lane and one exiting lane. The eastbound approach should be stop controlled. This access is necessary due to the size of the development.

- Install one Right Turn Only (R3-5R) sign on the south side of Site Access 2 at the eastbound approach of Site Access 2 at Nashville Highway.

- An exclusive right turn lane with approximately 260 feet of storage should be provided on the southbound approach of Nashville Highway at Site Access 2, as shown in the site plan.

- The existing median break, located approximately 150 feet north of Site Access 2, should be closed.

- Due to its proximity, the existing cemetery access on the southeast area of the project site should either be closed or consolidated with the proposed southern Site Access 2

In summary, based on the analyses conducted, no further recommendations are presented for the proposed Village at Carter's Station development.

APPENDICES

APPENDIX A
PRELIMINARY CONCEPT PLAN

APPENDIX B
DETAILED TURNING MOVEMENT COUNTS

APPENDIX C
TDOT COUNT DATA

APPENDIX D
CAPACITY ANALYSES

APPENDIX E
TRIP GENERATION CALCULATIONS

APPENDIX F
SIGNAL WARRANT ANALYSIS

APPENDIX G
TURN LANE WARRANT ANALYSIS

APPENDIX A
PRELIMINARY CONCEPT PLAN

PURPOSE OF SUBMITTAL - TO ANNEX A PORTION OF THE SITE NOT WITHIN THE CITY LIMITS OF COLUMBIA AND TO REZONE THE ENTIRE PROPERTY TO CRS.

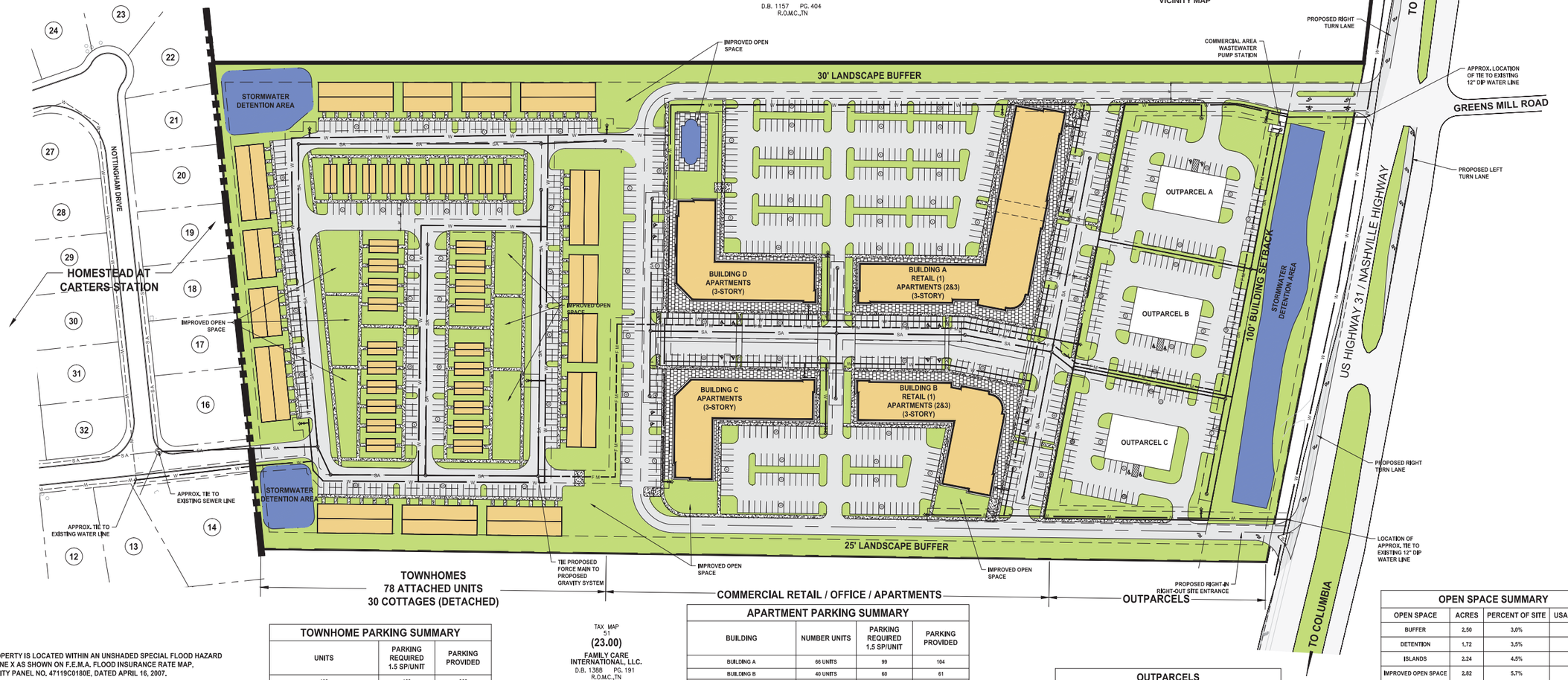
PROPERTY DEVELOPER:
FP TCI CCS, LLC.

PROJECT DESCRIPTION:
ANNEX AND REZONE PROPERTY TO DEVELOP INTO A 214 UNIT APARTMENT AND 108 UNIT TOWNHOME DEVELOPMENT WITH 30,000 SF OF RETAIL AND 19,000 SF OF RESTAURANT WITH 3 COMMERCIAL OUTPARCELS.

ALL ROAD NAMES TO BE APPROVED BY E-911.



VICINITY MAP



TOWNHOME PARKING SUMMARY		
UNITS	PARKING REQUIRED 1.5 SP/UNIT	PARKING PROVIDED
108	162	262
TOTAL	162	262

TAX MAP 51
(23.00)
FAMILY CARE INTERNATIONAL, LLC.
D.B. 1388 PG. 191
R.O.M.C.,TN

APARTMENT PARKING SUMMARY			
BUILDING	NUMBER UNITS	PARKING REQUIRED 1.5 SP/UNIT	PARKING PROVIDED
BUILDING A	66 UNITS	99	104
BUILDING B	40 UNITS	60	61
BUILDING C	54 UNITS	81	101
BUILDING D	54 UNITS	81	120
TOTAL	181 UNITS	321	386

RETAIL OFFICE BUILDING & PARKING					
BUILDING	AREA (SF)	RETAIL PARKING REQUIRED 1 SP/400 SF.	RESTAURANT PARKING REQUIRED 1SP/100 SF.	TOTAL REQUIRED PARKING	PARKING PROVIDED
BUILDING A	37,000	47	119	166	166
BUILDING B	22,000	28	71	99	99
TOTAL	59,000	75	190	265	265

OUTPARCELS	
PARCEL	ACRES
OUTPARCEL A	1,36
OUTPARCEL B	1,15
OUTPARCEL C	1,25
TOTAL	3,76

OPEN SPACE SUMMARY			
OPEN SPACE	ACRES	PERCENT OF SITE	USABLE AREA
BUFFER	2,50	3,0%	1,7
DETENTION	1,72	3,5%	0,3
ISLANDS	2,24	4,5%	0
IMPROVED OPEN SPACE	2,82	5,7%	1,4
TOTAL	9,28	16,7%	3,4

THIS PROPERTY IS LOCATED WITHIN AN UNSHADED SPECIAL FLOOD HAZARD AREA ZONE X AS SHOWN ON F.E.M.A. FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 47119C0180E, DATED APRIL 16, 2007.

TRAFFIC IMPACT STUDY
DEVELOPER WILL CONDUCT TRAFFIC STUDY IMMEDIATELY FOLLOWING THIS SUBMITTAL. DEVELOPER WILL SUBMIT TRAFFIC STUDY TO CITY AND TDOT AND REQUEST PERMISSION TO SIGNALIZE SITE ENTRANCE AT GREENS MILL ROAD AND CONSTRUCT NECESSARY LEFT-HAND TURN LANE AND RIGHT-HAND TURN / DECEL LANE.

LEGEND

- SANITARY SEWER — SA
- WATER LINE — W
- SANITARY SEWER MANHOLE — S
- FIRE HYDRANT ASSEMBLY
- WATER METER — W
- WATER VALVE
- STOP SIGN

VILLAGE AT CARTER'S CREEK MULTI-USE DEVELOPMENT

FP TCI CCS, LLC.
COLUMBIA, TENNESSEE
MAURY COUNTY
APRIL 17, 2017

GRAPHIC SCALE
80 0 40 80
(IN FEET)
1 inch = 80 ft.

MARTIN ENGINEERING & SURVEYING, LLC
5226 Main Street, Suite C-3
Spring Hill, TN 37174
615.812.2147
gary@martinengrg.com

APPENDIX B
DETAILED TURNING MOVEMENT COUNTS

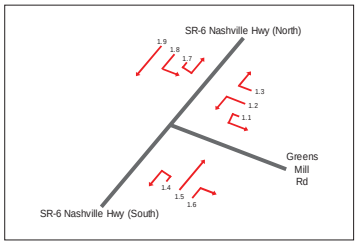
Columbia, TN
Classified Turn Movement Count

Site 1 of 4
Greens Mill Rd
SR-6 Nashville Hwy (South)
SR-6 Nashville Hwy (North)

Lat/Long
35.702619°, -86.979254°

Date
Wednesday 3 May 2017

Weather
Sunny Intervals
Temp: 28°C



Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
1 (615) 431-6750
1 (800) 615-3765

0600 - 0900 (Weekday AM Peak)

	Westbound Greens Mill Rd					Northbound SR-6 Nashville Hwy (South)					Southbound SR-6 Nashville Hwy (North)					
TIME	U-Turn 1.1	Left 1.2	Right 1.3	Peds 1a	App Total	U-Turn 1.4	Thru 1.5	Right 1.6	Peds 1b	App Total	U-Turn 1.7	Left 1.8	Thru 1.9	Peds 1c	App Total	Int Total
0600 - 0615	0	3	9	0	12	0	382	0	0	382	1	1	163	0	165	559
0615 - 0630	0	1	5	0	6	0	369	4	0	373	0	6	558	0	564	943
0630 - 0645	0	3	2	0	5	0	360	0	0	360	0	3	392	0	395	760
0645 - 0700	0	3	13	0	16	0	380	0	0	380	1	2	244	0	247	643
Hourly Total	0	10	29	0	**39**	0	1491	4	0	**1495**	2	12	1357	0	**1371**	**2905**
0700 - 0715	1	4	14	0	19	0	370	2	0	372	0	3	249	0	252	643
0715 - 0730	0	9	27	0	36	0	487	0	0	487	0	7	340	0	347	870
0730 - 0745	0	9	25	0	34	0	459	1	0	460	1	11	401	0	413	907
0745 - 0800	0	6	11	0	17	0	379	7	0	386	0	7	315	0	322	725
Hourly Total	1	28	77	0	**106**	0	1695	10	0	**1705**	1	28	1305	0	**1334**	**3145**
0800 - 0815	0	3	8	0	11	0	415	1	0	416	0	6	285	0	291	718
0815 - 0830	0	5	7	0	12	0	335	2	0	337	1	2	249	0	252	601
0830 - 0845	0	8	15	0	23	0	363	6	0	369	1	4	238	0	243	635
0845 - 0900	0	4	9	0	13	0	337	3	0	340	2	3	214	0	219	572
Hourly Total	0	20	39	0	**59**	0	1450	12	0	**1462**	4	15	986	0	**1005**	**2526**
Grand Total	1	58	145	0	**204**	0	4636	26	0	**4662**	7	55	3649	0	**3710**	**8576**
App Percentage	0.49	28.43	71.08	0.00		0.00	99.44	0.56	0.00		0.19	1.48	98.33	0.00		
Int Percentage	0.01	0.68	1.69	0.00	2.38	0.00	54.06	0.30	0.00	54.36	0.08	0.64	42.54	0.00	43.26	
Cars	0	58	142	-	200	0	4410	25	-	4435	6	52	3430	-	3488	
Trucks	1	0	3	-	4	0	226	1	-	227	1	3	218	-	222	
P/Cycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	
Cars (%)	0.00	100.00	97.93	-	98.04	0.00	95.13	96.15	-	95.13	85.71	94.55	94.02	-	94.02	
Trucks (%)	100.00	0.00	2.07	-	1.96	0.00	4.87	3.85	-	4.87	14.29	5.45	5.98	-	5.98	

1500 - 1800 (Weekday PM Peak)

	Westbound Greens Mill Rd					Northbound SR-6 Nashville Hwy (South)					Southbound SR-6 Nashville Hwy (North)					
TIME	U-Turn 1.1	Left 1.2	Right 1.3	Peds 1a	App Total	U-Turn 1.4	Thru 1.5	Right 1.6	Peds 1b	App Total	U-Turn 1.7	Left 1.8	Thru 1.9	Peds 1c	App Total	Int Total
1500 - 1515	0	4	10	0	14	0	260	8	0	268	0	25	432	0	457	739
1515 - 1530	0	5	2	0	7	0	285	8	0	293	1	6	398	0	405	705
1530 - 1545	0	3	4	0	7	0	274	6	0	280	0	11	468	0	479	766
1545 - 1600	1	5	7	0	13	0	317	4	0	321	0	10	425	0	435	769
Hourly Total	1	17	23	0	**41**	0	1136	26	0	**1162**	1	52	1723	0	**1776**	**2979**
1600 - 1615	0	7	7	0	14	0	244	9	0	253	0	8	397	0	405	672
1615 - 1630	0	2	8	0	10	1	299	6	0	306	0	9	455	0	464	780
1630 - 1645	0	4	8	0	12	0	302	6	0	308	1	10	430	0	441	761
1645 - 1700	0	4	10	0	14	0	327	3	0	330	1	10	436	0	447	791
Hourly Total	0	17	33	0	**50**	1	1172	24	0	**1197**	2	37	1718	0	**1757**	**3004**
1700 - 1715	0	7	5	0	12	0	310	9	0	319	0	12	398	0	410	741
1715 - 1730	0	7	13	0	20	0	365	14	0	379	0	8	380	0	388	787
1730 - 1745	0	4	11	0	15	0	327	3	0	330	0	6	420	0	426	771
1745 - 1800	0	3	7	0	10	0	314	4	0	318	0	11	393	0	404	732
Hourly Total	0	21	36	0	**57**	0	1316	30	0	**1346**	0	37	1591	0	**1628**	**3031**
Grand Total	1	55	92	0	**148**	1	3624	80	0	**3705**	3	126	5032	0	**5161**	**9014**
App Percentage	0.68	37.16	62.16	0.00		0.03	97.81	2.16	0.00		0.06	2.44	97.50	0.00		
Int Percentage	0.01	0.61	1.02	0.00	1.64	0.01	40.20	0.89	0.00	41.10	0.03	1.40	55.82	0.00	57.26	
Cars	0	54	91	-	145	1	3454	80	-	3535	3	126	4880	-	5009	
Trucks	1	1	1	-	3	0	170	0	-	170	0	0	151	-	151	
P/Cycles	0	0	0	-	0	0	0	0	-	0	0	0	1	-	1	
Cars (%)	0.00	98.18	98.91	-	97.97	100.00	95.31	100.00	-	95.41	100.00	100.00	97.00	-	97.07	
Trucks (%)	100.00	1.82	1.09	-	2.03	0.00	4.69	0.00	-	4.59	0.00	0.00	3.00	-	2.93	

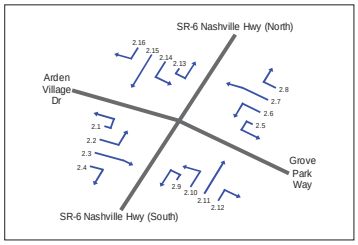
Columbia, TN
Classified Turn Movement Count

Site 2 of 4
Arden Village Dr
Grove Park Way
SR-6 Nashville Hwy (South)
SR-6 Nashville Hwy (North)

Lat/Long
35.706070°, -86.976722°

Date
Wednesday 3 May 2017

Weather
Sunny Intervals
Temp: 28°C



Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
1 (615) 431-6750
1 (800) 615-3765

0600 - 0900 (Weekday AM Peak)

	Eastbound Arden Village Dr						Westbound Grove Park Way						Northbound SR-6 Nashville Hwy (South)						Southbound SR-6 Nashville Hwy (North)						
TIME	U-Turn 2.1	Left 2.2	Thru 2.3	Right 2.4	Peds 2a	App Total	U-Turn 2.5	Left 2.6	Thru 2.7	Right 2.8	Peds 2b	App Total	U-Turn 2.9	Left 2.10	Thru 2.11	Right 2.12	Peds 2c	App Total	U-Turn 2.13	Left 2.14	Thru 2.15	Right 2.16	Peds 2d	App Total	Int Total
0600 - 0615	0	4	0	0	0	4	0	0	0	5	0	5	0	2	397	0	0	399	0	0	166	2	0	168	576
0615 - 0630	0	3	0	0	0	3	0	3	0	4	0	7	0	2	372	0	0	374	0	0	574	5	0	579	963
0630 - 0645	0	1	1	2	0	4	0	1	0	4	0	5	1	0	361	1	0	363	0	2	373	1	0	376	748
0645 - 0700	0	6	0	2	0	8	0	0	0	4	0	4	0	1	390	3	0	394	0	3	253	4	0	260	666
Hourly Total	0	14	1	4	0	**19**	0	4	0	17	0	**21**	1	5	1520	4	0	**1530**	0	5	1366	12	0	**1383**	**2953**
0700 - 0715	0	8	0	1	0	9	0	1	0	3	0	4	0	4	376	3	0	383	0	2	240	0	0	242	638
0715 - 0730	0	7	0	3	0	10	0	2	0	5	0	7	0	0	506	1	0	507	0	5	335	3	0	343	867
0730 - 0745	0	5	0	1	0	6	0	0	0	5	0	5	0	2	474	2	0	478	1	7	413	3	0	424	913
0745 - 0800	0	7	0	3	0	10	0	0	0	3	0	3	0	1	386	2	0	389	0	3	297	6	0	306	708
Hourly Total	0	27	0	8	0	**35**	0	3	0	16	0	**19**	0	7	1742	8	0	**1757**	1	17	1285	12	0	**1315**	**3126**
0800 - 0815	0	4	0	2	0	6	0	2	0	8	0	10	0	0	406	5	0	411	0	7	292	1	0	300	727
0815 - 0830	0	3	0	2	0	5	0	0	0	11	0	11	0	2	347	7	1	357	0	5	254	1	0	260	633
0830 - 0845	0	1	0	3	0	4	0	1	0	9	0	10	0	1	377	4	1	383	0	5	239	0	0	244	641
0845 - 0900	0	5	0	2	0	7	0	2	0	11	0	13	0	2	340	5	0	347	0	8	218	2	0	228	595
Hourly Total	0	13	0	9	0	**22**	0	5	0	39	0	**44**	0	5	1470	21	2	**1498**	0	25	1003	4	0	**1032**	**2596**
Grand Total	0	54	1	21	0	**76**	0	12	0	72	0	**84**	1	17	4732	33	2	**4785**	1	47	3654	28	0	**3730**	**8675**
App Percentage	0.00	71.05	1.32	27.63	0.00		0.00	14.29	0.00	85.71	0.00		0.02	0.36	98.89	0.69	0.04		0.03	1.26	97.96	0.75	0.00		
Int Percentage	0.00	0.62	0.01	0.24	0.00	0.88	0.00	0.14	0.00	0.83	0.00	0.97	0.01	0.20	54.55	0.38	0.02	55.16	0.01	0.54	42.12	0.32	0.00	43.00	
Cars	0	54	1	20	-	75	0	10	0	67	-	77	0	17	4504	32	-	4553	1	42	3437	26	-	3506	
Trucks	0	0	0	1	-	1	0	2	0	5	-	7	1	0	228	1	-	230	0	5	217	2	-	224	
P/Cycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	
Cars (%)	0.00	100.00	100.00	95.24	-	98.68	0.00	83.33	0.00	93.06	-	91.67	0.00	100.00	95.18	96.97	-	95.19	100.00	89.36	94.06	92.86	-	93.99	
Trucks (%)	0.00	0.00	0.00	4.76	-	1.32	0.00	16.67	0.00	6.94	-	8.33	100.00	0.00	4.82	3.03	-	4.81	0.00	10.64	5.94	7.14	-	6.01	

1500 - 1800 (Weekday PM Peak)

	Eastbound Arden Village Dr						Westbound Grove Park Way						Northbound SR-6 Nashville Hwy (South)						Southbound SR-6 Nashville Hwy (North)						
TIME	U-Turn 2.1	Left 2.2	Thru 2.3	Right 2.4	Peds 2a	App Total	U-Turn 2.5	Left 2.6	Thru 2.7	Right 2.8	Peds 2b	App Total	U-Turn 2.9	Left 2.10	Thru 2.11	Right 2.12	Peds 2c	App Total	U-Turn 2.13	Left 2.14	Thru 2.15	Right 2.16	Peds 2d	App Total	Int Total
1500 - 1515	0	2	0	0	0	2	0	2	0	5	0	7	0	2	260	7	0	269	1	7	443	8	0	459	737
1515 - 1530	0	2	2	2	0	6	0	6	1	8	0	15	0	1	277	9	0	287	1	6	405	4	0	416	724
1530 - 1545	0	2	1	3	0	6	0	3	2	7	0	12	0	4	262	4	0	270	2	10	437	3	0	452	740
1545 - 1600	0	3	0	1	0	4	0	8	0	9	0	17	1	3	317	2	0	323	0	4	429	8	0	441	785
Hourly Total	0	9	3	6	0	**18**	0	19	3	29	0	**51**	1	10	1116	22	0	**1149**	4	27	1714	23	0	**1768**	**2986**
1600 - 1615	0	5	0	2	0	7	0	5	0	11	0	16	0	1	250	5	0	256	1	13	410	8	0	432	711
1615 - 1630	0	4	0	0	0	4	0	8	0	6	0	14	0	7	291	4	0	302	0	11	440	9	0	460	780
1630 - 1645	0	0	0	3	0	3	0	4	0	6	0	10	0	1	310	7	0	318	0	12	439	2	0	453	784
1645 - 1700	0	2	0	3	0	5	0	9	0	10	0	19	0	0	325	10	0	335	0	11	436	4	0	451	810
Hourly Total	0	11	0	8	0	**19**	0	26	0	33	0	**59**	0	9	1176	26	0	**1211**	1	47	1725	23	0	**1796**	**3085**
1700 - 1715	0	2	0	0	0	2	0	7	1	14	0	22	0	1	316	6	0	323	0	11	419	9	0	439	786
1715 - 1730	0	4	0	0	0	4	0	5	0	10	0	15	0	3	366	7	0	376	0	7	369	8	0	384	779
1730 - 1745	0	3	0	1	0	4	0	2	0	12	0	14	0	5	326	3	0	334	0	9	440	7	0	456	808
1745 - 1800	0	4	0	2	0	6	0	9	0	4	0	13	0	6	307	11	0	324	0	9	385	15	0	409	752
Hourly Total	0	13	0	3	0	**16**	0	23	1	40	0	**64**	0	15	1315	27	0	**1357**	0	36	1613	39	0	**1688**	**3125**
Grand Total	0	33	3	17	0	**53**	0	68	4	102	0	**174**	1	34	3607	75	0	**3717**	5	110	5052	85	0	**5252**	**9196**
App Percentage	0.00	62.26	5.66	32.08	0.00		0.00	39.08	2.30	58.62	0.00		0.03	0.91	97.04	2.02	0.00		0.10	2.09	96.19	1.62	0.00		
Int Percentage	0.00	0.36	0.03	0.18	0.00	0.58	0.00	0.74	0.04	1.11	0.00	1.89	0.01	0.37	39.22	0.82	0.00	40.42	0.05	1.20	54.94	0.92	0.00	57.11	
Cars	0	32	3	16	-	51	0	66	3	101	-	170	1	34	3436	75	-	3546	5	108	4904	85	-	5102	
Trucks	0	1	0	1	-	2	0	2	1	1	-	4	0	0	171	0	-	171	0	2	147	0	-	149	
P/Cycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	0	-	1	
Cars (%)	0.00	96.97	100.00	94.12	-	96.23	0.00	97.06	75.00	99.02	-	97.70	100.00	100.00	95.26	100.00	-	95.40	100.00	98.18	97.09	100.00	-	97.16	
Trucks (%)	0.00	3.03	0.00	5.88	-	3.77	0.00	2.94	25.00	0.98	-	2.30	0.00	0.00	4.74	0.00	-	4.60	0.00	1.82	2.91	0.00	-	2.84	

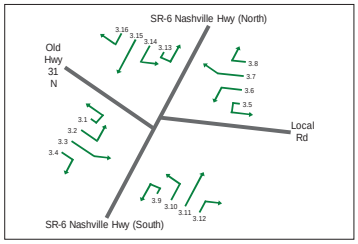
Columbia, TN
Classified Turn Movement Count

Site 3 of 4
Old Hwy 31 N
Local Rd
SR-6 Nashville Hwy (South)
SR-6 Nashville Hwy (North)

Lat/Long
35.707700°, -86.975686°

Date
Wednesday 3 May 2017

Weather
Sunny Intervals
Temp: 28°C



Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
1 (615) 431-6750
1 (800) 615-3765

0600 - 0900 (Weekday AM Peak)

	Eastbound Old Hwy 31 N						Westbound Local Rd						Northbound SR-6 Nashville Hwy (South)						Southbound SR-6 Nashville Hwy (North)						
	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	Int
TIME	3.1	3.2	3.3	3.4	3a	Total	3.5	3.6	3.7	3.8	3b	Total	3.9	3.10	3.11	3.12	3c	Total	3.13	3.14	3.15	3.16	3d	Total	Total
0600 - 0615	0	0	0	9	0	9	0	0	0	0	0	0	0	13	402	0	0	415	0	0	167	0	0	167	591
0615 - 0630	0	0	0	27	0	27	0	0	0	0	0	0	0	10	370	0	0	380	0	0	554	0	0	554	961
0630 - 0645	0	0	0	9	0	9	0	0	0	0	0	0	1	20	339	0	0	360	0	0	363	0	0	363	732
0645 - 0700	0	0	0	12	0	12	0	0	0	0	0	0	1	38	361	0	0	400	0	0	238	0	0	238	650
Hourly Total	0	0	0	57	0	**57**	0	0	0	0	0	**0**	2	81	1472	0	0	**1555**	0	0	1322	0	0	**1322**	**2934**
0700 - 0715	0	0	0	11	0	11	0	0	0	0	0	0	0	45	336	0	0	381	0	0	230	0	0	230	622
0715 - 0730	0	0	0	35	0	35	0	0	0	0	0	0	0	55	461	0	0	516	1	0	305	0	0	306	857
0730 - 0745	0	0	0	45	0	45	0	0	0	0	0	0	2	46	433	0	0	481	0	0	381	0	0	381	907
0745 - 0800	0	1	0	26	0	27	0	0	0	0	0	0	0	13	400	0	0	413	0	0	285	0	0	285	725
Hourly Total	0	1	0	117	0	**118**	0	0	0	0	0	**0**	2	159	1630	0	0	**1791**	1	0	1201	0	0	**1202**	**3111**
0800 - 0815	0	0	0	17	0	17	0	0	0	0	0	0	0	14	397	0	0	411	0	0	280	1	0	281	709
0815 - 0830	0	0	0	8	0	8	0	0	0	0	0	0	0	14	350	0	0	364	0	0	248	2	0	250	622
0830 - 0845	0	0	0	6	0	6	0	0	0	0	0	0	0	17	366	0	0	383	0	0	240	0	0	240	629
0845 - 0900	0	1	0	9	0	10	0	0	0	0	0	0	1	39	319	0	0	359	0	0	215	0	0	215	584
Hourly Total	0	1	0	40	0	**41**	0	0	0	0	0	**0**	1	84	1432	0	0	**1517**	0	0	983	3	0	**986**	**2544**
Grand Total	0	2	0	214	0	**216**	0	0	0	0	0	**0**	5	324	4534	0	0	**4863**	1	0	3506	3	0	**3510**	**8589**
App Percentage	0.00	0.93	0.00	99.07	0.00		0.00	0.00	0.00	0.00	0.00		0.10	6.66	93.23	0.00	0.00		0.03	0.00	99.89	0.09	0.00		
Int Percentage	0.00	0.02	0.00	2.49	0.00	2.51	0.00	0.00	0.00	0.00	0.00	0.00	0.06	3.77	52.79	0.00	0.00	56.62	0.01	0.00	40.82	0.03	0.00	40.87	
Cars	0	2	0	207	-	209	0	0	0	0	-	0	5	318	4307	0	-	4630	1	0	3289	3	-	3293	
Trucks	0	0	0	7	-	7	0	0	0	0	-	0	0	6	227	0	-	233	0	0	217	0	-	217	
P/Cycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	
Cars (%)	0.00	100.00	0.00	96.73	-	96.76	0.00	0.00	0.00	0.00	-	0.00	100.00	98.15	94.99	0.00	-	95.21	100.00	0.00	93.81	100.00	-	93.82	
Trucks (%)	0.00	0.00	0.00	3.27	-	3.24	0.00	0.00	0.00	0.00	-	0.00	0.00	1.85	5.01	0.00	-	4.79	0.00	0.00	6.19	0.00	-	6.18	

1500 - 1800 (Weekday PM Peak)

	Eastbound Old Hwy 31 N						Westbound Local Rd						Northbound SR-6 Nashville Hwy (South)						Southbound SR-6 Nashville Hwy (North)						
	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	Int
TIME	3.1	3.2	3.3	3.4	3a	Total	3.5	3.6	3.7	3.8	3b	Total	3.9	3.10	3.11	3.12	3c	Total	3.13	3.14	3.15	3.16	3d	Total	Total
1500 - 1515	0	0	0	46	0	46	0	0	0	0	0	0	0	5	258	0	0	263	1	0	419	1	0	421	730
1515 - 1530	0	0	0	24	0	24	0	0	0	0	0	0	0	13	278	0	0	291	0	0	393	0	0	393	708
1530 - 1545	0	0	0	24	0	24	0	1	1	0	0	2	0	6	272	0	0	278	0	0	438	2	0	440	744
1545 - 1600	0	0	0	18	0	18	0	0	0	0	0	0	0	13	311	1	0	325	0	0	419	2	0	421	764
Hourly Total	0	0	0	112	0	**112**	0	1	1	0	0	**2**	0	37	1119	1	0	**1157**	1	0	1669	5	0	**1675**	**2946**
1600 - 1615	0	0	0	18	0	18	0	0	0	0	0	0	1	11	255	0	0	267	0	0	410	0	0	410	695
1615 - 1630	0	0	0	18	0	18	0	0	0	0	0	0	0	12	285	0	0	297	0	0	439	0	0	439	754
1630 - 1645	0	0	0	26	0	26	0	0	0	0	0	0	0	11	303	0	0	314	0	0	433	0	0	433	773
1645 - 1700	0	0	0	19	0	19	0	0	0	0	0	0	0	8	335	0	0	343	1	0	426	0	0	427	789
Hourly Total	0	0	0	81	0	**81**	0	0	0	0	0	**0**	1	42	1178	0	0	**1221**	1	0	1708	0	0	**1709**	**3011**
1700 - 1715	0	1	0	24	0	25	0	0	0	0	0	0	0	14	315	0	0	329	0	0	412	0	0	412	766
1715 - 1730	0	0	0	23	0	23	0	0	0	0	0	0	0	16	358	0	0	374	0	0	355	0	0	355	752
1730 - 1745	0	1	0	25	0	26	0	0	0	0	0	0	0	14	328	0	0	342	1	0	427	0	0	428	796
1745 - 1800	0	2	0	18	0	20	0	0	0	0	0	0	1	13	308	0	0	322	0	0	392	0	0	392	734
Hourly Total	0	4	0	90	0	**94**	0	0	0	0	0	**0**	1	57	1309	0	0	**1367**	1	0	1586	0	0	**1587**	**3048**
Grand Total	0	4	0	283	0	**287**	0	1	1	0	0	**2**	2	136	3606	1	0	**3745**	3	0	4963	5	0	**4971**	**9005**
App Percentage	0.00	1.39	0.00	98.61	0.00		0.00	50.00	50.00	0.00	0.00		0.05	3.63	96.29	0.03	0.00		0.06	0.00	99.84	0.10	0.00		
Int Percentage	0.00	0.04	0.00	3.14	0.00	3.19	0.00	0.01	0.01	0.00	0.00	0.02	0.02	1.51	40.04	0.01	0.00	41.59	0.03	0.00	55.11	0.06	0.00	55.20	
Cars	0	4	0	277	-	281	0	1	1	0	-	2	2	129	3440	1	-	3572	3	0	4819	5	-	4827	
Trucks	0	0	0	6	-	6	0	0	0	0	-	0	0	7	166	0	-	173	0	0	143	0	-	143	
P/Cycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	0	-	1	
Cars (%)	0.00	100.00	0.00	97.88	-	97.91	0.00	100.00	100.00	0.00	-	100.00	100.00	94.85	95.40	100.00	-	95.38	100.00	0.00	97.12	100.00	-	97.12	
Trucks (%)	0.00	0.00	0.00	2.12	-	2.09	0.00	0.00	0.00	0.00	-	0.00	0.00	5.15	4.60	0.00	-	4.62	0.00	0.00	2.88	0.00	-	2.88	

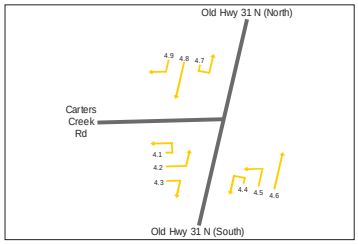
Columbia, TN
Classified Turn Movement Count

Site 4 of 4
Carters Creek Rd
Old Hwy 31 N (South)
Old Hwy 31 N (North)

Lat/Long
35.710390°, -86.975503°

Date
Wednesday 3 May 2017

Weather
Sunny Intervals
Temp: 28°C



Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
1 (615) 431-6750
1 (800) 615-3765

0600 - 0900 (Weekday AM Peak)

	Eastbound Carters Creek Rd					Northbound Old Hwy 31 N (South)					Southbound Old Hwy 31 N (North)					
	U-Turn	Left	Right	Peds	App	U-Turn	Left	Thru	Peds	App	U-Turn	Thru	Right	Peds	App	Int
TIME	4.1	4.2	4.3	4a	Total	4.4	4.5	4.6	4b	Total	4.7	4.8	4.9	4c	Total	Total
0600 - 0615	0	14	14	0	28	0	11	1	0	12	0	0	6	0	6	46
0615 - 0630	0	18	25	0	43	0	6	2	0	8	0	2	13	0	15	66
0630 - 0645	0	16	9	0	25	0	19	6	0	25	0	1	9	0	10	60
0645 - 0700	0	17	9	0	26	0	29	8	0	37	0	4	7	0	11	74
Hourly Total	0	65	57	0	**122**	0	65	17	0	**82**	0	7	35	0	**42**	**246**
0700 - 0715	0	25	11	0	36	0	30	15	0	45	0	3	22	0	25	106
0715 - 0730	0	41	21	0	62	0	30	28	0	58	0	14	32	0	46	166
0730 - 0745	0	38	21	0	59	0	24	27	0	51	0	24	23	0	47	157
0745 - 0800	0	17	27	0	44	0	9	3	0	12	0	4	11	0	15	71
Hourly Total	0	121	80	0	**201**	0	93	73	0	**166**	0	45	88	0	**133**	**500**
0800 - 0815	0	17	15	0	32	0	11	8	0	19	0	1	10	0	11	62
0815 - 0830	0	23	6	0	29	0	5	9	0	14	0	3	9	0	12	55
0830 - 0845	0	12	5	0	17	0	4	17	0	21	0	2	4	0	6	44
0845 - 0900	0	17	6	0	23	0	14	24	0	38	0	5	13	0	18	79
Hourly Total	0	69	32	0	**101**	0	34	58	0	**92**	0	11	36	0	**47**	**240**
Grand Total	0	255	169	0	**424**	0	192	148	0	**340**	0	63	159	0	**222**	**986**
App Percentage	0.00	60.14	39.86	0.00		0.00	56.47	43.53	0.00		0.00	28.38	71.62	0.00		
Int Percentage	0.00	25.86	17.14	0.00	43.00	0.00	19.47	15.01	0.00	34.48	0.00	6.39	16.13	0.00	22.52	
Cars	0	240	163	-	403	0	186	148	-	334	0	62	146	-	208	
Trucks	0	15	6	-	21	0	6	0	-	6	0	1	13	-	14	
P/Cycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	
Cars (%)	0.00	94.12	96.45	-	95.05	0.00	96.88	100.00	-	98.24	0.00	98.41	91.82	-	93.69	
Trucks (%)	0.00	5.88	3.55	-	4.95	0.00	3.13	0.00	-	1.76	0.00	1.59	8.18	-	6.31	

1500 - 1800 (Weekday PM Peak)

	Eastbound Carters Creek Rd					Northbound Old Hwy 31 N (South)					Southbound Old Hwy 31 N (North)					
	U-Turn	Left	Right	Peds	App	U-Turn	Left	Thru	Peds	App	U-Turn	Thru	Right	Peds	App	Int
TIME	4.1	4.2	4.3	4a	Total	4.4	4.5	4.6	4b	Total	4.7	4.8	4.9	4c	Total	Total
1500 - 1515	0	17	33	0	50	0	5	3	0	8	0	16	42	0	58	116
1515 - 1530	0	21	19	0	40	0	6	4	0	10	0	5	22	0	27	77
1530 - 1545	0	14	16	0	30	0	8	4	0	12	0	9	20	0	29	71
1545 - 1600	0	15	16	0	31	0	13	6	0	19	0	8	20	0	28	78
Hourly Total	0	67	84	0	**151**	0	32	17	0	**49**	0	38	104	0	**142**	**342**
1600 - 1615	0	10	12	0	22	0	13	3	0	16	0	4	15	0	19	57
1615 - 1630	0	13	17	0	30	0	8	2	0	10	0	2	16	0	18	58
1630 - 1645	0	17	19	0	36	0	8	4	0	12	0	8	23	0	31	79
1645 - 1700	0	13	12	0	25	0	8	6	0	14	0	6	20	0	26	65
Hourly Total	0	53	60	0	**113**	0	37	15	0	**52**	0	20	74	0	**94**	**259**
1700 - 1715	0	19	21	0	40	0	12	3	0	15	0	7	24	0	31	86
1715 - 1730	0	13	16	0	29	0	10	6	0	16	0	9	15	0	24	69
1730 - 1745	0	19	14	0	33	0	10	6	0	16	0	10	13	0	23	72
1745 - 1800	0	8	20	0	28	0	10	2	0	12	0	3	32	0	35	75
Hourly Total	0	59	71	0	**130**	0	42	17	0	**59**	0	29	84	0	**113**	**302**
Grand Total	0	179	215	0	**394**	0	111	49	0	**160**	0	87	262	0	**349**	**903**
App Percentage	0.00	45.43	54.57	0.00		0.00	69.38	30.63	0.00		0.00	24.93	75.07	0.00		
Int Percentage	0.00	19.82	23.81	0.00	43.63	0.00	12.29	5.43	0.00	17.72	0.00	9.63	29.01	0.00	38.65	
Cars	0	172	209	-	381	0	106	47	-	153	0	87	256	-	343	
Trucks	0	7	6	-	13	0	5	2	-	7	0	0	6	-	6	
P/Cycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	
Cars (%)	0.00	96.09	97.21	-	96.70	0.00	95.50	95.92	-	95.63	0.00	100.00	97.71	-	98.28	
Trucks (%)	0.00	3.91	2.79	-	3.30	0.00	4.50	4.08	-	4.38	0.00	0.00	2.29	-	1.72	

Grand Total (All Sessions)

	Westbound					Northbound					Southbound					
	Greens Mill Rd					SR-6 Nashville Hwy (South)					SR-6 Nashville Hwy (North)					
TIME	U-Turn 1.1	Left 1.2	Right 1.3	Peds 1a	App Total	U-Turn 1.4	Thru 1.5	Right 1.6	Peds 1b	App Total	U-Turn 1.7	Left 1.8	Thru 1.9	Peds 1c	App Total	Int Total
Grand Total	2	113	237	0	**352**	1	8260	106	0	**8367**	10	181	8680	0	**8871**	**17590**
App Percentage	0.57	32.10	67.33	0.00		0.01	98.72	1.27	0.00		0.11	2.04	97.85	0.00		
Int Percentage	0.01	0.64	1.35	0.00	2.00	0.01	46.96	0.60	0.00	47.57	0.06	1.03	49.35	0.00	50.43	
Cars	0	112	233	-	345	1	7864	105	-	7970	9	178	8310	-	8497	
Trucks	2	1	4	-	7	0	396	1	-	397	1	3	369	-	373	
P/Cycles	0	0	0	-	0	0	0	0	-	0	0	0	1	-	1	
Cars (%)	0.00	99.12	98.31	-	98.01	100.00	95.21	99.06	-	95.26	90.00	98.34	95.75	-	95.79	
Trucks (%)	100.00	0.88	1.69	-	1.99	0.00	4.79	0.94	-	4.74	10.00	1.66	4.25	-	4.21	

Grand Total (All Sessions)

	Eastbound						Westbound						Northbound						Southbound						
	Arden Village Dr						Grove Park Way						SR-6 Nashville Hwy (South)						SR-6 Nashville Hwy (North)						
TIME	U-Turn 2.1	Left 2.2	Thru 2.3	Right 2.4	Peds 2a	App Total	U-Turn 2.5	Left 2.6	Thru 2.7	Right 2.8	Peds 2b	App Total	U-Turn 2.9	Left 2.10	Thru 2.11	Right 2.12	Peds 2c	App Total	U-Turn 2.13	Left 2.14	Thru 2.15	Right 2.16	Peds 2d	App Total	Int Total
Grand Total	0	87	4	38	0	**129**	0	80	4	174	0	**258**	2	51	8339	108	2	**8502**	6	157	8706	113	0	**8982**	**17871**
App Percentage	0.00	67.44	3.10	29.46	0.00		0.00	31.01	1.55	67.44	0.00		0.02	0.60	98.08	1.27	0.02		0.07	1.75	96.93	1.26	0.00		
Int Percentage	0.00	0.49	0.02	0.21	0.00	0.72	0.00	0.45	0.02	0.97	0.00	1.44	0.01	0.29	46.66	0.60	0.01	47.57	0.03	0.88	48.72	0.63	0.00	50.26	
Cars	0	86	4	36	-	126	0	76	3	168	-	247	1	51	7940	107	-	8099	6	150	8341	111	-	8608	
Trucks	0	1	0	2	-	3	0	4	1	6	-	11	1	0	399	1	-	401	0	7	364	2	-	373	
P/Cycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	0	-	1	
Cars (%)	0.00	98.85	100.00	94.74	-	97.67	0.00	95.00	75.00	96.55	-	95.74	50.00	100.00	95.22	99.07	-	95.28	100.00	95.54	95.82	98.23	-	95.85	
Trucks (%)	0.00	1.15	0.00	5.26	-	2.33	0.00	5.00	25.00	3.45	-	4.26	50.00	0.00	4.78	0.93	-	4.72	0.00	4.46	4.18	1.77	-	4.15	

Grand Total (All Sessions)

	Eastbound						Westbound						Northbound						Southbound						
	Old Hwy 31 N						Local Rd						SR-6 Nashville Hwy (South)						SR-6 Nashville Hwy (North)						
TIME	U-Turn 3.1	Left 3.2	Thru 3.3	Right 3.4	Peds 3a	App Total	U-Turn 3.5	Left 3.6	Thru 3.7	Right 3.8	Peds 3b	App Total	U-Turn 3.9	Left 3.10	Thru 3.11	Right 3.12	Peds 3c	App Total	U-Turn 3.13	Left 3.14	Thru 3.15	Right 3.16	Peds 3d	App Total	Int Total
Grand Total	0	6	0	497	0	**503**	0	1	1	0	0	**2**	7	460	8140	1	0	**8608**	4	0	8469	8	0	**8481**	**17594**
App Percentage	0.00	1.19	0.00	98.81	0.00		0.00	50.00	50.00	0.00	0.00		0.08	5.34	94.56	0.01	0.00		0.05	0.00	99.86	0.09	0.00		
Int Percentage	0.00	0.03	0.00	2.82	0.00	2.86	0.00	0.01	0.01	0.00	0.00	0.01	0.04	2.61	46.27	0.01	0.00	48.93	0.02	0.00	48.14	0.05	0.00	48.20	
Cars	0	6	0	484	-	490	0	1	1	0	-	2	7	447	7747	1	-	8202	4	0	8108	8	-	8120	
Trucks	0	0	0	13	-	13	0	0	0	0	-	0	0	13	393	0	-	406	0	0	360	0	-	360	
P/Cycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	0	-	1	
Cars (%)	0.00	100.00	0.00	97.38	-	97.42	0.00	100.00	100.00	0.00	-	100.00	100.00	97.17	95.17	100.00	-	95.28	100.00	0.00	95.75	100.00	-	95.75	
Trucks (%)	0.00	0.00	0.00	2.62	-	2.58	0.00	0.00	0.00	0.00	-	0.00	0.00	2.83	4.83	0.00	-	4.72	0.00	0.00	4.25	0.00	-	4.25	

Grand Total (All Sessions)

	Eastbound					Northbound					Southbound					
	Carters Creek Rd					Old Hwy 31 N (South)					Old Hwy 31 N (North)					
TIME	U-Turn 4.1	Left 4.2	Right 4.3	Peds 4a	App Total	U-Turn 4.4	Left 4.5	Thru 4.6	Peds 4b	App Total	U-Turn 4.7	Thru 4.8	Right 4.9	Peds 4c	App Total	Int Total
Grand Total	0	434	384	0	**818**	0	303	197	0	**500**	0	150	421	0	**571**	**1889**
App Percentage	0.00	53.06	46.94	0.00		0.00	60.60	39.40	0.00		0.00	26.27	73.73	0.00		
Int Percentage	0.00	22.98	20.33	0.00	43.30	0.00	16.04	10.43	0.00	26.47	0.00	7.94	22.29	0.00	30.23	
Cars	0	412	372	-	784	0	292	195	-	487	0	149	402	-	551	
Trucks	0	22	12	-	34	0	11	2	-	13	0	1	19	-	20	
P/Cycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	
Cars (%)	0.00	94.93	96.88	-	95.84	0.00	96.37	98.98	-	97.40	0.00	99.33	95.49	-	96.50	
Trucks (%)	0.00	5.07	3.13	-	4.16	0.00	3.63	1.02	-	2.60	0.00	0.67	4.51	-	3.50	

Peak Hour Window: 0600 - 0900 (Weekday AM Peak)

0715 - 0815 (Intersection Peak Hour)

	Westbound					Northbound					Southbound					
	Greens Mill Rd					SR-6 Nashville Hwy (South)					SR-6 Nashville Hwy (North)					
TIME	U-Turn 1.1	Left 1.2	Right 1.3	Peds 1a	App Total	U-Turn 1.4	Thru 1.5	Right 1.6	Peds 1b	App Total	U-Turn 1.7	Left 1.8	Thru 1.9	Peds 1c	App Total	Int Total
0715 - 0730	0	9	27	0	36	0	487	0	0	487	0	7	340	0	347	870
0730 - 0745	0	9	25	0	34	0	459	1	0	460	1	11	401	0	413	907
0745 - 0800	0	6	11	0	17	0	379	7	0	386	0	7	315	0	322	725
0800 - 0815	0	3	8	0	11	0	415	1	0	416	0	6	285	0	291	718
Hourly Total	0	27	71	0	**98**	0	1740	9	0	**1749**	1	31	1341	0	**1373**	**3220**
Grand Total	0	27	71	0	**98**	0	1740	9	0	**1749**	1	31	1341	0	**1373**	**3220**
App Percentage	0.00	27.55	72.45	0.00		0.00	99.49	0.51	0.00		0.07	2.26	97.67	0.00		
Int Percentage	0.00	0.84	2.20	0.00	3.04	0.00	54.04	0.28	0.00	54.32	0.03	0.96	41.65	0.00	42.64	
Cars	0	27	71	-	98	0	1653	9	-	1662	1	30	1256	-	1287	3047
Trucks	0	0	0	-	0	0	87	0	-	87	0	1	85	-	86	173
P/Cycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
Cars (%)	0.00	100.00	100.00	-	100.00	0.00	95.00	100.00	-	95.03	100.00	96.77	93.66	-	93.74	94.63
Trucks (%)	0.00	0.00	0.00	-	0.00	0.00	5.00	0.00	-	4.97	0.00	3.23	6.34	-	6.26	5.37
PHF	0.000	0.750	0.657	-	0.681	0.000	0.893	0.321	-	0.898	0.250	0.705	0.836	-	0.831	0.888

Peak Hour Window: 0600 - 0900 (Weekday AM Peak)

0715 - 0815 (Intersection Peak Hour)

	Eastbound Arden Village Dr						Westbound Grove Park Way						Northbound SR-6 Nashville Hwy (South)						Southbound SR-6 Nashville Hwy (North)						
TIME	U-Turn 2.1	Left 2.2	Thru 2.3	Right 2.4	Peds 2a	App Total	U-Turn 2.5	Left 2.6	Thru 2.7	Right 2.8	Peds 2b	App Total	U-Turn 2.9	Left 2.10	Thru 2.11	Right 2.12	Peds 2c	App Total	U-Turn 2.13	Left 2.14	Thru 2.15	Right 2.16	Peds 2d	App Total	Int Total
0715 - 0730	0	7	0	3	0	10	0	2	0	5	0	7	0	0	506	1	0	507	0	5	335	3	0	343	867
0730 - 0745	0	5	0	1	0	6	0	0	0	5	0	5	0	2	474	2	0	478	1	7	413	3	0	424	913
0745 - 0800	0	7	0	3	0	10	0	0	0	3	0	3	0	1	386	2	0	389	0	3	297	6	0	306	708
0800 - 0815	0	4	0	2	0	6	0	2	0	8	0	10	0	0	406	5	0	411	0	7	292	1	0	300	727
Hourly Total	0	23	0	9	0	**32**	0	4	0	21	0	**25**	0	3	1772	10	0	**1785**	1	22	1337	13	0	**1373**	**3215**
Grand Total	0	23	0	9	0	**32**	0	4	0	21	0	**25**	0	3	1772	10	0	**1785**	1	22	1337	13	0	**1373**	**3215**
App Percentage	0.00	71.88	0.00	28.13	0.00		0.00	16.00	0.00	84.00	0.00		0.00	0.17	99.27	0.56	0.00		0.07	1.60	97.38	0.95	0.00		
Int Percentage	0.00	0.72	0.00	0.28	0.00	1.00	0.00	0.12	0.00	0.65	0.00	0.78	0.00	0.09	55.12	0.31	0.00	55.52	0.03	0.68	41.59	0.40	0.00	42.71	
Cars	0	23	0	8	-	31	0	3	0	20	-	23	0	3	1684	9	-	1696	1	19	1252	12	-	1284	3034
Trucks	0	0	0	1	-	1	0	1	0	1	-	2	0	0	88	1	-	89	0	3	85	1	-	89	181
P/Cycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Cars (%)	0.00	100.00	0.00	88.89	-	96.88	0.00	75.00	0.00	95.24	-	92.00	0.00	100.00	95.03	90.00	-	95.01	100.00	86.36	93.64	92.31	-	93.52	94.37
Trucks (%)	0.00	0.00	0.00	11.11	-	3.13	0.00	25.00	0.00	4.76	-	8.00	0.00	0.00	4.97	10.00	-	4.99	0.00	13.64	6.36	7.69	-	6.48	5.63
PHF	0.000	0.821	0.000	0.750	-	0.800	0.000	0.500	0.000	0.656	-	0.625	0.000	0.375	0.875	0.500	-	0.880	0.250	0.786	0.809	0.542	-	0.810	0.880

Peak Hour Window: 0600 - 0900 (Weekday AM Peak)

0715 - 0815 (Intersection Peak Hour)

	Eastbound						Westbound						Northbound						Southbound						
	Old Hwy 31 N						Local Rd						SR-6 Nashville Hwy (South)						SR-6 Nashville Hwy (North)						
TIME	U-Turn 3.1	Left 3.2	Thru 3.3	Right 3.4	Peds 3a	App Total	U-Turn 3.5	Left 3.6	Thru 3.7	Right 3.8	Peds 3b	App Total	U-Turn 3.9	Left 3.10	Thru 3.11	Right 3.12	Peds 3c	App Total	U-Turn 3.13	Left 3.14	Thru 3.15	Right 3.16	Peds 3d	App Total	Int Total
0715 - 0730	0	0	0	35	0	35	0	0	0	0	0	0	0	55	461	0	0	516	1	0	305	0	0	306	857
0730 - 0745	0	0	0	45	0	45	0	0	0	0	0	0	2	46	433	0	0	481	0	0	381	0	0	381	907
0745 - 0800	0	1	0	26	0	27	0	0	0	0	0	0	0	13	400	0	0	413	0	0	285	0	0	285	725
0800 - 0815	0	0	0	17	0	17	0	0	0	0	0	0	0	14	397	0	0	411	0	0	280	1	0	281	709
Hourly Total	0	1	0	123	0	**124**	0	0	0	0	0	**0**	2	128	1691	0	0	**1821**	1	0	1251	1	0	**1253**	**3198**
Grand Total	0	1	0	123	0	**124**	0	0	0	0	0	**0**	2	128	1691	0	0	**1821**	1	0	1251	1	0	**1253**	**3198**
App Percentage	0.00	0.81	0.00	99.19	0.00		0.00	0.00	0.00	0.00	0.00		0.11	7.03	92.86	0.00	0.00		0.08	0.00	99.84	0.08	0.00		
Int Percentage	0.00	0.03	0.00	3.85	0.00	3.88	0.00	0.00	0.00	0.00	0.00	0.00	0.06	4.00	52.88	0.00	0.00	56.94	0.03	0.00	39.12	0.03	0.00	39.18	
Cars	0	1	0	117	-	118	0	0	0	0	-	0	2	126	1604	0	-	1732	1	0	1167	1	-	1169	3019
Trucks	0	0	0	6	-	6	0	0	0	0	-	0	0	2	87	0	-	89	0	0	84	0	-	84	179
P/Cycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Cars (%)	0.00	100.00	0.00	95.12	-	95.16	0.00	0.00	0.00	0.00	-	0.00	100.00	98.44	94.86	0.00	-	95.11	100.00	0.00	93.29	100.00	-	93.30	94.40
Trucks (%)	0.00	0.00	0.00	4.88	-	4.84	0.00	0.00	0.00	0.00	-	0.00	0.00	1.56	5.14	0.00	-	4.89	0.00	0.00	6.71	0.00	-	6.70	5.60
PHF	0.000	0.250	0.000	0.683	-	0.689	0.000	0.000	0.000	0.000	-	0.000	0.250	0.582	0.917	0.000	-	0.882	0.250	0.000	0.821	0.250	-	0.822	0.881

Peak Hour Window: 0600 - 0900 (Weekday AM Peak)

0645 - 0745 (Intersection Peak Hour)

	Eastbound					Northbound					Southbound					
	Carters Creek Rd					Old Hwy 31 N (South)					Old Hwy 31 N (North)					
TIME	U-Turn 4.1	Left 4.2	Right 4.3	Peds 4a	App Total	U-Turn 4.4	Left 4.5	Thru 4.6	Peds 4b	App Total	U-Turn 4.7	Thru 4.8	Right 4.9	Peds 4c	App Total	Int Total
0645 - 0700	0	17	9	0	26	0	29	8	0	37	0	4	7	0	11	74
0700 - 0715	0	25	11	0	36	0	30	15	0	45	0	3	22	0	25	106
0715 - 0730	0	41	21	0	62	0	30	28	0	58	0	14	32	0	46	166
0730 - 0745	0	38	21	0	59	0	24	27	0	51	0	24	23	0	47	157
Hourly Total	0	121	62	0	**183**	0	113	78	0	**191**	0	45	84	0	**129**	**503**
Grand Total	0	121	62	0	**183**	0	113	78	0	**191**	0	45	84	0	**129**	**503**
App Percentage	0.00	66.12	33.88	0.00		0.00	59.16	40.84	0.00		0.00	34.88	65.12	0.00		
Int Percentage	0.00	24.06	12.33	0.00	36.38	0.00	22.47	15.51	0.00	37.97	0.00	8.95	16.70	0.00	25.65	
Cars	0	115	58	-	173	0	111	78	-	189	0	44	77	-	121	483
Trucks	0	6	4	-	10	0	2	0	-	2	0	1	7	-	8	20
P/Cycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
Cars (%)	0.00	95.04	93.55	-	94.54	0.00	98.23	100.00	-	98.95	0.00	97.78	91.67	-	93.80	96.02
Trucks (%)	0.00	4.96	6.45	-	5.46	0.00	1.77	0.00	-	1.05	0.00	2.22	8.33	-	6.20	3.98
PHF	0.000	0.738	0.738	-	0.738	0.000	0.942	0.696	-	0.823	0.000	0.469	0.656	-	0.686	0.758

Columbia, TN
Classified Turn Movement Count

Site 1 of 4
Greens Mill Rd
SR-6 Nashville Hwy (South)
SR-6 Nashville Hwy (North)

Lat/Long
35.702619°, -86.979254°

Date
Wednesday 3 May 2017

Weather
Sunny Intervals
Temp: 28°C

Peak Hour Data (Interactive Diagram)

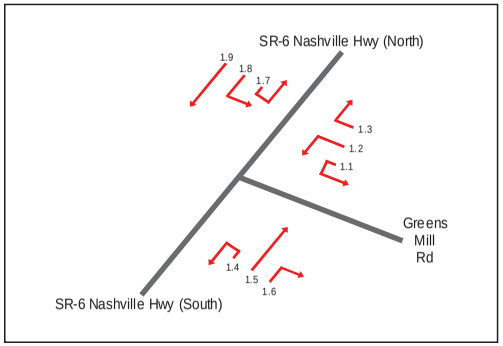
Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
1 (615) 431-6750
1 (800) 615-3765

C (Southbound) SR-6 Nashville Hwy (North)

C (In)	C (Out)	C (Tot)
1373	1812	3185

Peds	Thru	Left	U-Turn
0	1341	31	1



A (Westbound) Greens Mill Rd

Peds	0
Right	71
Left	27
U-Turn	0

A (In)	98
A (Out)	40
A (Tot)	138

B (Northbound) SR-6 Nashville Hwy (South)

U-Turn	Thru	Right	Peds
0	1740	9	0

B (Out)	B (In)	B (Tot)
1368	1749	3117

Time Interval

0715 - 0815 (Intersection Peak Hour)

Parameter

Grand Total

Columbia, TN
Classified Turn Movement Count

Site 2 of 4
Arden Village Dr
Grove Park Way
SR-6 Nashville Hwy (South)
SR-6 Nashville Hwy (North)

Lat/Long
35.706070°, -86.976722°

Date
Wednesday 3 May 2017

Weather
Sunny Intervals
Temp: 28°C

Peak Hour Data (Interactive Diagram)

Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
1 (615) 431-6750
1 (800) 615-3765

D (Southbound) SR-6 Nashville Hwy (North)

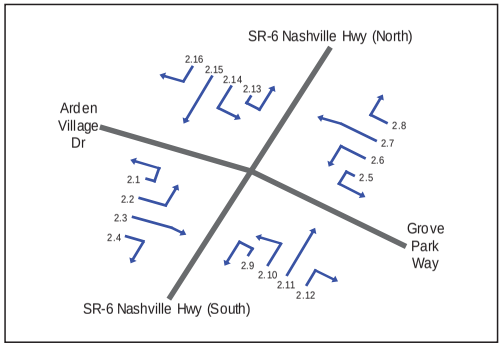
D (In)	D (Out)	D (Tot)
1373	1817	3190

Peds	Right	Thru	Left	U-Turn
0	13	1337	22	1

A (Eastbound) Arden Village Dr

A (Out)	16
A (In)	32
A (Tot)	48

U-Turn	0
Left	23
Thru	0
Right	9
Peds	0



B (Westbound) Grove Park Way

Peds	0
Right	21
Thru	0
Left	4
U-Turn	0

B (In)	25
B (Out)	32
B (Tot)	57

C (Northbound) SR-6 Nashville Hwy (South)

U-Turn	Left	Thru	Right	Peds
0	3	1772	10	0

C (Out)	C (In)	C (Tot)
1350	1785	3135

Time Interval

0715 - 0815 (Intersection Peak Hour)

Parameter

Grand Total

Columbia, TN
Classified Turn Movement Count

Site 3 of 4
Old Hwy 31 N
Local Rd
SR-6 Nashville Hwy (South)
SR-6 Nashville Hwy (North)

Lat/Long
35.707700°, -86.975686°

Date
Wednesday 3 May 2017

Weather
Sunny Intervals
Temp: 28°C

Peak Hour Data (Interactive Diagram)

Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
1 (615) 431-6750
1 (800) 615-3765

D (Southbound) SR-6 Nashville Hwy (North)

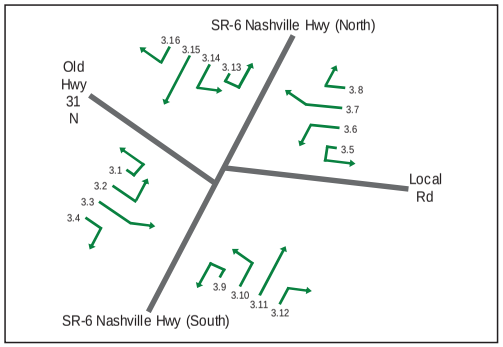
D (In)	D (Out)	D (Tot)
1253	1693	2946

Peds	Right	Thru	Left	U-Turn
0	1	1251	0	1

A (Eastbound) Old Hwy 31 N

A (Out)	129
A (In)	124
A (Tot)	253

U-Turn	0
Left	1
Thru	0
Right	123
Peds	0



B (Westbound) Local Rd

Peds	0
Right	0
Thru	0
Left	0
U-Turn	0

B (In)	0
B (Out)	0
B (Tot)	0

C (Northbound) SR-6 Nashville Hwy (South)

U-Turn	Left	Thru	Right	Peds
2	128	1691	0	0

C (Out)	C (In)	C (Tot)
1376	1821	3197

Time Interval

0715 - 0815 (Intersection Peak Hour)

Parameter

Grand Total

Columbia, TN
Classified Turn Movement Count

Site 4 of 4
Carters Creek Rd
Old Hwy 31 N (South)
Old Hwy 31 N (North)

Lat/Long
35.710390°, -86.975503°

Date
Wednesday 3 May 2017

Weather
Sunny Intervals
Temp: 28°C

Peak Hour Data (Interactive Diagram)

Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
1 (615) 431-6750
1 (800) 615-3765

C (Southbound) Old Hwy 31 N (North)

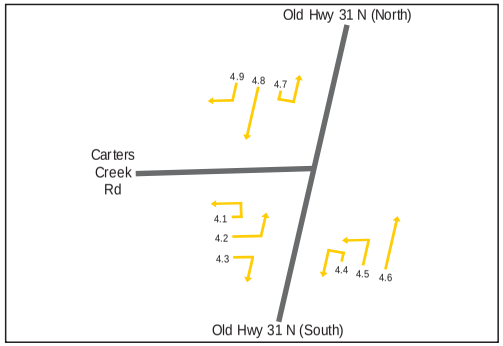
C (In)	C (Out)	C (Tot)
129	199	328

Peds	Right	Thru	U-Turn
0	84	45	0

A (Eastbound) Carters Creek Rd

A (Out)	197
A (In)	183
A (Tot)	380

U-Turn	0
Left	121
Right	62
Peds	0



B (Northbound) Old Hwy 31 N (South)

U-Turn	Left	Thru	Peds
0	113	78	0

B (Out)	B (In)	B (Tot)
107	191	298

Time Interval

0645 - 0745 (Intersection Peak Hour)

Parameter

Grand Total

Peak Hour Window: 1500 - 1800 (Weekday PM Peak)

1645 - 1745 (Intersection Peak Hour)

	Westbound					Northbound					Southbound					
	Greens Mill Rd					SR-6 Nashville Hwy (South)					SR-6 Nashville Hwy (North)					
TIME	U-Turn 1.1	Left 1.2	Right 1.3	Peds 1a	App Total	U-Turn 1.4	Thru 1.5	Right 1.6	Peds 1b	App Total	U-Turn 1.7	Left 1.8	Thru 1.9	Peds 1c	App Total	Int Total
1645 - 1700	0	4	10	0	14	0	327	3	0	330	1	10	436	0	447	791
1700 - 1715	0	7	5	0	12	0	310	9	0	319	0	12	398	0	410	741
1715 - 1730	0	7	13	0	20	0	365	14	0	379	0	8	380	0	388	787
1730 - 1745	0	4	11	0	15	0	327	3	0	330	0	6	420	0	426	771
Hourly Total	0	22	39	0	**61**	0	1329	29	0	**1358**	1	36	1634	0	**1671**	**3090**
Grand Total	0	22	39	0	**61**	0	1329	29	0	**1358**	1	36	1634	0	**1671**	**3090**
App Percentage	0.00	36.07	63.93	0.00		0.00	97.86	2.14	0.00		0.06	2.15	97.79	0.00		
Int Percentage	0.00	0.71	1.26	0.00	1.97	0.00	43.01	0.94	0.00	43.95	0.03	1.17	52.88	0.00	54.08	
Cars	0	22	38	-	60	0	1279	29	-	1308	1	36	1600	-	1637	3005
Trucks	0	0	1	-	1	0	50	0	-	50	0	0	34	-	34	85
P/Cycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
Cars (%)	0.00	100.00	97.44	-	98.36	0.00	96.24	100.00	-	96.32	100.00	100.00	97.92	-	97.97	97.25
Trucks (%)	0.00	0.00	2.56	-	1.64	0.00	3.76	0.00	-	3.68	0.00	0.00	2.08	-	2.03	2.75
PHF	0.000	0.786	0.750	-	0.763	0.000	0.910	0.518	-	0.896	0.250	0.750	0.937	-	0.935	0.977

Peak Hour Window: 0600 - 0900 (Weekday AM Peak)

0715 - 0815 (Intersection Peak Hour)

	Eastbound Arden Village Dr						Westbound Grove Park Way						Northbound SR-6 Nashville Hwy (South)						Southbound SR-6 Nashville Hwy (North)						
TIME	U-Turn 2.1	Left 2.2	Thru 2.3	Right 2.4	Peds 2a	App Total	U-Turn 2.5	Left 2.6	Thru 2.7	Right 2.8	Peds 2b	App Total	U-Turn 2.9	Left 2.10	Thru 2.11	Right 2.12	Peds 2c	App Total	U-Turn 2.13	Left 2.14	Thru 2.15	Right 2.16	Peds 2d	App Total	Int Total
0715 - 0730	0	7	0	3	0	10	0	2	0	5	0	7	0	0	506	1	0	507	0	5	335	3	0	343	867
0730 - 0745	0	5	0	1	0	6	0	0	0	5	0	5	0	2	474	2	0	478	1	7	413	3	0	424	913
0745 - 0800	0	7	0	3	0	10	0	0	0	3	0	3	0	1	386	2	0	389	0	3	297	6	0	306	708
0800 - 0815	0	4	0	2	0	6	0	2	0	8	0	10	0	0	406	5	0	411	0	7	292	1	0	300	727
Hourly Total	0	23	0	9	0	**32**	0	4	0	21	0	**25**	0	3	1772	10	0	**1785**	1	22	1337	13	0	**1373**	**3215**
Grand Total	0	23	0	9	0	**32**	0	4	0	21	0	**25**	0	3	1772	10	0	**1785**	1	22	1337	13	0	**1373**	**3215**
App Percentage	0.00	71.88	0.00	28.13	0.00		0.00	16.00	0.00	84.00	0.00		0.00	0.17	99.27	0.56	0.00		0.07	1.60	97.38	0.95	0.00		
Int Percentage	0.00	0.72	0.00	0.28	0.00	1.00	0.00	0.12	0.00	0.65	0.00	0.78	0.00	0.09	55.12	0.31	0.00	55.52	0.03	0.68	41.59	0.40	0.00	42.71	
Cars	0	23	0	8	-	31	0	3	0	20	-	23	0	3	1684	9	-	1696	1	19	1252	12	-	1284	3034
Trucks	0	0	0	1	-	1	0	1	0	1	-	2	0	0	88	1	-	89	0	3	85	1	-	89	181
P/Cycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Cars (%)	0.00	100.00	0.00	88.89	-	96.88	0.00	75.00	0.00	95.24	-	92.00	0.00	100.00	95.03	90.00	-	95.01	100.00	86.36	93.64	92.31	-	93.52	94.37
Trucks (%)	0.00	0.00	0.00	11.11	-	3.13	0.00	25.00	0.00	4.76	-	8.00	0.00	0.00	4.97	10.00	-	4.99	0.00	13.64	6.36	7.69	-	6.48	5.63
PHF	0.000	0.821	0.000	0.750	-	0.800	0.000	0.500	0.000	0.656	-	0.625	0.000	0.375	0.875	0.500	-	0.880	0.250	0.786	0.809	0.542	-	0.810	0.880

Peak Hour Window: 0600 - 0900 (Weekday AM Peak)

0715 - 0815 (Intersection Peak Hour)

	Eastbound Old Hwy 31 N						Westbound Local Rd						Northbound SR-6 Nashville Hwy (South)						Southbound SR-6 Nashville Hwy (North)						
TIME	U-Turn 3.1	Left 3.2	Thru 3.3	Right 3.4	Peds 3a	App Total	U-Turn 3.5	Left 3.6	Thru 3.7	Right 3.8	Peds 3b	App Total	U-Turn 3.9	Left 3.10	Thru 3.11	Right 3.12	Peds 3c	App Total	U-Turn 3.13	Left 3.14	Thru 3.15	Right 3.16	Peds 3d	App Total	Int Total
0715 - 0730	0	0	0	35	0	35	0	0	0	0	0	0	0	55	461	0	0	516	1	0	305	0	0	306	857
0730 - 0745	0	0	0	45	0	45	0	0	0	0	0	0	2	46	433	0	0	481	0	0	381	0	0	381	907
0745 - 0800	0	1	0	26	0	27	0	0	0	0	0	0	0	13	400	0	0	413	0	0	285	0	0	285	725
0800 - 0815	0	0	0	17	0	17	0	0	0	0	0	0	0	14	397	0	0	411	0	0	280	1	0	281	709
Hourly Total	0	1	0	123	0	**124**	0	0	0	0	0	**0**	2	128	1691	0	0	**1821**	1	0	1251	1	0	**1253**	**3198**
Grand Total	0	1	0	123	0	**124**	0	0	0	0	0	**0**	2	128	1691	0	0	**1821**	1	0	1251	1	0	**1253**	**3198**
App Percentage	0.00	0.81	0.00	99.19	0.00		0.00	0.00	0.00	0.00	0.00		0.11	7.03	92.86	0.00	0.00		0.08	0.00	99.84	0.08	0.00		
Int Percentage	0.00	0.03	0.00	3.85	0.00	3.88	0.00	0.00	0.00	0.00	0.00	0.00	0.06	4.00	52.88	0.00	0.00	56.94	0.03	0.00	39.12	0.03	0.00	39.18	
Cars	0	1	0	117	-	118	0	0	0	0	-	0	2	126	1604	0	-	1732	1	0	1167	1	-	1169	3019
Trucks	0	0	0	6	-	6	0	0	0	0	-	0	0	2	87	0	-	89	0	0	84	0	-	84	179
P/Cycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Cars (%)	0.00	100.00	0.00	95.12	-	95.16	0.00	0.00	0.00	0.00	-	0.00	100.00	98.44	94.86	0.00	-	95.11	100.00	0.00	93.29	100.00	-	93.30	94.40
Trucks (%)	0.00	0.00	0.00	4.88	-	4.84	0.00	0.00	0.00	0.00	-	0.00	0.00	1.56	5.14	0.00	-	4.89	0.00	0.00	6.71	0.00	-	6.70	5.60
PHF	0.000	0.250	0.000	0.683	-	0.689	0.000	0.000	0.000	0.000	-	0.000	0.250	0.582	0.917	0.000	-	0.882	0.250	0.000	0.821	0.250	-	0.822	0.881

Peak Hour Window: 0600 - 0900 (Weekday AM Peak)

0645 - 0745 (Intersection Peak Hour)

	Eastbound					Northbound					Southbound					
	Carters Creek Rd					Old Hwy 31 N (South)					Old Hwy 31 N (North)					
TIME	U-Turn 4.1	Left 4.2	Right 4.3	Peds 4a	App Total	U-Turn 4.4	Left 4.5	Thru 4.6	Peds 4b	App Total	U-Turn 4.7	Thru 4.8	Right 4.9	Peds 4c	App Total	Int Total
0645 - 0700	0	17	9	0	26	0	29	8	0	37	0	4	7	0	11	74
0700 - 0715	0	25	11	0	36	0	30	15	0	45	0	3	22	0	25	106
0715 - 0730	0	41	21	0	62	0	30	28	0	58	0	14	32	0	46	166
0730 - 0745	0	38	21	0	59	0	24	27	0	51	0	24	23	0	47	157
Hourly Total	0	121	62	0	**183**	0	113	78	0	**191**	0	45	84	0	**129**	**503**
Grand Total	0	121	62	0	**183**	0	113	78	0	**191**	0	45	84	0	**129**	**503**
App Percentage	0.00	66.12	33.88	0.00		0.00	59.16	40.84	0.00		0.00	34.88	65.12	0.00		
Int Percentage	0.00	24.06	12.33	0.00	36.38	0.00	22.47	15.51	0.00	37.97	0.00	8.95	16.70	0.00	25.65	
Cars	0	115	58	-	173	0	111	78	-	189	0	44	77	-	121	483
Trucks	0	6	4	-	10	0	2	0	-	2	0	1	7	-	8	20
P/Cycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
Cars (%)	0.00	95.04	93.55	-	94.54	0.00	98.23	100.00	-	98.95	0.00	97.78	91.67	-	93.80	96.02
Trucks (%)	0.00	4.96	6.45	-	5.46	0.00	1.77	0.00	-	1.05	0.00	2.22	8.33	-	6.20	3.98
PHF	0.000	0.738	0.738	-	0.738	0.000	0.942	0.696	-	0.823	0.000	0.469	0.656	-	0.686	0.758

Columbia, TN
Classified Turn Movement Count

Site 1 of 4
Greens Mill Rd
SR-6 Nashville Hwy (South)
SR-6 Nashville Hwy (North)

Lat/Long
35.702619°, -86.979254°

Date
Wednesday 3 May 2017

Weather
Sunny Intervals
Temp: 28°C

Peak Hour Data (Interactive Diagram)

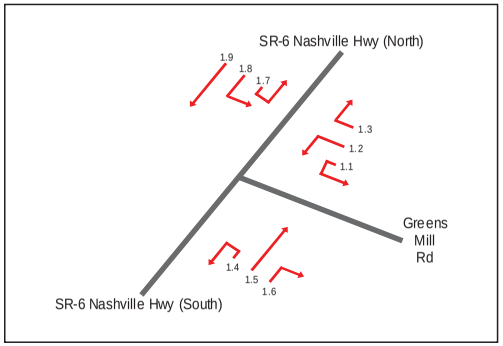
Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
1 (615) 431-6750
1 (800) 615-3765

C (Southbound) SR-6 Nashville Hwy (North)

C (In)	C (Out)	C (Tot)
1671	1369	3040

Peds	Thru	Left	U-Turn
0	1634	36	1



A (Westbound) Greens Mill Rd

Peds	0
Right	39
Left	22
U-Turn	0

A (In)	61
A (Out)	65
A (Tot)	126

B (Northbound) SR-6 Nashville Hwy (South)

U-Turn	Thru	Right	Peds
0	1329	29	0

B (Out)	B (In)	B (Tot)
1656	1358	3014

Time Interval

1645 - 1745 (Intersection Peak Hour)

Parameter

Grand Total

Columbia, TN
Classified Turn Movement Count

Site 2 of 4
Arden Village Dr
Grove Park Way
SR-6 Nashville Hwy (South)
SR-6 Nashville Hwy (North)

Lat/Long
35.706070°, -86.976722°

Date
Wednesday 3 May 2017

Weather
Sunny Intervals
Temp: 28°C

Peak Hour Data (Interactive Diagram)

Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
1 (615) 431-6750
1 (800) 615-3765

D (Southbound) SR-6 Nashville Hwy (North)

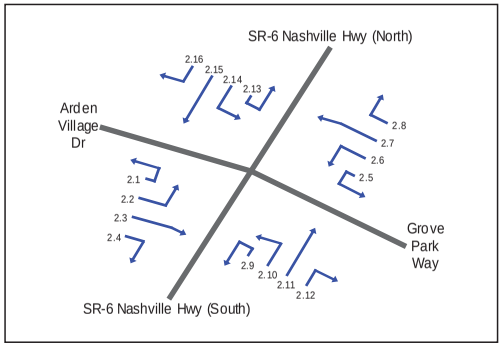
D (In)	D (Out)	D (Tot)
1373	1817	3190

Peds	Right	Thru	Left	U-Turn
0	13	1337	22	1

A (Eastbound) Arden Village Dr

A (Out)	16
A (In)	32
A (Tot)	48

U-Turn	0
Left	23
Thru	0
Right	9
Peds	0



B (Westbound) Grove Park Way

Peds	0
Right	21
Thru	0
Left	4
U-Turn	0

B (In)	25
B (Out)	32
B (Tot)	57

C (Northbound) SR-6 Nashville Hwy (South)

U-Turn	Left	Thru	Right	Peds
0	3	1772	10	0

C (Out)	C (In)	C (Tot)
1350	1785	3135

Time Interval

0715 - 0815 (Intersection Peak Hour)

Parameter

Grand Total

Columbia, TN
Classified Turn Movement Count

Site 3 of 4
Old Hwy 31 N
Local Rd
SR-6 Nashville Hwy (South)
SR-6 Nashville Hwy (North)

Lat/Long
35.707700°, -86.975686°

Date
Wednesday 3 May 2017

Weather
Sunny Intervals
Temp: 28°C

Peak Hour Data (Interactive Diagram)

Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
1 (615) 431-6750
1 (800) 615-3765

D (Southbound) SR-6 Nashville Hwy (North)

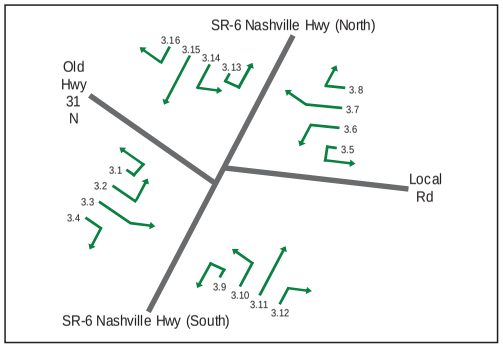
D (In)	D (Out)	D (Tot)
1253	1693	2946

Peds	Right	Thru	Left	U-Turn
0	1	1251	0	1

A (Eastbound) Old Hwy 31 N

A (Out)	129
A (In)	124
A (Tot)	253

U-Turn	0
Left	1
Thru	0
Right	123
Peds	0



B (Westbound) Local Rd

Peds	0
Right	0
Thru	0
Left	0
U-Turn	0

B (In)	0
B (Out)	0
B (Tot)	0

C (Northbound) SR-6 Nashville Hwy (South)

U-Turn	Left	Thru	Right	Peds
2	128	1691	0	0

C (Out)	C (In)	C (Tot)
1376	1821	3197

Time Interval

0715 - 0815 (Intersection Peak Hour)

Parameter

Grand Total

Columbia, TN
Classified Turn Movement Count

Site 4 of 4
Carters Creek Rd
Old Hwy 31 N (South)
Old Hwy 31 N (North)

Lat/Long
35.710390°, -86.975503°

Date
Wednesday 3 May 2017

Weather
Sunny Intervals
Temp: 28°C

Peak Hour Data (Interactive Diagram)

Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
1 (615) 431-6750
1 (800) 615-3765

C (Southbound) Old Hwy 31 N (North)

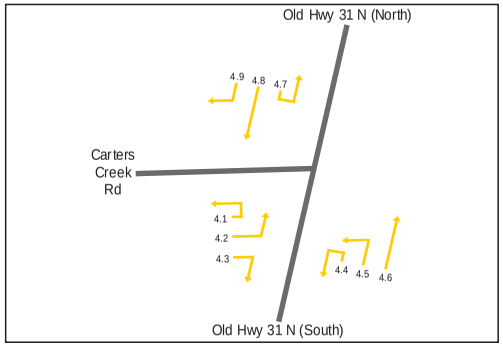
C (In)	C (Out)	C (Tot)
129	199	328

Peds	Right	Thru	U-Turn
0	84	45	0

A (Eastbound) Carters Creek Rd

A (Out)	197
A (In)	183
A (Tot)	380

U-Turn	0
Left	121
Right	62
Peds	0



B (Northbound) Old Hwy 31 N (South)

U-Turn	Left	Thru	Peds
0	113	78	0

B (Out)	B (In)	B (Tot)
107	191	298

Time Interval

0645 - 0745 (Intersection Peak Hour)

Parameter

Grand Total

APPENDIX C
TDOT COUNT DATA

TDOT Station Information

Station	000019	000223	000091
Route	00972	SR396	SR006
Location	SOUTHEAST NEAPOLIS	NEAR SPRING HILL	SOUTH OF NEAPOLIS
County	Maury	Maury	Maury
2015	1195	23291	34875
2014	1072	22575	34235
2013	973	23466	30975
2012	1016	21687	29517
2011	1048	21362	30297
2010	1104	22563	27335
2009	1145	21991	27095
2008	1110	23333	27226
2007	1207	21691	27921
2006	1193	22601	32741
2005	1171	25005	31459
2004	1399	25000	30322
2003	1359	24980	28802
2002	1184	23863	27462
2001	1089	24391	30777
2000	1165	NA	28764
1999	1231	NA	27152
1998	970	NA	26643
1997	963	NA	27282
1996	1056	NA	23600
1995	979	NA	24941
1994	650	NA	22257
1993	640	NA	20906
1992	642	NA	19642
1991	618	NA	19229
1990	640	NA	15303
1989	658	NA	16510
1988	585	NA	11643
1987	474	NA	9833
1986	610	NA	10334
1985	423	NA	9022
1984	NA	NA	NA
1983	NA	NA	NA

APPENDIX D
CAPACITY ANALYSES

EXISTING CONDITIONS CAPACITY ANALYSES

Intersection	
Int Delay, s/veh	1.7

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	140	1702	1269	1	2	125
Future Vol, veh/h	140	1702	1269	1	2	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	152	1850	1379	1	2	136

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1380	0	-	0	2609	690
Stage 1	-	-	-	-	1380	-
Stage 2	-	-	-	-	1229	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	493	-	-	-	20	388
Stage 1	-	-	-	-	199	-
Stage 2	-	-	-	-	239	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	493	-	-	-	20	388
Mov Cap-2 Maneuver	-	-	-	-	20	-
Stage 1	-	-	-	-	199	-
Stage 2	-	-	-	-	239	-

Approach	NB	SB	SE
HCM Control Delay, s	1.2	0	26.7
HCM LOS			D

Minor Lane/Major Mvmt	NBL	NBT	SELn1	SBT	SBR
Capacity (veh/h)	493	-	301	-	-
HCM Lane V/C Ratio	0.309	-	0.459	-	-
HCM Control Delay (s)	15.5	0	26.7	-	-
HCM Lane LOS	C	A	D	-	-
HCM 95th %tile Q(veh)	1.3	-	2.3	-	-

Intersection	
Int Delay, s/veh	23.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	27	71	1740	9	31	1341
Future Vol, veh/h	27	71	1740	9	31	1341
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	485	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	77	1891	10	34	1458

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2692	951	0	0	1901	0
Stage 1	1896	-	-	-	-	-
Stage 2	796	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	~ 17	260	-	-	309	-
Stage 1	104	-	-	-	-	-
Stage 2	405	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 15	260	-	-	309	-
Mov Cap-2 Maneuver	~ 15	-	-	-	-	-
Stage 1	104	-	-	-	-	-
Stage 2	360	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 765.7	0	0.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	47	309	-
HCM Lane V/C Ratio	-	-	2.266	0.109	-
HCM Control Delay (s)	-	-	$ 765.7	18.1	-
HCM Lane LOS	-	-	F	C	-
HCM 95th %tile Q(veh)	-	-	11.1	0.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	9.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	0	9	4	0	21	3	1798	10	22	1359	13
Future Vol, veh/h	23	0	9	4	0	21	3	1798	10	22	1359	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	95	-	-	340	-	145	130	-	185
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	0	10	4	0	23	3	1954	11	24	1477	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2509	3486	739	2747	3486	977	1477	0	0	1954	0	0
Stage 1	1525	1525	-	1961	1961	-	-	-	-	-	-	-
Stage 2	984	1961	-	786	1525	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 14	6	360	9	6	250	452	-	-	295	-	-
Stage 1	123	178	-	65	108	-	-	-	-	-	-	-
Stage 2	267	108	-	351	178	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 12	5	360	8	5	250	452	-	-	295	-	-
Mov Cap-2 Maneuver	~ 12	5	-	8	5	-	-	-	-	-	-	-
Stage 1	122	164	-	65	107	-	-	-	-	-	-	-
Stage 2	241	107	-	314	164	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 818.2	129.4	0	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	452	-	-	12	360	8	250	295	-	-
HCM Lane V/C Ratio	0.007	-	-	2.083	0.027	0.543	0.091	0.081	-	-
HCM Control Delay (s)	13	-	-	$ 1132.4	15.3	$ 699.6	20.8	18.3	-	-
HCM Lane LOS	B	-	-	F	C	F	C	C	-	-
HCM 95th %tile Q(veh)	0	-	-	4	0.1	1.1	0.3	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	113	84	75	66	43	76
Future Vol, veh/h	113	84	75	66	43	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	123	91	82	72	47	83

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	323	88	129	0	-	0
Stage 1	88	-	-	-	-	-
Stage 2	235	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	671	970	1457	-	-	-
Stage 1	935	-	-	-	-	-
Stage 2	804	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	631	970	1457	-	-	-
Mov Cap-2 Maneuver	631	-	-	-	-	-
Stage 1	935	-	-	-	-	-
Stage 2	757	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.8	4.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1457	-	741	-	-
HCM Lane V/C Ratio	0.056	-	0.289	-	-
HCM Control Delay (s)	7.6	0	11.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.2	-	-

Intersection	
Int Delay, s/veh	4.6

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	61	1336	1647	0	2	93
Future Vol, veh/h	61	1336	1647	0	2	93
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	66	1452	1790	0	2	101

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1790	0	-	0	2649	895
Stage 1	-	-	-	-	1790	-
Stage 2	-	-	-	-	859	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	342	-	-	-	19	284
Stage 1	-	-	-	-	119	-
Stage 2	-	-	-	-	375	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	342	-	-	-	0	284
Mov Cap-2 Maneuver	-	-	-	-	0	-
Stage 1	-	-	-	-	119	-
Stage 2	-	-	-	-	0	-

Approach	NB	SB	SE
HCM Control Delay, s	8.7	0	24.7
HCM LOS			C

Minor Lane/Major Mvmt	NBL	NBT	SELn1	SBT	SBR
Capacity (veh/h)	342	-	284	-	-
HCM Lane V/C Ratio	0.194	-	0.364	-	-
HCM Control Delay (s)	18	8.3	24.7	-	-
HCM Lane LOS	C	A	C	-	-
HCM 95th %tile Q(veh)	0.7	-	1.6	-	-

Intersection	
Int Delay, s/veh	5.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	22	39	1336	29	36	1655
Future Vol, veh/h	22	39	1336	29	36	1655
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	485	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	42	1452	32	39	1799

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2446	742	0	0	1484	0
Stage 1	1468	-	-	-	-	-
Stage 2	978	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	26	358	-	-	449	-
Stage 1	178	-	-	-	-	-
Stage 2	325	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	24	358	-	-	449	-
Mov Cap-2 Maneuver	24	-	-	-	-	-
Stage 1	178	-	-	-	-	-
Stage 2	297	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	271.7	0	0.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	59	449	-
HCM Lane V/C Ratio	-	-	1.124	0.087	-
HCM Control Delay (s)	-	-	271.7	13.8	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	5.5	0.3	-

Intersection	
Int Delay, s/veh	11.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	0	4	23	1	46	9	1340	26	38	1664	38
Future Vol, veh/h	11	0	4	23	1	46	9	1340	26	38	1664	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	95	-	-	340	-	145	130	-	185
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	4	25	1	50	10	1457	28	41	1809	41

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2639	3367	904	2463	3367	728	1809	0	0	1457	0	0
Stage 1	1891	1891	-	1476	1476	-	-	-	-	-	-	-
Stage 2	748	1476	-	987	1891	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 11	8	280	~ 16	8	366	336	-	-	460	-	-
Stage 1	72	117	-	132	189	-	-	-	-	-	-	-
Stage 2	371	189	-	265	117	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 8	7	280	~ 14	7	366	336	-	-	460	-	-
Mov Cap-2 Maneuver	~ 8	7	-	~ 14	7	-	-	-	-	-	-	-
Stage 1	70	107	-	128	183	-	-	-	-	-	-	-
Stage 2	309	183	-	238	107	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 831.7	$ 327.2	0.1	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	336	-	-	8	280	14	175	460	-	-
HCM Lane V/C Ratio	0.029	-	-	1.495	0.016	1.786	0.292	0.09	-	-
HCM Control Delay (s)	16	-	-	$ 1127.6	18.1	$ 926.7	33.8	13.6	-	-
HCM Lane LOS	C	-	-	F	C	F	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.4	0	3.8	1.2	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	64	63	40	21	32	72
Future Vol, veh/h	64	63	40	21	32	72
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	70	68	43	23	35	78

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	184	74	113	0	-	0
Stage 1	74	-	-	-	-	-
Stage 2	110	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	805	988	1476	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	781	988	1476	-	-	-
Mov Cap-2 Maneuver	781	-	-	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	888	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	4.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1476	-	872	-	-
HCM Lane V/C Ratio	0.029	-	0.158	-	-
HCM Control Delay (s)	7.5	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

BACKGROUND CONDITIONS
CAPACITY ANALYSES

Intersection	
Int Delay, s/veh	2.2

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	152	1855	1383	1	2	135
Future Vol, veh/h	152	1855	1383	1	2	135
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	165	2016	1503	1	2	147

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1504	0	-	0	2843	752
Stage 1	-	-	-	-	1504	-
Stage 2	-	-	-	-	1339	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	441	-	-	-	14	353
Stage 1	-	-	-	-	170	-
Stage 2	-	-	-	-	209	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	441	-	-	-	14	353
Mov Cap-2 Maneuver	-	-	-	-	14	-
Stage 1	-	-	-	-	170	-
Stage 2	-	-	-	-	209	-

Approach	NB	SB	SE
HCM Control Delay, s	1.4	0	35.6
HCM LOS			E

Minor Lane/Major Mvmt	NBL	NBT	SELn1	SBT	SBR
Capacity (veh/h)	441	-	261	-	-
HCM Lane V/C Ratio	0.375	-	0.571	-	-
HCM Control Delay (s)	18	0	35.6	-	-
HCM Lane LOS	C	A	E	-	-
HCM 95th %tile Q(veh)	1.7	-	3.2	-	-

Intersection	
Int Delay, s/veh	41.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	29	77	1896	9	33	1461
Future Vol, veh/h	29	77	1896	9	33	1461
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	485	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	84	2061	10	36	1588

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2932	1035	0	0	2071	0
Stage 1	2066	-	-	-	-	-
Stage 2	866	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	~ 12	229	-	-	265	-
Stage 1	83	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 10	229	-	-	265	-
Mov Cap-2 Maneuver	~ 10	-	-	-	-	-
Stage 1	83	-	-	-	-	-
Stage 2	321	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 1371.5	0	0.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	33	265	-
HCM Lane V/C Ratio	-	-	3.491	0.135	-
HCM Control Delay (s)	-	-	$ 1371.5	20.7	-
HCM Lane LOS	-	-	F	C	-
HCM 95th %tile Q(veh)	-	-	13.5	0.5	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	15.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	0	9	4	0	22	3	1960	10	23	1481	14
Future Vol, veh/h	25	0	9	4	0	22	3	1960	10	23	1481	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	95	-	-	340	-	145	130	-	185
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	0	10	4	0	24	3	2130	11	25	1610	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2732	3797	805	2992	3797	1065	1610	0	0	2130	0	0
Stage 1	1660	1660	-	2137	2137	-	-	-	-	-	-	-
Stage 2	1072	2137	-	855	1660	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 10	4	325	6	4	219	402	-	-	252	-	-
Stage 1	101	153	-	50	88	-	-	-	-	-	-	-
Stage 2	235	88	-	319	153	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 8	4	325	5	4	219	402	-	-	252	-	-
Mov Cap-2 Maneuver	~ 8	4	-	5	4	-	-	-	-	-	-	-
Stage 1	100	138	-	50	87	-	-	-	-	-	-	-
Stage 2	208	87	-	279	138	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 1462.8	208.6	0	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	402	-	-	8	325	5	219	252	-	-
HCM Lane V/C Ratio	0.008	-	-	3.397	0.03	0.87	0.109	0.099	-	-
HCM Control Delay (s)	14	-	-	$ 1983.5	16.4	$ 1227.3	23.4	20.9	-	-
HCM Lane LOS	B	-	-	F	C	F	C	C	-	-
HCM 95th %tile Q(veh)	0	-	-	4.6	0.1	1.2	0.4	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	123	91	82	71	46	82
Future Vol, veh/h	123	91	82	71	46	82
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	134	99	89	77	50	89

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	350	95	139	0	-	0
Stage 1	95	-	-	-	-	-
Stage 2	255	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	647	962	1445	-	-	-
Stage 1	929	-	-	-	-	-
Stage 2	788	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	606	962	1445	-	-	-
Mov Cap-2 Maneuver	606	-	-	-	-	-
Stage 1	929	-	-	-	-	-
Stage 2	738	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	4.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1445	-	719	-	-
HCM Lane V/C Ratio	0.062	-	0.324	-	-
HCM Control Delay (s)	7.7	0	12.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.4	-	-

Intersection	
Int Delay, s/veh	5.4

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	65	1456	1795	0	2	100
Future Vol, veh/h	65	1456	1795	0	2	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	71	1583	1951	0	2	109

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1951	0	-	0	2884	976
Stage 1	-	-	-	-	1951	-
Stage 2	-	-	-	-	933	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	296	-	-	-	13	251
Stage 1	-	-	-	-	97	-
Stage 2	-	-	-	-	343	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	296	-	-	-	0	251
Mov Cap-2 Maneuver	-	-	-	-	0	-
Stage 1	-	-	-	-	97	-
Stage 2	-	-	-	-	0	-

Approach	NB	SB	SE
HCM Control Delay, s	10.1	0	30.2
HCM LOS			D

Minor Lane/Major Mvmt	NBL	NBT	SELn1	SBT	SBR
Capacity (veh/h)	296	-	251	-	-
HCM Lane V/C Ratio	0.239	-	0.442	-	-
HCM Control Delay (s)	20.9	9.6	30.2	-	-
HCM Lane LOS	C	A	D	-	-
HCM 95th %tile Q(veh)	0.9	-	2.1	-	-

Intersection	
Int Delay, s/veh	10.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	23	42	1455	31	39	1803
Future Vol, veh/h	23	42	1455	31	39	1803
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	485	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	46	1582	34	42	1960

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2663	808	0	0	1615	0
Stage 1	1598	-	-	-	-	-
Stage 2	1065	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	~ 18	324	-	-	400	-
Stage 1	151	-	-	-	-	-
Stage 2	292	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 16	324	-	-	400	-
Mov Cap-2 Maneuver	~ 16	-	-	-	-	-
Stage 1	151	-	-	-	-	-
Stage 2	261	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 563	0	0.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	41	400	-
HCM Lane V/C Ratio	-	-	1.723	0.106	-
HCM Control Delay (s)	-	-	$ 563	15.1	-
HCM Lane LOS	-	-	F	C	-
HCM 95th %tile Q(veh)	-	-	7.3	0.4	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	19.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	0	4	25	1	50	9	1460	28	41	1813	41
Future Vol, veh/h	11	0	4	25	1	50	9	1460	28	41	1813	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	95	-	-	340	-	145	130	-	185
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	4	27	1	54	10	1587	30	45	1971	45

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2874	3667	985	2681	3667	793	1971	0	0	1587	0	0
Stage 1	2060	2060	-	1607	1607	-	-	-	-	-	-	-
Stage 2	814	1607	-	1074	2060	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 7	5	247	~ 11	5	331	290	-	-	410	-	-
Stage 1	56	96	-	109	163	-	-	-	-	-	-	-
Stage 2	338	163	-	235	96	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 4	4	247	~ 10	4	331	290	-	-	410	-	-
Mov Cap-2 Maneuver	~ 4	4	-	~ 10	4	-	-	-	-	-	-	-
Stage 1	54	85	-	105	157	-	-	-	-	-	-	-
Stage 2	271	157	-	206	85	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 1868.2	$ 535.8	0.1	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	290	-	-	4	247	10	127	410	-	-
HCM Lane V/C Ratio	0.034	-	-	2.989	0.018	2.717	0.436	0.109	-	-
HCM Control Delay (s)	17.8	-	-	$ 2540.4	19.8	$ 1519.2	53.7	14.8	-	-
HCM Lane LOS	C	-	-	F	C	F	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.7	0.1	4.4	1.9	0.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	69	68	43	22	34	78
Future Vol, veh/h	69	68	43	22	34	78
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	75	74	47	24	37	85

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	196	79	122	0	-	0
Stage 1	79	-	-	-	-	-
Stage 2	117	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	793	981	1465	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	908	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	767	981	1465	-	-	-
Mov Cap-2 Maneuver	767	-	-	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	878	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1465	-	860	-	-
HCM Lane V/C Ratio	0.032	-	0.173	-	-
HCM Control Delay (s)	7.5	0	10.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

PROJECTED CONDITIONS CAPACITY ANALYSES

Intersection	
Int Delay, s/veh	3.9

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	161	1957	1464	1	2	142
Future Vol, veh/h	161	1957	1464	1	2	142
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	175	2127	1591	1	2	154

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1592	0	-	0	3006	796
Stage 1	-	-	-	-	1592	-
Stage 2	-	-	-	-	1414	-
Critical Hdwy	4.14	-	-	-	7.54	6.94
Critical Hdwy Stg 1	-	-	-	-	6.54	-
Critical Hdwy Stg 2	-	-	-	-	6.54	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	408	-	-	-	6	330
Stage 1	-	-	-	-	112	-
Stage 2	-	-	-	-	145	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	408	-	-	-	6	330
Mov Cap-2 Maneuver	-	-	-	-	6	-
Stage 1	-	-	-	-	112	-
Stage 2	-	-	-	-	145	-

Approach	NB	SB	SE
HCM Control Delay, s	1.5	0	78.1
HCM LOS			F

Minor Lane/Major Mvmt	NBL	NBT	SELn1	SBT	SBR
Capacity (veh/h)	408	-	189	-	-
HCM Lane V/C Ratio	0.429	-	0.828	-	-
HCM Control Delay (s)	20.3	0	78.1	-	-
HCM Lane LOS	C	A	F	-	-
HCM 95th %tile Q(veh)	2.1	-	5.9	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	0	28	0	1949	1518	37
Future Vol, veh/h	0	28	0	1949	1518	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	30	0	2118	1650	40

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	845	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	306	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	306	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NE	SW
HCM Control Delay, s	18.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NET	EBLn1	SWT	SWR
Capacity (veh/h)	-	306	-	-
HCM Lane V/C Ratio	-	0.099	-	-
HCM Control Delay (s)	-	18.1	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.3	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	111	18	28	29	15	77	44	1896	9	33	1498	51
Future Vol, veh/h	111	18	28	29	15	77	44	1896	9	33	1498	51
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	485	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	121	20	30	32	16	84	48	2061	10	36	1628	55

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2862	3894	842	3057	3916	1035	1684	0	0	2071	0	0
Stage 1	1728	1728	-	2161	2161	-	-	-	-	-	-	-
Stage 2	1134	2166	-	896	1755	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 8	~ 3	308	~ 5	~ 3	229	376	-	-	265	-	-
Stage 1	~ 92	142	-	48	85	-	-	-	-	-	-	-
Stage 2	216	85	-	301	137	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	~ 3	308	-	~ 3	229	376	-	-	265	-	-
Mov Cap-2 Maneuver	-	~ 3	-	-	~ 3	-	-	-	-	-	-	-
Stage 1	~ 92	123	-	48	85	-	-	-	-	-	-	-
Stage 2	~ 111	85	-	197	118	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			0.4	0.4
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	376	-	-	-	8	-	265	-	-
HCM Lane V/C Ratio	0.127	-	-	-	6.25	-	0.135	-	-
HCM Control Delay (s)	16	0	-	-	$ 3267.5	-	20.7	-	-
HCM Lane LOS	C	A	-	-	F	-	C	-	-
HCM 95th %tile Q(veh)	0.4	-	-	-	7.7	-	0.5	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	20.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	0	9	4	0	22	3	2071	10	23	1569	14
Future Vol, veh/h	25	0	9	4	0	22	3	2071	10	23	1569	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	95	-	-	340	-	145	130	-	185
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	0	10	4	0	24	3	2251	11	25	1705	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2887	4013	853	3161	4013	1126	1705	0	0	2251	0	0
Stage 1	1755	1755	-	2258	2258	-	-	-	-	-	-	-
Stage 2	1132	2258	-	903	1755	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 7	3	302	~ 4	3	199	369	-	-	225	-	-
Stage 1	88	137	-	42	76	-	-	-	-	-	-	-
Stage 2	216	76	-	299	137	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 6	3	302	~ 4	3	199	369	-	-	225	-	-
Mov Cap-2 Maneuver	~ 6	3	-	~ 4	3	-	-	-	-	-	-	-
Stage 1	87	122	-	42	75	-	-	-	-	-	-	-
Stage 2	188	75	-	257	122	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 2034.3	265.9	0	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	369	-	-	6	302	4	199	225	-	-
HCM Lane V/C Ratio	0.009	-	-	4.529	0.032	1.087	0.12	0.111	-	-
HCM Control Delay (s)	14.8	-	-	$ 2760.4	17.3	$ 1588.3	25.5	23	-	-
HCM Lane LOS	B	-	-	F	C	F	D	C	-	-
HCM 95th %tile Q(veh)	0	-	-	4.8	0.1	1.3	0.4	0.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	123	95	87	75	49	82
Future Vol, veh/h	123	95	87	75	49	82
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	134	103	95	82	53	89

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	369	98	142	0	-	0
Stage 1	98	-	-	-	-	-
Stage 2	271	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	631	958	1441	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	775	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	587	958	1441	-	-	-
Mov Cap-2 Maneuver	587	-	-	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	722	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	4.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1441	-	706	-	-
HCM Lane V/C Ratio	0.066	-	0.336	-	-
HCM Control Delay (s)	7.7	0	12.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.5	-	-

Intersection	
Int Delay, s/veh	6.5

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	75	1564	1918	0	2	112
Future Vol, veh/h	75	1564	1918	0	2	112
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	82	1700	2085	0	2	122

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2085	0	-	0	3098	1042
Stage 1	-	-	-	-	2085	-
Stage 2	-	-	-	-	1013	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	262	-	-	-	9	226
Stage 1	-	-	-	-	81	-
Stage 2	-	-	-	-	312	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	262	-	-	-	0	226
Mov Cap-2 Maneuver	-	-	-	-	0	-
Stage 1	-	-	-	-	81	-
Stage 2	-	-	-	-	0	-

Approach	NB	SB	SE
HCM Control Delay, s	11.9	0	38.7
HCM LOS			E

Minor Lane/Major Mvmt	NBL	NBT	SELn1	SBT	SBR
Capacity (veh/h)	262	-	226	-	-
HCM Lane V/C Ratio	0.311	-	0.548	-	-
HCM Control Delay (s)	24.8	11.3	38.7	-	-
HCM Lane LOS	C	B	E	-	-
HCM 95th %tile Q(veh)	1.3	-	3	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	29	0	1553	1855	56
Future Vol, veh/h	0	29	0	1553	1855	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	32	0	1688	2016	61

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1039	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	227	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	227	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	227	-	-
HCM Lane V/C Ratio	-	0.139	-	-
HCM Control Delay (s)	-	23.4	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.5	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	118	20	29	23	22	42	67	1455	31	39	1859	79
Future Vol, veh/h	118	20	29	23	22	42	67	1455	31	39	1859	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	485	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	128	22	32	25	24	46	73	1582	34	42	2021	86

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3096	3909	1053	2850	3935	808	2107	0	0	1615	0	0
Stage 1	2148	2148	-	1744	1744	-	-	-	-	-	-	-
Stage 2	948	1761	-	1106	2191	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 5	~ 3	223	~ 8	~ 3	324	257	-	-	400	-	-
Stage 1	~ 49	87	-	90	139	-	-	-	-	-	-	-
Stage 2	280	136	-	224	82	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	0	223	-	0	324	257	-	-	400	-	-
Mov Cap-2 Maneuver	-	0	-	-	0	-	-	-	-	-	-	-
Stage 1	~ 49	78	-	90	0	-	-	-	-	-	-	-
Stage 2	-	0	-	124	73	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			11.5	0.3
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	257	-	-	-	223	-	400	-	-
HCM Lane V/C Ratio	0.283	-	-	-	0.239	-	0.106	-	-
HCM Control Delay (s)	24.5	11.2	-	-	26.1	-	15.1	-	-
HCM Lane LOS	C	B	-	-	D	-	C	-	-
HCM 95th %tile Q(veh)	1.1	-	-	-	0.9	-	0.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	30

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	0	4	25	1	50	9	1578	28	41	1948	41
Future Vol, veh/h	11	0	4	25	1	50	9	1578	28	41	1948	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	95	-	-	340	-	145	130	-	185
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	4	27	1	54	10	1715	30	45	2117	45

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3085	3942	1059	2883	3942	858	2117	0	0	1715	0	0
Stage 1	2207	2207	-	1735	1735	-	-	-	-	-	-	-
Stage 2	878	1735	-	1148	2207	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 5	3	221	~ 7	3	300	255	-	-	366	-	-
Stage 1	45	81	-	91	140	-	-	-	-	-	-	-
Stage 2	309	140	-	211	81	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 3	3	221	~ 6	3	300	255	-	-	366	-	-
Mov Cap-2 Maneuver	~ 3	3	-	~ 6	3	-	-	-	-	-	-	-
Stage 1	43	71	-	87	135	-	-	-	-	-	-	-
Stage 2	241	135	-	181	71	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 2565.2	$ 959.1	0.1	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	255	-	-	3	221	6	102	366	-	-
HCM Lane V/C Ratio	0.038	-	-	3.986	0.02	4.529	0.543	0.122	-	-
HCM Control Delay (s)	19.7	-	-	$ 3490.2	21.$	$ 2760.4	76.1	16.2	-	-
HCM Lane LOS	C	-	-	F	C	F	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.8	0.1	4.8	2.5	0.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	69	75	49	26	39	78
Future Vol, veh/h	69	75	49	26	39	78
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	75	82	53	28	42	85

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	220	85	127	0	-	0
Stage 1	85	-	-	-	-	-
Stage 2	135	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	768	974	1459	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	740	974	1459	-	-	-
Mov Cap-2 Maneuver	740	-	-	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	858	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	4.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1459	-	846	-	-
HCM Lane V/C Ratio	0.037	-	0.185	-	-
HCM Control Delay (s)	7.6	0	10.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

PROJECTED CONDITIONS WITH TURN LANE IMPROVEMENTS CAPACITY ANALYSES

Intersection	
Int Delay, s/veh	3.9

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	161	1957	1464	1	2	142
Future Vol, veh/h	161	1957	1464	1	2	142
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	175	2127	1591	1	2	154

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1592	0	-	0	3006	796
Stage 1	-	-	-	-	1592	-
Stage 2	-	-	-	-	1414	-
Critical Hdwy	4.14	-	-	-	7.54	6.94
Critical Hdwy Stg 1	-	-	-	-	6.54	-
Critical Hdwy Stg 2	-	-	-	-	6.54	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	408	-	-	-	6	330
Stage 1	-	-	-	-	112	-
Stage 2	-	-	-	-	145	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	408	-	-	-	6	330
Mov Cap-2 Maneuver	-	-	-	-	6	-
Stage 1	-	-	-	-	112	-
Stage 2	-	-	-	-	145	-

Approach	NB	SB	SE
HCM Control Delay, s	1.5	0	78.1
HCM LOS			F

Minor Lane/Major Mvmt	NBL	NBT	SELn1	SBT	SBR
Capacity (veh/h)	408	-	189	-	-
HCM Lane V/C Ratio	0.429	-	0.828	-	-
HCM Control Delay (s)	20.3	0	78.1	-	-
HCM Lane LOS	C	A	F	-	-
HCM 95th %tile Q(veh)	2.1	-	5.9	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	28	0	1949	1518	37
Future Vol, veh/h	0	28	0	1949	1518	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	-	0	-	-	-	140
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	30	0	2118	1650	40

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	825	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	316	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	316	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT
Capacity (veh/h)	-	316	-
HCM Lane V/C Ratio	-	0.096	-
HCM Control Delay (s)	-	17.6	-
HCM Lane LOS	-	C	-
HCM 95th %tile Q(veh)	-	0.3	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	111	18	28	29	15	77	44	1896	9	33	1498	51
Future Vol, veh/h	111	18	28	29	15	77	44	1896	9	33	1498	51
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	200	-	-	485	-	140
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	121	20	30	32	16	84	48	2061	10	36	1628	55

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2834	3866	814	3057	3861	1035	1628	0	0	2071	0	0
Stage 1	1700	1700	-	2161	2161	-	-	-	-	-	-	-
Stage 2	1134	2166	-	896	1700	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 8	~ 3	321	~ 5	~ 4	229	395	-	-	265	-	-
Stage 1	~ 96	146	-	48	85	-	-	-	-	-	-	-
Stage 2	216	85	-	301	146	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	~ 2	321	-	~ 3	229	395	-	-	265	-	-
Mov Cap-2 Maneuver	-	~ 2	-	-	~ 3	-	-	-	-	-	-	-
Stage 1	~ 84	126	-	42	75	-	-	-	-	-	-	-
Stage 2	~ 94	75	-	199	126	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			0.3	0.4
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	395	-	-	-	5	-	265	-	-
HCM Lane V/C Ratio	0.121	-	-	-	10	-	0.135	-	-
HCM Control Delay (s)	15.4	-	-	$ 5459.4		-	20.7	-	-
HCM Lane LOS	C	-	-	-	F	-	C	-	-
HCM 95th %tile Q(veh)	0.4	-	-	-	8	-	0.5	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	20.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	0	9	4	0	22	3	2071	10	23	1569	14
Future Vol, veh/h	25	0	9	4	0	22	3	2071	10	23	1569	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	95	-	-	340	-	145	130	-	185
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	0	10	4	0	24	3	2251	11	25	1705	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2887	4013	853	3161	4013	1126	1705	0	0	2251	0	0
Stage 1	1755	1755	-	2258	2258	-	-	-	-	-	-	-
Stage 2	1132	2258	-	903	1755	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 7	3	302	~ 4	3	199	369	-	-	225	-	-
Stage 1	88	137	-	42	76	-	-	-	-	-	-	-
Stage 2	216	76	-	299	137	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 6	3	302	~ 4	3	199	369	-	-	225	-	-
Mov Cap-2 Maneuver	~ 6	3	-	~ 4	3	-	-	-	-	-	-	-
Stage 1	87	122	-	42	75	-	-	-	-	-	-	-
Stage 2	188	75	-	257	122	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 2034.3	265.9	0	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	369	-	-	6	302	4	199	225	-	-
HCM Lane V/C Ratio	0.009	-	-	4.529	0.032	1.087	0.12	0.111	-	-
HCM Control Delay (s)	14.8	-	-	$ 2760.4	17.3	$ 1588.3	25.5	23	-	-
HCM Lane LOS	B	-	-	F	C	F	D	C	-	-
HCM 95th %tile Q(veh)	0	-	-	4.8	0.1	1.3	0.4	0.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	123	95	87	75	49	82
Future Vol, veh/h	123	95	87	75	49	82
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	134	103	95	82	53	89

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	369	98	142	0	-	0
Stage 1	98	-	-	-	-	-
Stage 2	271	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	631	958	1441	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	775	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	587	958	1441	-	-	-
Mov Cap-2 Maneuver	587	-	-	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	722	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	4.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1441	-	706	-	-
HCM Lane V/C Ratio	0.066	-	0.336	-	-
HCM Control Delay (s)	7.7	0	12.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.5	-	-

Intersection	
Int Delay, s/veh	6.5

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	75	1564	1918	0	2	112
Future Vol, veh/h	75	1564	1918	0	2	112
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	82	1700	2085	0	2	122

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2085	0	-	0	3098	1042
Stage 1	-	-	-	-	2085	-
Stage 2	-	-	-	-	1013	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	262	-	-	-	9	226
Stage 1	-	-	-	-	81	-
Stage 2	-	-	-	-	312	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	262	-	-	-	0	226
Mov Cap-2 Maneuver	-	-	-	-	0	-
Stage 1	-	-	-	-	81	-
Stage 2	-	-	-	-	0	-

Approach	NB	SB	SE
HCM Control Delay, s	11.9	0	38.7
HCM LOS			E

Minor Lane/Major Mvmt	NBL	NBT	SELn1	SBT	SBR
Capacity (veh/h)	262	-	226	-	-
HCM Lane V/C Ratio	0.311	-	0.548	-	-
HCM Control Delay (s)	24.8	11.3	38.7	-	-
HCM Lane LOS	C	B	E	-	-
HCM 95th %tile Q(veh)	1.3	-	3	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	29	0	1553	1855	56
Future Vol, veh/h	0	29	0	1553	1855	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	-	0	-	-	-	140
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	32	0	1688	2016	61

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1008	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	239	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	239	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.3	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT
Capacity (veh/h)	-	239	-
HCM Lane V/C Ratio	-	0.132	-
HCM Control Delay (s)	-	22.3	-
HCM Lane LOS	-	C	-
HCM 95th %tile Q(veh)	-	0.4	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	118	20	29	23	22	42	67	1455	31	39	1859	79
Future Vol, veh/h	118	20	29	23	22	42	67	1455	31	39	1859	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	200	-	-	485	-	140
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	128	22	32	25	24	46	73	1582	34	42	2021	86

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3053	3866	1010	2850	3849	808	2021	0	0	1615	0	0
Stage 1	2105	2105	-	1744	1744	-	-	-	-	-	-	-
Stage 2	948	1761	-	1106	2105	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 5	~ 3	238	~ 8	~ 4	324	278	-	-	400	-	-
Stage 1	~ 53	91	-	90	139	-	-	-	-	-	-	-
Stage 2	280	136	-	224	91	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	~ 2	238	-	~ 3	324	278	-	-	400	-	-
Mov Cap-2 Maneuver	-	~ 2	-	-	~ 3	-	-	-	-	-	-	-
Stage 1	~ 39	81	-	66	103	-	-	-	-	-	-	-
Stage 2	136	100	-	127	81	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			1	0.3
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	278	-	-	-	5	-	400	-	-
HCM Lane V/C Ratio	0.262	-	-	-	10.652	-	0.106	-	-
HCM Control Delay (s)	22.5	-	-	-	$ 5754.7	-	15.1	-	-
HCM Lane LOS	C	-	-	-	F	-	C	-	-
HCM 95th %tile Q(veh)	1	-	-	-	8.4	-	0.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	30

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	0	4	25	1	50	9	1578	28	41	1948	41
Future Vol, veh/h	11	0	4	25	1	50	9	1578	28	41	1948	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	95	-	-	340	-	145	130	-	185
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	4	27	1	54	10	1715	30	45	2117	45

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3085	3942	1059	2883	3942	858	2117	0	0	1715	0	0
Stage 1	2207	2207	-	1735	1735	-	-	-	-	-	-	-
Stage 2	878	1735	-	1148	2207	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 5	3	221	~ 7	3	300	255	-	-	366	-	-
Stage 1	45	81	-	91	140	-	-	-	-	-	-	-
Stage 2	309	140	-	211	81	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 3	3	221	~ 6	3	300	255	-	-	366	-	-
Mov Cap-2 Maneuver	~ 3	3	-	~ 6	3	-	-	-	-	-	-	-
Stage 1	43	71	-	87	135	-	-	-	-	-	-	-
Stage 2	241	135	-	181	71	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 2565.2	$ 959.1	0.1	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	255	-	-	3	221	6	102	366	-	-
HCM Lane V/C Ratio	0.038	-	-	3.986	0.02	4.529	0.543	0.122	-	-
HCM Control Delay (s)	19.7	-	-	$ 3490.2	21.$	$ 2760.4	76.1	16.2	-	-
HCM Lane LOS	C	-	-	F	C	F	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.8	0.1	4.8	2.5	0.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	69	75	49	26	39	78
Future Vol, veh/h	69	75	49	26	39	78
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	75	82	53	28	42	85

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	220	85	127	0	-	0
Stage 1	85	-	-	-	-	-
Stage 2	135	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	768	974	1459	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	740	974	1459	-	-	-
Mov Cap-2 Maneuver	740	-	-	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	858	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	4.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1459	-	846	-	-
HCM Lane V/C Ratio	0.037	-	0.185	-	-
HCM Control Delay (s)	7.6	0	10.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

PROJECTED CONDITIONS
WITH TURN LANE AND TRAFFIC SIGNAL IMPROVEMENTS
CAPACITY ANALYSES

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	18	28	29	15	77	44	1896	9	33	1498	51
Future Volume (veh/h)	111	18	28	29	15	77	44	1896	9	33	1498	51
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	121	20	30	32	16	84	48	2061	10	36	1628	55
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	255	89	133	91	42	133	270	2415	12	198	2321	1038
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.04	0.67	0.67	0.03	0.66	0.66
Sat Flow, veh/h	1290	674	1011	259	318	1009	1774	3612	18	1774	3539	1583
Grp Volume(v), veh/h	121	0	50	132	0	0	48	1009	1062	36	1628	55
Grp Sat Flow(s),veh/h/ln	1290	0	1684	1586	0	0	1774	1770	1860	1774	1770	1583
Q Serve(g_s), s	1.4	0.0	2.1	2.9	0.0	0.0	0.7	34.7	34.8	0.5	23.1	1.0
Cycle Q Clear(g_c), s	7.5	0.0	2.1	6.1	0.0	0.0	0.7	34.7	34.8	0.5	23.1	1.0
Prop In Lane	1.00		0.60	0.24		0.64	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	255	0	222	266	0	0	270	1183	1244	198	2321	1038
V/C Ratio(X)	0.47	0.00	0.22	0.50	0.00	0.00	0.18	0.85	0.85	0.18	0.70	0.05
Avail Cap(c_a), veh/h	379	0	384	415	0	0	321	1200	1261	260	2377	1064
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	0.0	30.6	32.3	0.0	0.0	7.8	10.1	10.1	12.7	8.7	4.8
Incr Delay (d2), s/veh	1.4	0.0	0.5	1.4	0.0	0.0	0.3	6.1	5.9	0.4	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	1.0	2.8	0.0	0.0	0.4	18.5	19.4	0.4	11.4	0.4
LnGrp Delay(d),s/veh	34.4	0.0	31.1	33.7	0.0	0.0	8.1	16.1	15.9	13.1	9.6	4.9
LnGrp LOS	C		C	C			A	B	B	B	A	A
Approach Vol, veh/h		171			132			2119			1719	
Approach Delay, s/veh		33.5			33.7			15.9			9.5	
Approach LOS		C			C			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.7	57.3		14.9	7.8	56.2		14.9
Change Period (Y+Rc), s	4.0	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.5	53.5		18.0	5.5	53.0		18.0
Max Q Clear Time (g_c+I1), s	2.5	36.8		9.5	2.7	25.1		8.1
Green Ext Time (p_c), s	0.0	16.0		0.9	0.0	26.0		1.0

Intersection Summary		
HCM 2010 Ctrl Delay		14.5
HCM 2010 LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	20	29	23	22	42	67	1455	31	39	1859	79
Future Volume (veh/h)	118	20	29	23	22	42	67	1455	31	39	1859	79
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	128	22	32	25	24	46	73	1582	34	42	2021	86
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	261	80	116	89	65	91	222	2393	51	287	2347	1050
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.05	0.68	0.68	0.04	0.66	0.66
Sat Flow, veh/h	1325	687	999	274	561	784	1774	3543	76	1774	3539	1583
Grp Volume(v), veh/h	128	0	54	95	0	0	73	789	827	42	2021	86
Grp Sat Flow(s),veh/h/ln	1325	0	1686	1619	0	0	1774	1770	1849	1774	1770	1583
Q Serve(g_s), s	2.2	0.0	2.3	1.1	0.0	0.0	1.0	20.7	20.8	0.6	35.5	1.5
Cycle Q Clear(g_c), s	6.4	0.0	2.3	4.2	0.0	0.0	1.0	20.7	20.8	0.6	35.5	1.5
Prop In Lane	1.00		0.59	0.26		0.48	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	261	0	196	245	0	0	222	1195	1249	287	2347	1050
V/C Ratio(X)	0.49	0.00	0.28	0.39	0.00	0.00	0.33	0.66	0.66	0.15	0.86	0.08
Avail Cap(c_a), veh/h	409	0	383	420	0	0	244	1195	1249	338	2391	1070
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	0.0	32.0	32.8	0.0	0.0	16.0	7.5	7.5	6.5	10.5	4.8
Incr Delay (d2), s/veh	1.4	0.0	0.8	1.0	0.0	0.0	0.9	1.4	1.3	0.2	3.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	1.1	2.0	0.0	0.0	1.1	10.3	10.8	0.3	18.0	0.7
LnGrp Delay(d),s/veh	35.0	0.0	32.7	33.8	0.0	0.0	16.8	8.9	8.9	6.7	13.9	4.8
LnGrp LOS	D		C	C			B	A	A	A	B	A
Approach Vol, veh/h		182			95			1689			2149	
Approach Delay, s/veh		34.4			33.8			9.2			13.4	
Approach LOS		C			C			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	58.0		13.7	8.5	57.0		13.7
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.3	53.2		18.0	5.0	53.5		18.0
Max Q Clear Time (g_c+I1), s	2.6	22.8		8.4	3.0	37.5		6.2
Green Ext Time (p_c), s	0.0	27.9		0.8	0.0	15.0		0.9

Intersection Summary		
HCM 2010 Ctrl Delay		13.1
HCM 2010 LOS		B

APPENDIX E
TRIP GENERATION CALCULATIONS

TRIP GENERATION
Church Property at Homestead

Apartment – 181 Units

Use ITE Land Use Code 220 and associated trip generation rates for 24-hour total trips and peak hour trips.

Average Daily Traffic – Use the Fitted Curve Equation for Average Daily Traffic on a Weekday

T = 6.06 (X) + 123.56
T = 6.06 (181) + 123.56
T = 1,220

A.M. Peak Hour - Use the Fitted Curve Equation for the AM Peak Hour of the Adjacent Street Traffic (one hour between 7:00 AM and 9:00 AM) on a Weekday

T = 0.49 (X) + 3.73
T = 0.49 (181) + 3.73
T = 92

Enter = 0.20 (92) = 18
Exit = 0.80 (92) = 74

P.M. Peak Hour - Use the Fitted Curve Equation for the PM Peak Hour of the Adjacent Street Traffic (one hour between 4:00 PM and 6:00 PM) on a Weekday

T = 0.55 (X) + 17.65
T = 0.55 (181) + 17.65
T = 117

Enter = 0.65 (117) = 77
Exit = 0.35 (117) = 41

TRIP GENERATION
Church Property at Homestead

Residential Condominium/Townhouse – 108 Units

Use ITE Land Use Code 230 and associated trip generation rates for 24-hour total trips and peak hour trips.

Average Daily Traffic – Use the Fitted Curve Equation for Average Daily Traffic on a Weekday

Ln(T) = 0.87 Ln(X) + 2.46
Ln(T) = 0.87 Ln(108) + 2.46
T = 688

A.M. Peak Hour - Use the Fitted Curve Equation for the AM Peak Hour of the Adjacent Street Traffic (one hour between 7:00 AM and 9:00 AM) on a Weekday

Ln(T) = 0.80 Ln(X) + 0.26
Ln(T) = 0.80 Ln(108) + 0.26
T = 55

Enter = 0.17 (55) = 9
Exit = 0.83 (55) = 46

P.M. Peak Hour - Use the Fitted Curve Equation for the PM Peak Hour of the Adjacent Street Traffic (one hour between 4:00 PM and 6:00 PM) on a Weekday

Ln(T) = 0.82 Ln(X) + 0.32
Ln(T) = 0.82 Ln(55) + 0.32
T = 37

Enter = 0.67 (37) = 25
Exit = 0.33 (37) = 12

TRIP GENERATION
Church Property at Homestead

Office – 9,300 square feet

Use ITE Land Use Code 710 and associated trip generation rates for 24-hour total trips and peak hour trips.

Average Daily Traffic – Use Average Rate for Average Daily Traffic on a Weekday

T = 11.03 (X)
T = 11.03 (9.3)
T = 103

A.M. Peak Hour - Use Average Rate for AM Peak Hour of the Adjacent Street (between 7:00 AM and 9:00 AM)

T = 1.56 (X)
T = 1.56 (9.3)
T = 15

Enter = 0.88 (15) = 13
Exit = 0.12 (15) = 2

P.M. Peak Hour - Use Average Rate for PM Peak Hour of the Adjacent Street (between 4:00 PM and 6:00 PM)

T = 1.49 (X)
T = 1.49 (9.3)
T = 14

Enter = 0.17 (14) = 2
Exit = 0.83 (14) = 12

TRIP GENERATION
Church Property at Homestead

Specialty Retail – 68,300 square feet

Use ITE Land Use Code 826 and associated trip generation rates for 24-hour total trips and peak hour trips.

Average Daily Traffic

T = 42.78 (X) + 37.66
T = 42.78 (68.3) + 37.66
T = 2960

AM Peak Hour - Assume the AM Peak Hour of the Adjacent Street (between 7:00 AM and 9:00 AM) is 50% of the PM Peak Hour Trip Generation of the Adjacent Street. Assume directional distribution is similar to that of LUC 820 for AM Peak Hour of the Adjacent Street.

T = 0.50 (PM Trips)
T = 0.50 (185)
T = 93

Enter = 0.61(93) = 57
Exit = 0.39(93) = 36

PM Peak Hour - Use PM Peak Hour of the Adjacent Street (between 4:00 and 6:00 PM)

T = 2.40(X) +21.48
T = 2.40(68.3) +21.48
T = 185

Enter = 0.44 (185) = 81
Exit = 0.56 (185) = 104

TRIP GENERATION
Church Property at Homestead

High-Turnover (Sit-Down) Restaurant – 9,300 square feet

Use ITE Land Use Code 932 and associated trip generation rates for 24-hour total trips and peak hour trips.

Average Daily Traffic
T = 127.15 (X)
T = 127.15 (9.3)
T = 1183

A.M. Peak Hour - Use average rate for the AM Peak Hour of the Adjacent Street (between 7:00 AM and 9:00 AM)

T = 10.81(X)
T = 10.81 (9.3)
T = 101

Enter = 0.55 (101) = 56
Exit = 0.45 (101) = 45

P.M. Peak Hour - Use average rate for the PM Peak Hour of the Adjacent Street (between 4:00 PM and 6:00 PM)

T = 9.85 (X)
T = 9.85 (9.3)
T = 92

Enter = 0.60 (92) = 55
Exit = 0.40 (92) = 37

TRIP GENERATION
TOTAL SITE GENERATED TRAFFIC

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HR.		PM PEAK HR.	
			ENTER	EXIT	ENTER	EXIT
Apartments (220)	181 d.u.	1,220	18	74	76	41
Townhomes (230)	108 d.u.	688	9	46	25	12
Office (710)	9,300 s.f.	103	13	2	2	12
Specialty Retail (826)	68,300 s.f.	2,960	57	36	81	104
Restaurant (932)	9,300 s.f.	1,183	56	45	55	37
TOTAL		**6,154**	**153**	**203**	**239**	**206**

TRIP GENERATION
INTERNAL SITE GENERATED TRAFFIC

Assumes: 15% Internal (for Commercial)

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HR.		PM PEAK HR.	
			ENTER	EXIT	ENTER	EXIT
Apartments (220)	181 d.u.	183	3	11	11	6
Townhomes (230)	108 d.u.	103	1	7	4	2
Office (710)	9,300 s.f.	15	2	0	0	2
Specialty Retail (826)	68,300 s.f.	0	0	0	0	0
Restaurant (932)	9,300 s.f.	0	0	0	0	0
TOTAL		**301**	**6**	**18**	**15**	**10**

TRIP GENERATION
EXTERNAL SITE GENERATED TRAFFIC

Assumes: 15% Internal (for Commercial)

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HR.		PM PEAK HR.	
			ENTER	EXIT	ENTER	EXIT
Apartments (220)	181 d.u.	1,037	15	63	65	35
Townhomes (230)	108 d.u.	585	8	39	21	10
Office (710)	9,300 s.f.	88	11	2	2	10
Specialty Retail (826)	68,300 s.f.	2,960	57	36	81	104
Restaurant (932)	9,300 s.f.	1,183	56	45	55	37
TOTAL		**5,853**	**147**	**185**	**224**	**196**

TRIP GENERATION
PASS-BY TRAFFIC

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HR.		PM PEAK HR.	
			ENTER	EXIT	ENTER	EXIT
Apartments (220)	181 d.u.	0	0	0	0	0
Townhomes (230)	108 d.u.	0	0	0	0	0
Office (710)	9,300 s.f.	0	0	0	0	0
Specialty Retail (826)	68,300 s.f.	0	0	0	0	0
Restaurant (932)	9,300 s.f.	0	0	0	0	0
TOTAL		**0**	**0**	**0**	**0**	**0**

TRIP GENERATION
NEW SITE GENERATED TRAFFIC (PRIMARY)

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HR.		PM PEAK HR.	
			ENTER	EXIT	ENTER	EXIT
Apartments (220)	181 d.u.	1,037	15	63	65	35
Townhomes (230)	108 d.u.	585	8	39	21	10
Office (710)	9,300 s.f.	88	11	2	2	10
Specialty Retail (826)	68,300 s.f.	2,960	57	36	81	104
Restaurant (932)	9,300 s.f.	1,183	56	45	55	37
TOTAL		**5,853**	**147**	**185**	**224**	**196**

APPENDIX F
SIGNAL WARRANT ANALYSIS

DESCRIPTIONS OF TRAFFIC SIGNAL WARRANTS

The *Manual on Uniform Traffic Control Devices* (MUTCD) sets forth nine different warrants that have been developed by the traffic engineering profession to aid in the determination of when a signal is warranted. These warrants present minimum conditions that normally indicate when a traffic signal is justified at a particular location. The MUTCD states that "traffic control signals should not be installed unless one or more of the factors… are met."

Although the MUTCD provides nine different warrants, only four of these are potentially applicable at the intersection under study. These four warrants, described in the MUTCD, are as follows:

Warrant 1A, Minimum Vehicular Volume

The Minimum Vehicular Volume warrant is intended for application where the volume of intersecting traffic is the principal reason for consideration of signal installation. The warrant is satisfied when, for each of any eight hours of an average day, the traffic volumes given below in Table F1 exist on the major street and on the higher volume minor street approach to the intersection.

TABLE F1. MINIMUM VEHICULAR VOLUMES FOR WARRANT 1A

Number of lanes for moving traffic on each approach		Vehicles per hour on major street	Vehicles per hour on higher volume minor approach
Major Street	Minor Street	Total of Both Approaches	One Direction Only
1 Lane	1 Lane	500	150
2 Lanes or more	1 Lane	600	150
2 Lanes or more	2 Lanes or more	600	200
1 Lane	2 Lanes or more	500	200

When the 85th percentile speed of the major street traffic exceeds 40 mph in either an urban or a rural area, or when the intersection lies within the built up area of an isolated community having a population of less than 10,000, the Minimum Vehicular Volume warrant is 70 percent of the requirements stated in Table H1.

Warrant 1B, Interruption of Continuous Traffic

The Interruption of Continuous Traffic warrant applies to operating conditions where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or hazard when entering or crossing the major street. The warrant is satisfied when, for each of any eight hours of an average day, the traffic volumes given below in Table F2 exist on the major street and on the higher volume minor street approach to an intersection. Also, the signal installation shall not seriously disrupt progressive traffic flow.

TABLE F2. MINIMUM VEHICULAR VOLUMES FOR WARRANT 1B

Number of lanes for moving traffic on each approach		Vehicles per hour on major street	Vehicles per hour on higher volume minor approach
Major Street	Minor Street	Total of Both Approaches	One Direction Only
1 Lane	1 Lane	750	75
2 Lanes or more	1 Lane	900	75
2 Lanes or more	2 Lanes or more	900	100
1 Lane	2 Lanes or more	750	100

When the 85th percentile speed of major street traffic exceeds 40 mph in either an urban or a rural area, or when the intersection lies within the built up area of an isolated community having a population of less than 10,000, the Interruption of Continuous Traffic warrant is 70 percent of the requirements above.

In exceptional cases, signals occasionally may be justified where no single warrant is satisfied but where Warrants 1A and 1B are satisfied to the extent of 80 percent or more of the stated values. This warrant is referred to as Warrant 1C (Combination Warrant)

Warrant 2, Four Hour Volume

The Four Hour Volume warrant is satisfied when for each of any four high hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor street approach (one direction only) all fall above the curves in Figure I1 for the existing combination of approach lanes.

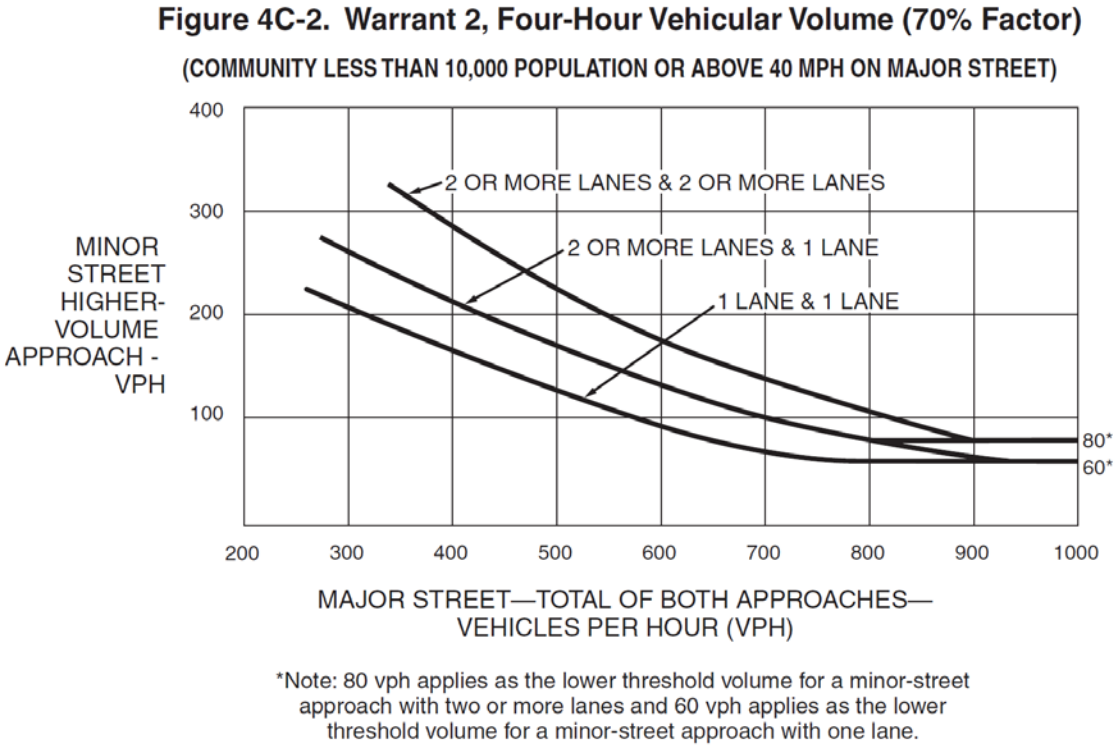


Figure F1. Warrant 2, Four-Hour Vehicular Volume

Warrant 3, Peak Hour Volume

The Peak Hour Volume warrant is intended for application when traffic conditions are such that for one hour of the day, minor street traffic suffers undue traffic delay in entering or crossing the major street. The Peak Hour Volume warrant is satisfied when the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor street approach (one direction only) for one hour (any four consecutive 15 minute periods) of an average day falls above the curve in Figure I2 for the existing combination of approach lanes.

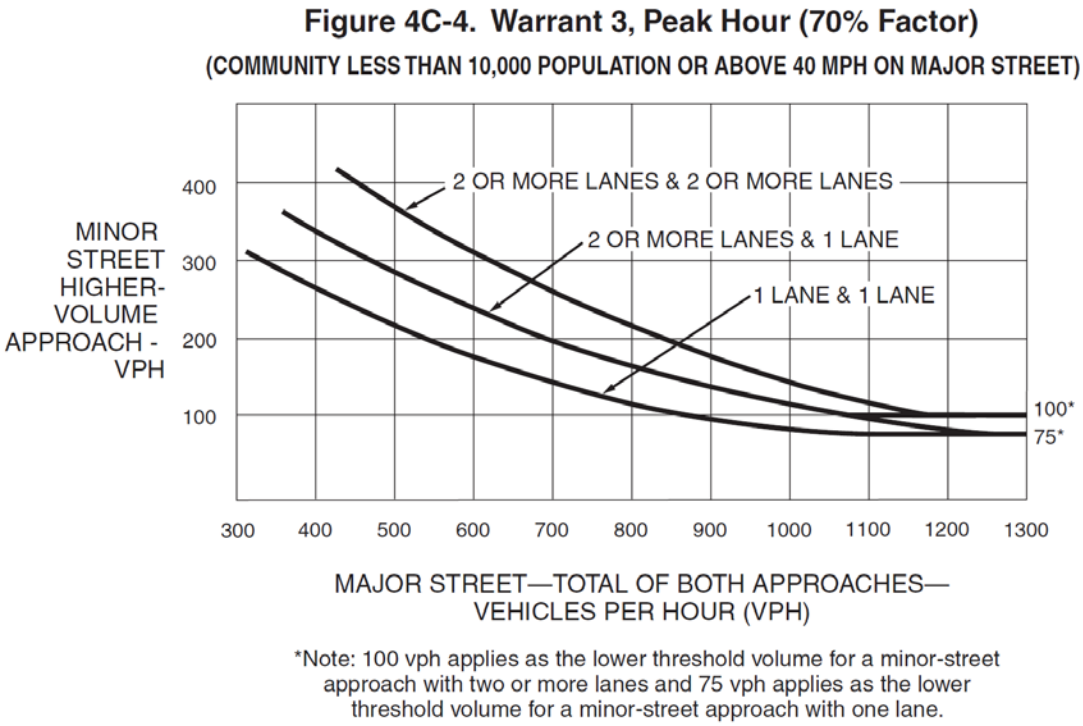


Figure F2. Warrant 3, Peak-Hour Vehicular Volume

APPENDIX G
TURN LANE WARRANT ANALYSIS

LEFT TURN LANE WARRANT ANALYSES
(Based on Harmelink Methodology)
Projected Conditions
Nashville Highway and Site Access #1
Northbound (AM Peak Hour)

4-lane roadway

INPUT

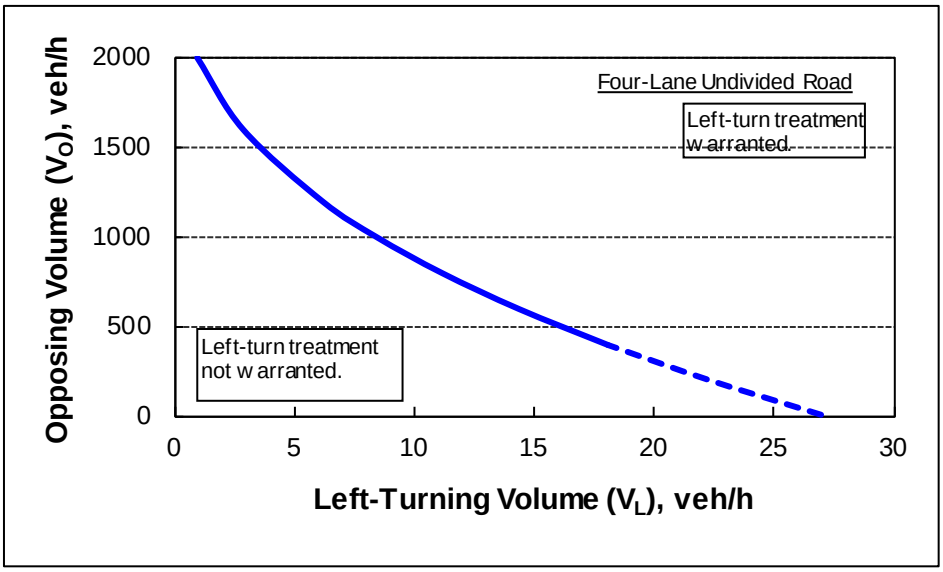
Variable	Value
Left-turning volume (V_L), veh/h:	44
Advancing volume (V_A), veh/h:	1949
Opposing volume (V_O), veh/h:	1582

OUTPUT

Variable	Message
Opposing volume (Vo) check:	O.K.
Combined volume (V_A and V_O) check:	O.K.
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	4.0
Critical headway, s:	6.0



Note: When V_O < 400 veh/h (dashed line), a left-turn lane is not normally warranted unless the advancing volume (V_A) in the same direction as the left-turning traffic exceeds 400 veh/h (V_A > 400 veh/h).

LEFT TURN LANE WARRANT ANALYSES
(Based on Harmelink Methodology)
Projected Conditions
Nashville Highway and Site Access #1
Northbound (PM Peak Hour)

4-lane roadway

INPUT

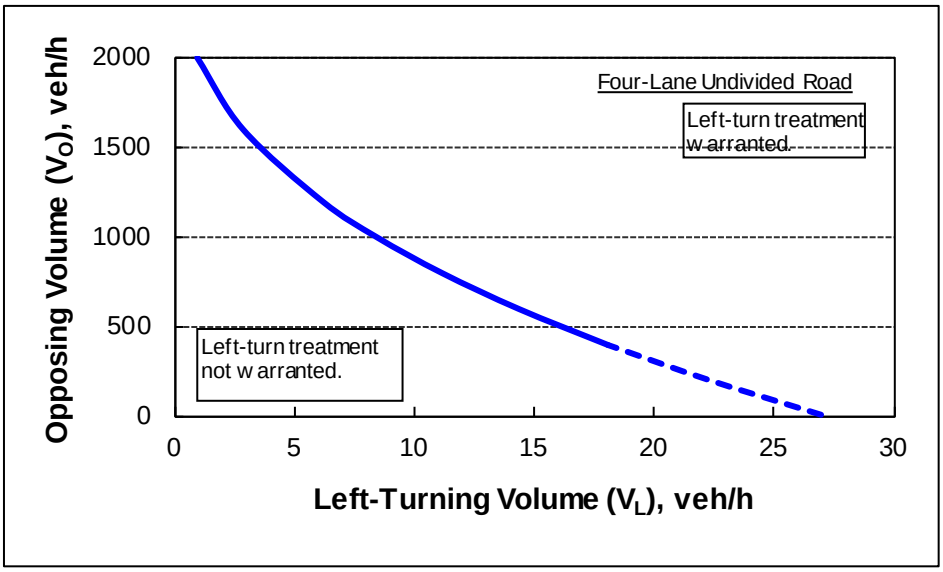
Variable	Value
Left-turning volume (V_L), veh/h:	67
Advancing volume (V_A), veh/h:	1553
Opposing volume (V_O), veh/h:	1977

OUTPUT

Variable	Message
Opposing volume (Vo) check:	O.K.
Combined volume (V_A and V_O) check:	O.K.
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	4.0
Critical headway, s:	6.0

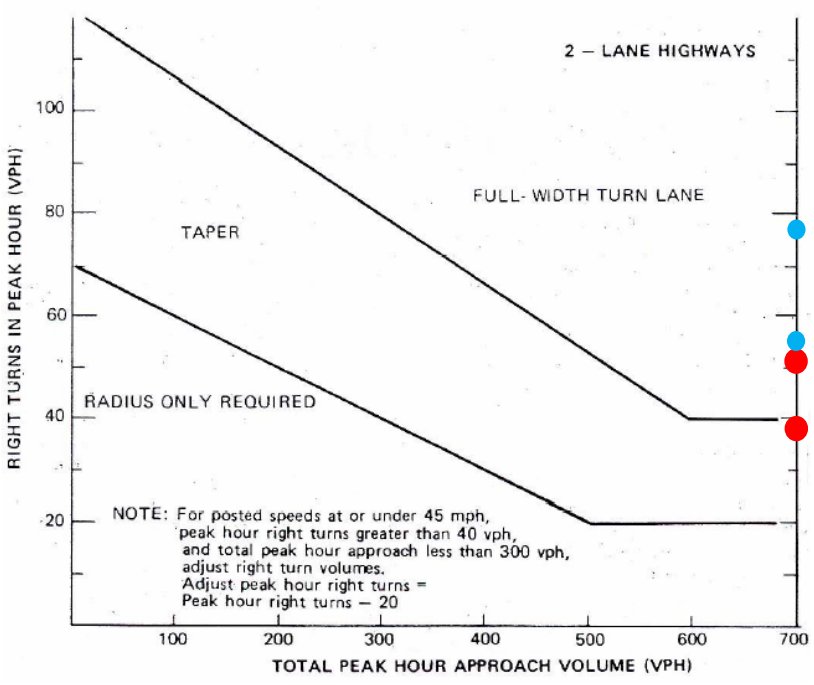


Note: When V_O < 400 veh/h (dashed line), a left-turn lane is not normally warranted unless the advancing volume (V_A) in the same direction as the left-turning traffic exceeds 400 veh/h (V_A > 400 veh/h).

RIGHT TURN LANE WARRANT ANALYSES
(Based on Intersection Channelization Design Guide)

Intersection Approach	AM Peak Hour			PM Peak Hour		
	V_R*	V_A*	Warrant Met?	V_R*	V_A*	Warrant Met?
Southbound Nashville Highway at Site Access #1	51	1,582	Yes	79	1,977	Yes
Southbound Nashville Highway at Site Access #2	37	1,555	Yes	56	1,911	Yes

* V_R = Right Turn Volumes, V_A = Advancing Volumes



A right turn lane is warranted on Nashville Highway at both site accesses based on projected traffic volumes.

November 7, 2023
Mr. Andrew Wiseman
Catalyst Design Group
5100 Tennessee Ave
Nashville, TN 37209
Sent via email: awiseman@catalyst-dg.com
RE: Water Availability Letter
Villages of Carters Creek
2425 Highway 31
Columbia, Maury County, TN

Dear Mr. Wiseman:

Columbia Power and Water Systems ("the Utility"/CPWS) is a municipal corporation authorized to provide water services in accordance with State law. CPWS has adopted rules, regulations, and standard operation procedures, prescribing the conditions under which CPWS will furnish water service. In addition, certain State laws delegate authority to the Tennessee Department of Environment and Conservation, various Planning Commissions and other authorities in Cities and Counties. These Cities and Counties have also adopted rules and regulations. Subject to the payment of all charges and fees imposed by CPWS and the approval of any and all required governmental agencies, water service will be made available on a first-come, first-served basis, subject to availability of all CPWS furnished equipment and materials appropriate for the development and provided the applicant complies with all rules and regulations of CPWS and conditions set out herein.

The proposed development is a gas station with convenience store and car wash. CPWS has evaluated the projected water demands for the proposed development in the water system hydraulic model and is able to meet a fire-flow capacity of 2,000 gpm at 20 psi while maintaining the existing level of service and pressures in this portion of the distribution system. CPWS can provide water for the proposed development according to the following requirements:

- Domestic waterline connection will be made to the existing 8-inch water mains located on the North and South ends of the property.
- A minimum size 8-inch diameter water main will be installed to loop between the existing 8-inch mains on each end of the property.
- Domestic and fire protection service will be provided through a single fire-rated ultrasonic meter for each lot.
- Since the proposed lane is a private drive, any new hydrants required will be private hydrants on the customer side of the meter.
- Irrigation, if any, was not included in the below fee estimates. If required, it will be provided on a separate meter.

All of the above requirements are to be constructed and paid for by the Applicant and dedicated to CPWS once complete up to and including the meter. No construction of CPWS infrastructure shall be initiated until final construction plans have been approved by TDEC and all parties have fully executed a water service agreement.

Once you have received this Water Availability Letter, next steps in the process to obtain water service from CPWS are as follows:

- Provide site base CAD files in DWG format, including roads, lot lines, existing and proposed contours, and other existing and proposed utilities, for use in development of water construction drawings.
- Remit to CPWS new water service fees:

New Water Service Fee: $1,500 + $370 per SFU (32.6 SFUs)	$13,562.00

- CPWS will then develop water construction drawings and submit to TDEC for approval. Upon approval by TDEC and payment of meter and impact fees by the applicant, applicant may then schedule a pre-construction meeting with CPWS. Pre-construction meeting will not be scheduled until fees are paid in full or surety is provided in lieu of full payment. Final meter and impact fees are subject to change based on final design and meter size determination. Meter fees are subject to change based on market costs at time of purchase. Meters will not be set until meter and impact fees are paid.

Meter Fee: $7,000 per 6" ultra-sonic fire-rate meter (2 meters)	$14,000.00
Impact Fee: $25,000 per 2" meter equivalent (2 meters)	$50,000.00
Total Meter and Impact Fees Due =	**$64,000.00**

- After the pre-construction meeting, CPWS will then issue a formal notice to proceed. No construction of CPWS infrastructure may take place prior to the pre-construction meeting.
- Applicant is then required to construct all public water infrastructure per CPWS standard specifications and provide CPWS personnel unregulated access to the site to inspect the construction of the water infrastructure.

If you have any questions, please feel free to contact me at 423-774-0349 or eric.king@inflodesign.com. This letter is valid for one-hundred twenty (120) days from the date of this letter.

Sincerely,



Eric King, P.E.
Inflo Design Group, LLC
on behalf of Columbia Power and Water Systems

cc: Jonathan Hardin, CPWS
File 23-054

HYDRANT FLOW ANALYSIS

HYDRANT # & LOCATION: 0810 Nashville Hwy

DATE: 11/7/2023

MODEL BY: Inflo Design Group, LLC

SYS. DEMAND Max Day

DURATION: 2

WATER SUPPLIED BY: Columbia Power and Water Systems

PURPOSE OF TEST: Villages at Carters Creek

MODEL DATA

FLOW HYDRANT(S)	0810	n/a	n/a
GPM:	**1300**	0	0

TOTAL FLOW DURING SIMULATION: **1300** GPM

GAUGE HYDRANT

HYDRANT # & LOCATION:

Hydrant 0810

STATIC 92 PSI RESIDUAL: 86 PSI

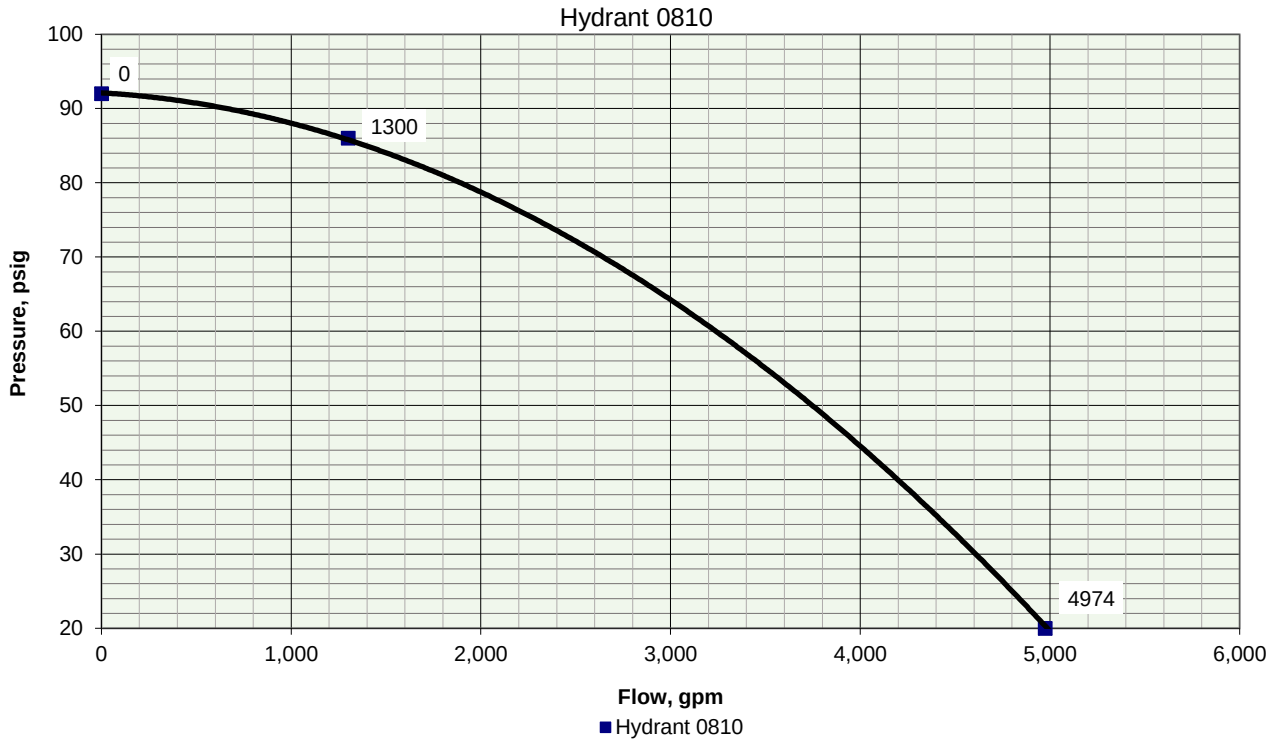
STATIC _____ PSI RESIDUAL: _____ PSI

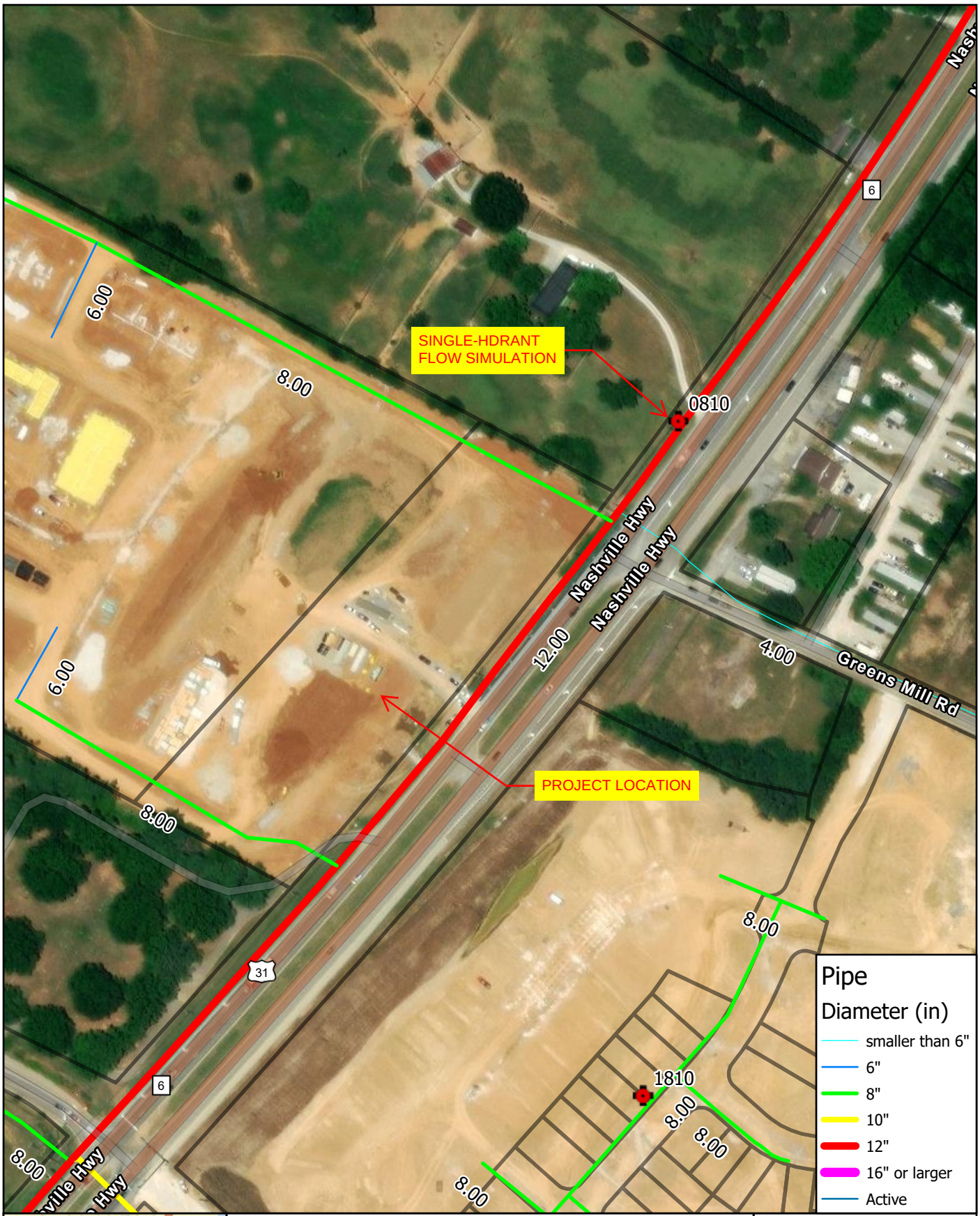
RESULTS: AT 20 PSI RESIDUAL

CONDITION 1 **4974** GPM

CONDITION 2 **---** GPM

REMARKS: Performance based on service elevations of 685' and current CPWS water infrastructure and does not account for additional losses associated with development piping.







Flow Test Location Map

Esri Community Maps Contributors, Tennessee STS GIS, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, Maxar, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

2023

Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet

N

0 100 200 Feet

0 0.02 0.04 Miles

Columbia Fire & Rescue

Fire Flow Requirements

Water Purveyor: Columbia Power & Water System

Date: 10/3/2023
Name: Andrew Wiseman
Phone: 6156891147
Email: awiseman@catalyst-dg.com
Address/Parcel ID: 2425 Nashville Highway, 051 02203 000
Property Type:
- ○ Residential
- ◉ Commercial
- ○ Industrial

Construction Type: wood frame
Enclosed Area (ft²): car wash (4,900 SF) Gas Station (5,300 SF)

FILLED OUT BY COLUMBIA FIRE AND RESCUE

NFPA Sprinkler Type: _____

Water System Demand without Sprinkler Credit

Fire flow Requirements (International Fire Code Appendix B)

Fire Flow: _____ gpm Duration: _____ hours

Fire Hydrant Location and Distribution (International Fire Code Appendix C)

Minimum number of hydrants: _____

Average spacing between hydrants: _____ft.

Maximum distance from frontage to hydrant: _____ ft.

Water System Demand with Sprinkler Credit

Fire flow requirements (International Fire Code Appendix B)

Fire Flow: _____ gpm Duration: _____ hours

Fire Hydrant Location and Distribution (International Fire Code Appendix C)

Minimum number of hydrants: _____

Average spacing between hydrants: _____ft.

Maximum distance from frontage to hydrant: _____ ft.

Fire Plan Reviewer: _____ Date: _____

CITY OF COLUMBIA
TENNESSEE

WASTEWATER DEPARTMENT

15 November 2023

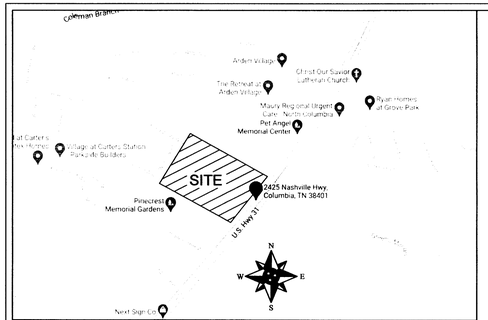
Collin Aufhammer
Nash Spring Hill, JV
500 W 5th St., STE #700
Austin, TX 78701

RE: Villages of Cater's Creek - Retail Outparcels, Address: 2425 Nashville Hwy, Columbia TN

Collin,

This letter serves as confirmation that the City of Columbia Wastewater Department has the available capacity to service the above-referenced development. Any extension to the existing sewer infrastructure will be initiated by the owner/developer, reviewed by our department and approved by the State of Tennessee. The project must be advanced in accordance with local, state and federal rules, regulations and policies. Funding and construction of those improvements will remain the responsibility of the owner/developer. New customers will be required to pay all fees applicable at the time of connection. No detailed design plan for an extension of the sewer has been proposed at this time.

Donnie Boshers, Director
City of Columbia, TN
Wastewater Department



VICINITY MAP (NOT TO SCALE)

GENERAL NOTES:

1. THIS PROPERTY IS LOCATED IN ZONE "X" AREA OF MINIMAL FLOODING AS PER FEMA FLOOD MAP 47119C0180E WITH AN EFFECTIVE DATE ON 04/16/2007.
2. PROPERTY CURRENTLY ZONED: CRS-PUD
3. SUBSURFACE AND ENVIRONMENTAL CONDITIONS WERE NOT EXAMINED OR CONSIDERED AS PART OF THIS SURVEY. NO STATEMENT IS MADE CONCERNING THE EXISTENCE OF UNDERGROUND OR OVERHEAD CONTAINERS OR FACILITIES THAT MAY EFFECT THE USE OR DEVELOPMENT OF THE PARCEL.
4. THIS SURVEY WAS PREPARED FOR THE EXCLUSIVE USE OF THE PERSON, PERSONS, OR ENTITY, IF ANY, NAMED HEREON. THIS DOES NOT EXTEND TO ANY UNNAMED PERSON WITHOUT AN EXPRESS WRITTEN CONSENT BY THE SURVEYOR.
5. HEREON PROPERTY IS SUBJECT TO THE RESTRICTIONS AND REGULATIONS SET FORTH BY THE CITY OF COLUMBIA PLANNING COMMISSION.
6. NO LIABILITY WILL BE ACCEPTED BEYOND THAT OF THE FOUR (4) YEAR STATUTE OF LIMITATIONS (T.C.A. 28-3-114 & T.C.A. 28-3-202) ORIGINATING FROM THE FIELD DATE SHOWN HEREON.
7. THE ENTIRETY OF THE EASTERLY PROPERTY BOUNDARY IS CONTIGUOUS WITH THE BOUNDARY OF NASHVILLE HIGHWAY WITHOUT GAPS, GORES, OR OVERLAPS.
8. THIS PROPERTY SURVEYED AND SHOWN HEREON IS THE SAME PROPERTY AS DESCRIBED IN THE TITLE COMMITMENT BEARING ORDER NO. 211613, WITH AN EFFECTIVE DATE OF AUGUST 5, 2021, PREPARED BY OLD REPUBLIC TITLE INSURANCE COMPANY.
9. NO ABOVE GROUND ENCROACHMENTS OF BUILDINGS, STRUCTURES OR OTHER IMPROVEMENTS FROM THE SUBJECT PROPERTY ONTO THE ADJOINING PROPERTIES OR FROM ADJOINING PROPERTIES ONTO THE SUBJECT PROPERTY OBSERVED IN THE PROCESS OF CONDUCTING THE SURVEY EXCEPT THE POND LOCATED ON THE SOUTHEAST CORNER OF THE PROPERTY.
10. NO EVIDENCE OF RECENT EARTH MOVING WORK OR BUILDING CONSTRUCTION WAS OBSERVED AT THE TIME OF SURVEY.
11. THE SURVEYOR HAS NOT BEEN ADVISED OF ANY DESIGNATED WETLAND AREAS ON THE PROPERTY.
12. NO CEMETERIES OR BURIAL GROUNDS WERE OBSERVED ON THE PROPERTY AT THE TIME OF SURVEY.
13. THE SUBJECT PROPERTY ABUTS AND HAS DIRECT, PHYSICAL ACCESS TO NASHVILLE HIGHWAY (A.K.A. HIGHWAY 31), A PUBLIC DEDICATED RIGHT-OF-WAY.
14. BASE INFORMATION WAS TAKEN FROM A SURVEY PREPARED BY OHM ADVISORS, DATED 9/17/2021, CATALYST DESIGN GROUP AND ANY OTHER OF THEIR CONSULTANTS SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY AND/OR COMPLETENESS OF THAT INFORMATION SHOW HEREON OR ANY ERRORS OR OMISSIONS RESULTING FROM SUCH.

EXISTING LEGEND

- IRON PIN (FOUND-NOTED)
- CONCRETE MONUMENT (FOUND-NOTED)
- IRON PIN (SET) 5/8" IRON REBAR, 24" IN LENGTH WITH YELLOW CAP LABELED "OHM ADVISORS"
- WATER VALVE
- POWER UTILITY POLE
- WATER METER
- LIGHT POLE/YARD LIGHT
- CLEAN OUT
- STORM DRAIN INLET
- STORM MANHOLE
- SANITARY MANHOLE
- FIRE HYDRANT
- GUY WIRE ANCHOR
- YARD DRAIN
- IRRIGATION CONTROL VALVE
- SIGN
- ELECTRICAL BOX
- GAS METER
- GAS VALVE
- ELECTRIC METER
- SUBJECT PROPERTY LINE
- ADJOINING PROPERTY LINE
- EASEMENT
- FENCE
- SANITARY SEWER LINE
- OVERHEAD ELECTRIC LINE
- UNDERGROUND GAS LINE
- STORM SEWER LINE
- WATER LINE
- M.B.S.L. (MINIMUM BUILDING SETBACK LINE)

PROPOSED LEGEND

- STORM PIPE & CATCH BASIN
- STORM PIPE & CURB INLET
- STORM PIPE & MANHOLE
- STORM PIPE & HEADWALL
- SEWER PIPE & MANHOLE
- SEWER FORCE MAIN
- WATERLINE
- SEWER PUMP STATION
- PUBLIC UTILITY EASEMENT
- PRIVATE DRAINAGE EASEMENT

SURVEYORS CERTIFICATE

I hereby certify that this is a Category I survey and that the Ratio of Precision of the unadjusted survey is greater than 1:10,000 as shown hereon and that this survey was done in compliance with current Tennessee Minimum Standards of Practice.

Jason Moseley, TN RLS # 2644
OHM Advisors
209 10th Avenue South,
Suite 154
Nashville, TN 37203
(615)-649-5264

JASON MOSELEY — 2644 — REGISTERED LAND SURVEYOR — STATE OF TENNESSEE — DEPARTMENT OF AGRICULTURE — COMMERCE & INSURANCE — TENNESSEE NO. 2644

12/15/2021

Certificate of Ownership and Dedication

I (we) hereby certify that I am (we are) the owner(s) of the property shown and described hereon as evidenced in Book Number R2761, page 1144, Maury County Registers Office, and that I (we) hereby adopt this plan of subdivision with my (our) free consent, establish the minimum building restriction lines, and that offers of irrevocable dedication for all public ways, utilities, and other facilities have been filed.

11/29/21
Date

Owner / Andy Pastor

Executive Vice President
Title (if action for partnership or corporation)

Certificate of Compliance

I hereby certify that the subdivision plat shown hereon has been found to comply with the Columbia Subdivision Regulations and other adopted ordinances and policies.

City Engineer
Columbia, Tennessee

12/14/21
Date

Certificate of Approval for Sewer System

I hereby certify that the sewer system outlined or indicated on this final subdivision plat has been installed in accordance with the current local and state government requirements, or a sufficient bond or other surety has been filed to guarantee said installation.

Director of Wastewater Department
Columbia, Tennessee

12/08/2021
Date

Certificate of Approval for Recording

I hereby certify that the subdivision plat shown hereon has been found to comply with the Columbia Subdivision Regulations, with the exception of such variances, if any, as noted in the minutes of the Planning Commission, and that it has been approved for recording in the Office of the County Register.

Secretary, Planning Commission
Columbia, Tennessee

12/14/21
Date

Certificate of Approval of Subdivision Name and Street Names

Subdivision name and street names approved by the City Engineering Department and by E-911 Maury County.

Crystal Gideon
Maury County E911

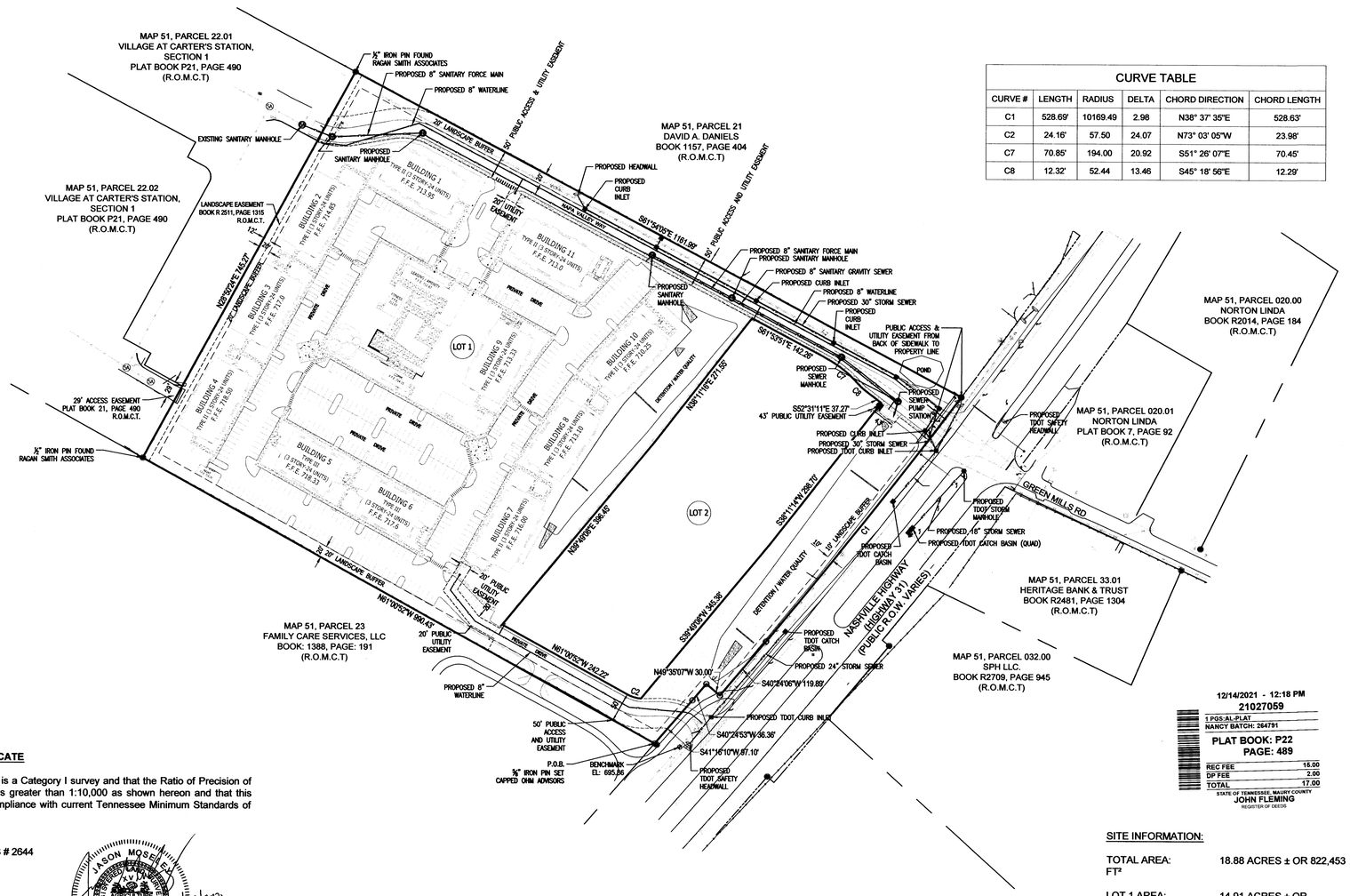
12-16-21
Date

Certificate of Approval of Water System

I hereby certify that the water system(s) outlined or indicated on the final subdivision plat entitled Village's at Carter's Creek has/have been installed in accordance with current local and state government requirements, or a sufficient bond or other surety has been filed to guarantee said installation.

12/13/21
Date

Tony Kelly
Name, Title, Agency of Authorized Approving Agent



SITE INFORMATION:

TOTAL AREA: 18.88 ACRES ± OR 822,453 FT²

LOT 1 AREA: 14.91 ACRES ± OR 649,524FT²

LOT 2 AREA: 3.97 ACRES ± OR 172,929 FT²

IMPERVIOUS AREA: 8.04 ACRES ±

PERVIOUS AREA: 10.85 ACRES ±

CURVE TABLE

CURVE #	LENGTH	RADIUS	DELTA	CHORD DIRECTION	CHORD LENGTH
C1	528.69'	10169.49	2.98	N38° 37' 35"E	528.63'
C2	24.16'	57.50	24.07	N73° 03' 05"W	23.98'
C7	70.85'	194.00	20.92	S51° 26' 07"E	70.45'
C8	12.32'	52.44	13.46	S45° 18' 56"E	12.29'

12/14/2021 - 12:18 PM
21027059
1 POS-AL-PLAT
NANCY BATCH: 264791
PLAT BOOK: P22
PAGE: 489

REC FEE	15.00
DP FEE	2.00
TOTAL	17.00

STATE OF TENNESSEE, MAURY COUNTY
JOHN FLEMING
REGISTER OF DEEDS

OHM ADVISORS
209 10th AVENUE SOUTH
SUITE 116
NASHVILLE, TN 37203
615-649-5264

TENNESSEE GRID NORTH
HORIZONTAL DATUM = NAD83
VERTICAL DATUM= NAVD88
GNSS REFERENCE STATION : TN37

GRAPHIC SCALE 1"= 100'
100' 0 100'

A MAJOR PLAT OF VILLAGES AT CARTER'S CREEK

COLUMBIA, MAURY COUNTY, TENNESSEE

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REVISION TABLE

1.	10/15/2021	REVISIONS FROM TECHNICAL AND DIVISION COMMENTS

SURVEY ORDERED BY: CERCO DEVELOPMENT, INC.
500 WEST 5TH ST, SUITE 700
AUSTIN, TX 78701

PROPERTY ADDRESS: 2425 NASHVILLE HWY
COLUMBIA, TENNESSEE 37174

PROPERTY OWNER: OP II NASH 2425 NASHVILLE HWY LAND LP
500 W 5TH ST #700
AUSTIN, TEXAS 78701

DEED REFERENCE: BOOK R2761, PAGE 1144, R.O.M.C.T.
PLAT REFERENCE: N/A
TAX MAP: 51 GROUP: PARCEL: 22
COLUMBIA, MAURY COUNTY, TENNESSEE

OHM PROJECT#: 1231-21-0020

DRAWN BY: ES | DATE: 10/15/2021

FIELD WORK: ES/SS/TB/MH | DATE: 6/25/2021

"P:\1000_1999\1231210020_Villages_At_Carter_Creek_Plat_Survey\VILLAGES CARTER CREEK FINAL PLAT.dwg"

SHEET 1 OF 1

October 16, 2023

Kevin McCarthy
City Planner
City of Columbia
700 N Garden St
Columbia TN, 38401

Re: Villages at Carter's Creek – Retail Out Parcel Rezoning
Columbia, TN

To Whom it May Concern:

Please let this letter serve as a description of proposed rezoning description and policy compliance statement.

Zoning Description:

The purpose of this request for rezoning is to request a more appropriate straight rezoning and to cancel a portion of the existing PUD on this parcel in order to hopefully attract less specialized type development required by the current PUD and avoid updating to the PUD to current zoning requirements if changes are made. Our intent is for this portion of the property to remain as commercial/retail as originally envisioned along the highway 31 corridor. However, the requested CD-4C would allow a greater variety of potential uses allow the greatest flexibility to a prospective commercial developments.

Comprehensive Plan Compliance Statement:

To the best our knowledge and based on our pre-application meeting, the CD-4C would be appropriate within the Suburban Corridor land use policy. We feel that we are meeting the character area intent within the transition from Suburban to Urban to provide a mix of uses and that the CD-4C would comply under the Comprehensive Plan and Article 3 of the zoning ordinance. The site is unique in that it was master planned with commercial use in mind such that it will have access control with the existing infrastructure on to Nashville highway and will have additional pedestrian connectivity to the developments within the PUD.

The conceptual site plan that has been included with this request indicates potential for a carwash and a convenience store with gas for preliminary review. We feel that there is a multitude of potential uses and opportunity for development with the updated zoning. We have provided the original PUD Traffic Impact study for additional documentation that this site was designed for 68,300 SF of retail and 9,300 SF of restaurant. The recommended improvements are currently under construction.

Thank you for your consideration of this request.

Best Regards,

Catalyst Design Group

Andrew Wisemen, PE
Principal | Project Manager

October 16, 2023

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CITY OF COLUMBIA TENNESSEE

DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)*
Fold hard copy submittals larger than 8½"x11"

ADDRESS/LOCATION	Villages of Carter's Creek, 2425 Nashville Hwy, Columbia, TN		
	TAX MAP: 55	GROUP:	PARCEL: 22.03
SUMMARY OF NATURE OF REQUEST AND WORK	Requesting the concurrent review and approval of a cancellation of the exiting PUD on the property and Rezoning to CD-4C. This site lies within the suburban Corridor, per the Pre-App this site would meet the comprehensive plan as CD-4C.		

DATE OF PRE-APPLICATION CONFERENCE	8/30	*Pre-application meetings are scheduled for Wednesdays.*

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☐ Annexation ☒ Rezoning ☐ Preliminary Plat ☐ Final Plat ☐ PUD Preliminary Master Plan ☐ PUD Final Site Plan ☐ Multi-Family Site Plan ☒ Other: existing PUD abandonment **File naming nomenclature examples:* *Freedom Point Site Plan* *Freedom Point Master Plan* *Freedom Point Final Plat*	**Annexations/Rezoning/PUD's:** ☒ Written Legal Description copy ☒ Requested Zone Listed ☒ Compliance with Comprehensive Plan ~~☐ Annexation Permission Form~~ ☒ Plans and/or Plats conforming to City standards with check list completed ☒ Columbia Water System Availability Letter **Plats/PUDs:** ☒ Project Name (include Sections & Phases) Villages of Carters creek (Retail Parcels) ☒ Total Number of Lots 1 ☒ Total acreage 3.97 acres

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	Andrew Wiseman	PHONE	615-689-1147
ADDRESS	5100 Tennessee Ave. , Nashville, TN 37209	EMAIL	awiseman@catalyst-dg.com

PROPERTY OWNER NAME	Nash Spring Hill JV, LP Nelson Crowe	PHONE	512-682-5500
ADDRESS	500 W 5TH ST STE #700 AUSTIN TX 78701	EMAIL	ncrowe@endeavor-re.com

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

APPLICANT NAME	APPLICANT SIGNATURE	DATE

PROPERTY OWNER NAME	PROPERTY OWNER SIGNATURE	DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	

DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS	
DATE OF PUBLIC NOTICES IN DAILY HERALD	

BOARD ACTION	

CBP LLC Property/ Preliminary & Final Plat

Project #:	23-0532	Location:	Map 073 Parcel 18.06, 18.10, 18.11
Applicant:	Allen B. O'Leary	Case Type(s):	Preliminary Plat/ Final Plat
Staff Planner:	Austin Brass, AICP	Proposed Use:	None

PROJECT SUMMARY

The applicant is seeking approval for a Final & Preliminary Plat for the re-platting of three lots and the dedication of right-of-way situated at the intersection of Bear Creek Pike and Lasea Road. Notably, tract 4 spans 1.84 acres with 199 feet of frontage along Bear Creek Pike, while tract 5 encompasses an established commercial building (a farm supply equipment business) with 338 feet of frontage on Bear Creek Pike. Tract 6 features 160 feet of frontage along Lasea Road. Furthermore, the preliminary and final plat includes a private 30-foot shared access easement spanning all tracts for mutual access, along with a 25-foot Right-of-Way dedication strip along Lasea Road.

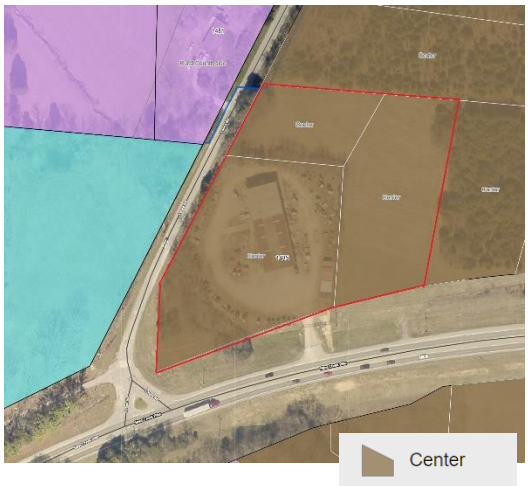
- The Final & Preliminary Plat is for the re-platting of 3 lots and the dedication of public right-of-way for Lasea Road.
- A surety is not applicable for this final plat as there is no new public infrastructure associated with this final plat that is being created.
- The DRC reviewed this proposal at its January 9th, 2024 meeting. Staff review included standard comments. Full technical comments are provided in the agenda packet.
- The Planning Commission is the **Decision-Making Authority** for this Final & Preliminary Plat.
- Templates are provided at the end of the report to assist the Planning Commission in crafting properly formatted motions.

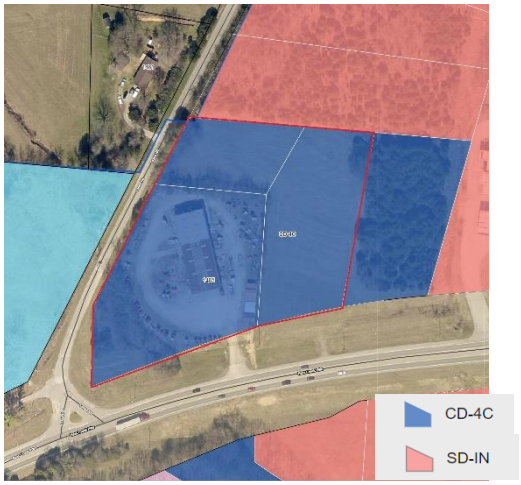
SITE INFORMATION

CURRENT ZONING	EXISTING USE	EXISTING IMP.	LAND AREA
CD-4C	Commercial Building	None	+/- 5.13 Acres



FUTURE LAND USE MAP	ZONING MAP





SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	Center	CD-4C	Farm Supply Business/ Vacant Land
North	Center	SD-INT	Single-Family Residential
South	Center	CD-4C/ SD-INT	Vacant Wooded Land
East	Center	SD-INT	Convivence Store with Fuel Sales
West	Suburban Corridor	CD-4	Vacant Land

CONFORMITY WITH ZONING ORDINANCE

The Final Plat and associated Preliminary Plat comply with the Zoning Ordinance standards for the re-platting of three tracts including a 25' dedication of right-of-way strip along Lasea Road. The applicant has stated that there are no current development plans for the property at this time. It has been noted that additional standards will be required under Zoning Ordinance 4400 when the property is reviewed for any subsequent development.

REVIEW PROCESS

The Development Review Committee evaluated the proposed Preliminary & Final Plat at its January 9th, 2024 meeting, as directed by section **8.3.7** of the Zoning Ordinance. Technical comments are provided in the agenda package and summarized above.

2.2.7 Property Vestment In accordance with TCA 13-4-310, approval by the CMPC of a Preliminary Plat on or after January 1, 2015, will cause a vested property right to be established. Vestment rights and periods shall be in accordance with TCA 13-4-310 and the Zoning Ordinance.

Section **8.5.24** of the Zoning Ordinance directs the Planning Commission to review Subdivision Plats for conformity with the standards of the Ordinance and the City Subdivision Regulations. The Ordinance indicates that all Preliminary and Final Plats must be prepared, submitted, reviewed and acted upon in accordance with the Subdivision Regulations.

The Planning Commission is the Decision-Making Authority for Preliminary & Final Plats under **§ 8.3.3.B.1** of the Zoning Ordinance and **§ 2.3 (Final) & § 2.2.6 (Preliminary)** of the Subdivision Regulations.

Section **2.3.6** of the Subdivision Regulations establishes the review criteria for approval of Final Plats.

A. Recommendations and final action on a Preliminary Plat shall be based on consideration of the following criteria:

1. Whether the proposed Preliminary Plat complies with the applicable zoning district and overlay districts;

2. Whether the proposed Preliminary Plat is consistent with all standards of these Subdivision Regulations and other related codes and ordinances enforced by the City; and

3. Whether the CMPC determines that the particular site is suitable for the type of platting and development proposed.

B. Recommendations and final action on a Final Plat shall be based on consideration of the following criteria:

1. Whether the proposed Final Plat complies with the applicable zoning district and overlay districts;

2. Whether the proposed Final Plat is consistent with all standards of these Subdivision Regulations and other related codes and ordinances enforced by the City; and

3. Whether the proposed Final Plat meets all the requirements or conditions of any applicable development approvals, such as development plans or associated modification of standards.

Final Plat approval shall be subject to the completion of required improvements, or in lieu, the CMPC may approve a Performance Agreement.

Staff recommends approval of Preliminary & Final Plat 23-0532 with the following conditions:

1. *That final plat be recorded at the Register of Deeds within sixty (60) days of Planning Commission approval per 2.3.5, Final Action of the City of Columbia Subdivision Regulations.*
2. *Approval subject to any technical comments as listed.*

In the event of a denial, **§ 2.3.5** of the Subdivision Regulations requires the Planning Commission to identify the specific parts of applicable plans and regulations with which the plat does not comply.

SAMPLE MOTIONS

Approve:

Move to approve the Preliminary & Final Plat as presented and find that the plat conforms to the applicable zoning ordinance, the Subdivision Regulations, and the Preliminary Plat [subject to remaining technical comments from staff & staff conditions of approval as listed].

Approve with Conditions:

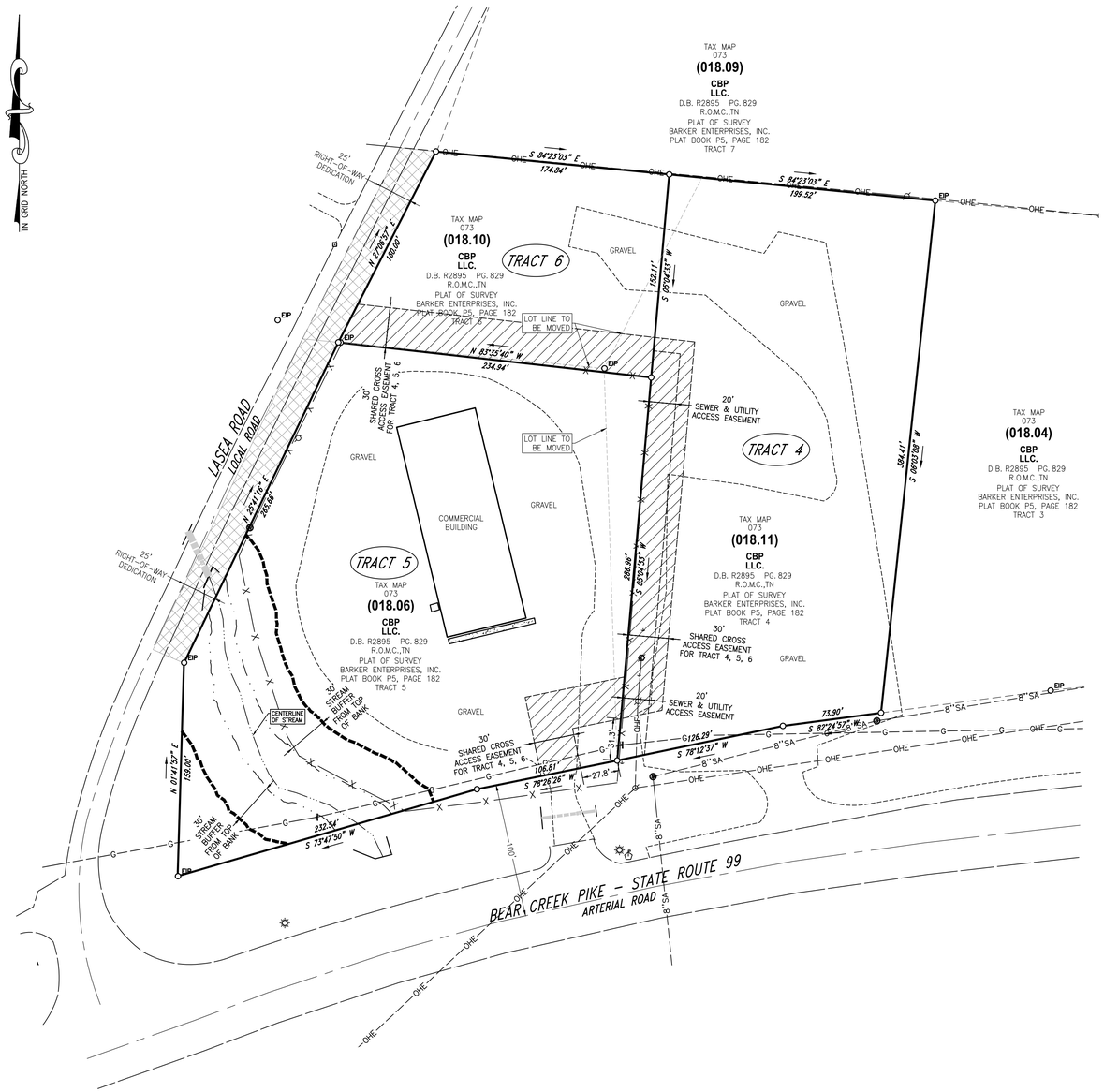
Move to approve the Preliminary & Final Plat as presented and find that the plat conforms to the applicable zoning ordinance, the Subdivision Regulations, and the Preliminary Plat, subject to the following conditions: [list any additional conditions of approval crafted by Planning Commission].

Defer for Continued Review:

Move to find that there is insufficient information to make a decision, defer the application for continued review, and request that the applicant provide: [list additional information] for review at the next regularly scheduled meeting of the Planning Commission.

Deny:

Move to find that the Preliminary & Final Plat as presented does not conform to the applicable zoning ordinance, the Subdivision Regulations, or the approved Preliminary Plat, and deny the request due to [list specific deficiencies].



Legend

EIP								
IPS	Iron Rod Found	Bench Mark	Catch Basin	Electric Riser	Power Pole	Adjoining Property Line	Edge of Water	Overhead Electric Line
●	Iron Rod Set	Stake Found	Curb Inlet	Telephone Riser	Flag Pole	Subject Property Line	Ditch / Creek Centerline	Overhead Telephone Line
I.P.F.	Iron Pipe Found	Fire Hydrant	Storm Pipe	Telephone Booth	Guy Wire	Easement Line	Minor Contour Line	Underground Utility Line
AXLE	Axle Found	Water Meter	Cable Manhole	Gas Meter	Mailbox	Building Setback Line	Index Contour Line	Underground Cable Line
FCM	Fence Post	Water Valve	Electric Manhole	Gas Valve	Parking Block	Centerline	Gas Line	Underground Electric Line
P.K.F.	Concrete Monument Existing PK Nail Found	Water Reducer	Telephone Manhole	Light Pole	Satellite Dish	Edge of Pavement	Sanitary Sewer Line	Underground Telephone Line
P.K.S.	PK Nail Set	Clean Out	Water Manhole	Power Pole	Handicap Parking	Edge of Gravel	Water Line	Forced Main Line
R.R.S.-F	Railroad Spike Found	Sanitary Sewer Manhole	Electric Meter	Telephone Pole	Water Spigot	Fence Line	Storm Sewer Line	
R.R.S.-S	Railroad Spike Set	Storm Sewer Manhole	Cable Riser	Guy Pole	Bollard	Landscape	Overhead Utility Line	
				Evergreen Tree	Sign	Woods / Tree line	Overhead Cable Line	
				Deciduous Tree				
				Bush				

LOT AREA TABLE

TRACT	SQ. FT.	ACRES
4	80,366.5	1.84
5	101,426.8	2.33
6	30,877.8	0.71

PURPOSE NOTE:
The purpose of this plat is to reconfigure 3 existing commercial lots and dedicate right-of-way.

DRIVEWAY NOTE:
All driveways shall be constructed to contain gutter flow within the street and right-of-way, particularly lots that do not have a sidewalk.

GENERAL NOTE:
The recording of this plat vacates, voids, and supercedes previous plat of record P5, Page 182 for Tracts 4, 5, and 6.

PARCEL NUMBER:
TAX MAP 073, PARCEL 018.06, 018.10, 018.11

DEED BOOK:
R2895, PAGE 829

PLAT BOOK:
P5, PAGE 182

PARCEL ADDRESS:
PARCEL 018.06: 1485 BEAR CREEK PIKE
PARCEL 018.10: LASEA ROAD
PARCEL 018.11: BEAR CREEK PIKE

EXISTING ZONING:
CD-4C

BUILDING SETBACKS:
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FRONT(PRINCIPAL) – 6' MIN., 40' MAX
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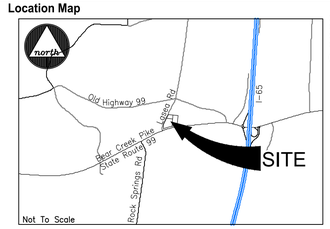
ACREAGE OF PARCEL:
±5.13 ACRES
±0.24 ACRES – RIGHT-OF-WAY DEDICATION

PROPERTY OWNER:
CBP LLC
2205 GOLF CLUB LN
COLUMBIA, TN 38401

Surveyor's Notes

1. All distances were measured with E.D.M. equipment and have been adjusted for temperature and pressure.
2. The property (Boundary) Line Survey exceeds the minimum requirements of an Urban Land Survey Category 1 as per Standards of Practice adopted by the State Board of Examiners for Land Surveyors for the State of Tennessee, and the precision of the unadjusted survey is greater than 1 foot in 10,000 feet.
3. Information concerning site utility services and appurtenances shown hereon is based on visible evidence noted during the survey, information provided by utility representatives or information shown on original construction plans by other. Information and location of service lines on site should be considered approximate and there may be underground utility lines that are not shown on the survey. Owner(s) and contractor(s) should assume responsibility of locating all underground utility service lines prior to any construction, excavation or any disturbance of the existing ground elevation to avoid hazard of unnecessary expense.
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5. The property shown hereon is located within the City of Columbia, Maury County, TN. All matters pertaining to construction, use location of improvements, signage, parking, noise, vibration, emissions, fire hazards, radiation, illumination, setback provisions, etc., are subject to the City of Columbia's Zoning Regulation as interpreted and regulated by the Department of Planning and Codes.
6. The area of the parcels as shown hereon.
7. This property currently identified as Tax Map No. 073, Parcel No. 018.06, 018.10, 018.11, Maury County. For designation shown thus ( ) indicates Parcel Numbers for said map.
8. Plat reference: P5, Page 182
9. Deed reference: Book R2895, Page 829
10. Bearings based on: Tennessee State Plane, Fipzone 4100.
11. This drawing was prepared in accordance with our field survey notes. It shows improvements as they exist to the best of our knowledge, but is not guaranteed to be correct in each and every detail.
12. This survey was prepared from current deeds of record and does not represent a title search or a guarantee of title, and is subject to any state of facts a current and accurate search may reveal.
13. This survey was prepared for the exclusive use of the person, persons, or entity, if any, named on the certification hereon. Said certificate does not extend to any unnamed person without an express re-certification by the surveyor naming said person.
14. The certification as provided on this survey, is purely a statement of professional opinion based on knowledge, information and belief, based on existing field evidence and documentary evidence provided by others.
15. The certification is not an expressed or implied warranty or guarantee.
16. This property is not located in a Special Flood Hazard Area on a not printed F.E.M.A. Flood Insurance Rate Map, Community Panel No. 47119C0195E, dated April 16, 2007, and shown hereon graphically.
17. All public utility and drainage easements located on proposed lots are to be maintained by the individual property owner for said lot.
18. All property corners are ½" rebar with cap reading "WES 1987" unless otherwise noted.
19. There exists a Public Utility and Drainage Easement 10' in width along the front & rear and 5' in width along the side property lines.

Location Map



©2023

CERTIFICATE OF OWNERSHIP AND DEDICATION

I, (we) hereby certify that I am (we are) the owner(s) of the property shown and described hereon as evidenced in Book Number R2895, Page 829, Maury County Registers Office, and that I (we) hereby adopt this plan of subdivision with my (our) free consent, establish the minimum building restriction lines, and that offers of irrevocable dedication for all public ways, utilities, and other facilities have been filed.

Date _____ CBP LLC _____

CERTIFICATE OF APPROVAL FOR SUBDIVISION NAME AND STREET NAMES

Subdivision name and street names approved by the City Engineering Department and by E-911 Maury County.

Date _____ Maury County E-911 Columbia, Tennessee _____

CERTIFICATE OF APPROVAL OF SEWER SYSTEM

I hereby certify that the sewer system outlined or indicated on this final subdivision plat has been installed in accordance with the current local and state government requirements, or a sufficient bond or other has been filed to guarantee said installation.

Date _____ Director of Wastewater Department Columbia, Tennessee _____

CERTIFICATE OF APPROVAL OF WATER SYSTEM

I, (we) hereby certify that the water system(s) outlined or indicated on the final subdivision plat entitled CBP LLC Property, Tracts 4, 5, 6 has/have been installed in accordance with current local and state government requirements, or a sufficient bond or other surety has been filed to guarantee said installation.

Date _____ Columbia Power & Water Systems Columbia, Tennessee _____

CERTIFICATE OF COMPLIANCE

I hereby certify that the subdivision plat shown hereon has been found to comply with the City of Columbia Subdivision Regulations and other adopted ordinances and policies.

Date _____ City Engineer Columbia, Tennessee _____

CERTIFICATE OF APPROVAL FOR RECORDING

I hereby certify that the subdivision plat shown hereon has been found to comply with the City of Columbia Subdivision Regulations, with the exception of such variances, if any, as are noted in the minutes of the Planning Commission, and that it has been approved for recording in the Office of the County Register:

Date _____ Secretary, Planning Commission Columbia, Tennessee _____

SURVEYOR'S CERTIFICATION (TENNESSEE)

I hereby certify that to the best of my knowledge and belief this is a true and accurate survey of the property shown hereon; that this is a category "I" Land Survey as defined in Title 62, Chapter 18, Tennessee Code Annotated, and that the ratio of precision is greater than or equal to 1:10,000.

1/16/24 Date — Allen B. O'Leary — TN RLS #1987 Number

Register of Deed Recording Stamp

ALLEN B. O'LEARY REGISTERED LAND SURVEYOR 1987 AGRICULTURE TENNESSEE NO. 1987

WES ENGINEERS & SURVEYORS
CIVIL ENGINEERS & LAND SURVEYORS
2486 NASHVILLE HIGHWAY
COLUMBIA, TN 38401
PHONE: (931) 388-2329
www.wesengineers.com

ENGINEERS & SURVEYORS

Client
PARMAN HOLDINGS CORPORATION

FINAL PLAT

CBP LLC PROPERTY, TRACTS 4, 5, 6

LASEA RD AND BEAR CREEK PIKE, COLUMBIA, TN

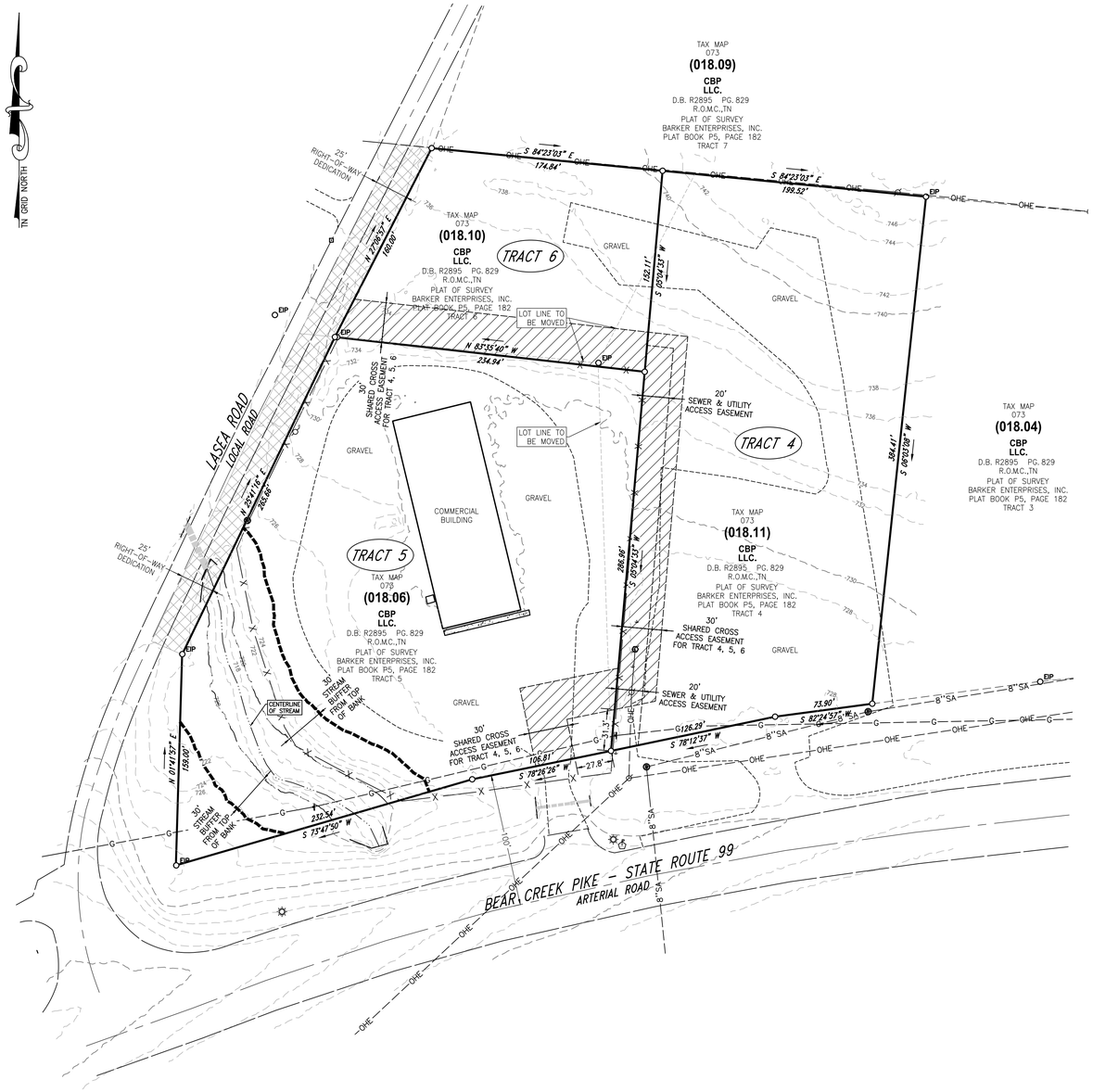
REVISIONS	DATE
STAFF COMMENTS ADDRESSED	01-16-2024

Drawn: EB
Checked: AO
Approved: AO
Date: 12-18-2023

Job no. 23582
Scale: Vertical: 1"=50' Horizontal:

1 of 1

FILE: J:_WES_Engineers_Surveyors 2023\23582 - 1485 Bear Creek Pike - Parman Holdings\Dwg\Survey\23582 Bear Creek Survey.dwg

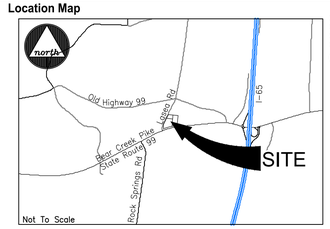


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14. The certification as provided on this survey, is purely a statement of professional opinion based on knowledge, information and belief, based on existing field evidence and documentary evidence provided by others.
15. The certification is not an expressed or implied warranty or guarantee.
16. This property is not located in a Special Flood Hazard Area on a not printed F.E.M.A. Flood Insurance Rate Map, Community Panel No. 47119C0195E, dated April 16, 2007, and shown hereon graphically.
17. All public utility and drainage easements located on proposed lots are to be maintained by the individual property owner for said lot.
18. All property corners are ½" rebar with cap reading "WES 1987" unless otherwise noted.
19. There exists a Public Utility and Drainage Easement 10' in width along the front & rear and 5' in width along the side property lines.

Legend

EIP	Iron Rod Found	Bench Mark	Catch Basin	Electric Riser	Power Pole	Adjoining Property Line	Edge of Water — OHE — Overhead Electric Line
IPS	Iron Rod Set	Stake Found	Curb Inlet	Telephone Riser	Flag Pole	Subject Property Line	Ditch / Creek Centerline — OHT — Overhead Telephone Line
I.P.F.	Iron Pipe Found	Fire Hydrant	Storm Pipe	Telephone Booth	Guy Wire	Easement Line	Minor Contour Line — UG — Underground Utility Line
AXLE	Axle Found	Water Meter	Cable Manhole	Gas Meter	Mailbox	Building Setback Line	Index Contour Line — UGC — Underground Cable Line
FCM	Fence Post	Water Valve	Electric Manhole	Gas Valve	Parking Block	Centerline	Gas Line — UGE — Underground Electric Line
	Concrete Monument Existing	Water Reducer	Telephone Manhole	Light Pole	Satellite Dish	Edge of Pavement	Sanitary Sewer Line — UGT — Underground Telephone Line
P.K.F.	PK Nail Found	Clean Out	Water Manhole	Power Pole	Handicap Parking	Edge of Gravel	Water Line — FM — Forced Main Line
P.K.S.	PK Nail Set	Sanitary Sewer Manhole	Electric Meter	Telephone Pole	Water Spigot	Fence Line	Storm Sewer Line
R.R.S.F.	Railroad Spike Found	Storm Sewer Manhole	Cable Riser	Guy Pole	Bollard	Landscape	Overhead Utility Line
R.R.S.S.	Railroad Spike Set					Woods / Tree line	Overhead Cable Line

Evergreen Tree, Deciduous Tree, Bush, Sign

WES ENGINEERS & SURVEYORS
CIVIL ENGINEERS & LAND SURVEYORS
2486 NASHVILLE HIGHWAY
COLUMBIA, TN 38401
PHONE: (931) 388-2329
www.wesengineers.com
ENGINEERS & SURVEYORS

Client
PARMAN HOLDINGS CORPORATION

PRELIMINARY PLAT

CBP LLC PROPERTY, TRACTS 4, 5, 6
LASEA RD AND BEAR CREEK PIKE, COLUMBIA, TN

REVISIONS	DATE
STAFF COMMENTS ADDRESSED	01-16-2024

Drawn: EB
Checked: AO
Approved: AO
Date: 12-18-2023

Job. no. 23582
Scale: Vertical: 1"=50' Horizontal:

1 of 1

ALLEN BOYD BEARD
REGISTERED LAND SURVEYOR
AGRICULTURE
TENNESSEE NO. 1987

FILE:K:\WES_Engineers_Surveyors 2023\23582 - 1485 Bear Creek Pike - Parman Holdings\Dwg\Survey\23582 Bear Creek Survey.dwg

January 16, 2024

City of Columbia
Development Services
700 North Garden Street
Columbia, TN 38401

RE: Project Name: CBP LLC PROPERTY, TRACTS 4, 5, 6
City of Columbia Staff Review Submittal

On behalf of CBP, LLC, the owner of the proposed final plat reconfiguring of 3 existing commercial lots, **WES Engineers & Surveyors** would like to submit this Final Plat to the City of Columbia for approval. Comments are addressed below in red.

Planning

1. The lead staff person for this case is Planner II Robert Archibald; he will prepare the staff report for this item. Please contact rarchibald@columbiatn.com with question about the development review process or technical comments. Noted.
2. At resubmittal, please provide a response letter addressing each comment along with any revised plans. If the nature of the comment does not warrant a response, please simply note that the information has been acknowledged. Noted.
3. In response to comments, to the degree possible at this time, please indicate the purpose of the plat and intended use of the property, especially “tract 4”. If no development of change of use contemplated at this time, please just confirm that is the case. The purpose of the plat is to realign the property lines with an existing fence line.

Engineering

4. Final Plat: remove streets drainage and utilities certificate. Certificate has been removed.
5. Final Plat: add standard PUDE note. Note has been added.
6. Provide shared cross access easement (along 4 and 5, and 5 and 6 shared lines property lines) for the benefit of all lots. A cross access easement has been added.
7. Show stream buffer (lot 5). A stream buffer has been added.

Wastewater

8. Columbia suggests a 20 ft sewer/utility access easement so the back lot will have sewer readily available in the future for any owners. The northwest lot would require an 8" sewer main extension with manholes and to be dedicated to the City, not just a service line. A 20 ft wide sewer & utility access easement has been added long property line 4/5.

Columbia Power

9. Columbia Power System does not have existing power facilities near your proposed development within our service territory. DREMC will be the service provider for this area. Noted.

Atmos Energy

10. Natural gas is available along Bear creek Pike. Noted

If you have any questions or comments with this submittal, please do not hesitate to contact me directly.

Sincerely,
WES Engineers & Surveyors



Allen B. O'Leary, RLS
Principal

CITY OF COLUMBIA
TENNESSEE

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, January 9, 2024

ITEM NO.
23-0532

DESCRIPTION: The purpose of this plat is to reconfigure 3 existing commercial lots and dedicate right-of-way.

RECOMMENDATION: For final recommendation please see staff report.

COMMENTS:

Engineering

1. Final Plat: remove streets drainage and utilities certificate.
2. Final Plat: add standard PUDE note
3. Provide shared cross access easement (along 4 and 5, and 5 and 6 shared lines property lines) for the benefit of all lots.

4. Show stream buffer (lot 5)

Wastewater

5. Columbia suggests a 20 ft sewer/utility access easement so the back lot will have sewer readily available in the future for any owners. The northwest lot would require an 8" sewer main extension with manholes and to be dedicated to the City, not just a service line.

Fire

6. No comments

Planning

7. In response to comments, to the degree possible at this time, please indicate the purpose of the plat and intended use of the property, especially "tract 4". If no development of change of use contemplated at this time, please just confirm that is the case.
8. The lead staff person for this case is Planner II Robert Archibald; he will prepare the staff report for this item. Please contact rarchibald@columbiatn.com with question about the development review process or technical comments.

9. At resubmittal, please provide a response letter addressing each comment along with any revised plans. If the nature of the comment does not warrant a response, please simply not that the information has been acknowledged.

Maury County E911

10. No comment.

Atmos Energy

11. Natural gas available along Bear creek Pike

Building

12. No comments.

Columbia Power

13. Columbia Power System does not have existing power facilities near your proposed development within our service territory. DREMC will be the service provider for this area.

Duck River Electric Membership Corp

14. No comments.

ATT

15. NO ISSUES

Maury County Highway Dept.

16. No comments provided.

Columbia Water

17. "No comments."

Maury County Schools

18. No Comment

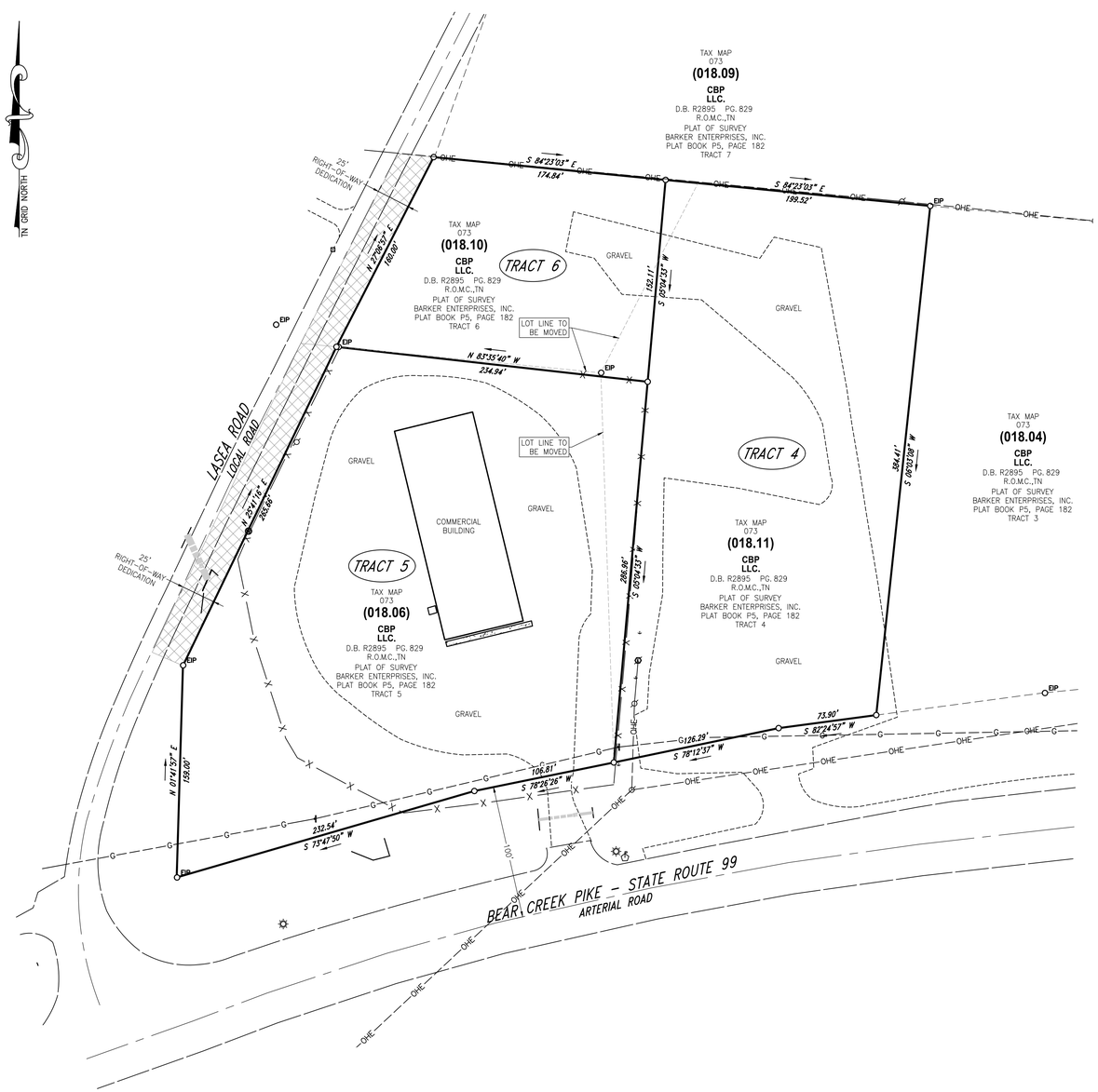
ATTACHMENTS: Final Plat, Preliminary Plat

NOTE: All submittals shall be compliant with City standards prior to Planning Commission review. Items that are not adhering to the regulations and/or comments for that request will not be forwarded to the next agenda until such items are amended.

Current Enrollment / Capacity

	Facility Name	Date Constructed	Sq. Ft.	Acreage	Capacity
Elementary	Baker	1960	43,920	12	340
	Battle Creek	2019	90,000	30	700
	Brown	1968	56,720	20	405
	Highland	1986	47,800	4.5	380
	Howell	1999	81,600	17.5	700
	Mt. Pleasant	1978	80,021	22	630
	Riverside	1984	71,150	14	500
	Spring Hill	1984	69,000	10	540
	Woodard	1990	76,200	17	600
	Wright	2005	97,765	18	740
					5535
Middle	Battle Creek	2019	125,000	45	900
	Cox	1997	137,200	25	900
	Mt. Pleasant	2001	113,938	29.2	550
	Spring Hill	2010	158,106	39.49	950
	Whitthorne	1979	175,600	17	1050
					4350
High	Central	2016	296,740	55	1700
	Mt. Pleasant	1969	110,759	31	600
	Spring Hill	1993	181,800	57	1200
					3500
Unit	Culleoka	1969	205,800	34	1020
	Hampshire	1978	83,410	13.12	500
	Santa Fe	1964	94,225	24	650
					2170
Other	Central Office	1960	15,400	1.5	
	College Hill	1958	42,211	2.26	
	Maintenance	1987	9,400	4.7	
	McDowell		46,165	7	
			2,509,930	**550.27**	**15555**

Current Enrollment	Capacity Used
328	96.5%
632	90.3%
358	88.4%
304	80.0%
592	84.6%
580	92.1%
406	81.2%
445	82.4%
559	93.2%
601	81.2%
4805	***86.8%***
731	81.2%
656	72.9%
424	77.1%
527	55.5%
971	92.5%
3309	***76.1%***
1396	82.1%
379	63.2%
1223	101.9%
2998	***85.7%***
875	85.8%
408	81.6%
509	78.3%
1792	***82.6%***
166	
13070	



LOT AREA TABLE

TRACT	SQ. FT.	ACRES
4	80,366.5	1.84
5	101,426.8	2.33
6	30,877.8	0.71

PURPOSE NOTE:
The purpose of this plat is to reconfigure 3 existing commercial lots and dedicate right-of-way.

DRIVEWAY NOTE:
All driveways shall be constructed to contain gutter flow within the street and right-of-way, particularly lots that do not have a sidewalk.

GENERAL NOTE:
The recording of this plat vacates, voids, and supercedes previous plat of record P5, Page 182 for Tracts 4, 5, and 6.

PARCEL NUMBER:
TAX MAP 073, PARCEL 018.06, 018.10, 018.11

DEED BOOK:
R2895, PAGE 829

PLAT BOOK:
P5, PAGE 182

PARCEL ADDRESS:
PARCEL 018.06: 1485 BEAR CREEK PIKE
PARCEL 018.10: LASEA ROAD
PARCEL 018.11: BEAR CREEK PIKE

EXISTING ZONING:
CD-4C

BUILDING SETBACKS:
PRINCIPAL BUILDING
FRONT(PRINCIPAL) – 6' MIN., 40' MAX
FRONT(SECONDARY) – 6' MIN., 40' MAX
SIDE – 0'
REAR – 3' MIN. OR 15' FROM CENTER LINE OF REAR ALLEY
ACCESSORY BUILDING
FRONT(PRINCIPAL) – 20' MIN. BEHIND PRINCIPAL BUILDING FRONTAGE
FRONT(SECONDARY) – 5' MIN.
SIDE – 0'
REAR – 3' MIN. OR 5' IF GARAGE DOOR FACES REAR ALLEY

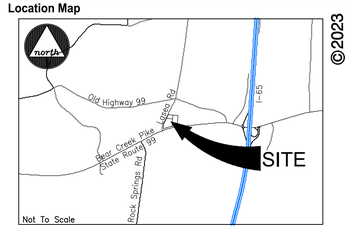
ACREAGE OF PARCEL:
±5.13 ACRES
±0.24 ACRES – RIGHT-OF-WAY DEDICATION

PROPERTY OWNER:
CBP LLC
2205 GOLF CLUB LN
COLUMBIA, TN 38401

Surveyor's Notes

1. All distances were measured with E.D.M. equipment and have been adjusted for temperature and pressure.
2. The property (Boundary) Line Survey exceeds the minimum requirements of an Urban Land Survey Category 1 as per Standards of Practice adopted by the State Board of Examiners for Land Surveyors for the State of Tennessee, and the precision of the unadjusted survey is greater than 1 foot in 10,000 feet.
3. Information concerning site utility services and appurtenances shown hereon is based on visible evidence noted during the survey, information provided by utility representatives or information shown on original construction plans by other. Information and location of service lines on site should be considered approximate and there may be underground utility lines that are not shown on the survey. Owner(s) and contractor(s) should assume responsibility of locating all underground utility service lines prior to any construction, excavation or any disturbance of the existing ground elevation to avoid hazard of unnecessary expense.
4. Information concerning major utilities or appurtenances shown hereon are based on visible evidence noted during the survey or information provided by utility representatives. Verification of existence, size, location, depth and availability of service should be confirmed by local utility agencies.
5. The property shown hereon is located within the City of Columbia, Maury County, TN. All matters pertaining to construction, use location of improvements, signage, parking, noise, vibration, emissions, fire hazards, radiation, illumination, setback provisions, etc., are subject to the City of Columbia's Zoning Regulation as interpreted and regulated by the Department of Planning and Codes.
6. The area of the parcels as shown hereon.
7. This property currently identified as Tax Map No. 073, Parcel No. 018.06, 018.10, 018.11, Maury County. For designation shown thus ( ) indicates Parcel Numbers for said map.
8. Plat reference: P5, Page 182
9. Deed reference: Book R2895, Page 829
10. Bearings based on: Tennessee State Plane, Fipzone 4100.
11. This drawing was prepared in accordance with our field survey notes. It shows improvements as they exist to the best of our knowledge, but is not guaranteed to be correct in each and every detail.
12. This survey was prepared from current deeds of record and does not represent a title search or a guarantee of title, and is subject to any state of facts a current and accurate search may reveal.
13. This survey was prepared for the exclusive use of the person, persons, or entity, if any, named on the certification hereon. Said certificate does not extend to any unnamed person without an express re-certification by the surveyor naming said person.
14. The certification as provided on this survey, is purely a statement of professional opinion based on knowledge, information and belief, based on existing field evidence and documentary evidence provided by others.
15. The certification is not an expressed or implied warranty or guarantee.
16. This property is not located in a Special Flood Hazard Area on a not printed F.E.M.A. Flood Insurance Rate Map, Community Panel No. 47119C0195E, dated April 16, 2007, and shown hereon graphically.
17. All public utility and drainage easements located on proposed lots are to be maintained by the individual property owner for said lot.
18. All property corners are ½" rebar with cap reading "WES 1987" unless otherwise noted.

Location Map



©2023

CERTIFICATE OF OWNERSHIP AND DEDICATION

I, (we) hereby certify that I am (we are) the owner(s) of the property shown and described hereon as evidenced in Book Number R2895, Page 829, Maury County Registers Office, and that I (we) hereby adopt this plan of subdivision with my (our) free consent, establish the minimum building restriction lines, and that offers of irrevocable dedication for all public ways, utilities, and other facilities have been filed.

Date — CBP LLC

CERTIFICATE OF APPROVAL OF STREETS, DRAINAGE, STREET SIGNS, AND UTILITIES

I hereby certify that the streets, drainage, and utilities designated in CBP LLC Property, Tracts 4, 5, 6 have been installed in accordance with City Specifications, or a performance surety in the amount of $_____ for streets and drainage has been posted with the City of Columbia, Tennessee, to assure completion of such improvements.

Date — City Engineer, Columbia, Tennessee

CERTIFICATE OF APPROVAL FOR SUBDIVISION NAME AND STREET NAMES

Subdivision name and street names approved by the City Engineering Department and by E-911 Maury County.

Date — Maury County E-911, Columbia, Tennessee

CERTIFICATE OF APPROVAL OF SEWER SYSTEM

I hereby certify that the sewer system outlined or indicated on this final subdivision plat has been installed in accordance with the current local and state government requirements, or a sufficient bond or other has been filed to guarantee said installation.

Date — Director of Wastewater Department, Columbia, Tennessee

CERTIFICATE OF APPROVAL OF WATER SYSTEM

I, (we) hereby certify that the water system(s) outlined or indicated on the final subdivision plat entitled CBP LLC Property, Tracts 4, 5, 6 has/have been installed in accordance with current local and state government requirements, or a sufficient bond or other surety has been filed to guarantee said installation.

Date — Columbia Power & Water Systems, Columbia, Tennessee

CERTIFICATE OF COMPLIANCE

I hereby certify that the subdivision plat shown hereon has been found to comply with the City of Columbia Subdivision Regulations and other adopted ordinances and policies.

Date — City Engineer, Columbia, Tennessee

CERTIFICATE OF APPROVAL FOR RECORDING

I hereby certify that the subdivision plat shown hereon has been found to comply with the City of Columbia Subdivision Regulations, with the exception of such variances, if any, as are noted in the minutes of the Planning Commission, and that it has been approved for recording in the Office of the County Register.

Date — Secretary, Planning Commission, Columbia, Tennessee

SURVEYOR'S CERTIFICATION (TENNESSEE)

I hereby certify that to the best of my knowledge and belief this is a true and accurate survey of the property shown hereon; that this is a category "I" Land Survey as defined in Title 62, Chapter 18, Tennessee Code Annotated, and that the ratio of precision is greater than or equal to 1:10,000.

12/18/23 Date — Allen B. O'Leary — TN RLS #1987 Number

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Legend

- EIP Iron Rod Found
- IPS Iron Rod Set
- I.P.F. Iron Pipe Found
- AXLE Axle Found
- FENCE Fence Post
- CM Concrete Monument Existing
- P.K.F. PK Nail Found
- P.K.S. PK Nail Set
- R.R.S..F Railroad Spike Found
- R.R.S.S. Railroad Spike Set
- Bench Mark
- Stake Found
- Fire Hydrant
- Water Meter
- Water Valve
- Water Reducer
- Clean Out
- Sanitary Sewer Manhole
- Storm Sewer Manhole
- Catch Basin
- Curb Inlet
- Storm Pipe
- Cable Manhole
- Electric Manhole
- Telephone Manhole
- Water Manhole
- Electric Meter
- Cable Riser
- Electric Riser
- Telephone Riser
- Telephone Booth
- Gas Meter
- Gas Valve
- Light Pole
- Power Pole
- Telephone Pole
- Guy Pole
- Power Pole
- Flag Pole
- Guy Wire
- Mailbox
- Parking Block
- Satellite Dish
- Handicap Parking
- Water Spigot
- Bollard
- Evergreen Tree
- Deciduous Tree
- Bush
- Sign
- Adjoining Property Line
- Subject Property Line
- Easement Line
- Building Setback Line
- Centerline
- Edge of Pavement
- Edge of Gravel
- Fence Line
- Landscape
- Woods / Tree line
- Edge of Water
- Ditch / Creek Centerline
- Minor Contour Line
- Index Contour Line
- Gas Line
- SA Sanitary Sewer Line
- W Water Line
- ST Storm Sewer Line
- OH Overhead Utility Line
- OHC Overhead Cable Line
- OHE Overhead Electric Line
- OHT Overhead Telephone Line
- UG Underground Utility Line
- UGC Underground Cable Line
- UGE Underground Electric Line
- UGT Underground Telephone Line
- FM Forced Main Line

Register of Deed Recording Stamp

WES ENGINEERS & SURVEYORS
CIVIL ENGINEERS & LAND SURVEYORS
2486 NASHVILLE HIGHWAY
COLUMBIA, TN 38401
PHONE: (931) 388-2329
www.wesengineers.com

ENGINEERS & SURVEYORS

Client
PARMAN HOLDINGS CORPORATION

FINAL PLAT

CBP LLC PROPERTY, TRACTS 4, 5, 6
LASEA RD AND BEAR CREEK PIKE, COLUMBIA, TN

REVISIONS	DATE

Drawn: EB
Checked: AO
Approved: AO
Date: 12-18-2023

Job. no. 23582
Scale: Vertical: 1"=50' Horizontal:

1 of 1

FILE: J:\WES_Engineers_Surveyors 2023\23582 – 1485 Bear Creek Pike – Parman Holdings\Dwg\Survey\23582 Bear Creek Survey.dwg

December 18, 2023

City of Columbia
Development Services
700 North Garden Street
Columbia, TN 38401

RE: **Project Name: CBP LLC PROPERTY, TRACTS 4, 5, 6**
City of Columbia Staff Review Submittal

On behalf of CBP, LLC, the owner of the proposed final plat reconfiguring of 3 existing commercial lots, **WES Engineers & Surveyors** would like to submit this Final Plat to the City of Columbia for approval.

If you have any questions or comments with this submittal, please do not hesitate to contact me directly.

Sincerely,
WES Engineers & Surveyors



Allen B. O'Leary, RLS
Principal

CITY OF COLUMBIA TENNESSEE

DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)*
Fold hard copy submittals larger than 8½"x11"

ADDRESS/LOCATION	Lasea Road & Bear Creek Pike, Columbia, TN		
	TAX MAP: 073	GROUP:	PARCEL: 18.06,18.10,18.11
SUMMARY OF NATURE OF REQUEST AND WORK	Request Final Plat approval for re-configuring 3 existing commercial lots and dedicate right-of-way.		

DATE OF PRE-APPLICATION CONFERENCE		*Pre-application meetings are scheduled for Wednesdays.*

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
❑ Annexation ❑ Rezoning ❑ Preliminary Plat ☑ Final Plat ❑ PUD Preliminary Master Plan ❑ PUD Final Site Plan ❑ Multi-Family Site Plan ❑ Other: **File naming nomenclature examples:* *Freedom Point Site Plan* *Freedom Point Master Plan* *Freedom Point Final Plat*	**Annexations/Rezoning/PUD's:** ❑ Written Legal Description copy ❑ Requested Zone Listed ❑ Compliance with Comprehensive Plan ❑ Annexation Permission Form ❑ Plans and/or Plats conforming to City standards with check list completed ❑ Columbia Water System Availability Letter **Plats/PUDs:** ☑ Project Name (include Sections & Phases) CBP LLC PROPERTY, TRACTS 4, 5, 6 ☑ Total Number of Lots 3 ☑ Total acreage ±5.13

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	Allen B. O'Leary	PHONE	931-388-2329
ADDRESS	2486 Nashville Hwy, Columbia, TN	EMAIL	allen@wesengineers.com

PROPERTY OWNER NAME	CBP, LLC	PHONE	
ADDRESS	2205 Golf Club Lane Columbia, TN 38401	EMAIL	

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

Allen OLeary
APPLICANT NAME

APPLICANT SIGNATURE

12/18/23
DATE

CBP, LLC
PROPERTY OWNER NAME

PROPERTY OWNER SIGNATURE

12/18/23
DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	

DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS	
DATE OF PUBLIC NOTICES IN DAILY HERALD	

BOARD ACTION	

2446 Nashville Hwy/ Preliminary & Final Plat

Project #:	23-0544	Location:	Map 051 Parcel 19.00, 20.00, 20.01
Applicant:	Colton Dorris/ Kimley Horn	Case Type(s):	Final Plat/ Preliminary Plat
Staff Planner:	Austin Brass, AICP	Proposed Use:	Mixed Use/ Multi-Family

PROJECT SUMMARY

The applicant is seeking approval for a Final & Preliminary Plat to merge three adjacent parcels into a single tract and to allocate right-of-way for extending the northern section of Greens Mill Road. This consolidation of lots and the extension of the right-of-way are essential for enhancing the intersection at Greens Mill Road & Nashville Hwy, facilitating the necessary infrastructure upgrades for public utilities. The rezoning from GCS & RS-40 to MRC Planned Unit Development was approved by the Planning Commission under the former Zoning Code 3638, as per case 22-0135 on September 14th, 2022. Subsequently, the City Council approved the Rezoning and PUD Master plan on November 10th, 2022. The PUD master plan encompasses a 4-story mixed-use building featuring 7,000 square feet of retail and office space on the ground floor. Additionally, the plan incorporates five multi-family structures, each comprising 28 units in a ¾ split configuration.

- The PUD Master Plan associated with this preliminary and final plat is subject to Ordinance 3638, the pre-July 2022 zoning ordinance.
- The Final Plat is for the consolidation of three parcels into one contagious lot with an associated Preliminary Plat for the creation of public right-of-way for the extension of Greens Mill Road to accommodate traffic and utility improvements for the Greens Mill Road and Nashville Hwy intersections.
- A surety is not applicate for this final plat as there is no new public infrastructure associated with this final plat that is being created.
- The applicant has executed a development agreement in the format prescribed by Appendix B of the Subdivision Regulations.
- The DRC reviewed this proposal at its January 9th, 2024 meeting. Staff review included standard comments and requests for technical corrections. Full technical comments are provided in the agenda packet.
- Applicant provided overlay of PUD master plan showing Right-of-Way dedication noting the relocation of retaining wall and detention pond from the proposed ROW to the private property.
- The Planning Commission is the **Decision-Making Authority** for this Final & Preliminary Plat.

- Templates are provided at the end of the report to assist the Planning Commission in crafting properly formatted motions.

SITE INFORMATION

CURRENT ZONING	EXISTING USE	EXISTING IMP.	LAND AREA
PUD	In Development	Infrastructure for Development	10.84 +/- Acres



FUTURE LAND USE MAP



ZONING MAP



SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	Suburban Corridor	PUD	Vacant/Developing
North	Suburban Neighborhood/Corridor	PUD	Vacant Parcel/ Single-Family Residential
South	Suburban Neighborhood/Corridor	CD-4/ PUD	Residential (*Drumwright PUD*)
East	Suburban Neighborhood	County Zoning	Vacant Land/ Single-Family Home
West	Suburban Corridor	CD-3/PUD	Vacant Land/ Single-Family Home

CONFORMITY WITH ZONING ORDINANCE

The Final Plat and associated Preliminary Plat comply with the Zoning Ordinance standards for the combination of three lots with a PUD Master Plan approved under the previous Zoning Ordinance 3638 including Right-of-Way dedication.

REVIEW PROCESS

The Development Review Committee evaluated the proposed Final & Preliminary Plat at its January 9th, 2024 meeting, as directed by section **8.3.7** of the Zoning Ordinance. Technical comments are provided in the agenda package and summarized above.

2.2.7 Property Vestment In accordance with TCA 13-4-310, approval by the CMPC of a Preliminary Plat on or after January 1, 2015, will cause a vested property right to be established. Vestment rights and periods shall be in accordance with TCA 13-4-310 and the Zoning Ordinance

Section **8.5.24** of the Zoning Ordinance directs the Planning Commission to review Subdivision Plats for conformity with the standards of the Ordinance and the City Subdivision Regulations. The Ordinance indicates that all Preliminary and Final Plats must be prepared, submitted, reviewed and acted upon in accordance with the Subdivision Regulations.

The Planning Commission is the Decision-Making Authority for Preliminary & Final Plats under **§ 8.3.3.B.1** of the Zoning Ordinance and **§ 2.3 (Final) & § 2.2.6 (Preliminary)** of the Subdivision Regulations.

Section **2.3.6** of the Subdivision Regulations establishes the review criteria for approval of Final Plats.

A. Recommendations and final action on a Preliminary Plat shall be based on consideration of the following criteria:

1. Whether the proposed Preliminary Plat complies with the applicable zoning district and overlay districts;

2. Whether the proposed Preliminary Plat is consistent with all standards of these Subdivision Regulations and other related codes and ordinances enforced by the City; and

3. Whether the CMPC determines that the particular site is suitable for the type of platting and development proposed.

B. Recommendations and final action on a Final Plat shall be based on consideration of the following criteria:

1. Whether the proposed Final Plat complies with the applicable zoning district and overlay districts;

2. Whether the proposed Final Plat is consistent with all standards of these Subdivision Regulations and other related codes and ordinances enforced by the City; and

3. Whether the proposed Final Plat meets all the requirements or conditions of any applicable development approvals, such as development plans or associated modification of standards.

Final Plat approval shall be subject to the completion of required improvements, or in lieu, the CMPC may approve a Performance Agreement.

Staff recommends approval of Preliminary & Final Plat 23-0532 with the following conditions:

1. That final plat be recorded at the Register of Deeds within sixty (60) days of Planning Commission approval per 2.3.5, Final Action of the City of Columbia Subdivision Regulations.
2. Approval subject to any technical comments as listed.

In the event of a denial, **§ 2.3.5** of the Subdivision Regulations requires the Planning Commission to identify the specific parts of applicable plans and regulations with which the plat does not comply.

SAMPLE MOTIONS

Approve:

Move to approve the Final Plat as presented and find that the plat conforms to the applicable zoning ordinance, the Subdivision Regulations, and the Preliminary Plat [subject to remaining technical comments from staff & staff conditions of approval as listed].

Approve with Conditions:

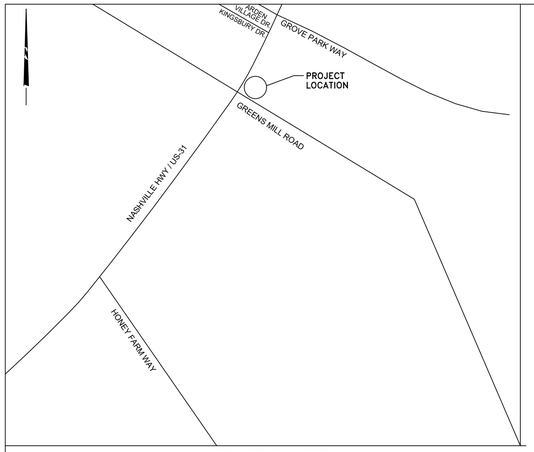
Move to approve the Final Plat as presented and find that the plat conforms to the applicable zoning ordinance, the Subdivision Regulations, and the Preliminary Plat, subject to the following conditions: [list any additional conditions of approval crafted by Planning Commission].

Defer for Continued Review:

Move to find that there is insufficient information to make a decision, defer the application for continued review, and request that the applicant provide: [list additional information] for review at the next regularly scheduled meeting of the Planning Commission.

Deny:

Move to find that the Final Plat as presented does not conform to the applicable zoning ordinance, the Subdivision Regulations, or the approved Preliminary Plat, and deny the request due to [list specific deficiencies].



VICINITY MAP
NOT TO SCALE

CURVE DATA

NO.	DELTA	RADIUS	TANGENT	LENGTH	CHORD	BEARING
C1	13-29-08	410.53'	48.54'	96.63'	96.40'	N63-59-45W
C2	04-19-43	1,745.26'	65.96'	131.85'	131.82'	N54-38-27W
C3	09-40-45	725.00'	61.38'	122.48'	122.33'	N60-17-44W

NOTES:

1) THE PURPOSE OF THIS PLAT IS TO CONSOLIDATE 3 PARCELS INTO ONE LOT/PARCEL AND DEDICATE RIGHT-OF-WAY ALONG GREENS MILL ROAD AND DEDICATE EASEMENTS.

2) UTILITIES HAVE BEEN PLOTTED FROM SURFACE FEATURES FOUND AT THE TIME OF SURVEY AND AVAILABLE MAPS AND RECORDS. THERE MAY BE OTHER UTILITIES, THE EXISTENCE OF WHICH ARE NOT KNOWN TO THE UNDERSIGNED. SIZE AND LOCATION OF ALL UNDERGROUND UTILITIES MUST BE VERIFIED BY THE APPROPRIATE UTILITY COMPANY PRIOR TO ANY CONSTRUCTION.

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5) ALL DEED AND PLAT REFERENCES ARE MADE TO THE REGISTER'S OFFICE FOR MAURY COUNTY, TENNESSEE.

6) THIS PLAT WAS REQUESTED BY THE OWNER AS SHOWN HEREON.

7) 5/8" IRON RODS WILL BE PLACED AT ALL NEW PROPERTY CORNERS FOR THIS SURVEY UNLESS OTHERWISE SHOWN.

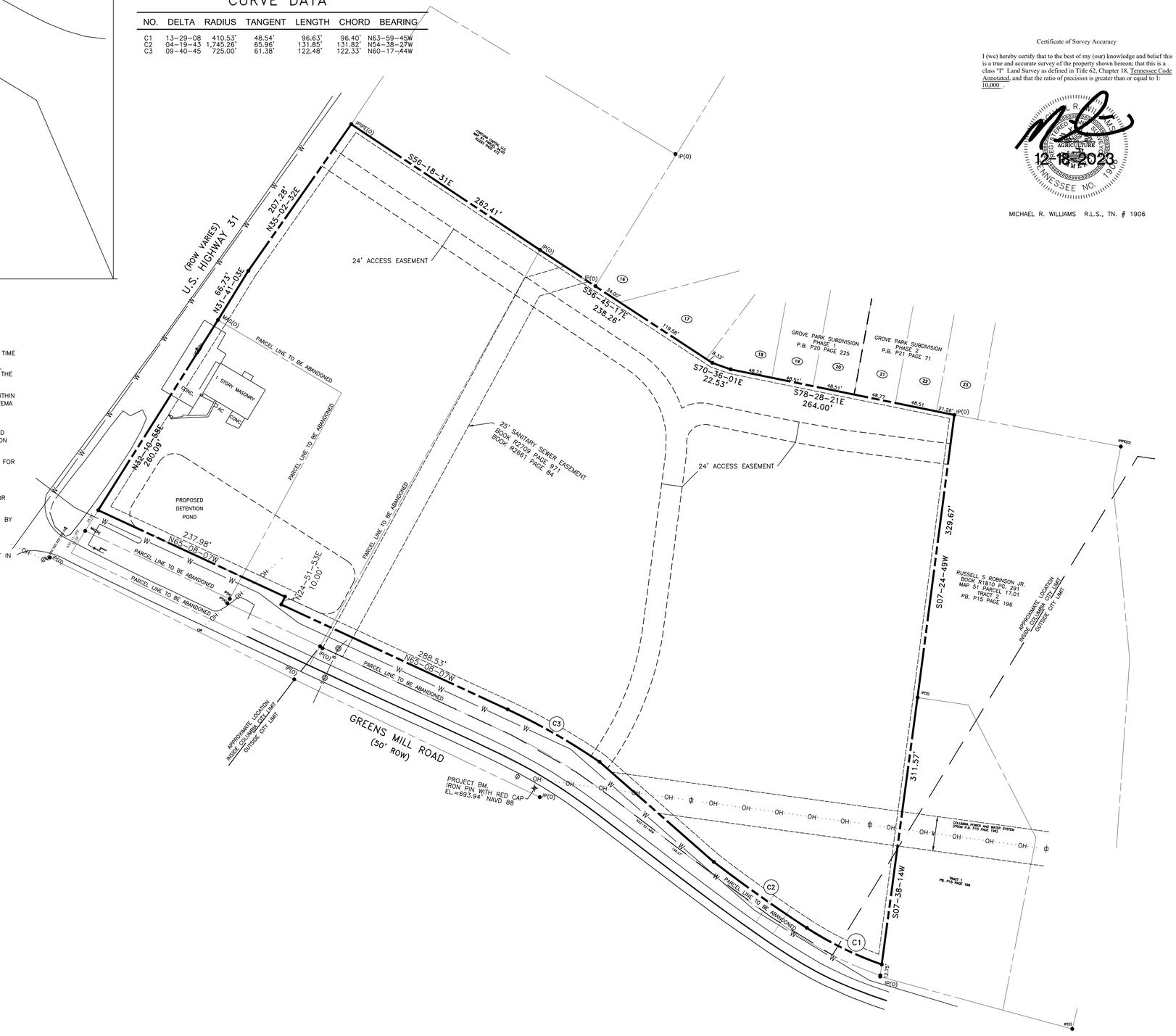
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9) ALL PARCEL INFORMATION REFERS TO MAURY COUNTY TAX MAP 51.

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LEGEND

CONCRETE MONUMENT OLD	■ CM(O)
T-POST OLD	◊
IRON PIN OLD	● IP(O)
GAS VALVE	⊕
WATER VALVE	⊠
FIRE HYDRANT	♆
WATER METER	◫
MANHOLE	◎
UTILITY POLE	⊟
LIGHT POLE	□⋈
GAS METER	⊠
WATER METER	⊟
EDGE OF PAVEMENT	——— ——— ———
FENCE LINE	——— X ——— X ——— X -
PROPERTY/R.O.W. LINE	——— — — ———
EDGE OF CONC.	———
SEWER LINE	
UNDERGROUND WATER	—10"——W——10"——W



SCALE: 1"=60'
60 30 0 30 60

SEC. 8 P.B. P69-95
S.P.C.S. NAD 83(2011)/NAVD 88

Certificate of Survey Accuracy

I (we) hereby certify that to the best of my (our) knowledge and belief this is a true and accurate survey of the property shown hereon; that this is a class "I" Land Survey as defined in Title 62, Chapter 18, Tennessee Code Annotated, and that the ratio of precision is greater than or equal to 1: 10,000 .

MICHAEL R. WILLIAMS R.L.S., TN. # 1906

Certificate of Ownership and Dedication

I (we) hereby certify that I am (we are) the owner(s) of the property shown and described hereon as evidenced in Owner Table, and that I (we) hereby adopt this plan of subdivision with my (our) free consent, establish the minimum building restriction lines, and that offers of irrevocable dedication for all public ways, utilities, and other facilities have been filed.

20 _____ _____
Date Dinesh Davar,CFO
Greens Mill Development Holdings LLC

Certificate of Approval of Water System

I hereby certify that the water system(s) outlined or indicated on the final subdivision plat entitled Consolidation Plat Greens mill Road has/have been installed in accordance with current local and state government requirements, or a sufficient bond or other surety has been filed to guarantee said installation.

20 _____ _____
Date Name, Title, Agency of
Authorized Approving Agent

Certificate of Approval of Streets, Drainage, and Utilities

I hereby certify that the streets, drainage and utilities designated in Consolidation Plat Greens Mill Road Subdivision have been installed in accordance with City specifications, or a performance surety in the amount of $_____ for streets and drainage has been posted with the City of Columbia, Tennessee, to assure completion of such improvements.

_____
City Engineer Date
Columbia, Tennessee

Certificate of Approval for Recording

I hereby certify that the subdivision plat shown hereon has been found to comply with the Columbia Subdivision Regulations, with the exception of such variances, if any, as noted in the minutes of the Planning Commission, and that it has been approved for recording in the Office of the County Register.

_____
Secretary, Planning Commission Date
Columbia, Tennessee

Certificate of Approval of Subdivision Name and Street Names

Subdivision name and street names approved by the City Engineering Department and by E-911 Maury County.

_____
Maury County E911 Date

Certificate of Approval for Sewer System

I hereby certify that the sewer system outlined or indicated on this final subdivision plat has been installed in accordance with the current local and state government requirements, or a sufficient bond or other surety has been filed to guarantee said installation.

_____
Director of Wastewater Department Date
Columbia, Tennessee

Certificate of Compliance

I hereby certify that the subdivision plat shown hereon has been found to comply with the Columbia Subdivision Regulations and other adopted ordinances and policies.

_____
City Engineer Date
Columbia, Tennessee

PREPARED BY:
WOLD ARCHITECTS AND ENGINEERS
214 Centerview Drive Suite 300
Brentwood, TN 37027
615.370.8530
615.370.8500
woldae.com
SURVEY DIVISION dreagan@woldae.com

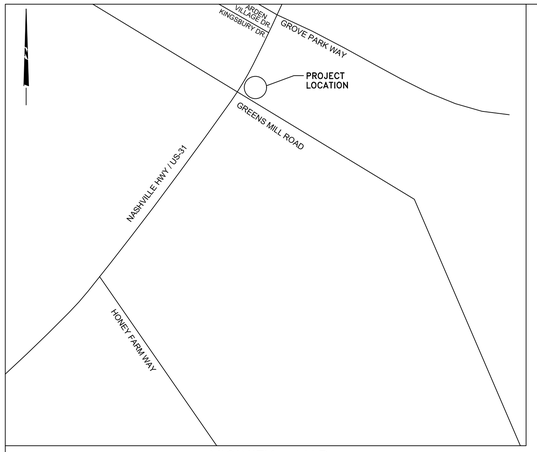
SITE ADDRESS:
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COLUMBIA, TN. 38401
SITE ADDRESS:
2450 NASHVILLE HWY.
COLUMBIA, TN. 38401
SITE ADDRESS:
2446 NASHVILLE HWY.
COLUMBIA, TN. 38401

OWNER TABLE INFO:
GREEN MILLS DEVELOPMENT HOLDINGS LLC
MAP 51 PARCELS 20.00 & 20.01
BOOK R2915 PG. 1204

OWNER TABLE INFO:
GREEN MILLS DEVELOPMENT HOLDINGS LLC
MAP 51 PARCEL 19.00
BOOK R2915 PG. 1209

LOT 1 TOTAL AREA: 472,442.56 SQ. FT. OR (10.846± ACRES)
DEDICATION FOR GREENS MILL ROADWAY
TOTAL AREA: 32,188.70 SQ. FT. OR (0.739± ACRES)

FINAL PLAT
CONSOLIDATION OF PARCELS 19, 20 20.01
GREEN MILLS ROAD
3RD CIVIL DISTRICT
COLUMBIA-MAURY COUNTY-TENNESSEE
DATE: 12-18-2023
SHEET 1 OF 1
WOLD PROJECT NO. 27358(2 LOT PLAT)



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NOT TO SCALE

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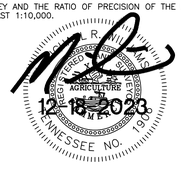
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PREPARED BY:

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PRELIMINARY PLAT
CONSOLIDATION OF PARCELS 19, 20 20.01
GREEN MILLS ROAD
3RD CIVIL DISTRICT
COLUMBIA-MAURY COUNTY-TENNESSEE
DATE: 12-18-2023
SHEET 1 OF 1
WOLD PROJECT NO. 27358(2 LOT PLAT)



Kimley»Horn

Greens Mill Lot Consolidation

Plat & PUD Overlay

January 16, 2024

0 50 50 100 150

NORTH

Planning

1. The lead staff person for this case is Planner Austin Brass, AICP; he will prepare the staff report for this item. Please contact abrass@columbiatn.com with questions about the development review process or technical comments. (Acknowledged)
2. At resubmittal, please provide a response letter addressing each comment along with any revised plans. If the nature of the comment does not warrant a response, please simply note that the information has been acknowledged. (Acknowledged)
3. The Preliminary PUD Master Plan depicts a 1.5' – 5' retaining wall just inside the RoW on Greens Mill Road. The proposed property line does not appear to exactly match the PUD Master Plan. Please confirm that the new property line will accommodate the wall and grading for the stormwater pond at the southwest corner of the property. (The platted ROW Dedication line does come into the property near the corner of Greens Mill Rd. and US 31 10' more than the one on the PUD Plan. This revision was made to accommodate a waterline. Any Retaining wall, Detention Pond and grading will be revised and verified to be placed on private property and not in the public ROW.)
4. Please correct the zoning reference in note 4 to reflect the MRC Planned Unit Development approved under Zoning Ordinance 3638. Please reference the specific ordinance and date of approval by City Council (Ord. # 4435; November 10, 2022). (Corrections made as requested)
5. In response to comments, please indicate plans for the demolition of the existing masonry structure on the site. (the existing structure will be demolished prior to any construction of the Multi-use structures)
6. At resubmittal. Please provide an exhibit showing the proposed access easement and RoW dedication over the approved Preliminary PUD Master Plan. The RoW locations and access easements should match the drive aisles with sufficient space for the required buffers and parking spaces. The RoW location should provide for the multifamily building setbacks and the detention pond location. In response to comments, please identify and explain any discrepancies between the two documents (e.g. the branching SS lines on the eastern portion of the property between multifamily buildings from contour 715' to 711'). (the plat purpose is to dedicate ROW along Greens Mill Road to allow for a waterline construction. Final Site Details are still being designed and may change. Owner is aware that a new and revised plat may be required once all design items are finalized. I am attaching a copy of the PUD Layout plan. The only change is the 10 additional feet of ROW Dedication at the southwest corner near Greens Mill Rd. and US 31.)
7. Please update city limit location to the eastern edge of Drumwright Subdivision. (City Limit Location matches GIS Maps)
8. A tall chain link fence has been erected on the property. The applicable zoning ordinance (3638) discouraged the use of chain link fronting public streets (12.4.2.C). Please resolve this issue prior to the February Planning Commission meeting. The response to comments should indicate the applicants plan to correct this zoning violation. (This fence was installed for security of the site while under construction and will be removed upon completion of the project.)

Engineering

9. Provide bearing and distances on new property lines along Greens Mill Road. (missing info added)
10. Add standard PUDE note: A Public Utility and Drainage Easement is provided ten (10) feet in width on all property lines parallel and abutting public roads or rights-of-way, and five (5) feet in width on all interior lot lines. (See note 10)

11. Remove proposed sewer from the Plat document. (Proposed sewer removed)

Wastewater

12. Columbia Wastewater at some point would require this Property/Development to makes accommodations for Columbia, such that the Laurel Chase (Grove Park) Pump Station could be taken down during development and have the existing Pump Station Sewer rerouted through this Property/Development by gravity. Planners should keep this in mind with respect to building placement and other items. Sanitary sewer plans should be subject to change. (noted)

Columbia Power

13. Columbia Power System has an existing power line near your proposed residential development. We are willing to serve this residential development subject to all Columbia Power System policies and procedures in effect at actual time service is rendered provided an approved final plat and complete electrical load information is furnished as soon as possible prior to start of actual construction. Unfortunately, due to current supply chain challenges, no timeframe can be guaranteed regarding the availability of meters or transformers appropriate for your development. (noted)

Atmos Energy

14. Natural gas available along Nashville Hwy. (noted)

Maury County E911

15. Contact Maury County 911 for street names to be reserved. Ggideon@maury9ll.org or website Maury911.org (noted)

ATT

16. Needs pole and cable relocation. AT&T needs contact on who to send bill to for the relocation. (noted)

No comments were received Fire, Police, Building, Public Works, Duck River Electric Membership Corp., Maury County Highway Dept., or Maury County Schools.

NOTE: All submittals shall be compliant with City standards prior to Planning Commission review. Items that are not adhering to the regulations and/or comments for that request will not be forwarded to the next agenda until such items are amended.

CITY OF COLUMBIA
TENNESSEE

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, January 9, 2024

ITEM NO.
23-0544

DESCRIPTION: Applicant requesting approval of the submitted final plat to combine 2446 Nashville HWY, 2450 Nashville HWY, and 2417 Greens Mill Rd. The plat also dedicates adequate right-of-way for the improvements to the Greens Mill/Nashville HWY intersection and the public utilities being proposed by others.

COMMENTS:

Planning

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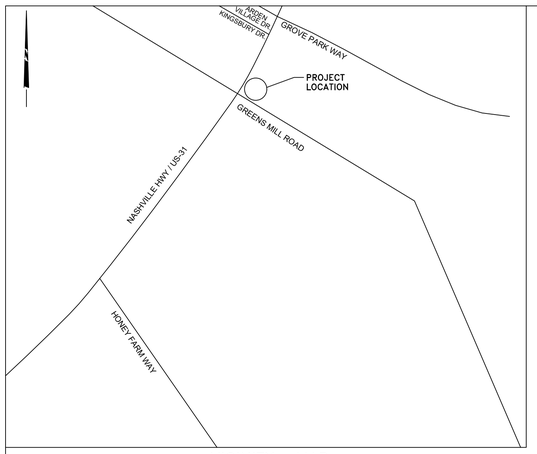
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Current Enrollment / Capacity

	Facility Name	Date Constructed	Sq. Ft.	Acreage	Capacity
Elementary	Baker	1960	43,920	12	340
	Battle Creek	2019	90,000	30	700
	Brown	1968	56,720	20	405
	Highland	1986	47,800	4.5	380
	Howell	1999	81,600	17.5	700
	Mt. Pleasant	1978	80,021	22	630
	Riverside	1984	71,150	14	500
	Spring Hill	1984	69,000	10	540
	Woodard	1990	76,200	17	600
	Wright	2005	97,765	18	740
					5535
Middle	Battle Creek	2019	125,000	45	900
	Cox	1997	137,200	25	900
	Mt. Pleasant	2001	113,938	29.2	550
	Spring Hill	2010	158,106	39.49	950
	Whitthorne	1979	175,600	17	1050
					4350
High	Central	2016	296,740	55	1700
	Mt. Pleasant	1969	110,759	31	600
	Spring Hill	1993	181,800	57	1200
					3500
Unit	Culleoka	1969	205,800	34	1020
	Hampshire	1978	83,410	13.12	500
	Santa Fe	1964	94,225	24	650
					2170
Other	Central Office	1960	15,400	1.5	
	College Hill	1958	42,211	2.26	
	Maintenance	1987	9,400	4.7	
	McDowell		46,165	7	
			2,509,930	**550.27**	**15555**

Current Enrollment	Capacity Used
328	96.5%
632	90.3%
358	88.4%
304	80.0%
592	84.6%
580	92.1%
406	81.2%
445	82.4%
559	93.2%
601	81.2%
4805	***86.8%***
731	81.2%
656	72.9%
424	77.1%
527	55.5%
971	92.5%
3309	***76.1%***
1396	82.1%
379	63.2%
1223	101.9%
2998	***85.7%***
875	85.8%
408	81.6%
509	78.3%
1792	***82.6%***
166	
13070	



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MICHAEL R. WILLIAMS R.L.S., TN. # 1906

NOTES:

1) THE PURPOSE OF THIS PLAT IS TO CONSOLIDATE 3 PARCELS INTO ONE LOT/PARCEL AND DEDICATE RIGHT-OF-WAY ALONG GREENS MILL ROAD AND DEDICATE EASEMENTS.

2) UTILITIES HAVE BEEN PLOTTED FROM SURFACE FEATURES FOUND AT THE TIME OF SURVEY AND AVAILABLE MAPS AND RECORDS. THERE MAY BE OTHER UTILITIES, THE EXISTENCE OF WHICH ARE NOT KNOWN TO THE UNDERSIGNED. SIZE AND LOCATION OF ALL UNDERGROUND UTILITIES MUST BE VERIFIED BY THE APPROPRIATE UTILITY COMPANY PRIOR TO ANY CONSTRUCTION.

3) BY GRAPHIC PLOTTING AND SCALED MAP LOCATION SUBJECT SITE LIES WITHIN ZONE "X" AREAS OUTSIDE THE 100 YEAR FLOOD PLAIN AS EVIDENCED ON FEMA FLOOD INSURANCE RATE MAP (FIRM) MAP NO. 47119C0180E, DATED 04-16-2007.

4) SUBJECT PROPERTIES ARE CURRENTLY ZONED: PARCEL 19.00 ZONED "GCS" AND PARCELS 20.00 & 20.01 ZONED "RD-40". SETBACKS PER CITY OF COLUMBIA ZONING AND CODES.

5) ALL DEED AND PLAT REFERENCES ARE MADE TO THE REGISTER'S OFFICE FOR MAURY COUNTY, TENNESSEE.

6) THIS PLAT WAS REQUESTED BY THE OWNER AS SHOWN HEREON.

7) 5/8" IRON RODS WILL BE PLACED AT ALL NEW PROPERTY CORNERS FOR THIS SURVEY UNLESS OTHERWISE SHOWN.

8) TOPOGRAPHIC SURVEY INFORMATION PROVIDED FROM SURVEY PERFORMED BY THIS SURVEYOR 2-21-22.

9) ALL PARCEL INFORMATION REFERS TO MAURY COUNTY TAX MAP 51.

PREPARED BY:
WOLD ARCHITECTS AND ENGINEERS
214 Centerview Drive Suite 300
Brentwood, TN 37027
615.370.8530
615.370.8500
woldae.com
SURVEY DIVISION dreagan@woldae.com

SITE ADDRESS:
2417 GREENS MILL RD.
COLUMBIA, TN. 38401

SITE ADDRESS:
2450 NASHVILLE HWY.
COLUMBIA, TN. 38401

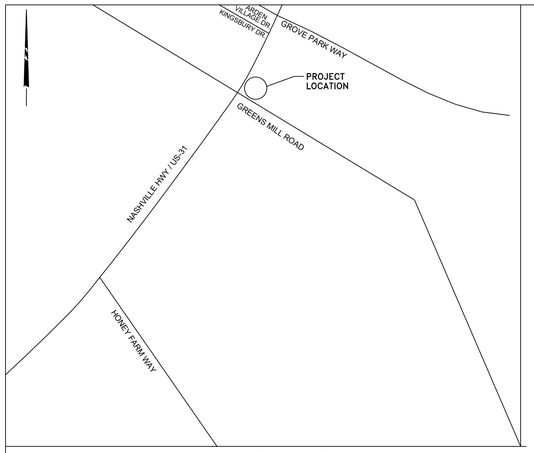
SITE ADDRESS:
2446 NASHVILLE HWY.
COLUMBIA, TN. 38401

OWNER TABLE INFO:
GREEN MILLS DEVELOPMENT HOLDINGS LLC
MAP 51 PARCELS 20.00 & 20.01
BOOK R2915 PG. 1204

OWNER TABLE INFO:
GREEN MILLS DEVELOPMENT HOLDINGS LLC
MAP 51 PARCEL 19.00
BOOK R2915 PG. 1209

LOT 1 TOTAL AREA: 472,442.56 SQ. FT. OR (10.846± ACRES)
DEDICATION FOR GREENS MILL ROADWAY
TOTAL AREA: 32,188.70 SQ. FT. OR (0.739± ACRES)

PRELIMINARY PLAT
CONSOLIDATION OF PARCELS 19, 20 20.01
GREEN MILLS ROAD
3RD CIVIL DISTRICT
COLUMBIA-MAURY COUNTY-TENNESSEE
DATE: 12-18-2023
SHEET 1 OF 1
WOLD PROJECT NO. 27358(2 LOT PLAT)



VICINITY MAP
NOT TO SCALE

CURVE DATA

NO.	DELTA	RADIUS	TANGENT	LENGTH	CHORD	BEARING
C1	13-29-08	410.53'	48.54'	96.63'	96.40'	N63-59-45W
C2	04-19-43	1,745.26'	65.96'	131.85'	131.82'	N54-38-27W
C3	09-40-45	725.00'	61.38'	122.48'	122.33'	N60-17-44W

NOTES:

1) THE PURPOSE OF THIS PLAT IS TO CONSOLIDATE 3 PARCELS INTO ONE LOT/PARCEL AND DEDICATE RIGHT-OF-WAY ALONG GREENS MILL ROAD AND DEDICATE EASEMENTS.

2) UTILITIES HAVE BEEN PLOTTED FROM SURFACE FEATURES FOUND AT THE TIME OF SURVEY AND AVAILABLE MAPS AND RECORDS. THERE MAY BE OTHER UTILITIES, THE EXISTENCE OF WHICH ARE NOT KNOWN TO THE UNDERSIGNED. SIZE AND LOCATION OF ALL UNDERGROUND UTILITIES MUST BE VERIFIED BY THE APPROPRIATE UTILITY COMPANY PRIOR TO ANY CONSTRUCTION.

3) BY GRAPHIC PLOTTING AND SCALED MAP LOCATION SUBJECT SITE LIES WITHIN ZONE "X" AREAS OUTSIDE THE 100 YEAR FLOOD PLAIN AS EVIDENCED ON FEMA FLOOD INSURANCE RATE MAP (FIRM) MAP NO. 47119C0180E, DATED 04-16-2007.

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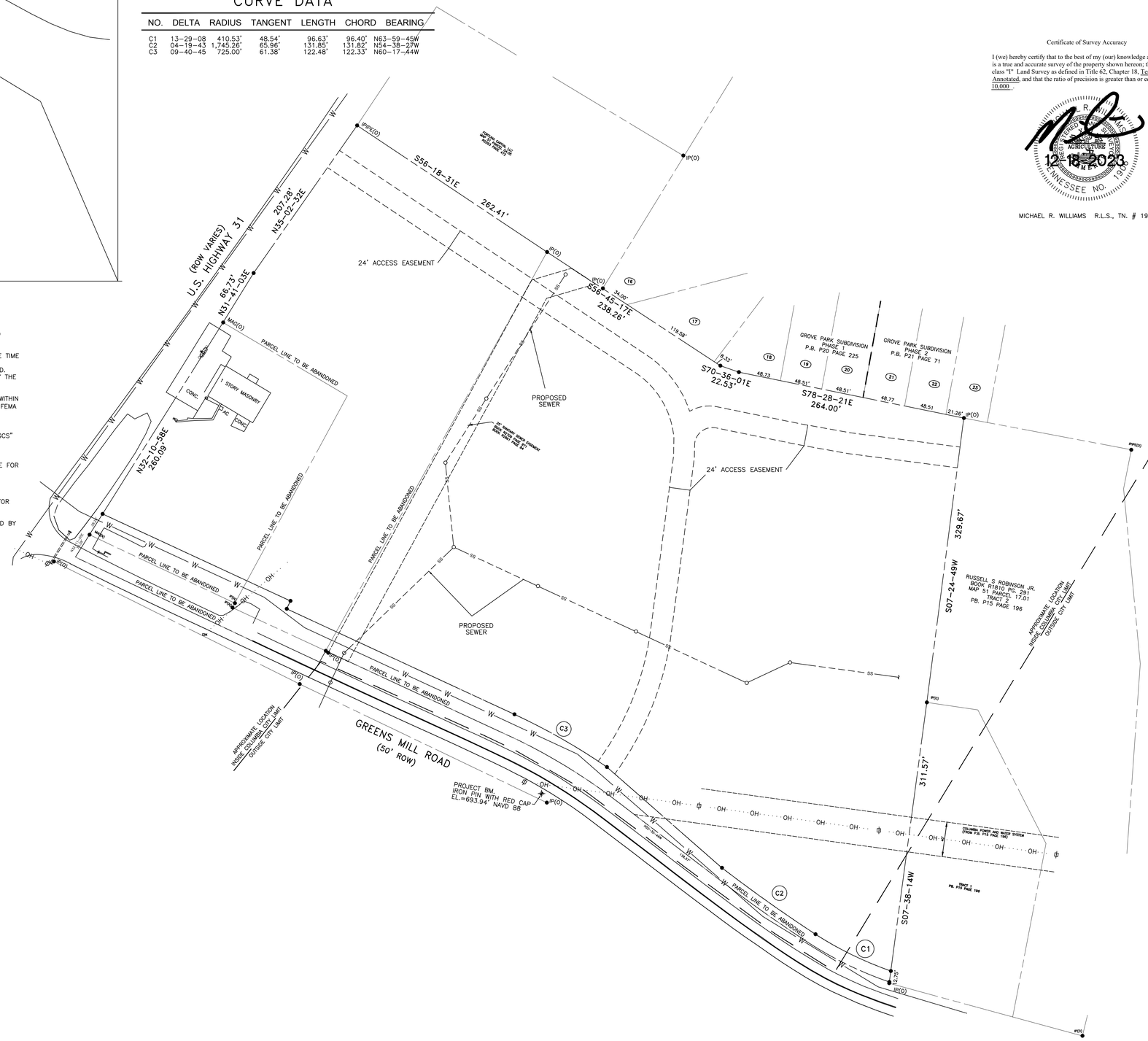
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9) ALL PARCEL INFORMATION REFERS TO MAURY COUNTY TAX MAP 51.



SCALE: 1"=60'
60 30 0 30 60

SEC. 8 P.B. P69-95
S.P.C.S.: NAD 83(2011)/NAVD 88

Certificate of Survey Accuracy

I (we) hereby certify that to the best of my (our) knowledge and belief this is a true and accurate survey of the property shown hereon; that this is a class "I" Land Survey as defined in Title 62, Chapter 18, Tennessee Code Annotated, and that the ratio of precision is greater than or equal to 1: 10,000 .

STATE OF TENNESSEE REGISTERED LAND SURVEYOR MICHAEL R. WILLIAMS 1906 AGRICULTURE SURVEYING 12-18-2023 TENNESSEE NO. 1906

MICHAEL R. WILLIAMS R.L.S., TN. # 1906

Certificate of Ownership and Dedication

I (we) hereby certify that I am (we are) the owner(s) of the property shown and described hereon as evidenced in Owner Table, and that I (we) hereby adopt this plan of subdivision with my (our) free consent, establish the minimum building restriction lines, and that offers of irrevocable dedication for all public ways, utilities, and other facilities have been filed.

20____ _____
Date Owner

_____ Title (if action for partnership or corporation)

Certificate of Approval of Water System

I hereby certify that the water system(s) outlined or indicated on the final subdivision plat entitled Consolidation Plat Greens mill Road has/have been installed in accordance with current local and state government requirements, or a sufficient bond or other surety has been filed to guarantee said installation.

20____ _____
Date Name, Title, Agency of Authorized Approving Agent

Certificate of Approval of Streets, Drainage, and Utilities

I hereby certify that the streets, drainage and utilities designated in Consolidation Plat Greens Mill Road Subdivision have been installed in accordance with City specifications, or a performance surety in the amount of $_____ for streets and drainage has been posted with the City of Columbia, Tennessee, to assure completion of such improvements.

_____
City Engineer Date
Columbia, Tennessee

Certificate of Approval for Recording

I hereby certify that the subdivision plat shown hereon has been found to comply with the Columbia Subdivision Regulations, with the exception of such variances, if any, as noted in the minutes of the Planning Commission, and that it has been approved for recording in the Office of the County Register.

_____
Secretary, Planning Commission Date
Columbia, Tennessee

Certificate of Approval of Subdivision Name and Street Names

Subdivision name and street names approved by the City Engineering Department and by E-911 Maury County.

_____
Maury County E911 Date

Certificate of Approval for Sewer System

I hereby certify that the sewer system outlined or indicated on this final subdivision plat has been installed in accordance with the current local and state government requirements, or a sufficient bond or other surety has been filed to guarantee said installation.

_____
Director of Wastewater Department Date
Columbia, Tennessee

Certificate of Compliance

I hereby certify that the subdivision plat shown hereon has been found to comply with the Columbia Subdivision Regulations and other adopted ordinances and policies.

_____
City Engineer Date
Columbia, Tennessee

PREPARED BY:
WOLD ARCHITECTS AND ENGINEERS
214 Centerview Drive Suite 300
Brentwood, TN 37027
615.370.8500
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woldae.com
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SITE ADDRESS:
2417 GREENS MILL RD.
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DEDICATION FOR GREENS MILLS ROADWAY
TOTAL AREA: 32,188.70 SQ. FT. OR (0.739± ACRES)

FINAL PLAT
CONSOLIDATION OF PARCELS 19, 20 20.01
GREEN MILLS ROAD
3RD CIVIL DISTRICT
COLUMBIA-MAURY COUNTY-TENNESSEE
DATE: 12-18-2023
SHEET 1 OF 1
WOLD PROJECT NO. 27358(2 LOT PLAT)

Appendix B: Subdivision Development Agreement

This DEVELOPMENT AGREEMENT is made and entered into on this

_____ day of _____, 20_____ ,
between THE CITY OF COLUMBIA, TENNESSEE, (hereinafter the "CITY"), and

Greens Mill Development Holdings, LLC, the DEVELOPER (hereinafter the "DEVELOPER") named on the Addendum to this Agreement attached hereto and by this reference made a part hereof (hereinafter the "ADDENDUM").

WITNESSETH:

WHEREAS, the DEVELOPER desires to develop the property described on the ADDENDUM (hereinafter the "PROJECT"); and,

WHEREAS, the Development Plan of the PROJECT has been approved by the Columbia Municipal Planning Commission (hereinafter the “CMPC”) on the

14th day of September, 20 22 ,
pursuant to Tennessee Code Annotated Title 13, Chapter 4, and the Subdivision Regulations of Columbia, Tennessee (hereinafter the "SUBDIVISION REGULATIONS”); and,

WHEREAS, the DEVELOPER is the owner of the PROJECT and has authority to engage in such development; and,

WHEREAS, the DEVELOPER desires to develop and improve said PROJECT; and,

WHEREAS, in order to provide for the health, safety, and welfare of future residents of the PROJECT, it will be necessary for certain improvements to the CITY'S utility systems, public infrastructure, and common areas to be constructed within and to serve the PROJECT including but not be limited to roads, bridges, sidewalks, pedestrian facilities, stormwater facilities, street signs, markings, signals, street lighting, recreation and park facilities, landscaping, and the like (hereinafter the “IMPROVEMENTS”); and,

WHEREAS, in order for the IMPROVEMENTS to be fully integrated with the utility systems and public infrastructure of the CITY and to function in a satisfactory manner, the DEVELOPER has agreed to construct, in accordance with the Subdivision Regulations and other rules, regulations, and ordinances of the CITY, the IMPROVEMENTS in said PROJECT and extend utilities to the PROJECT at their own cost; and,

WHEREAS, the CITY is willing to accept the dedication of the streets, utilities, and other improvements as determined in the Development Plan of the PROJECT, subject to the City of Columbia City Council approval by resolution, and subject to the applicant's compliance with all requirements in this agreement and applicable existing laws of the CITY of Columbia and the State of Tennessee,

NOW, THEREFORE, it is agreed and understood as follows:

B1 General Conditions

B1.1 Construction Costs

The DEVELOPER shall pay for all material and labor necessary to install and complete the roads, sidewalks, sewers, utilities, and other facilities in accordance with this agreement.

B1.2 City Ordinances, Rules and Regulations

All currently existing CITY ordinances, rules and regulations, and the Subdivision Regulations adopted by the CMPC are made a part of this agreement. In the event of a conflict between the terms of this agreement and a CITY ordinance, the ordinance shall prevail. In the event of a conflict between the terms of this agreement and the Subdivision Regulations, the Subdivision Regulations shall prevail. All work done under this agreement is to be performed in accordance with plans and specifications approved by the City and made a part, hereof.

B1.3 Fees

Review fees, inspection fees, and other amounts established by the CITY shall be paid prior to any review of the plans. If the DEVELOPER fails to install the facilities in accordance with the terms of this Agreement, no portion of the review fees, inspection fees, or other amounts paid to the CITY shall be refundable to the DEVELOPER.

B1.4 Inspection

The CITY shall have a continuous right to inspect the work and facilities to assure that the work and facilities are in accordance with the Subdivision Regulations, approved Construction Plans, and other rules, regulations, and ordinances of the CITY.

B1.5 Right of Entry

The CITY shall have the right, in case of breach of the Performance Agreement, to enter upon any property of the DEVELOPER and take all necessary actions to complete the work and obligations not completed.

B1.6 Easements

The DEVELOPER shall obtain and dedicate to the CITY or cause to be dedicated to the CITY, either by dedication on the plat or by easement deed, in either case in a form acceptable to the CITY, permanent easements of such widths as required by the CITY and noted on the Plans. The DEVELOPER further agrees to grant the necessary easements and rights-of-way across the DEVELOPER's properties without expense to the CITY and waive any claim for damages.

B1.7 Stormwater Maintenance Agreement

If the PROJECT includes any detention or retention ponds, common drainage ditches, water quality facilities, or stormwater facilities outside of the CITY rights-of-way, the DEVELOPER will submit a Stormwater Maintenance Agreement, to be filed with and recorded with the Final Plat.

B1.8 Attorney Fees and Other Expenses

The DEVELOPER shall pay all reasonable costs and expenses incurred by the CITY in enforcing or completing this agreement. The DEVELOPER shall pay all costs and expenses, including the CITY'S attorney fees, of any legal proceedings brought by the CITY against the DEVELOPER seeking remedies for the DEVELOPER'S failure to perform any of its obligations hereunder, whether or not any proceedings are prosecuted to judgment.

B1.9 Agreement Not Assignable

No third party shall obtain any benefits or rights under this agreement nor shall the rights or duties be assigned by either party.

B1.10 Revocation and Interpretation

This agreement shall bind the DEVELOPER when executed by the DEVELOPER and may not be revoked by the DEVELOPER without permission of the CITY, even if the agreement has not been executed by the CITY, or does not bind CITY, for other reasons. This agreement shall be interpreted in accordance with Tennessee law and may only be enforced in the Chancery Court or Circuit Court or Court of competent jurisdiction of Maury County, Tennessee, and Tennessee Appellate Courts.

B1.11 No Oral Agreement

This agreement may not be orally amended and supersedes all prior negotiations, commitments, or understandings.

B1.12 Separability

If any portion of this agreement is held to be unenforceable, the CITY shall have the right to determine whether the remainder of the agreement shall remain in effect, or whether the agreement shall be void and all rights of the DEVELOPER pursuant to this agreement terminated.

B 1.13 Transferability

The DEVELOPER agrees to not transfer the property on which this PROJECT is to be located without first providing the CITY with written notice. The transferee shall provide the CITY an Assumption Agreement of this Agreement, whereby the transferee agrees to perform the IMPROVEMENTS required under this agreement and to provide a performance surety. The DEVELOPER understands that if the DEVELOPER transfers said property without providing the notice of transfer and Assumption Agreement as required herein, they will be in breach of this agreement and in violation of the Subdivision Regulations.

B1.14 Indemnity

The DEVELOPER shall indemnify and hold the CITY harmless from all loss, costs, expenses, liability, money damages, penalties, or claims arising out of any work covered by this agreement, including any attorney fees incurred by the CITY in connection therewith. Inspection of the IMPROVEMENTS by an authorized representative of the CITY shall not constitute a waiver by the CITY of any defect or of any of the DEVELOPER'S obligations hereunder.

B1.15 Binding Effect

This agreement shall be binding upon the DEVELOPER and the DEVELEPOR's heirs, administrators, executors, assigns, and any other successors in interest.

B1.16 Entire Agreement

This document contains the entire agreement between the parties, and there are no collateral understandings or agreements between them. No variations or alterations of the terms of this agreement shall be binding upon either of the parties, unless the same be reduced to writing and made an amendment to this agreement.

B1.17 Headings

Paragraph titles and headings contained herein are inserted for convenience only and shall not be deemed a part of the agreement and in no way shall define, limit, extend, or describe the scope or intent of any provision, hereof.

B2 Performance Surety

At the time of execution of this agreement, the DEVELOPER shall provide the CITY a performance surety, in an amount determined by the City Engineer for the IMPROVEMENTS and other items specified by the Construction Plans, plats, and plans approved by the CMPC. This performance surety shall secure performance of all obligations of the DEVELOPER under this agreement. The performance surety shall meet all requirements established in Chapter 4: Performance Agreement of the Subdivision Regulations and secure full compliance with all terms and conditions of this agreement. The performance surety may be called for failure to comply with the provisions of this agreement in whole or in part according to the terms of the performance surety. The performance surety will not be released, except and until there has been full compliance with this agreement.

B3 Construction

B3.1 Construction Plans

The DEVELOPER shall submit to the CITY, Construction Plans describing in reasonable detail all utility systems, all storm water management systems, all street systems, pedestrian facilities, and all IMPROVEMENTS. The Construction Plans shall be designed according to the Engineering Standards and Specifications, all other codes and ordinances enforced by the City, and sound engineering judgment. The design of all utility systems shall follow the State of Tennessee and utility provider design criteria and specifications. In the event of a disagreement as to compliance with or interpretation of the Construction Plans and the CITY'S specifications, the decision of the CITY shall be final and binding on the DEVELOPER. The Construction Plans shall be prepared by a design professional licensed by the State of Tennessee to design all systems and shall bear the seal, signature, date, and license number of the professional preparing the Construction Plans.

B3.2 Commencement of Construction

Construction of IMPROVEMENTS may not begin until the following events have occurred:

A. The Preliminary Plat has been approved by the CMPC;
B. The Construction Plans are approved by the CITY;
C. The Tennessee Department of Environment and Conservation has approved the applicable portions of the Plans and has confirmed its approval to the CITY and/or DEVELOPER in writing;
D. The CITY shall have received an appropriately executed Development Agreement; and
E. The DEVELOPER shall give the CITY notice of commencement of construction, in writing at least one (1) working day prior to commencement.

B3.3 Site Grading

The DEVELOPER, hereby, agrees to construct all site grading to comply with the approved Construction Plans, including the approved Erosion Control Plan for the PROJECT and to comply with the Engineering Standards and Specifications, Stormwater Ordinance, and all other codes and ordinances enforced by the CITY.

B3.4 Storm Water Management Systems

The DEVELOPER shall be responsible for all storm water management work made necessary by the development of this PROJECT. It is understood and agreed that the CITY in its proprietary function is not and could not be expected to oversee, supervise, or direct the construction of all drainage improvements, and the excavation incident thereto. Neither is the CITY vested with the original design responsibility nor the means to formally survey elevations or the locations of improvements at every stage of the construction process. The CITY is vested with the right of periodic inspections, stop work order, and final approval as a measure of secondary or subsequent enforcement. The DEVELOPER has and shall retain the responsibility to properly anticipate, survey, design and construct the subdivision storm water improvements and give full assurance that same shall not adversely affect the flow or quality of surface water from or upon any property. In providing technical assistance, plan and design review, the CITY does not and shall not relieve or accept any liability from the DEVELOPER.

B3.5 Street Construction

The DEVELOPER, hereby, agrees to construct and improve the streets shown on the Construction Plans to comply with the CITY's specifications and to the satisfaction and approval of the City Engineer by grading, draining, subgrade preparation, base preparation, curbing, signage, striping, signalization, sidewalk installation, and paving with the required preparation, amounts, and types of material. The DEVELOPER further agrees to pay the cost of all engineering, inspection and laboratory cost incidental to the construction of subdivision streets including but not limited to material and density testing. The DEVELOPER further agrees to make all necessary adjustments to manholes and valve boxes to meet finished surface grade and to repair subsurface or base material, as required, in areas directed by the CITY Engineer, prior to application of final surface.

B3.6 Time Period for Construction

The DEVELOPER agrees to be bound to complete, within three (3) years of commencement of construction, all IMPROVEMENTS shown on the plat and plans and all things required by this agreement.

The DEVELOPER further agrees that if due to unforeseen circumstances, he is unable to complete all work included in this agreement within the time specified above, but desires to complete said agreement to the satisfaction of the CITY, the DEVELOPER shall submit a written request for extension of the agreement period to the CITY at least sixty (60) days prior to the expiration of the existing agreement period, specifying the reason for the DEVELOPER's failure to complete the work as agreed and a prospective date for such completion. The DEVELOPER further agrees that if the performance surety executed to secure the value of the work to be performed under this agreement, due to inflation or rising costs, is determined to be inadequate by the City Engineer to secure the cost of said IMPROVEMENTS at the time an extension is sought, the DEVELOPER will provide the additional security to bring the performance surety amount in line with current cost projections as made by the CITY. The DEVELOPER understands that the DEVELOPER's failure to follow the extension procedure constitutes a breach of this agreement and places the DEVELOPER in violation of the Subdivision Regulations. The DEVELOPER further understands, that should the DEVELOPER fail to complete any part of the work outlined in this agreement in a good and workmanlike manner as approved, the CITY shall reserve the right to withhold and withdraw all building permits within the PROJECT until all items of this Agreement have been fulfilled by the DEVELOPER.

B3.7 Off-Site Improvements

The DEVELOPER shall construct any and all off-site facilities that may be required to serve the PROJECT. Unless specifically noted in the Construction Plans and made a part of separate agreement with the CITY, the CITY shall not be required to reimburse the DEVELOPER for construction of off-site improvements.

B3.9 Inspection and Compliance

After construction begins, the CITY shall provide on-site construction inspection as the CITY deems necessary to ensure that all work is performed and completed in accordance with the Construction Plans, CITY specifications, and the contents of this agreement. In the event of a disagreement as to compliance with or interpretation of the Construction Plans and the CITY'S specifications, the decision of the CITY shall be final and binding on the DEVELOPER. If the DEVELOPER fails to construct in accordance with the approved Construction Plans or to comply with the CITY'S specifications, the CITY may issue a stop-work order and DEVELOPER, hereby, agrees to be bound by such order.

B3.10 Testing

The DEVELOPER agrees to pay the cost of all engineering, inspection, and laboratory cost incidental to construction of the streets, sidewalks, utilities, sewers, compacted fill material, and other facilities included within this agreement. Such testing includes, but is not limited to, material and density testing.

B3.11 Scrap Removal

The DEVELOPER agrees to comply with all local, state, and federal rules and regulations regarding waste material and debris disposal.

B3.12 Traffic Control

The DEVELOPER, hereby, agrees to prepare a traffic control/detour plan where required and shall submit said plan to the CITY for review and approval. All traffic control and safety devices, including

signs, lane markings, and barriers necessitated by construction activity undertaken pursuant to this agreement shall be installed and maintained by the DEVELOPER. All traffic control devices shall meet the standards and be installed in accordance with the latest edition of the Manual on Uniform Traffic Control Devices for Streets and Highways, published by the United States Department of Transportation.

B3.13 Temporary Facilities

The DEVELOPER shall provide all temporary facilities including but not limited to utilities and roadways, that are determined by the CITY to be required in connection with or as a result of interruption of service or access that occurs as a consequence of construction activity associated with the work covered by this agreement. Such temporary services shall in all regards and at all points in time be adequate to assure emergency access and adequate fire flows.

B4 Acceptance of Improvements

B4.1 Completion of Improvements

At such time as the improvements have been constructed and installed, in accordance with the Constructions Plans and specifications, required testing and inspections completed and found satisfactory, and all clean-up and cover-up has been done to the satisfaction the City Engineer, a letter requesting preliminary acceptance of the PROJECT will be provided by the DEVELOPER. Formal acceptance shall follow the procedure established in the Subdivision Regulations.

The DEVELOPER agrees the DEVELOPER shall have no claim, direct or implied, in the title or ownership of the IMPROVEMENTS specified in this agreement when the IMPROVEMENTS are complete and thereafter accepted by the CITY. The DEVELOPER will be responsible for construction failures and defects in PROJECT prior to final acceptance. During this period, it shall remain the responsibility of the DEVELOPER to correct and cure these defects and failures.

B4.2 As-Built Drawings and Post-Completion Items

The DEVELOPER agrees to furnish to the CITY as-built plans, on a reproducible, stable media, of the sanitary sewer, storm water management, water mains and service system, and streets within the subdivision before the CITY shall accept the subdivision.

B4.3 Acceptance of Facilities

Upon final acceptance of all or part of the IMPROVEMENTS in the PROJECT, then those IMPROVEMENTS shall become the property of the CITY free from all claims from any person or entity without the necessity of any further writing, agreement, or deed. The DEVELOPER further agrees that any facilities placed within a public or platted right-of-way or dedicated public easement are irrevocably dedicated to the public use without any right of reimbursement or compensation of any kind.

B4.4 Failure to Install

In the event the DEVELOPER fails to install the facilities in accordance with the terms of this agreement, the CITY may, in its sole discretion, elect to accept all or a portion of the IMPROVEMENTS in the PROJECT. Should the CITY choose to accept all or a portion of these IMPROVEMENTS, the CITY shall become the sole owner of these facilities. The CITY may give notice of acceptance by writing delivered to the DEVELOPER or recorded in the Register’s Office of Maury County, Tennessee. No further writing or deed shall be required.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed in multiple originals by persons properly authorized so, to do on or as of the day and year first given.

Greens Mill Road Consolidation Plat PROJECT	
Completed by the Developer	*Completed by the City*
Greens Mill Development Holdings, LLC DEVELOPER NAME	
AUTHORIZED AGENT NAME	CITY ENGINEER
SIGNATURE	SIGNATURE
DATE	DATE
18100 Von Karman Ave., Suite 500 STREET	
Invine, CA 92612 CITY, STATE, ZIP	
949.852.0700 PHONE	
patrick.woepse@steadfastco.com EMAIL	
Attest	*Attest*
ATTEST NAME	ATTEST NAME
ATTEST SIGNATURE	ATTEST SIGNATURE
DATE	DATE

Appendix B: Subdivision Development Agreement

This DEVELOPMENT AGREEMENT is made and entered into on this

_____ day of _____, 20_____ ,
between THE CITY OF COLUMBIA, TENNESSEE, (hereinafter the "CITY"), and

Greens Mill Development Holdings, LLC, the DEVELOPER (hereinafter the "DEVELOPER") named on the Addendum to this Agreement attached hereto and by this reference made a part hereof (hereinafter the "ADDENDUM").

WITNESSETH:

WHEREAS, the DEVELOPER desires to develop the property described on the ADDENDUM (hereinafter the "PROJECT"); and,

WHEREAS, the Development Plan of the PROJECT has been approved by the Columbia Municipal Planning Commission (hereinafter the “CMPC”) on the

14th day of September, 2022 ,
pursuant to Tennessee Code Annotated Title 13, Chapter 4, and the Subdivision Regulations of Columbia, Tennessee (hereinafter the "SUBDIVISION REGULATIONS”); and,

WHEREAS, the DEVELOPER is the owner of the PROJECT and has authority to engage in such development; and,

WHEREAS, the DEVELOPER desires to develop and improve said PROJECT; and,

WHEREAS, in order to provide for the health, safety, and welfare of future residents of the PROJECT, it will be necessary for certain improvements to the CITY'S utility systems, public infrastructure, and common areas to be constructed within and to serve the PROJECT including but not be limited to roads, bridges, sidewalks, pedestrian facilities, stormwater facilities, street signs, markings, signals, street lighting, recreation and park facilities, landscaping, and the like (hereinafter the “IMPROVEMENTS”); and,

WHEREAS, in order for the IMPROVEMENTS to be fully integrated with the utility systems and public infrastructure of the CITY and to function in a satisfactory manner, the DEVELOPER has agreed to construct, in accordance with the Subdivision Regulations and other rules, regulations, and ordinances of the CITY, the IMPROVEMENTS in said PROJECT and extend utilities to the PROJECT at their own cost; and,

WHEREAS, the CITY is willing to accept the dedication of the streets, utilities, and other improvements as determined in the Development Plan of the PROJECT, subject to the City of Columbia City Council approval by resolution, and subject to the applicant's compliance with all requirements in this agreement and applicable existing laws of the CITY of Columbia and the State of Tennessee,

NOW, THEREFORE, it is agreed and understood as follows:

B1 General Conditions

B1.1 Construction Costs

The DEVELOPER shall pay for all material and labor necessary to install and complete the roads, sidewalks, sewers, utilities, and other facilities in accordance with this agreement.

B1.2 City Ordinances, Rules and Regulations

All currently existing CITY ordinances, rules and regulations, and the Subdivision Regulations adopted by the CMPC are made a part of this agreement. In the event of a conflict between the terms of this agreement and a CITY ordinance, the ordinance shall prevail. In the event of a conflict between the terms of this agreement and the Subdivision Regulations, the Subdivision Regulations shall prevail. All work done under this agreement is to be performed in accordance with plans and specifications approved by the City and made a part, hereof.

B1.3 Fees

Review fees, inspection fees, and other amounts established by the CITY shall be paid prior to any review of the plans. If the DEVELOPER fails to install the facilities in accordance with the terms of this Agreement, no portion of the review fees, inspection fees, or other amounts paid to the CITY shall be refundable to the DEVELOPER.

B1.4 Inspection

The CITY shall have a continuous right to inspect the work and facilities to assure that the work and facilities are in accordance with the Subdivision Regulations, approved Construction Plans, and other rules, regulations, and ordinances of the CITY.

B1.5 Right of Entry

The CITY shall have the right, in case of breach of the Performance Agreement, to enter upon any property of the DEVELOPER and take all necessary actions to complete the work and obligations not completed.

B1.6 Easements

The DEVELOPER shall obtain and dedicate to the CITY or cause to be dedicated to the CITY, either by dedication on the plat or by easement deed, in either case in a form acceptable to the CITY, permanent easements of such widths as required by the CITY and noted on the Plans. The DEVELOPER further agrees to grant the necessary easements and rights-of-way across the DEVELOPER's properties without expense to the CITY and waive any claim for damages.

B1.7 Stormwater Maintenance Agreement

If the PROJECT includes any detention or retention ponds, common drainage ditches, water quality facilities, or stormwater facilities outside of the CITY rights-of-way, the DEVELOPER will submit a Stormwater Maintenance Agreement, to be filed with and recorded with the Final Plat.

B1.8 Attorney Fees and Other Expenses

The DEVELOPER shall pay all reasonable costs and expenses incurred by the CITY in enforcing or completing this agreement. The DEVELOPER shall pay all costs and expenses, including the CITY'S attorney fees, of any legal proceedings brought by the CITY against the DEVELOPER seeking remedies for the DEVELOPER'S failure to perform any of its obligations hereunder, whether or not any proceedings are prosecuted to judgment.

B1.9 Agreement Not Assignable

No third party shall obtain any benefits or rights under this agreement nor shall the rights or duties be assigned by either party.

B1.10 Revocation and Interpretation

This agreement shall bind the DEVELOPER when executed by the DEVELOPER and may not be revoked by the DEVELOPER without permission of the CITY, even if the agreement has not been executed by the CITY, or does not bind CITY, for other reasons. This agreement shall be interpreted in accordance with Tennessee law and may only be enforced in the Chancery Court or Circuit Court or Court of competent jurisdiction of Maury County, Tennessee, and Tennessee Appellate Courts.

B1.11 No Oral Agreement

This agreement may not be orally amended and supersedes all prior negotiations, commitments, or understandings.

B1.12 Separability

If any portion of this agreement is held to be unenforceable, the CITY shall have the right to determine whether the remainder of the agreement shall remain in effect, or whether the agreement shall be void and all rights of the DEVELOPER pursuant to this agreement terminated.

B 1.13 Transferability

The DEVELOPER agrees to not transfer the property on which this PROJECT is to be located without first providing the CITY with written notice. The transferee shall provide the CITY an Assumption Agreement of this Agreement, whereby the transferee agrees to perform the IMPROVEMENTS required under this agreement and to provide a performance surety. The DEVELOPER understands that if the DEVELOPER transfers said property without providing the notice of transfer and Assumption Agreement as required herein, they will be in breach of this agreement and in violation of the Subdivision Regulations.

B1.14 Indemnity

The DEVELOPER shall indemnify and hold the CITY harmless from all loss, costs, expenses, liability, money damages, penalties, or claims arising out of any work covered by this agreement, including any attorney fees incurred by the CITY in connection therewith. Inspection of the IMPROVEMENTS by an authorized representative of the CITY shall not constitute a waiver by the CITY of any defect or of any of the DEVELOPER'S obligations hereunder.

B1.15 Binding Effect

This agreement shall be binding upon the DEVELOPER and the DEVELEPOR's heirs, administrators, executors, assigns, and any other successors in interest.

B1.16 Entire Agreement

This document contains the entire agreement between the parties, and there are no collateral understandings or agreements between them. No variations or alterations of the terms of this agreement shall be binding upon either of the parties, unless the same be reduced to writing and made an amendment to this agreement.

B1.17 Headings

Paragraph titles and headings contained herein are inserted for convenience only and shall not be deemed a part of the agreement and in no way shall define, limit, extend, or describe the scope or intent of any provision, hereof.

B2 Performance Surety

At the time of execution of this agreement, the DEVELOPER shall provide the CITY a performance surety, in an amount determined by the City Engineer for the IMPROVEMENTS and other items specified by the Construction Plans, plats, and plans approved by the CMPC. This performance surety shall secure performance of all obligations of the DEVELOPER under this agreement. The performance surety shall meet all requirements established in Chapter 4: Performance Agreement of the Subdivision Regulations and secure full compliance with all terms and conditions of this agreement. The performance surety may be called for failure to comply with the provisions of this agreement in whole or in part according to the terms of the performance surety. The performance surety will not be released, except and until there has been full compliance with this agreement.

B3 Construction

B3.1 Construction Plans

The DEVELOPER shall submit to the CITY, Construction Plans describing in reasonable detail all utility systems, all storm water management systems, all street systems, pedestrian facilities, and all IMPROVEMENTS. The Construction Plans shall be designed according to the Engineering Standards and Specifications, all other codes and ordinances enforced by the City, and sound engineering judgment. The design of all utility systems shall follow the State of Tennessee and utility provider design criteria and specifications. In the event of a disagreement as to compliance with or interpretation of the Construction Plans and the CITY'S specifications, the decision of the CITY shall be final and binding on the DEVELOPER. The Construction Plans shall be prepared by a design professional licensed by the State of Tennessee to design all systems and shall bear the seal, signature, date, and license number of the professional preparing the Construction Plans.

B3.2 Commencement of Construction

Construction of IMPROVEMENTS may not begin until the following events have occurred:

A. The Preliminary Plat has been approved by the CMPC;
B. The Construction Plans are approved by the CITY;
C. The Tennessee Department of Environment and Conservation has approved the applicable portions of the Plans and has confirmed its approval to the CITY and/or DEVELOPER in writing;
D. The CITY shall have received an appropriately executed Development Agreement; and
E. The DEVELOPER shall give the CITY notice of commencement of construction, in writing at least one (1) working day prior to commencement.

B3.3 Site Grading

The DEVELOPER, hereby, agrees to construct all site grading to comply with the approved Construction Plans, including the approved Erosion Control Plan for the PROJECT and to comply with the Engineering Standards and Specifications, Stormwater Ordinance, and all other codes and ordinances enforced by the CITY.

B3.4 Storm Water Management Systems

The DEVELOPER shall be responsible for all storm water management work made necessary by the development of this PROJECT. It is understood and agreed that the CITY in its proprietary function is not and could not be expected to oversee, supervise, or direct the construction of all drainage improvements, and the excavation incident thereto. Neither is the CITY vested with the original design responsibility nor the means to formally survey elevations or the locations of improvements at every stage of the construction process. The CITY is vested with the right of periodic inspections, stop work order, and final approval as a measure of secondary or subsequent enforcement. The DEVELOPER has and shall retain the responsibility to properly anticipate, survey, design and construct the subdivision storm water improvements and give full assurance that same shall not adversely affect the flow or quality of surface water from or upon any property. In providing technical assistance, plan and design review, the CITY does not and shall not relieve or accept any liability from the DEVELOPER.

B3.5 Street Construction

The DEVELOPER, hereby, agrees to construct and improve the streets shown on the Construction Plans to comply with the CITY's specifications and to the satisfaction and approval of the City Engineer by grading, draining, subgrade preparation, base preparation, curbing, signage, striping, signalization, sidewalk installation, and paving with the required preparation, amounts, and types of material. The DEVELOPER further agrees to pay the cost of all engineering, inspection and laboratory cost incidental to the construction of subdivision streets including but not limited to material and density testing. The DEVELOPER further agrees to make all necessary adjustments to manholes and valve boxes to meet finished surface grade and to repair subsurface or base material, as required, in areas directed by the CITY Engineer, prior to application of final surface.

B3.6 Time Period for Construction

The DEVELOPER agrees to be bound to complete, within three (3) years of commencement of construction, all IMPROVEMENTS shown on the plat and plans and all things required by this agreement.

The DEVELOPER further agrees that if due to unforeseen circumstances, he is unable to complete all work included in this agreement within the time specified above, but desires to complete said agreement to the satisfaction of the CITY, the DEVELOPER shall submit a written request for extension of the agreement period to the CITY at least sixty (60) days prior to the expiration of the existing agreement period, specifying the reason for the DEVELOPER's failure to complete the work as agreed and a prospective date for such completion. The DEVELOPER further agrees that if the performance surety executed to secure the value of the work to be performed under this agreement, due to inflation or rising costs, is determined to be inadequate by the City Engineer to secure the cost of said IMPROVEMENTS at the time an extension is sought, the DEVELOPER will provide the additional security to bring the performance surety amount in line with current cost projections as made by the CITY. The DEVELOPER understands that the DEVELOPER's failure to follow the extension procedure constitutes a breach of this agreement and places the DEVELOPER in violation of the Subdivision Regulations. The DEVELOPER further understands, that should the DEVELOPER fail to complete any part of the work outlined in this agreement in a good and workmanlike manner as approved, the CITY shall reserve the right to withhold and withdraw all building permits within the PROJECT until all items of this Agreement have been fulfilled by the DEVELOPER.

B3.7 Off-Site Improvements

The DEVELOPER shall construct any and all off-site facilities that may be required to serve the PROJECT. Unless specifically noted in the Construction Plans and made a part of separate agreement with the CITY, the CITY shall not be required to reimburse the DEVELOPER for construction of off-site improvements.

B3.9 Inspection and Compliance

After construction begins, the CITY shall provide on-site construction inspection as the CITY deems necessary to ensure that all work is performed and completed in accordance with the Construction Plans, CITY specifications, and the contents of this agreement. In the event of a disagreement as to compliance with or interpretation of the Construction Plans and the CITY'S specifications, the decision of the CITY shall be final and binding on the DEVELOPER. If the DEVELOPER fails to construct in accordance with the approved Construction Plans or to comply with the CITY'S specifications, the CITY may issue a stop-work order and DEVELOPER, hereby, agrees to be bound by such order.

B3.10 Testing

The DEVELOPER agrees to pay the cost of all engineering, inspection, and laboratory cost incidental to construction of the streets, sidewalks, utilities, sewers, compacted fill material, and other facilities included within this agreement. Such testing includes, but is not limited to, material and density testing.

B3.11 Scrap Removal

The DEVELOPER agrees to comply with all local, state, and federal rules and regulations regarding waste material and debris disposal.

B3.12 Traffic Control

The DEVELOPER, hereby, agrees to prepare a traffic control/detour plan where required and shall submit said plan to the CITY for review and approval. All traffic control and safety devices, including

signs, lane markings, and barriers necessitated by construction activity undertaken pursuant to this agreement shall be installed and maintained by the DEVELOPER. All traffic control devices shall meet the standards and be installed in accordance with the latest edition of the Manual on Uniform Traffic Control Devices for Streets and Highways, published by the United States Department of Transportation.

B3.13 Temporary Facilities

The DEVELOPER shall provide all temporary facilities including but not limited to utilities and roadways, that are determined by the CITY to be required in connection with or as a result of interruption of service or access that occurs as a consequence of construction activity associated with the work covered by this agreement. Such temporary services shall in all regards and at all points in time be adequate to assure emergency access and adequate fire flows.

B4 Acceptance of Improvements

B4.1 Completion of Improvements

At such time as the improvements have been constructed and installed, in accordance with the Constructions Plans and specifications, required testing and inspections completed and found satisfactory, and all clean-up and cover-up has been done to the satisfaction the City Engineer, a letter requesting preliminary acceptance of the PROJECT will be provided by the DEVELOPER. Formal acceptance shall follow the procedure established in the Subdivision Regulations.

The DEVELOPER agrees the DEVELOPER shall have no claim, direct or implied, in the title or ownership of the IMPROVEMENTS specified in this agreement when the IMPROVEMENTS are complete and thereafter accepted by the CITY. The DEVELOPER will be responsible for construction failures and defects in PROJECT prior to final acceptance. During this period, it shall remain the responsibility of the DEVELOPER to correct and cure these defects and failures.

B4.2 As-Built Drawings and Post-Completion Items

The DEVELOPER agrees to furnish to the CITY as-built plans, on a reproducible, stable media, of the sanitary sewer, storm water management, water mains and service system, and streets within the subdivision before the CITY shall accept the subdivision.

B4.3 Acceptance of Facilities

Upon final acceptance of all or part of the IMPROVEMENTS in the PROJECT, then those IMPROVEMENTS shall become the property of the CITY free from all claims from any person or entity without the necessity of any further writing, agreement, or deed. The DEVELOPER further agrees that any facilities placed within a public or platted right-of-way or dedicated public easement are irrevocably dedicated to the public use without any right of reimbursement or compensation of any kind.

B4.4 Failure to Install

In the event the DEVELOPER fails to install the facilities in accordance with the terms of this agreement, the CITY may, in its sole discretion, elect to accept all or a portion of the IMPROVEMENTS in the PROJECT. Should the CITY choose to accept all or a portion of these IMPROVEMENTS, the CITY shall become the sole owner of these facilities. The CITY may give notice of acceptance by writing delivered to the DEVELOPER or recorded in the Register’s Office of Maury County, Tennessee. No further writing or deed shall be required.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed in multiple originals by persons properly authorized so, to do on or as of the day and year first given.

Greens Mill Road Consolidation Plat PROJECT	
Completed by the Developer	*Completed by the City*
Greens Mill Development Holdings, LLC DEVELOPER NAME	
AUTHORIZED AGENT NAME	CITY ENGINEER
SIGNATURE	SIGNATURE
DATE	DATE
18100 Von Karman Ave., Suite 500 STREET	
Invine, CA 92612 CITY, STATE, ZIP	
949.852.0700 PHONE	
patrick.woepse@steadfastco.com EMAIL	
Attest	*Attest*
ATTEST NAME	ATTEST NAME
ATTEST SIGNATURE	ATTEST SIGNATURE
DATE	DATE

CITY OF COLUMBIA TENNESSEE

DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy of submittal on USB thumb drive or CD*
Fold hard copy submittals larger than 8½"x11"

ADDRESS/LOCATION	2446 Nashville HWY / 2417 Greens Mill Rd / 2417 Greens Mill Rd		
	TAX MAP: 051	GROUP:	PARCEL: 19.00, 20.00, 20.01
SUMMARY OF NATURE OF REQUEST AND WORK	The applicant is requesting approval of the submitted preliminary and final plat to combine the three parcels mentioned above. The plat also dedicated adequate Right-of-Way for the improvements to the Greens Mill/Nashville HWY intersection and the public utilities being proposed by others.		

REQUEST DATE FOR PRE-APPLICATION CONFERENCE	N/A	*Pre-application meetings are scheduled for Wednesdays.*

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
❑ Annexation ❑ Rezoning ❑ Sketch Plat – *Must be submitted at least two weeks prior to Preliminary Plat submittal* ☒ Preliminary Plat ☒ Final Plat ❑ PUD Preliminary Master Plan + Checklist ❑ PUD Final Site Plan + Checklist ❑ Multi-Family Site Plan ❑ Other: _____ **File naming nomenclature examples:* *Freedom Point Site Plan* *Freedom Point Master Plan* *Freedom Point Final Plat* *Freedom Point Elevations*	<u>Annexations/Rezoning:</u> ❑ Written Legal Description copy ❑ Requested Zone Listed ❑ Compliance with Comprehensive Plan ❑ Annexation Permission Form ❑ Plans and/or Plats conforming to City standards <u>Plats/PUDs:</u> • Project Name (include Sections & Phases) _____ • Total Number of Lots _____ • Total acreage _____

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	Colton Dorris	PHONE	931.561.4604
ADDRESS	10 Lea Avenue, Suite 400, Nashville, TN 37210	EMAIL	Colton.dorris@kimley-horn.com

PROPERTY OWNER NAME	Greens Mill Development Holdings, LLC	PHONE	(949) 518-2191
ADDRESS	18100 Von Karman, Suite 500 Irvine, CA 92612	EMAIL	patrick.woepse@steadfastco.com

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

APPLICANT NAME	APPLICANT SIGNATURE	DATE
Greens Mill Development Holdings, LLC Dinesh Davar, Authorized Signer	Dinesh Davar (Dec 14, 2023 17:13 PST)	Dec 14, 2023
PROPERTY OWNER NAME	PROPERTY OWNER SIGNATURE	DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	

DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS	
DATE OF PUBLIC NOTICES IN DAILY HERALD	

BOARD ACTION	

Greens Mill Application

Final Audit Report 2023-12-15

Created:	2023-12-14
By:	Breana Finney (Breana.Finney@SteadfastCo.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAA2uVbTvIgLuXJJWEXwEF7ipPEGxMWsB3a

"Greens Mill Application" History

Document created by Breana Finney (Breana.Finney@SteadfastCo.com)
2023-12-14 - 9:48:35 PM GMT- IP address: 72.194.102.130

Document emailed to Dinesh Davar (dinesh.davar@steadfastco.com) for signature
2023-12-14 - 9:48:53 PM GMT

Email viewed by Dinesh Davar (dinesh.davar@steadfastco.com)
2023-12-15 - 1:12:44 AM GMT- IP address: 68.111.85.238

Document e-signed by Dinesh Davar (dinesh.davar@steadfastco.com)
Signature Date: 2023-12-15 - 1:13:41 AM GMT - Time Source: server- IP address: 68.111.85.238

Agreement completed.
2023-12-15 - 1:13:41 AM GMT

From: Keli Frymire
To: Paul Keltner; Austin Brass; Kevin McCarthy
Cc: Joshua Gibbs; Ty; Greg Gamble; Brad Snyder; Tyler Gray
Subject: [Caution External Email] - Columbia Bluffs - Planning Commission Deferral Request
Date: Monday, February 12, 2024 4:43:14 PM
Attachments: image001.png

Good afternoon all,
I spoke with Kevin today on the phone and am sending this email as a follow up to that conversation.

We request to defer the Columbia Bluffs PUD-R and Columbia Bluffs CD-4 annexation and rezoning projects from the February 14, 2024 Planning Commission agenda to the March 13, 2024 agenda. We would like to ensure that we have the appropriate time to work through the late sewer comments and remove any uncertainty surrounding this issue. Additionally, Kevin and I discussed the Land Use policy amendment for the CD-4 parcel and will need to also use this time to update this request to include the land use policy change.

Thank you again for working with us on these projects.

Keli Frymire | PLA
Mailing: 3020 Stansberry Lane, Suite 201; Franklin, TN 37069
Physical: Freeport, FL
keli@gdc-tn.com
Mobile: (706) 566-6480
www.gdc-tn.com

Columbia Bluffs Planned Unit Development

Project #:	23-0414	Location:	Tax Map 90 Parcel 12.01
Applicant:	Greg Gamble	Case Type(s):	Annex, RZ, Pre. PUD Master Plan
Staff Planners:	Kevin C. McCarthy, AICP Austin Brass, AICP	Proposed Use:	Single-Family Homes & Daycare

PROJECT SUMMARY

The applicant requests annexation with a plan of services and rezoning of a 409.92-acre site to Planned Unit Development Residential (PUD-R). The subject site is located along the Duck River between Iron Bridge Road and Bear Creek. The applicant further requests approval of a Preliminary PUD Master Plan to develop 800 homes and a daycare facility. The subject property is part of a larger existing parcel. The extent of the proposed PUD is located outside the city but within its Urban Growth Boundary. The subject site includes most a larger parcel, a small portion of which is located within Columbia's corporate limits. The Zoning Ordinance requires the Planning Commission and City Council to determine that a Planned Unit Development is warranted prior to approving the rezoning and Preliminary Master Plan. The zoning conformity section of the report addresses these criteria.

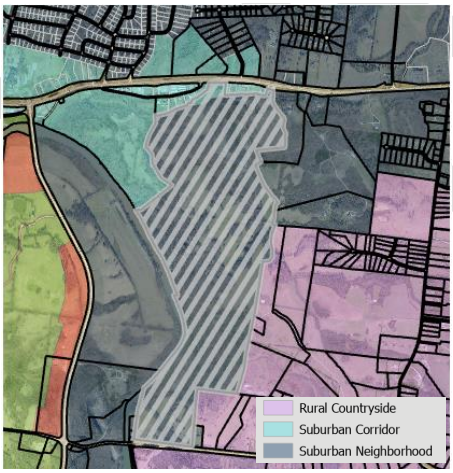
- The applicant proposes a customized set of standards which deviate from the PUD-R standards and offers justification for each deviation.
- The Architectural Design Review Team evaluated proposed elevations and made a recommendation to the Planning Commission. The recommendation includes deviations from the PUD-R standards.
- The Development Review Committee evaluated the proposal twice. City staff communicated with the applicant on multiple occasions as the proposal progressed through the review process. The applicant incorporated some recommendations from staff and declined others.
- The Parks & Greenways element of Connect Columbia indicates that development of this parcel should include a greenway and other park space.
- The Wastewater Department has advised the applicant to minimize the use of pump stations.
- The Planning Commission is the **recommending body** for the annexation, rezoning, and PUD Master Plan.
- Professional planning staff commentary identifies recommended conditions of approval.
- Templates are provided at the end of the report to assist the Planning Commission in crafting properly formatted motions.

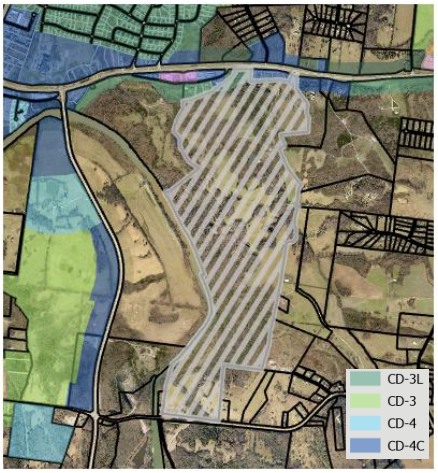
SITE INFORMATION

CURRENT ZONING	EXISTING USE	EXISTING IMP.	LAND AREA
Unincorporated	Vacant	Various Structures	+/- 409.92



FUTURE LAND USE MAP	ZONING MAP





SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	Suburban Neighborhood	Unincorporated	Vacant
North	Suburban Corridor	CD-3L/CD-4C	Single Family
South	Suburban Neighborhood	Unincorporated	County Park
East	Suburban Corridor	CD-3L/Unincorporated	Single Family
West	Rural Countryside	Unincorporated	Single Family/Duck River

CONSISTENCY WITH CONNECT COLUMBIA

Suburban Neighborhood: The future land use of the subject site is Suburban Neighborhood. The Character Area is characterized by a residential development and neighborhoods, with limited, intermixed and compatible civic uses (Connect Columbia, p. 22). The Future Land Use Plan indicates that "the general development pattern is defined by a single use activity on individual lots" (Connect Columbia, p. 22). Green space is largely incorporated on individual lots; neighborhood and community parks should be located within neighborhoods to enhance the quality of life. Development should emphasize connectivity and housing diversity (Connect Columbia, p. 23). The Character Area Matrix from page twenty-two of the Future Land Use Plan (excerpted below) is a guide to approving requests for zoning map amendments and Planned Unit Developments. The future land use classification is implemented by the CD-3L and CD-3 character districts, as well as PUDs.

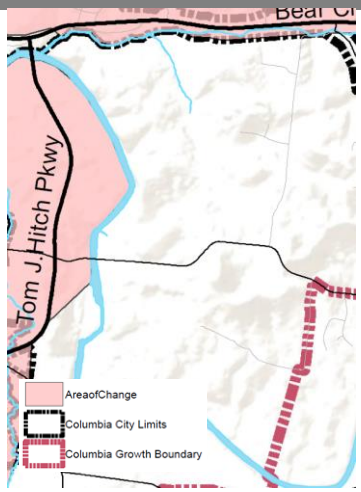
DRAFT

CHARACTER AREA MATRIX

	Development Pattern	Zoning Category and Uses	Infrastructure	Design Standard
SUBURBAN NEIGHBORHOOD	**Is the property in an Area of Change?** **No:** The development pattern is established. Changes to overall character of the area should rarely occur. **Yes:** The development pattern is evolving. Changes to the area are likely as development occurs. New development should respect both the natural environment and blend with existing, surrounding neighborhood assets.	**Residential Uses Zoning Category:** Low Density Residential District and Medium Residential. **Public and Civic Uses Zoning Category:** Religious Facilities, Government Facilities (low impact), and Educational Facilities.	**Not in an Area of Change:** Limited new services, with mostly in-fill enhancements to existing infrastructure. **Within an Area of Change:** Extensions to transportation, water, sewer, and other services should be expected. New service or extensive redevelopment of existing services should be vetted and reviewed by Planning Commission and City Council as a primary element of approval.	Scale: New dwellings and structures should be compatible with the established character of the area. Architecture: New developments should include a mix of architectural styles. Residential garages, if front-facing, should be recessed from the front façade of the structure. Civic use should respect the residential character, while providing architectural interest.

AREA OF CHANGE

The subject site **is not located** in an Area of Change (Connect Columbia Map 3). In 2017 the Planning Commission determined that the development pattern was established. Changes to overall character of the area should rarely occur. The designation does not necessarily mean that any particular development proposal is inconsistent with Connect Columbia. It does mean that the Planning Commission may pause to ensure the context of the area surrounding the subject property is considered fully in the review process. (Connect Columbia p. 14).



CONFORMITY WITH ZONING ORDINANCE

- **The Planning Commission may determine that the condition of the subject site and the innovative nature of the proposed development presents an exceptional situation as described in §8.5.21.B.2 of the Zoning Ordinance.**
    - The Ordinance requires that that Planning Commission and City Council make formal, written findings regarding each of the criteria listed in §8.5.21.B.2.
    - Under **§8.5.21.B.2.a**, the Planning Commission must determine that the Preliminary Master PUD Development Plan is necessary to implement the Comprehensive Plan is consistent with Connect Columbia, the Comprehensive Plan.
        - The applicant maintains that the proposed alternative standards are consistent with Connect Columbia's visions for the Suburban Neighborhood future land use.
    - Under **8.5.21.B.2.b**, the Planning Commission must determine that due to unique site conditions or the necessary and intrinsic uses, size, or form of the Development, such Development cannot under any other plan, design, or circumstances conform to one of more of the character districts specified in the Ordinance.
        - The applicant maintains that the uniqueness of the land and its proximity to the Duck River warrants use of special customized standards which provide for greater environmental protection.
        - The applicant posits that by using smaller lots and customized Throughfare standards, the proposed development will provide high quality housing and amenities in less environmentally impactful manner than a development under CD-3L or CD-3.
        - The applicant also suggests that the bulk and design standards of the character districts within the zoning ordinance are not conducive to the age-restricted portion of the community.
    - Under **8.5.21.B.2.c**, the Planning Commission must determine that the Master PUD Development Plan provides an innovative plan of development that is harmonious with the features of the subject property and character of adjacent property. The Commission must determine that the plan promotes quality design and environmentally sensitive development by taking advantage of special site characteristics, locations and land uses.
        - The applicant emphasizes the uniqueness of the land and its proximity to the Duck River. The applicant believes that the proposed customized

standards provide for greater environmental protection and higher quality development than can be achieved without a PUD.

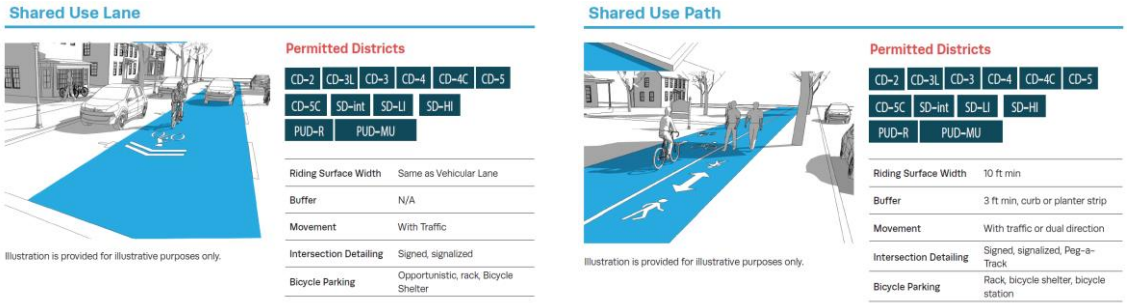
- Under **8.5.21.B.2.d**, the Planning Commission must determine that there are sufficient existing infrastructure, services, and utilities available to the site prior to Development.
  - The applicant obtained will-serve and availability letters from utility providers. Additional comments were identified in the Development Review Committee comments. A traffic impact study identifies improvements necessary to maintain the established level of service. Staff has additional concerns related to the impact of the development on parks and greenways level of services and the sanitary sewer design for the development (see planning staff commentary below). The Planning Commission must determine that sufficient existing infrastructure, services, and utilities are available to the site prior to development.

Blocks, Thoroughfares & Connectivity

- **The proposed PUD Preliminary PUD Master Plan proposes a customized alternative set of Throughfare assemblies which do not conform to the standard assemblies in Article 5 of the Zoning Ordinance.**
  - Table 5.2.2.G-1 indicates that the Urban Neighborhood Street (70' wide), Urban Center Street (65' wide), and 2-Lane Avenue (90' wide) are appropriate Throughfare assemblies for PUD-R.
  - Table 5.2.2.G-1 establishes the elements of the Thoroughfares, Internal Drives and Alleys.
  - The applicant has proposed several alternatives to the prescribed standards. These alternatives use the same width of right-of-way and provide the same elements as the prescribed standards but modify the dimensions of some features (e.g. a 5' wide sidewalk with a 10' multiuse path rather than two 5' wide sidewalks).

- **The applicant proposes to provide Bikeways via Share Use Lanes.**
  - The Zoning Ordinance requires developments greater than 80 acres to provide a bicycle network comprised of bikeway types listed in Table 5.2.4.B. Except for the roadway sections containing the multiuse path, the applicant proposes to utilize shared use lanes.
  - Bicycles and motor vehicles utilize the same travel lane in a shared use lane.

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- **The proposed PUD Preliminary Master Plan generally conforms to the standard for block formation and size**.
    - The Zoning Ordinance requires that Thoroughfares on development sites be arranged to form blocks (§ 5.2.2.D, p.308).
    - A block perimeter may not exceed 2,000 feet (Table 4.3.1-K, p. 157; Table 5.2.2.D, p. 308).
    - The term block is defined in § 9.3 (p. 482) to include lots and building sites circumscribed by thoroughfares and alleys.
    - For the most part, the proposed master plan depicts lots arranged into conforming blocks.
    - Some of the perimeter lots, as well as some of the larger lots in the southern portion of the development, are not part of the blocks. This is permitted at the edge of a development parcel under § 5.2.2.D. Several lots in the southern portion of the site are located outside of blocks to account for the shape and topography of the site.

Civic Spaces

- **The proposed Preliminary PUD Master Plan provides the required Civic Space in the form of Playgrounds, Greens, Pocket Parks and other Civic Space types dispersed throughout the development.**
    - Section 5.3.1 of Zoning Ordinance requires any development parcel[1] to utilize at least 5% but no more than 20% of its gross acreage as Civic Space conforming to the standards of Table 5.3.3-A.

[1] Development Parcel: a parcel of land: (1) which, either alone or together with one or more other parcels under a common Development scheme, program or plan, is ten (10) or more gross acres; (2) with respect to the Development of which any new Thoroughfare, Internal Drive, or extension or change of the design of any existing Thoroughfare or Internal Drive is required or will be made or proposed; or (3) with respect to which any District assignment or any Thoroughfare or Internal Drive or alignment thereof is proposed to be made or changed by a Zoning Map or Zoning Map amendment. (§ 9.3, p. 490).

- The applicant proposes to dedicate 84.89 acres (20.7%) of the 409-acre site to formal Civic Space meeting the standards of the Ordinance.
- The applicant proposes to provide additional amenitized open space, in excess of the 20% Civic Space maximum.
- Section 5.3.3 offers eight Civic Space types that include green space, natural areas, pocket parks, etc.
- Each Civic Space type has its own standards for intent, size, frontage, character, and typical facilities.
- Section 5.3.3.B further requires civic space designed and equipped as a playground within 800 feet of every lot or building site within a PUD-R development.
- The applicant proposes to provide ten Civic Spaces. All of them are Greens; some include playgrounds. The proposed master plan depicts typical facilities including playground equipment, benches, dog park, community garden, trails, and water features.

Space	Area
A	5.89 acres
B	0.59 acres
C	0.90 acres
D	6.12 acres
E	3.68 acres
F	0.51 acres
G	1.24 acres
H	0.64 acres
I	1.64 acres
J	63.68 acres

- The largest of these spaces, Green J, is much larger than the maximum area of a Green allowed by Table 5.3.3-B of the Ordinance. The applicant proposes to deviate from the standard Civic Space type as part of the PUD process. The proposed Civic Space places the most sensitive portions of the site outside the area of development. It also features extensive primitive walking trails and a multipurpose field.

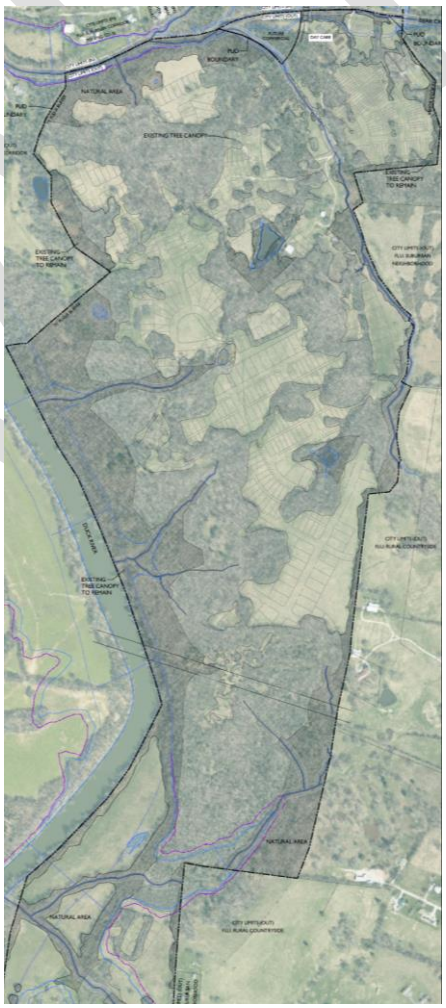
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Tree Preservation

- **Section 4.3.16 of the Zoning Ordinance requires a percentage of existing tree cover to be preserved based upon the existing canopy on the development site.**
  - The applicant's tree preservation plan identifies 262.4 acres (64%) of the 409-acre site as existing tree canopy.
  - Table 4.3.16.L of the Ordinance requires retention of at least 36% of the existing canopy.
  - The applicant's tree preservation plan proposes to preserve and/or replant 39% of the existing tree canopy and identifies 101.5 acres of tree save areas.
  - Much of the area shown as tree save area is on the southern and western portions of the site. At the request of planning staff, the applicant adjusted the grading plan in part to ensure maximum tree preservation in this portion of the property.

Existing Tree Canopy Cover (as % of Total Development, Lot or Building Site Size)	Minimum Tree Canopy Retention by Zoning District (as % of Total Tree Canopy Cover) [1] [2]		
	CD-2 CD-3L CD-3 CD-4 [3] CD-4C [3] CD-5C [3] SD-MHP SD-INT [3] PUD-R PUD-MU [3]	CD-4 [4] CD-4C [4] CD-5C [4] SD-INT [4] PUD-MU [4]	SD-LI [4] SD-HI
80% – 100%	30%	15%	10%
60% – 79%	36%	18%	11%
40% – 59%	45%	22%	12%
20% – 39%	48%	24%	13%
19% – less	54%	26%	14%

[1] Additional tree canopy retention may be required under other provisions of this Ordinance.
[2] CD-5 and CV do not have a minimum tree canopy retention requirement.
[3] Residential portion of Development or construction in noted Districts.
[4] Non-Residential portion of Development or construction in noted Districts.



If the Preliminary Master Plan is approved, Development Services staff will confirm conformity with the standards of § 4.3.16 during subsequent reviews when more is known about condition of existing canopy, including the location of heritage/specimen trees, and any factors which may impact tree save areas.

Architecture

- **Prior to review by the Planning Commission, the Architectural Design Review Team must review and make a recommendation on the design of all buildings in a Planned Unit Development (§ 8.5.21.L, p. 457).**
    - On January 9th, 2024, the City of Columbia Architectural Design Review team conducted a thorough assessment of this proposal in accordance with the standards outlined in the Zoning Code.
    - The Architectural Design Review team recommended approval of this request, including deviations from the design standards, which have been highlighted in red below.
    - This recommendation is being presented to the Planning Commission with this request as part of the Planned Unit Development process. Notably, this development parcel comprises a total of 800 dwelling units, consisting of:
        - 296 active adult homes;
        - 151 rear-loaded single-family homes;
        - 93 courtyard homes;
        - 94 large lot homes; and
        - 166 townhomes.

      In addition, a 12,000-14,000 SF daycare facility is proposed utilizing a commercial budling type including a clubhouse amenity space.

    - Both of these uses are permitted within the PUD-R district. It's important to note that the highlighted text in red indicates deviations from the base standards of the PUD-R Character District.
    - The Architectural Design Review Team (ART) recommended approval of the facades of the proposed single-family homes with modifications to the PUD-R standards as summarized in the table below. The applicant's proposed deviation are noted in red.

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(PUD-R) District Standards : Single-Family Homes		
Design Standards:	**Required**	**Proposed**
Vertical Composition:	Identifiable Base, Middle, & Cap	All elevations indicate a defined base. This may with a brick rowlock course at foundations for brick elevations and a brick or stone base for non-brick elevations.
Finished Floor Elevation:	Min 18 inches above finished grade	Active Adult Homes: **0 inches above finished grade at façade for ADA accessibility;** all other homes consist of a minimum of 18 inches above finished grade.
Façade Position & Façade Articulation:	Main entrance at façade & position parallel to frontage line	All lots/home sites front a street section.
Façade Openings:	20 ft. or less spacing for windows/doors	All windows appear to be 20 ft. or less with no blank facades.
Façade Glazing:	20-60 %	Glazing appears to be at least 20 percent.
Window Shape:	Square or vertical proportions	All windows are square or vertical proportioned
Window Alignment:	Upper floor windows and other features must be aligned with those of first floor	All upper-level windows align with lower-level windows.
Window Types:	Single-hung, double-hung, casement	All windows adhere to the window type standards as described.
Window Glazing Material:	Clear	All windows proposed are clear glass.
Window Trim in 1st Layer:	Min 4 in. trim with sill and top plate/ soldier course above lintel and rowlock course below sill	Elevations are consistent with window trim details and rowlock course below window sills and soldier course above windows for brick elevations.
Shutters:	Functional to cover half of window width/ shutter dogs	Elevations do not indicate the use of shutters.
Façade Window Sill Height:	5 ft. min above grade	Active Adult Homes: **2ft. min above grade** Courtyard Homes: **3 ft. min above grade** All other homes: 5 ft. min above grade
Porch Frontages:	Min. 6ft. clear depth, excluding rails, pillars, columns	A note has been provided that indicate a porch width minimum of 6’
Façade Variety:	No façade may exist more than once on a block face	A detail has been provided to indicate variety of facades to ensure that a façade is not present

	or within view of same façade	more than once on a block face or in view of the same façade.
Roof Type & Pitch:	Hip/ Gable	All roofs appear to be of a hip and gable design.
Primary Building Materials:	Brick, Fiber Cement Board, Wood	All elevations indicate a primary façade material of brick & fiber cement board.
Foundation Cladding:	Brick or Natural Stone	Some elevations that are fiber cement board do indicate a foundation cladding of brick or natural stone
Porch Pier/ Chimney Cladding:	Brick or Natural Stone & any space under porch concealed by lattice/ brick or natural stone for chimney	All elevations indicate a porch pier that is clad in brick or natural stone; **cladding excluded if column is a 6 X 6 cedar column from roof line to porch.**
Garage Location:	3rd Layer *(20 ft. behind primary façade)*	**Active Adult Homes: 2nd Layer** **Courtyard Homes: 2nd Layer** **Large Lot Homes: 2nd Layer** Single Family Alley Loaded: 3rd Layer
Garage Design:	Min. interior dimensions 10 X 20 per vehicle Parking Space. Garage door must have ornamental lighting above with a carriage house door design.	Garage design indicates a 10 X 20 per vehicle parking space. Noting that each garage will have an ornamental lighting fixture above it.
Garage Door Width:	9ft width with 2ft separation between door	**Elevations exceed the 9' garage door maximum width requirements with a 16' maximum width proposed.**

- The Architectural Design Review Team (ART) recommended approval of the facades of the proposed townhome designs with modifications to the PUD-R standards as summarized in the table below. The applicant's proposed deviation are noted in red.

(PUD R) District Standards : Townhomes		
Design Standards:	**Required**	**Proposed**
Vertical Composition:	Identifiable Base, Middle, & Cap	Elevations indicate a defined base, middle, and cap for all townhomes.
Finished Floor Elevation:	Min 18 inches above finished grade	Min 18 inches
Façade Position & Façade Articulation:	Main entrance at façade & position parallel to frontage line	All townhomes enfront a street section
Façade Openings:	20 ft. or less spacing for windows/doors	All windows appear to be 20 ft or less with no blank facades.
Façade Glazing:	20-60 %	Glazing appears to be at least 20 percent.
Window Shape:	Square or vertical proportions	All windows are square or vertical proportioned.
Window Alignment:	Upper floor windows and other features must be aligned with those of first floor	All windows align with those on the first floor.
Window Types:	Single-hung, double-hung, casement	All windows adhere to the window type standards as described.
Window Glazing Material:	Clear	All windows proposed are clear glass.
Window Trim in 1st Layer:	Min 4 in. trim with sill and top plate/ soldier course above lintel and rowlock course below sill	Elevations appear to consist of window trim details and rowlock course below window sills and soldier course above windows for brick elevations.
Shutters:	Functional to cover half of window width/ shutter dogs	All shutters will be functional with shutter dogs
Façade Window Sill Height:	5 ft. min above grade	5 ft. min above grade
Porch Frontages:	Min. 6ft. clear depth, excluding rails, pillars, columns	A note has been provided that indicate a porch width minimum of 6'
Façade Variety:	No façade may exist more than once on a block face	A detail has been provided to indicate variety of facades to ensure that a façade is not present more than once on a block face or in view of the

	or within view of same façade	same façade for single-family homes. This detail was not provided for the townhome section but can apply.
Roof Type & Pitch:	Hip/ Gable	Hip & gable elements are provided for roof type and pitch.
Primary Building Materials:	Brick, Fiber Cement Board, Wood	Brick and fiber cement board have been indicated as the primary materials for townhomes.
Foundation Cladding:	Brick or Natural Stone	Elevations that are fiber cement board indicate a foundation cladding of brick or natural stone.
Porch Pier/ Chimney Cladding:	Brick or Natural Stone & any space under porch concealed by lattice/ brick or natural stone for chimney	Brick or natural stone.
Garage Location:	3rd Layer (20 ft. behind primary façade)	All townhomes are proposed to be rear loaded with garages being located in the 3rd layer in adhered to this design standard.
Garage Design:	Min. interior dimensions 10 X 20 per vehicle Parking Space. Garage door must have ornamental lighting above with a carriage house door design.	All unites are proposed to be rear loaded with garages located in the 3rd layer.
Garage Door Width:	9ft width with 2ft separation between door	N/A, garages located in 3rd layer and will be rear loaded.

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- The Architectural Design Review Team (ART) recommended approval of the facades of the proposed day care facility design with modifications to the PUD-R standards as summarized in the table below. The applicant's proposed deviation are noted in red.

(PUD R) District Standards : Day Care Facility		
Design Standards:	**Required**	**Proposed**
Vertical Composition:	Identifiable Base, Middle, & Cap	All structure indicates a defined base, middle, and cap.
Finished Floor Elevation:	Min 18 inches above finished grade	**That finished floor elevation match finished grade for ADA accessibility with no knee wall.**
Façade Position & Façade Articulation:	Main entrance at façade & position parallel to frontage line	The proposed daycare enfronts a proposed street section with entrance.
Façade Openings:	20 ft. or less spacing for windows/doors	All windows appear to be 20 ft or less with no blank facades
Façade Glazing:	20-60 % (70% glazing for shopfront elevation)	Shopfront elevation will require a 70 percent glazing requirement.
Window Shape:	Square or vertical proportions	All windows are square or vertical proportioned.
Window Alignment:	Upper floor windows and other features must be aligned with those of first floor	All windows align with those on the first floor.
Window Types:	Single-hung, double-hung, casement except in shopfront or galley	Windows appear to be fixed glass at all elevations
Window Glazing Material:	Clear	All windows proposed are clear glass.
Window Trim in 1st Layer:	Min 4 in. trim with sill and top plate/ soldier course above lintel and rowlock course below sill	Elevations appear to consist of window trim details and rowlock course below window sills and soldier course above windows for brick elevations.
Shutters:	Functional to cover half of window width/ shutter dogs	N/A
Façade Window Sill Height:	5 ft. min above grade	N/A; daycare facility is a non-residential use
Porch Frontages:	Min. 6ft. clear depth, excluding rails, pillars, columns	Min 6ft.

Façade Variety:	No façade may exist more than once on a block face or within view of same façade	This use proposed is a single site use that consists of one façade.
Roof Type & Pitch:	Hip/ Gable	Roof type & pitch proposed is hip & gable
Primary Building Materials:	Brick, Fiber Cement Board, Wood	Elevations consists of a primary façade material of brick with a stone base including fiber cement board
Foundation Cladding:	Brick or Natural Stone	Foundation cladding indicated is stone
Porch Pier/ Chimney Cladding:	Brick or Natural Stone & any space under porch concealed by lattice/ brick or natural stone for chimney	Porch piers indicate a stone base
Building Height:	2 Stories min- 4 stories max	2 stories

Bulk & Site Standards

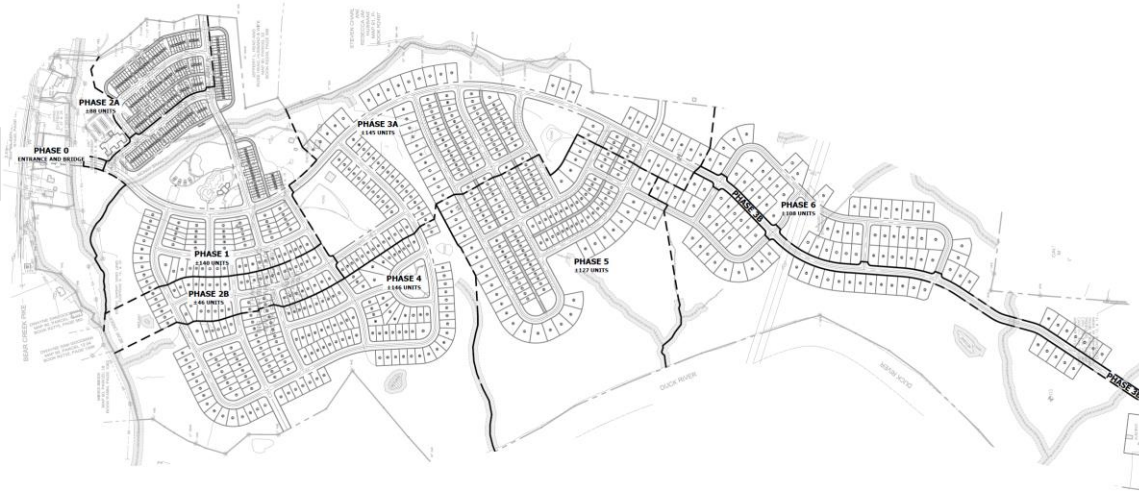
- **The Revised Final PUD Master Plan proposes a customized set of bulk and site standards which deviate from the prescriptive PUD-R standards in Table 4.3.1-K.**
- The prescribed and proposed standards are summarized in the table below. The applicant's proposed deviation are noted in **red**.

PUD-R District Bulk Standards		
Bulk Standards:	**Required**	**Proposed**
Minimum Lot/ Building Site Width Minimum and Maximum:	38 ft. min/ 180 ft. max Townhomes: 18-36 ft. Single-Family Homes: 38 ft. min	All lots exceed a 38' minimum & townhomes are within 18-36 ft' lot width/building site parameters.
Density:	12 density units per acre maximum	1.96 density units per acre
Lot/Building Enfrontment:	Facades must have main entrance in principle of building frontage/ 20 percent of less may enfront pedestrian path.	All lots enfront a throughfare street section with townhome lots 200-205 enfronting a pedestrian path.

Principal Building:	6 max. per lot/building site for townhomes/ 1 max per lot other	1 single-family home per lot/ 6 townhomes per row. Amenity & Daycare Facility on individual lots
Building Height:	1-2 Stories for House/2-3 stories for Townhomes	1-2 Stories for Houses/ 2 story townhomes
Frontage Buildout:	60% minimum	60% minimum
Parking:	1.5 spaces per dwelling unit/ 2 spaces per single-family homes	All single-family homes utilize 2 parking spaces per dwelling including 1.5 space for townhome unts.
Max. Impervious:	70% max; 90% max for attached townhome units	Does not exceed maximum impervious surface coverage
Setbacks:	**Front:** – 15 ft- 35 ft. **Side:** – 0 ft. min for townhomes; 10 ft. min **Rear:** 10 ft. min	**Front:** 15-20 ft. (all uses) **Side:** **Active Adult Homes: 5 ft.** **Courtyard Homes: 7.5 ft.** **Large Lot Homes: 7.5 ft.** **Single-Family Alley Loaded Homes: 5 ft.** **Townhomes (end units): 7.5 ft.** **Daycare Facility:** N/A *(Triple Corner Lot)* **Rear:** 10-20 ft. (all uses)
Driveway:	10 ft max. in 1st layer if residential; 24 ft. max if non-residential	**Active Adult Homes: 18 ft. max in 1st layer** **Courtyard Homes: 12 ft. max in 1st layer** **Large Lot Homes: 12 ft. max in 1st layer** **Single-Family Alley Loaded Homes:** N/A (3rd layer) **Townhomes:** N/A (3rd layer) **Day Care Facility**: 24' maximum

Phasing of the Development

- **At Final PUD Master Plan, the phasing plan will require Planning Commission approval to provide the daycare and amenities early enough to serve residents and the community.**
    - Section 8.5.21.F.4 of the Zoning Ordinance authorizes the Planning Commission to approve phasing which would allow the establishment of non-residential uses even if no residential construction takes place.
    - The applicant provided a phasing plan which indicates that most of the amenities and recreation facilities of the development will be construed in Phase 1 and 3A.
    - The phasing plan does not make clear when the daycare facility will be constructed. It is the strong preference of staff that it be constructed in an early phase of the development.
    - The phasing plan indicates that 419 homes will be constructed in Phases 0 through 3A prior to completion of the spine road through the development connecting Bear Creek Pike and Iron Bridge Road. The connection will be available during the construction of Phases 4 – 6.
    - In discussion with the Planning Commission, the applicant should confirm when it intends to construct the bridge over Bear Creek, connecting the development to Bear Creek Pike.



Phasing Plan Provided by the Applicant

REVIEW PROCESS

The Development Review Committee evaluated the proposed Preliminary Plat at its November 2023 meeting, as directed by § **8.3.7** of the Zoning Ordinance. At the request of the Zoning Administrator, the Development Review Committee reviewed the proposal for a second time at its January 2024 meeting. Staff has been in continuous communication with the applicant. A summary of those communications is provided below. Technical comments are provided in the agenda package and summarized in the next section.

- November 7, 2023 Architectural Design Review Team Meeting (deferred).
- November 7, 2023 Development Review Committee Meeting.
    - November 8, 2023 Development Services staff provided partial comments immediately while waiting for outside reviewers to provide notes.
    - November 10, 2023 staff provided full technical comments to applicant.
- November 13 – 21, 2023 Development Services staff and the applicant team had extensive communication about alternative thoroughfare assemblies.
- December 5, 2023 Meeting of Development Services Staff and Applicant team to discuss technical comments and resubmittal.
- January 9, 2024 Architectural Design Review Team Meeting (recommendation of approval).
- January 9, 2024 Development Review Committee Meeting.
- January 16, 2024 Discussion between applicant team and City Planner/Zoning Administrator to discuss the format of the second resubmittal to technical comments.
- January 31, 2024 Development Services and Parks & Recreation staff discussed the development's impact on the level of service for park facilities in Columbia.
    - February 1, 2024 Development Services staff met with the applicant team to review the Parks & Recreation request.
- February 3, 2024 the Columbia Wastewater Department notified the applicant team that the proposed plan for sanitary sewer did not meet city standards for pump stations.
    - February 5, 2024 Wastewater and Development Services staff met with the applicant team to discuss solutions to the pump station.
    - February 8 – 9, 2024 Wastewater and Development Services staff continued to communicate with the applicant about pump station alternatives.
- February 9, 2024 the applicant provided clarification related to the phasing plan.

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As required by § **8.5.d.D** of the Zoning Ordinance, staff posted signs on the subject property, mailed letters to adjacent property owners, and published notice of the Planning Commission's meeting in newspapers of general circulation.

The Planning Commission is the **recommending body** for all Annexations, Rezonings, and Preliminary PUD Master Plans under **§ 8.3.3.B.1** of the Zoning Ordinance. The City Council is the Decision-Making Authority.

Sections **8.5.21.B**, **8.5.21.M**, **8.5.18** and **8.5.19** of the Zoning Ordinance establishes the criteria for Planning Commission review and action for a rezoning to Planned Unit Development with a Preliminary PUD Master Plan.

For rezoning, the Planning Commission must determine:

a. *the rezoning is consistent and not in conflict with the comprehensive plan or other applicable approved local plans for the area;*
b. *It has been determined that the legal purposes for which zoning exists, as set forth in Section 1.5 [, are not contravened];* [2]
c. *It has been determined that there will be no adverse effect upon adjoining property owners unless such effect can be justified by the overwhelming public good or welfare;*
d. *It has been determined that no one property owner or small group of property owners will benefit materially from the change to the detriment of the general public;*
e. *It has been determined that conditions affecting the area have changed to a sufficient to warrant the zoning map amendment or that the existing zoning of the property was the result of a mistake; and*
f. *It has been determined that adequate school, road, parks, wastewater treatment, water supply, and stormwater drainage facilities are available.*

For the customized set of standards (which are reviewed as a zoning text amendment), the Planning Commission must determine:

a. *The extent to which the proposed Zoning Ordinance Amendment is consistent with the remainder of this Ordinance, including, specifically, any purpose and intent statements;*
b. *The extent to which the proposed Zoning Ordinance Amendment represents a new idea not considered in this Ordinance, or represents a revision necessitated by*

[2] Ordinance 4400 contains this incomplete sentence. The previous ordinance contained a nearly identical list of criteria at § 3.18.7.B. The corresponding criterion in Ordinance 3638 read "the legal purposes for which zoning exists are not contravened."

changing circumstances over time;

c. *Whether or not the proposed Zoning Ordinance Amendment corrects an error in this Ordinance; and*
d. *Whether or not the proposed Zoning Ordinance Amendment revises this Ordinance to comply with state or federal statutes or case law.*

For the Planned Unit Development Master Plan the Planning Commission must determine that the property and the proposed development meet the uniqueness criteria at 8.5.21.B.2, that the development cannot be accomplished under any base character district, and that the proposal :

a. *conform to all applicable standards and requirements of the Ordinance,*
b. *would be compatible with other development permitted under all applicable provisions of the Ordinance;*
c. *will not significantly interfere with the use and enjoyment of other land in the vicinity;*
d. *adequately conserve woodland and the protect water courses from erosion and siltation;*
e. *maximize safety, convenience, and amenities for the residents and visitors of the Development; and*
f. *adequately address all such other matters as they may find to have a material bearing upon the stated standards and objectives of the Ordinance.*

SUMMARY OF DEVELOPMENT REVIEW COMMITTEE COMMENTS

The DRC reviewed this proposal at its November 2023 and January 2024 meetings. A full list of comments, and the applicant's responses, is provided in the agenda packet. Some key comments are noted below.

- **Planning** requested a more complete justification for utilizing the PUD process and specific explanation of how the proposed standards will produce a high quality development.
- Planning also requested the elimination of cul-de-sacs and improvement of the block and lot configuration of the development.
- At the second DRC review, planning staff provided direction related to the requested deviations in bulk and design standards, indicating staff's analysis of the proposals.
- Planning requested changes to the tree preservation plan.
- Planning requested specific formatting of resubmittals., clarification of the phasing plan, and reclassification of some open space as Civic Space.
- Together with Engineering, Planning requested improvements to the proposed alternative Throughfare assemblies.

- **Engineering** indicated that all approvals are subject to completion of specific improvements recommended by the Traffic Impact Study (TIS).
- The City Engineer also requested a stub for future connection to east.
- Engineering indicated that if the Preliminary PUD Master Plan is approved, a geotechnical assessment and geotechnical analysis and recommendation of all closed depressions will be required at Final Master Plan and Preliminary Plat. Engineering further requested evaluation and clarification regarding the feature depicted as a small wetland as well as other small depressions on the western portion of the site.
- Engineering commented on the slope of building sites and the preference's of city staff regarding adequate drainage of lots.
- The City Engineer initially noted that many walls may not be constructable in the locations depicted in the proposed Master Plan without encroaching on wetland buffers. The applicant revised these plans accordingly.
- Columbia Water System's (**CPWS**) consultant (Inflow) noted that the applicant's water availability letter was dated October 13, 2023 and would expire before the date of the Planning Commission meeting. The applicant provided an updated letter.
- **Wastewater** noted that all sewer improvements including but not limited to off-site improvements, on-site improvements, and pump station and equipment installation shall be completed and functioning to the satisfaction of the Director of the Wastewater Department prior to the filing of any Final Plat with the City of Columbia Municipal Planning Commission. Wastewater later expanded on these comments in order to make the applicant aware that the initial plan for sewerage would not meet the department's requirements. Wastewater offered these additional comments in order to sav time and expense for the applicant under subsequent reviews.
- **Public Works** indicated that the townhomes will utilize dumpster service; the City will provide trashcans for single-family detached homes.
- Columbia Power (**CPWS**) noted that supply chain concerns could affect the timing of any development. This is a standard comment from the utility.
- **Maury County Schools** noted that the site is currently in the attendance zones of Howell Elementary, Cox Middle School, Battle Creek High School. New construction or realignment of school attendance zones may be necessary to accommodate new students. This is a standard comment from the school system.

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COMMENTARY FROM PROFESSIONAL PLANNING STAFF

The Preliminary PUD Master Plan, if approved by City Council, should be formatted in the same manner as the Character District tables in 4.3.1 of the Ordinance. A PUD Master Plan effectively creates a new zoning standard. Historically, PUDs approved in Columbia have varied substantially in format and detail. This has led to uncertainly and ambiguity as the approvals age and properties develop and change ownership. This is the first new PUD request under the current ordinance. The customizable format of Tables 4.3.1-A though U is a useful feature of the ordinance. If the Preliminary PUD Master Plan is approved, the standards should be depicted in a format similar to the 10-page summary provided for each character district. Similarly, alternative Civic Space and Thoroughfare designs should be prepared in the format utilized at Table 5.3.3-B and 5.2.2.G-1.

The Civic Space and open space plan provided by the applicant includes alternative standards which are consistent with the overall framework of Article 5. The applicant proposes to exceed the 20% maximum Civic Space and to provide alternative Civic Space types. The Civic Spaces proposed by the applicant meet and exceed the standards of the Ordinance. Planning staff believes the additional civic space is appropriate for the context and utilizes the site's natural features.

The applicant revised the grading plan and throughfare layout at the request of planning staff. **The initial PUD** justification letter provided by the applicant described the conservation benefits of the proposed PUD-R achieved by clustering. However, the initial plans depicted significant alteration of the site, effectively flattening portions of the landscape in order to create additional single-family lots. Many of the lots enfronted cul-de-sacs and formed ill-shaped blocks. The applicant revised the plan according to the staff recommendation. This resulted in a reduction of the overall number of lots requested, as well as a better conforming pattern of blocks and lots.

The applicant proposes alternative Thoroughfare assemblies which deviate from the prescriptions of Article 5 of the Zoning Ordinance. The Zoning Administrator generally agrees that the alternative Thoroughfare assemblies proposed by the applicant are tailored to the purposes of the proposed PUD and appropriate for the site, provided the City Engineer deems them an acceptable equivalent to the prescribed thoroughfare assemblies.

Staff is concerned that some of the proposed customization of setback standard will provide inadequate spacing between structures. The Zoning Administrator has no advice to Planning Commission regarding reduction of setbacks from 10' to 7.5'. However, the Zoning Administrator does not support a reduction of side setbacks from 10' to 5' on detached alley loaded homes and active adult homes.

The applicant requests a customized standard which would permit garages to be located in the second layer for courtyard style homes. The applicant also requests to utilize wider garage doors and driveways than permitted by the PUD-R standards. The Zoning Administrator has no advice to Planning Commission regarding the request except to note that this would be allowed in base Character Districts and does not by itself diminish the street-scape. The apparent intent of requiring garages to be located in the third layer is to discourage the use of PUDs. The wider garage doors are appropriate where placed perpendicular to the frontage but inappropriate where they face the street.

The Wastewater Department has worked with the applicant to design a plan for sewerage which meets city standards for efficiency and long-term maintenance costs. Wastewater indicated that the sewerage plan presented in the Preliminary PUD Master Plan does not meet the city's standards for good municipal practices. Specifically, the proposal utilizes two pump stations. The southernmost pump station only serves eighty-one lots. The wastewater engineer determined that the design was inefficient and may create inordinate long-term maintenance costs for the city. After receiving these comments, the applicant provided a markup of the plans indicating that it is feasible to combine the two pump stations. The wastewater engineer, with the assistance of Development Services staff, has continued to discuss sewerage design preferences with the applicant team. If the Preliminary PUD Master Plan is approved, the sewerage specifications can be finalized during Final Preliminary PUD Master Plan and Preliminary Plat review. Conditional approval of the Preliminary PUD Master Plan subject to technical comments should require development of the site in compliance with standard sewer specifications, no sanitary sewer depths greater than twenty feet, longitudinal and perpendicular grades which accommodate access for maintenance, and utilization of a single pump station.

Planning staff urges the Planning Commission to condition approval of the requested PUD Master Plan on dedication of a public park and greenway space to the City of Columbia in order to maintain the parks and recreation level of service in the city. The future Bicycle and Greenway Plan within Connect Columbia indicates a proposed greenway trail on the subject site located at the east side of the Duck River connecting with Yanahli Park to the south. The plan also indicates that additional park space is needed along the Bear Creek Pike corridor in order to maintain the level of service established in the Comprehensive Plan. The applicant's proposal depicts primitive trails in the general location of the planned greenway. The applicant also intends to construct a multiuse path along a significant portion of the north-south spine road within the development. Staff has met with the applicant to communicate these concerns and requests that any approval be conditioned on:

1) Dedication of parkland on the adjacent and related property on the north side of Bear Creek and construction of appropriate facilities as specified by the Department of Parks & Recreation; as well as
2) Dedication and construction of a greenway on the western portion of the property, the precise location, materials, and design specifications to be determined by the City Engineer based on topography and feasibility of construction.

There is an essential nexus between the proposed development and the need for an additional park and greenway. The Planning Commission can establish the timing of these improvements as part of the Final PUD Master Plan. The City of Columbia has an interest in maintaining the established level of parks and recreation services for residents. In 2017, as part of the process of creating a Parks & Greenways plan, the city evaluated existing facilities and additions necessary to maintain the level of service. The evaluation determined that an additional park (Connect Columbia Parks & Greenways Plan p.33) and a greenway (p. 29) would be needed in the vicinity of the subject site if growth occurred in the area. The applicant proposes to bring that growth the area, triggering the need for additional facilities.

Dedication of the park and greenway is roughly proportional to the impact of the development and the increased entitlements requested by the applicant. The proposed PUD, by itself, will increase the total number of households in Columbia by approximately 4.6%.[3] Furthermore, in order to entitle the land and accomplish the land developer's goals, the applicant requests approval to use the PUD process with substantial deviation from the PUD-R standards.

The illustrative elevations provided by the applicant do not fit on the typical lots proposed. The pattern book proposed by the applicant depicts illustrations of residential structures of various sizes and types. When scaled according to the known door width, the illustrations seem to depict buildings which will not fit within the building envelope area depicted in the typical lot layouts. This may be a topic of discussion between the applicant and the Planning Commission. Staff understands to pattern book provided at preliminary PUD Master Plan as an indication of design intent rather than a binding standard. The materials and designs will be reviewed again at the time of Final PUD Master Plan and any subsequent revisions. The decision-making authority for design review will make a binding determination at that time.

[3] The applicant proposes to develop 800 homesites. The 2022 ACS 5-year estimate indicates that there are 17,041 households in corporate limits of Columbia.

SAMPE MOTIONS

Approve:

Move to find, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in sections **8.5.21.B**, **8.5.21.M**, **8.5.18** and **8.5.19** of the City of Columbia Zoning Ordinance have been satisfied, and recommend approval of the Annexation with a Plan of Services and Rezoning to PUD-R with Preliminary Planned Unit Development Master Plan as presented *[,subject to technical comments and other conditions presented by planning staff*].

Approve Subject to Conditions:

Move to find, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in sections **8.5.21.B**, **8.5.21.M**, **8.5.18** and **8.5.19** of the City of Columbia Zoning Ordinance have been satisfied, and recommend approval of the Annexation with a Plan of Services and Rezoning to PUD-R with Preliminary Planned Unit Development Master Plan, subject to the following conditions: [*list conditions of approval crafted by Planning Commission*].

Deny:

Move to recommend denial of the Annexation with a Plan of Services and Rezoning to PUD-R having found, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in sections **8.5.21.B**, **8.5.21.M**, **8.5.18** and **8.5.19** of the City of Columbia Zoning Ordinance, are not satisfied [*list specific reasons for denial*].

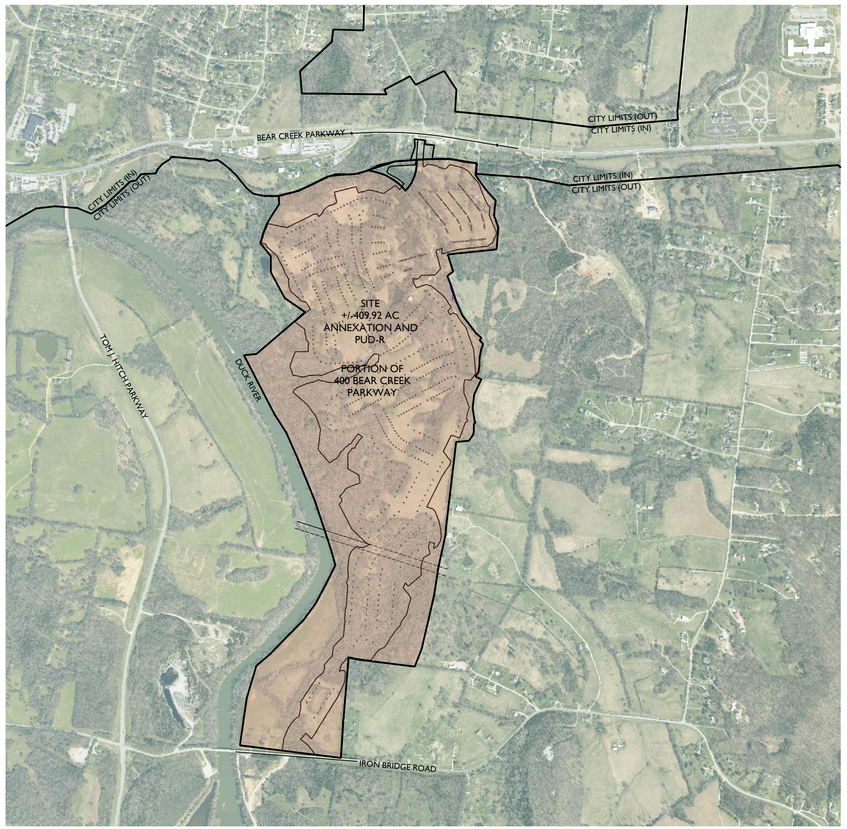
Defer:

Move to find that there is insufficient information to make a decision, defer the matter to the next regularly scheduled meeting of the Planning Commission, and request that the [*applicant/staff*] provide: [*list additional information*] for review at a future meeting.

DRAFT

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 BEAR CREEK PARKWAY
COLUMBIA, TENNESSEE



LOCATION MAP

0 500 1000 2000
GRAPHIC SCALE 1"=1,000'-0"

OWNER:
HK BIG BEAR BLUFFS, LLC
14025 RIVEREDGE DRIVE, SUITE 175
TAMPA, FL33637
JIM HARVEY

DEVELOPER:
KOLTER LAND
14025 RIVEREDGE DRIVE, SUITE 175
TAMPA, FL33637
JIM HARVEY
615.582.3253
jgibbs@kolter.com

APPLICANT/ LAND PLANNER:
GAMBLE DESIGN COLLABORATIVE
3020 STANSBERRY LANE, SUITE 201
FRANKLIN, TN 37064
GREG GAMBLE
615-975-5765
greg.gamble@gdc-tn.com

ENGINEER:
CSDG
2305 KLINE AVENUE, SUITE 300
NASHVILLE, TN 37211
JIM HARRISON
615-248-9999
jimh@csdgtn.com

COMMITMENT TO ENVIRONMENTAL STEWARDSHIP

1. **Strategy for Resource Protection utilizing a PUD Planning and Design Approach**

   a. Establish a Limits of Disturbance along the Duck River and its tributaries based upon slopes, natural drainage ways, floodplain areas, and mature tree canopy.

   b. Design new development around open space areas to highlight them as community amenities with pedestrian systems that will connect the entire conservation design open space throughout the community.

   c. Pedestrian circulation and trails are highly encouraged along the river, along stream corridors, and through scenic areas.

   d. The quantity of Open Space preservation should greatly exceed any established base zone district.

   e. New home lots should generally be smaller, clustered areas away from the protected banks of the Duck River.

   f. Document on-site natural resources through a State approved Hydrologist and concurrence reports with local, state, and federal agencies.

   g. Remove debris removal along creek banks to prevent impact to Bear Creek (shoes, clothing, random bottles, containers, fencing, wood)

   h. Use Best Management Practices for Stormwater Pollution Prevention Plans during construction.

   i. Use only one crossing point (< less than approx. 50' - 60' feet that spans the creek with no structures within Bear Creek (similar to several crossings visible from US (Highway 412).

2. **Strategy for Protection through Construction**

   Implementation of the Plan requires protective measures. PUD phasing and areas of disturbance should be documented and considered through the PUD process. Protection practices shall include:

   A. Storm water erosion control applications I.E.

      i. Stormwater Detention Areas,

      ii. natural riparian buffers

      iii. silt fencing

      iv. sediment ponds

      v. Check dams

      vi. Ongoing stormwater monitoring of Environmental Controls of water runoff areas and tributaries

   B. Compliance with CGP, ARAP and NPDES permitting to address the protections that provide additional oversight to the project.

   Throughout the duration of the project, these types of practices within the action areas will ensure environmental compliance with local, state and federal requirements.

3. **Strategy for Protection when construction is completed.**

   Once development is completed permanent storm water detention areas and water out fall locations will be cleaned and stabilized in accordance with the local, state, and federal guidelines.

SHEET INDEX

C0.0	COVER SHEET
C0.01	EXISTING CONDITIONS
C1.0	PHASING PLAN
C2.0	OVERALL PRELIMINARY MASTER DEVELOPMENT PLAN
C2.1	ENLARGED PRELIMINARY MASTER DEVELOPMENT PLAN
C2.2	ENLARGED PRELIMINARY MASTER DEVELOPMENT PLAN
C2.3	ENLARGED PRELIMINARY MASTER DEVELOPMENT PLAN
C2.3	ENLARGED PRELIMINARY MASTER DEVELOPMENT PLAN
C2.4	ENLARGED PRELIMINARY MASTER DEVELOPMENT PLAN
C2.5	ENLARGED PRELIMINARY MASTER DEVELOPMENT PLAN
C2.6	PROPOSED LOT DIAGRAMS
C2.7	STREET SECTIONS
C2.8	STREET SECTIONS
C2.9	TREE CANOPY COVERAGE
C3.00	OVERALL SITE UTILITY PLAN
C3.01	SITE UTILITY PLAN
C3.02	SITE UTILITY PLAN
C3.03	SITE UTILITY PLAN
C3.04	SITE UTILITY PLAN
C4.00	OVERALL GRADING & DRAINAGE PLAN
C4.01	GRADING & DRAINAGE PLAN
C4.02	GRADING & DRAINAGE PLAN
C4.03	GRADING & DRAINAGE PLAN
C4.04	GRADING & DRAINAGE PLAN
C4.05	LOT DRAINAGE DIAGRAMS
L1.0	OVERALL CIVIC SPACE PLAN
L1.1	CIVIC SPACE ENLARGEMENT
L1.2	CIVIC SPACE ENLARGEMENT
L1.3	CIVIC SPACE ENLARGEMENT
L1.4	CIVIC SPACE ENLARGEMENT
L1.5	CIVIC SPACE ENLARGEMENT
L1.6	CIVIC SPACE ENLARGEMENT

GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT
1-23-24

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

PRE-APP: August 30, 2023
INITIAL SUBMITTAL: October 16, 2023
RESUBMITTAL: December 18, 2023
RESUBMITTAL: January 23, 2024



CSDG
Planning | Engineering
Landscape Architecture
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csdgtn.com

SEAL



COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
Review Comments

ISSUE DATE: 01/23/24

REVISION HISTORY:

Rev.	Description	Date
1	Initial Submittal	10/16/23
2	Tech Review Comments	12/18/23
3	Tech Review Comments	01/23/24

DRAWN BY: TWG
CHECKED BY: TWG

EXISTING CONDITIONS PLAN

C0.01

PROJECT NO.: 21-160-01

Jan 23, 2024 - 9:16am T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C0.01 - Existing Conditions Plan.dwg

PHASING BREAKDWON:

PHASE 1: LOT NUMBERS 100-161 (62 SINGLE FAMILY LOTS)
LOT NUMBERS 200-277 (78 TOWNHOME LOTS)

PHASE 2A: LOT NUMBERS 300-387 (88 TOWNHOME LOTS)
PHASE 2B: LOT NUMBERS 400-445 (46 SINGLE FAMILY LOTS)

PHASE 3A: LOT NUMBERS 500-644 (145 SINGLE FAMILY LOTS)

PHASE 4: LOT NUMBERS 700-845 (146 SINGLE FAMILY LOTS)

PHASE 5: LOT NUMBERS 900-1026 (127 SINGLE FAMILY LOTS)

PHASE 6: LOT NUMBERS 1100-1207 (108 SINGLE FAMILY LOTS)

*PHASE 3B INCLUDES MAIN COLLECTOR ROAD CONNECTION TO IRON BRIDGE ROAD

PROJECTED TIMELINE*:

PHASE 1 (±140 UNITS)		
	2024-2025	FINAL MASTER PLAN
	2025-2026	BEGIN CONSTRUCTION
	2025-2026	PLATTING
	2028-2029	VERTICAL CONSTRUCTION COMPLETE
PHASE 2 (±134 UNITS)		
	2025-2026	FINAL MASTER PLAN
	2026-2027	BEGIN CONSTRUCTION
	2026-2027	PLATTING
	2029-2030	VERTICAL CONSTRUCTION COMPLETE
PHASE 3 (±145 UNITS)		
	2026-2027	FINAL MASTER PLAN
	2027-2028	BEGIN CONSTRUCTION
	2027-2028	PLATTING
	2031-2032	VERTICAL CONSTRUCTION COMPLETE
PHASE 4 (±146 UNITS)		
	2027-2028	FINAL MASTER PLAN
	2028-2029	BEGIN CONSTRUCTION
	2028-2029	PLATTING
	2032-2033	VERTICAL CONSTRUCTION COMPLETE
PHASE 5 (±127 UNITS)		
	2029-2030	FINAL MASTER PLAN
	2031-2032	BEGIN CONSTRUCTION
	2031-2032	PLATTING
	2033-2034	VERTICAL CONSTRUCTION COMPLETE
PHASE 6 (±108 UNITS)		
	2030-2031	FINAL MASTER PLAN
	2032-2033	BEGIN CONSTRUCTION
	2032-2033	PLATTING
	2033-2034	VERTICAL CONSTRUCTION COMPLETE

*PROJECTED TIMELINE IS AN ESTIMATE ONLY. TIMING OF ACTUAL COMMENCEMENT OF HORIZONTAL & VERTICAL CONSTRUCTION FOR ALL PHASES WILL BE PREDICATED ON LOCAL AND STATE APPROVALS.

PHASE 0
ENTRANCE AND BRIDGE

PHASE 2A
±88 UNITS

PHASE 1
±140 UNITS

PHASE 2B
±46 UNITS

PHASE 3A
±145 UNITS

PHASE 4
±146 UNITS

PHASE 5
±127 UNITS

PHASE 6
±108 UNITS

PHASE 3B

BEAR CREEK PIKE — U.S. 412 - SR99 (R.O.W. VARIES)

IRON BRIDGE ROAD (PVT. R.O.W. VARIES)

DUCK RIVER

N

0 300 600
SCALE: 1"= 300'

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SEAL

JAMES T. HARRISON
REGISTERED
ENGINEER
01-23-24
No. 021998
STATE OF TENNESSEE

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
Review Comments

ISSUE DATE: 01/23/24

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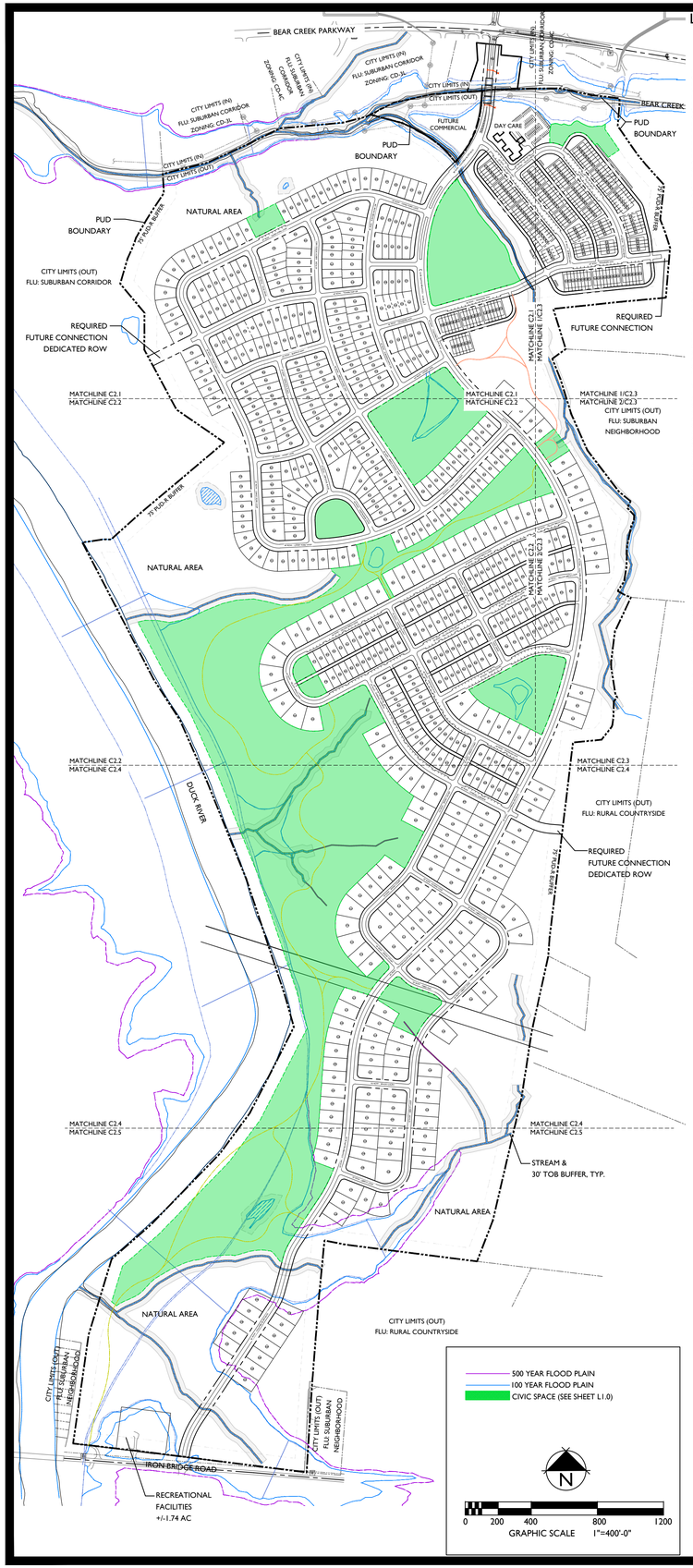
DRAWN BY: TWG
CHECKED BY: TWG

PHASING PLAN

C1.00

PROJECT NO.: 21-160-01

Jan 23, 2024 - 8:53am T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C1.00 - Phasing Plan.dwg



LEGAL DESCRIPTION OF PROPERTY:

LEGAL DESCRIPTION FOR ANNEXATION OF 409.92 ACRES TO PUD
FOR PART OF MAP 90, PARCEL 12.01
DEED BOOK R2051, PAGE 792
BIG BEAR BLUFFS, LLC

LAND LYING IN THE 4TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE, BOUNDED ON THE NORTH BY BEAR CREEK PIKE, ROCK 'N' ROLL JESUS, LLC, AS OF RECORD IN DEED BOOK R2727, PAGE 1242 OF THE REGISTERS OFFICE OF MAURY COUNTY, TENNESSEE (ROMCTN); AMIT J. PATEL AND WIFE, MINAXIBEN G. PATEL AS OF RECORD IN DEED BOOK R2411, PAGE 1348, ROMCTN; HK BIG BEAR BLUFFS, LLC (R BOOK 2878, PAGE 981, ROMCTN; ON THE EAST BY JEFFERY L. HEAD AND ROSE HEAD, WIFE & HUSBAND AS OF RECORD IN DEED BOOK R2230, PAGE 388, ROMCTN, STEVEN CHARLES FOSTER AND REBECCA JANE FOSTER, HUSBAND & WIFE AS OF RECORD IN DEED BOOK R2497, PAGE 1334, ROMCTN, BARRY C. BLACKBURN, TRUSTEE FOR BARRY C. BLACKBURN REVOCABLE TRUST AS OF RECORD IN DEED BOOK R2301, PAGE 1492, ROMCTN, BRENT W. THORNTON AND WIFE TERRI L. THORNTON AS OF RECORD IN DEED BOOK R2096, PAGE 766, ROMCTN, CALVIN DEAN JOHNSON FORMERLY CARL JOHNSON AND WIFE, BARBARA D. JOHNSON AS OF RECORD IN DEED BOOK 375, PAGE 543, ROMCTN, AND CALVIN DEAN JOHNSON AND WIFE SHERYL GAY JOHNSON AS OF RECORD IN DEED BOOK R747, PAGE 602, ROMCTN; ON THE SOUTH BY IRON BRIDGE ROAD; AND ON THE WEST BY JIMMY MATHEWS AS OF RECORD IN DEED BOOK 1311, PAGE 80, DAVID LUNN HARRIS ETUX AS OF RECORD IN DEED BOOK R2415, PAGE 1148, ROMCTN, DUCK RIVER, AND MARK A. SEAGO AND WIFE TINA SEAGO AS OF RECORD DEED BOOK R2369, PAGE 973 ROMCTN; AND CONTINUED TO THE NORTH BY MIKE BIKES AS OF RECORD IN DEED BOOK R1884, PAGE 1082, DWAYNE SAM GOODMAN AS OF RECORD IN DEED BOOK R2732, PAGE 1288, AND IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

TO FIND THE TRUE POINT OF BEGINNING, COMMENCE AT AN 1 INCH IRON PIPE FOUND IN THE SOUTHERN ROW OF BEAR CREEK PIKE, SAID POINT ALSO BEING THE NORTHWEST BOUNDARY OF ROCK 'N' ROLL JESUS, LLC (BK R2727, PG 1242) AND HAVING A TENNESSEE STATE PLANE COORDINATE OF NORTH 475,793.95 EAST 1,872,344.21;

THENCE, WITH THE WEST BOUNDARY OF JESUS, THE FOLLOWING CALLS:

S 05°01'16" W, FOR A DISTANCE OF 269.51 FEET, TO AN IRON PIN FOUND;
S 21°32'47" E, FOR A DISTANCE OF 51.20 FEET TO A THE CENTER OF BEAR CREEK BEING THE SOUTHWEST CORNER OF ROCK N ROLL JESUS;
THENCE, WITH THE SOUTH BOUNDARY OF ROCK 'N' ROLL JESUS, LLC, AMIT J. PATEL & HK BIG BEAR BLUFFS, LLC, AND ALSO BEING THE CENTER OF BEAR CREEK, N 85°53'31" E, 307.86 FEET TO THE TRUE POINT OF BEGINNING;

THENCE, CONTINUING WITH BEAR CREEK, THE FOLLOWING CALLS:

N 85°53'31" E, FOR A DISTANCE OF 85.49 FEET TO A POINT;
N 83°39'27" E, FOR A DISTANCE OF 218.80 FEET TO A POINT;
S 89°57'56" E, FOR A DISTANCE OF 168.93 FEET TO A POINT;
S 71°59'31" E, FOR A DISTANCE OF 77.46 FEET TO A POINT;
S 78°01'13" E, FOR A DISTANCE OF 120.71 FEET TO A POINT;
S 83°35'45" E, FOR A DISTANCE OF 172.70 FEET TO A POINT ALONG THE WEST BOUNDARY OF JEFFERY L. HEAD;

THENCE, WITH THE WEST BOUNDARY OF HEAD, THE FOLLOWING CALLS:

S 0°56'50" W, FOR A DISTANCE OF 40.52 FEET TO AN IRON PIN;
S 04°40'44" W, FOR A DISTANCE OF 127.32 FEET TO A 1-1/2" PIPE FOUND;
S 34°29'27" E, FOR A DISTANCE OF 153.87 FEET TO A T-POST;
S 35°04'16" E, FOR A DISTANCE OF 55.17 FEET TO A T-POST;
S 39°22'56" E, FOR A DISTANCE OF 84.02 FEET TO A T-POST;
S 42°05'33" E, FOR A DISTANCE OF 106.39 FEET TO A T-POST;
S 42°31'20" E, FOR A DISTANCE OF 55.23 FEET TO AN 1-1/2" PIPE FOUND;
S 7°06'58" W, FOR A DISTANCE OF 101.11 FEET TO A 3" METAL POST;
S 5°45'07" W, FOR A DISTANCE OF 110.19 FEET TO AN 1-1/2" PIPE FOUND;
S 21°14'47" E, FOR A DISTANCE OF 78.14 FEET TO A T-POST;
S 17°34'01" E, FOR A DISTANCE OF 102.59 FEET TO A 24" CEDAR;
S 4°57'22" W, FOR A DISTANCE OF 172.54 FEET TO A T-POST;
S 4°32'31" W, FOR A DISTANCE OF 130.65 FEET TO 36" OAK;
S 84°46'29" W, FOR A DISTANCE OF 270.35 FEET TO 20" MAPLE;
S 84°01'38" W, FOR A DISTANCE OF 414.11 FEET TO A FENCEPOST;
S 17°15'39" E, FOR A DISTANCE OF 254.68 FEET TO A 6" ROTTED HACKBERRY FENCE POST TIED TO THE SOUTHWEST CORNER OF HEAD;

THENCE, WITH THE WEST BOUNDARY OF FOSTER, THE FOLLOWING CALLS:

S 54°11'15" W, FOR A DISTANCE OF 100.29 FEET TO 6' ROTTED HACKBERRY FENCE POST;
S 21°03'18" E, FOR A DISTANCE OF 130.86 FEET TO A CEDAR FENCE POST;
S 17°11'57" E, FOR A DISTANCE OF 221.38 FEET TO A 12" ELM;
S 23°49'07" E, FOR A DISTANCE OF 240.66 FEET TO A T-POST;
S 37°24'05" E, FOR A DISTANCE OF 315.73 FEET TO 14" ELM;
S 50°37'42" E, FOR A DISTANCE OF 91.73 FEET TO 60" TWIN OAK;
S 29°59'39" W, FOR A DISTANCE OF 35.62 FEET TO 60" OAK;
S 40°35'26" W, FOR A DISTANCE OF 9.08 FEET TO A T-POST;
S 42°52'20" E, FOR A DISTANCE OF 62.79 FEET TO A POINT;
S 1°50'17" W, FOR A DISTANCE OF 30.25 FEET TO A POINT;
S 23°53'47" W, FOR A DISTANCE OF 42.59 FEET TO 14" HACKBERRY;
S 11°25'58" W, FOR A DISTANCE OF 117.73 FEET TO A T-POST;
S 2°03'52" W, FOR A DISTANCE OF 130.94 FEET TO ROTTED HACKBERRY;
S 9°12'29" W, FOR A DISTANCE OF 87.18 FEET A POINT;
S 33°58'56" W, FOR A DISTANCE OF 69.04 FEET TO A 30" HACKBERRY;
S 61°19'48" E, FOR A DISTANCE OF 54.74 FEET TO A 24" HACKBERRY;
S 70°11'17" E, FOR A DISTANCE OF 34.53 FEET TO 12" CEDAR POST AT THE SOUTHWEST CORNER OF FOSTER;

THENCE, WITH THE WEST BOUNDARY OF BLACKBURN, THE FOLLOWING CALLS:

S 25°13'18" W, FOR A DISTANCE OF 225.44 FEET TO A 36" HACKBERRY;
S 7°09'46" W, FOR A DISTANCE OF 177.84 FEET TO A 8" DOGWOOD;
S 0°16'28" W, FOR A DISTANCE OF 41.40 FEET TO A 24" HACKBERRY FLAGGED;
S 8°53'22" E, FOR A DISTANCE OF 173.37 FEET TO A T-POST;
S 50°40'30" E, FOR A DISTANCE OF 13.02 FEET TO 6" FENCE POST;
S 39°18'12" W, FOR A DISTANCE OF 34.16 FEET TO A POINT;
S 1°12'16" W, FOR A DISTANCE OF 95.58 FEET TO A 12" OSAGE;
S 7°58'27" W, FOR A DISTANCE OF 43.94 FEET TO A 6" ROTTED TREE;
S 9°41'30" W, FOR A DISTANCE OF 13.75 FEET TO A 6" TREE USED AS FENCE POST;
S 38°17'00" W, FOR A DISTANCE OF 100.34 FEET TO A 14" ROTTEN CEDAR;
S 84°35'04" W, FOR A DISTANCE OF 173.30 FEET TO FENCE CORNER PK FOUND;
S 6°46'35" W, FOR A DISTANCE OF 1187.64 FEET TO A POINT;
S 4°03'46" W, FOR A DISTANCE OF 112.89 FEET TO A 26" CEDAR;
S 12°22'22" W, FOR A DISTANCE OF 465.96 FEET TO A 1" PIPE FOUND;

THENCE, WITH THE WEST BOUNDARY OF BLACKBURN AND CONTINUING TO THORNTON, THE FOLLOWING CALLS:

S 8°47'46" W, FOR A DISTANCE OF 411.13 FEET TO 1" PIPE FOUND;

THENCE, WITH THE WEST BOUNDARY THORNTON, THE FOLLOWING CALLS:

S 13°08'41" W, FOR A DISTANCE OF 759.59 FEET TO 1" PIPE FOUND;
S 21°10'50" W, FOR A DISTANCE OF 265.00 FEET TO 1" PIPE FOUND AT THE SOUTHWEST CORNER OF THORNTON;

THENCE, WITH THE NORTH BOUNDARY OF JOHNSON, THE FOLLOWING CALLS:

N 82°44'49" W, FOR A DISTANCE OF 800.97 FEET TO 1" PIPE FOUND;
N 78°43'22" W, FOR A DISTANCE OF 130.34 FEET TO 1" PIPE FOUND;

THENCE, WITH THE WEST BOUNDARY OF JOHNSON, THE FOLLOWING CALLS:

S 5°33'34" W, FOR A DISTANCE OF 375.75 FEET TO 1" PIPE FOUND;
S 4°27'28" W, FOR A DISTANCE OF 508.55 FEET TO A POINT;
S 5°35'19" W, FOR A DISTANCE OF 523.31 FEET TO 5/8" IRON PIN FOUND AT THE SOUTHWEST CORNER OF THORNTON;

THENCE, WITH THE NORTH BOUNDARY OF IRON BRIDGE ROAD RIGHT-OF-WAY, THE FOLLOWING CALLS:

N 82°45'55" W, FOR A DISTANCE OF 501.29 FEET TO AN 5/8" IRON PIN FOUND;
N 82°46'22" W, FOR A DISTANCE OF 525.64 FEET TO RAILROAD SPIKE PK FOUND;
N 83°23'15" W, FOR A DISTANCE OF 396.04 FEET TO 5/8" IRON PIN FOUND AT SOUTHEAST CORNER OF MATTHEWS;

THENCE, WITH THE EAST BOUNDARY OF MATHEWS, HARRIS AND DUCK RIVER, THE FOLLOWING CALLS:

N 8°06'23" E, FOR A DISTANCE OF 864.54 FEET TO 1/2" IRON PIN FOUND;
N 1°16'09" E, FOR A DISTANCE OF 478.23 FEET TO A POINT;
N 48°48'57" E, FOR A DISTANCE OF 312.04 FEET TO A POINT;
N 44°09'58" E, FOR A DISTANCE OF 600.70 FEET TO A POINT;
N 36°27'00" E, FOR A DISTANCE OF 305.02 FEET TO A POINT;
N 27°21'22" E, FOR A DISTANCE OF 284.62 FEET TO A POINT;
N 26°51'38" E, FOR A DISTANCE OF 301.40 FEET TO 1" PIPE FOUND;

N 15°43'20" W, FOR A DISTANCE OF 197.42 FEET TO A POINT;
N 18°27'24" W, FOR A DISTANCE OF 744.16 FEET TO A POINT;
N 21°50'04" W, FOR A DISTANCE OF 031.16 FEET TO A POINT;
N 23°44'52" W, FOR A DISTANCE OF 409.10 FEET TO A POINT;
N 32°40'41" W, FOR A DISTANCE OF 286.98 FEET TO A POINT;
N 27°28'08" W, FOR A DISTANCE OF 932.36 FEET TO A POINT;

THENCE, DIRECTING RIGHT AWAY FROM DUCK RIVER TO THE SOUTH AND EAST BOUNDARY OF SEAGO, THE FOLLOWING CALLS:

N 85°09'29" E, FOR A DISTANCE OF 22.00 FEET TO A POINT;
N 81°22'35" E, FOR A DISTANCE OF 109.60 FEET TO A POINT;
S 87°29'25" E, FOR A DISTANCE OF 42.46 FEET TO 26" OAK;
N 46°08'47" E, FOR A DISTANCE OF 244.67 FEET TO A POINT;
N 46°56'39" E, FOR A DISTANCE OF 291.18 FEET TO 10" HACKBERRY AND 8" CEDAR;
N 49°46'28" E, FOR A DISTANCE OF 367.28 FEET TO 1" PIPE FOUND;
N 55°27'24" W, FOR A DISTANCE OF 350.42 FEET TO A POINT;
N 28°16'29" W, FOR A DISTANCE OF 411.36 FEET TO A 1" PIPE FOUND;
N 7°17'50" E, FOR A DISTANCE OF 220.64 FEET TO AN IRON PIN FOUND;
N 39°56'42" W, FOR A DISTANCE OF 228.86 FEET TO AN IRON PIN FOUND;
N 16°17'40" E, FOR A DISTANCE OF 158.31 FEET TO A POINT;
N 24°10'55" E, FOR A DISTANCE OF 52.03 FEET TO A POINT;
N 25°26'46" E, FOR A DISTANCE OF 28.14 FEET TO 1" PIPE IRON PIPE;
N 19°40'08" E, FOR A DISTANCE OF 57.72 FEET TO A 12" CEDAR;
N 30°13'56" E, FOR A DISTANCE OF 123.71 FEET TO A POINT;
N 32°10'27" E, FOR A DISTANCE OF 87.89 FEET TO A POINT;
N 33°44'57" E, FOR A DISTANCE OF 105.82 FEET TO 1" PIPE FOUND;
N 3°11'17" W, FOR A DISTANCE OF 116.30 FEET TO A POINT AT THE NORTHEAST CORNER OF SEAGO AND THE CENTER OF BEAR CREEK;

THENCE, ALONG BEAR CREEK AND SOUTHERN BOUNDARY OF MIKES BIKES, THE FOLLOWING CALLS:

N 75°48'45" E, FOR A DISTANCE OF 280.14 FEET TO A POINT;
N 85°23'51" E, FOR A DISTANCE OF 281.90 FEET TO A POINT AT THE SOUTHEAST CORNER OF BIKES;

THENCE, ALONG SOUTH BOUNDARY OF GOODMAN, N 83°42'14" E, 199.86 FEET TO A POINT;

THENCE, CREATING A NEW LINE FOR THE ANNEXATION OF 409.92 ACRES. THE FOLLOWING CALLS:

N 84°40'48" E, FOR A DISTANCE OF 385.89 FEET TO A POINT;
N 75°36'41" E, FOR A DISTANCE OF 141.99 FEET TO A POINT;
N 83°11'05" E, FOR A DISTANCE OF 28.87 FEET TO A POINT AT AN INTERSECTION OF MCKAY BRANCH
CONTINUING ALONG MCKAY BRANCH AND CREATING A NEW LINE FOR THE ANNEXATION OF 409.92 ACRES. THE FOLLOWING CALLS:
S 7°51'27" E, FOR A DISTANCE OF 201.29 FEET TO A POINT;
S 65°15'03" E, FOR A DISTANCE OF 74.45 FEET TO A POINT;
S 61°08'47" E, FOR A DISTANCE OF 61.78 FEET TO A POINT;
S 68°09'42" E, FOR A DISTANCE OF 42.46 FEET TO A POINT;
S 81°12'54" E, FOR A DISTANCE OF 86.37 FEET TO A POINT;
S 45°49'08" E, FOR A DISTANCE OF 65.41 FEET TO A POINT;
S 39°48'13" E, FOR A DISTANCE OF 73.31 FEET TO A POINT;

THENCE, LEAVING MCKAY BRANCH AND CREATING A NEW LINE FOR THE ANNEXATION OF 409.92 ACRES. THE FOLLOWING CALLS:

NORTHEASTERLY ALONG A CURVE THROUGH A CENTRAL ANGLE OF 38°33'55", AN ARC DISTANCE OF 380.30 FEET TO A POINT OF TANGENCY, SAID CURVE IS CONCAVE NORTHWESTERLY AND HAS A RADIUS OF 565.50 FEET, CHORD BEARING N 24°33'52" E WITH A CHORD DISTANCE OF 373.16 FEET TO A POINT OF TANGENCY;
N 05°15'54" E, 84.04 FEET TO THE POINT OF BEGINNING CONTAINING 409.92 ACRES (17,855,971 SQ.FT.) AND BEING A PORTION OF THE PROPERTY DOWN ON TAX MAP 90 PARCEL 12.01 CONVEYED TO BIG BEAR BLUFFS, LLC BY DEED OF RECORD IN BOOK R2827, PAGE 287 IN THE REGISTER'S OFFICE OF MAURY COUNTY, TENNESSEE.

ANNEXATION AND REZONING REQUEST:

REQUEST TO ANNEX +/-409.92 ACRES AND REZONE TO PUD-R
FUTURE LAND USE: SUBURBAN NEIGHBORHOOD

CONNECT COLUMBIA FINDINGS:

Annexation should provide for a continuation of orderly, planned development of the City. Lot sizes and development scale should be compatible with surrounding development. If proposed development abuts land that is undeveloped or has low density/intensity, the density and intensity of the proposed development should taper towards the periphery to provide compatibility of the development pattern. Land annexed into the City should follow the transect and Character Area Matrix to provide the most appropriate land uses and zoning for the newly annexed land.

Response: The proposed Columbia Bluffs subdivision is 2 miles from the downtown core. Density and lot size transitions from higher density/intensity at the north, along the Bear Creek Parkway corridor to the south, where a more rural character is appropriate adjacent to Iron Bridge Rd and the Yanahli Park. The properties along Bear Creek Parkway have been identified as "area of change." With the development along this corridor, residential development in close proximity to downtown and new commercial development along Tom Hitch Parkway is a logical progression of development pattern.

Connectivity, directly through street, sidewalks, bikeways, greenways, and trails, and indirectly, through a mixture of housing and business types, should be encouraged throughout Columbia..

Response: In addition to roadway and sidewalk connections, Columbia Bluffs proposes nature trails through out the property. The development will also provide a roadway connection between Bear Creek Parkway and Iron Bridge Road. A variety of housing types are proposed, including an age restricted Active Adult neighborhood.

Suburban Neighborhood: Future development should emphasize connectivity and housing diversity.

Response: Columbia Bluffs proposes a variety of housing styles

Near-term Priorites: HOUSING MIX/TYPES: Promote mastered planned housing opportunities for a "full-life cycle" community to accommodate retirees and young professionals. Review Zoning standards to permit smaller lot and home sizes to encourage such developments.

DEVIATIONS FROM PUD-R ZONING STANDARDS REQUEST:

PUD-R Table 4.3.1-K District Standards: Planned Unit Development - Residential District

Bulk Standard	Required	Proposed
Side Setback	0 feet minimum on attached side of attached buildig types, otherwise 10 feet minimum; 24 feet maximum per side	Active Adult Homes: 5 feet Courtyard Homes: 7.5 feet Large Lot Homes: 7.5 feet Single Family Alley Loaded Homes: 5 feet Town Homes: 7.5 feet
Finished Floor Level	Minimum 18 inches above finished grade at façade.	Active Adult Homes: 0 inches above finished grade at façade for ADA accessibility; All other homes a minimum of 18 inches above finished grade at façade.
Façade Window Sill Height	If Residential: 5 ft. min. above avg. grade at Facade	Active Adult Homes: 24 inches minimum above average grade at façade; Courtyard Homes: 36 inches minimum above average grade at façade. All other homes 5 ft. minimum above average grade at façade.
Shopfront Frontages	12 in.-24 in. knee wall required at Frontage	For Clubhouse and Pre-School: finished floor elevation may match finished grade for ADA accessibility; no knee wall required.
Porch Peir Cladding	brick or natural stone, with any space under Porch concealed by painted or stained latticework between piers	brick or natural stone, with any space under porch concealed by painted or stained latticework between peirs; cladding may be excluded if column appears as a 6" x 6" cedar column from roof line to porch.
Garage Location	in 3rd Layer Only	Active Adult Homes: 2nd Layer Courtyard Homes: 2nd Layer Large Lot (side loaded): 2nd Layer Single Family Alley Loaded: 3rd Layer Town Homes: 3rd Layer
Garage Design	Min. interior dimensions 10 ft. x 20 ft. per vehicle Parking space. If Garage faces Street: max. Garage door width 33% of total of Garage + Facade width. Garage must be detailed, finished, & designed like rest of Building with carriage house doors; max. Garage door width 9 ft.; each Garage door must have ornamental lighting fixture above it; min. 2 ft. separation between Garage doors	Active Adult Homes: 10 ft x 20 ft per vehicle parking space; Garage Door width 67% pf total of garage + façade width; Garage must be detailed, finished, & designed like rest of Building with carriage house doors with windows; Single garage door width of 16 feet maximum; each Garage door must have ornamental lighting fixture above it; Courtyard Homes: 10 ft x 20 ft per vehicle parking space; Garage Doors are not permitted to face the public street and must be perpendicular to the right of way; Garage must be detailed, finished, & designed like rest of Building with carriage house doors with windows; Single garage door width of 16 feet maximum; each Garage door must have ornamental lighting fixture above it; Large Lot Homes: 10 ft x 20 ft per vehicle parking space; Garage Doors are not permitted to face the public street unless they are located in the 3rd Layer; Garage doors in the must be perpendicular to the right of way; Garage must be detailed, finished, & designed like rest of Building with carriage house doors with windows; Single garage door width of 16 feet maximum; each Garage door must have ornamental lighting fixture above it;
Driveway / Vehicular Entrance Maximum Width	10 ft max. in 1st Layer if Residential; 24 ft max. in 1st Layer if non-Residential, regardless if shared or not	Active Adult Homes: 18 ft max. in 1st Layer Courtyard Homes: 12 ft max in 1st Layer Large Lot Homes: 12 ft max in 1st Layer Single Family Alley Loaded: Not Applicable Town Home: Not Applicable
Non-Building Components	Recreation or Play Equipment NP in 1st or 2nd Layer	Recreation or Play Equipment Permitted in 1st and 2nd layer if provided in HOA maintained Civic Space or on the Day Care parcel.

Article 5: Development Parcel Plans and Standards. Table 5.2.2.G-1 Urban Neighborhood Street

Bulk Standard	Required	Proposed
Right of Way Width	70 ft	See Sheet C2.7
Pavement Width	38 ft	See Sheet C2.7

Article 5.3.1.A - Percentage of Civic Space

Bulk Standard	Required	Proposed
Civic Space Requirement	Any Development Parcel shall include at least 5% but not more than 20% of its gross acreage assigned as Civic Space(s). The Civic Space provided pursuant to this Section 5.3.1.A shall be in addition to all Yard, Setback, and Impervious Surface area required not permitted to be covered under this Ordinance and the Subdivision Regulations.	Remove: "but not more than 20%": Any Development Parcel shall include at least 5% of its gross acreage assigned as Civic Space(s). The Civic Space provided pursuant to this Section 5.3.1.A shall be in addition to all Yard, Setback, and Impervious Surface area required not permitted to be covered under this Ordinance and the Subdivision Regulations.

Table 5.3.3-A Civic Space Types - Summary

Bulk Standard	Required	Proposed
Civic Space Types - Green	An open area, available for unstructured recreation. A Green may be spatially defined by landscaping rather than Building Frontages. Its landscape shall consist of lawn and Trees, naturalistically disposed. The minimum size is 0.5 acre and the maximum is 8 acres.	Remove: "and the maximum is 8 acres": An open area, available for unstructured recreation. A Green may be spatially defined by landscaping rather than Building frontages. Its landscape shall consist of lawn and Trees, naturalistically disposed. The minimum size is 0.5 acre.

Table 5.3.3-B Civic Space Types - Specific Standards

Bulk Standard	Required	Proposed
Civic Space Types - Green	An open area, available for unstructured recreation. A Green may be spatially defined by landscaping rather than Building Frontages. Its landscape shall consist of lawn and Trees, naturalistically disposed. The minimum size is 0.5 acre and the maximum is 8 acres.	Remove: "and the maximum is 8 acres" from Intent and Specification Size: An open area, available for unstructured recreation. A Green may be spatially defined by landscaping rather than Building Frontages. Its landscape shall consist of lawn and Trees, naturalistically disposed. The minimum size is 0.5 acre.

Article 5.5.5 Civic Spaces Required

Bulk Standard	Required	Proposed
B. Playground	A Civic Space designed and equipped as a Playground conforming to Table 5.3.3-B (Civic Spaces – Playground) (1) within 800 feet of every Lot or Building Site in Residential Use in all Districts except CD-2, CD-3L, SD-INT, and SD-LI; and (2) within 1300 feet of every Lot or Building Site in Residential Use in Districts CD-2, CD-3L, and SD-LI; and	Add: A Civic Space designed and equipped as a Playground conforming to Table 5.3.3-B (Civic Spaces – Playground) (1) within 800 feet of every Lot or Building Site, excluding Active Adult lots, in Residential Use in all Districts except CD-2, CD-3L, SD-INT, and SD-LI;and (2) within 1300 feet of every Lot or Building Site in Residential Use in Districts CD-2, CD-3L, and SD-LI; and
C. Thoroughfare Enfrontment	Each Civic Space shall have a minimum of 50% of its perimeter Enfronting a Thoroughfare, except for Playgrounds or Community Gardens.	Remove the minimum perimeter requirement.

NOTE: ARCHITECTURAL DESIGN REVIEW BOARD APPROVED THE ARCHITECTURAL ELEVATIONS, WITH THE ABOVE LISTED DEVIATIONS AT THE JANUARY 9, 2024 MEETING.

PROJECT DESCRIPTION AND SITE DATA:

REQUEST TO ANNEX AND REZONE THE COLUMBIA BLUFFS PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN.

THE PUD-R PLAN PROPOSES AN ENVIRONMENTALLY SENSITIVE MASTER PLAN FOR A DIVERSE RESIDENTIAL DEVELOPMENT. APPROXIMATELY ONE-THIRD OF THE PROPOSED DEVELOPMENT IS RESERVED FOR ACTIVE ADULT/AGE RESTRICTED SINGLE-FAMILY HOMES. ADDITIONALLY, TOWN HOMES AND A VARIETY OF DETACHED SINGLE-FAMILY HOMES ARE PROPOSED.

IN ADDITION TO THE RESIDENTIAL COMPONENT, THE PUD-R PLANS PROPOSES A DAY CARE FACILITY AND A VARIETY OF NEIGHBORHOOD AMENITIES.

TOTAL SITE AREA: 409.92 ACRES
FUTURE LAND USE: SUBURBAN NEIGHBORHOOD

TOTAL AREA OF ROWS/ALLEY EASEMENTS: 60.34 AC; 14.7% OF GROSS AREA
OPEN SPACE: 214.93 AC; 52.4% OF GROSS AREA
ESTIMATED SITE ISR: 47.6%

TOTAL DWELLING UNITS: 800 HOMES
OVERALL SITE DENSITY: 1.96 DUA

RESIDENTIAL BREAKDOWN		NON RESIDENTIAL
ACTIVE ADULT HOMES:	296	DAYCARE 12,000 - 14,000 SF
TOWNHOMES:	166	RECREATION FACILITY LOT - 75,789 SF
ALLEY SINGLE-FAMILY:	151	CLUBHOUSE
COURTYARD HOMES:	93	
LARGE LOT HOMES:	94	

EXISTING TREE CANOPY COVERAGE: 262.4 AC; 64% OF TOTAL SITE
REQUIRED TREE CANOPY RETENTION: 36%; SEE SHEET C2.9

TOTAL OPEN SPACE PROVIDED: 214.93 AC; 52.4% OF GROSS SITE AREA
OPEN SPACE BREAKDOWN
CIVIC SPACE: 84.89 AC
ENVIRONMENTAL PROTECTION (FLOODWAY, STREAM/BUFFERS, 100 YR FLOOD PLAIN): 75.0 AC
ALL OTHER OPEN SPACE: 55.04 AC

CIVIC SPACE REQUIRED: 5% MINIMUM; 20.5 AC
CIVIC SPACE PROVIDED: 20.7%; 84.89 AC (SEE SHEET L1.0)

PARKING: SEE LOT DIAGRAMS (C2.6) FOR PROPOSED RESIDENTIAL PARKING;
AND SHEETS L1.0-L1.6 FOR CIVIC SPACE PARKING
RESIDENTIAL: 2 PARKING SPACES PER UNIT
DAYCARE: 1 PER STAFF + 0.5 PER CHILD
CIVIC SPACE: 1 PER 5,000 SF

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

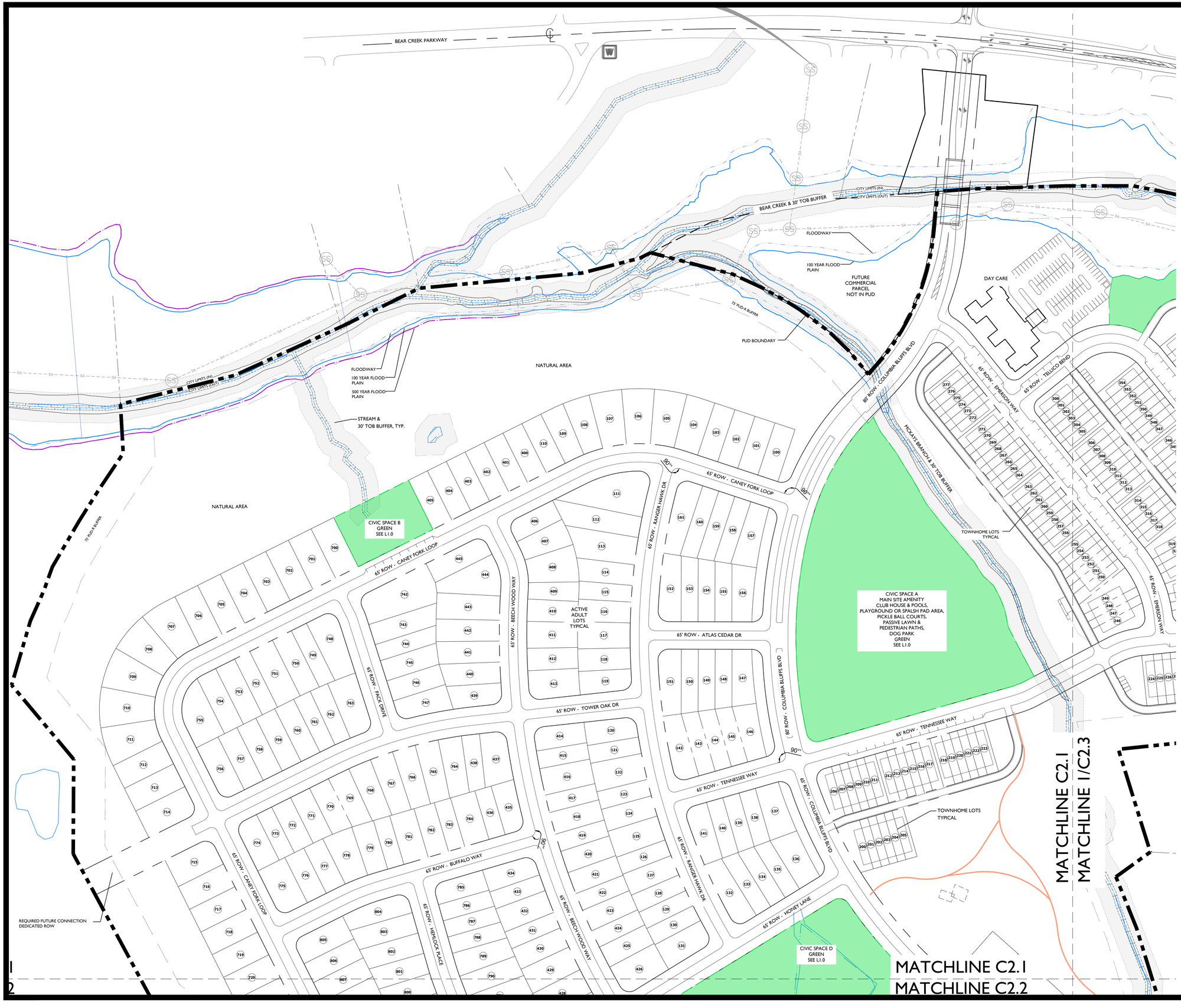
COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE
REGISTERED
TENNESSEE
LANDSCAPE ARCHITECT
282

Date: October 16, 2023

Revision Date
1 December 18, 2023
2 January 23, 2024
3

OVERALL PUD-R PMDP
SHEET
C2.0



500 YEAR FLOOD PLAIN
100 YEAR FLOOD PLAIN
CIVIC SPACE (SEE SHEET L1.0)
PAVED TRAIL (TO BE FIELD LOCATED)
PRIMITIVE TRAIL (TO BE FIELD LOCATED)

OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300
GRAPHIC SCALE 1"=100'-0"

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT
10-23-23

Date: October 16, 2023

Revision	Date
1	December 18, 2023
2	January 23, 2024
3	

ENLARGED PUD-R PMDP

SHEET
C2.1

MATCHLINE C2.1
MATCHLINE C2.2

MATCHLINE C2.1
MATCHLINE C2.2

MATCHLINE C2.2
MATCHLINE C2.4

CIVIC SPACE D
MAIL KIOSK
SEATING, PASSIVE LAWN & PEDESTRIAN PATHS, GREEN
SEE L1.0

CIVIC SPACE G
ACTIVE ADULT AMENITY
COVERED SEATING, PASSIVE LAWN & PEDESTRIAN PATHS, DOG PARK, COMMUNITY GARDEN, GREEN
SEE L1.0

CIVIC SPACE H
PASSIVE LAWN & PEDESTRIAN PATHS, PLAYGROUND GREEN
SEE L1.0

CIVIC SPACE J
TRAIL HEAD, SEATING, PASSIVE LAWN & PEDESTRIAN PATHS, GREEN
SEE L1.0

CIVIC SPACE E
MAIL KIOSK, PASSIVE LAWN & PEDESTRIAN PATHS, PLAYGROUND GREEN
SEE L1.0

ACTIVE ADULT LOTS TYPICAL

COURTYARD LOTS TYPICAL

ALLEY HOMES TYPICAL

LARGE LOTS TYPICAL

NATURAL AREA

65' ROW - HONEY LANE
65' ROW - HEMLOCK PLACE
65' ROW - WESTBORNE COVE
65' ROW - CANEY FORK LOOP
65' ROW - BEECHWOOD WAY
65' ROW - COLUMBIA BLUFFS BLVD
60' ROW - YELLOW BIRCH LOOP
55' ROW - WATAUGA WAY
55' ROW - PACK DRIVE
65' ROW - PIGEON COURT
60' ROW - OVERHILL GARDENS
55' ROW - EMORY COURT

75' PUD-R BUFFER

FLOODWAY
100 YEAR FLOOD PLAIN

STREAM & 30' TOB BUFFER, TYP.

DUCK RIVER

500 YEAR FLOOD PLAIN
100 YEAR FLOOD PLAIN
CIVIC SPACE (SEE SHEET L1.0)
PAVED TRAIL (TO BE FIELD LOCATED)
PRIMITIVE TRAIL (TO BE FIELD LOCATED)

OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300
GRAPHIC SCALE 1"=100'-0"

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

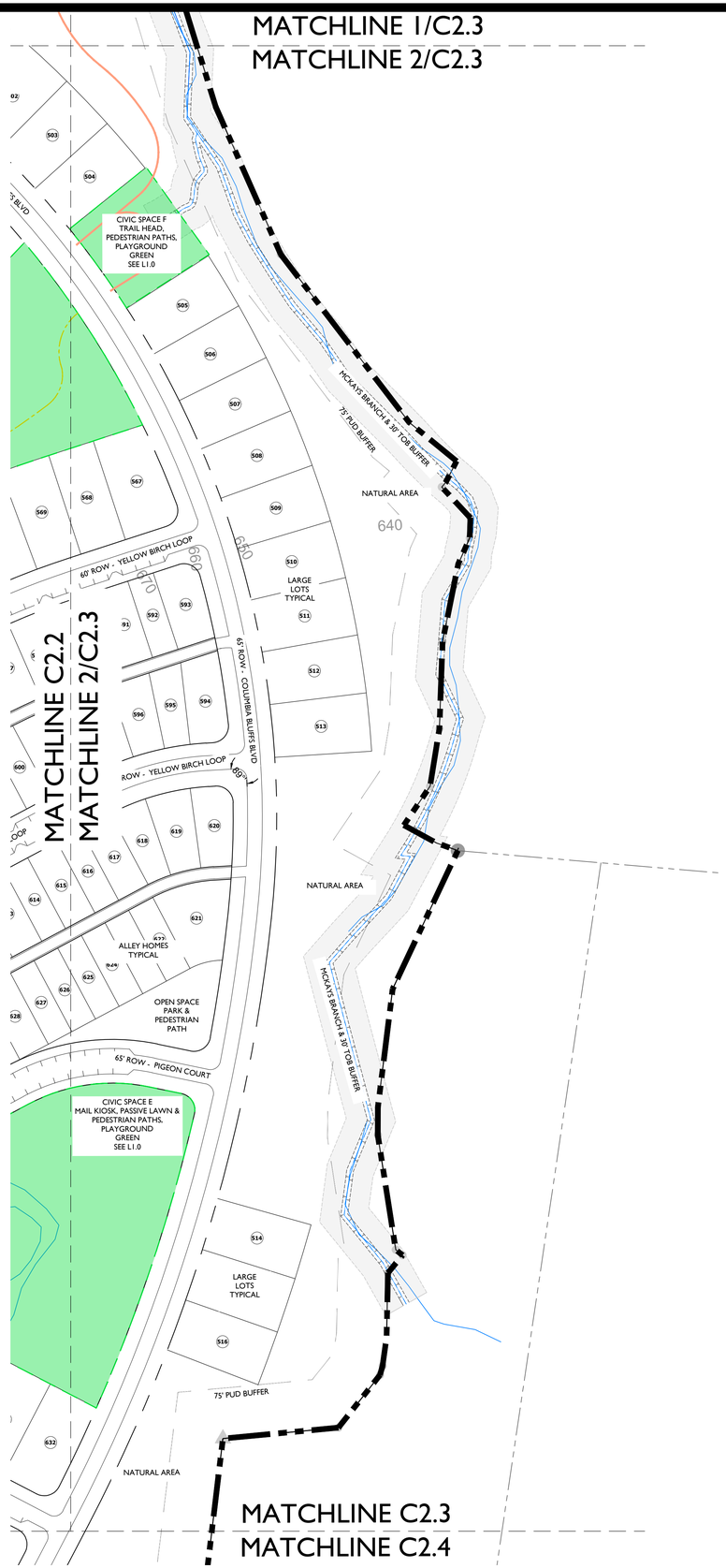
GREGORY C. GAMBLE
REGISTERED
TENNESSEE
LANDSCAPE ARCHITECT
128

Date: October 16, 2023

Revision Date
1 December 18, 2023
2 January 23, 2024
3

ENLARGED PUD-R PMDP
SHEET
C2.2





GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT
1.25.24

Date: October 16, 2023

Revision Date
1 December 18, 2023
2 January 23, 2024
3

500 YEAR FLOOD PLAIN
100 YEAR FLOOD PLAIN
CIVIC SPACE (SEE SHEET L1.0)
PAVED TRAIL (TO BE FIELD LOCATED)
PRIMITIVE TRAIL (TO BE FIELD LOCATED)

OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300
GRAPHIC SCALE 1"=100'-0"

ENLARGED PUD-R PMDP

SHEET
C2.3

MATCHLINE C2.3
MATCHLINE C2.4

75' PLOA BUFFER
FLOODWAY
100 YEAR FLOOD PLAIN
DUCK RIVER
CIVIC SPACE J
TRAIL HEAD, SEATING, PASSIVE LAWN & PEDESTRIAN PATHS, GREEN
SEE L1.0
LARGE LOTS TYPICAL
COURTYARD LOTS TYPICAL
55' ROW - EMORY COURT
60' ROW - OVERHILL GARDENS
65' ROW - COLUMBIA BLUFFS BLVD
55' ROW - ACADIA COVE
55' ROW - LIBERTY LOOP
DEDICATED ROW REQUIRED FUTURE CONNECTION
75' PLOA BUFFER
OHE
100' TVA LINE AND EASEMENT
NATURAL AREA
CIVIC SPACE I
MAIL KIOSK, SEATING, PASSIVE LAWN & PEDESTRIAN PATHS, PLAYGROUND
GREEN
SEE L1.0
55' ROW - OBED WAY
55' ROW - BAYOU COURT
STREAM & 30' TOB BUFFER, TYP.

MATCHLINE C2.4
MATCHLINE C2.5

500 YEAR FLOOD PLAIN
100 YEAR FLOOD PLAIN
CIVIC SPACE (SEE SHEET L1.0)
PAVED TRAIL (TO BE FIELD LOCATED)
PRIMITIVE TRAIL (TO BE FIELD LOCATED)

OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300
GRAPHIC SCALE 1"=100'-0"

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

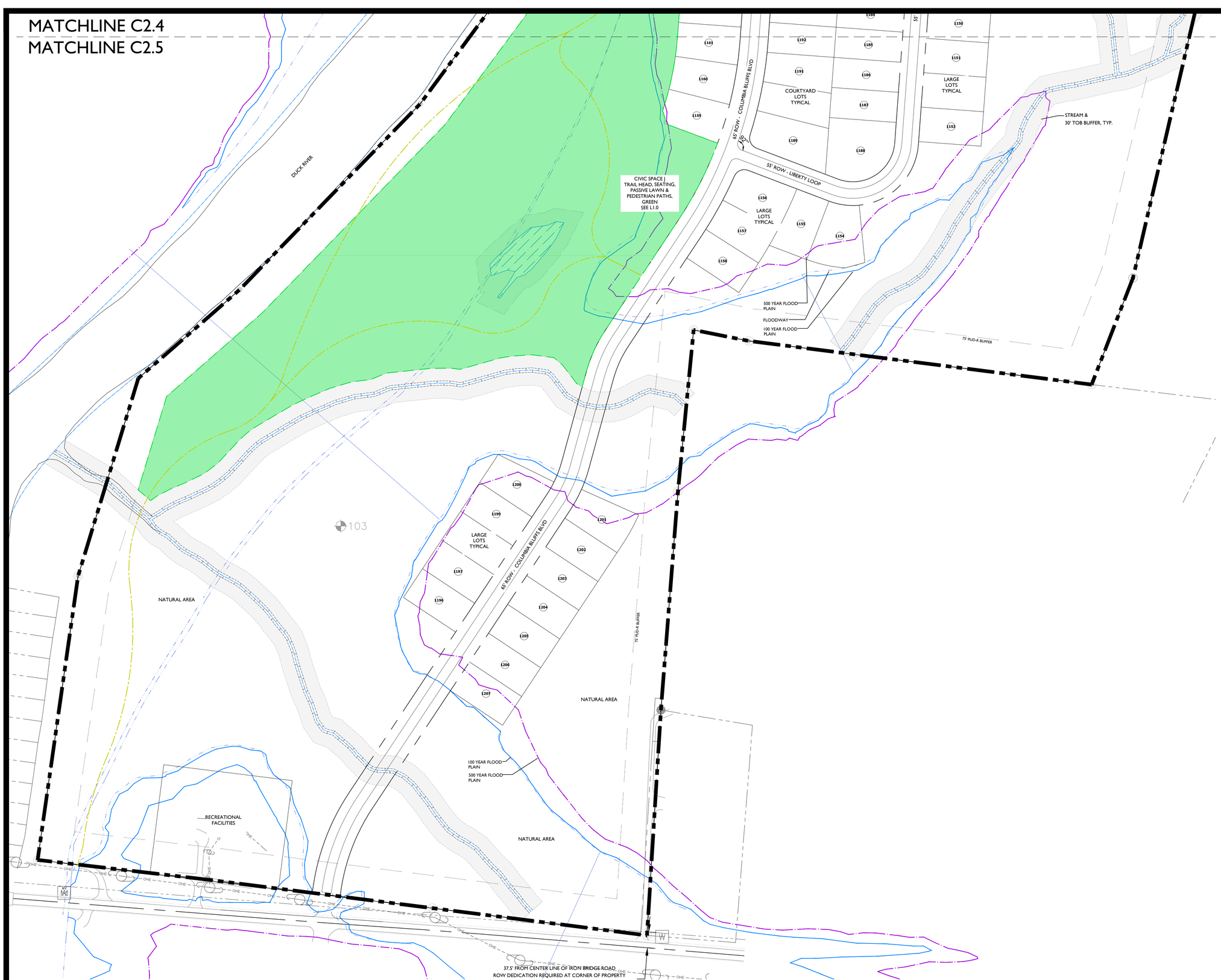
GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT
10-23-24

Date: October 16, 2023

Revision	Date
1	December 18, 2023
2	January 23, 2024
3	

ENLARGED PUD-R PMDP
SHEET
C2.4

MATCHLINE C2.4
MATCHLINE C2.5



500 YEAR FLOOD PLAIN
100 YEAR FLOOD PLAIN
CIVIC SPACE (SEE SHEET L1.0)
PAVED TRAIL (TO BE FIELD LOCATED)
PRIMITIVE TRAIL (TO BE FIELD LOCATED)

OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300
GRAPHIC SCALE 1"=100'-0"

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE REGISTERED LANDSCAPE ARCHITECT
1.23.24

Date: October 16, 2023

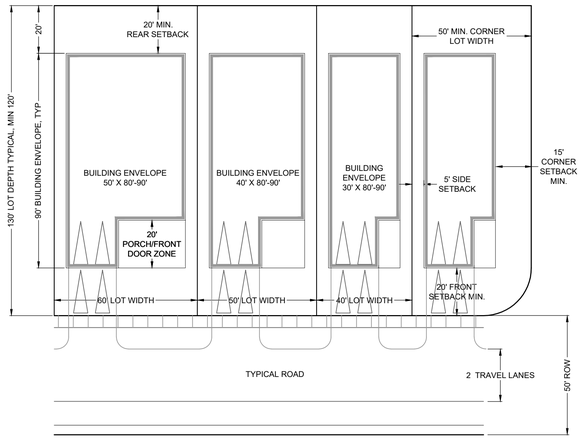
Revision Date
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3

ENLARGED PUD-R PMDP

SHEET
C2.5

ACTIVE ADULT/ AGE RESTRICTED DETACHED SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 40' X 120'; 50' X 120'; 60' X 120'

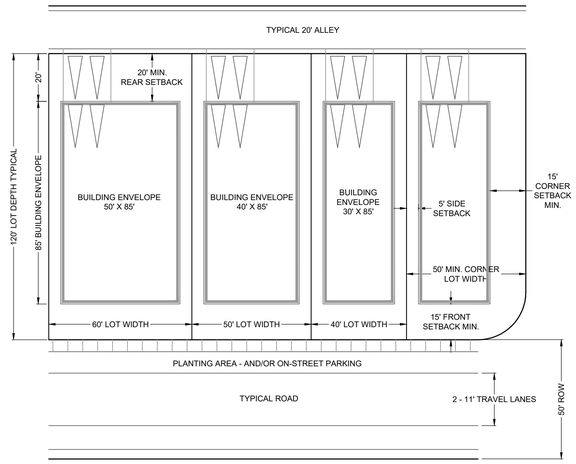
SETBACKS:	MODIFICATION REQUESTS:	LOT DISTRIBUTION:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 5' MIN. CORNER: 15' MIN. REAR: 20' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 5' GARAGE LOCATED IN 2ND LAYER DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16' DRIVEWAY TO BE 18' WIDE IN FIRST LAYER WINDOW SILL HEIGHT 3' ABOVE MIN. GRADE AT FACADE	60' LOTS: 60 50' LOTS: 139 40' LOTS: 97	60%



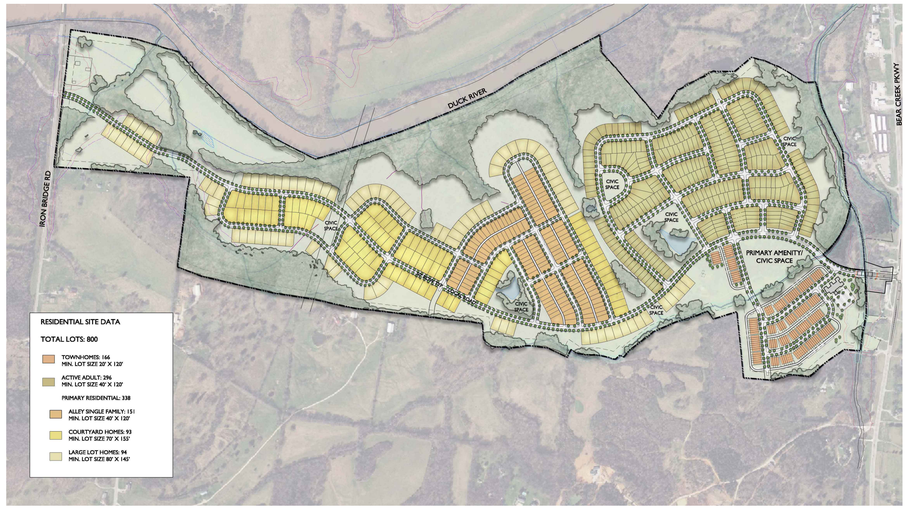
1 C2.6 ACTIVE ADULT LOT DIAGRAM N.T.S

PRIMARY RESIDENTIAL - ALLEY LOADED DETACHED SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 40' X 120'; 50' X 120'; 60' X 120'

SETBACKS:	MODIFICATION REQUESTS:	LOT DISTRIBUTION:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 5' MIN. CORNER: 15' MIN. REAR: 20' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 5'	50' LOTS: 60 40' LOTS: 91	63%



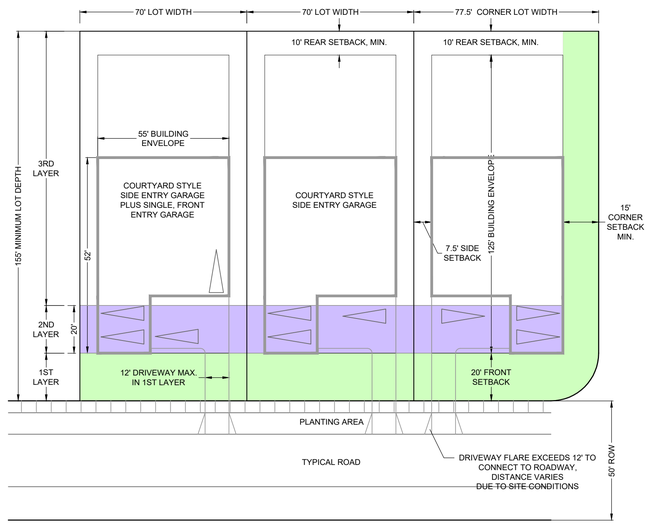
2 C2.6 SINGLE-FAMILY ALLEY LOT DIAGRAM N.T.S



3 C2.6 KEY MAP N.T.S

PRIMARY RESIDENTIAL COURTYARD SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 70' MIN. X 155'

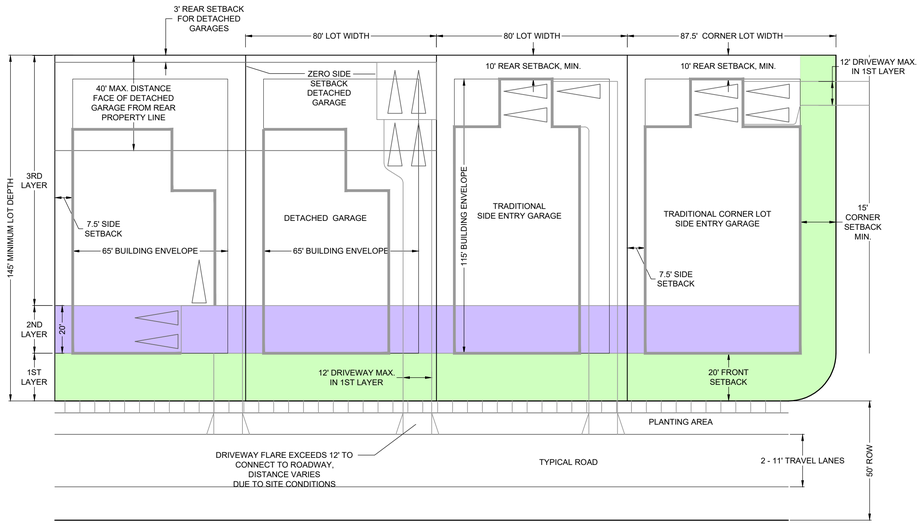
SETBACKS:	MODIFICATION REQUESTS:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 7.5' MIN. CORNER: 15' MIN. REAR: 10' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5' GARAGE LOCATED IN 2ND LAYER DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16' DRIVEWAY TO BE 12' WIDE IN FIRST LAYER WINDOW SILL HEIGHT 3' ABOVE FINISHED GRADE MIN.	30%



4 C2.6 COURTYARD HOME LOT DIAGRAM N.T.S

PRIMARY RESIDENTIAL LARGE LOT SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 80' MIN. X 145'

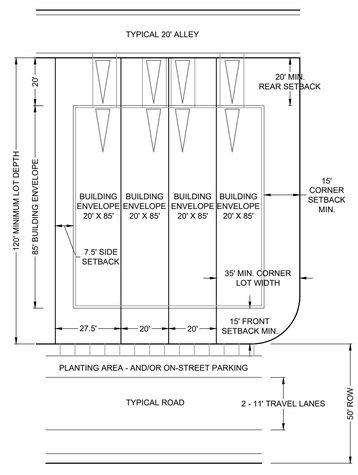
SETBACKS:	MODIFICATION REQUESTS:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 7.5' MIN. CORNER: 15' MIN. REAR: 10' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5' GARAGE LOCATED IN 2ND LAYER DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16' DRIVEWAY TO BE 12' WIDE IN FIRST LAYER	60%



5 C2.6 LARGE LOT HOME LOT DIAGRAM N.T.S

PRIMARY RESIDENTIAL ALLEY LOADED TOWN HOMES
TYPICAL INTERIOR LOT DIMENSIONS 20' MIN. X 120'
UNITS PER BUILDING: 4, 6, 7, OR 8

SETBACKS:	MODIFICATION REQUESTS:	TYPICAL ISR:
FRONT: 15' MIN. SIDE : 7.5' MIN. CORNER: 15' MIN. REAR: 20' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5'	80% INTERIOR UNITS



6 C2.6 TOWN HOME LOT DIAGRAM N.T.S

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

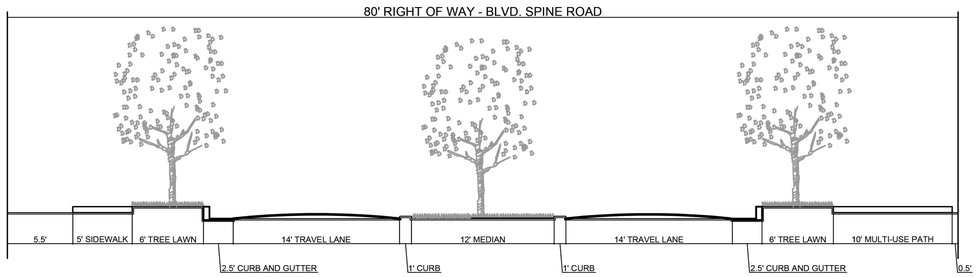
GREGORY C. GAMBLE REGISTERED LANDSCAPE ARCHITECT TENNESSEE 1282

Date: October 16, 2023

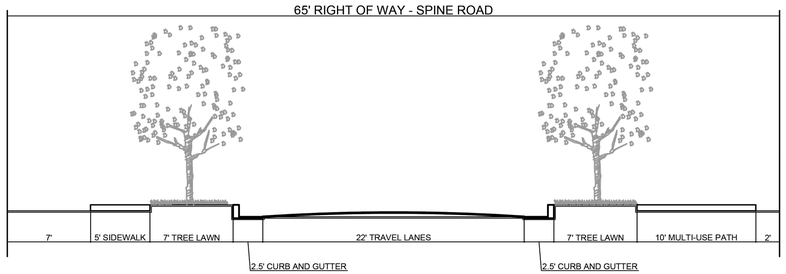
Revision Date
1 December 18, 2023
2 January 23, 2024
3

LOT DIAGRAMS

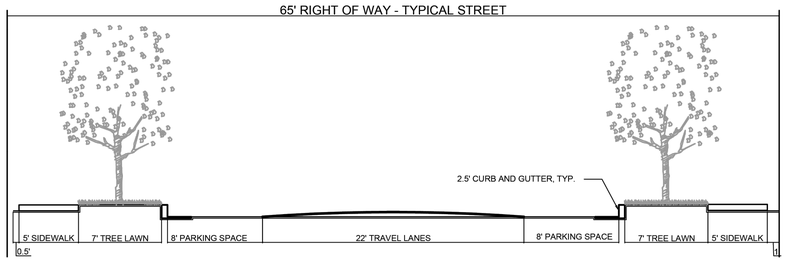
SHEET C2.6



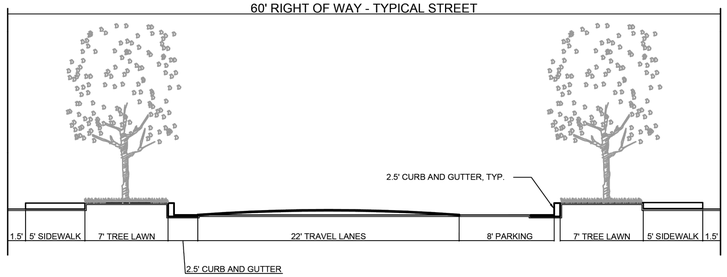
1 C2.7 80' ROW - COLUMBIA BLUFFS BLVD STREET SECTION N.T.S



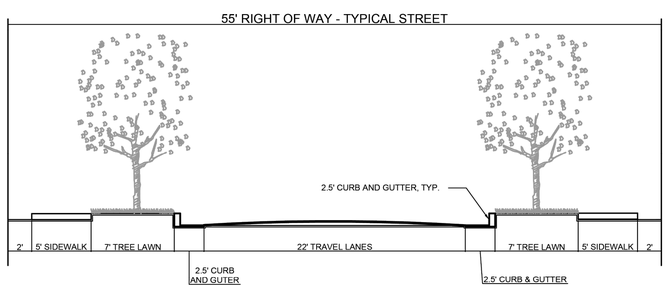
2 C2.7 65' ROW - COLUMBIA BLUFFS BLVD STREET SECTION N.T.S



3 C2.7 65' ROW - CD3 STREET SECTION W/ ON-STREET PARKING N.T.S



4 C2.7 60' ROW - CD3 STREET SECTION WITH ON STREET PARKING N.T.S



5 C2.7 55' ROW - CD3 STREET SECTION N.T.S

GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
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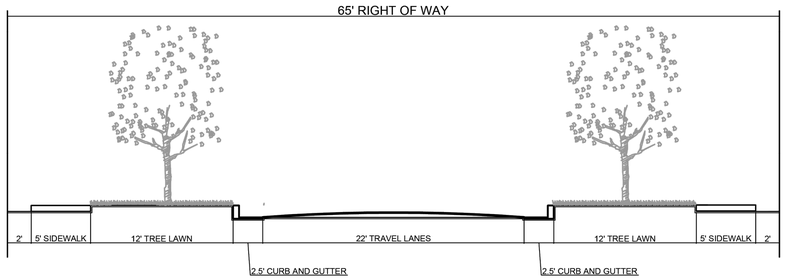
GREGORY C. GAMBLE — REGISTERED LANDSCAPE ARCHITECT — 1.25.24

Date: October 16, 2023

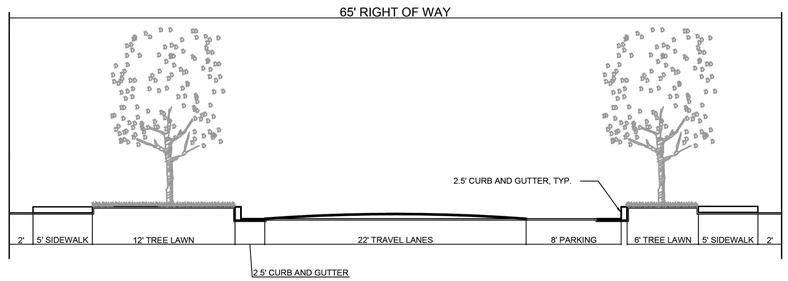
Revision	Date
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2	January 23, 2024
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STREET SECTIONS

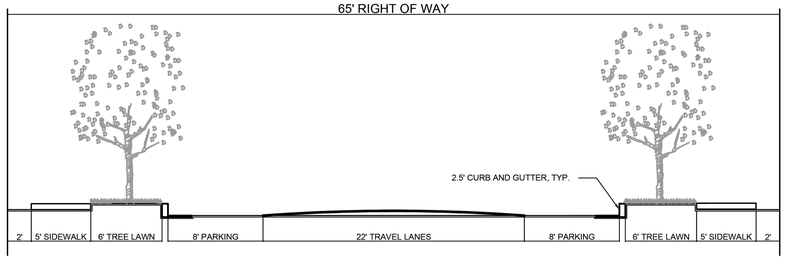
SHEET C2.7



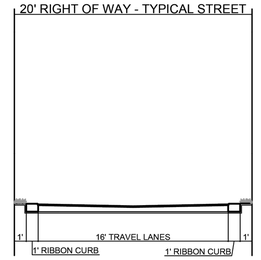
1 C2.8 65' ROW - CD4 STREET SECTION - NO ON-STREET PARKING N.T.S



2 C2.8 65' ROW - CD4 STREET SECTION W/ ON-STREET PARKING N.T.S



3 C2.8 65' ROW - CD4 STREET SECTION W/ ON-STREET PARKING N.T.S



4 C2.8 20' ROW - ALLEY STREET SECTION N.T.S

GAMBLE DESIGN COLLABORATIVE
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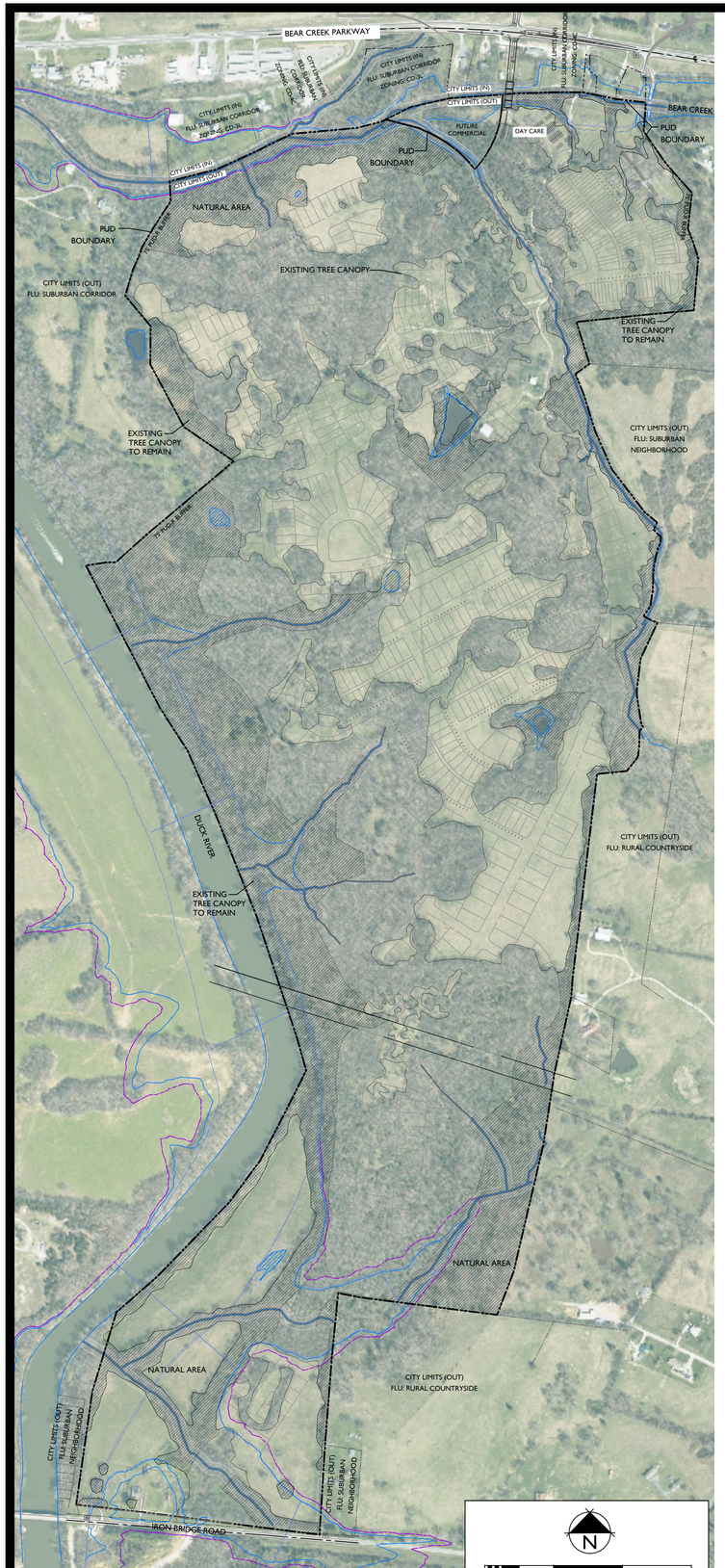
GREGORY C. GAMBLE REGISTERED LANDSCAPE ARCHITECT 1-23-24

Date: October 16, 2023

Revision	Date
1	December 18, 2023
2	January 23, 2024
3	

STREET SECTIONS

SHEET C2.8



SITE DATA:

EXISTING TREE CANOPY COVERAGE: 262.4 AC; 64% OF TOTAL SITE
REQUIRED TREE CANOPY RETENTION: 36%; 94.5 AC MIN
ESTIMATED PRESERVATION: 101.5 AC; 39%

ANTICIPATED PRESERVATION AREAS TO BE DETERMINED WITH FINAL GRADING/STORMWATER.

GAMBLE DESIGN COLLABORATIVE
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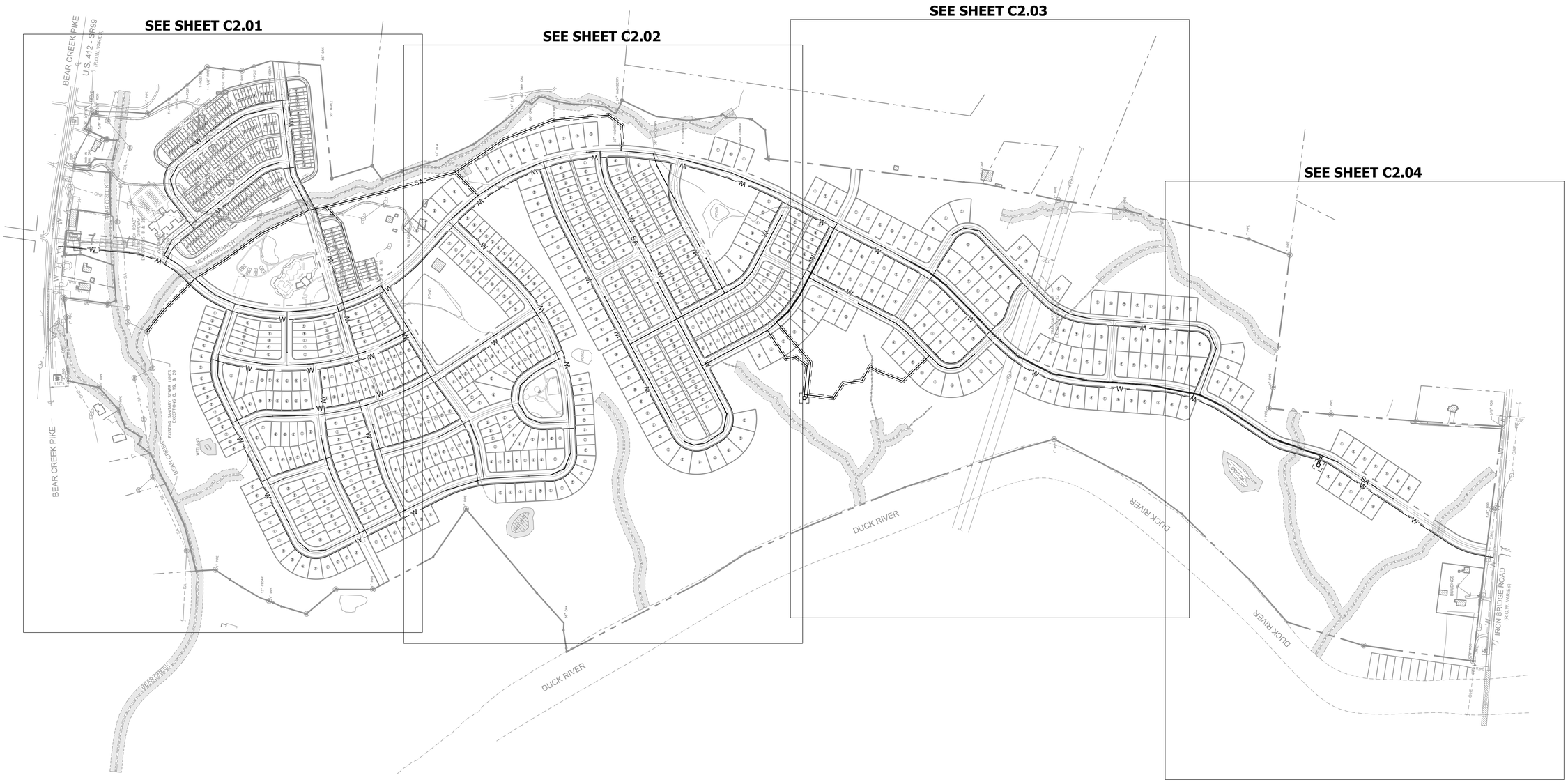
GREGORY C. GAMBLE
REGISTERED
TENNESSEE
LANDSCAPE ARCHITECT
1.25.24

Date: October 16, 2023

Revision Date
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2 January 23, 2024
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OVERALL PUD-R PMDP

SHEET
C2.9



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PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

Review Comments

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REVISION HISTORY:

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1	Initial Submittal	10/16/23
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DRAWN BY: TWG
CHECKED BY: TWG

OVERALL UTILITY PLAN

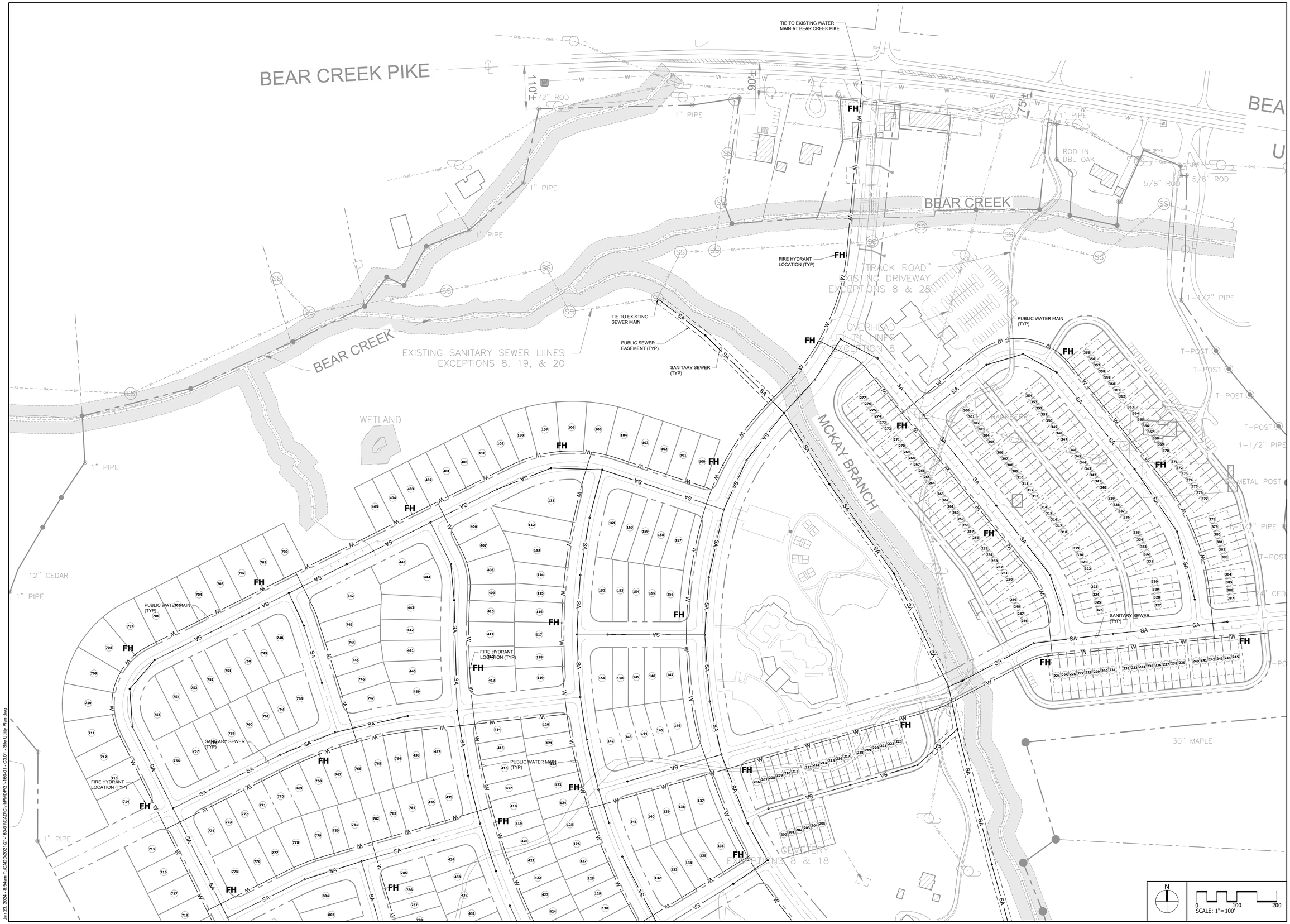
C3.00

PROJECT NO.: 21-160-01

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SCALE: 1"= 300'

Jan 23, 2024 - 8:54am T:\CAD\D\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.00 - Overall Utility Plan.dwg



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DRAWN BY: TWG
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SITE UTILITY PLAN

C3.01
PROJECT NO.: 21-160-01

Jan 23, 2024 - 8:54am T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.01 - Site Utility Plan.dwg



Jan 23, 2024 - 8:54am T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.02 - Site Utility Plan.dwg

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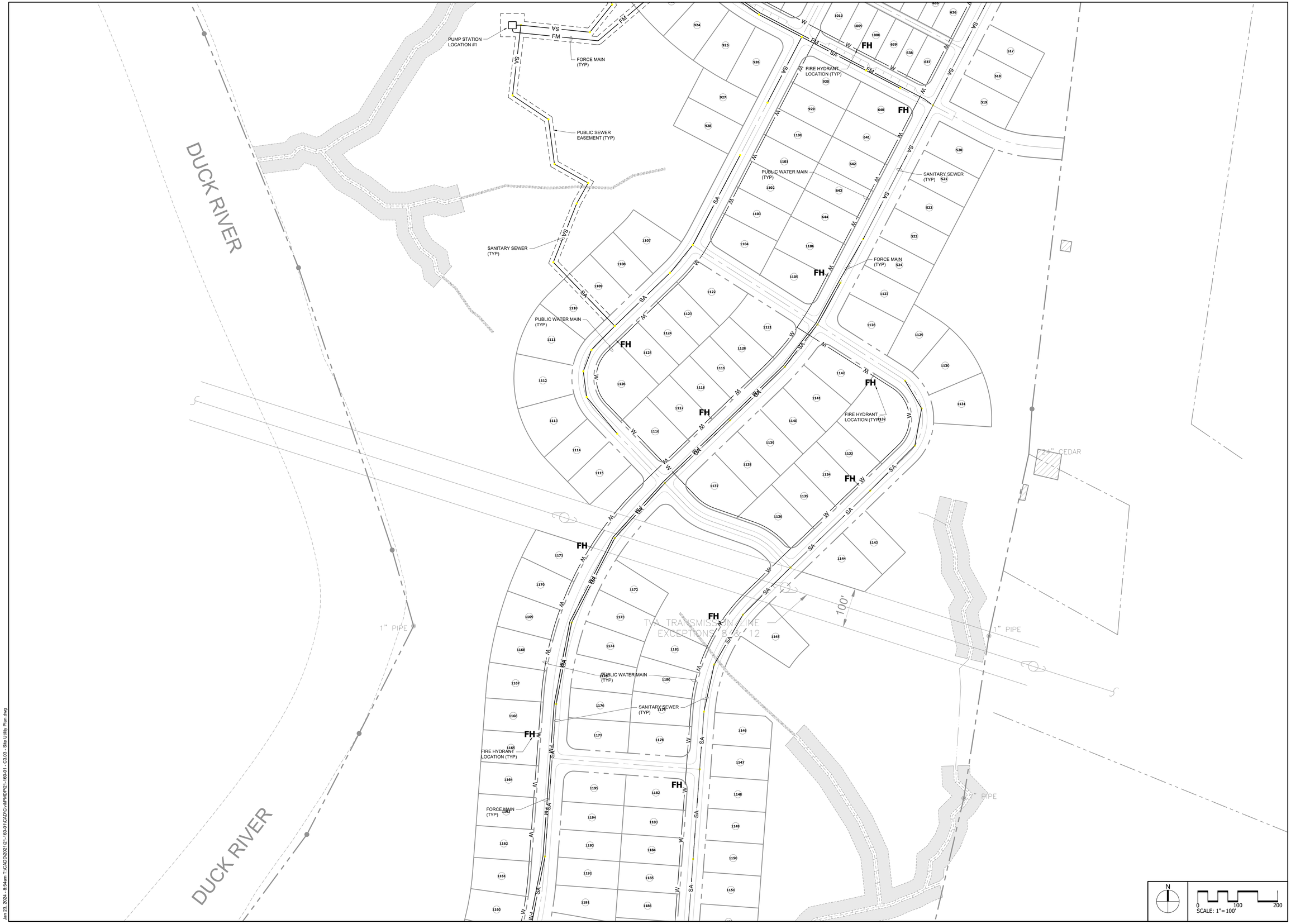
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CHECKED BY: TWG

SITE UTILITY PLAN

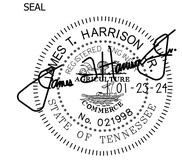
C3.02

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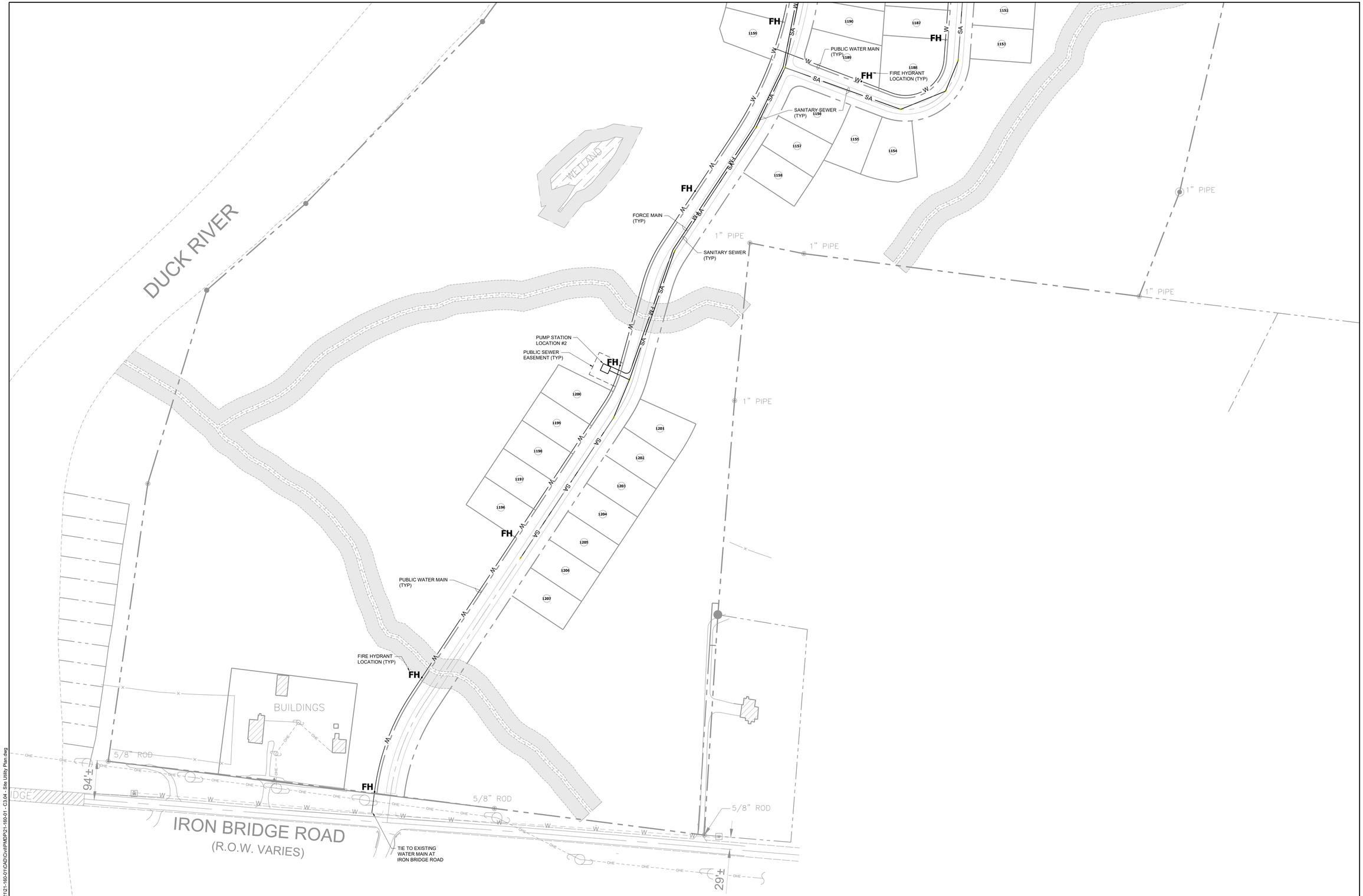
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SITE UTILITY PLAN

C3.03

PROJECT NO.: 21-160-01

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COMMERCE
No. 021998
STATE OF TENNESSEE
10-23-24

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SITE UTILITY PLAN

C3.04

PROJECT NO.: 21-160-01

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SCALE: 1"= 100'

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N

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SCALE: 1"= 300'

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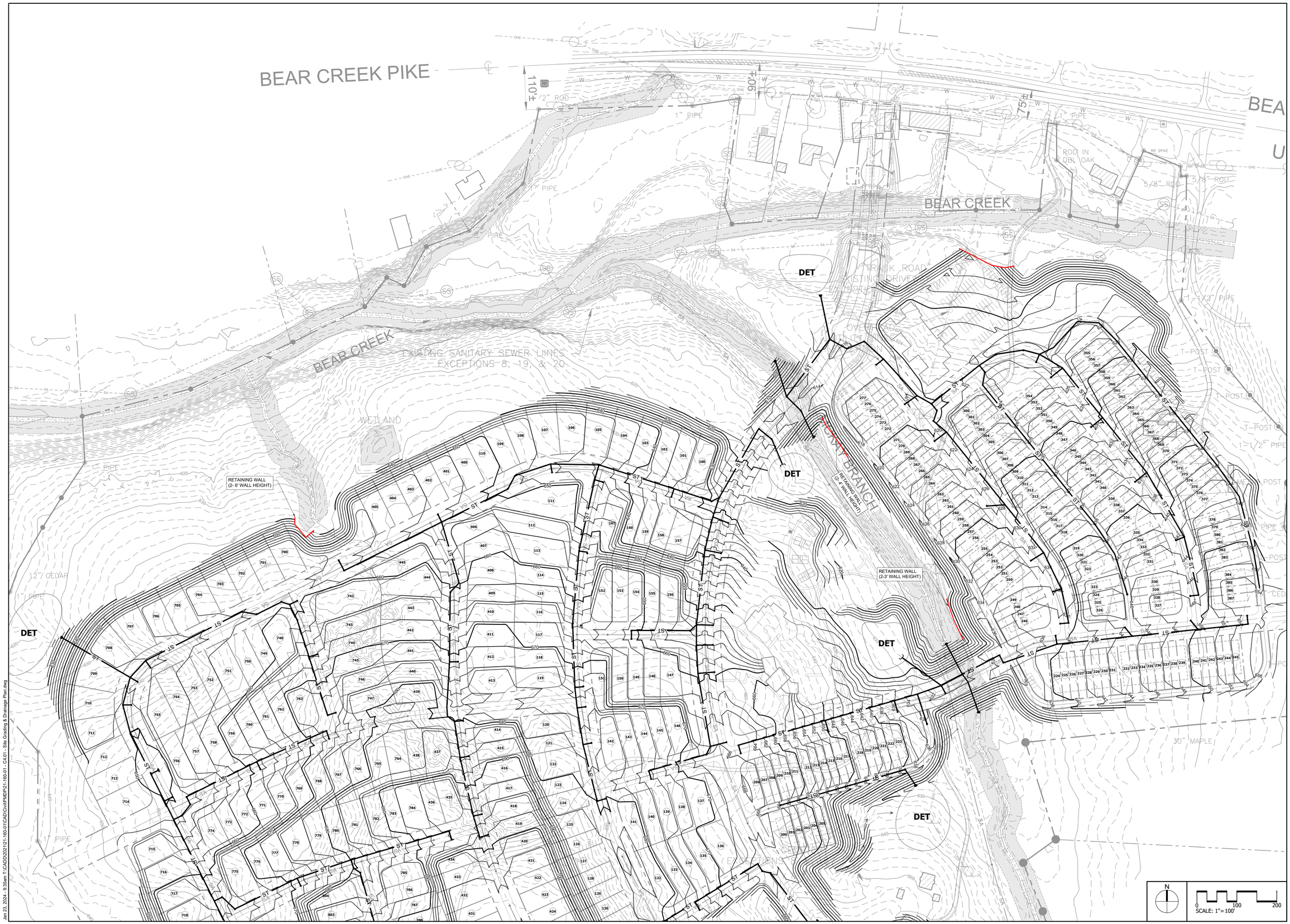
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OVERALL GRADING & DRAINAGE PLAN

C4.00

PROJECT NO.: 21-160-01

Jan 23, 2024 - 9:38am T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.00 - Overall Grading & Drainage Plan.dwg



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ENGINEER
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STATE OF TENNESSEE
10-23-24

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SITE GRADING & DRAINAGE PLAN

C4.01

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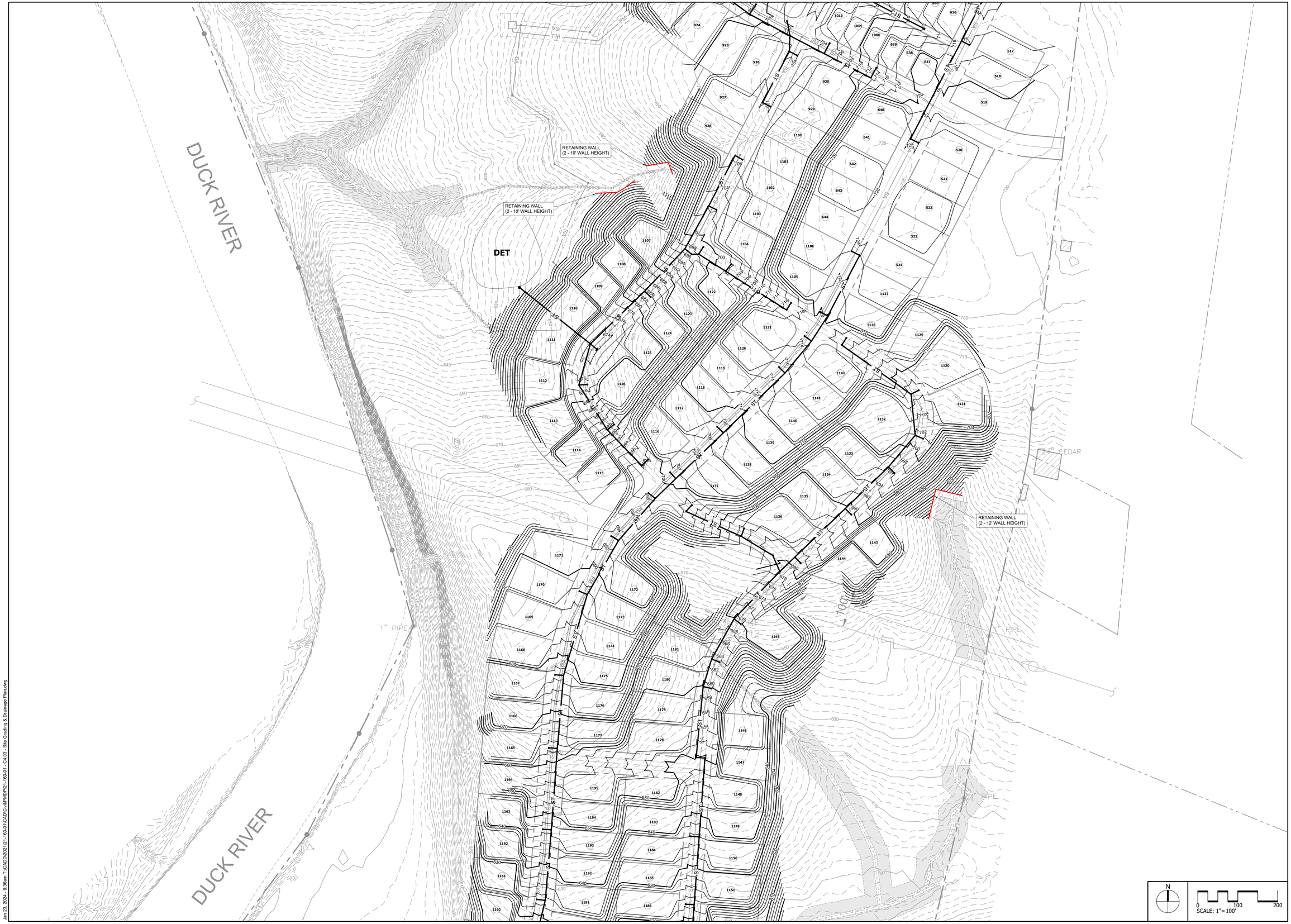
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SITE GRADING & DRAINAGE PLAN

C4.02

PROJECT NO.: 21-160-01

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SCALE: 1"= 100'

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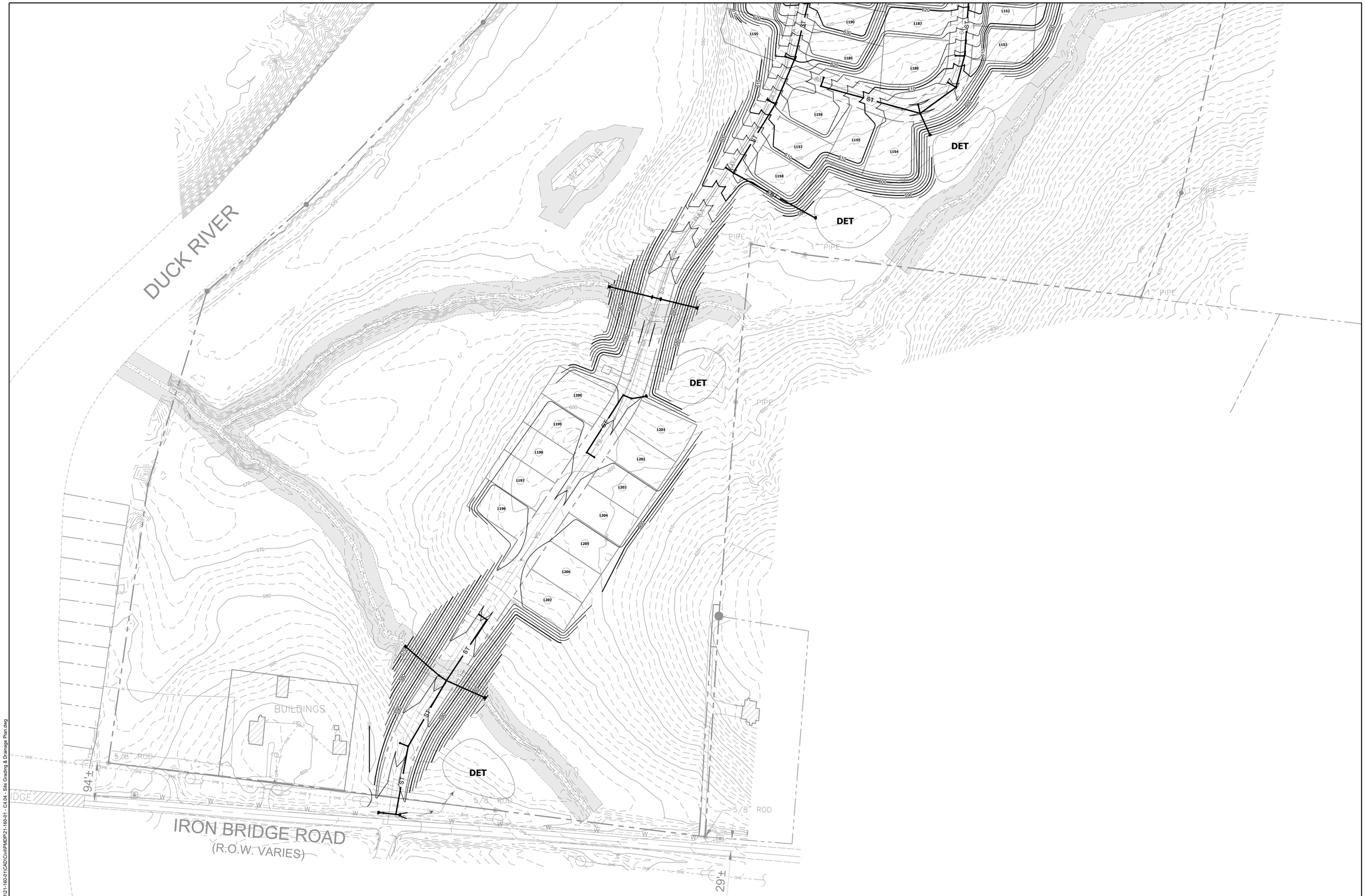
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SITE GRADING & DRAINAGE PLAN

C4.03

PROJECT NO.: 21-160-01

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SITE GRADING & DRAINAGE PLAN

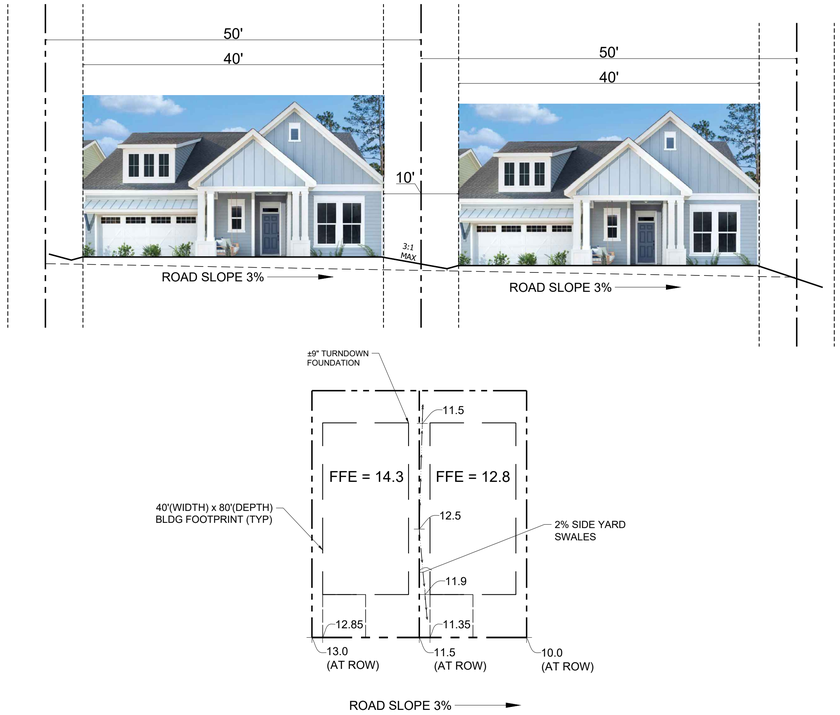
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PROJECT NO.: 21-160-01

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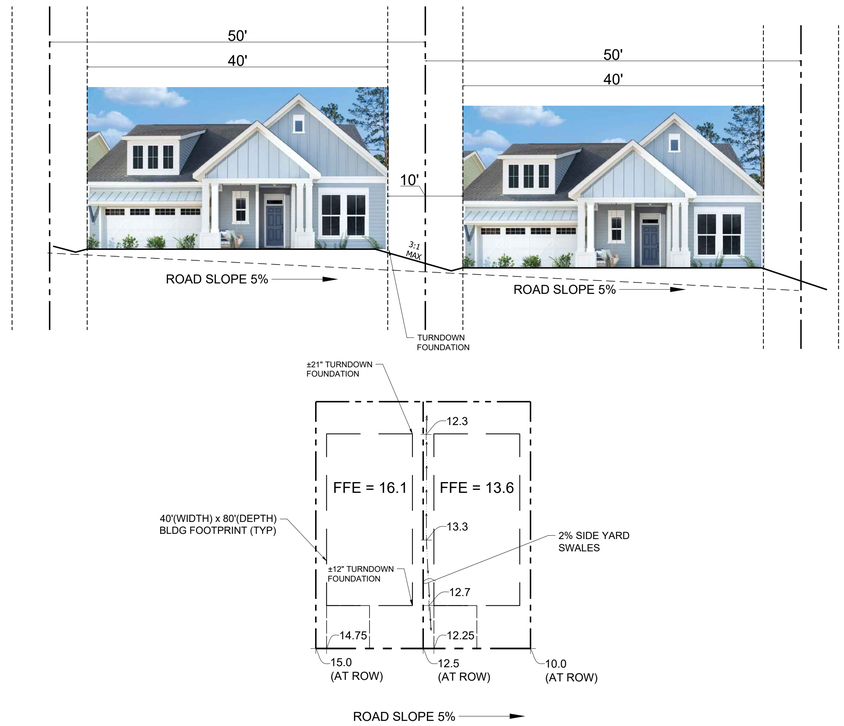
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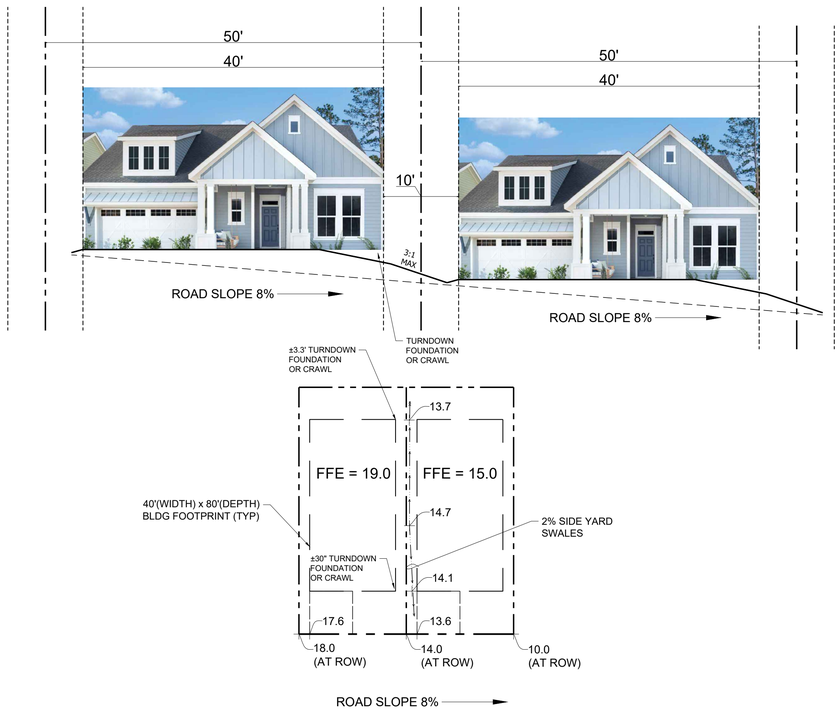
LOT GRADING DIAGRAM - 3% ROAD SLOPE

NTS



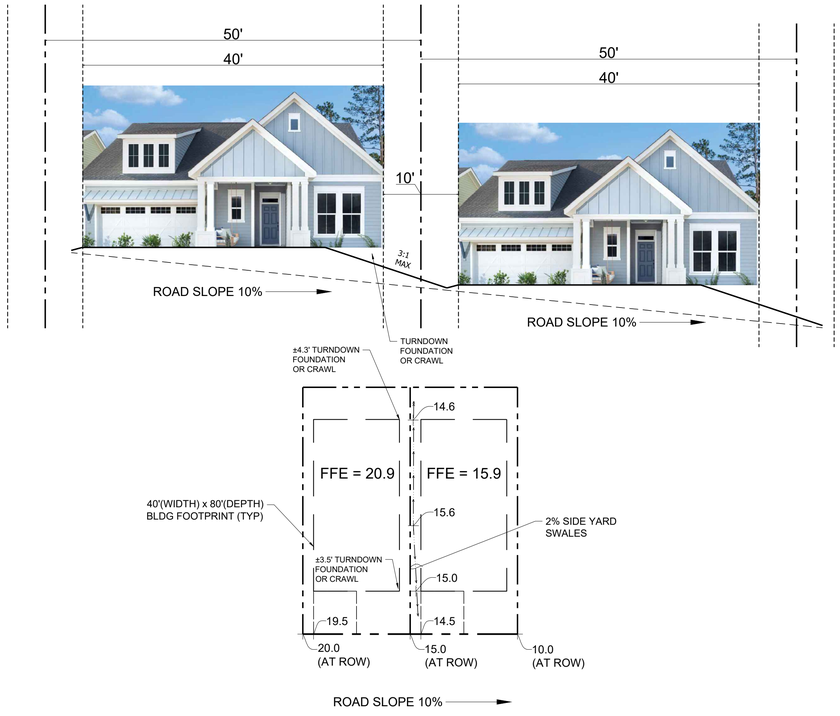
LOT GRADING DIAGRAM - 5% ROAD SLOPE

NTS



LOT GRADING DIAGRAM - 8% ROAD SLOPE

NTS

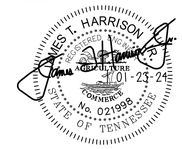


LOT GRADING DIAGRAM - 10% ROAD SLOPE

NTS

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Landscape Architecture
2305 Kline Ave, Ste 300
Nashville, TN 37211
615.248.9999
csdgtn.com

SEAL



COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

Review Comments

ISSUE DATE: 01/23/24

REVISION HISTORY:

Rev.	Description	Date
1	Initial Submittal	10/16/23
2	Tech Review Comments	12/18/23
3	Tech Review Comments	01/23/24

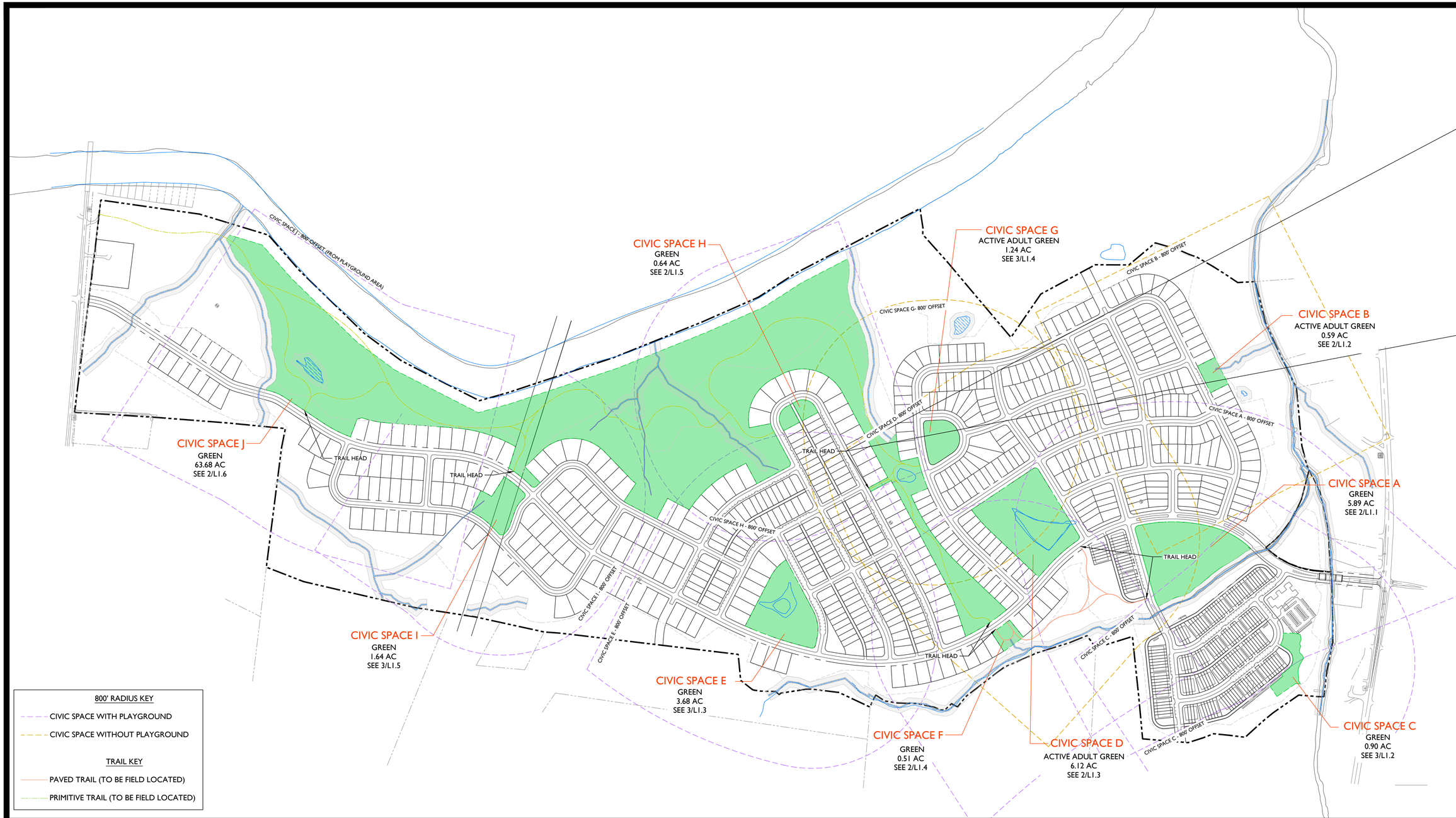
DRAWN BY: TWG
CHECKED BY: TWG

LOT DRAINAGE DIAGRAMS

C4.05

PROJECT NO.: 21-160-01

Jan 23, 2024 - 8:53am T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.05 - Lot Drainage Diagrams.dwg



800' RADIUS KEY

- CIVIC SPACE WITH PLAYGROUND
- CIVIC SPACE WITHOUT PLAYGROUND

TRAIL KEY

- PAVED TRAIL (TO BE FIELD LOCATED)
- PRIMITIVE TRAIL (TO BE FIELD LOCATED)

OVERALL CIVIC SPACE PLAN

N

0 300 600 900

GRAPHIC SCALE 1"=300'-0"

TOTAL OPEN SPACE PROVIDED: 214.93 AC; 52.4% OF GROSS SITE AREA

OPEN SPACE BREAKDOWN

CIVIC SPACE: 84.89 AC

ENVIRONMENTAL PROTECTION (FLOODWAY, STREAM/BUFFERS, 100 YR FLOOD PLAIN): 75.0 AC

ALL OTHER OPEN SPACE: 55.04 AC

CIVIC SPACE REQUIRED: 5% MINIMUM; 20.5 AC

CIVIC SPACE PROVIDED: 20.7%; 84.89 AC (SEE SHEET L1.0)

CIVIC SPACE BREAKDOWN

KEY	SIZE	PLAYGROUND
A	5.89 AC	YES
B	0.59 AC	NO
C	0.90 AC	YES
D	6.12 AC	NO
E	3.68 AC	YES
F	0.51 AC	YES
G	1.24 AC	YES
H	0.64 AC	YES
I	1.64 AC	YES
J	63.68 AC	YES

GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS

PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

GLORY C. GAMBLE REGISTERED LANDSCAPE ARCHITECT 1-23-24

Date: October 16, 2023

Revision Date

1 December 18, 2023

2 January 23, 2024

OVERALL CIVIC SPACE PLAN

SHEET

L1.0



1 LI.1 KEY MAP N.T.S

NEIGHBORHOOD CLUBHOUSE





PICKLE BALL COURTS



DOG PARK

WALKING PATHS





SWING BENCH

POOL





PICKLE BALL COURTS



2 LI.1 CIVIC SPACE - A
CONCEPTUAL PLAN

0' 50' 100'

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE
REGISTERED LANDSCAPE ARCHITECT
1.25.24

Date: October 16, 2023
Revision Date
1 December 18, 2023
2 January 23, 2024
△

OVERALL CIVIC SPACE PLAN
SHEET
LI.1



1 / LI.2 KEY MAP N.T.S



2 / LI.2 CIVIC SPACE - B

CONCEPTUAL PLAN NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'



BENCHES



FORMAL PLANTING



FORMAL LAWN



WALKING PATH



3 / LI.2 CIVIC SPACE - C

CONCEPTUAL PLAN NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'

PLAYGROUND





FORMAL PLANTING

PLAYGROUND



GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee



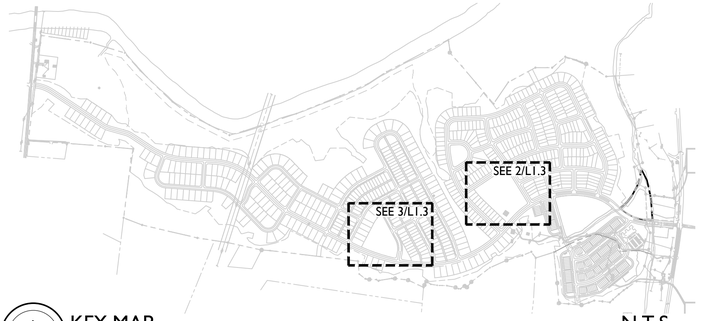
Date: October 16, 2023

Revision	Date
1	December 18, 2023
2	January 23, 2024
3	

OVERALL CIVIC SPACE PLAN

SHEET LI.2





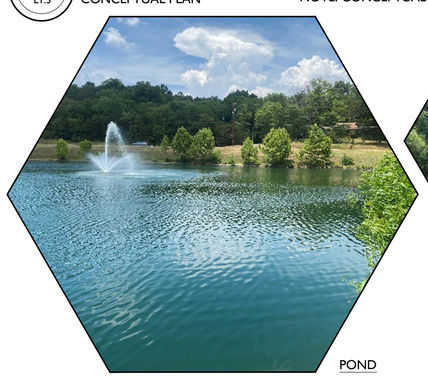
1 / L1.3 KEY MAP N.T.S



2 / L1.3 CIVIC SPACE - D
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

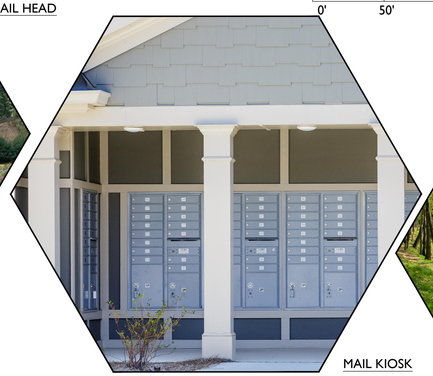
0' 50' 100'



POND



TRAIL HEAD



MAIL KIOSK

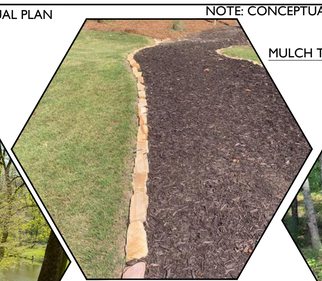
3 / L1.3 CIVIC SPACE - E
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

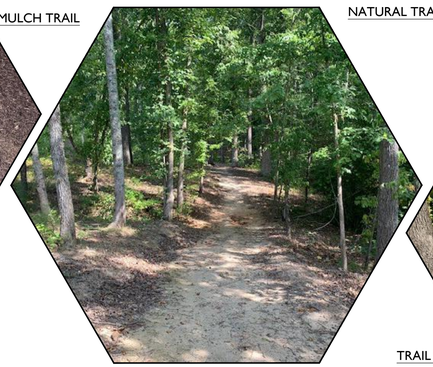
0' 30' 60'



NATURAL POND



MULCH TRAIL



NATURAL TRAIL



TRAIL SIGN

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE REGISTERED LANDSCAPE ARCHITECT 1.25.24

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OVERALL CIVIC SPACE PLAN

SHEET L1.3



2 L1.4 CIVIC SPACE - F

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'



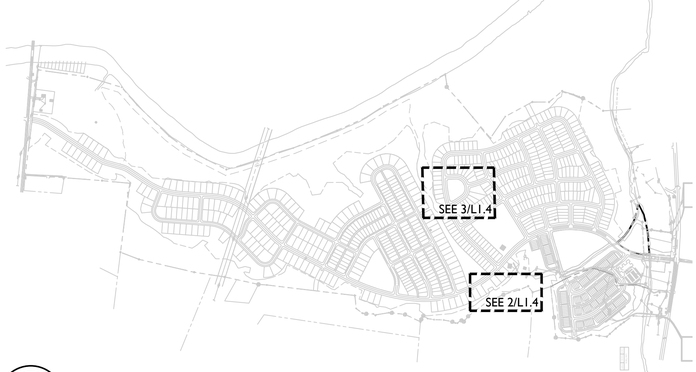
SWINGS



FORMAL PARK



PLAYGROUND



1 L1.4 KEY MAP N.T.S



3 L1.4 CIVIC SPACE - G

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

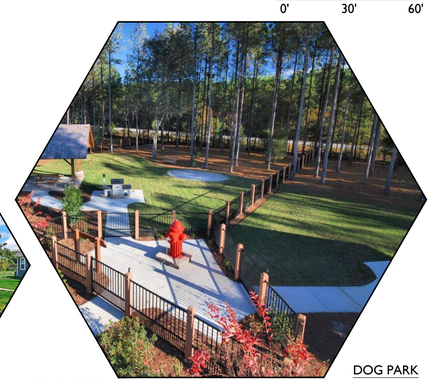
0' 30' 60'



FORMAL PARK



COMMUNITY GARDEN



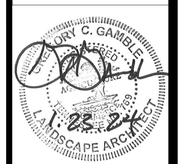
DOG PARK

GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee



Date: October 16, 2023

Revision Date

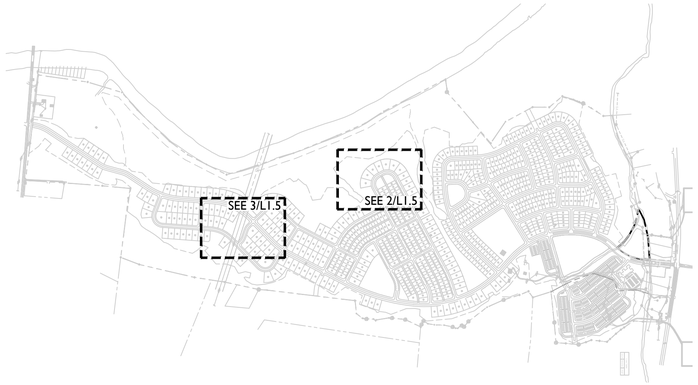
1 December 18, 2023

2 January 23, 2024

OVERALL CIVIC SPACE PLAN

SHEET

L1.4



1 LI.5 KEY MAP N.T.S



2 LI.5 CIVIC SPACE - H

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'

SWINGS





PLAYGROUND



PLAYGROUND



3 LI.5 CIVIC SPACE - I

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'



SWINGS



MAIL KIOSK



FORMAL PLANTING

GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE REGISTERED LANDSCAPE ARCHITECT 1.23.24

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Revision Date
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2 January 23, 2024
3

OVERALL CIVIC SPACE PLAN

SHEET LI.5



2 / L1.6 CIVIC SPACE - J

CONCEPTUAL PLAN NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 100' 200'

NOTE: PRIMITIVE WALKING TRAILS TO BE FIELD LOCATED.



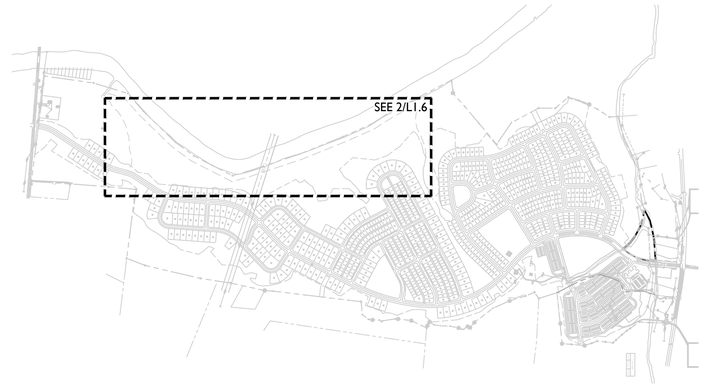
OPEN FIELD



TRAIL HEAD



MULTI-PURPOSE FIELD



1 / L1.6 KEY MAP N.T.S

GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE REGISTERED LANDSCAPE ARCHITECT TENNESSEE 1282

Date: October 16, 2023

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1	December 18, 2023
2	January 23, 2024
3	

OVERALL CIVIC SPACE PLAN

SHEET L1.6

KOLTERLAND

14025 Riveredge Drive
Suite 175
Tampa, FL 33637

T 813-615-1244
F 813-615-1461
www.kolter.com

February 9th, 2024

Mr. Kevin McCarthy & Mr. Austin Brass
Planning Department
City of Columbia, TN
N. Garden Street
Columbia, TN

RE: Memorandum of Understanding (MOU) for the- Construction of the Columbia Bluffs Amenity

Dear Mr. McCarthy and Mr. Brass,

Kolter Land (Developer) would like to submit this MOU to the Planning Department regarding the timing of the construction of the Amenity for the Columbia Bluffs project.

Prior to final acceptance of *Phase 3 and all subsections* of vertical build out, and prior to the Submission of the Final Plat to the Planning Commission for *Phase 4*, the **Amenity Center**, located east of the Active Adult portion of the development will have commenced and be completed.

Please let me know if you should have any questions.

Respectfully,

Joshua Gibbs
Kolter Land Partners, LLC
Vice President
14025 Riveredge Drive, Suite 175
Tampa, FL 33637
(615) 582-3253

GRAVITY SEWER TO SOUTHERN PUMP STATION

NORTHERN PUMP STATION TO BE REMOVED. FLOW REDIRECTED TO SOUTHERN STATION

GRAVITY SEWER TO SOUTHERN PUMP STATION

SOUTHERN PUMP STATION (OFF PAGE)
±238 LOTS DIRECTED TO STATION
(±149 LOTS REDIRECTED FROM NORTHERN STATION)

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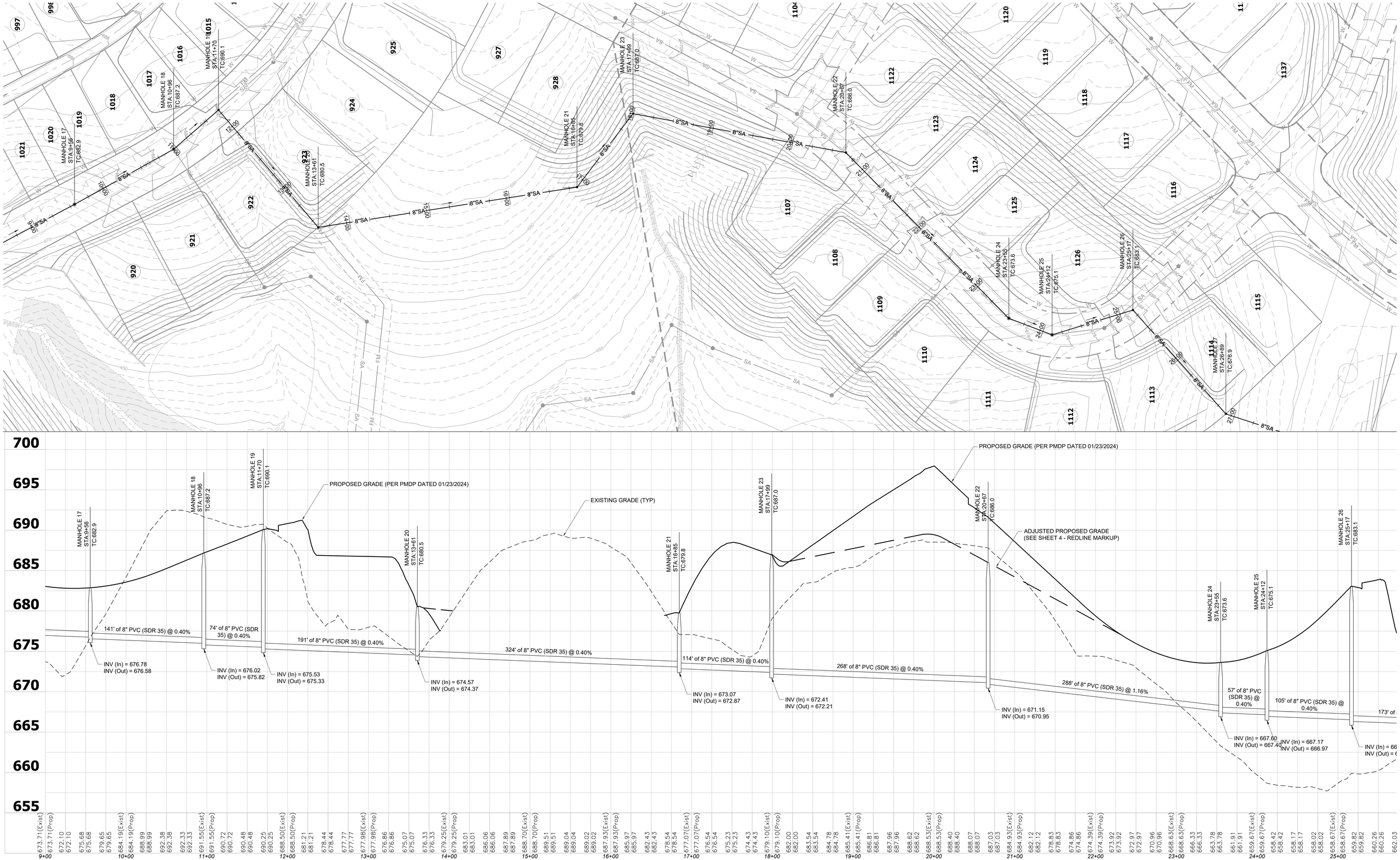
COLUMBIA BLUFFS - PMDP EXHIBIT

SEWER PLAN - LAYOUT ADJUSTMENT (SHEET 1 OF 4)

PN:21-160-01 | D:02.06.2024

N

SCALE: 1"=100'



CSDG Planning | Engineering Landscape Architecture

COLUMBIA BLUFFS - PMDP EXHIBIT

SEWER PROFILE (SHEET 2 OF 4)

PN:21-160-01 | D:02.06.2024

N

SCALE: 1"= 50'



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COLUMBIA BLUFFS - PMDP EXHIBIT

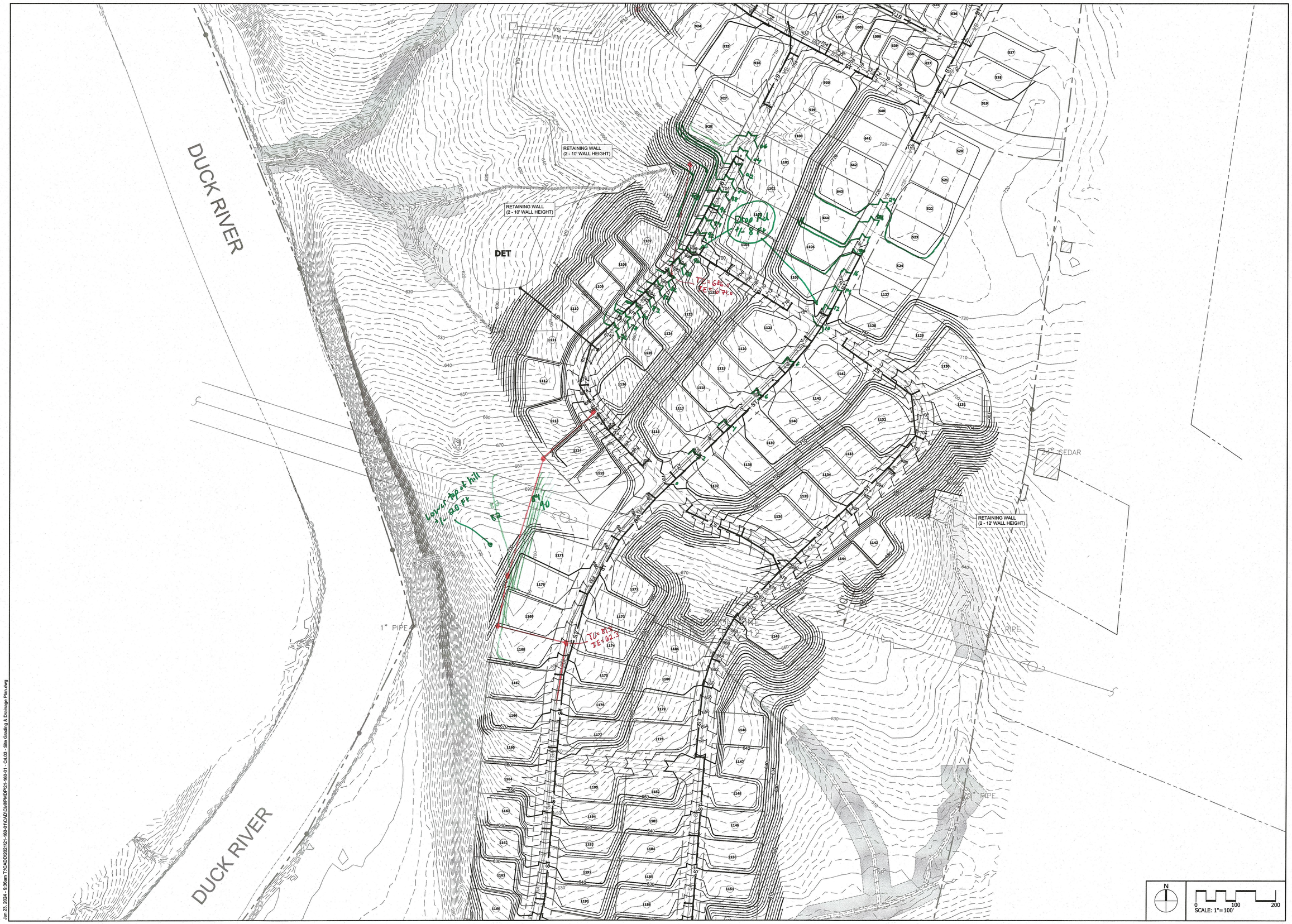
SEWER PROFILE (SHEET 3 OF 4)

PN:21-160-01 | D:02.06.2024

N

SCALE: 1"=50'

REDLINE MARKUP (GRADING ADJUSTMENTS FOR SEWER REVISION)
SHEET 4 OF 4



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Nashville, TN 37211
615.248.9999
csdgtn.com

SEAL



COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
Review Comments

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DRAWN BY: TWG
CHECKED BY: TWG

SITE GRADING & DRAINAGE PLAN

C4.03

PROJECT NO.: 21-160-01

N

SCALE: 1"= 100'

Jan 23, 2024 - 9:38am T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.03 - Site Grading & Drainage Plan.dwg

Kevin McCarthy

From: Ryan Filipkowski
Sent: Saturday, February 3, 2024 10:55 AM
To: keli@gdc-tn.com; greg.gamble@gdc-tn.com; jgibbs@kolter.com
Cc: Donnie Boshers; Austin Brass; Paul Keltner; Glenn Harper; Melissa Sanders; Kevin McCarthy
Subject: Columbia Bluffs Preliminary PUD

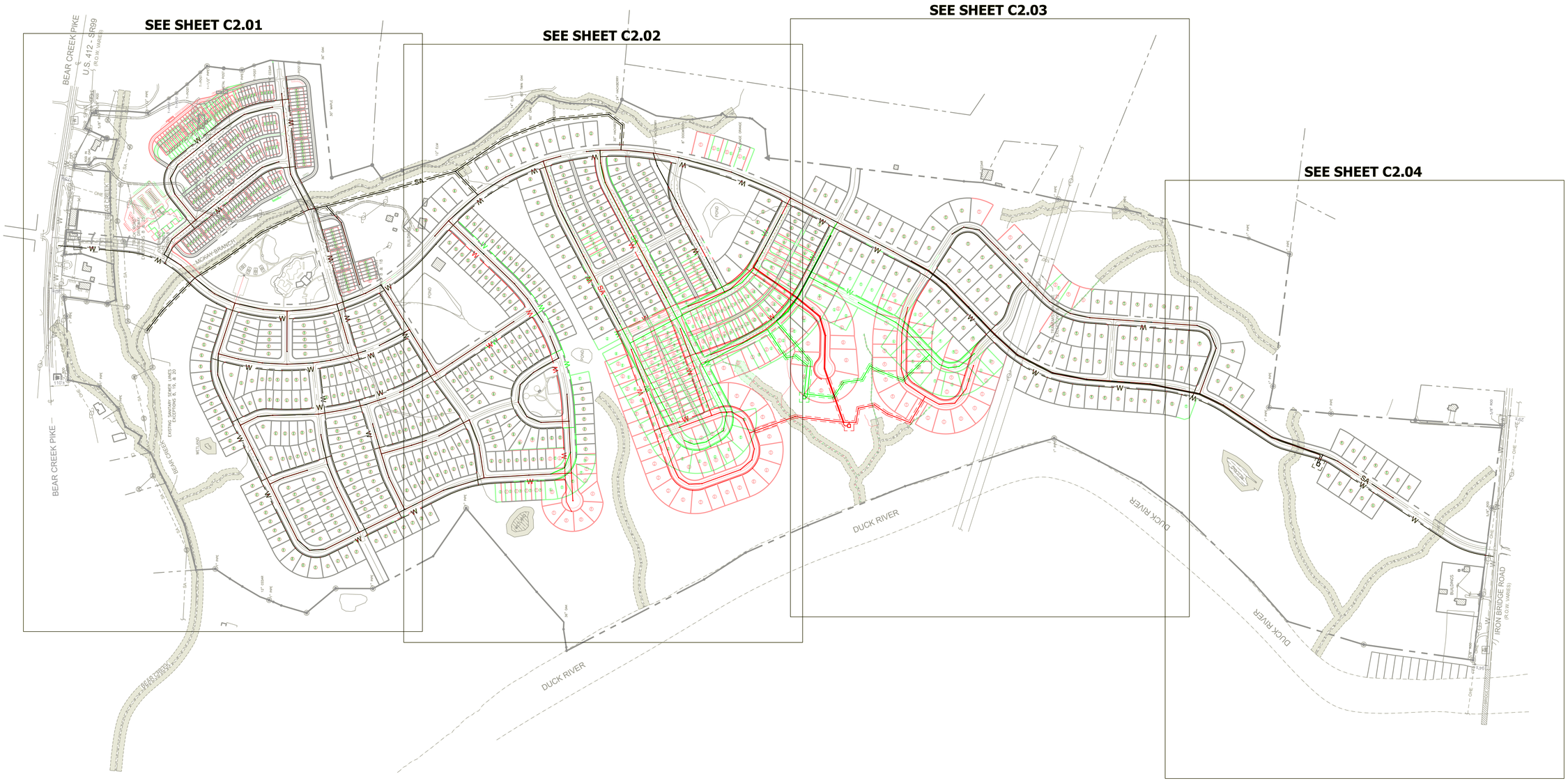
Mr. Gamble,

We have been looking more closely at the proposed Preliminary PUD Master Plan for Columbia Bluffs in order to anticipate questions we may be asked by Planning Commission. We wanted to bring a couple of items to your attention now in case the topic comes up during the meeting on February 14th.

The Wastewater Department prefers to eliminate the southern sanitary pump station from the PUD. Pump stations meeting city standards should serve closer to 150 units or more in order to achieve minimal cost efficiency. The number of units served by the pump station (81) is insufficient to obtain a flow rate that warrants a separate pump station. Upsizing the station may present other inefficiencies and problems. The elimination of this station and redirection to the northern pump station sewershed should not force sewer deeper than ~15 ft. Also, for the suction lift pump stations that Columbia prefers, the rule-of-thumb greatest depth from pumps to wetwell suction piping is about ~20 ft.

We understand that this information may impact your plan of development and you may want to discuss potential alternatives with staff before addressing Planning Commission. We have also communicated these concerns to Planning staff. Please communicate through Kevin and Austin if you would like to schedule a time to go over these comments.

Ryan Filipkowski, P.E.
Civil Engineer
Columbia Wastewater



N

0 300 600
SCALE: 1"= 300'

Dec 20, 2023 - 7:52pm T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.00 - Overall Utility Plan.dwg

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Planning | Engineering
Landscape Architecture
2005 Iron Ave, Ste 200
Nashville, TN 37212
615.346.9006
csdgnow.com

SEAL

JAMES T. HARRISON
REGISTERED
PROFESSIONAL
ENGINEER
12-15-23
COMMERCE
No. 021998
STATE OF TENNESSEE

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
INITIAL SUBMITTAL
Review Submittal

ISSUE DATE: 12/18/2023

REVISION HISTORY:

Rev.	Description	Date
1	Initial Submittal	10/18/2023
2	Tech Review Comments	11/27/2023
3	Tech Review Comments	01/23/24

DRAWN BY: TWG
CHECKED BY: TWG

OVERALL UTILITY PLAN

C3.00

PROJECT NO.: 21-160-01

BEAR CREEK PIKE

TIE TO EXISTING WATER MAIN AT BEAR CREEK PIKE

110'+/-

206'+/-

75'+/-

1/2" ROD

1" PIPE

1" PIPE

1" PIPE

1" PIPE

1" PIPE

ROD IN DBL OAK

5/8" ROD

5/8" ROD

1-1/2" PIPE

BEAR CREEK

BEAR CREEK

FIRE HYDRANT LOCATION (TYP)

TRACK ROAD

EXISTING DRIVEWAY EXCEPTIONS 8 & 25

OVERHEAD UTILITY LINES EXCEPTION 8

TIE TO EXISTING SEWER MAIN

PUBLIC SEWER EASEMENT (TYP)

SANITARY SEWER (TYP)

EXISTING SANITARY SEWER LIINES EXCEPTIONS 8, 19, & 20

PUBLIC WATER MAIN (TYP)

MCKAY BRANCH

WETLAND

1" PIPE

12" CEDAR

1" PIPE

PUBLIC WATER MAIN (TYP)

FIRE HYDRANT LOCATION (TYP)

SANITARY SEWER (TYP)

FIRE HYDRANT LOCATION (TYP)

PUBLIC WATER MAIN (TYP)

SANITARY SEWER (TYP)

1" PIPE

CEMETERY EXCEPTIONS 8 & 18

T-POST

T-POST

T-POST

1-1/2" PIPE

METAL POST

1-1/2" PIPE

T-POST

24" CED

30" MAPLE

N

0 100 200

SCALE: 1"= 100'

Dec 20, 2023 - 7:52pm T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.01 - Site Utility Plan.dwg

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Planning | Engineering
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2525 Kiln Ave, Ste 200
Nashville, TN 37214
615.244.9004
csdg.com

SEAL

JAMES T. HARRISON
REGISTERED
PROFESSIONAL
ENGINEER
COMMERCE
No. 021998
STATE OF TENNESSEE
12-15-23

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

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INITIAL SUBMITTAL
Review Submittal

ISSUE DATE: 12/18/2023

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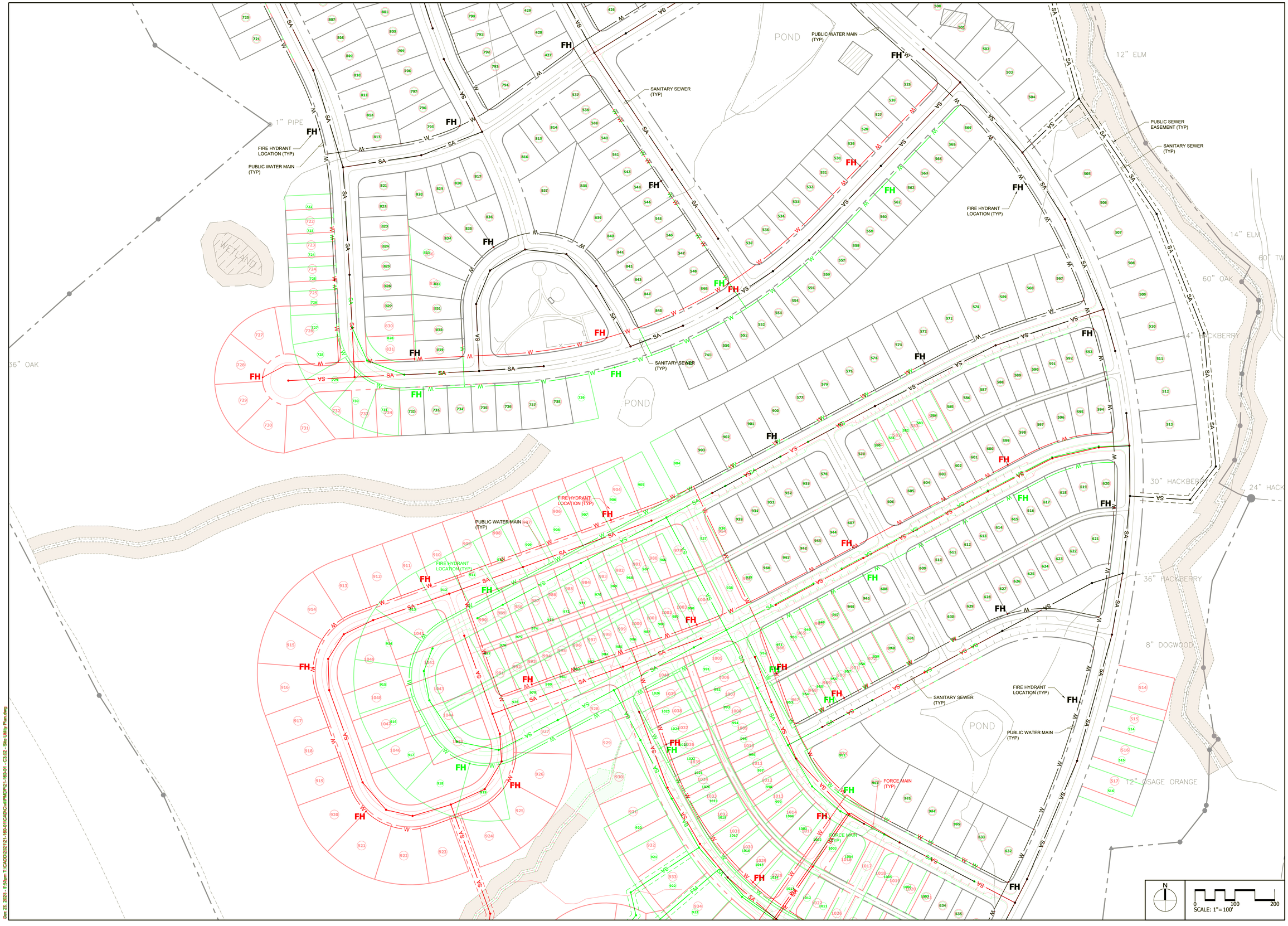
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DRAWN BY: TWG
CHECKED BY: TWG

SITE UTILITY PLAN

C3.01

PROJECT NO.: 21-160-01



N

0 100 200
SCALE: 1"= 100'

CSDG
Planning | Engineering
Landscape Architecture
2909 Hillsboro Ave, Ste 300
Nashville, TN 37212
615.846.9008
csdgtn.com

SEAL

JAMES T. HARRISON IV
REGISTERED
ENGINEER
AGRICULTURE
COMMERCE
No. 021998
STATE OF TENNESSEE
12-15-23

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
INITIAL SUBMITTAL
Review Submittal

ISSUE DATE: 12/28/2023

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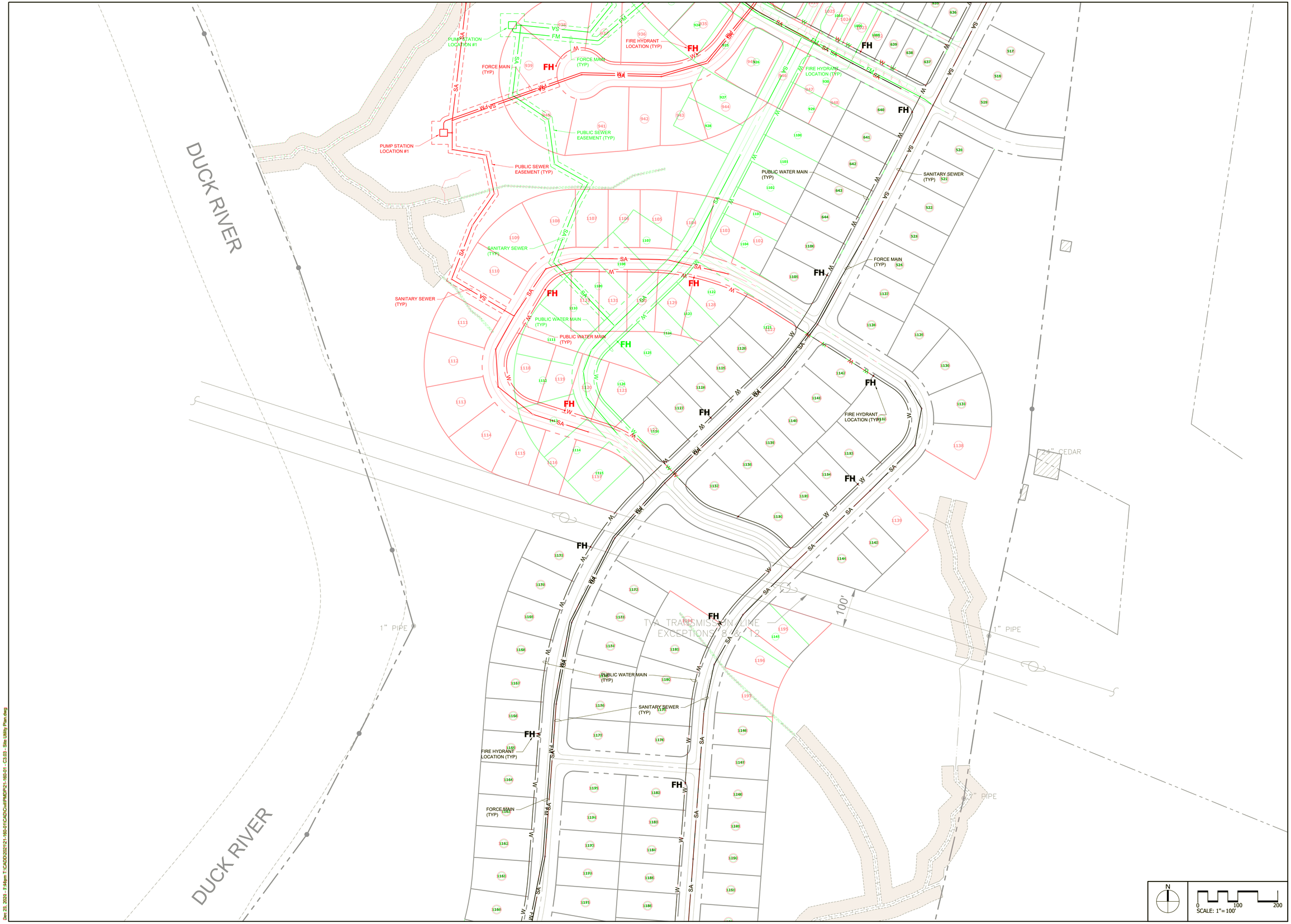
DRAWN BY: TWG
CHECKED BY: TWG

SITE UTILITY PLAN

C3.02

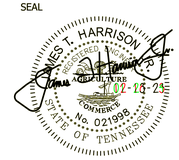
PROJECT NO.: 21-160-01

Dec 20, 2023 - 7:54pm T:\CADD\2021\21-160-01\CADD\Civil\PMDP\21-160-01 - C3.02 - Site Utility Plan.dwg



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Landscape Architecture
2525 Kirby Ave, Ste 200
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615.248.9048
csdgnow.com

SEAL



COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
INITIAL SUBMITTAL
Revised Submittal

ISSUE DATE: 12/28/2023

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CHECKED BY: TWG

SITE UTILITY PLAN

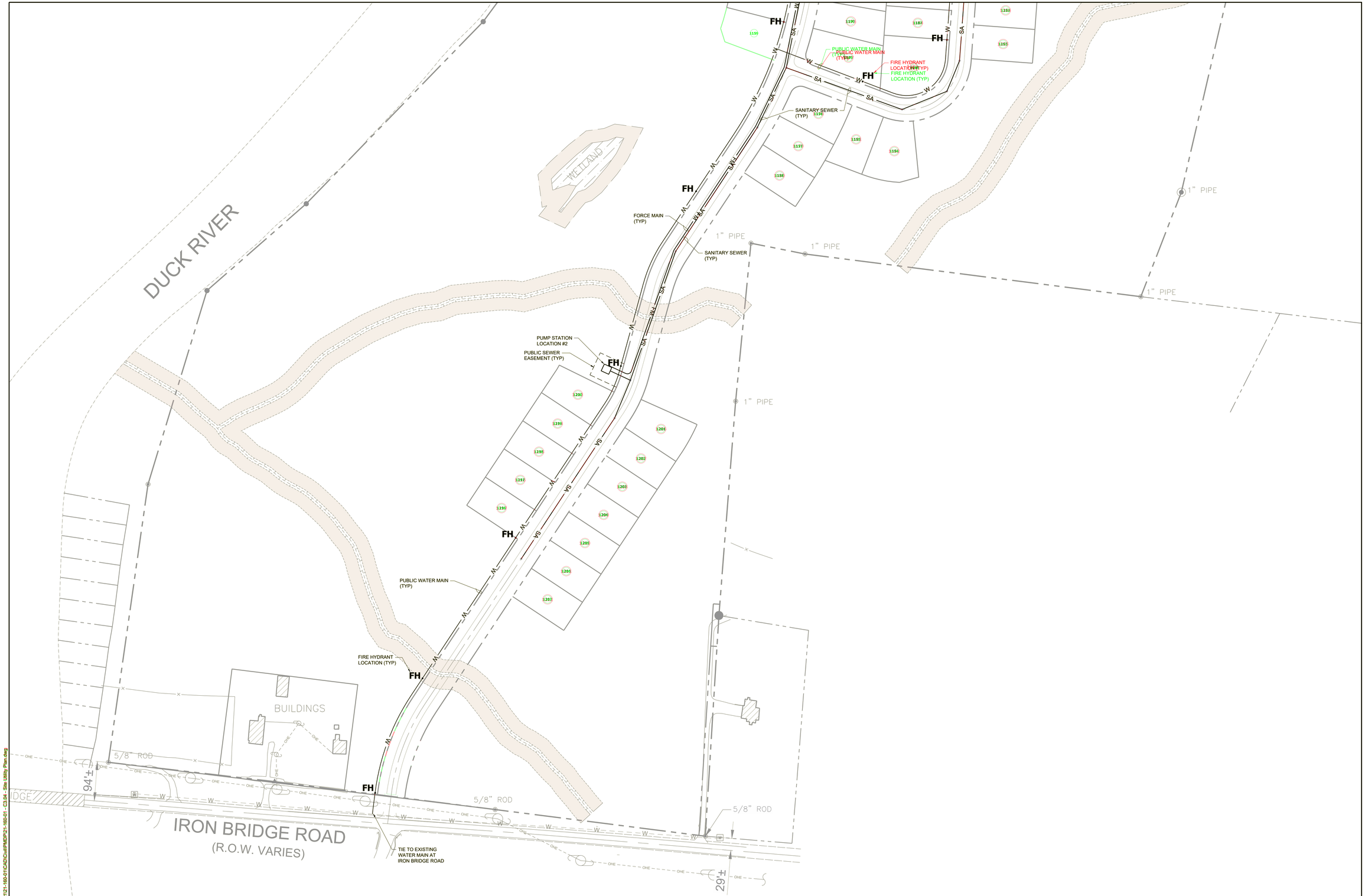
C3.03

PROJECT NO.: 21-160-01

N

0 100 200
SCALE: 1"= 100'

Dec 20, 2023 - 7:44pm T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.03 - Site Utility Plan.dwg



Dec 20, 2023 - 3:46pm T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.04 - Site Utility Plan.dwg

CSDG
Planning | Engineering
Landscape Architecture
2505 Kline Ave, Ste 200
Nashville, TN 37211
615.244.9052
csdgtn.com

SEAL

JAMES T. HARRISON IV
REGISTERED
PROFESSIONAL
ENGINEER
12-18-23
No. 021998
STATE OF TENNESSEE

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
INITIAL SUBMITTAL
Revised Submittal

ISSUE DATE: 12/18/2023

REVISION HISTORY:

Rev.	Description	Date
1	Initial Submittal	12/18/2023
2	Tech Review Comments	12/18/2023
3	Tech Review Comments	01/23/24

DRAWN BY: TWG
CHECKED BY: TWG

SITE UTILITY PLAN

N

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SCALE: 1"= 100'

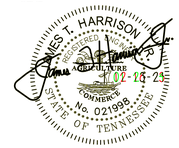
C3.04

PROJECT NO.: 21-160-01



CSDG
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Landscape Architecture
2000 Vine Ave, Ste 300
Nashville, TN 37203
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SEAL



COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
INITIAL SUBMITTAL
Initial Submittal

ISSUE DATE: 12/18/2023

REVISION HISTORY:

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1	Initial Submittal	12/18/2023
2	Tech Review Comments	12/18/2023
3	Tech Review Comments	01/23/24

DRAWN BY: TWG
CHECKED BY: TWG

OVERALL GRADING & DRAINAGE PLAN

C4.00

PROJECT NO.: 21-160-01

N

0 300 600
SCALE: 1"= 300'

Dec 23, 2023 - 7:49pm T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.00 - Overall Grading & Drainage Plan.dwg

BEAR CREEK PIKE

BEAR CREEK

EXISTING SANITARY SEWER LINES
EXCEPTIONS 8, 19, & 20

WETLAND

RETAINING WALL
(2-6' WALL HEIGHT)

RETAINING WALL
(2-3' WALL HEIGHT)

DET

110'+

75'+

1" PIPE

5/8" ROD

12" CEDAR

30" MAPLE

1-1/2" PIPE

T-POST

ROD IN DBL OAK

N

0 100 200
SCALE: 1"= 100'

Dec 20, 2023 - 7:36pm T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.01 - Site Grading & Drainage Plan.dwg

CSDG
Planning | Engineering
Landscape Architecture
2000 Vine Ave, Ste 300
Nashville, TN 37203
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SEAL

JAMES T. HARRISON
REGISTERED
LANDSCAPE ARCHITECT
12-18-23
DEPARTMENT OF COMMERCE
No. 021998
STATE OF TENNESSEE

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
INITIAL SUBMITTAL

ISSUE DATE: 12/18/2023

REVISION HISTORY:

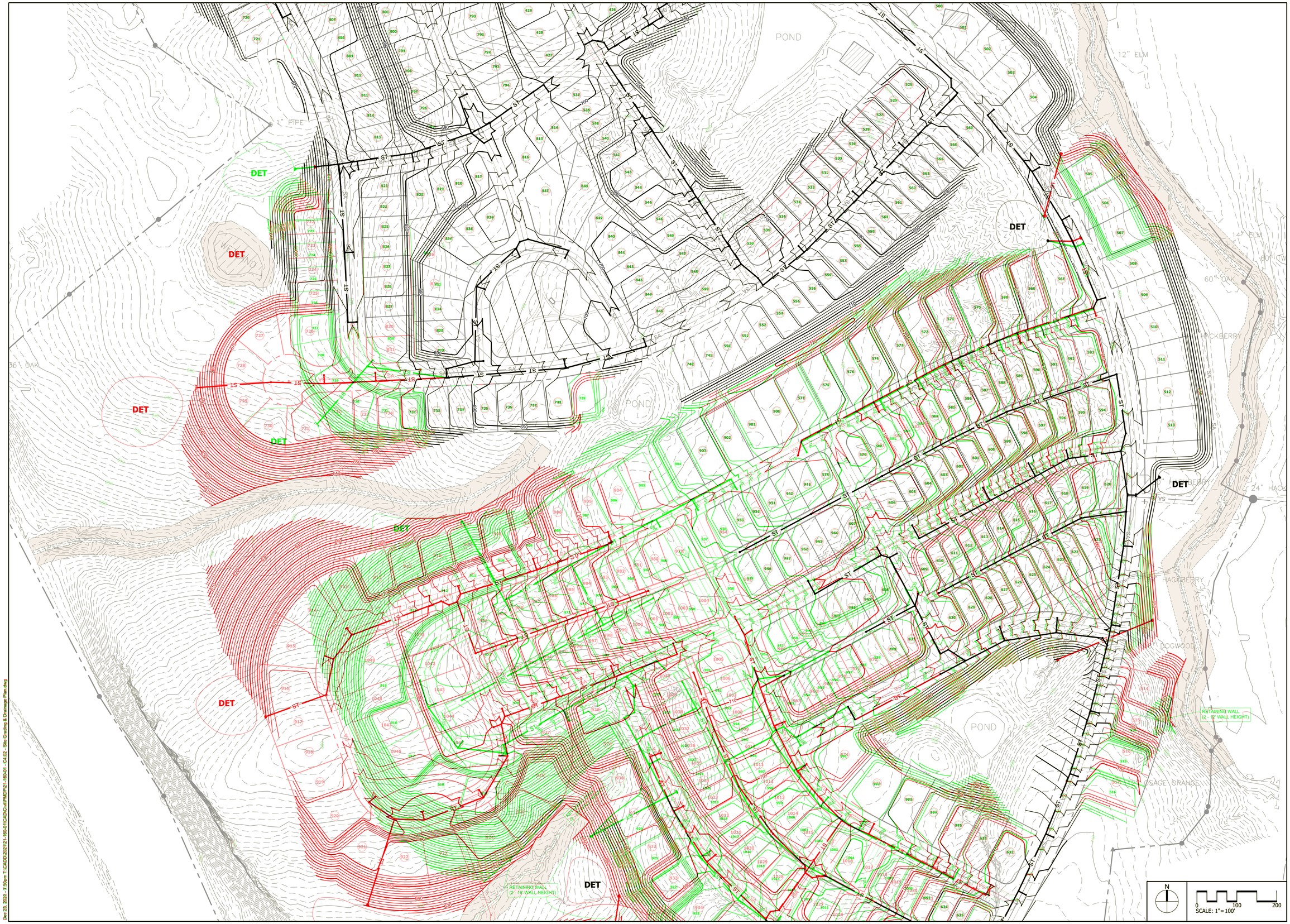
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3	Tech Review Comments	01/23/24

DRAWN BY: TWG
CHECKED BY: TWG

SITE GRADING & DRAINAGE PLAN

C4.01

PROJECT NO.: 21-160-01



Dec 20, 2023 - 7:36pm T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.02 - Site Grading & Drainage Plan.dwg

CSDG
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SEAL

JAMES T. HARRISON
REGISTERED
PROFESSIONAL
ENGINEER
10-16-23
No. 021998
STATE OF TENNESSEE

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
INITIAL SUBMITTAL
Revised Submittal

ISSUE DATE: 12/18/2023

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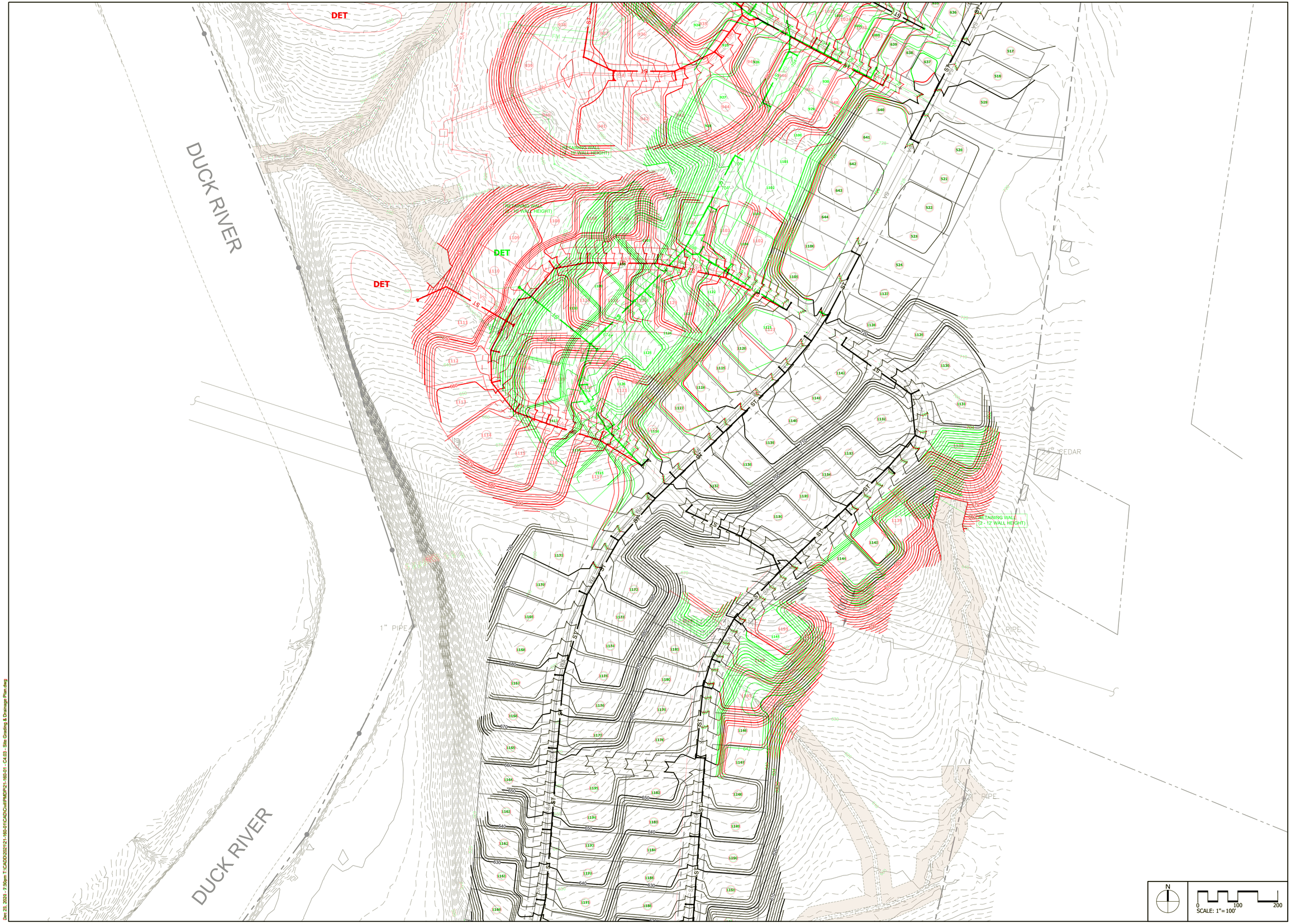
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CHECKED BY: TWG

SITE GRADING & DRAINAGE PLAN

C4.02

PROJECT NO.: 21-160-01



Dec 20, 2023 - 7:36pm T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.03 - Site Grading & Drainage Plan.dwg

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2000 Mallory Lane, Ste 200
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SEAL

JAMES T. HARRISON IV
REGISTERED
PROFESSIONAL
ENGINEER
No. 021998
STATE OF TENNESSEE
12-18-23

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
INITIAL SUBMITTAL

ISSUE DATE: 12/18/2023

REVISION HISTORY:

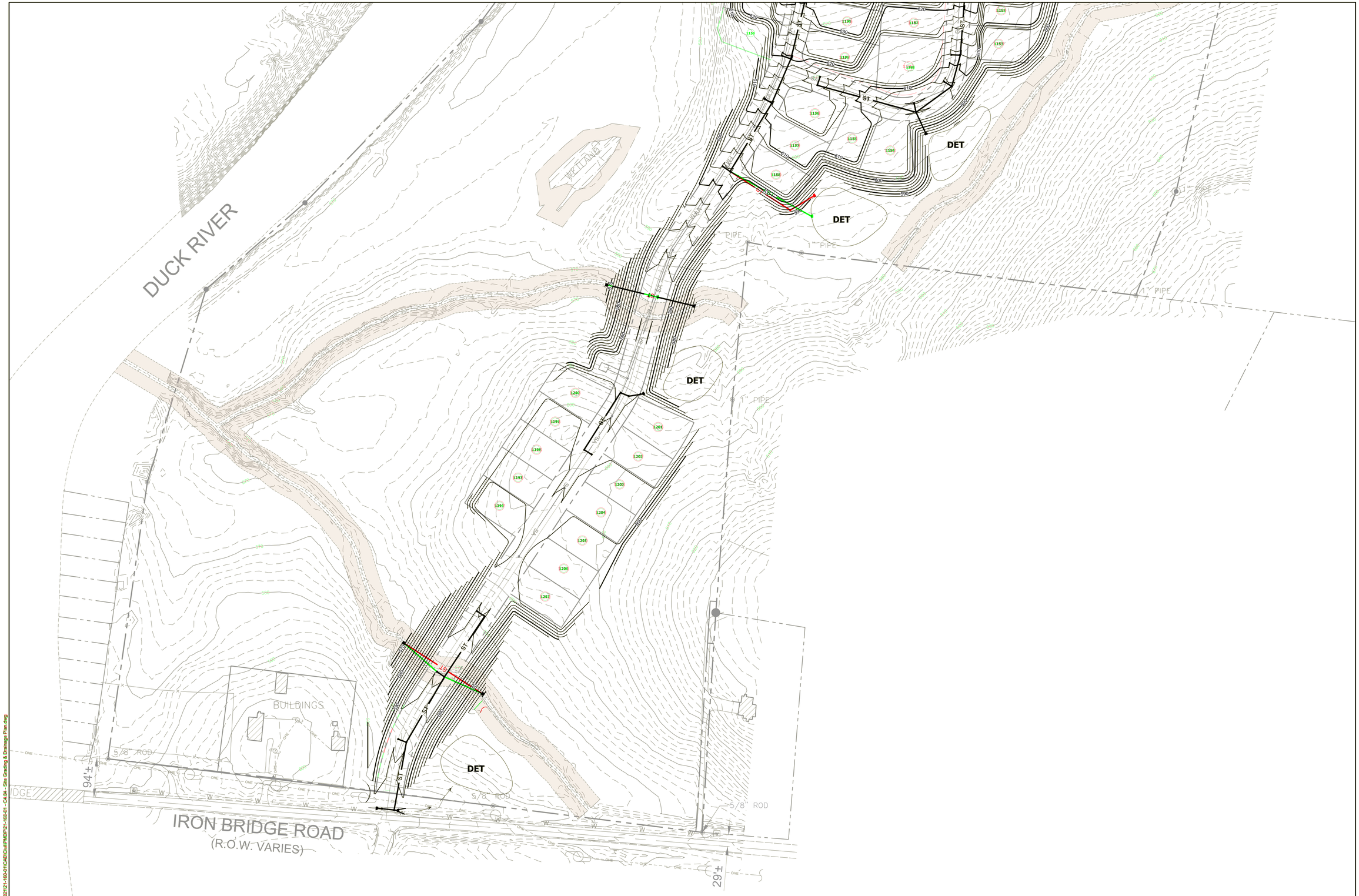
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DRAWN BY: TWG
CHECKED BY: TWG

SITE GRADING & DRAINAGE PLAN

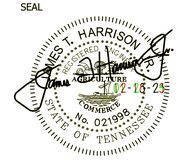
C4.03

PROJECT NO.: 21-160-01



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csdgroup.com

SEAL



COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
INITIAL SUBMITTAL
Review Submittal

ISSUE DATE: 12/18/2023

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SITE GRADING & DRAINAGE PLAN

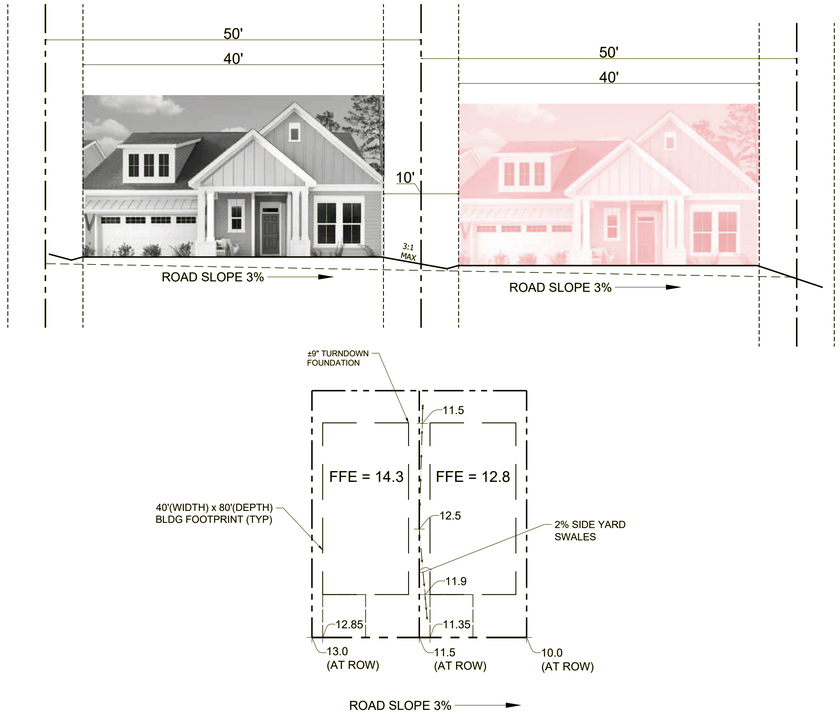
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PROJECT NO.: 21-160-01

N

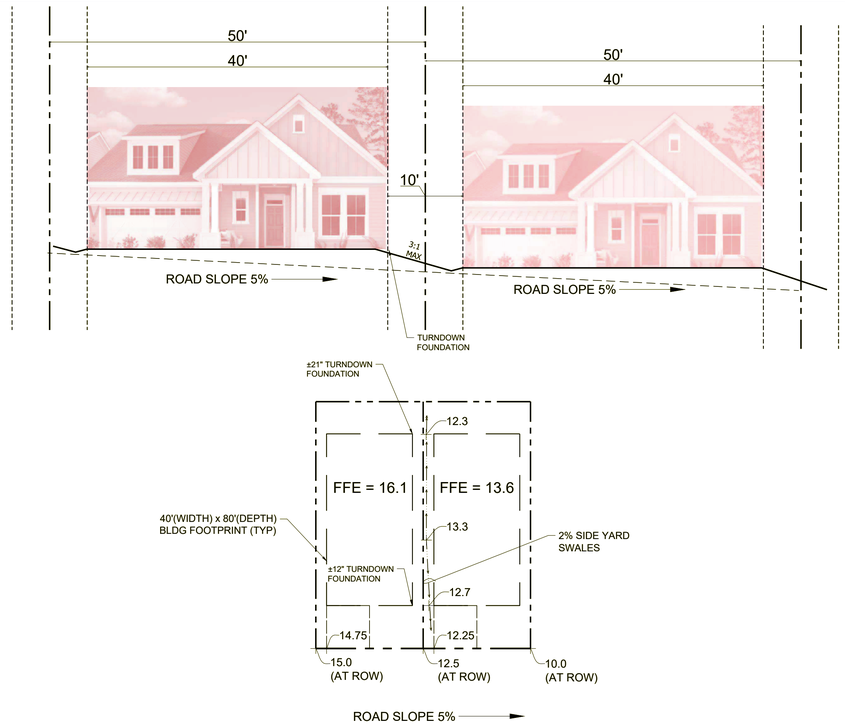
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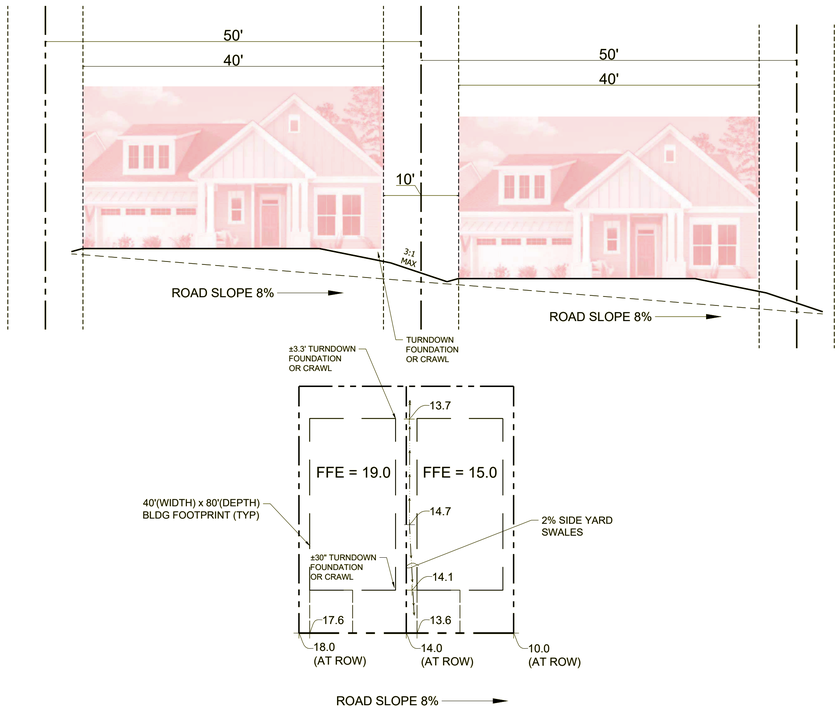
LOT GRADING DIAGRAM - 3% ROAD SLOPE

NTS



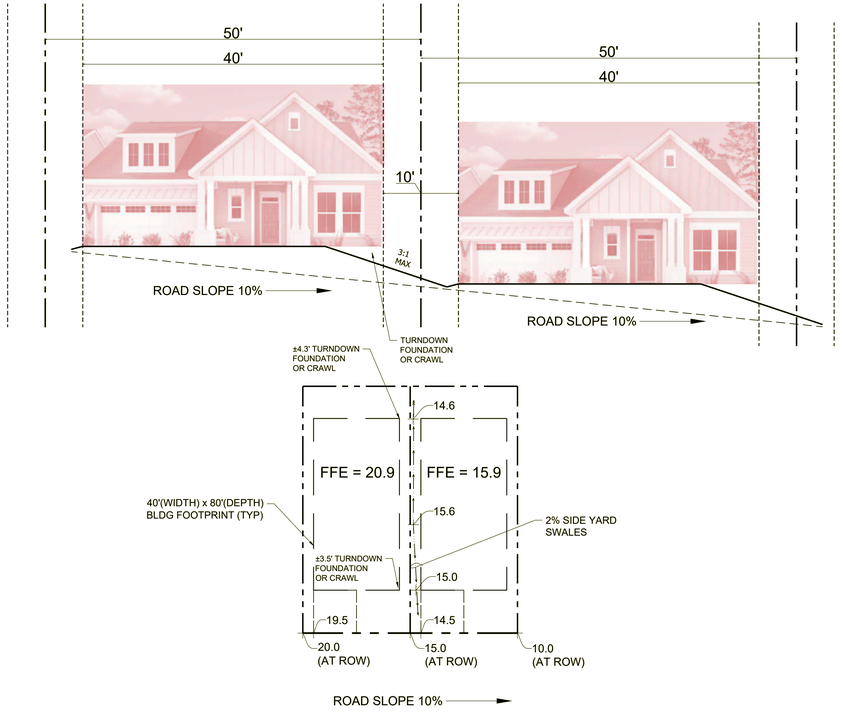
LOT GRADING DIAGRAM - 5% ROAD SLOPE

NTS



LOT GRADING DIAGRAM - 8% ROAD SLOPE

NTS

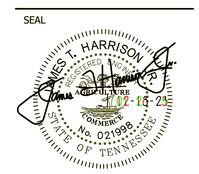


LOT GRADING DIAGRAM - 10% ROAD SLOPE

NTS

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2908 Kirby Ave, Ste 300
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615.834.9004
csdgtn.com

SEAL



COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
INITIAL SUBMITTAL
Review Submittal

ISSUE DATE: 12/18/2023

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CHECKED BY: TWG

LOT DRAINAGE DIAGRAMS

C4.05

PROJECT NO.: 21-160-01

Dec 20, 2023 - 7:57pm T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.05 - Lot Drainage Diagrams.dwg

SEE SHEET C3.01

SEE SHEET C3.02

SEE SHEET C3.03

SEE SHEET C3.04

BEAR CREEK PIKE

U.S. 412 - SR99

DUCK RIVER

DUCK RIVER

DUCK RIVER

SCALE: 1" = 300'

PLAN OF SERVICES

FOR ANNEXATION

400 BEAR CREEK PIKE PROPERTY

+/-400 ACRES,

BEING

TAX MAP 90 PARCEL 12.01

A. Water

"The project is within Columbia Power and Water's service area. The availability of capacity to serve will be based on a determination by the Fire Marshal of fire flow requirements and the information submitted on the Water Service Availability Request application. Any off-site improvements detailed in the availability letter are the responsibility of the developer/owner. All public water system improvements are subject to the preparation and approval of detailed construction plans prepared in accordance with CPWS and Tennessee Department of Environment and Conservation requirements."

B. Sewer

All sewer improvements including but not limited to off-site improvements, on-site improvements, and pump station and equipment installation shall be completed and functioning to the satisfaction of the Director of the Wastewater Department prior to the filing of any Final Plat with the City of Columbia Municipal Planning Commission, unless specific approval is granted by the Director and a surety of sufficient amount is provided. Note: Pump stations will require a building permit and all other required permits from additional entities. All inspections must be completed and certificates of completion granted before Council Agenda Deadline. Please contact the Wastewater Department for standard design details and equipment.

C. Police

The jurisdiction of the Columbia Police Department will be extended to the areas annexed immediately upon the effective date of annexation.

D. Fire and Rescue

1. The City of Columbia Fire & Rescue provides an array of services to the citizens and visitors of the City of Columbia. These services include but may not be limited to non-emergency services such as fire prevention and codes enforcement, pre-incident planning, public education programs, smoke alarm check/replacement, emergency management preparedness, and emergency services such as fire suppression, heavy rescue, emergency medical first response, and hazardous materials response. The City of Columbia Fire Department currently holds an Insurance Service Organization (ISO) class 1 rating.

   Columbia Fire & Rescue strives to provide all services in a timely, courteous, and professional manner. Due to the nature of emergency services, we strive to arrive at the incident scene as quickly as possible but without posing additional dangers to the residents/visitors we meet while responding to your location.

Infrastructure:

The infrastructure put in place is like the foundation of your development. If the infrastructure is designed and constructed with the present needs and future plans in mind, your development will be prepared for the future.

Water:

Columbia Fire & Rescue requires that there be sufficient water provided through the municipal water system to meet the needed fire flow requirements for your facility. These flows are calculated by the Fire Marshal. These flows are based on many factors dealing with your buildings' construction type, fire load in the building, square footages, and etc. If you install fire sprinkler systems in your facilities, Columbia Fire & Rescue can drastically reduce fire flow requirements.

Roadway and Bridges: Columbia Fire & Rescue serves the residents and visitors of our jurisdiction by utilizing highly trained firefighters and modern fire apparatus. A minimum response to a structure fire in your development will be four fire apparatus. One of the fire apparatus that will respond to your development will be a ladder truck with a gross vehicle weight rating of approximately 80,000 pounds. Roadways and bridges must be designed and constructed not only with light vehicle traffic in mind but with the emergency service vehicles that will be servicing your development.

Damage Free Property Access: Columbia Fire & Rescue requires all gates automatic or manual that will be or may be locked to be equipped with Knox Rapid Entry system. You can research this product at www.knoxbox.com or

your gate vendor will be familiar with the product. Our department would also be happy to work with you to find what Knox Rapid Entry product is best suited for your application.

Damage Free Home/Facility Access: Currently, Columbia Fire & Rescue does not require residential occupancies to be equipped with the Knox Rapid Entry system. However, this product is a very wise investment for your future development. The Knox Rapid Entry System products allow homes to be secured but also allow the Columbia Fire & Rescue Department access to your property and/or homes without any delay or property damage. The system has an armored key lock safe recess mounted to the exterior of the homes with the key to the residence inside. Firefighters access the residence key during an emergency to gain entry into the home without causing any property damage. Again, our department would be happy to provide you with information and education on this program and its many positive attributes.

Emergency Response to Your Location: The proposed annex will be located on the property at 400 Bear Creek Pike in Columbia, Tennessee. This location is approximately 1.4 miles from Columbia Fire Station #3 located at 705 Tom Sharp Road, 3.3 miles from Fire Station #1 located at 1000 South Garden in downtown Columbia, and 7.4 miles from Fire Station #5 located at 2633 Nashville Hwy. These distances are used to calculate an estimated response time to your development for the different levels of emergency response that may be needed at your facilities.

Medical Emergency Response: Columbia Fire & Rescue normally responds a minimum of one fire apparatus from Station #3 to service your location for a medical emergency. From the time you dial 911 until the fire department will arrive at your location will be within 3.5 minutes. Should your property experience a mass casualty incident where additional fire apparatus/firefighters would need to respond, then Fire Station #1 could send an additional unit and arrive on-scene 4.5 minutes of your 911 call.

Fire Incident Response: Columbia Fire & Rescue recommends a multi-faceted fire suppression approach. First, future homes should be constructed to meet or exceed all applicable fire and life safety codes. Secondly, even if not required by building, fire, or life safety codes, we encourage the installation and use of fire sprinkles in future homes. Columbia Fire & Rescue's normal fire incident response to a single family residential development is three fire apparatus with a minimum 15 firefighters and 1 Chief Officer. Response times will be similar to the times estimated in the emergency medical response section. Your first fire apparatus should be on-scene within approximately 3.5 minutes, the second fire apparatus should be on-scene within 4.5 minutes, and the third/fourth apparatus should be on-scene within 4.5 minutes. Due to OSHA standards that require at least four firefighters to arrive on-scene prior to initiating an interior fire attack

and Columbia Fire & Rescue's minimum staffing policy, it could take the 4.5 minutes to get the minimum number of firefighters to the scene to begin an interior fire attack.

In summary, the members of the Columbia Fire & Rescue consider it an honor to serve the residents and visitors in our community each and every day. When an emergency occurs, time is our worst enemy. Columbia firefighters train to reduce every second while not posing any additional undue risk to firefighters and/or the public when responding to or working at an emergency incident. The times estimated in the referenced examples are a combination of averages and estimations. Our department has very little data to support incident responses to your location. The time estimations are based on the fire companies being at their regular station, time it takes for Maury 911 to process a 911 call, the time it takes for Columbia firefighters to board the apparatus and leave the station, and the travel time from the station to your location is an estimate based on road miles, probable traffic conditions, and road conditions. You can see by the examples referenced above that it will take time for Columbia Fire & Rescue to receive your call for help and then respond to your location. The roadways have considerable driveway/cross street connections, hills, curves, and reduced speed zones that contribute to a long response time for fire apparatus to arrive.

E. Development Services

1. The planning and zoning jurisdiction of the City will extend to the annexed areas immediately upon the effective date of the annexation.

2. The property shall be zoned PUD-R (Planned Unit Development – Residential District) upon the effective date of the annexation.

3. The code administration jurisdiction of the City will extend to the annexed areas immediately upon the effective date of the annexation.

4. Upon the effective date of annexation, all development will be required to abide by the Columbia Zoning Ordinance.

F. Streets

1. Upon acceptance by City Council and all warranties have expired; all streets and drainage systems will be maintained by Public Works. Service will include street sweeping, catch basin cleaning, street repair and snow removal drainage maintenance, and sidewalk repair.

2. Upon acceptance by City Council, all approved street signs will be maintained by Public Works.

G. Parks and Recreation

Residents of the annexed areas may use all existing recreational facilities, parks, etc., on the effective date of annexation. The same standards and policies now used in the present City will be followed in expanding the recreational program and facilities in the enlarged City.

H. Refuse Collection

Single family homes will receive City of Columbia trashcan service. For 189 townhomes, we recommend five or six 8-yard dumpsters with 3x/week collection if utilizing City of Columbia sanitation services. Private sanitation services, including dumpsters, compactors, individual receptacles or valet service, may be utilized. Individual trash receptacles will not be provided by the City of Columbia to townhome residents.

Single Family homes will receive the following City of Columbia sanitation services: Residential customers will be issued one 96-gallon garbage receptacle with the option to purchase up to two additional garbage receptacles. The Sanitation Department will provide weekly curbside garbage collection. Bi-weekly curbside recycling will be offered on a subscription basis. Brush collection will be provided on a bi-weekly basis. Residents are allotted three free bulk item pickups per year.

Townhomes will receive the following services: The Sanitation Department will provide dumpster collection. For the 189 units, we recommend five (5) or six (6) 8-yard dumpsters serviced 3 times a week. Brush collection will be provided on a bi-weekly basis. Residents are allotted three free bulk item pickups per year. Private sanitation services, including dumpsters, compactors, individual receptacles or valet service, a are an option for townhomes. Individual receptacles will not be provided by the City of Columbia to multi-family apartment or townhomes.

I. Power

Columbia Power System has an existing power line near the proposed development. We are willing to serve this new development subject to all Columbia Power System policies and procedures in effect at actual time service is rendered provided an approved final plat and complete electrical load information is furnished as soon as possible prior to start of actual construction.

J. Schools

This property falls under the jurisdiction of Maury County Public School System.

The development combined with current neighborhoods and additional approved developments in these zones may require either new construction or realignment of school zones to accommodate new students.

CPWS

February 5, 2024
Mr. Joshua Gibbs
Kolter Land
14025 Riveredge Drive, Suite 175
Tampa, FL 33637
Sent via email: jgibbs@kolter.com
RE: Water Availability Letter
Big Bear Bluffs Single Family
400 Bear Creek Pike
Tax Map 90, Parcel 12.01
Columbia, Maury County, TN

Dear Mr. Gibbs:

Columbia Power and Water Systems ("the Utility"/CPWS) is a municipal corporation authorized to provide water services in accordance with State law. CPWS has adopted rules, regulations, and standard operation procedures, prescribing the conditions under which CPWS will furnish water service. In addition, certain State laws delegate authority to the Tennessee Department of Environment and Conservation, various Planning Commissions and other authorities in Cities and Counties. These Cities and Counties have also adopted rules and regulations. Subject to the payment of all charges and fees imposed by CPWS and the approval of any and all required governmental agencies, water service will be made available on a first-come, first-served basis, subject to availability of all CPWS furnished equipment and materials appropriate for the development and provided the applicant complies with all rules and regulations of CPWS and conditions set out herein.

As submitted by the applicant, the proposed development includes up to 860 single-family residential units in townhome and detached configurations, an approximately 4,600 square-foot amenity building with pool, a daycare, and irrigation for common areas. CPWS has evaluated the projected water demands for the proposed development and is able to meet a fire-flow capacity of 1,000 gpm at 20 psi for all proposed lots (as submitted by the applicant in concept plan dated 9/29/2023) while maintaining the existing level of service and pressures in this portion of the distribution system. CPWS can provide water for the proposed development according to the following requirements:

- Water availability for the proposed 860 units is contingent upon the schedule of development as provided by the applicant. Any acceleration of the schedule (start, finish, or increased unit count per phase) will require re-evaluation of water availability. Acceptance of an accelerated schedule is not guaranteed. The schedule as provided by the applicant is as follows:

Project Phase	Approximate Units	Sitework Started	Vertical Construction Completion	Notes
Phase 1	129	Q1 2026	Q2 2028	
Phase 2	142	Q2 2028	Q4 2029	Includes amenity building
Phase 3	109	Q3 2029	Q1 2031	Includes daycare
Phase 4	135	Q4 2030	Q2 2032	
Phase 5	112	Q1 2032	Q2 2033	
Phase 6	122	Q2 2033	Q1 2034	
Phase 7	94	Q1 2030	Q2 2033	

- This Water Availability Letter represents water availability for the entire development, but a new water service application and fee is required for subsequent phases. Water service is not guaranteed until the relevant impact fees are paid for each meter to be installed.
- A new 12-inch water main will be required to be installed by the Applicant from Bear Creek Pike, south through the spine road of the proposed development to Iron Bridge Road. From there a 16-inch main will be installed west to Tom J Hitch Parkway. From the intersection of Tom J Hitch Parkway and Iron Bridge Road, a new 16-inch water main will be installed north to the existing 12-inch CPWS water main located just south of the Duck River bridge on Tom J Hitch, as well as south to the existing 12-main near 1451 Tom J Hitch Parkway. The attached figure provides a visual representation of these requirements.
- A permanent, exclusive 20-foot water main easement will be provided by the developer for the new 16-inch and 12-inch water mains. Within the development, the easement may overlap the right-of-way of the spine road.
- Lane additions or other required improvements at Bear Creek Pike or other roadways may necessitate additional construction to relocate any impacted existing water mains.
- All off-site improvements must be constructed, tested per CPWS standards and deeded over to CPWS prior to connection of any domestic water meter used for full-time residence.
- The remainder of the water mains in the development shall be a minimum of 8-inch diameter with looped connections throughout the development. Final design to accommodate fire protection loads may necessitate an increase in some water main sizes in the development.

All of the above requirements are to be constructed and paid for by the Applicant and deeded over to CPWS once complete up to and including the meter. No construction of water infrastructure shall be initiated until final construction plans have been approved by TDEC and a water service agreement with CPWS is fully executed.

Once you have received this Water Availability Letter, next steps in the process to obtain water service from CPWS are as follows:

- Present the attached fireflow analysis figure for coordination and approval of development from the Columbia Fire Marshall.
- Prior to expiration of this water letter, remit to CPWS the new water service fees for Phase 1 of the development as follows:

New Water Service Fee: $1,500 + $370 per SFU (129 SFUs)	$49,230.00

- Provide site base CAD files in DWG format, including roads, lot lines, existing and proposed contours, and other existing and proposed utilities, for use in development of water construction drawings. *This should include survey for the corridor of any required offsite improvements.*
- CPWS will then develop water construction drawings and submit them to TDEC for approval. Upon approval by TDEC and payment of Phase 1 meter and impact fees by the applicant, applicant may then schedule a pre-construction meeting with CPWS. Pre-construction meeting will not be scheduled until fees are paid in full or surety is provided in lieu of full payment. Final meter and impact fees are subject to change based on final design and meter size determination. Meter fees are subject to change based on market costs at time of purchase. Meters will not be set until meter and impact fees are paid. Meter and impact fees for Phase 1 are as follows:

Meter Fee: $540 per 3/4" meter (129 meters)	$69,660.00
Impact Fee: $4,500 per 3/4" meter (129 meters)	$580,500.00
Total Meter and Impact Fees Due =	**$650,160.00**

- After the pre-construction meeting, CPWS will then issue a formal notice to proceed. No construction of CPWS infrastructure may take place prior to the pre-construction meeting.
- Applicant is then required to construct all public water infrastructure per CPWS standard specifications and provide CPWS personnel unregulated access to the site to inspect the construction of the water infrastructure.

If you have any questions, please feel free to contact me at 423-774-0349 or eric.king@inflodesign.com. This letter is valid for one-hundred twenty (120) calendar days from the date of this letter.

Sincerely,



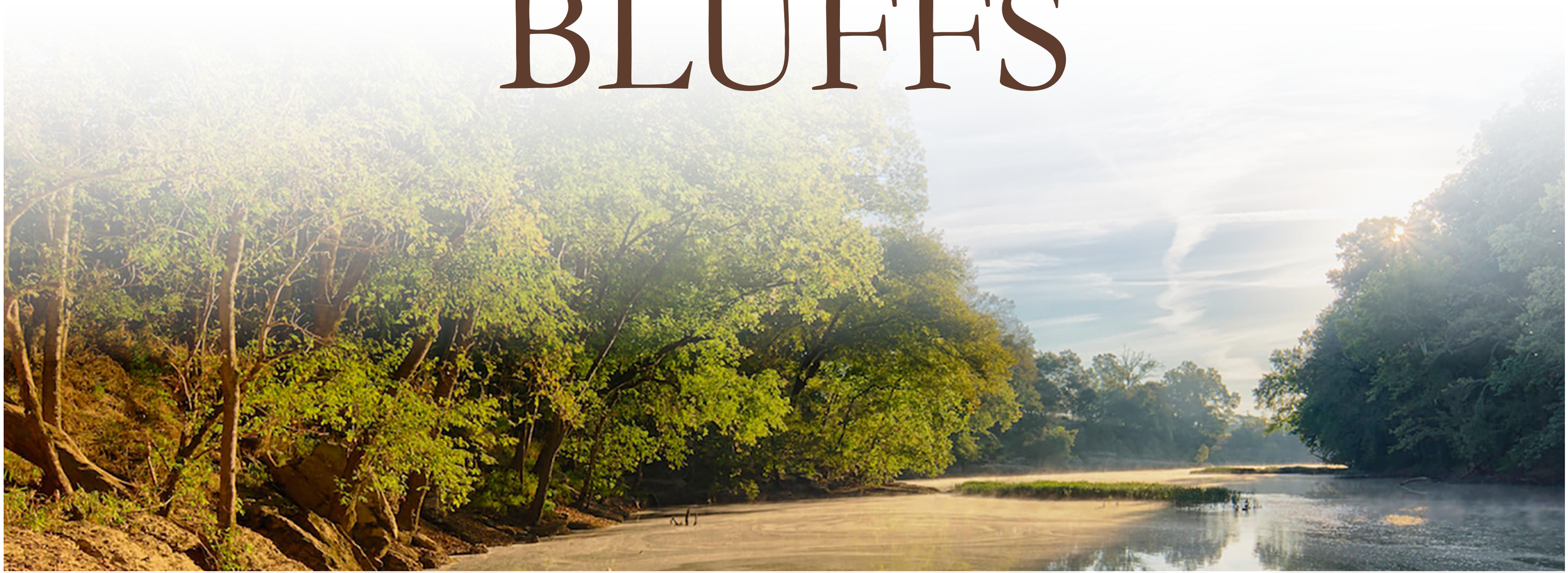
Eric King, P.E.
Inflo Design Group, LLC
on behalf of Columbia Power and Water Systems

cc: Jonathan Hardin, CPWS
File 22-092

COLUMBIA

City of Columbia, Tennessee

BLUFFS



Architectural Review Team Submittal

w/Corrected Comments

January 23, 2024



COLUMBIA BLUFFS ARCHITECTURE

DEVELOPER
JIM HARVEY
KOLTER LAND
14025 RIVEREDGE DRIVE, SUITE 175
TAMPA, FL 33637

ENGINEER
JIM HARRISON
CIVIL SITE DESIGN GROUP
2305 KLINE AVENUE, SUITE 300
NASHVILLE, TN 37211

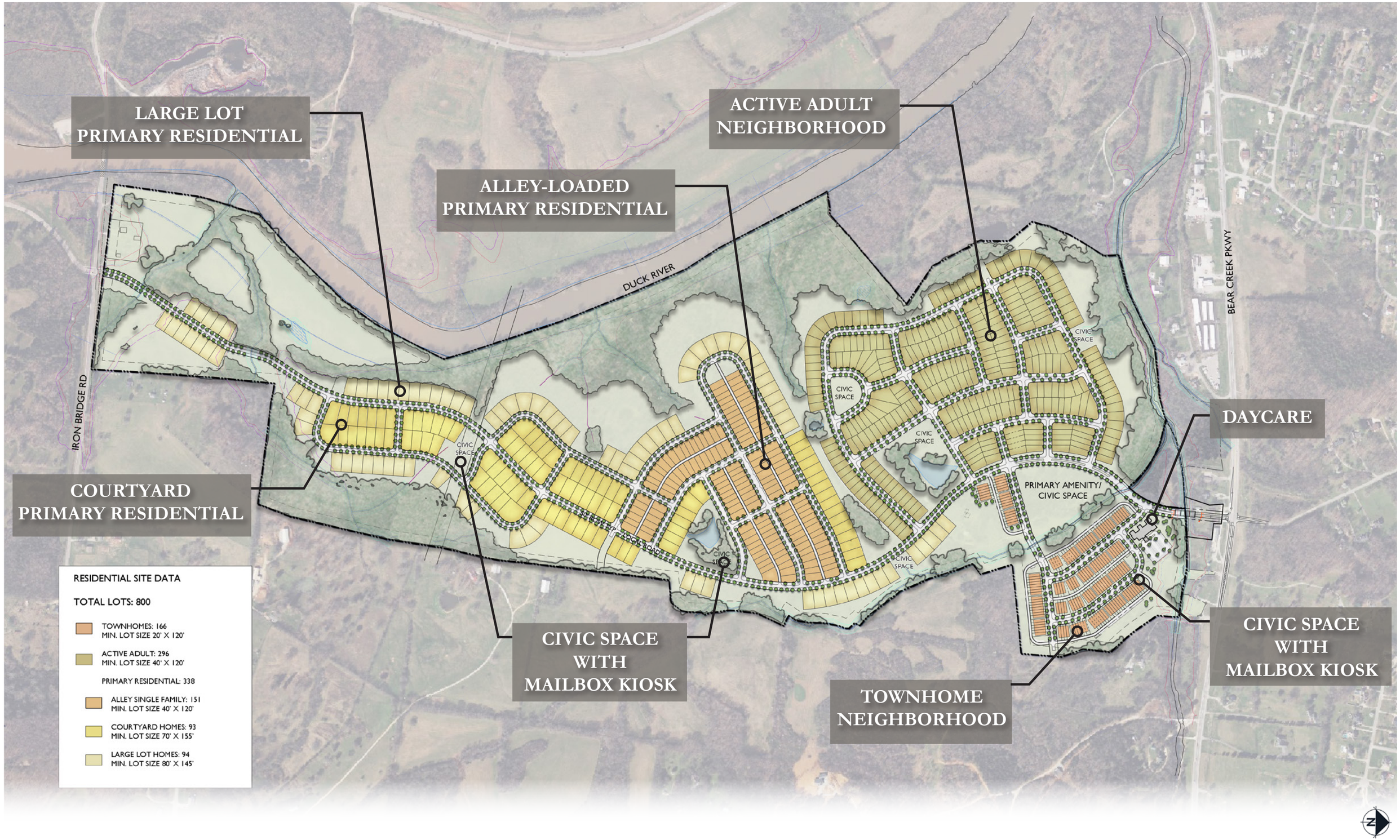
LANDSCAPE ARCHITECT
GREG GAMBLE
GAMBLE DESIGN COLLABORATIVE
3020 STANSBERRY LANE, SUITE 201
FRANKLIN, TN 37069

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18. CIVIC SPACE ARCHITECTURE

SUBMITTED: 10/16/2023
REVISED: 12/18/2023
APPROVED BY ARCHITECTURAL REVIEW TEAM AT 01/09/2024 MEETING
ARCHITECTURAL REVIEW TEAM COMMENTS: 01/09/2024
REVISED PER APPROVAL COMMENTS: 01/23/2024

DEVELOPMENT TEAM



MASTER DEVELOPMENT PLAN

	Single Family & Townhomes	Active Adult Single Family
Building Height and Massing	• Primarily a mix of 1-story and 2-story, with a maximum of 3-story • Attached garages encouraged	
Building Separation	• Single Family: 10' minimum • Townhomes: 15' minimum	• Single Family: 10' minimum
Street Facades	• Maximize frontage and orientation onto residential streets • Porches should orient to residential streets • Entries visible from residential streets	• Maximize frontage and orientation onto residential streets • Porches should orient to residential streets • Entries visible from residential streets
Building Entries	• Porches minimum 6' deep and 6' wide	
Roof Forms	• Roofs may vary in style, but should be designed to create unity to the full community • All roof forms to be reviewed and approved by the master developer	• Roofs may vary in style, but should be designed to create unity to the full community • All roof forms to be reviewed and approved by the master developer
Roof Detail	• All roofs should create eaves for shadow and rain protection • Where used, gutters should be expressed as positive elements adding desirable detail	• All roofs should create eaves for shadow and rain protection • Where used, gutters should be expressed as positive elements adding desirable detail
Parking	• Garage-parked • Each garage parking space shall be a minimum of 10' x 20' • Garage doors with windows required	• Garage-parked • Each garage parking space shall be a minimum of 10' x 20' • Garage doors should have windows

ARCHITECTURAL GUIDELINE NOTE:

The architectural guidelines and conceptual elevations are intended to convey the architectural quality and design intent. Final elevations and color schemes will be brought back to be approved by the ADRT at final PUD-R Development Plan.

COMPLIANCE NOTE:

The architectural guidelines as shown in this pattern book represent compliance with the standards set by the Zoning Ordinance except in areas requesting a modification of standards which are requeted to be approved through the PUD-R Preliminary Development Plan process.

Architectural Building Materials

In keeping with the upscale project image, the materials used for structures at Columbia Bluffs should be appropriate for the individual building design concepts and shall be consistent with the project theme. Materials shall be selected and used with consideration to building scale, color scheme, mass, and the surrounding environment.

Roofing Materials

Permitted:
- Dimensional Asphalt Shingles
- Laminated Shingles
- Copper Finishes
- Standing Seam Metal Roofs

Not Permitted:
- Rolled Asphalt
- Asbestos Cement Shingles
- Brightly Colored Metal Roofing

Exterior Siding Materials

Permitted:
- Brick
- Stone
- Natural Wood Accents
- Stucco
- Hardie Plank/Panels
- Cementitious Fiber Siding/Cladding

Not Permitted:
- All Plastics (including vinyl)
- Plywood
- Exposed Concrete Block

Awnings

Permitted:
High Quality Heavy Canvas
Illuminated Awnings
Metal Awnings

Colors

Permitted:
- Muted
- Natural
- Earth Tones

Conditional Permitted:
- Bright
- Primary Colors (per review and approval of the Master Developer)

Building Requirements:
- Maximum Height (Stories) 3 stories

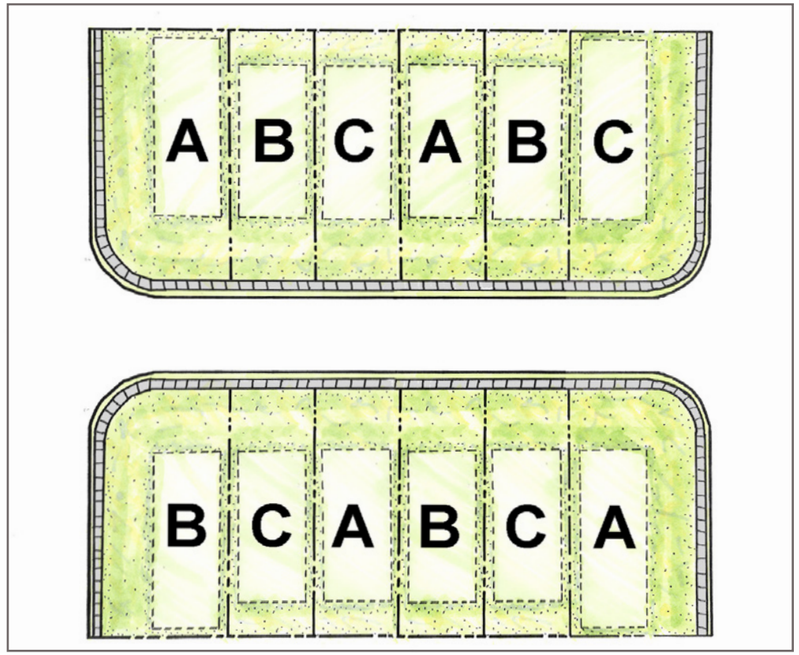








IMAGE OF HOMES REPRESENT AN EXAMPLE OF FACADE VARIETY ALONG SAME STREET. FINAL SELECTION OF MATERIALS AND STYLES TO BE APPROVED AT FMDP.



In order to avoid monotony of architectural design, no approval shall be issued for the construction of a dwelling if it is substantially like any proposed neighboring building for which on approval has already been issued or is being concurrently considered.

- A building shall be considered neighboring if it fronts on the same street as the building under construction or an intersecting street; no building elevation may be repeated across from, adjacent to, or diagonal to a similar building elevation. There shall be a minimum of a 2-lot gap between each similar building elevation (see diagram to above in which A, B, and C represent different elevation styles).
- Vary garage door locations to the front facade of the house when possible. Avoid continuous runs of garages in the same unbroken plain.
- Vary roof orientation, ridge lines, and eave heights between each lot when possible.
- Building facade colors and design elements should vary between each lot with a variation of massing and architectural details on each block.
- Landscaping should vary in composition from building to building when possible.

Final determination of the appropriate elevation pattern and variety is subject to review by the Architectural Design Review Team.

FACADE VARIETY







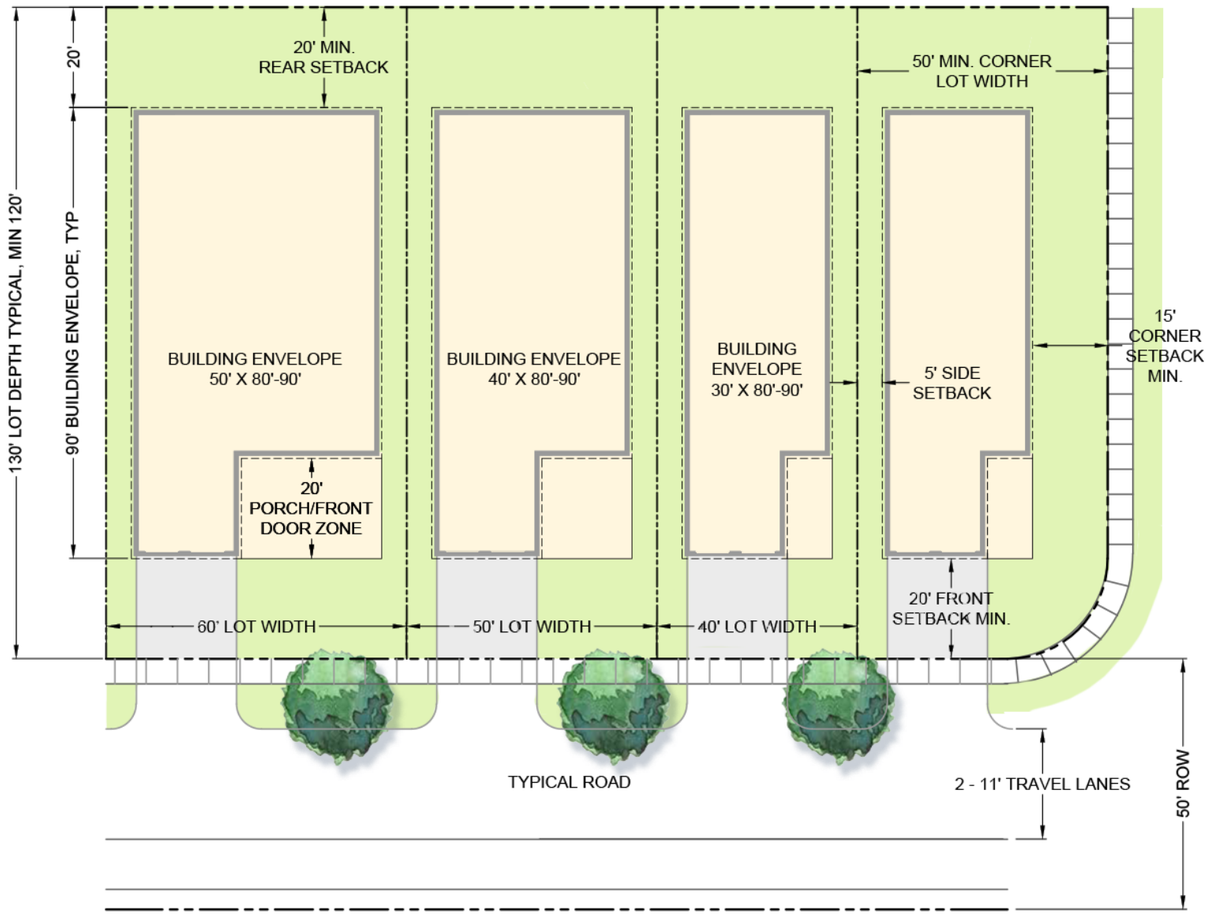


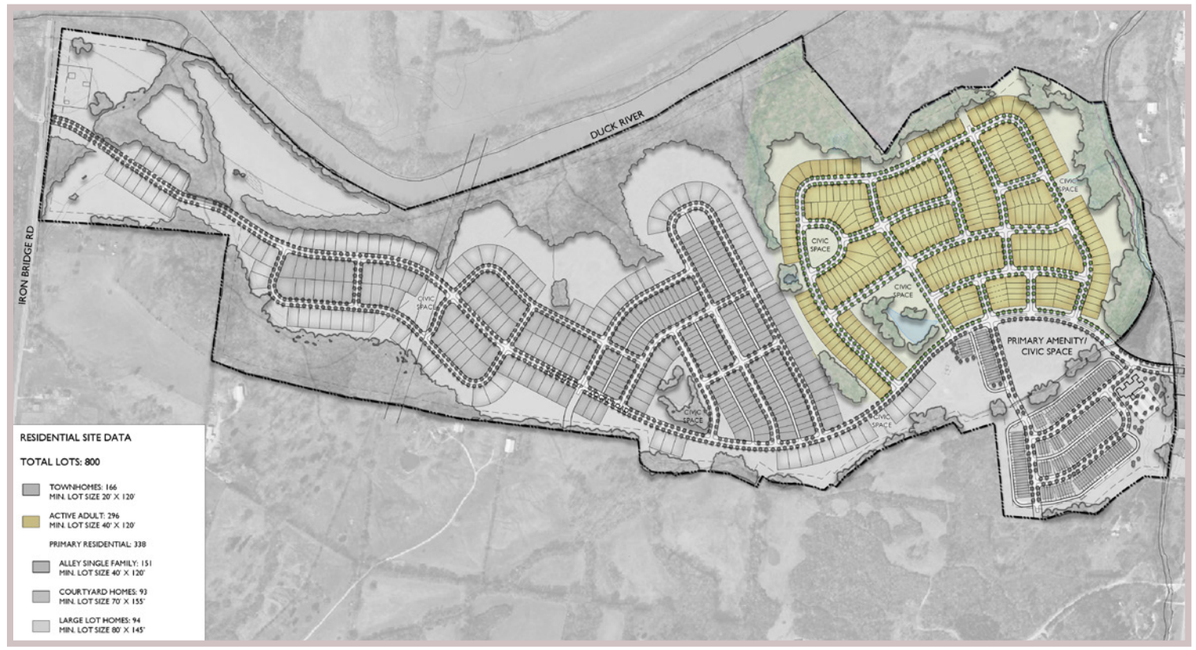
ACTIVE ADULT SINGLE FAMILY:

1. CODE DEVIATION: SIDE YARD SETBACK OF 5 FEET
2. CODE DEVIATION: FINISHED FLOOR LEVEL MAY MATCH THE FINISHED GRADE ELEVATION
3. CODE DEVIATION: GARAGE DOORS ARE LOCATED IN THE SECOND LAYER.
4. CODE DEVIATION: GARAGE DOORS ARE A MINIMUM OF 16 FEET IN WIDTH, AND A MAXIMUM OF 67% OF THE TOTAL GARAGE PLUS THE FAÇADE WIDTH.
5. CODE DEVIATION: FAÇADE WINDOW SILL HEIGHT, 24 INCHES MINIMUM ABOVE AVERAGE GRADE AT FAÇADE
6. CODE DEVIATION: 18 FOOT MAXIMUM WIDTH DRIVEWAY IN THE 1ST LAYER
7. ALL HOMES TO HAVE BRICK OR STONE SKIRTING AROUND THE FOUNDATION. PRIMARY MATERIALS MUST CONTINUE THROUGH THE 2ND LAYER.
8. BRICK HOMES MUST HAVE ROWLOCK TO ESTABLISH A BASE / FOUNDATION FOR THE HOME.
9. PORCH COLUMNS TO HAVE BRICK OR STONE FOUNDATIONS. TOP OF MASONRY COLUMN TO ALIGN WITH BRICK OR STONE ROWLOCK AT THE FOUNDATION OF THE HOME.
10. EACH GARAGE DOOR MUST HAVE ORNAMENTAL LIGHTING FIXTURE ABOVE IT.

ACTIVE ADULT SINGLE FAMILY

COLOR RENDERING PRESENTS AN ILLUSTRATIVE DEPICTION OF ARCHITECTURE AND LANDSCAPE MATERIAL







LOT RANGE: 40'-60'
296 HOMES

BUILDING SETBACKS:
- FRONT: 20'
- REAR: 20'
- SIDE: 5'
- CORNER: 15'

ALL LOTS TO HAVE FRONT LOADED GARAGES
- MINIMUM 20' OF DRIVEWAY ON LOT
- EACH GARAGE PARKING SPACE SHALL BE A MINIMUM OF 10' X 20'.

SITE SETBACKS ARE DUE TO ALL INCLUSIVE MAINTENANCE APPLICATION GOVERNED BY THE PROPOSED HOA, TO BE DEED RESTRICTED.

ACTIVE ADULT SINGLE FAMILY











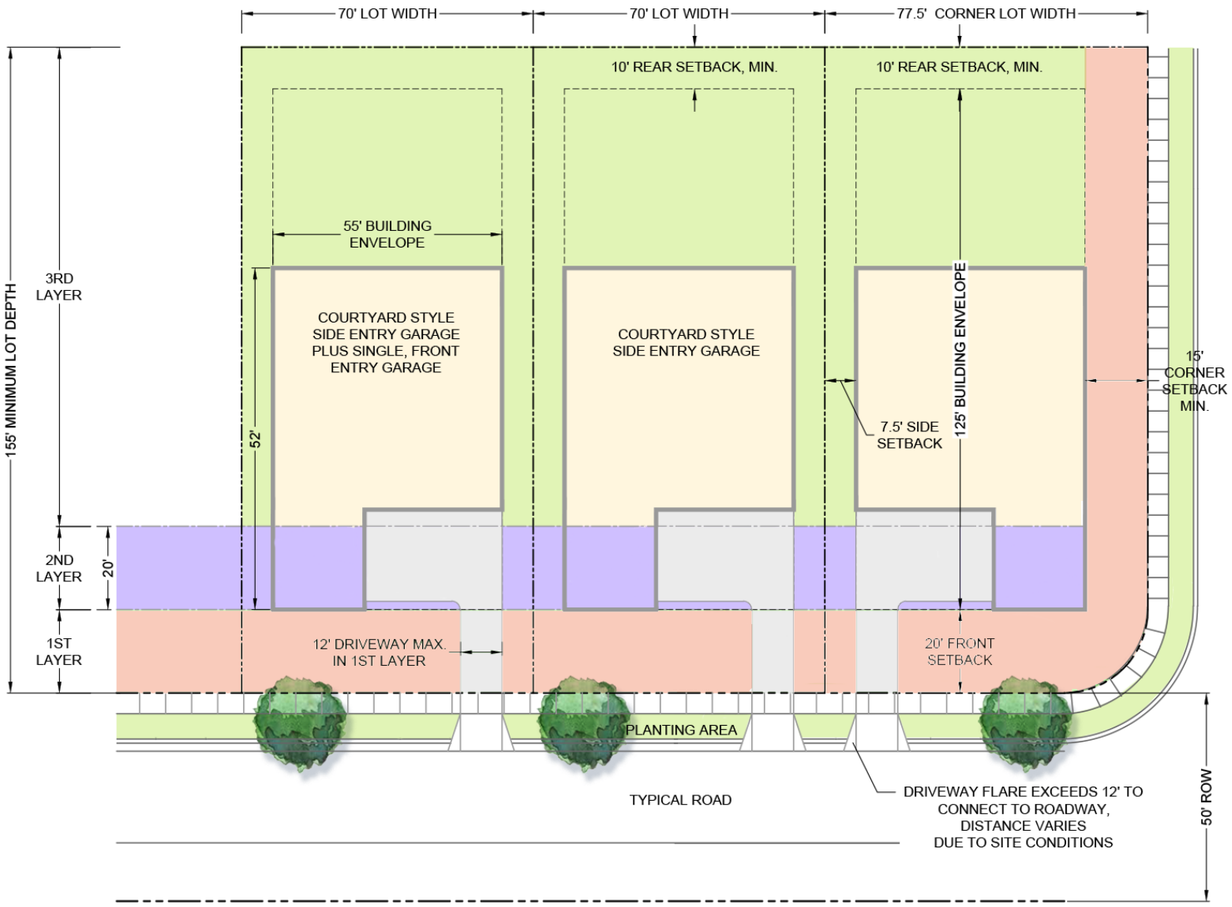


COURTYARD HOMES:

1. CODE DEVIATION: SIDE YARD SETBACK OF 7.5 FEET
2. CODE DEVIATION: FAÇADE WINDOW SILL HEIGHT. 36 INCHES MINIMUM ABOVE AVERAGE GRADE AT FAÇADE.
3. CODE DEVIATION: GARAGE LOCATED IN 2ND LAYER
4. CODE DEVIATION: GARAGE DOOR MUST BE PERPENDICULAR TO THE RIGHT OF WAY, MUST HAVE WINDOWS, AND MAY BE UP TO 16 FEET IN WIDTH.
5. CODE DEVIATION: 12 FOOT MAXIMUM WIDTH DRIVEWAY IN THE 1ST LAYER
6. ALL GARAGE DOORS TO HAVE WINDOWS
7. ALL HOMES TO HAVE BRICK OR STONE FOUNDATION. PRIMARY MATERIALS MUST CONTINUE THROUGH THE 2ND LAYER.
8. BRICK HOMES MUST HAVE ROWLOCK TO ESTABLISH A BASE / FOUNDATION FOR THE HOME.
9. PORCH COLUMNS TO HAVE BRICK OR STONE FOUNDATIONS. TOP OF MASONRY COLUMN TO ALIGN WITH BRICK OR STONE ROWLOCK AT THE FOUNDATION OF THE HOME. CLADDING MAY BE EXCLUDED IF COLUMNS APPEAR AS 6” X 6” CEDAR COLUMNS FROM ROOF LINE TO PORCH.
10. EACH GARAGE DOOR MUST HAVE ORNAMENTAL LIGHTING FIXTURE ABOVE IT.

COLOR RENDERING PRESENTS AN ILLUSTRATIVE DEPICTION OF ARCHITECTURE AND LANDSCAPE MATERIAL

COURTYARD HOMES





LOT: 70' MINIMUM
93 HOMES

BUILDING SETBACKS:

FRONT:	20'
REAR:	20'
SIDE:	7.5'
CORNER:	15'

ALL LOTS TO HAVE SIDE LOADED GARAGES WITH THE OPTION OF A SINGLE, FRONT-LOADED GARAGE IN THE 3RD LAYER.

- MINIMUM 20' LENGTH OF DRIVEWAY ON LOT
- EACH GARAGE PARKING SPACE SHALL BE A MINIMUM OF 10' X 20'.

COURTYARD HOMES











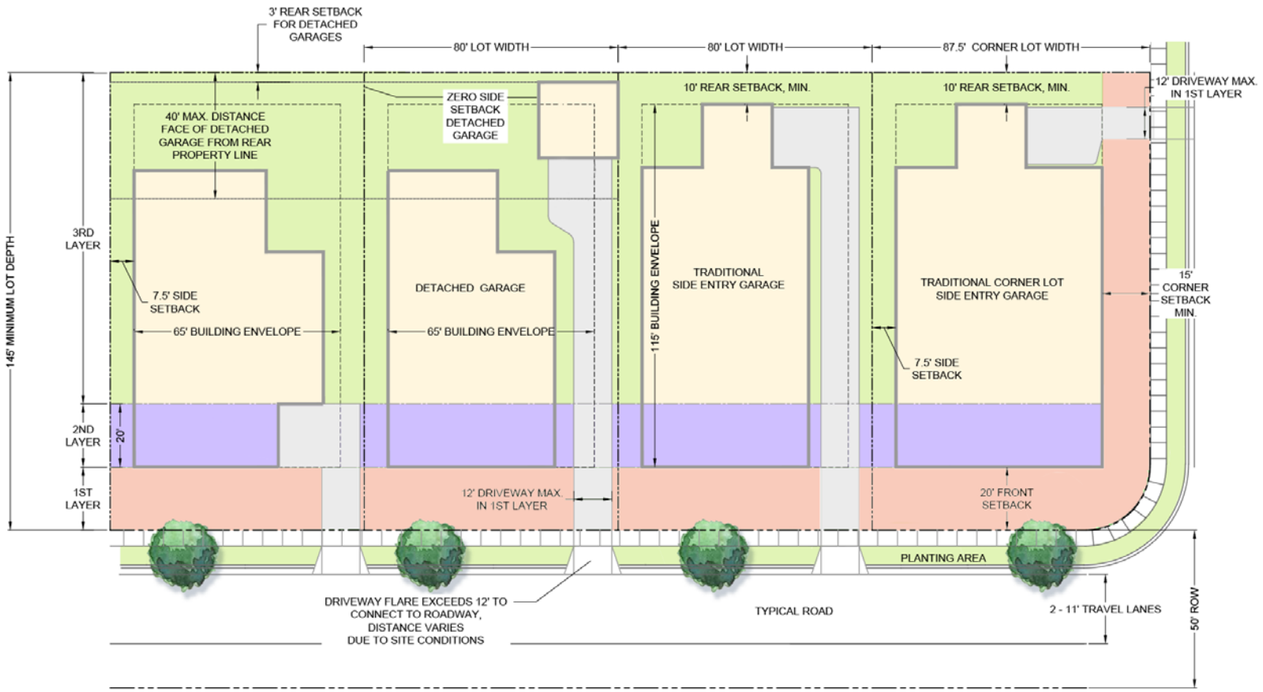


LARGE LOT HOMES:

1. CODE DEVIATION: SIDE YARD SETBACK OF 7.5 FEET
2. CODE DEVIATION: GARAGE DOOR MUST BE PERPENDICULAR TO THE RIGHT OF WAY, MUST HAVE WINDOWS, AND MAY BE UP TO 16 FEET IN WIDTH.
3. CODE DEVIATION: 12 FOOT MAXIMUM WIDTH DRIVEWAY IN THE 1ST LAYER
4. BRICK HOMES MUST HAVE ROWLOCK TO ESTABLISH A BASE / FOUNDATION FOR THE HOME.

LARGE LOT HOMES

COLOR RENDERING PRESENTS AN ILLUSTRATIVE DEPICTION OF ARCHITECTURE AND LANDSCAPE MATERIAL





LOTS: 80' MINIMUM
94 HOMES

BUILDING SETBACKS:

FRONT:	20'
REAR:	20'
SIDE:	7.5'
CORNER:	15'

LOTS WILL HAVE A MIX OF GARAGE LOCATIONS, ATTACHED AND DETACHED
- MINIMUM 20' OF DRIVEWAY ON LOT
- EACH GARAGE PARKING SPACE SHALL BE A MINIMUM OF 10' X 20'.

LARGE LOT HOMES











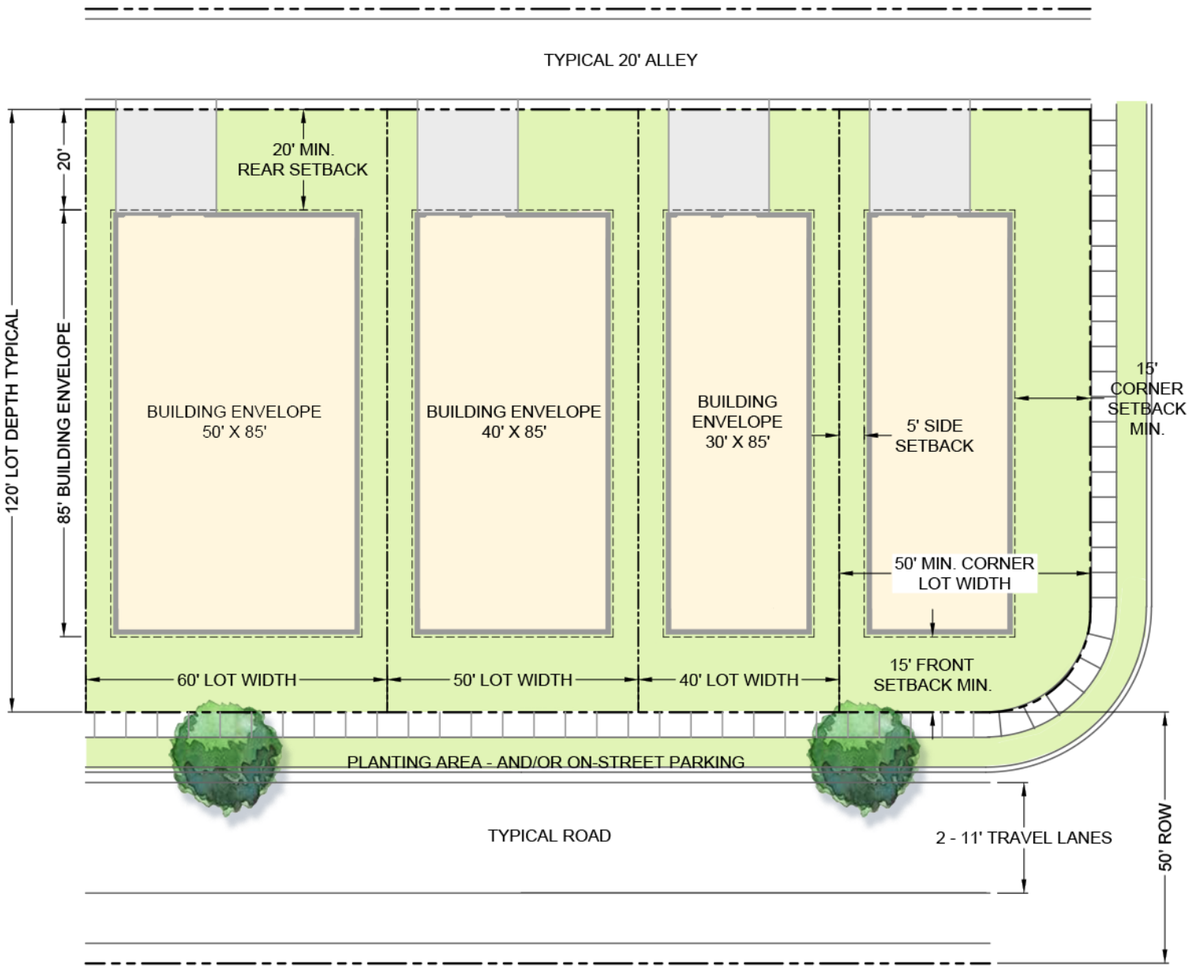


SINGLE-FAMILY ALLEY LOADED:

1. CODE DEVIATION: SIDE YARD SETBACK OF 5 FEET.
2. BRICK HOMES MUST HAVE ROWLOCK TO ESTABLISH A BASE/FOUNDATION FOR THE HOME.

SINGLE-FAMILY ALLEY LOADED

COLOR RENDERING PRESENTS AN ILLUSTRATIVE DEPICTION OF ARCHITECTURE AND LANDSCAPE MATERIAL





LOT RANGE: 40’-60’
151 HOMES

BUILDING SETBACKS:

FRONT:	15’
REAR:	20’
SIDE:	5’
CORNER:	15’

ALL LOTS TO HAVE REAR LOADED GARAGES
- MINIMUM 20’ LENGTH OF DRIVEWAY ON LOT
- EACH GARAGE PARKING SPACE SHALL BE A MINIMUM OF 10’ X 20’.

SINGLE-FAMILY ALLEY LOADED





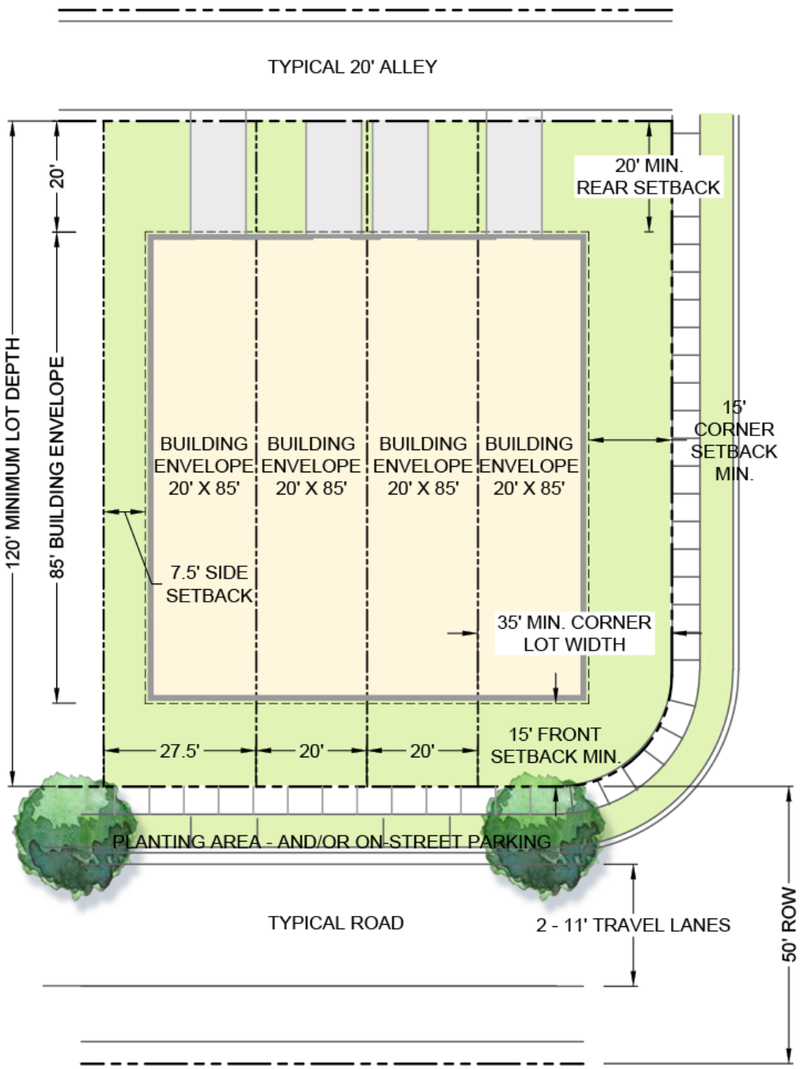
TOWNHOMES:

1. CODE DEVIATION: SIDE YARD SETBACK OF 7.5 FEET.
2. ALL SHUTTERS SHOWN ARE FUNCTIONAL WITH SHUTTER DOGS
3. BRICK HOMES MUST HAVE ROWLOCK TO ESTABLISH A BASE / FOUNDATION FOR THE HOME.
4. PORCH COLUMNS TO HAVE BRICK OR STONE FOUNDATIONS. TOP OF MASONRY COLUMN TO ALIGN WITH BRICK OR STONE ROWLOCK AT THE FOUNDATION OF THE HOME. CLADDING MAY BE EXCLUDED IF COLUMNS APPEAR AS 6" X 6" CEDAR COLUMNS FROM ROOF LINE TO PORCH.



COLOR RENDERING PRESENTS AN ILLUSTRATIVE DEPICTION OF ARCHITECTURE AND LANDSCAPE MATERIAL

TOWNHOMES





LOTS: 20' MINIMUM
166 HOMES

BUILDING SETBACKS:

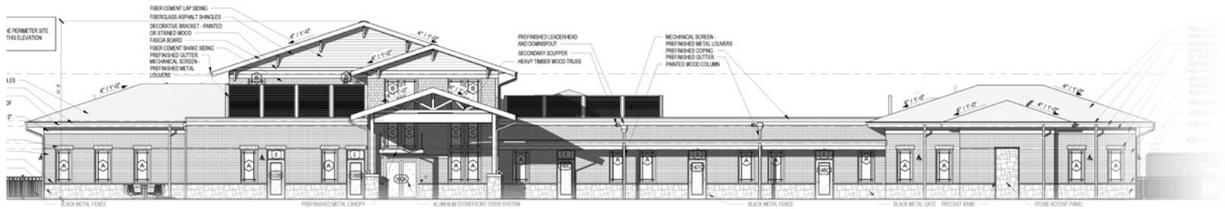
FRONT:	15'
REAR:	20'
SIDE:	7.5'
CORNER:	15'

ALL LOTS TO HAVE REAR LOADED GARAGES
- MINIMUM 20' LENGTH OF DRIVEWAY ON LOT
- EACH GARAGE PARKING SPACE SHALL BE A MINIMUM OF 10' X 20'.TOWNHOME BUILDINGS

WILL CONSIST OF 4, 6, 7, AND 8 UNIT BUILDINGS.

TOWNHOMES

DAYCARE ELEVATIONS



WEST ELEVATION



EAST ELEVATION



SOUTH ELEVATION



NORTH ELEVATION

ELEVATIONS ARE CONCEPTUAL.
FINAL APPROVALS TO BE DETERMINED WITH FMDP.



DAYCARE

CHILD DAYCARE TO BE APPROXIMATELY 12,000-14,000 SQFT., AND WILL SERVE AS A BENEFIT NOT ONLY TO THE LOCAL NEIGHBORHOOD BUT TO THE COMMUNITY AS WELL.

DAYCARE:

1. SHOPFRONT IS CALCULATED AT THE MAIN ENTRY ELEVATION ONLY. __% PROVIDED. ALL OTHER ELEVATION HAVE A MINUMUM OF 20% GLAZING.

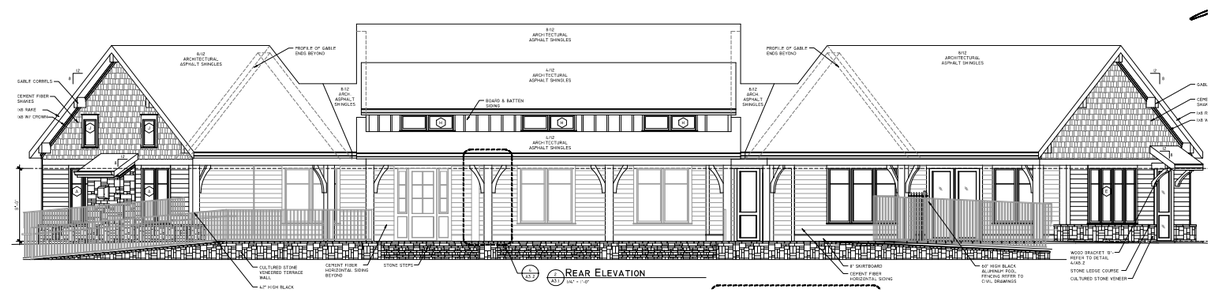
AMENITY PHOTOGRAPHS



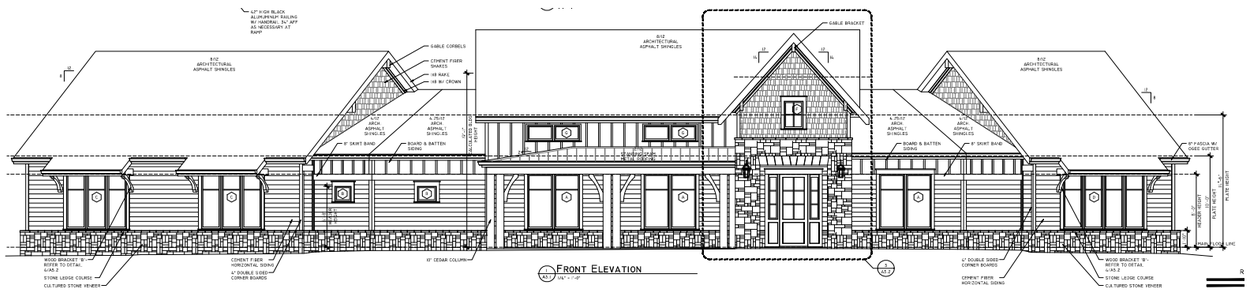


POOL AND CLUBHOUSE FROM SIMILAR KOLTER PROJECT

AMENITY ELEVATIONS



REAR ELEVATION



FRONT ELEVATION

IMAGES AND ELEVATIONS ARE CONCEPTUAL.
FINAL APPROVALS TO BE DETERMINED WITH FMDP.

AMENITY:

1. ALL COLUMNS WILL HAVE STONE BASE. HEIGHT OF COLUMNS TO MATCH THE ROW LOCK ON THE FACADE ELEVATION.





5 CIVIC SPACES ARE PLANNED FOR THIS SITE.

THREE OF THESE SITES WILL HAVE COVERED MAILBOX KIOSKS. COVERED SEATING WILL BE PROVIDED IN MOST PARKS.

IMAGES ARE TO PROVIDE EXAMPLES OF TYPES OF COVERED SEATING AND MAILBOX KIOSKS, BUT COULD BE SUBJECT TO REVISIONS AT FMDP APPROVALS.

PUD-R Table 4.3.1-K District Standards: Planned Unit Development - Residential District

Bulk Standard	Required		Proposed
Density	12 density units per acre maximum		1.96 density units per acre
Block Perimeter	2000 feet maximum		
Principal Building	6 maximum per lot / building site for attached townhouse buildings, 1 maximum per lot / building site		
Accessory Buildings	1 maximum per building site		
Lot / Building Site Width	18 ft. min; 180 ft. max; For Townhouses with each unit on its own Lot or Building Site: 18 - 36 ft. for single Townhouse unit attached to other Townhouse units X 8 max. attached Townhouse units For multiple Townhouses on a single Lot or Building Site: 18 -20 ft. per Townhouse unit X 8 max. attached Townhouse units 38 ft min. for House, 25 ft min. for each Duplex unit or 50 ft min. for both units of Duplex, and 100 ft. max. for Small Multifamily Building		
Frontage Buildout	60% Minimum		
Impervious Surface Coverage	70% Maximum; except 90% maximum for each group of attached townhouse units		
Lot / Building Site Enfrontment	Must enfront a vehicular Thoroughfare or Internal Drive, except ≤ 20% of the Lots / Building Sites within a Development Parcel may Enfront a Pedestrian Path, Passage, pedestrian walkway or water body if such Lots / Building Sites have legal and physical vehicular access to a vehicular Thoroughfare via Driveway or Easement.		
Lot / Building Site Access	All Lots must have legal and physical vehicular access to a vehicular Thoroughfare via Driveway, Internal Drive or Easement.		
Setbacks			
Front Setback, Principal	15 - 35 feet		
Front Setback, Secondary	15 - 35 feet		
Side Setback	0 feet minimum on attached side of attached buildig types, otherwise 10 feet minimum; 24 feet maximum per side		Active Adult Homes: 5 feet Courtyard Homes: 7.5 feet Large Lot Homes: 7.5 feet Single Family Alley Loaded Homes: 5 feet Town Homes: 7.5 feet
Rear Setback	10 feet minimum		
Building Standards			
Building Height	1-2 Stories for houses and duplex building types; 2-3 stories for townhouse.		
Ceiling Height	May not exceed 14 feet from finished floor to finished ceiling		
Vertical Composition	Each Principal building must have an identifiable base, middle, and cap.		
Finished Floor Level	Minimum 18 inches above finished grade at façade.		Active Adult Homes: 0 inches above finished grade at façade for ADA accessibility; All other homes a mimimum of 18 inches above finished grade at façade.
Main Entrance	Main entrance must be in façade of principal frontage		
Façade Position	Parallel to straight frontage line or to tangent of curved frontage line		
Façade Proportions	Must be vertically proportioned		
Facade Articulation	Not Applicable		
Façade Openings	Facade windows and/or doors must be spaced ≤ 20 ft. apart. In Stories above first, Facade openings must be ≤ 50% of total Facade area.		
Façade Glazing	20% – 60% of total Facade area for non-Shopfront; 70% of total Facade area, min. for Shopfront.		
Window Shape	Square or vertical in proportion, except for transoms		
Window Alignment	Upper floor windows and other features must be aligned with those of first floor.		
Window Types	Except in Shopfront or Gallery Frontage, and except for transoms and sidelights, Windows in Facade and 1st & 2nd Layers must be single-hung, double-hung, casement or awning types. In Stories above first, Facade openings must be ≤ 50% of total Facade area.		
Window Glazing Material	Clear glass for all Elevations.		

Window Trim in 1st layer	Min. 4 in. trim with sill and top plate if siding surrounding window; soldier course above lintel and rollock course below sill if brick or stone surrounds window		
Shutters	If any, must be functional and proportioned to cover half of window width from each side or entire window width, with shutter dogs		
Façade Window Sill Height	If Residential: 5 ft. min. above avg. grade at Facade		Active Adult Homes: 24 inches minimum above average grade at façade; Courtyard Homes: 36 inches minimum above average grade at façade. All other homes 5 ft. minimum above average grade at façade.
Porch Frontages	Min. 6 ft. clear depth, excluding rails, pillars, columns or other features		
Shopfront Frontages	12 in.-24 in. knee wall required at Frontage		For Clubhouse and Pre-School: finished floor elevation may match finished grade for ADA accessibility; no knee wall required.
Façade Variety	No Facade may exist more than once on a Block Face or within view of the same Facade		
Roof Pitch	6:12 - 14:12, except for shed roofs which may be 3:12 - 14:12 and except roof pitch may match the primary roof pitch of an existing Building that is less than 6:12		
Roof Design	Eaves shall extend no less than nine inches beyond the supporting walls. Gable end rakes shall overhang at least six inches. Eaves and rakes on Accessory Buildings and dormers shall overhang at least six inches. Soffits shall be placed perpendicular to the Building wall, not sloping in plane with the roof (except for gable end rakes).		
Building Materials			
Primary Building materials	Brick, Natural Stone, Wood, Cementitious Siding; Authentic Stucco over masonry		
Changes in Building Materials	Primary materials must continue along side Elevations through 2nd Layer. Primary materials shall continue for entire length of all Facades facing a Frontage. Any material changes must coincide with form, structural, or massing changes and shall not occur at outside corner of such change.		
Building Colors	Up to 3 colors, including the natural color of any allowed materials, but excluding trim colors		
Foundation Cladding	brick or natural stone		
Porch Peir Cladding	brick or natural stone, with any space under Porch concealed by painted or stained latticework between piers		brick or natural stone, with any space under porch concealed by painted or stained latticework between peirs; cladding may be excluded if column appears as a 6" x 6" cedar column from roof line to porch.
Chimney Cladding	brick, natural stone, or material matching primary material of Facade		
Vehicular Parking Requirements			
Off-Street Parking Surface	Asphalt, concrete or other hard surface		
Garage Location	in 3rd Layer Only		Active Adult Homes: 2nd Layer Courtyard Homes: 2nd Layer Large Lot (side loaded): 2nd Layer Single Family Alley Loaded: 3rd Layer Town Homes: 3rd Layer
			Active Adult Homes: 10 ft x 20 ft per vehicle parking space; Garage Door width 67% pf total of garage + façade width; Garage must be detailed, finished, & designed like rest of Building with carriage house doors with windows; Single garage door width of 16 feet maximum; each Garage door must have ornamental lighting fixture above it;

Garage Design	Min. interior dimensions 10 ft. x 20 ft. per vehicle Parking space. If Garage faces Street: max. Garage door width 33% of total of Garage + Facade width. Garage must be detailed, finished, & designed like rest of Building with carriage house doors; max. Garage door width 9 ft.; each Garage door must have ornamental lighting fixture above it; min. 2 ft. separation between Garage doors		Courtyard Homes: 10 ft x 20 ft per vehicle parking space; Garage Doors are not permitted to face the public street and must be perpendicular to the right of way; Garage must be detailed, finished, & designed like rest of Building with carriage house doors with windows; Single garage door width of 16 feet maximum; each Garage door must have ornamental lighting fixture above it; Large Lot Homes: 10 ft x 20 ft per vehicle parking space; Garage Doors are not permitted to face the public street unless they are located in the 3rd Layer; Garage doors in the must be perpendicular to the right of way; Garage must be detailed, finished, & designed like rest of Building with carriage house doors with windows; Single garage door width of 16 feet maximum; each Garage door must have ornamental lighting fixture above it;
Driveway / Vehicular Entrace Location	in any layer		
Driveway / Vehicular Entrance Maximum Width	10 ft max. in 1st Layer if Residential; 24 ft max. in 1st Layer if non-Residential, regardless if shared or not		Active Adult Homes: 18 ft max. in 1st Layer Courtyard Homes: 12 ft max in 1st Layer Large Lot Homes: 12 ft max in 1st Layer Single Family Alley Loaded: Not Applicable Town Home: Not Applicable
Non-Building Components	Recreation or Play Equipment NP in 1st or 2nd Layer		Recreation or Play Equipment Permitted in 1st and 2nd layer if provided in HOA maintained Civic Space or on the Day Care parcel.

Article 5: Development Parcel Plans and Standards. Table 5.2.2.G-1 Urban Neighborhood Street

Bulk Standard	Required		Proposed
Right of Way Width	70 ft		See Sheet C2.7
Pavement Width	38 ft		See Sheet C2.7

Article 5.3.1.A - Percentage of Civic Space

Bulk Standard	Required		Proposed
Civic Space Requirement	Any Development Parcel shall include at least 5% but not more than 20% of its gross acreage assigned as Civic Space(s). The Civic Space provided pursuant to this Section 5.3.1.A shall be in addition to all Yard, Setback, and Impervious Surface area required not permitted to be covered under this Ordinance and the Subdivision Regulations.		Remove: "but not more than 20%": Any Development Parcel shall include at least 5% of its gross acreage assigned as Civic Space(s). The Civic Space provided pursuant to this Section 5.3.1.A shall be in addition to all Yard, Setback, and Impervious Surface area required not permitted to be covered under this Ordinance and the Subdivision Regulations.

Table 5.3.3-A Civic Space Types - Summary

Bulk Standard	Required		Proposed
Civic Space Types - Green	An open area, available for unstructured recreation. A Green may be spatially defined by landscaping rather than Building Frontages. Its landscape shall consist of lawn and Trees, naturalistically disposed. The minimum size is 0.5 acre and the maximum is 8 acres.		Remove: "and the maximum is 8 acres": An open area, available for unstructured recreation. A Green may be spatially defined by landscaping rather than Building Frontages. Its landscape shall consist of lawn and Trees, naturalistically disposed. The minimum size is 0.5 acre.

Table 5.3.3-B Civic Space Types - Specific Standards

Bulk Standard	Required		Proposed
Civic Space Types - Green	An open area, available for unstructured recreation. A Green may be spatially defined by landscaping rather than Building Frontages. Its landscape shall consist of lawn and Trees, naturalistically disposed. The minimum size is 0.5 acre and the maximum is 8 acres.		Remove: "and the maximum is 8 acres" from Intent and Specification Size: An open area, available for unstructured recreation. A Green may be spatially defined by landscaping rather than Building Frontages. Its landscape shall consist of lawn and Trees, naturalistically disposed. The minimum size is 0.5 acre.

Article 5.5.5 Civic Spaces Required

Bulk Standard	Required		Proposed

B. Playground	A Civic Space designed and equipped as a Playground conforming to Table 5.3.3-B (Civic Spaces – Playground) (1) within 800 feet of every Lot or Building Site in Residential Use in all Districts except CD-2, CD-3L, SD-INT, and SD-LI, and (2) within 1300 feet of every Lot or Building Site in Residential Use in Districts CD-2, CD-3L, and SD-LI; and		Add: A Civic Space designed and equipped as a Playground conforming to Table 5.3.3-B (Civic Spaces – Playground) (1) within 800 feet of every Lot or Building Site, excluding Active Adult lots, in Residential Use in all Districts except CD-2, CD-3L, SD-INT, and SD-LI,and (2) within 1300 feet of every Lot or Building Site in Residential Use in Districts CD-2, CD-3L, and SD-LI; and
C. Thoroughfare Enfrontment	Each Civic Space shall have a minimum of 50% of its perimeter Enfronting a Thoroughfare, except for Playgrounds or Community Gardens.		Remove the minimum perimeter requirement.

Property and Master Plan Description

Identifying paths for new development, suburban neighborhood development, through *Connect Columbia*

- **Fostered as part of a practice of managed growth that relies on balancing growth, economic development and community development**
  Columbia Bluffs seeks to be a master planned community with diversity of housing options and civic opportunities.

- **Preservation of historic, cultural and environmental assets**
  Columbia Bluffs seeks to build civic areas around the historic/cultural history of the property and utilize proactive measures to protect the natural environmental systems supporting the Duck River.

- **Connectivity**
  Columbia Bluffs seeks to provide a north-south roadway connection between Iron Bridge and Bear Creek Parkway as well as provide stub road opportunities for future development to the east.

- ***Connect Columbia* Top Priorities: allowing a PUD model that will allow flexibility with more assurance of the final outcome**
  Columbia Bluffs seeks to create a master planned neighborhood with commitments on density, architectural character, quality amenities, and protected open space.

- **Suburban Neighborhood goals: future development emphasizing connectivity and housing diversity, pedestrian friendly**
  Columbia Bluffs seeks to development a master plan with all of these goals.

- ***Connect Columbia* Near-Term Priorities: promote master planned housing opportunities for a "full-life cycle" to accommodate retirees and young professionals and to review zoning standards to permit smaller lot and home sizes to encourage such developments.**
  Columbia Bluffs seeks to create a master planned neighborhood with housing opportunities that range from Active Adult age-restricted living, larger lots/homes to support growing families and generational living opportunities, to smaller lots and town homes for young families.

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PUD Justification

PUD Zoning is only to be used under certain very specific conditions.

- 2.4.4 – *PUD district may be assigned to an area within a parcel of land over 10 gross acres, only if due to unique site conditions or the necessary and intrinsic uses, size, or form a proposed development* ***cannot under any plan, design, or circumstances conform to one or more of the character districts*** *and standards therefor.*

Environmental Uniqueness. The uniqueness of the land and its proximity to the Duck River provides a unique opportunity to master plan the community with greater environmental protection.

The Duck River may be the most significant natural feature in Columbia. It's the protection and preservation of this resource for aquatic species diversity, wildlife, and a clean Columbia is paramount. Open spaces should be identified and preserved with these specific goals in mind. Based on the Zoning Ordinance Primary Use Table 4.3.9.A-1, open spaces are defined based on the use type. While some uses on this chart are similar, they do not seem to capture the breadth of environmental resource protections and would therefore fall under "other open space use not listed under any use category" which is limited to use within a PUD only. The use of the PUD-R for this property ensures the City's oversight and the design team's plans for development are thought about on the front end and not left to speculation. The property should be developed using Conservation Design Concepts where low impact development is proposed and where conservation is the top priority within sensitive land and around environmental features in order to protect them. These conservation areas include floodplains, steep slopes, natural drainage areas, and areas of established tree canopy along the Duck River.

The Zoning Ordinance does not require a Conservation Plan, nor a development strategy to protect a resource as significant as the Duck River. Section 6.2 Preservation of Natural Features states: Development shall preserve the natural features of the site, such as wetlands, unique wildlife habitats, Historic Structures, major trees and scenic views both from and into the site. This regulation is too vague and not specific enough for the subject property.

The applicant has chosen a PUD-R zoning district instead of CD-3 in order to utilize different neighborhood planning strategies than are allowed under a straight CD-3 zoning project. PUD-R allows for utilization of a cluster development strategy. While Columbia Bluffs is seeking an overall development density of less than what is allowed under CD-3, the PUD-R district allows for smaller lots, lesser lot coverage, and greater impervious surface coverage. The PUD-R also allows for the applicant to ask for modifications to the development standards, which if approved, will further the cluster development design implementation.

Additionally, the applicant is seeking to develop an active adult age restricted neighborhood within the master planned community. While there is no provision in CD-3 that would prohibit the development of an age-restricted neighborhood, many of the zoning criteria in CD-3 are not conducive to the typical design standards utilized in active

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adult age restricted developments. Active adult developments utilize smaller lots and lot coverage in order to reduce the exterior landscape maintenance, which is performed by the HOA. The builders associated with these developments have distinct building programs which cater to the specialized needs of their customers. These homes also tend to require accessible access, which could not be achieved without the ability to seek architectural modification including relief from finished floor level and window sill height at the façade.

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Environmental Protection Strategy

1. **Strategy for Resource Protection utilizing a PUD Planning and Design Approach**

    a. Establish a Limits of Disturbance along the Duck River and its tributaries based upon slopes, natural drainage ways, floodplain areas, and mature tree canopy.
    b. Design new development around open space areas to highlight them as community amenities with pedestrian systems that will connect the entire conservation design open space throughout the community.
    c. Pedestrian circulation and trails are highly encouraged along the river, along stream corridors, and through scenic areas.
    d. The quantity of Open Space preservation should greatly exceed any established base zone district.
    e. New home lots should generally be smaller, clustered areas away from the protected banks of the Duck River.
    f. Document on-site natural resources through a State approved Hydrologist and concurrence reports with local, state, and federal agencies.
    g. Remove debris removal along creek banks to prevent impact to Bear Creek (shoes, clothing, random bottles, containers, fencing, wood)
    h. Use Best Management Practices for Stormwater Pollution Prevention Plans during construction.
    i. Use only one crossing point (< less than approx. 50’ - 60’ feet that spans the creek with no structures within Bear Creek (similar to several crossings visible from US (Highway 412).

2. **Strategy for Protection through Construction**

    Implementation of the Plan requires protective measures. PUD phasing and areas of disturbance should be documented and considered through the PUD process. Protection practices shall include:

    A. Storm water erosion control applications I.E.
        i. Stormwater Detention Areas,
        ii. natural riparian buffers
        iii. silt fencing
        iv. sediment ponds
        v. Check dams

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vi. Ongoing stormwater monitoring of Environmental Controls of water runoff areas and tributaries

B. Compliance with CGP, ARAP and NPDES permitting to address the protections that provide additional oversight to the project.

Throughout the duration of the project, these types of practices within the action areas will ensure environmental compliance with local, state and federal requirements.

3. Strategy for Protection when construction is completed.

Once development is completed permanent storm water detention areas and water out fall locations will be cleaned and stabilized in accordance with the local, state, and federal guidelines.

PUD Standards and the Columbia Bluffs Plans

The Columbia Bluffs Master Plan will address and satisfy the standards for PUD Development as defined in 3.7.1 PUD-R District Standards: **PUD-Residential**: *Specifically, this District is intended for predominantly Residential areas on sites where there are sufficient existing infrastructure, services, and utilities available for a proposed Development. Development in this District:*

a. Is walkable and provides a diverse mixture of housing choices and Building Types,
b. Is necessary to implement and is consistent with the Comprehensive Plan,
c. Cannot under any circumstances, plan, or design conform to one or more of the other Districts and standards therefor due to its necessary and intrinsic Uses or size or form,
d. Provides an innovative plan and design,
e. Is harmonious with and respects the land use, character, and natural or man-made features of both the subject property and Adjacent property,
f. Promotes quality and environmentally sensitive planning and design by taking advantage of special site characteristics, locations and land uses,
g. Provides Civic Space,
h. Is the best use of the site consistent with the goals of protecting and enhancing the natural environment. There are specific Development standards provided for this District, which may be supplemented by additional standards approved as part of the applicable Final Master PUD Development Plan.

PUD-R Justification
Date: January 23, 2024
Project: Columbia Bluffs Preliminary PUD-R Master Development Plan

Deviations from PUD-R Standards

A full listing of deviations has been provided in a separate document. Additional explanation for some of these requests is below. The developer seeks to reduce the development footprint and increase the open space held in preservation. The reduction in ROW width, setbacks, and variations in garage locations will provide for a unique, clustered neighborhood experience.

1. Utilization of street sections with smaller ROW impacts than the 70' ROW Urban Neighborhood Street. In coordination with Staff, the applicant is proposing a variety of street sections based on the development intensity and presence of on-street parking. These street sections range from 55' ROW to 80' ROW. This reduced ROW would yield 7 acres of additional open space.
2. Reduction in side setbacks from 10' to 7.5' on front loaded homes and townhomes provides approximately 6.2 acres of additional land placed into open space. (19,920 sf townhomes + 33,655 sf front load x 2 side yards x 2.5' reduction).
3. Reduction in side setbacks from 10' to 5' on detached alley loaded homes and active adult homes provides approximately 12.3 acres of additional land placed into open space. (445 homes x 120' depth x 2 side yards x 5' reduction = 422,400 SF)
4. Allow garage in 2nd layer on courtyard style homes (garage doors not facing frontage in second layer). The courtyard style home provides façade variety while also allowing side and not front facing garage access.
5. Allow active adult lots to have a finished floor level lower than 18 inches above finished grade at the façade. This provision will allow lot to achieve greater accessibility access.
6. Reduced window sill height at the façade from 5' minimum above average grade at façade to 3' minimum in the active adult and courtyard style homes. This will allow greater accessibility access in the active adult homes, but also allows for windows along the garage façade in courtyard homes.

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February 2, 2024

KL Nexus TN, LLC
14025 River Edge Drive
Suite 175
Tampa, Florida 33637

ATTENTION: Mr. Joshua Gibbs
jgibbs@kolter.com

Subject: Site Inspection Report
Columbia Bluffs Subdivision
400 Bear Creek Pike
Columbia, Tennessee

Dear Mr. Gibbs,

A representative of GEOServices, Mr. Wayne Harnack, P.E. was present at the above referenced proposed project to observe site conditions. At the time of our visit no visible construction has been performed. The proposed subdivision will consist of approximately 800 residences. A topographic map has been designed which indicates several wetland areas and the possibility of sink holes.

We explored the area where sink holes were anticipated, and we did not observe any features. We did observe surface bedrock and several solution channels for water drainage.

If there are any questions pertaining to this report, please do not hesitate to contact our office.

Sincerely,
GEOServices, LLC



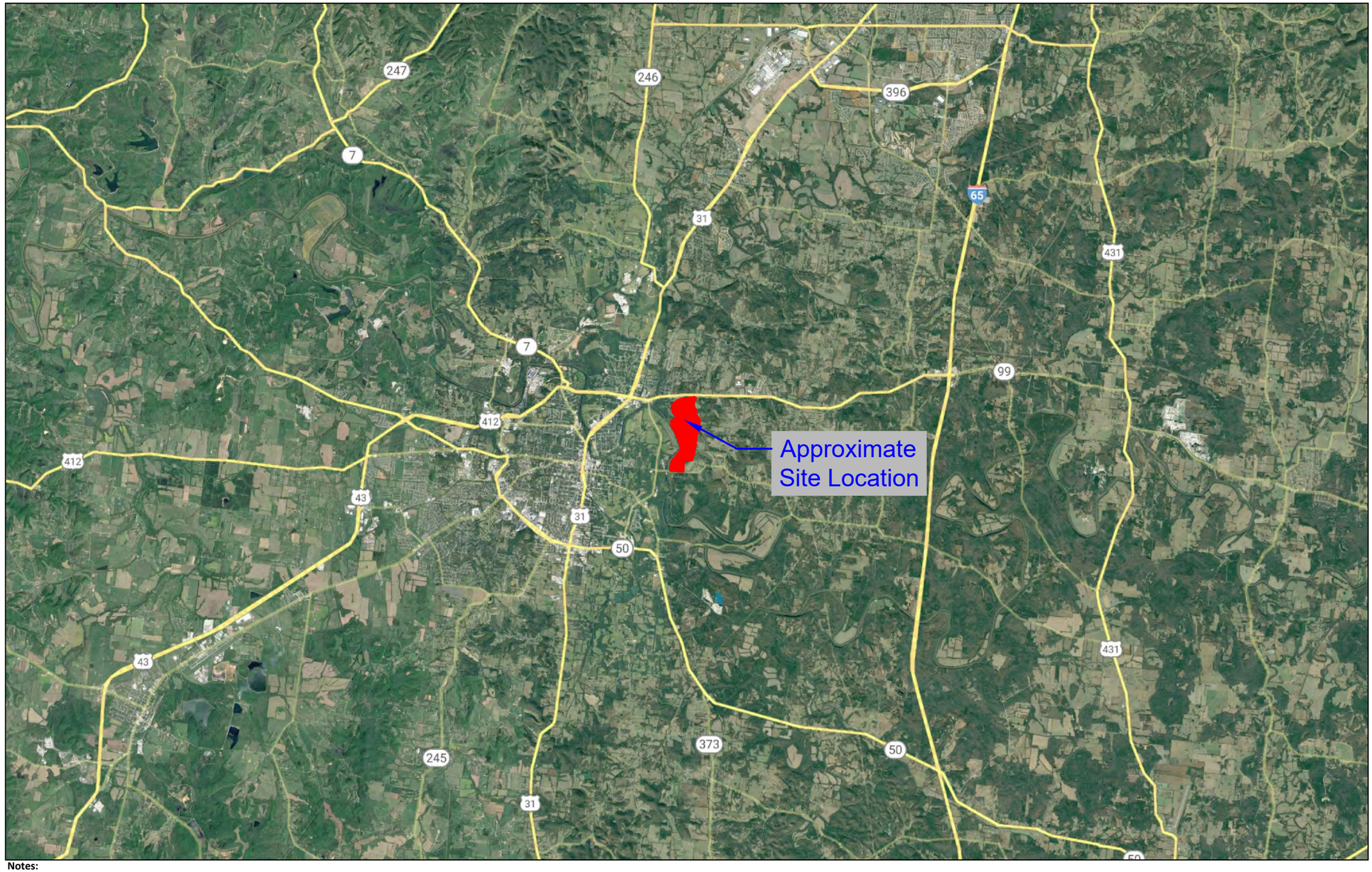
Wayne F. Harnack. P.E.
Chief Operating Officer of Construction Services

GEOServices, LLC, Geotechnical and Materials Engineers

APPENDICES

GEOServices, LLC, Geotechnical and Materials Engineers

APPENDIX A



Notes:

1) Aerial Provided by: Google Earth Pro, (11/25/2019)

Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

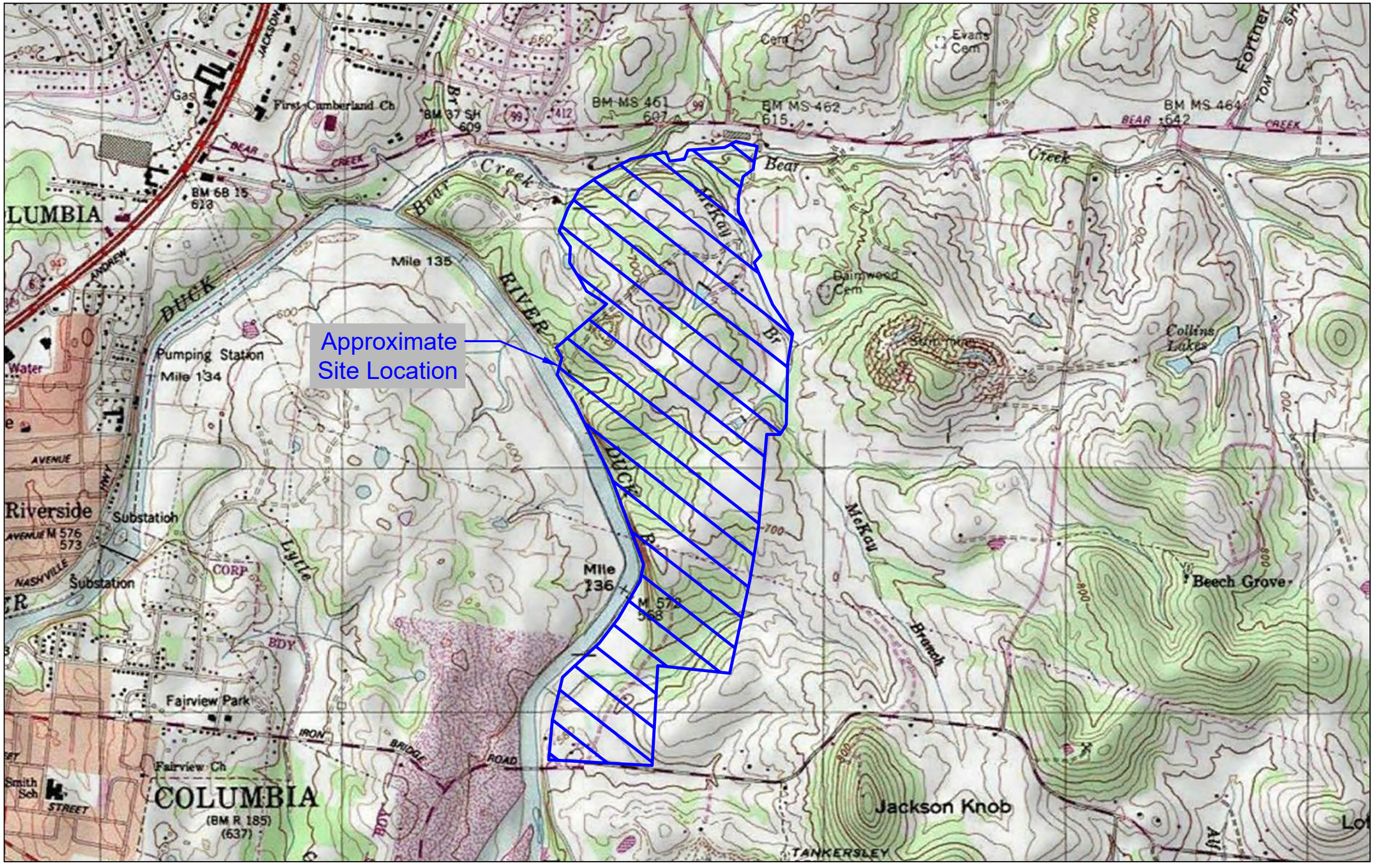
Site Vicinity Plan
Proposed Bear Creek Property
Bear Creek Pike to Iron Bridge Road
Columbia, Tennessee

DATE: 12/20/2021

GEOS Project No. 31-211695

FIGURE: 1

N



Source Provided by: MYTOPO

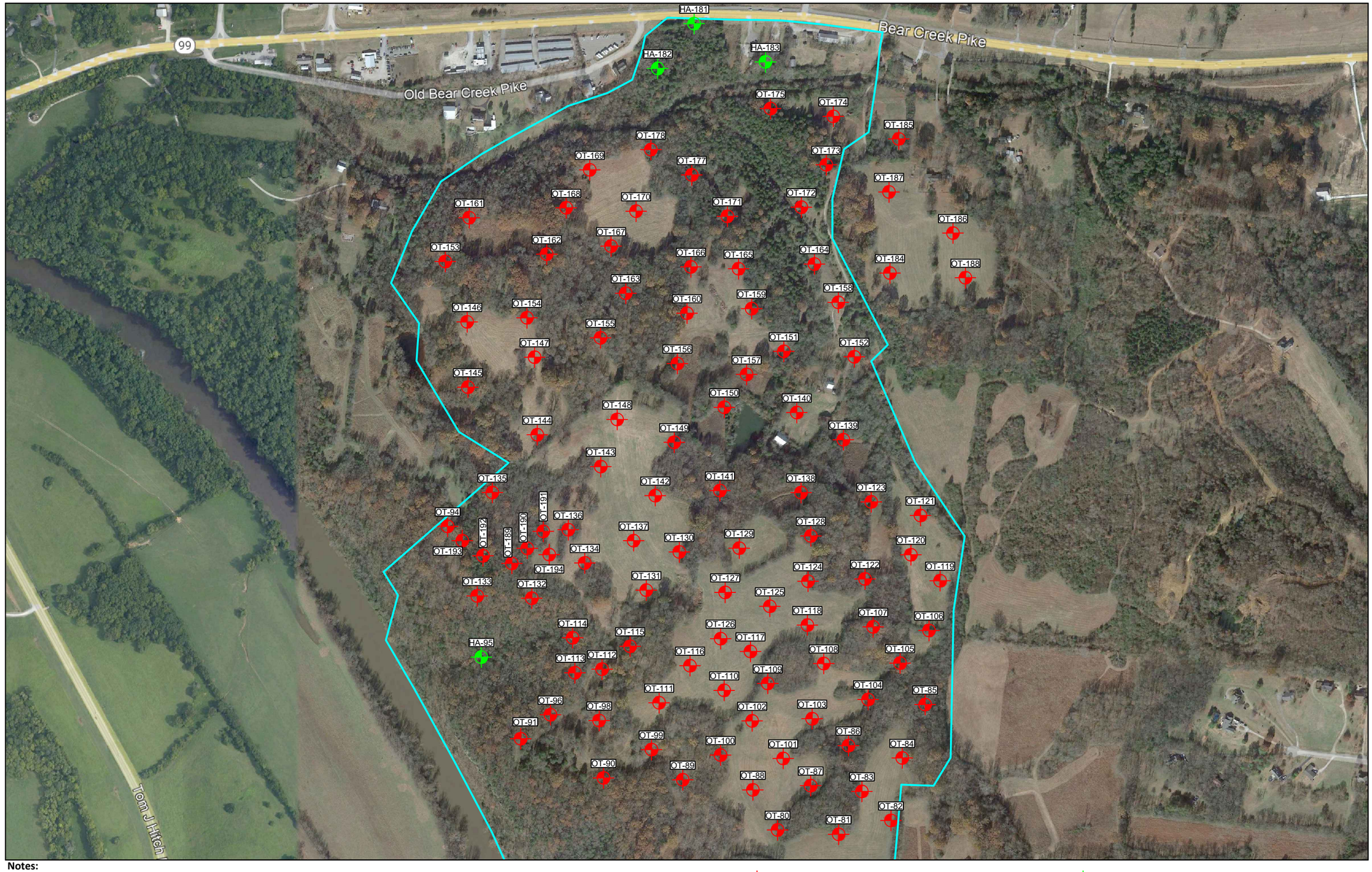
Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

USGS Topographic Map
Proposed Bear Creek Property
Bear Creek Pike to Iron Bridge Road
Columbia, Tennessee

DATE:
12/20/2021

GEOS Project No.
31-211695

FIGURE:
2



Notes:

1) Site Source Provided by: Client
2) Aerial Provided by: Google Earth Pro, (11/25/2019)
3) Observation Trench Locations are shown in general arrangement only
4) Do Not use Observation Trench Locations for determinations of Distance or Quantities

Observation Trench Location & Identifier

Hand Auger Location & Identifier

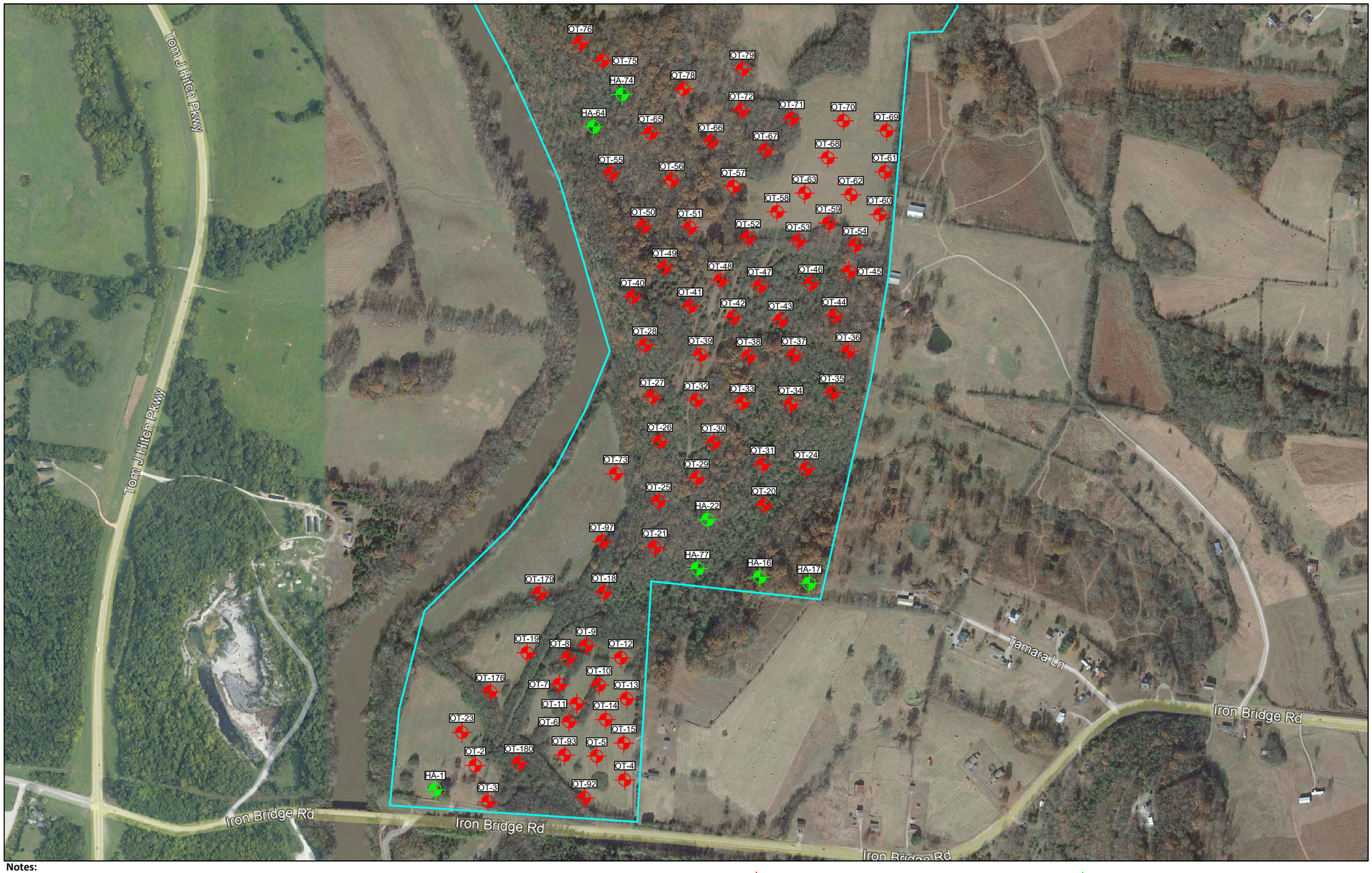
Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

Observation Trench Location Plan
Proposed Bear Creek Property (North)
Bear Creek Pike to Iron Bridge Road
Columbia, Tennessee

DATE: 12/20/2021

GEOS Project No. 31-211695

FIGURE: 3



Notes:

1) Site Source Provided by: Client
2) Aerial Provided by: Google Earth Pro, (11/25/2019)
3) Observation Trench Locations are shown in general arrangement only
4) Do Not use Observation Trench Locations for determinations of Distance or Quantities

Observation Trench Location & Identifier

Hand Auger Location & Identifier

Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

Observation Trench Location Plan
Proposed Bear Creek Property (South)
Bear Creek Pike to Iron Bridge Road
Columbia, Tennessee

DATE: 12/20/2021

GEOS Project No. 31-211695

FIGURE: 4

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: HS-1	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: January 5, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) - reddish brown with black mottling; moist; (RESIDUUM)					
	Hand Shovel Termination at 1 foot					
2.0	Probe Rod through soil					
3.0						
4.0	Hand Shovel/Probe Rod Termination at 3.5 feet					
5.0						
6.0						
7.0						
8.0						
9.0						

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-2	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Lean CLAY (CL) - brown; soft to firm; moist; (RESIDUUM)					
2.0		3-3-4				
3.0						
4.0		6-7-6				
5.0	Fat CLAY (CH) with sand at depth - light brown, brown with black mottling; moist; (RESIDUUM)					
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-3	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0						
	Lean CLAY (CL) with small rock fragments - brown, dark brown; firm; moist; (RESIDUUM)					
2.0		5-5-5				
3.0						
4.0		7-8-9				
5.0	Fat CLAY (CH) with chert fragments - light brown, brown; moist; (RESIDUUM)					
6.0						
7.0	Observation Trench Refusal at 6.5 feet					
8.0						
9.0						



Excavated test pit



Excavated material

Comments: Rock ledge encountered at 4 feet below ground surface.

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-4	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) - brown, light brown; soft to firm; moist; (RESIDUUM)					
2.0		4-4-5				
3.0						
4.0		4-6-6				
5.0						
6.0		7-8-7				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-5	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) - brown; moist; (RESIDUUM)					
2.0						
3.0	Observation Trench Refusal at 3 feet					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-6	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)					
2.0		6-7-8				
3.0	Fat CLAY (CH) with chert fragments at depth - light brown, brown, gray; stiff; moist; (RESIDUUM)					
4.0		9-9-9				
5.0						
6.0		9-10-9				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-7	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: November 29, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0	Fat CLAY (CH) - light brown, brown; moist; (RESIDUUM)					
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-8	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0	Fat CLAY (CH) - light brown, brown; moist; (RESIDUUM)					
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-9	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (2 inches)					
1.0						
2.0						
		6-7-8				
3.0						
4.0						
	Fat CLAY (CH) - brown with trace black mottling; firm to stiff; moist; (RESIDUUM)	6-7-9				
5.0						
6.0						
		9-10-10				
7.0						
8.0						
	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-10	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0	Observation Trench Refusal at 3.5 feet					
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-11	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - dark brown, gray; soft to firm; moist; (RESIDUUM)					
2.0		2-3-3				
3.0						
4.0		4-5-5				
5.0						
6.0	Fat CLAY (CH) - gray, brown with black mottling; moist; (RESIDUUM)					
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-12	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments, chert fragments - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0						
6.0	Observation Trench Refusal at 6 feet					
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: Rock ledge encountered at 1.5 feet below ground surface.

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-13	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments, trace siltstone at depth - brown; soft to firm; moist; (RESIDUUM)					
2.0		2-4-5				
3.0						
4.0		7-7-8				
5.0						
6.0						
7.0						
8.0	Observation Trench Refusal at 7.5 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-14	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments, trace siltstone at depth - brown; firm; moist; (RESIDUUM)					
2.0		7-8-8				
3.0						
4.0	Observation Trench Refusal at 3.5 feet					
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-15	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Fat CLAY (CH) - brown; soft to firm; moist; (RESIDUUM)					
2.0		4-4-4				
3.0						
4.0		5-6-5				
5.0						
6.0		8-8-9				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: HS-16	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: January 5, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Lean CLAY (CL) - brown with black mottling; moist; (RESIDUUM)					
	Hand Shovel Refusal at 1.2 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: HS-17	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: January 5, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) with abundant roots - light brown with black mottling; moist; (RESIDUUM)					
2.0	Hand Shovel Termination at 1.5 feet					
3.0	Probe Rod through soil					
4.0	Hand Shovel/Probe Rod Termination at 3.5 feet					
5.0						
6.0						
7.0						
8.0						
9.0						

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-18	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) with weathered rock fragments - brown; moist; (RESIDUUM)					
	Observation Trench Refusal at 0.8 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-19	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown, dark brown; very soft to soft; moist; (RESIDUUM)					
2.0		1-2-3				
3.0						
4.0		4-4-4				
5.0						
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-20	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil and boulders (12 inches)					
1.0	Observation Trench Refusal at 1 foot					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-21	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil and Boulders (10 inches)					
1.0	Lean CLAY (CL) - brown; moist; (RESIDUUM)					
2.0						
3.0	Observation Trench Refusal at 2.5 feet					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: HS-22	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: January 5, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Hand Shovel Refusal at 0.8 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-23	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0						
2.0		3-4-5				
3.0						
4.0	Fat CLAY (CH) with chert fragments, small rock fragments at depth, trace siltstone at depth - brown; moist; (RESIDUUM)					
5.0						
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-24	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (2 inches)					
1.0	Observation Trench Refusal at 0.2 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-25	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) - brown, light brown; moist; (RESIDUUM)					
2.0	Observation Trench Refusal at 2 feet					
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-26	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with weathered rock fragments - brown; moist; (RESIDUUM)					
2.0						
3.0	Observation Trench Refusal at 3 feet					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-27	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (8 inches)					
1.0	Fat CLAY (CH) - brown, light brown, gray with black mottling; stiff; moist; (RESIDUUM)					
2.0		8-9-10				
3.0						
4.0		8-8-10				
5.0						
6.0	Observation Trench Termination at 6 feet	12-12-15				
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-28	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (8 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)					
2.0		4-5-5				
3.0						
4.0		5-6-6				
5.0	Fat CLAY (CH) - brown with black mottling; stiff; moist; (RESIDUUM)					
6.0		8-9-10				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-29	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
1.0	Topsoil and weathered rock fragments (18 inches)					
2.0	Observation Trench Refusal at 1.5 feet					
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-30	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (2 inches)					
1.0	Observation Trench Refusal at 0.2 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-31	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil, weathered rock fragments, boulders (12 inches)					
1.0	Fat CLAY (CH) - brown, light brown; moist; (RESIDUUM)					
2.0	Observation Trench Refusal at 2 feet					
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-32	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) - brown; firm; moist; (RESIDUUM)					
2.0		6-7-8				
3.0						
4.0		7-9-9				
5.0						
6.0		7-7-7				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-33	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) - brown, light brown, gray; moist; (RESIDUUM)					
2.0		10-11-11				
3.0	Fat CLAY (CH) with weathered rock fragments at depth - brown; stiff to very stiff; moist; (RESIDUUM)					
4.0		15+				
5.0	Observation Trench Refusal at 4.5 feet					
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-34	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (11 inches)					
1.0	Fat CLAY (CH) with trace weathered rock fragments - light brown, brown with black mottling at depth; firm to stiff; moist; (RESIDUUM)					
2.0		6-6-7				
3.0						
4.0		7-9-9				
5.0						
6.0	Observation Trench Termination at 6 feet					
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: Rock ledge encountered at 1 foot below ground surface

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-35	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil and weathered rock fragments (12 inches)					
1.0	Observation Trench Refusal at 1 foot					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-36	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) - brown, light brown, gray with black mottling; firm to very stiff; moist; (RESIDUUM)					
2.0		6-7-8				
3.0						
4.0		7-9-9				
5.0						
6.0		15+				
7.0	Observation Trench Termination at 7 feet					
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-37	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Fat CLAY (CH) - reddish brown, brown with black mottling; firm to stiff; moist; (RESIDUUM)					
2.0		7-8-9				
3.0						
4.0		9-10-10				
5.0						
6.0		11-10-10				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-38	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (8 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments at depth - brown, light brown, gray; stiff; moist; (RESIDUUM)					
2.0		8-8-9				
3.0						
4.0						
5.0						
6.0	Observation Trench Refusal at 6 feet					
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-39	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (8 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)					
2.0		5-5-5				
3.0						
4.0	Fat CLAY (CH) with siltstone at depth - brown with trace black mottling; firm; moist; (RESIDUUM)	6-6-7				
5.0						
6.0		6-8-7				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-40	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Lean CLAY (CL) - brown, gray; firm; moist; (RESIDUUM)					
2.0		6-6-7				
3.0						
4.0	Fat CLAY (CH) - brown, gray with black mottling; firm; moist; (RESIDUUM)	7-8-9				
5.0						
6.0						
7.0						
8.0						
9.0	Observation Trench Termination at 8 feet					



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-41	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)					
2.0		5-5-5				
3.0	Fat CLAY (CH) - brown with black mottling; firm; moist; (RESIDUUM)					
4.0		6-6-8				
5.0						
6.0						
7.0						
8.0						
	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-42	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)					
2.0		5-5-6				
3.0						
4.0		5-5-5				
5.0	Fat CLAY (CH) - brown with black mottling; stiff; moist; (RESIDUUM)					
6.0		7-8-9				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-43	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Fat CLAY (CH) - reddish brown, brown with black mottling; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-44	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown; soft; moist; (RESIDUUM)					
2.0		2-3-4				
3.0						
4.0		4-4-5				
5.0						
6.0	Fat CLAY (CH) - brown, orangish brown, light brown with black mottling; moist; (RESIDUUM)					
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-45	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) - brown with trace black mottling; moist; (RESIDUUM)					
2.0						
3.0						
4.0	Fat CLAY (CH) - brown, light brown with black mottling; moist; (RESIDUUM)					
5.0						
6.0	Observation Trench Refusal at 6 feet					
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-46	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown with trace black mottling; moist; (RESIDUUM)					
2.0	Fat CLAY (CH) - brown, light brown with black mottling; soft to firm; moist; (RESIDUUM)	6-7-6				
3.0						
4.0						
5.0						
6.0	Observation Trench Refusal at 5.5 feet					
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-47	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (8 inches)					
1.0	Lean CLAY (CL) - brown, gray; firm; moist; (RESIDUUM)					
2.0		6-8-9				
3.0						
4.0	Fat CLAY (CH) - brown, gray with black mottling; firm to stiff; moist; (RESIDUUM)	8-8-9				
5.0						
6.0		8-9-10				
7.0						
8.0						
	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-48	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)					
2.0		6-7-8				
3.0						
4.0	Fat CLAY (CH) - brown with black mottling; stiff; moist; (RESIDUUM)	7-8-9				
5.0						
6.0		8-10-10				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-49	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 30, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (5 inches)					
1.0	Lean CLAY (CL) - brown, gray; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0	Fat CLAY (CH) - brown with black mottling; moist; (RESIDUUM)					
8.0						
	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-50	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 2, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
1.0	Topsoil (18 inches)					
2.0	Fat CLAY (CH) with weathered rock fragments - light brown, gray; moist; (RESIDUUM)					
3.0						
4.0	Observation Trench Refusal at 4 feet					
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-51	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 2, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0						
	Fat CLAY (CH) with weathered rock fragments at depth - light brown, gray; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0	Observation Trench Refusal at 7 feet					
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-52	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown with trace black mottling; firm; moist; (RESIDUUM)					
2.0		5-6-7				
3.0						
4.0		4-5-5				
5.0						
6.0	Fat CLAY (CH) - brown, orangish brown with black mottling; stiff; moist; (RESIDUUM)	9-10-11				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-53	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) - brown with trace black mottling; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0						
6.0	Fat CLAY (CH) - brown, orangish brown, light brown with black mottling; moist; (RESIDUUM)					
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-54	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) - brown with trace black mottling; moist; (RESIDUUM)					
2.0	Fat CLAY (CH) - brown, light brown, reddish brown with black mottling; soft to firm; moist; (RESIDUUM)	4-4-4				
3.0						
4.0		5-5-6				
5.0						
6.0		6-7-7				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-55	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: December 2, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0						
	Fat CLAY (CH) - reddish brown; moist; (RESIDUUM)					
2.0						
	Observation Trench Refusal at 2.5 feet					
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-56	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 2, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0						
	Fat CLAY (CH) - reddish brown; moist; (RESIDUUM)					
2.0	Observation Trench Refusal at 2 feet					
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-57	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (2 inches)					
1.0	Fat CLAY (CH) - brown; moist; (RESIDUUM)					
2.0						
3.0	Observation Trench Refusal at 3 feet					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-58	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (2 inches)					
1.0	Lean CLAY (CL) - brown with trace black mottling; firm; moist; (RESIDUUM)					
2.0		5-5-5				
3.0						
4.0		5-5-5				
5.0						
6.0	Fat CLAY (CH) with trace sand - brown, light brown with black mottling; firm; moist; (RESIDUUM)	7-8-8				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-59	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (1 inch)					
1.0	Lean CLAY (CL) with sand - brown with trace black mottling; moist; (RESIDUUM)					
2.0	Fat CLAY (CH) - brown, light brown, reddish brown with black mottling; soft to firm; moist; (RESIDUUM)	3-3-4				
3.0						
4.0		4-5-6				
5.0						
6.0		6-6-8				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-60	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (1 inch)					
1.0	Lean CLAY (CL) - brown with trace black mottling; moist; (RESIDUUM)					
2.0	Fat CLAY (CH) - brown, light brown with black mottling; soft to firm; moist; (RESIDUUM)	3-4-4				
3.0						
4.0		4-4-5				
5.0						
6.0		7-7-7				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-61	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown with trace black mottling; soft to firm; moist; (RESIDUUM)					
2.0		2-4-4				
3.0						
4.0		4-5-5				
5.0						
6.0	Fat CLAY (CH) - brown, light brown, reddish brown with black mottling; firm; moist; (RESIDUUM)	6-7-9				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-62	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (1 inch)					
1.0	Lean CLAY (CL) - brown with trace black mottling; firm; moist; (RESIDUUM)					
2.0		5-5-6				
3.0						
4.0	Fat CLAY (CH) - brown, light brown with black mottling; firm; moist; (RESIDUUM)	6-7-7				
5.0						
6.0		7-7-8				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-63	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown with trace black mottling; firm to soft to firm; moist; (RESIDUUM)					
2.0		4-5-5				
3.0						
4.0		4-4-5				
5.0						
6.0		6-8-8				
7.0	Fat CLAY (CH) with trace sand - brown, light brown with black mottling; firm; moist; (RESIDUUM)					
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: HS-64	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: January 5, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Hand Shovel Refusal at 0.5 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-65	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Lean CLAY (CL) with trace weathered fragments - brown, dark brown; soft to firm; moist; (RESIDUUM)					
2.0		3-4-4				
3.0						
4.0		4-5-5				
5.0						
6.0		8-9-10				
7.0	Fat CLAY (CH) - brown; moist; (RESIDUUM)					
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-66	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 2, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
1.0	Topsoil (12 inches)					
2.0	Fat CLAY (CH) with weathered rock fragments - light brown, gray; moist; (RESIDUUM)					
3.0						
4.0	Observation Trench Refusal at 3.5 feet					
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: Rock ledge encountered at 8 inches below ground surface

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-67	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Fat CLAY (CH) - brown, reddish brown with trace black mottling; firm; moist; (RESIDUUM)					
2.0		6-7-8				
3.0						
4.0		8-8-8				
5.0						
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-68	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (1 inch)					
1.0	Lean CLAY (CL) - brown; moist; (RESIDUUM)					
2.0	Fat CLAY (CH) with sand at depth - brown, light brown, gray; firm to stiff; moist; (RESIDUUM)	6-7-7				
3.0						
4.0		7-7-8				
5.0						
6.0		8-9-11				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-69	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By: Charlie Capps**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		7-7-7 @ 1'				
2.0						
3.0		9-10-10 @ 3'				
4.0	Fat CLAY (CH) with trace sand - red-brown with black mottling; firm to stiff; moist; (RESIDUUM)					
5.0		11-12-12 @ 5'				
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-70	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Lean CLAY (CL) - brown; moist; (RESIDUUM)					
2.0		4-5-5				
3.0						
4.0		7-8-8				
5.0	Fat CLAY (CH) with trace sand at depth - brown, light brown, reddish brown with black mottling at depth; firm; moist; (RESIDUUM)					
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-71	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 1, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (1 inch)					
1.0	Lean CLAY (CL) - brown; moist; (RESIDUUM)					
2.0	Fat CLAY (CH) with sand - brown, light brown, reddish brown; moist; (RESIDUUM)					
3.0						
4.0						
5.0						
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-72	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0	Fat CLAY (CH) - light brown, brown with black mottling; moist; (RESIDUUM)					
6.0						
7.0						
8.0						
9.0	Observation Trench Termination at 8 feet					



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-73	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Lean CLAY (CL) - dark brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0	Fat CLAY (CH) - dark brown, gray; moist; (RESIDUUM)					
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: HS-74	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: January 5, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (2 inches)					
1.0	Hand Shovel Refusal at 0.2 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-75	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0	Observation Trench Refusal at 1 foot					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-76	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Observation Trench Refusal at 0.8 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: HS-77	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: January 5, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0	Hand Shovel Refusal at 1 foot					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-78	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (8 inches)					
1.0	Lean CLAY (CL) with weathered fragments - light brown; moist; (RESIDUUM)					
2.0						
3.0	Observation Trench Refusal at 2.5 feet					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-79	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (8 inches)					
1.0	Fat CLAY (CH) - light brown, gray with black mottling; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0	Observation Trench Refusal at 4.5 feet					
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-80	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil and trace weathered rock fragments (6 inches)					
1.0	Fat CLAY (CH) - brown with black mottling; moist; (RESIDUUM)					
2.0						
3.0						
4.0	Observation Trench Refusal at 4 feet					
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-81	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
1.0	Topsoil (18 inches)					
2.0	Lean CLAY (CL) with sand - brown with black mottling; stiff; moist; (RESIDUUM)					
3.0		8-9-9 @ 3'				
4.0						
5.0		11-12-12 @ 5'				
6.0	Fat CLAY (CH) with sand - red-tan-brown with black mottling; stiff; moist; (RESIDUUM)					
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-82	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
1.0	Topsoil (12 inches)					
2.0	Lean CLAY (CL) with sand - dark-brown; soft; moist; (RESIDUUM)	4-4-5 @ 1'				
3.0		5-6-6 @ 3'				
4.0						
5.0		8-8-8 @ 5'				
6.0	Lean CLAY (CL) with sand - brown with black mottling; firm; moist; (RESIDUUM)					
7.0						
8.0						
9.0	Observation Trench Termination at 8 feet					



Excavated test pit



Excavated material

Comments:

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-83	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		4-4-4 @ 1'				
2.0	Lean CLAY (CL) with sand - brown; soft; moist; (RESIDUUM)					
3.0		5-6-6 @ 3'				
4.0						
5.0		10-10-10 @ 5'				
6.0	Lean CLAY (CL) with sand - brown with black mottling; firm to stiff; moist; (RESIDUUM)					
7.0						
8.0						
	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-84	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		5-5-5 @ 1'				
2.0	Lean CLAY (CL) with sand - brown; firm; moist; (RESIDUUM)					
3.0		5-5-6 @ 3'				
4.0						
5.0		11-11-11 @ 5'				
6.0	Fat CLAY (CH) with sand - red-tan-brown with black mottling; stiff; moist; (RESIDUUM)					
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-85	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By: Charlie Capps**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with sand - dark-brown, brown; very-soft; moist; (RESIDUUM)	2-2-2 @ 1'				
2.0						
3.0		2-2-2 @ 3'				
4.0						
5.0	Observation Trench Refusal at 4.5 feet					
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-86	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (2 inches)					
1.0	Lean CLAY (CL) with sand - brown, gray, red-brown; very-soft; moist; (RESIDUUM)	1-2-2 @ 1'				
2.0						
3.0		1-1-1 @ 3'				
4.0						
5.0	Lean CLAY (CL) with sand - gray; very-soft; very-moist; (RESIDUUM)	2-2-2 @ 5'				
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-87	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		4-4-4 @ 1'				
2.0	Lean CLAY (CL) with sand - dark-brown; soft; moist; (RESIDUUM)					
3.0		5-5-6 @ 3'				
4.0	Lean CLAY (CL) with sand - brown, gray-brown, red with black mottling; firm to stiff; moist; (RESIDUUM)					
5.0		10-10-10 @ 5'				
6.0						
7.0	CLAYEY SAND - gray; moist; (RESIDUUM)					
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-88	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (8 inches)					
1.0	Lean CLAY (CL) with sand - brown, gray; soft; moist; (RESIDUUM)					
2.0		3-4-4				
3.0						
4.0		4-3-4				
5.0	Fat CLAY (CH) - light brown, brown with black mottling; soft to firm; moist; (RESIDUUM)					
6.0		5-5-5				
7.0						
8.0	Observation Trench Refusal at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-89	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0						
	Lean CLAY (CL) with trace weathered fragments, boulders - light brown; moist; (RESIDUUM)					
2.0						
3.0						
	Observation Trench Refusal at 3.5 feet					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-90	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0	Fat CLAY (CH) with weathered fragments - brown; moist; (RESIDUUM)					
	Observation Trench Refusal at 1.5 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-91	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Observation Trench Refusal at 0.5 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-92	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)					
2.0		4-5-5				
3.0						
4.0		5-5-5				
5.0	Fat CLAY (CH) - brown with black mottling; firm; moist; (RESIDUUM)					
6.0		7-8-9				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-93	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Fat CLAY (CH) with trace chert fragments - brown, light brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0						
	Observation Trench Refusal at 5.5 feet					
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: Rock ledge encountered at 3.5 feet below ground surface.

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-94	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Observation Trench Refusal at 0.3 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: HS-95	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: January 5, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Hand Shovel Refusal at 0.5 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-96	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0	Observation Trench Refusal at 1 foot					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-97	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (2 inches)					
1.0	Lean CLAY (CL) - dark brown, dark gray; soft; moist; (RESIDUUM)					
2.0		4-4-4				
3.0	Fat CLAY (CH) - dark brown, brown, dark gray; firm to soft; moist; (RESIDUUM)					
4.0		4-6-5				
5.0						
6.0		4-4-4				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-98	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0						
	Fat CLAY (CH) with weathered fragments - brown; moist; (RESIDUUM)					
2.0						
	Observation Trench Refusal at 2 feet					
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-99	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil and weathered rock fragments (10 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments and boudlers - brown, light brown with black mottling; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0	Observation Trench Termination at 7 feet					
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-100	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)					
2.0		7-7-9				
3.0	Fat CLAY (CH) with sand at depth - light brown, brown, gray with black mottling; firm to stiff; moist; (RESIDUUM)					
4.0		6-8-10				
5.0						
6.0		12-13-15				
7.0	Observation Trench Termination at 7 feet					
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-101	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		4-4-5 @ 1'				
2.0	Lean CLAY (CL) with sand - dark-brown; soft to firm; moist; (RESIDUUM)					
3.0		5-5-5 @ 3'				
4.0						
5.0		6-6-7 @ 5'				
6.0	Lean CLAY (CL) with sand - brown, tan-brown; firm; moist; (RESIDUUM)					
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-102	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown with black mottling; firm; moist; (RESIDUUM)					
2.0		6-8-9				
3.0	Fat CLAY (CH) with trace sand - light brown, brown, gray with black mottling; firm to stiff; moist; (RESIDUUM)					
4.0		5-7-7				
5.0						
6.0		9-11-12				
7.0						
8.0	Observation Trench Termination at 7.5 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-103	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with sand - tan-red-brown with black mottling; firm; moist; (RESIDUUM)	8-8-8 @ 1'				
2.0						
3.0						
4.0	Observation Trench Refusal at 3.5 feet					
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-104	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		4-4-5 @ 1'				
2.0	Lean CLAY (CL) with sand - dark-brown; soft; moist; (RESIDUUM)					
3.0	Lean CLAY (CL) with sand - brown; soft; moist; (RESIDUUM)	4-4-5 @ 3'				
4.0						
5.0		10-11-11 @ 5'				
6.0	Fat CLAY (CH) with sand - brown, gray with black mottling; stiff; moist; (RESIDUUM)					
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-105	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By: Charlie Capps**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with sand - brown; firm; moist; (RESIDUUM)	8-8-8 @ 1'				
2.0						
3.0	Fat CLAY (CH) with trace sand - brown, gray with black mottling; stiff; moist; (RESIDUUM)	9-9-9 @ 3'				
4.0						
5.0						
6.0	Observation Trench Refusal at 5.5 feet					
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: _____

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-106	GEOServices Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		2-3-3 @ 1'				
2.0	Lean CLAY (CL) with sand - dark-brown; soft to firm; moist; (RESIDUUM)					
3.0		7-7-7 @ 3'				
4.0						
5.0	Lean CLAY (CL) with sand, chert fragments - dark-brown; stiff; moist; (RESIDUUM)	9-9-9 @ 5'				
6.0						
7.0	Observation Trench Refusal at 6.5 feet					
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-107	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Fat CLAY (CH) - brown, orangish brown with black mottling; firm to stiff; moist; (RESIDUUM)					
2.0		6-6-7				
3.0						
4.0		10-11-12				
5.0						
6.0						
7.0	Observation Trench Termination at 7 feet					
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-108	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Lean CLAY (CL) - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0	Fat CLAY (CH) with siltstone at depth - brown, orangish brown, gray with black mottling; moist; (RESIDUUM)					
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-109	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Lean CLAY (CL) - brown, reddish brown; soft to firm; moist; (RESIDUUM)					
2.0		3-3-5				
3.0						
4.0		5-5-7				
5.0	Fat CLAY (CH) - brown with black mottling; firm; moist; (RESIDUUM)					
6.0		6-7-8				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-110	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Lean CLAY (CL) - brown, reddish brown; soft to firm; moist; (RESIDUUM)					
2.0		3-4-5				
3.0						
4.0		5-7-7				
5.0	Fat CLAY (CH) - brown, reddish brown with black mottling; moist; (RESIDUUM)					
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-111	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown, dark brown; very soft; moist; (RESIDUUM)					
2.0		2-2-3				
3.0						
4.0	Fat CLAY (CH) - brown, orangish brown with black mottling; firm to stiff; moist; (RESIDUUM)	6-8-8				
5.0						
6.0		8-9-10				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-112	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0						
	Fat CLAY (CH) with weathered fragments at depth - brown; moist; (RESIDUUM)					
2.0						
3.0	Observation Trench Refusal at 1.5 feet					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-113	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) - brown; moist; (RESIDUUM)					
	Observation Trench Refusal at 1 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-114	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) - brown; moist; (RESIDUUM)					
	Observation Trench Refusal at 1 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: Rock ledge encountered at 6 inches below ground surface.

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-115	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with weathered rock fragments - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0	Observation Trench Refusal at 3.5 feet					
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-116	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Lean CLAY (CL) - brown with black mottling; soft; moist; (RESIDUUM)					
2.0		3-3-3				
3.0						
4.0	Fat CLAY (CH) - brown, light brown; firm; moist; (RESIDUUM)	4-4-6				
5.0						
6.0		6-7-8				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-117	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)					
2.0		5-5-4				
3.0	Fat CLAY (CH) with sand at depth - light brown, brown, gray with black mottling; firm to stiff; moist; (RESIDUUM)					
4.0		7-7-9				
5.0						
6.0		8-10-10				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-118	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (2 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)					
2.0		4-5-5				
3.0						
4.0		8-9-8				
5.0	Fat CLAY (CH) - light brown, brown with black mottling; firm; moist; (RESIDUUM)					
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-119	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		4-4-5 @ 1'				
2.0	Lean CLAY (CL) with sand - dark brown; soft; moist; (RESIDUUM)					
3.0	Lean CLAY (CL) with sand, chert fragments - dark brown; firm; moist; (RESIDUUM)	5-5-5 @ 3'				
4.0	Observation Trench Refusal at 3.5 feet					
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-120	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		5-5-5 @ 1'				
2.0	Lean CLAY (CL) with sand - dark-brown; firm; moist; (RESIDUUM)					
3.0		4-4-4 @ 3'				
4.0	Lean CLAY (CL) with sand, chert fragments - dark-brown; soft; moist; (RESIDUUM)					
5.0	Observation Trench Refusal at 4.5 feet					
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-121	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		4-4-5 @ 1'				
2.0	Lean CLAY (CL) with sand - brown, dark brown; soft to firm; moist; (RESIDUUM)					
3.0		5-7-7 @ 3'				
	Observation Trench Refusal at 3.5 feet					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-122	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Lean CLAY (CL) - brown, orangish brown; stiff; moist; (RESIDUUM)					
2.0		9-9-9				
3.0						
4.0	Fat CLAY (CH) with trace sand - light brown, orangish brown with black mottling; stiff; moist; (RESIDUUM)	8-10-10				
5.0						
6.0		9-11-11				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-123	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) with chert fragments at depth - brown, orangish brown, gray at depth with black mottling; firm to stiff; moist; (RESIDUUM)					
2.0		6-6-7				
3.0						
4.0		10-11-12				
5.0						
6.0						
7.0						
8.0	Observation Trench Refusal at 7.5 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-124	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) - brown with black mottling; firm; moist; (RESIDUUM)					
2.0		6-7-8				
3.0						
4.0	Fat CLAY (CH) - brown, reddish brown; firm to stiff; moist; (RESIDUUM)	8-8-10				
5.0						
6.0		10-11-12				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-125	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown; soft to firm; moist; (RESIDUUM)					
2.0		3-4-4				
3.0						
4.0		4-5-5				
5.0						
6.0						
7.0	Fat CLAY (CH) - brown, light brown; moist; (RESIDUUM)					
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-126	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)					
2.0		4-6-6				
3.0						
4.0		6-8-9				
5.0	Fat CLAY (CH) - brown, orangish brown, gray with black mottling; firm; moist; (RESIDUUM)					
6.0		8-8-9				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-127	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: December 3, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (8 inches)					
1.0	Lean CLAY (CL) with sand and trace sandstone - brown, reddish brown; firm; moist; (RESIDUUM)					
2.0		8-8-9				
3.0						
4.0		8-8-8				
5.0						
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-128	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Fat CLAY (CH) with siltstone at depth - brown, light brown with black mottling; firm to stiff; moist; (RESIDUUM)					
2.0		6-7-8				
3.0						
4.0		7-8-9				
5.0						
6.0		9-10-10				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-129	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Lean CLAY (CL) - brown with black mottling; firm; moist; (RESIDUUM)					
2.0		6-7-6				
3.0						
4.0	Fat CLAY (CH) - brown, light brown with black mottling; firm to stiff; moist; (RESIDUUM)	7-8-8				
5.0						
6.0		10-11-11				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-130	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments, boulders - brown, gray with black mottling; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0	Observation Trench Refusal at 5 feet					
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-131	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 3, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)					
2.0		4-5-6				
3.0						
4.0	Fat CLAY (CH) - brown, light brown; stiff; moist; (RESIDUUM)	7-9-9				
5.0						
6.0		9-9-10				
7.0	Observation Trench Refusal at 7 feet					
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-132	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Observation Trench Refusal at 0.5 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-133	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) - brown; moist; (RESIDUUM)					
2.0	Observation Trench Refusal at 1 foot					
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-134	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: December 7, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown, orangish brown; firm; moist; (RESIDUUM)					
2.0		5-6-6				
3.0						
4.0						
5.0	Fat CLAY (CH) - orangish brown, light brown with black mottling; moist; (RESIDUUM)					
6.0						
7.0						
8.0						
	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-135	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) - brown; moist; (RESIDUUM)					
	Observation Trench Refusal at 1 foot					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-136	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)					
2.0		4-5-6				
3.0						
4.0		6-5-6				
5.0	Fat CLAY (CH) - orangish brown, light brown with black mottling; firm to stiff; moist; (RESIDUUM)					
6.0		8-10-11				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-137	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown, orangish brown; firm; moist; (RESIDUUM)					
2.0		4-5-5				
3.0						
4.0	Fat CLAY (CH) - orangish brown, light brown with black mottling; firm; moist; (RESIDUUM)	6-6-7				
5.0						
6.0		8-8-8				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-138	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) - brown with black mottling; firm to stiff; moist; (RESIDUUM)					
2.0		8-9-8				
3.0						
4.0		7-8-9				
5.0						
6.0		9-9-9				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-139	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		5-5-6 @ 1'				
2.0	Lean CLAY (CL) with trace sand, chert fragments - brown; firm; moist; (RESIDUUM)					
3.0	Observation Trench Refusal at 3 feet					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Proposed Development at Bear Creek Pike Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-140	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211		
Date Excavated: December 6, 2021	**Observed By: Charlie Capps**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		5-6-6 @ 1'				
2.0	Lean CLAY (CL) with sand - brown; firm; moist; (RESIDUUM)					
3.0		6-7-8 @ 3'				
4.0						
5.0		10-10-10 @ 5'				
6.0	Fat CLAY (CH) with sand, chert fragments - light-brown with black mottling; stiff; moist; (RESIDUUM)					
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-141	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Lean CLAY (CL) - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0	Fat CLAY (CH) - orangish brown, light brown with black mottling; moist; (RESIDUUM)					
6.0						
7.0						
8.0						
	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-142	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - orangish brown; firm; moist; (RESIDUUM)					
2.0		5-5-5				
3.0						
4.0	Fat CLAY (CH) - orangish brown, light brown with black mottling; firm; moist; (RESIDUUM)	6-6-8				
5.0						
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-143	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Lean CLAY (CL) - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0						
6.0	Fat CLAY (CH) with trace sand at depth - orangish brown, light brown with black mottling; moist; (RESIDUUM)					
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-144	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) - light brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0	Observation Trench Refusal at 7.5 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-145	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
	Fat CLAY (CH) - brown; moist; (RESIDUUM)					
1.0	Observation Trench Refusal at 1 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: Rock ledge encountered at 6 inches below ground surface.

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-146	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments - brown; moist; (RESIDUUM)					
2.0						
3.0	Observation Trench Refusal at 2.5 feet					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-147	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with trace weathered rock fragments at depth - light brown, gray; firm to stiff; moist; (RESIDUUM)					
2.0		8-8-8				
3.0						
4.0		8-9-9				
5.0						
6.0		10-11-12				
7.0						
8.0	Observation Trench Termination at 7.5 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-148	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (2 inches)					
1.0	Fat CLAY (CH) - brown with black mottling; firm to stiff; moist; (RESIDUUM)					
2.0		5-6-7				
3.0						
4.0		7-7-7				
5.0						
6.0		8-10-10				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-149	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with siltstone and trace sand - orangish brown with black mottling; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-150	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 9, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) - brown; soft; moist; (RESIDUUM)					
2.0		3-3-3				
3.0						
4.0		4-4-5				
5.0						
6.0	Fat CLAY (CH) - brown, gray; firm; moist; (RESIDUUM)	5-5-5				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-151	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 9, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) - brown; soft; moist; (RESIDUUM)					
2.0		3-4-4				
3.0						
4.0		4-5-5				
5.0	Fat CLAY (CH) - brown, gray; firm; moist; (RESIDUUM)					
6.0						
7.0						
8.0	Observation Trench Termination at 7.5 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-152	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 9, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) - brown, dark brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0	Observation Trench Refusal at 4.5 feet					
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: Water at bedrock surface

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-153	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0	Observation Trench Refusal at 3.5 feet					
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: Rock ledge encountered at 1 foot below ground surface.

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-154	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: December 8, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments - brown; moist; (RESIDUUM)					
2.0		3-3-3				
3.0						
4.0						
5.0						
6.0						
7.0						
8.0	Observation Trench Refusal at 7.5 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-155	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 7, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) - brown; soft; moist; (RESIDUUM)					
2.0		4-4-5				
3.0						
4.0	Fat CLAY (CH) - reddish brown, brown with black mottling; firm to stiff; moist; (RESIDUUM)	5-5-6				
5.0						
6.0		7-9-9				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-156	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 9, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Fat CLAY (CH) - brown with black mottling; firm to stiff; moist; (RESIDUUM)					
2.0		5-5-7				
3.0						
4.0		8-10-11				
5.0						
6.0		10-11-11				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-157	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 9, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0	Observation Trench Refusal at 7 feet					
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-158	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 9, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil with weathered rock fragments, boulders (6 inches)					
1.0	Observation Trench Refusal at 0.5 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-159	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 9, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) with trace weathered rock fragments - brown, orangish brown, light brown; firm to stiff; moist; (RESIDUUM)					
2.0		7-7-9				
3.0						
4.0		9-10-11				
5.0						
6.0						
7.0	Observation Trench Refusal at 7 feet					
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-160	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 9, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments, boulders, siltstone at depth - brown, gray; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-161	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments, boulders - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0	Observation Trench Refusal at 5 feet					
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: Rock ledge encountered at 3 feet below ground surface.

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-162	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments - brown; moist; (RESIDUUM)					
2.0	Observation Trench Refusal at 2 feet					
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-163	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments, boulders - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0	Observation Trench Refusal at 3.5 feet					
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-164	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 9, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0						
	Lean CLAY (CL) with boulders - dark brown; moist; (RESIDUUM)					
2.0						
	Observation Trench Refusal at 2.5 feet					
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: Water at bedrock surface

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-165	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 9, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0	Observation Trench Refusal at 4.5 feet					
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: Rock ledge encountered at 3.5 feet below ground surface.

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-166	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) - brown; stiff; moist; (RESIDUUM)					
2.0		9-9-10				
3.0						
4.0		8-10-10				
5.0						
6.0						
7.0	Observation Trench Refusal at 7 feet					
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-167	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments, boulders - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0						
5.0	Observation Trench Refusal at 5 feet					
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-168	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with trace weathered rock fragments - brown; moist; (RESIDUUM)					
2.0						
3.0	Observation Trench Refusal at 3 feet					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-169	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0	Observation Trench Refusal at 3.5 feet					
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-170	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	Lean CLAY (CL) - brown; soft; moist; (RESIDUUM)					
2.0		2-3-3				
3.0	Fat CLAY (CH) with trace weathered rock fragments - brown; firm; moist; (RESIDUUM)					
4.0		4-5-5				
5.0						
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: Rock ledge encountered at 3.5 feet below ground surface.

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-171	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Fat CLAY (CH) - brown; firm to stiff; moist; (RESIDUUM)					
2.0		5-6-7				
3.0						
4.0		8-9-9				
5.0						
6.0	Observation Trench Refusal at 5.5 feet					
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: Rock ledge encountered at 4 feet below ground surface.

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-172	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 9, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil with weathered rock fragments, boulders (10 inches)					
1.0	Observation Trench Refusal at 0.8 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-173	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 9, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)					
2.0		3-5-6				
3.0						
4.0		5-6-7				
5.0						
6.0	Fat CLAY (CH) - brown; firm; moist; (RESIDUUM)	8-8-9				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-174	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 9, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0						
	Lean CLAY (CL) - dark brown; moist; (RESIDUUM)					
2.0						
3.0	Observation Trench Refusal at 3 feet					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: Water at bedrock surface

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-175	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 9, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0	Lean CLAY (CL) - dark brown; moist; (RESIDUUM)					
2.0	Observation Trench Refusal at 1.5 feet					
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: Water at bedrock surface

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-176	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)					
2.0		4-5-5				
3.0						
4.0		6-7-6				
5.0	Fat CLAY (CH) with weathered rock fragments at depth - light brown, brown; firm; moist; (RESIDUUM)					
6.0		8-8-10				
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: Rock ledge encountered at 6 feet below ground surface.

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-177	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments - brown; moist; (RESIDUUM)					
2.0						
3.0	Observation Trench Refusal at 2.5 feet					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-178	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: December 8, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with weathered rock fragments - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0	Observation Trench Refusal at 3.5 feet					
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-179	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (2 inches)					
1.0	Lean CLAY (CL) - dark brown, dark gray with black mottling; firm; moist; (RESIDUUM)					
2.0		6-6-5				
3.0						
4.0		7-8-9				
5.0	Fat CLAY (CH) - dark brown, brown, dark gray; moist; (RESIDUUM)					
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-180	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: November 29, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with chert fragments, small rock fragments at depth, trace siltstone at depth - brown; very soft; wet; (RESIDUUM)					
2.0		2-2-3				
3.0						
4.0	Observation Trench Refusal at 3.5 feet					
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: HS-181	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: January 5, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Lean CLAY (CL) with weathered rock fragments - brown; moist; (RESIDUUM)					
2.0	Hand Shovel Refusal at 1.5 feet					
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: HS-182	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: January 5, 2021	**Observed By:** Jacob Barber	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	Hand Shovel Refusal at 0.8 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: HS-183	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: January 5, 2021	**Observed By: Jacob Barber**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (3 inches)					
1.0	Lean CLAY (CL) - brown, dark brown; moist; (RESIDUUM)					
2.0	Hand Shovel Termination at 1.5 feet					
3.0	Probe Rod through soil					
4.0						
5.0	Hand Shovel/Probe Rod Termination at 4.5 feet					
6.0						
7.0						
8.0						
9.0						

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-184	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: March 4, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) - brown; firm to stiff; moist; (RESIDUUM)	7-7-7				
2.0						
3.0		8-9-9				
4.0						
5.0		8-9-9				
6.0						
7.0	Fat CLAY (CH) - brown with black oxide nodules; moist; (RESIDUUM)					
8.0						
9.0	Observation Trench Termination at 8.5 feet					



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-185	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: March 4, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) - dark brown, brown; moist; (RESIDUUM)					
	Observation Trench Refusal at 1.5 feet					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-186	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: March 4, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)	7-8-8				
2.0						
3.0		8-8-8				
4.0						
5.0		10-10-10				
6.0	Fat CLAY (CH) with chert fragments - brown with black oxide nodules; stiff; moist; (RESIDUUM)					
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-187	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: March 4, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) - brown; firm; moist; (RESIDUUM)	5-6-7				
2.0						
3.0		8-8-9				
4.0						
5.0	Fat CLAY (CH) with chert fragments - brown with black oxide nodules; firm to stiff; moist; (RESIDUUM)	10-10-10				
6.0						
7.0						
8.0	Observation Trench Termination at 8 feet					
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-188	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: March 4, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with trace sand - brown; firm; moist; (RESIDUUM)	5-6-6				
2.0						
3.0	Lean CLAY (CL) with trace sand and chert fragments - brown; stiff; moist; (RESIDUUM)	8-9-9				
4.0						
5.0		10-11-11				
6.0						
7.0	Fat CLAY (CH) with chert fragments - brown with black oxide nodules; moist; (RESIDUUM)					
8.0						
9.0	Observation Trench Termination at 8.5 feet					



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-189	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: March 4, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) trace sand, rock fragments - yellowish brown; firm; moist; (RESIDUUM)	7-7-8				
2.0						
3.0		8-8-9				
4.0	Observation Trench Refusal at 4 feet					
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments: _____

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-190	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: March 4, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) trace sand, rock fragments - dark brown; moist; (RESIDUUM)					
	Observation Trench Refusal at 1 foot					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-191	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: March 4, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) trace sand, rock fragments - dark brown; soft to firm; moist; (RESIDUUM)	4-4-5				
2.0						
3.0	Observation Trench Refusal at 3 feet	7-8-8				
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-192	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: March 4, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) rock fragments - brown; moist; (RESIDUUM)					
	Observation Trench Refusal at 1 foot					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-193	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: March 4, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) rock fragments - brown; moist; (RESIDUUM)					
	Observation Trench Refusal at 1 foot					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

Bear Creek Property Columbia, Tennessee	TEST PIT OBSERVATION RECORD Test Pit No.: OT-194	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
Date Excavated: March 4, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) trace sand, rock fragments - yellowish brown; moist; (RESIDUUM)					
2.0						
3.0	Observation Trench Refusal at 2.5 feet					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						



Excavated test pit



Excavated material

Comments:

GEOServices, LLC, Geotechnical and Materials Engineers

APPENDIX B

SOIL DATA SUMMARY							
Bear Creek Property							
GEOServices Project No. 31-211695							
December 13, 2021							
Observation Trench Number	Sample Number	Depth (feet)	Natural Moisture Content	Atterberg Limits			Soil Type
				LL	PL	PI	
2	1	2	21.2%	28	19	9	CL
	2	4	28.6%				
	3	6	28.1%				
3	1	2	37.1%				
	2	4	32.6%				
4	1	2	32.1%				
	2	4	33.2%				
	3	6	33.7%				
6	1	2	31.6%				
	2	4	26.6%	55	29	26	CH
7	1	2	26.0%				
	2	4	27.9%				
	3	6	28.9%				
8	1	2	23.9%				
	2	4	24.5%				
	3	6	28.7%				
9	1	2	22.9%				
	2	4	25.3%				
	3	6	26.2%				
10	1	2	32.2%				
11	1	2	25.6%				
	2	4	27.9%				
	3	6	27.4%				
12	1	2	24.8%				
	2	4	23.9%				
14	1	2	24.1%				
15	1	2	22.9%				
	2	4	20.7%				
19	1	2	23.2%				
	2	4	24.9%				
	3	6	31.0%				

SOIL DATA SUMMARY							
Bear Creek Property							
GEOServices Project No. 31-211695							
December 13, 2021							
Observation Trench Number	Sample Number	Depth (feet)	Natural Moisture Content	Atterberg Limits			Soil Type
				LL	PL	PI	
23	1	2	22.6%				
	2	4	21.7%				
	3	6	23.0%				
26	1	2	29.1%				
27	1	2	22.1%				
	2	4	20.6%				
28	1	2	20.5%				
	2	4	20.7%				
	3	6	31.0%				
32	1	2	23.7%				
	2	4	24.6%				
	3	6	31.8%				
33	1	2	20.8%				
	2	4	17.8%				
34	1	2	20.4%				
	2	4	21.1%				
	3	6	24.3%				
36	1	2	23.7%				
	2	4	22.0%				
	3	6	18.9%				
37	1	2	21.3%				
	2	4	18.2%				
	3	6	18.3%				
38	1	2	26.7%				
	2	4	32.0%				
39	1	2	22.3%				
	2	4	24.7%				
	3	6	25.5%				
41	1	2	20.6%				
	2	4	26.3%				
	3	6	29.7%				

SOIL DATA SUMMARY							
Bear Creek Property							
GEOServices Project No. 31-211695							
December 13, 2021							
Observation Trench Number	Sample Number	Depth (feet)	Natural Moisture Content	Atterberg Limits			Soil Type
				LL	PL	PI	
42	1	2	21.4%				
	2	4	26.2%	47	26	21	CL
	3	6	26.9%				
43	1	2	21.9%				
	2	4	24.5%				
	3	6	27.7%				
44	1	2	25.7%				
	2	4	27.9%				
	3	6	29.9%				
45	1	2	23.7%				
	2	4	25.3%				
46	1	2	21.7%				
	2	4	26.9%				
48	1	2	25.3%				
	2	4	26.0%				
	3	6	26.0%				
49	1	2	23.7%				
	2	4	25.9%				
	3	6	29.8%				
51	1	2	20.1%				
	2	4	21.6%				
	3	6	23.0%				
52	1	2	25.4%				
	2	4	30.0%				
	3	6	32.4%				
53	1	2	25.4%				
	2	4	26.8%				
	3	6	27.9%				
57	1	2	26.7%				
58	1	2	23.5%				
	2	4	25.8%				
	3	6	28.1%				

SOIL DATA SUMMARY							
Bear Creek Property							
GEOServices Project No. 31-211695							
December 13, 2021							
Observation Trench Number	Sample Number	Depth (feet)	Natural Moisture Content	Atterberg Limits			Soil Type
				LL	PL	PI	
60	1	2	28.4%				
	2	4	30.2%				
	3	6	33.1%				
63	1	2	26.9%				
	2	4	27.5%				
	3	6	29.8%				
65	1	2	27.9%				
	2	4	26.7%				
	3	6	28.0%				
67	1	2	21.3%				
	2	4	22.8%				
	3	6	22.9%				
68	1	2	22.5%				
	2	4	25.1%				
	3	6	27.0%				
69	1	2	18.9%				
	2	4	20.1%				
	3	6	22.3%				
71	1	2	25.7%				
	2	4	26.9%				
	3	6	30.6%				
72	1	2	26.4%				
	2	4	27.4%				
	3	6	26.7%				
79	1	2	28.9%				
	2	4	33.2%				
80	1	2	32.1%				
81	2	3	19.3%				
	3	5	20.7%				
82	1	1	25.5%				
	2	3	27.9%				
	3	5	28.9%				

SOIL DATA SUMMARY							
Bear Creek Property							
GEOServices Project No. 31-211695							
December 13, 2021							
Observation Trench Number	Sample Number	Depth (feet)	Natural Moisture Content	Atterberg Limits			Soil Type
				LL	PL	PI	
84	1	1	24.3%				
	2	3	28.9%				
	3	5	31.2%	57	33	24	MH
86	1	1	27.9%				
	2	3	31.4%				
	3	5	35.5%				
88	1	1	23.7%				
	2	3	25.7%				
	3	5	24.9%				
92	1	1	15.2%				
	2	3	22.5%				
	3	5	24.6%				
99	1	2	25.7%				
	2	4	31.0%				
100	1	2	20.9%				
	2	4	21.3%				
	3	6	22.0%				
101	1	2	21.3%				
	2	4	23.9%				
	3	6	24.7%				
102	1	2	23.0%				
	2	4	22.9%				
	3	6	24.2%				
104	1	1	23.9%				
	2	3	25.6%				
	3	5	26.0%				
105	1	1	30.0%				
	2	3	31.8%				
106	1	1	29.9%				
	2	3	28.7%				
	3	5	30.5%				
107	1	2	31.2%				
	2	4	32.6%				

SOIL DATA SUMMARY							
Bear Creek Property							
GEOServices Project No. 31-211695							
December 13, 2021							
Observation Trench Number	Sample Number	Depth (feet)	Natural Moisture Content	Atterberg Limits			Soil Type
				LL	PL	PI	
108	1	2	24.9%				
	2	4	28.6%				
	3	6	31.6%				
109	1	2	27.1%				
	2	4	28.9%				
	3	6	30.0%				
110	1	2	28.1%				
	2	4	28.9%				
	3	6	31.6%				
111	1	2	23.5%				
	2	4	25.2%				
	3	6	26.2%				
116	1	2	21.6%				
	2	4	21.1%				
	3	6	26.1%				
117	1	2	21.3%				
	2	4	23.0%				
	3	6	24.9%				
118	1	2	23.7%				
	2	4	24.6%				
119	1	1	26.9%				
	2	3	29.0%				
120	1	1	22.3%				
	2	3	24.9%				
121	1	1	23.7%				
122	1	2	22.8%				
	2	4	23.4%				
	3	6	25.0%				
123	1	2	24.7%				
	2	4	26.9%				
	3	6	32.4%				

SOIL DATA SUMMARY							
Bear Creek Property							
GEOServices Project No. 31-211695							
December 13, 2021							
Observation Trench Number	Sample Number	Depth (feet)	Natural Moisture Content	Atterberg Limits			Soil Type
				LL	PL	PI	
124	1	2	23.4%				
	2	4	22.1%				
	3	6	24.1%				
125	1	2	23.7%				
	2	4	23.1%				
126	1	2	29.1%				
	2	4	27.6%				
	3	6	30.6%				
127	1	2	20.5%				
	2	4	24.9%				
	3	6	25.6%				
128	1	2	32.5%				
	2	4	32.5%				
	3	6	32.8%				
129	1	2	21.4%				
	2	4	21.3%				
	3	6	26.3%				
130	1	2	26.3%				
134	1	2	28.7%				
	2	4	31.3%				
	3	6	32.9%				
136	1	2	29.8%				
	2	4	31.2%				
	3	6	32.1%				
137	1	2	30.0%				
	2	4	31.8%				
	3	6	30.9%				
138	1	2	18.2%				
	2	4	21.2%				
	3	6	23.1%				
140	1	1	21.4%				
	2	3	23.0%				

SOIL DATA SUMMARY							
Bear Creek Property							
GEOServices Project No. 31-211695							
December 13, 2021							
Observation Trench Number	Sample Number	Depth (feet)	Natural Moisture Content	Atterberg Limits			Soil Type
				LL	PL	PI	
141	1	2	22.7%				
	2	4	24.8%				
	3	6	31.4%				
142	1	2	33.5%				
	2	4	28.1%				
	3	6	28.2%				
143	1	2	43.7%				
	2	4	33.4%				
	3	6	32.9%	49	29	20	ML
144	1	2	32.4%				
	2	4	33.5%				
	3	6	31.4%				
146	1	2	37.6%				
147	1	2	24.5%				
	2	4	22.8%				
148	1	2	22.1%				
	2	4	21.1%				
	3	6	23.2.%				
149	1	2	35.4%				
	2	4	38.7%				
	3	6	39.8%				
150	1	2	21.1%				
	2	4	20.0%				
	3	6	19.9%				
151	2	4	25.1%				
154	1	2	32.4%				
	2	4	30.7%				
155	1	2	22.4%				
	2	4	23.3%				
	3	6	25.9%				

SOIL DATA SUMMARY							
Bear Creek Property							
GEOServices Project No. 31-211695							
December 13, 2021							
Observation Trench Number	Sample Number	Depth (feet)	Natural Moisture Content	Atterberg Limits			Soil Type
				LL	PL	PI	
156	1	2	20.4%				
	2	4	18.3%				
	3	6	20.7%				
157	1	2	22.4%				
	2	4	23.3%				
	3	6	25.9%				
159	1	2	27.2%				
	2	4	33.2%				
160	1	2	20.8%				
	2	4	22.5%				
161	1	2	39.3%				
165	1	2	31.9%				
	2	4	35.9%				
166	1	2	35.0%				
	2	4	31.5%				
167	1	2	32.0%				
169	1	2	26.0%				
170	1	2	22.8%				
	2	4	23.5%				
171	1	2	38.9%				
	2	4	38.6%				
173	1	2	21.0%				
	2	4	21.6%				
	3	6	23.5%				
176	1	2	18.8%				
	2	4	21.2%				
	3	6	22.0%				
177	1	2	29.0%				
178	1	2	30.9%				

GEOServices, LLC, Geotechnical and Materials Engineers

APPENDIX C

N



Photo: 6



Photo: 5



Photo: 1



Photo: 2



Photo: 3



Photo: 4



Notes:

1) Site Source Provided by: Client
2) Aerial Provided by: Google Earth Pro, (11/25/2019)

Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

Representative Photos
Proposed Bear Creek Property
Bear Creek Pike to Iron Bridge Road
Columbia, Tennessee

DATE: 12/20/2021

GEOS Project No. 31-211695

FIGURE: 5

N



Photo: 12



Photo: 11



Photo: 7



Photo: 8



Photo: 9



Photo: 10



Notes:

1) Site Source Provided by: Client
2) Aerial Provided by: Google Earth Pro, (11/25/2019)

Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

Representative Photos
Proposed Bear Creek Property
Bear Creek Pike to Iron Bridge Road
Columbia, Tennessee

DATE: 12/20/2021

GEOS Project No. 31-211695

FIGURE: 6

N















Notes:

1) Site Source Provided by: Client
2) Aerial Provided by: Google Earth Pro, (11/25/2019)

Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

Representative Photos
Proposed Bear Creek Property
Bear Creek Pike to Iron Bridge Road
Columbia, Tennessee

DATE: 12/20/2021

GEOS Project No. 31-211695

FIGURE: 7

N



Photo: 24



Photo: 23



Photo: 19



Photo: 20



Photo: 21



Photo: 22



Notes:

1) Site Source Provided by: Client
2) Aerial Provided by: Google Earth Pro, (11/25/2021)

Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

Representative Photos
Proposed Bear Creek Property
Bear Creek Pike to Iron Bridge Road
Columbia, Tennessee

DATE: 12/20/2021
GEOS Project No. 31-211695
FIGURE: 8

N



Photo: 25



Photo: 26



Notes:

1) Site Source Provided by: Client
2) Aerial Provided by: Google Earth Pro, (11/25/2019)

Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

Representative Photos
Proposed Bear Creek Property
Bear Creek Pike to Iron Bridge Road
Columbia, Tennessee

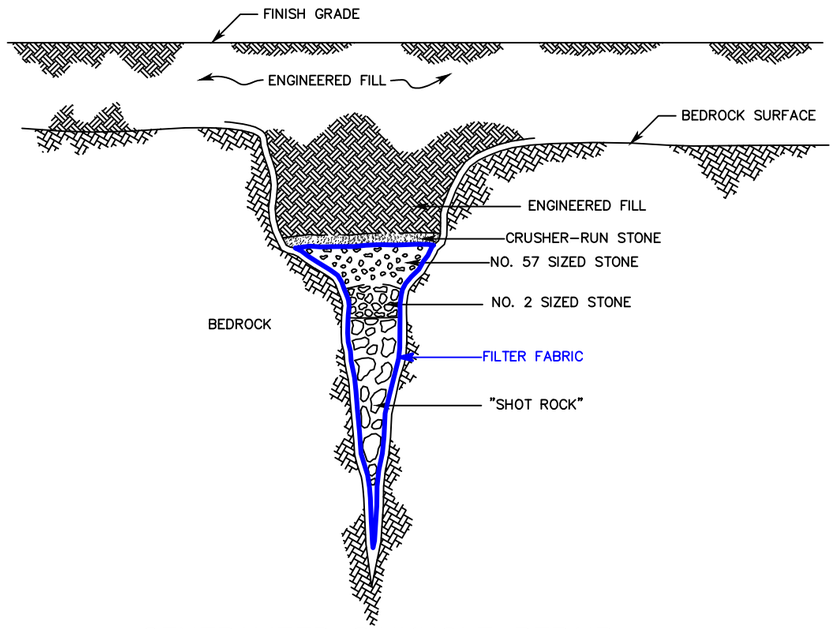
DATE: 12/20/2021

GEOS Project No. 31-211695

FIGURE: 9

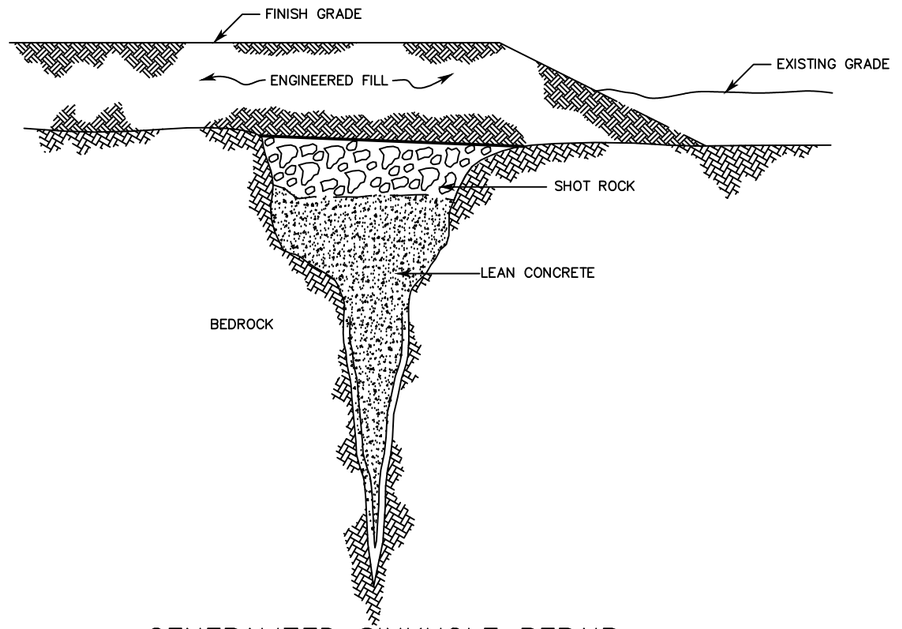
GEOServices, LLC, Geotechnical and Materials Engineers

APPENDIX D



GENERALIZED SINKHOLE REPAIR

FOR USE IN NON–BUILDING AREAS



GENERALIZED SINKHOLE REPAIR

FOR USE IN BUILDING AREAS

ACTUAL DIMENSIONS OF EXCAVATION AND VOLUMES
OF BACKFILL MATERIAL WILL BE BASED ON THE GEOTECHNICAL
ENGINEERS FIELD OBSERVATIONS DURING THE REPAIR

Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

Typical Sinkhole Repair Detail
Proposed Bear Creek Property
Bear Creek Pike to Iron Bridge Road
Columbia, Tennessee

DATE:
12/20/2021

GEOS Project No.
31-211695

FIGURE:
10

GEOS Universal Engineering Sciences
Geotechnical, Environmental and Materials Engineers

March 8, 2022

HK Big Bear Bluffs LLC
14025 Riveredge Drive, Suite 175
Tampa, FL 33637

Attention: Mr. James Harvey
jgibbs@kolter.com

Subject: **REPORT OF GEOTECHNICAL EXPLORATION SERVICES**
Proposed Bear Creek Property
Bear Creek Pike to Iron Bridge Road
Columbia, Tennessee
GEOServices Project No. 31-211695

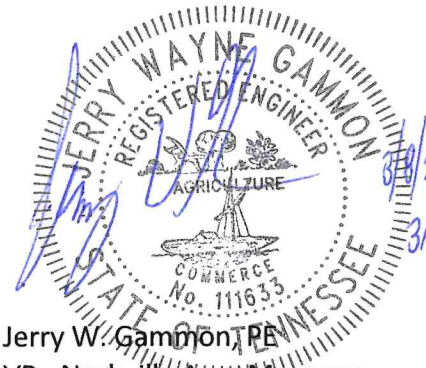
Dear Mr. Harvey:

We are submitting the results of the geotechnical exploration performed for the proposed Bear Creek Property development in Columbia, Tennessee. The geotechnical exploration was performed in accordance with GEOServices Proposal No. 13-211952 dated October 14, 2021 and authorized by you on November 5, 2020.

The following report presents our findings and recommendations for the proposed development. Should you have any questions regarding this report, or if we can be of any further assistance, please contact us at your convenience.

Sincerely,

GEOServices, LLC



3/8/2022
31-211695

Jacob L. Barber, E.I.
Staff Professional

Jerry W. Gammon, PE
VP - Nashville Area Manager
TN 111633



REPORT OF

GEOTECHNICAL EXPLORATION

Proposed Bear Creek Property
Columbia, Tennessee

GEOServices Project No. 31-211695

Submitted to:

HK Big Bear Bluffs LLC

14025 Riveredge Drive, Suite 175

Tampa, FL 33637

Submitted by:

GEOServices, LLC
91 South Eastgate Court
Lebanon, Tennessee 37090

Phone (615) 547-9314
Fax (615) 547-9451

GEOServices, LLC, Geotechnical and Materials Engineers

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APPENDIX A – Figures, Observation Trench Summary
APPENDIX B – Laboratory Results Summary
APPENDIX C – Site Photographs
APPENDIX D – Sinkhole Repair Detail

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this geotechnical exploration was to characterize the subsurface conditions for the design and construction of the Proposed Bear Creek Property development in Columbia, Tennessee. This report provides recommendations for general site preparation, excavation and fill requirements, foundation design, and slab-on-grade construction.

1.2 PROJECT DESCRIPTION

Initial project information was provided in an October 12, 2021, email transmission from Mr. Joshua Gibbs (Kolter Land Partners, LLC) to Mr. Jerry Gammon (GEOServices). A drawing titled "Bear Creek Property Boundary Survey", and an outlined aerial photo of the property was attached to the email. A site plan titled "Big Bear Farms – Master Plan" dated December 22, 2021 was provided in subsequent emails. We understand that a single-family residential development is planned to be developed on two adjoining properties, totaling approximately 420-acres located in Columbia, Tennessee. We assume the structures will be standard 1 to 2-story structures, assumed to be wood-framed with vinyl, stone, and brick veneer, slab-on-grade, and supported by shallow foundations. We have assumed cut depths and fill thicknesses will be less than about 10 feet, respectively. At this time, structural loading information has not been provided. From past experience with similar projects, we assume maximum column and wall loadings will be about 30 kips, and 1 kip per linear foot (klf), respectively.

At the time of site reconnaissance, the subject site was generally open grass areas as well as some moderate to densely forested areas. The wooded areas were generally to the southern portions and western portions of the property. Throughout the property, areas of large rock

outcropping/boulders were observed at the ground surface. Existing structures were noted onsite including barn structures toward the north, an existing residential structure in the northern area of the property, and a residential structure off of Iron Bridge Road at the southern edge of the property with accompanying barn structures. Surficial evidence of possible karst activity was noted in some areas, and representative photographs can be observed in Site Photos of the appendices. The site was observed to be generally rolling in elevation, with relatively steep changes in other areas. Several drainage features were observed throughout the property, generally in wooded areas. Several water features were observed throughout the property as well, as seen in Site Photos of the Appendices. Elevation changes across the property observed from Google Earth aerial imagery is noted to range from about 570 to about 725 feet. A proposed grading plan has not been provided at this time. GEOServices should be contacted once a final grading plan has been completed to verify the recommendations provided in the following sections still apply.

1.3 SCOPE OF SERVICES

This geotechnical exploration involved a site reconnaissance, field exploration, and engineering analysis. The following sections of this report present discussions of the field exploration, site conditions, and conclusions and recommendations. Following the text of this report, an observation trench summary and figures are provided in the appendices. Appendix A provides figures and observation trench summary records. Appendix B provides laboratory testing results. Appendix C provides representative site photographs. Appendix D provides a typical sinkhole repair detail.

The geotechnical scope of services did not include an environmental assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, bedrock, surface water, subsurface water, or air, on, or below, or around this site. Any statements in this report

or on the observation trench summary regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes.

2.0 EXPLORATION AND TESTING PROGRAMS

2.1 FIELD EXPLORATION

The site subsurface conditions were explored with 183 observation trenches at or near the locations shown by Figure 3 in Appendix A and were performed on November 29 and 30, December 1, 2, 3, 6, 7, 8, and 9, 2021, and March 4, 2022. Originally, the site was planned to be explored with 180 observation trenches. However, 8 of the 180 observation trenches (OT-16, OT-17, OT-22, OT-64, OT-74, OT-77, and OT-95) were not performed due to rocky conditions which were inaccessible to the mini-excavator. Therefore, these remaining 8 test locations were explored with hand tools. Furthermore, OT-1 was not performed in an effort to avoid hitting any existing utilities associated with the existing residence on-site and was explored with hand tools as well. The test locations were selected and located in the field by GEOServices by measuring distances from known site reference points and utilizing GPS coordinates extrapolated from Google Earth.

The observation trench locations were advanced using a subcontracted mini-excavator. Sampling of overburden soils was accomplished using a dynamic cone penetrometer (DCP). In dynamic cone penetrometer (DCP) testing, a 1.5-inch diameter cone (45^{o} vertex angle) is driven into the subgrade soil with a 15-pound steel mass falling 20 inches. The blows required to drive the embedded cone a depth of 1-3/4 inch have been correlated to N-values derived from the Standard Penetration Test (SPT). These DCP-values are indicated on the summary of observation trench logs at the testing depth and provide an indication of the relative density of granular materials and strength of cohesive materials.

The observation trenches were monitored for the presence of groundwater and backfilled upon completion. Minor settlement should be expected of the backfilled material over time. Detailed observation trench records are presented in Appendix A.

2.2 LABORATORY TEST PROGRAM

Soil samples collected during excavation were transported to our laboratory for visual classification and laboratory testing. The following laboratory testing was performed on select samples to determine various properties of the soil:

- Natural Moisture Content (ASTM D 2216): Moisture content determinations were performed. The natural moisture content is defined as the ratio of the weight of water present in the soil to the dry weight of soil.

- Atterberg Limits (ASTM D 4318): Atterberg Limits tests were performed. These tests help us to confirm our visual classifications according to the AASHTO Classification System and the Unified Soil Classification System (USCS). The plastic limit and liquid limit represent the moisture content at which a cohesive soil changes from a semi-solid to a plastic state and from a plastic state to liquid state, respectively.

The laboratory test results are presented in Appendix B.

3.0 SITE CONDITIONS

3.1 GEOLOGIC CONDITIONS

The subject site is located within the Central Basin Physiographic Province of Middle Tennessee. The Central Basin is an elliptical basin surrounded by the Highland Rim. The Basin is subdivided into inner and outer sections. The inner section is generally smooth and gently rolling in contrast to the higher and more deeply dissected outer Basin. Bedrock is primarily Ordovician limestone, shale, and dolomite in the outer Basin. The inner basin is generally covered with limestone with patches of bare platy rock and thin topsoil with glade areas supporting red cedar trees. The region

is moderate in karst development with many sinkholes and some large caves present, notably in the glade areas.

The Geologic Maps of the Carters Creek Quadrangle, Tennessee (Tennessee Division of Geology, 1963), Glendale Quadrangle, Tennessee (Tennessee Division of Geology, 1963), and Columbia Quadrangle, Tennessee (Tennessee Division of Geology, 1964) shows the site is underlain by the Hermitage, Carters, and Lebanon Limestone formations.

The Hermitage formation is typically a medium to dark brownish gray limestone. Residual soil formed by the in-place solution weathering of the parent limestone is typically a brownish sandy to silty clay. The horizontal bedding and somewhat uniform weathering characteristics of the Hermitage formation do not typically create conditions conducive to the creation of karst features, except where the formation weathers through to the underlying Carters formation, which is much more susceptible for the development of Karst.

The Carters Limestone formation is typically a hard, light gray to brownish gray, very fine grained to cryptocrystalline (i.e., microscopically crystalline), thin-bedded, with occasional thin shale lenses. The limestone weathers to produce a 5- to 10-foot thick layer of native soil (residuum) which is typically an orange to brown silty clay. The soil/rock interface may be irregular due to a layer of rounded boulders at the base of the soil zone.

The Lebanon Limestone formation is typically a medium-gray to medium dark-gray and yellowish-brown, cryptocrystalline to very fine-grained with some beds ranging up to coarse grained, thin-bedded limestone with thin shale partings, fossiliferous, and dolomitic fucoids common. These limestones generally weather to produce a layer of native soil (residuum) which is typically a brown or reddish-brown high plasticity clay with chert. Glades (i.e., areas of very thin soil) are common on which only limited vegetation, other than cedar trees, will grow.

The limestone bedrock consisting of Carters Limestone formation is susceptible to solution weathering and the creation of karst features, such as sinkholes. In general, because of the shallow overburden soils, karst features are relatively small in horizontal extent, but can extend into the bedrock several feet. Review of the topographic mapping indicated the presence of a closed depression onsite as shown in Figure 2 of the Appendices. Several other closed depressions are indicated within 1 mile of the site, primarily to the west and south of the site. We note the scale of the map often precludes mapping of smaller depressions. The area indicated on the topographic mapping as a closed depression can be seen in Site Photos 22, 23, and 24 of the Appendices, as well as other small locations containing surficial signs of possible karst activity in Site Photos 17 and 25. Due to the heavy underbrush encountered throughout the site, it is possible that other locations of possible karst activity were not observed during field activities.

Since the bedrock underlying the site mainly consists of carbonate rock, the site is susceptible to the typical carbonate hazards of irregular weathering, cave and cavern conditions, and overburden sinkholes. Carbonate rock, while appearing very hard and resistant, is soluble in slightly acidic water. This characteristic, plus differential weathering of the bedrock mass, is responsible for the hazards. Of these hazards, the occurrence of sinkholes is potentially the most damaging to overlying soil-supported structures. In Middle Tennessee, sinkholes occur primarily due to differential weathering of the bedrock and "flushing" or "raveling" of overburden soils into the cavities in the bedrock. The loss of solids creates a cavity or "dome" in the overburden. Growth of the dome over time or excavation over the dome can create a condition in which rapid, local subsidence or collapse of the roof of the dome occurs.

3.2 SUBSURFACE CONDITIONS

At the surface of each of the 183 observation trenches, topsoil was encountered to depths ranging from about 1 to 18 inches below the existing ground surface elevation. Beneath the

surficial layers, excavator refusal or residual soils were encountered to excavator refusal or termination depths ranging from about 0.2 to 8.5 feet below the existing ground surface elevation.

3.2.1 Residual Soils

Beneath the surficial layers, residual soils were encountered in 169 of the 183 observation trenches to excavator refusal or termination depths ranging from about 0.8 to 8.5 feet below the existing ground surface elevation. The residual soils generally consisted of brown, light brown, reddish brown, dark brown, orangish brown, and gray clays with varying amounts of siltstone, sandstone, sand, chert fragments, boulders, weathered rock fragments, and black mottling. A dynamic cone penetrometer (DCP) is used to evaluate the consistency or density of the subsurface soils. The DCP values of the residual soils ranged from 1 blow per increment to in excess of 15 bpi, indicating a consistency of very soft to very stiff. The natural moisture content of the residual soil samples retrieved from the exploration ranged from 15.2 to 43.7 percent. Atterberg limits testing on samples of the residual soils retrieved observation trenches OT-2, OT-6, OT-42, OT-84, OT-143 yielded liquid limits (LL) ranging from 28 to 57 percent and plasticity indices ranging (PI) from 9 and 26 percent. These soils are classified as lean clay (CL), fat clay (CH), silt (ML) and silt (MH), in accordance with the Unified Soil Classification System (USCS).

3.2.2 Refusal Conditions

Observation trench refusal materials were encountered in 92 of the 183 observation trenches at depths ranging from about 0.2 to 8 feet below existing ground surface elevation. Refusal is a designation applied to any material that cannot be penetrated by the bucket of the mini-excavator. Refusal may indicate dense gravel or cobble layers, boulders, rock ledges or pinnacles, dense siltstone layers, or the top of continuous bedrock. Based on our observations during the observation trench excavations, we anticipate the refusals are due to encountering limestone

bedrock, and/or immovable boulders. The following table presents the observation trench refusal depths at the observation trench locations:

OBSERVATION TRENCH REFUSAL DEPTHS					
Location	**Refusal Depth (feet)**	**Location**	**Refusal Depth (feet)**	**Location**	**Refusal Depth (feet)**
OT-1	TNP	OT-66	3 ½	OT-131	7
OT-2	> 8	OT-67	> 8	OT-132	½
OT-3	6 ½	OT-68	> 8	OT-133	1
OT-4	> 8	OT-69	> 8	OT-134	> 8
OT-5	3	OT-70	> 8	OT-135	1
OT-6	> 8	OT-71	> 8	OT-136	> 8
OT-7	> 8	OT-72	> 8	OT-137	> 8
OT-8	> 8	OT-73	> 8	OT-138	> 8
OT-9	> 8	OT-74	TNP	OT-139	3
OT-10	3 ½	OT-75	1	OT-140	> 8
OT-11	> 8	OT-76	1	OT-141	> 8
OT-12	6	OT-77	TNP	OT-142	> 8
OT-13	7 ½	OT-78	2 ½	OT-143	> 8
OT-14	3 ½	OT-79	4 ½	OT-144	7 ½
OT-15	> 8	OT-80	4	OT-145	1
OT-16	TNP	OT-81	> 8	OT-146	2 ½
OT-17	TNP	OT-82	> 8	OT-147	> 7 ½
OT-18	1	OT-83	> 8	OT-148	> 8
OT-19	> 8	OT-84	> 8	OT-149	> 8
OT-20	1	OT-85	4 ½	OT-150	> 8
OT-21	2 ½	OT-86	> 8	OT-151	> 7 ½
OT-22	TNP	OT-87	> 8	OT-152	4 ½

OT-23	> 8	OT-88	8	OT-153	3 ½
OT-24	0	OT-89	3 ½	OT-154	7 ½
OT-25	2	OT-90	1 ½	OT-155	> 8
OT-26	3	OT-91	½	OT-156	> 8
OT-27	> 6	OT-92	> 8	OT-157	7
OT-28	> 8	OT-93	5 ½	OT-158	½
OT-29	1 ½	OT-94	½	OT-159	7
OT-30	0	OT-95	TNP	OT-160	> 8
OT-31	2	OT-96	1	OT-161	5
OT-32	> 8	OT-97	> 8	OT-162	2
OT-33	4 ½	OT-98	2	OT-163	3 ½
OT-34	> 6	OT-99	> 7	OT-164	2 ½
OT-35	1	OT-100	> 7	OT-165	4 ½
OT-36	> 7	OT-101	> 8	OT-166	7
OT-37	> 8	OT-102	> 7 ½	OT-167	5
OT-38	6	OT-103	3 ½	OT-168	3
OT-39	> 8	OT-104	> 8	OT-169	3 ½
OT-40	> 8	OT-105	5 ½	OT-170	> 8
OT-41	> 8	OT-106	6 ½	OT-171	5 ½
OT-42	> 8	OT-107	> 7	OT-172	1
OT-43	> 8	OT-108	> 8	OT-173	> 8
OT-44	> 8	OT-109	> 8	OT-174	3
OT-45	6	OT-110	> 8	OT-175	1 ½
OT-46	5 ½	OT-111	> 8	OT-176	> 8
OT-47	> 8	OT-112	1 ½	OT-177	2 ½
OT-48	> 8	OT-113	1	OT-178	3 ½
OT-49	> 8	OT-114	1	OT-179	> 8
OT-50	4	OT-115	3 ½	OT-180	3 ½

OT-51	7	OT-116	> 8	OT-181	TNP
OT-52	> 8	OT-117	> 8	OT-182	TNP
OT-53	> 8	OT-118	> 8	OT-183	TNP
OT-54	> 8	OT-119	3 ½	OT-184	> 8 ½
OT-55	2 ½	OT-120	4 ½	OT-185	1 ½
OT-56	2	OT-121	3 ½	OT-186	8
OT-57	3	OT-122	> 8	OT-187	> 8
OT-58	> 8	OT-123	7 ½	OT-188	> 8 ½
OT-59	> 8	OT-124	> 8	OT-189	4
OT-60	> 8	OT-125	> 8	OT-190	1
OT-61	> 8	OT-126	> 8	OT-191	3
OT-62	> 8	OT-127	> 8	OT-192	1
OT-63	> 8	OT-128	> 8	OT-193	1
OT-64	TNP	OT-129	> 8	OT-194	2 ½
OT-65	> 8	OT-130	5		

Note: Refusal depths are taken from the ground surface elevation at the time of exploration and should be considered approximate. Depths rounded to the nearest ½ foot. TNP – Test Locations were explored via hand tools.

3.2.3 Subsurface Water

Subsurface water was encountered at OT-152 at a depth of about 4.5 feet below existing ground surface elevation. Additionally, discontinuous zones of perched water may exist within the overburden and/or at the contact with bedrock in other areas of the site. Subsurface water levels may fluctuate due to seasonal change in precipitation amounts or due to construction activities in the area. The groundwater presented in this report is the information that was collected at the time of our field activities. We recommend that the contractor determine the actual groundwater level at the site at the time of the construction activities.

3.2.4 General

The above subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The summary included in Appendix A should be reviewed for specific information at individual test locations. The depth and thickness of the subsurface strata indicated on the boring and observation trench summaries were generalized from and interpolated between test locations. The transition between materials will be more or less gradual than indicated and may be abrupt. Information on actual subsurface conditions exists only at the specific observation trench locations and is relevant to the time the exploration was performed. Variations may occur and should be expected between test locations. The stratification lines were used for our analytical purposes and, unless specifically stated otherwise, should not be used as the basis for design or construction cost estimates.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 SITE ASSESSMENT

The results of the subsurface exploration indicate that the site is adaptable for the proposed construction. However, as is the case with most sites, some inherent challenges are associated with this development of this site. These challenges include soft soil conditions, moisture sensitive soils, shallow refusal conditions, differential bearing concerns, and the underlying karst geology.

4.1.1 Soft Soil Conditions

Soft residual soil conditions were encountered in 37 of the 183 observation trenches at depths as deep as about 6 feet below existing ground surface elevation. Additional weak zones may be

encountered during construction phases. These weak zones encountered can potentially impact the performance of proposed structures and/or pavements depending on final grades. At this time, we have not been provided with a final grading plan. It is likely that some of the weak soils will be removed during mass grading activities. However, if these areas are not completely removed during mass grading activities, they will perform unsatisfactorily during initial proofroll activities in their current condition. Therefore, we recommend that the owner carry a contingency budget to undercut these weak areas during mass grading activities. We recommend that the contractor determine the consistency of the soil in these areas at the site at the time of the construction activities prior to undercutting and replacing.

4.1.2 Moisture Sensitive Soils

The subgrade soils at this site, as with most sites in middle Tennessee, consist of clayey and silty soils. These materials will be sensitive to changes in moisture contents. As such, it will be advantageous to perform grading activities during periods of warm and/or dry weather. Areas that are wet or become unstable can possibly be repaired by scarification and recompaction if grading occurs during warm, dry weather. If grading occurs during wet, cool weather, we expect that any possible soft soil at or near the surface soils across the site will have to be undercut and replaced. A budget contingency should be established for subgrade stabilization consistent with the time of year that grading will take place.

4.1.3 Shallow Refusal Conditions

Observation trench refusal materials were encountered in 84 of the 183 observation trenches at depths ranging from about 0.2 to 8 feet below existing ground surface elevation. The refusal materials encountered were generally hard and could not be penetrated by the bucket of the mini-excavator. These refusal materials are anticipated to be encountered in a portion of the

building footprints. As such, we anticipate excavation of the refusal materials could require blasting or hoe-ramming for removal.

4.1.4 Differential Bearing Concerns

Based on the results of our subsurface exploration, the possibility exists that a portion of the building foundations may bear in clay soil overburden material, while a portion could be bearing on bedrock conditions. This condition will result in a differential bearing condition which could result in excessive differential settlement across the buildings. As a result, recommendations to reduce the concern with differential settlement are provided in further sections.

4.1.5 Karst Geology

A certain degree of risk with respect to sinkhole formation and subsidence should be considered with any site located within geologic areas underlain by potentially soluble rock units. While an extensive effort to assess the potential for sinkhole formation on this site was beyond the scope of this evaluation, our observation trenches did not encounter obvious indications of sinkhole development. However, we do note apparent evidence a closed depression shown onsite from publicly available topographic maps. This area is depicted in Site Photos 22, 23, and 24 in the Appendices. Other areas containing surficial signs of possible karst activity are shown in Site Photos 17 and 25. If any karst feature is located in an area that require fill materials to achieve subgrade elevation, the observed karst feature should be stripped of clayey soil and the “throat” be remediated prior to structural backfill. GEOServices should be retained to provide recommendations during development activities.

4.2 SITE PREPARATION

4.2.1 Subgrade

Vegetation, topsoil, existing utilities, existing foundations, organic soils, rock fragments greater than 6 inches, and other debris should be removed from the proposed construction area. In the more wooded areas, thicker topsoil depths or deep root zones may be encountered which will also require removal. The actual depth of removal should be determined by a representative of the geotechnical engineer at the time of construction.

After completion of stripping operations and any required excavations to reach planned subgrade elevation, we recommend that the subgrade be proofrolled with a fully loaded, tandem-axle dump truck or other pneumatic-tired construction equipment of similar weight. The geotechnical engineer or his representative should observe proofrolling. Please note isolated undercutting should be expected within lots or roadways following proofroll activities and during the foundation observation process to eliminate isolated zones of weak soil layers. Weak or unstable areas should be undercut and remediated at the geotechnical engineer's recommendation. Areas to receive structural soil fill should also be proofrolled prior to the placement of any fill.

4.2.2 Structural Soil Fill

Material considered suitable for use as structural fill should be clean soil free of organics, trash, and other deleterious material, containing no rock fragments greater than 6 inches in any one dimension. Preferably, structural soil fill material should have a standard Proctor maximum dry density of 90 pcf or greater and a plasticity index (PI) of 35 percent or less. Materials with a PI greater that 35 percent are susceptible to volume changes with changes in moisture content. Volume changes in the foundation subgrade can cause structural distress in buildings, floor slabs, and pavements. Material to be used as structural fill should be tested by the geotechnical engineer to confirm that it meets the project requirements before being placed. This testing typically requires

at least 3 to 4 days to complete. To avoid delays during grading, samples of proposed fill materials (both on-site and off-site) should be collected during site preparation activities.

Structural fill should be placed in loose, horizontal lifts not exceeding 8 inches in thickness. Each lift should be compacted to at least 95 percent of the soil's maximum dry density per the standard Proctor method (ASTM D698) and within the range of minus (-) 2 percent to plus (+) 3 percent of the optimum moisture content. Each lift should be tested by geotechnical personnel to confirm that the contractors' method is capable of achieving the project requirements before placing any subsequent lifts. Any areas, which have become soft or frozen, should be removed before additional structural fill is placed.

4.2.3 Imported Shotrock / Processed Rock Fill

Shotrock, with acceptable gradation, can be used as structural fill. Shotrock utilized as structural fill should be well graded with a maximum rock size of 18 inches and be placed in lifts not to exceed 24 inches thick at depths deeper than 3 feet below planned subgrade elevation. Shotrock shallower than 3 feet below planned subgrade elevation should have a maximum rock size of 8 inches in largest dimension and placed in lifts not to exceed 12 inches thick.

Rock fill should have adequate fines to effectively "choke" the larger rock pieces, adequately filling voids or open spaces. The larger rock pieces should lie flat and not overlap each other. The percentage of soil in the fill should be limited to a maximum of 10 percent. Rock fill should be compacted using complete passes of a D-8 class crawler tractor, or equivalent. A pass is defined as a complete coverage of the surface with the D-8 track overlapping 50 percent. Half of the passes should be in each perpendicular direction. Rock fill placement should be accomplished under the full-time observation of a representative of the geotechnical engineer.

4.2.4 Compacted Crushed Stone Fill

Compacted crushed stone fill should be Type A, Class A, and Grading D in accordance with Section 903.05 of the Tennessee Department of Transportation specifications. The crushed stone fill should be placed in loose, horizontal lifts not exceeding 10 inches in loose thickness. Each lift should be compacted to at least 95 percent of maximum dry density per the standard Proctor method (ASTM D698). Each lift should be compacted and tested by geotechnical personnel to confirm that the contractor's method is capable of achieving the project requirements before placing any subsequent lifts.

4.3 FOUNDATIONS

4.3.1 Shallow Foundations

Soil Bearing Foundations

Foundations for the proposed construction can bear on stiff or better residual soils or properly placed and compacted structural soil fill. The recommended allowable bearing capacity for design of these foundations is 2,000 pounds per square foot (psf) or less. We recommend that continuous foundations be a minimum of 18 inches wide and isolated spread footings be a minimum of 24 inches wide to reduce the possibility of a localized punching shear failure. Exterior footings should be designed to bear at least 18 inches below finished exterior grade to protect against frost.

As mentioned previously, observation trench refusal was encountered at depths ranging about 0.2 to 8 feet below the existing ground surface elevation. It should be anticipated that bedrock may be encountered during foundation and/or utility excavations. If rock is encountered at the foundation bearing elevation, we recommend the rock be removed to a minimum depth of 12 inches below planned bearing elevation. The area can then be backfilled with properly compacted crushed stone or structural soil fill. The backfill will help act as a “cushion” to prevent point loading of the

foundation. If desired, the foundation designer may also elect to include additional reinforcing steel into the foundations at these transition points to help resist negative moment forces.

Rock Bearing Foundations

If bedrock is encountered over the majority of the building foundations, the remaining isolated foundation areas underlain by soil can be over-excavated to bedrock or a maximum of 4 feet, cleaned of remaining soil particles, and backfilled with lean concrete, flowable fill, or compacted rock fill. The recommended allowable bearing capacity for design of the foundations bearing on bedrock or rock fill is 4,000 pounds per square foot (psf) or less.

Foundation excavations should be opened, the subgrade evaluated, remedial work performed, and concrete placed in an expeditious manner. Exposure to weather often reduces foundation support capabilities, thus necessitating remedial measures prior to concrete placement. It is also important that proper surface drainage be maintained both during construction (especially in terms of maintaining dry footing trenches) and after construction.

4.3.2 Slabs-on-Grade

For slab-on-grade construction, the site should be prepared as previously described. We recommend that the subgrade be topped with a minimum 4-inch layer of crushed stone. A polyethylene vapor barrier is not required if the designer utilizes a dense graded aggregate base. The subgrade should be proofrolled and approved prior to the placement of the crushed stone. Based on the conditions encountered on this site, we recommend that the floor slabs be designed using a subgrade modulus of 100 pounds per cubic inch (pci). This subgrade modulus value is for small diameter loads (i.e., a 1 foot by 1-foot plate) and should be adjusted for wider loads.

At sites that have high plasticity soils, certain precautions should be considered to minimize or eliminate the potential for volume changes. If high plasticity clay is encountered at final subgrade

elevations, we recommend the soils directly beneath the slab undergo additional plasticity testing during construction to determine the plasticity of the underlying soils. Once this has been completed, recommendations for the required depth of removal can be provided, if needed. If removal of the highly plastic soils is not desirable, then measures should be taken to protect the soils from excessive amounts of wetting or drying. In addition, modification of the soils by lime or cement treatment can be utilized to reduce the soil plasticity.

5.0 CONSTRUCTION CONSIDERATIONS

5.1 EXCAVATIONS

Excavator refusal materials were encountered at depths ranging from about 0.4 to 8 feet below the existing ground surface elevation. Excavator refusal conditions generally correspond to materials which require blasting for removal. Typically, soils penetrated by the bucket of the excavator can be removed with conventional earthmoving equipment. However, excavation equipment varies, and field refusal conditions may vary. The weathering process is erratic and variations in the rock profile can occur in small lateral distances. Therefore, it is possible that some partially weathered rock and/or rock pinnacles or ledges requiring difficult excavation techniques may be encountered in isolated areas of the site between our observation trench locations.

Excavation Safety

Excavations should be sloped or shored in accordance with local, state, and federal regulations, including OSHA (29 CFR Part 1926) excavation trench safety standards. The contractor is usually solely responsible for site safety. This information is provided only as a service and under no circumstances should GEOServices be assumed to be responsible for construction site safety.

Overblasting Concerns

We caution against extensive overblasting in building areas during the site grading operations. Overblasting typically damages below grade bedrock by fracturing or heaving the rock from its original position. This often creates difficulties for foundations and floor slabs supported on these materials by creating voids in the rock unit and greatly reducing the support capacity. Any areas damaged by overblasting should be evaluated by the geotechnical engineer to determine appropriate corrective measures.

5.2 FOUNDATION CONSTRUCTION

Foundation excavations should be opened, the subgrade evaluated, remedial work performed, and concrete placed in an expeditious manner. Exposure to weather often reduces foundation support capabilities, thus necessitating remedial measures prior to concrete placement. It is also important that proper surface drainage be maintained both during construction (especially in terms of maintaining dry footing trenches) and after construction. Soil backfill for footings should be placed in accordance with the recommendations for structural fill presented herein.

Foundation subgrade observations should be performed by a GEOServices geotechnical engineer, or his qualified representative, so that the recommendations provided in this report are consistent with the site conditions encountered. A dynamic cone penetrometer (DCP) is commonly utilized to provide information that is compared to the data obtained in the geotechnical report. Where unacceptable materials are encountered, the material should be excavated to stiff, suitable soils or remediated at the geotechnical engineer's direction. Typical remedial measures consist of undercutting, overexcavation, or combinations thereof.

5.3 MOISTURE SENSITIVE SOILS

The fine-grained soils encountered at this site will be sensitive to disturbances caused by construction traffic and changes in moisture content. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. Construction traffic patterns should be varied to prevent the degradation of previously stable subgrade. In addition, plastic soils which become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. We caution if site grading is performed during the wet weather season, methods such as discing and allowing the material to dry will be required to meet the required compaction recommendations. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

5.4 DRAINAGE AND SURFACE WATER CONCERNS

To reduce the potential for undercut activities and construction induced dropouts, water should not be allowed to collect in the foundation excavations, on floor slab areas, or on prepared subgrades of the construction area either during or after construction. Undercut or excavated areas should be sloped to facilitate removal of any collected rainwater, subsurface water, or surface runoff. Positive site surface drainage should be provided to reduce infiltration of surface water around the perimeter of the building and beneath the floor slab. The grades should be sloped away from the building and surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill and floor slab areas of the building.

5.5 SINKHOLE CORRECTIVE ACTIONS AND CONSIDERATIONS

As mentioned previously, possible karst features were observed within the anticipated development area. We recommend that existing weak soils be removed from the depressed areas to underlying stiff or better residual soil or bedrock and evaluated by GEOServices. At that

time, recommendations will be provided for backfill, which will likely consist of an inverted filter or lean concrete placement if a throat is encountered or lining the bottom of the excavation with geotextile prior to backfilling with clean structural fill.

During construction and based on our experience, corrective actions, such as proper grade selection and positive site drainage, can be performed to decrease but not eliminate the potential for sinkhole development.

In general, the portions of a site that are excavated to achieve the desired grades will have a higher risk of sinkhole development than the areas that are filled, because of the exposure of relic fractures in the soil to rainfall and runoff. On the other hand, those portions of a site that receive a modest amount of fill (or that have been filled in the past) will have a decreased risk of sinkhole development caused by rainfall because that placement of a cohesive soil fill over these areas effectively caps the area with a relatively impervious "blanket" of remolded soil. Therefore, the recommendations that follow incorporate a modest remedial treatment program designed to make the surface of the soil in excavated areas less permeable.

Although it is our opinion that the risk of ground subsidence associated with sinkhole formation cannot be eliminated, we have found that several measures are useful in site design and development to reduce this potential risk. These measures include:

- Maintaining positive site drainage to route surface waters well away from structural areas both during construction and for the life of the structure.
- The scarification and re-compaction of the upper 6 to 10 inches of soil in earthwork cut areas.
- Verifying that subsurface piping beneath structures is carefully constructed and pressure tested prior to its placement in service.
- The use of pavement or lined ditches, particularly in cut areas, to collect and transport surface water to areas away from structures.

Considerations when building within a sinkhole prone area are to provide positive surface drainage away from any proposed building or parking area both during and after construction. Backfill in utility trenches of other excavations should consist of compacted, well-graded material such as dense graded aggregate or compacted on site soils. The use of an open graded stone such as No. 57 stone is not recommended unless the stone backfill is provided an exit path and not allowed to pond. If sinkhole conditions are observed, the type of corrective action is most appropriately determined by GEOServices on a case-by-case basis.

5.6 SLOPES

Analysis of proposed slopes for stability was not included in the authorized scope of services. If the client would like this service completed for proposed slopes, GEOS can perform these services for an additional fee, upon request. When requested, GEOS will issue an additional services proposal for review and authorization.

6.0 LIMITATIONS

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. This report is for our geotechnical work only, and no environmental assessment efforts have been performed. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other warranty, express or implied, is made.

The analyses and recommendations submitted herein are based, in part, upon the data obtained from the exploration. The nature and extent of variations between the observation trenches will not become evident until construction. We recommend that GEOServices be retained to observe the

project construction in the field. GEOServices cannot accept responsibility for conditions which deviate from those described in this report if not retained to perform construction observation and testing. If variations appear evident, then we will re-evaluate the recommendations of this report. In the event that any changes in the nature, design, or location of the structures are planned, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and conclusions modified or verified in writing. Also, if the scope of the project should change significantly from that described herein, these recommendations may have to be re-evaluated.

January 23, 2024

Paul Keltner, Director
Development Services
City of Columbia, TN

RE: Project# 23-0414; Re-Submittal 400 Bear Creek Parkway – Annexation Request and PUD-R Rezoning

Dear Mr. Keltner,
The accompanying documents and comment responses below are for the resubmittal of the above referenced project. It is our understanding that this project will be on the February CMPC agenda.

Below, please find written responses to the Technical Review comments provided on January 9, 2024.

Included in the submittal are the following:

1. Online/Digital upload of revised PUD-R documents
2. Comment responses to Development Review Committee (below)
3. Revised PUD justification letter
4. PUD-R Deviations Request Document

Staff Comments:

Planning

1. City Planner Kevin McCarthy, AICP and Planner Austin Brass, AICP will jointly prepare the staff report for this item. Please contact kmccarthy@columbiatn.com with question about the development review process or technical comments.
   Response: Noted.
2. At resubmittal, please provide a response letter addressing each comment along with any revised plans. If the nature of the comment does not warrant a response, or the comment was previously addressed, please simply note that the information has been acknowledged.
   Response: Noted.
3. As part of the resubmittal, please format the proposed alternative standards to the PUD in a table similar to 4.3.9.1-K either restating the prescribed standard or the proposed alternative as applicable. Alternative standards should be highlighted or otherwise noted to assist the Planning Commission in its evaluation of the proposal. The resubmittal deadline for this and the related application (23-0421) is extended to January 23rd in order to accommodate the time necessary

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to meet this request. Planning staff will meet with the applicant team to explain this request or answer questions about the formatting.
Response: Please see the new PUD Deviations request document uploaded with this submittal.

4. Please provide standard for "other open space use" in the format used in Article 5 for Civic Spaces. Use more than one if necessary to convey the unique amenities and protected lands proposed for the site.
   Response: The applicant is asking for two deviations from the "greens" standard in order to adapt this existing civic space type to the Columbia Bluffs project. There are open spaces on site that are not civic spaces. These spaces are typically the PUD-R Buffer, riparian areas, and tree save areas.
5. The justification letter describes the conservation benefits of the proposed PUD-R achieved by clustering. However, the plans depict significant alteration of the site, effectively flattening portions of the landscape in order to create additional single-family lots. Please consider shifting this density to a different structure type or a different location on the site in order to minimize the alteration of western portion of the site, as detailed in comments below.
   Response: The applicant has considered the Staff comments and has worked with staff to redesign areas of the plan on the western portion of the site. As a result, the total number of lots on the property is 800. A reduction of 36 lots from the previous submittal.
6. The plan of development for the site, particularly in the northwestern portion of the site, is too intense and many deviations from the standards of the ordinance stem from this proposed intensity. It may be appropriate to shift density to other parts of the site and/or other structure types; alternatively, it may be appropriate to reduce the overall number of units. Consider eliminating or relocating lots 936-944, and 722-733, 161-164, 104-117, 930-932, and 913-926 (civic space opportunity).
7. ***Response: The applicant has considered the Staff comments and has worked with staff to redesign areas of the plan on the western portion of the site. As a result, the total number of lots on the property is 800. A reduction of 36 lots from the previous submittal.***
8. Consider shifting more tree preservation are into the areas occupied by lots referenced previously 4.3.126.L.
   Response: The applicant has considered the Staff comments and has worked with staff to redesign areas of the plan on the western portion of the site. As a result, the total number of lots on the property is 800. A reduction of 36 lots from the previous submittal.
9. Please identify any areas with naturally occurring slopes of 20 percent or greater which are outside of tree preservation areas.
   Response: Naturally occurring slopes of 20% or greater shown on C0.01 Existing Conditions Plan.
10. The Zoning Administrator generally agrees with the proposed alternative thoroughfare assemblies proposed by the applicant is tailored to the purposes of the proposed PUD and appropriate for the site, provided the City Engineer deems them an acceptable equivalent to the prescribed thoroughfare assemblies in Article 5 of the Zoning Ordinance.
    Response: Noted.
11. The Zoning Administrator has no advice to Planning Commission regarding reduction of setback from 10' to 7.5'.
    Response: Noted

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12. The Zoning Administrator does not support a reduction of side setbacks from 10’ to 5’ on detached alley loaded homes and active adult homes. The proposed alternative provides inadequate spacing between structures.
    Response: The applicant is proposing that the alley loaded and active adult homes are to have yards maintained by the HOA. In order to be reduce the maintenance burden to these properties, the setbacks are requested to be reduced. It is the opinion of the applicant that the 5’ minimum setback still allows for the adequate movement of air and positive drainage.
13. The Zoning Administrator has no advice to Planning Commission regarding the request to allow garages in the 2nd layer for courtyard style homes except to note that this would be allowed in base Character Districts and does not by itself diminish the street-scape.
    Response: Noted.
14. The Zoning Administrator does not support 16' wide doors as an alternative to the 9' maximum prescribed by the Zoning Ordinance.
    Response: The applicant is proposing options to de-emphasize the front facing garage doors in most home styles. For most front accessed homes, the applicant is proposing lot diagrams which place the garage in the 3rd layer or perpendicular to the street. The applicant is requesting the alternative size to utilize a smaller garage footprint, but still providing the home with parking for more than one vehicle and/or storage space.
15. The Zoning Administrator does not support 18' wide driveways as an alternative to the 10 ' maximum prescribed by the Zoning Ordinance. The Zoning Administrator has no advice for Planning Commission regarding the proposed 12' driveway standard.
    Response: The 18’ wide driveway is only being requested in the Active Adult homes where the applicant is also requesting a the ability to have a two-car garage in the second layer. In order to allow access to either side of this garage space, an 18’ driveway is necessary. Please see the lot diagrams provided in this submittal for a graphic representation of this request.
16. The Zoning Administrator generally agrees with the proposed alternative to allow active adult lots to have a finished floor level lower than 18 inches above finished grade at the façade to provide greater accessibility.
    Response: Noted.
17. The Zoning Administrator has no advice for Planning Commission regarding the proposed reduction of window sill height at the façade from 5’ minimum above average grade at façade to 3’ minimum in the active adult and courtyard style homes.
    Response: Noted.
18. The Zoning Administrator does not support a waiver for the use of cul-de-sacs on the site. The large greenfield site can be designed to accommodate network connectivity. Portions of the site where topography makes connecting Thoroughfares impractical are not suitable for development. The creation of new cul-de-sacs exposes the city to liability and long-term maintenance costs for a portion of roadway which only benefits adjacent property owners.
    Response: The applicant has redesigned the site to remove the cul-de-sacs from the design.
19. The Zoning Administrator supports the alternative Civic Space standards and relaxation of Thoroughfare enfronment for Civic Spaces proposed by the applicant.
    Response: noted.
20. The parking area serving the daycare is located in the first layer. Please revise.
    Response: The applicant has redesigned this area to remove the parking area from the 1st layer.

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21. Page 29 of Connect Columbia as part of the future Bicycle and Greenway Plan indicates a proposed greenway trail on the subject site located at the east side of the Duck River connecting with Yanahli Park to the south. Please indicate this connection on the PUD master plan in adherence to the Comp Plan.
    Response: The applicant is proposing a multi-use path down the public spine road that connects Iron Bridge Road with Bear Creek Parkway. The applicant proposes that this multi-use path is a more appropriate location to serve the spirit of the Connect Columbia plan than for a paved path than adjacent to the banks of the Duck River. The applicant is seeking to protect the steep slopes and tree canopy in this area and construction of a paved and accessible path through this zone is counterproductive to this goal.
22. Parking which requires backing directly into a Thoroughfare or Internal drive is prohibited. However, 4.3.12.E.4 (p. 283). 4.3.12.C.14.c (p. 281) implies that an alley can serve as a drive aisle. The parking spaces located on Alleys in the townhomes section not associated with a specific lot or building site should be designated as parking lots and conform to the standards of 4.3.12.C.
    Response: Noted.

Fire

23. Alleys are not to be used for access for emergency vehicles. An approved fire apparatus road must be within 150' of all points of structures. The townhomes in the back and nearest Bear Creek will not meet this code. Also, unit 205 will be outside this code as well.
    Response: The applicant has removed the civic space from in front of the townhomes.

Engineering

24. Subject to Construction Plans and Traffic Impact Study.
    Response: Noted.
25. 8% maximum grade on alleys. Lots 206-223, 580-593, 609-620 are at 10%
    Response: Alleys revised to meet 8% maximum.
26. Whenever a proposed street intersects a street with an equal or greater classification, a tangent (measured from the edge of traveled way, or the right-of-way line when determined by the City Engineer, along the centerline of the intersecting street) shall be provided. See ESS Table 3
    Provide road names on all 100 scale sheets. Road names will require E-911 approval
    Response: This information has been added to the plans. The applicant is still working through Street Name approval with the E-911 Staff and will add the names currently approved at the time of submittal.
27. Provide alley street section. Provide boulevard street section. Label dimension for C&G and on-street as 8.5'
    Response: Alley Street Section has been provided and 2.5' C&G labels have been added to the street sections.
28. Alley drainage should be located in the center of the roadway. Inlet spacing generally 150 ft. max. Note alleys will have driveway style aprons when intersecting streets.
    Response: Understood, drainage located in center & approximately 150' spacing.
29. Note: Drainage channels within a subdivision providing drainage for the following shall be located on a common or open space lot a minimum of ten (10) feet in width within a dedicated

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public drainage easement or public right-of-way. 1. Eight (8) or more lots, either in whole or a portion of; 2. Public infrastructure; or 3. An area equivalent to two (2.0) acres.
Response: Understood, drainage to comply.

30. Wetland north of cul-de-sac on Street O appears to be a sinkhole. Additionally, there are other small depressions that will require evaluation. See ESS section 5.4
Storm network is incomplete for the southern portion of the site.
Response: Understood, depressions will be evaluated with geotechnical assessment. Preliminary storm network completed for full site.

31. Overall site geotechnical assessment and geotechnical analysis and recommendation of all closed depressions will be required at final master plan and preliminary plat.
Response: Noted.
32. Many of the lots have a 3:1 slope adjacent to the rear of the building site. This historically causes issues, because the builder tries to create a flatter back yard and violates the max 3:1; or adequate drainage is not provided when the slope is towards the building site.
Response: Understood, layout adjusted for better grading flexibility behind lots.
33. Many of the retaining walls are not constructible without encroachment into the aquatic buffer.
Response: Understood, proposed layout reduced the number & heights of walls compared to previous layout. Walls have been shifted further off of buffers.
34. Label existing contour elevations, highlight all retaining wall, provide tow and bow elevations along each retaining wall. See ESS 5.15 Retaining Walls
Response: Understood, contours labeled. Retaining walls highlighted on grading sheets, with approximate wall heights labeled.
35. Confirm all lot numbers match on all sheets
Response: The lot numbers have been renumbered and are consistent on all sheets.
36. Remove parking from the inside of curves along the alleys
Response: This parking has been removed.

Maury County E-911

37. No comment on annexation. Columbia Bluffs is still actively working on 32 street name requests.
Response: noted.

Columbia Water

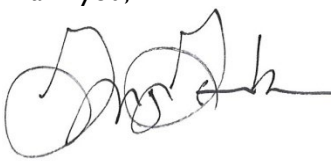
38. A water availability letter was issued on October 13, 2023, it remains valid for 120 days. The availability of capacity to serve is based on a determination by the Fire Marshal of fire flow requirements and the information submitted on the Water Service Availability Request application. Any off-site improvements detailed in the availability letter are the responsibility of the developer/owner. All public water system improvements are subject to the preparation and approval of detailed construction plans prepared in accordance with CPWS and Tennessee Department of Environment and Conservation requirements.
Response: The current water availability letter is valid through February 13, 2024. The applicant has applied for an extension of letter and expects to have this extension in hand prior to the Planning Commission meeting.

DEVELOPMENT PLANNING
DESIGN
MANAGEMENT

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If there are any questions or additional information needed, please feel free to reach out to me, or Keli Frymire (keli@gdc-tn.com) in my office.

Thank you,



Gamble Design Collaborative
Greg Gamble

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, January 9, 2024

ITEM NO.
23-0414

DESCRIPTION: Annexation request and PUD-R Preliminary Master Development Plan rezoning request for +/-410 acres between Bear Creek and Iron Bridge Road. PUD-R neighborhood to provide a variety of homes including Active Adult/Age restricted area, town homes, and large single-family home lots. PMDP also includes a daycare site and multiple amenities.

RECOMMENDATION: For final recommendation please see staff report.

COMMENTS:

Planning

1. Please provide standard for "other open space use" in the format used in Article 5 for Civic Spaces. Use more than one if necessary to convey the unique amenities and protected lands proposed for the site.
2. The justification letter describes the conservation benefits of the proposed PUD-R achieved by clustering. However, the plans depict significant alteration of the site, effectively flattening portions of the landscape in order to create additional single family lots. Please consider shifting this density to a different structure type or a different location on the site in order to minimize the alteration of western portion of the site..
3. City Planner Kevin McCarthy, AICP and Planner Austin Brass, AICP will jointly prepare the staff report for this item. Please contact kmccarthy@columbiatn.com with question about the development review process or technical comments.
4. Please expand upon the modification of standards listed on page five of the PUD-R justification letter. The list should include **all** requested deviations from the PUD-R standards at 4.3.1-K, as well as other deviations from standards of the ordinance (e.g. use of cul-de-sacs contrary to 5.2.2.E). For each requested deviation, please explain how the customized standard offers a better built environment to residents of the city of Columbia and/or better implements the Suburban Neighborhood future land use classification than the CD-3L or CD-3 character districts. The revised letter should support an explanation that the public purpose of the standards is satisfied "to equivalent or greater degree" by utilizing the proposed alternative (8.5.21.D; p. 452). Items two and three on the list provided with the application are a good template (i.e. explain the gain in open space from the modification).
5. Please add a projected timeline to phasing plan shown on sheet C1.00. The plan should be sufficiently detailed to provide adjacent property owners of the duration of actual

construction activity near their property. The phasing plan should comply with section 8.5.21.F (p. 453). The plan should indicate when Final PUD master plan and subsequent plats are projected (8.5.21.R; p. 461). The phasing plan should indicate if any extension requests are anticipated related to the timing of actual construction under 8.5.21.W (p. 464). The phasing timeline may be provided as a separate document if that is easier to prepare.

6. Advisory: The applicant has a separate but related application for the upcoming development review cycle. The other application rezones an adjacent parcel to CD-4 for commercial development. It may be advisable to combine these applications into a single large multi-use PUD at resubmittal (this will require review the Architectural Design Review Team).
7. Please expand upon the Environmental Uniqueness section on page two of the PUD-R justification letter. Please add information from the "Commitment to Environmental Stewardship" notes on the cover sheet of the master plan. Please explain which strategies could not be utilized under a CD-3 zoning.
8. Advisory: Consult with Asst. City Engineer regarding alternative design for segments of Street A.
9. Advisory: Please consult with the Director and Assistant Director of the City of Columbia Parks & Recreation department about composition of Civic Spaces (especially LI.6) and potential public access easement/alignment with Parks & Rec goals for level of service in East Columbia. If there are opportunities for public access/public benefit, please identify these in the revised PUD justification letter.
10. Please revise phasing plan to provide construction of Road A connecting Bear Creek Pike and Iron Bridge Road in the first phase.
11. Please revise to eliminate the cul-de-sacs in phases 3 and 6 per 5.2.2.E (or request as part of PUD deviations with explanation of equivalent public benefit).
12. The zoning ordinance contains contradictions related to PUD-R Civic Space types. Table 4.3.1-K (p. 157) indicates Sport fields are not a permitted Civic Space type in PUD-R. Table 5.3.3-B indicates otherwise. Please add this to the requested deviations and accompanying explanation.
13. 50" right of way shown on PUD does not conform to thoroughfare assemblies applicable to PUDs in 5.2.2.G-1. This is addressed in justification letter but please explain why it is necessary throughout the development and why the additional open space is a greater benefit than the omitted elements of the thoroughfare.
14. Due to the size and complexity of this request, it is the strong preference of planning staff that this request be reviewed again by the DRC following resubmittal to these comments before advancing to the Planning Commission agenda.
15. Sheet C2.0 indicates a tree save figure. Please provide a tree preservation plan with recent aerial image as described in 4.3.16.L of the zoning ordinance.
16. There appears to be small gaps in the pedestrian shed, please revise.
17. Please revise to show bicycle network and bikeway types utilized (5.2.4.A, p. 322-325).
18. The parking area serving the daycare is located in the first layer. Please revise.
19. Please provide greater detail on the lot/building site for the daycare site.

20. Please indicate pedestrian connection with townhomes that enfront a pedestrian path. Please ensure that this connection is with a proposed sidewalk.
21. As reviewed, there has been several waivers requested for setbacks, garage designs, and driveway widths exceeding 10' in first layer. Please coordinate with engineering requiring details of 5' side setbacks and drainage swales.
22. Impervious coverage for Development Parcel, daycare, and for typical lots.
23. Revise pattern book to show conforming interior garage dimensions.
24. Page 29 of Connect Columbia as part of the future Bicycle and Greenway Plan indicates a proposed greenway trail on the subject site located at the east side of the Duck River connecting with Yanali Park to the south. Please indicate this connection on the PUD master plan in adherence to the Comp Plan.

Fire

1. Alleys are not to be used for access for emergency vehicles. An approved fire appratus road must be within 150' of all points of structures. The townhomes in the back and nearest Bear Creek will not meet this code. Also unit 205 will be outside this code as well.

Engineering

2. Subject to Construction Plans and Traffic Impact Study.
3. Provide traffic improvement commitment letter with phasing based on improvement identified in the TIS and a overall diagram of all improvements.
4. 8% maximum grade on alleys. Lots 206-223, 580-593, 609-620 are at 10%
5. Whenever a proposed street intersects a street with an equal or greater classification, a tangent (measured from the edge of traveled way, or the right-of-way line when determined by the City Engineer, along the centerline of the intersecting street) shall be provided. See ESS Table 3

6. Provide road names on all 100 scale sheets. Road names will require E-911 approval
7. Provide alley street section. Provide boulevard street section. Label dimension for C&G and on-street as 8.5'
8. Alley drainage should be located in the center of the roadway. Inlet spacing generally 150 ft. max. Note alleys will have driveway style aprons when intersecting streets.
9. Note: Drainage channels within a subdivision providing drainage for the following shall be located on a common or open space lot a minimum of ten (10) feet in width within a dedicated public drainage easement or public right-of-way. 1. Eight (8) or more lots, either in whole or a portion of; 2. Public infrastructure; or 3. An area equivalent to two (2.0) acres.
10. Wetland north of cul-de-sac on Street O appears to be a sinkhole. Additionally, there are other small depressions that will require evaluation. See ESS section 5.4

11. Storm network is incomplete for the southern portion of the site.

12. Overall site geotechnical assessment and geotechnical analysis and recommendation of all closed depressions will be required at final master plan and preliminary plat.
13. Many of the lots have a 3:1 slope adjacent to the rear of the building site. This historically causes issues, because the builder tries to create a flatter back yard and violates the max 3:1; or adequate drainage is not provided when the slope is towards the building site.
14. Many of the retaining walls are not constructible without encroachment into the aquatic buffer.
15. Label existing contour elevations, highlight all retaining wall, provide tow and bow elevations along each retaining wall. See ESS 5.15 Retaining Walls
16. Confirm all lot numbers matches on all sheets
17. Remove parking from the inside of curves along the alleys

Building

18. No comment.

Wastewater

19. All sewer improvements including but not limited to off-site improvements, on-site improvements, and pump station and equipment installation shall be completed and functioning to the satisfaction of the Director of the Wastewater Department prior to the filing of any Final Plat with the City of Columbia Municipal Planning Commission, unless specific approval is granted by the Director and a surety of sufficient amount is provided. Note: Pump stations will require a building permit and all other required permits from additional entities. All inspections must be completed and certificates of completion granted before Council Agenda Deadline. Please contact the Wastewater Department for standard design details and equipment.

Police

20. No comments provided.

ATT

21. ATT TO SERVE

Maury County E911

22. No comment on annexation. Columbia Bluffs is still actively working on 32 street name request.

Maury County Schools

23. Howell Elementary, Cox Middle School, Battle Creek High School
    See Attached Capacity Numbers
    The development combined with current neighborhoods and additional approved developments in these zones may require either new construction or realignment of school zones to accommodate new students.

Public Works

24. Single family homes will receive City of Columbia trashcan service. For 189 townhomes, we recommend five or six 8-yard dumpsters with 3x/week collection if utilizing City of Columbia sanitation services. Private sanitation services, including dumpsters, compactors, individual receptacles or valet service, may be utilized. Individual trash receptacles will not be provided by the City of Columbia to townhome residents. Please see attached Plan of Services and City of Columbia Dumpster Guidelines & Accessibility Requirements.

Columbia Power

25. Columbia Power System has an existing power line near your proposed development. We are willing to serve this new development subject to all Columbia Power System policies and procedures in effect at actual time service is rendered provided an approved final plat and complete electrical load information is furnished as soon as possible prior to start of actual construction. • Unfortunately, due to current supply chain challenges, no timeframe can be guaranteed regarding the availability of meters or transformers appropriate. for your development.

Columbia Water

26. "A water availability letter was issued on October 13, 2023, it remains valid for 120 days. The letter will need to be updated prior to the applicable meeting of the Planning Commission. The availability of capacity to serve is based on a determination by the Fire Marshal of fire flow requirements and the information submitted on the Water Service Availability Request application. Any off-site improvements detailed in the availability letter are the responsibility of the developer/owner. All public water system improvements are subject to the preparation and approval of detailed construction plans prepared in accordance with CPWS and Tennessee Department of Environment and Conservation requirements."

Atmos Energy

27. Natural gas available along Bear Creek Pike

Duck River Electric Membership Corp

28. No comments provided.

Maury County Highway Dept.

29. No comments provided.

ATTACHMENTS: Concept Plan

NOTE: All submittals shall be compliant with City standards prior to Planning Commission review. Items that are not adhering to the regulations and/or comments for that request will not be forwarded to the next agenda until such items are amended.

COLUMBIA BLUFFS AERIAL IMPROVEMENT MAP

2-Tom J Hitch and Bear Creek: **(Phase 2**)

Construct a northbound right turn lane on Tom J Hitch Parkway with approximately 100 feet of storage and 60 feet of taper. The northbound right turn lane could be constructed using the existing shoulder and should not extend beyond the start of the bridge over Duck River.

Staff Response: *We agree that a northbound right turn lane on Tom J Hitch Parkway should be constructed. This improvement should be constructed according to AASHTO, TDOT, and City of Columbia standards.*

Restripe the northbound approach to provide one left turn lane and one through lane, plus the recommended right turn lane.

Staff Response: *We agree that the northbound approach on Tom J Hitch Parkway should include a left turn lane, through lane, and right turn lane.*

Modify the traffic signal design to provide a northbound right turn overlap during the westbound left turn phase and change the eastbound approach from protected/permissive left turn phasing to permissive only left turn phasing.

Staff Response: *We agree that providing northbound right turn overlap would improve traffic conditions.*

Optimize and coordinate the signal timing along Bear Creek Pike.

1 -Bear Creek Pike & Mt. Olive Road/School Access: **(Phase 1)**

Bear Creek Pike and Mt Olivet Road/School Access

- Restripe the southbound approach to a shared left turn/through lane and a right turn only lane.
  Staff Response: *We agree that the southbound approach should include a shared left turn/through lane and a right turn lane. This improvement should be constructed according to AASHTO, TDOT, and City of Columbia standards.*
- Modify the traffic signal design for the northbound approach to provide protected/permissive left turn signal phasing.
  Staff Response: *We agree that a northbound protected/permissive left turn signal phase would improve traffic operations.*
- Modify the traffic signal design for the southbound approach to provide a right turn overlap during the eastbound left turn phase.
  Staff Response: *We agree that a southbound right turn overlap would improve traffic operations.*
- Optimize and coordinate the signal timing along Bear Creek Pike.
  Staff Response: *We agree that optimizing and coordinating the signal timing along Bear Creek Pike would improve traffic operations.*

3-Bear Creek and Patterson Drive(South Bound Left Turn Lane) Improvements-Site Access # 1: **(Phase 3)-**

Bear Creek Pike and Patterson Drive/Site Access 1

- Site Access 1 should be constructed and aligned with Patterson Drive at Bear Creek Pike.
  Staff Response: *We agree that Site Access 1 should be constructed to align with Patterson Drive.*
- Site Access 1 should be designed to include width for one entering lane and two exiting lanes, which should be a northbound left turn lane and a northbound shared through/right turn lane.
  Staff Response: *We agree that one entering, and two exiting lanes is sufficient for Site Access 1. This access should be constructed according to AASHTO, TDOT, and City of Columbia standards, including providing sufficient sight distance.*
- An eastbound right turn deceleration lane should be constructed for Bear Creek Pike at Site Access 1 to accommodate the project traffic. The eastbound right turn lane should be designed so that the widening and taper does not begin until east of the guardrail over Bear Creek and include approximately 180 feet of storage and 160 feet of bay taper, or as approved by the City and TDOT.
  Staff Response: *We agree that an eastbound right turn deceleration lane along Bear Creek Pike is warranted. This improvement should be constructed according to AASHTO, TDOT, and City of Columbia standards, including providing sufficient sight distance.*
- A westbound right turn deceleration lane is recommended for Bear Creek Pike at Patterson Drive. The westbound right turn lane should be designed to include approximately 160 feet of storage and 180 feet of bay taper, or as approved by the City and TDOT.
  Staff Response: *We agree that a westbound right turn deceleration lane along Bear Creek Pike is warranted. This improvement should be constructed according to AASHTO, TDOT, and City of Columbia standards, including providing sufficient sight distance.*
- A westbound left turn deceleration lane is recommended for Bear Creek Pike at Site Access 1 to accommodate the project traffic. The westbound left turn lane should be designed to include approximately 225 feet of storage, 180 feet of bay taper, and 270 feet of approach taper assuming the widening is centered on the roadway.
  Staff Response: *We agree that a westbound left turn deceleration lane on Bear Creek Pike is warranted. This improvement should be constructed according to AASHTO, TDOT, and City of Columbia standards, including providing sufficient sight distance.*
- Install a traffic signal at the intersection of Bear Creek Pike and Patterson Drive/Site Access 1. Signal warrant analyses indicates a traffic signal will be warranted by the traffic volumes generated by the project site prior to completion of Phase 2, or comparable number of dwelling units. The signal design should include protected/permissive left turn signal phasing for the northbound and westbound approaches and permissive left turn signal phasing for the southbound and eastbound approaches.
  Staff Response: *We agree that a traffic signal should be installed at this intersection prior to the completion of Phase 2.*
- Optimize and coordinate the signal timing along Bear Creek Pike.
  Staff Response: *We agree that optimizing and coordinating the signal timing along Bear Creek Pike would improve traffic operations.*

4 Iron Bridge Road & Site Access #2: **(Phase 4 & Phase 5)**

Iron Bridge Road and Site Access 2

- Site Access 2 should be constructed and connected to Iron Bridge Road prior to the beginning of construction for Phase 4, of comparable number of dwelling units.
  Staff Response: *We agree that Site Access 2 should constructed prior to the beginning of construction for Phase 4. This access should be constructed according to AASHTO, TDOT, and City of Columbia standards, including providing sufficient sight distance.*
- Site Access 2 should be aligned with the Maury County Yanahli Park Access on Iron Bridge Road.
  Staff Response: *We agree that Site Access 2 should be aligned with the Maury County Yanahli Park Access.*
- At a minimum, Site Access 2 should be designed to include width for one entering lane and one exiting lane.
  Staff Response: *We agree that Site Access 2 should include one entering and one exiting lane. This access should be constructed according to AASHTO, TDOT, and City of Columbia standards, including providing sufficient sight distance.*
- Stop-control should be provided for the southbound approach of Site Access 2 at Iron Bridge Road.
  Staff Response: *We agree that this intersection will operate acceptably with stop-control along Site Access 2.*
- The Site Access 2 should be designed and constructed to allow for sufficient intersection sight distance, clear of any obstructions such as vegetation, landscaping, hardscaping, signs, and fencing within the departure sight triangles.
  Staff Response: *We agree that Site Access 2 should be constructed to provide sufficient sight distance. This access should be constructed according to AASHTO, TDOT, and City of Columbia standards.*
- An eastbound left turn deceleration lane is recommended for Iron Bridge Road at Site Access 2 to accommodate the project traffic. The eastbound left turn lane should be designed to include approximately 160 feet of storage, 180 feet of bay taper, and 270 feet of approach taper assuming the widening is centered on the roadway, or as approved by the City.
  Staff Response: *We agree that an eastbound left turn deceleration lane on Iron Bridge Road is warranted. This improvement should be constructed according to AASHTO, TDOT, and City of Columbia standards, including providing sufficient sight distance.*

Projected Phase Completion

Phase 1- 2026-28 #1
Phase 2-2027-29 #2
Phase 3-2028-31 # 3
Phase 4-2029-32 # 4
Phase 5-2030-33 #5
Phase 6- All improvements completed

5-James Campbell BLVD & Tom J. Hitch PKWY: **(Phase 5)**

Install a traffic signal at the intersection of James Campbell Boulevard and Tom J Hitch Parkway. The traffic signal design should include protected/permissive left turn signal phasing for the eastbound approach and a southbound right turn overlap.

Staff Response: *We agree that a signal should be installed at this intersection prior to the completion of Phase 3 of the proposed project. We agree that protected/permissive left turn phasing and right turn overlap will improve traffic operations. The City of Columbia is willing to share the responsibility of this improvement. The City will provide the design and the developer of this proposed development will provide the installation.*

Downtown Columbia

Tom J Hitch Pkwy

Iron Bridge Rd

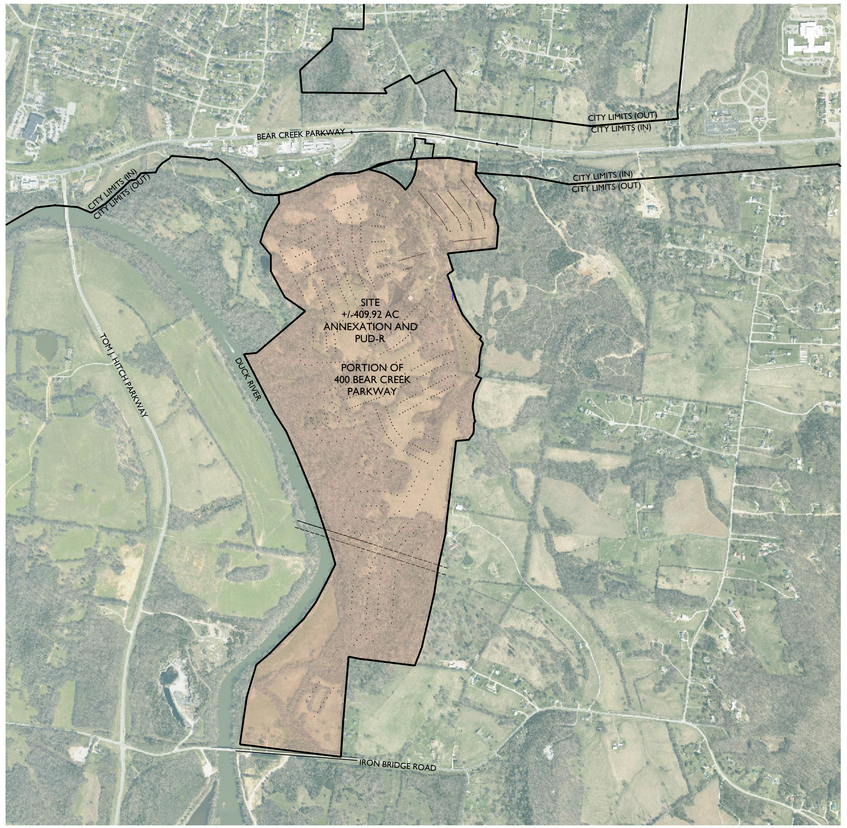
Mapleash Ave

Google Earth

35°39'04.30" N 87°03'21.51" W elev 590 ft eye alt 34245 ft

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 BEAR CREEK PARKWAY
COLUMBIA, TENNESSEE



LOCATION MAP

0 500 1000 2000
GRAPHIC SCALE 1"=1,000'-0"

OWNER:
HK BIG BEAR BLUFFS, LLC
14025 RIVEREDGE DRIVE, SUITE 175
TAMPA, FL33637
JIM HARVEY

DEVELOPER:
KOLTER LAND
14025 RIVEREDGE DRIVE, SUITE 175
TAMPA, FL33637
JIM HARVEY
615.582.3253
jgibbs@kolter.com

APPLICANT/ LAND PLANNER:
GAMBLE DESIGN COLLABORATIVE
3020 STANSBERRY LANE, SUITE 201
FRANKLIN, TN 37064
GREG GAMBLE
615-975-5765
greg.gamble@gdc-tn.com

ENGINEER:
CSDG
2305 KLINE AVENUE, SUITE 300
NASHVILLE, TN 37211
JIM HARRISON
615-248-9999
jimh@csdgtn.com

COMMITMENT TO ENVIRONMENTAL STEWARDSHIP

1. **Strategy for Resource Protection utilizing a PUD Planning and Design Approach**

   a. Establish a Limits of Disturbance along the Duck River and its tributaries based upon slopes, natural drainage ways, floodplain areas, and mature tree canopy.

   b. Design new development around open space areas to highlight them as community amenities with pedestrian systems that will connect the entire conservation design open space throughout the community.

   c. Pedestrian circulation and trails are highly encouraged along the river, along stream corridors, and through scenic areas.

   d. The quantity of Open Space preservation should greatly exceed any established base zone district.

   e. New home lots should generally be smaller, clustered areas away from the protected banks of the Duck River.

   f. Document on-site natural resources through a State approved Hydrologist and concurrence reports with local, state, and federal agencies.

   g. Remove debris removal along creek banks to prevent impact to Bear Creek (shoes, clothing, random bottles, containers, fencing, wood)

   h. Use Best Management Practices for Stormwater Pollution Prevention Plans during construction.

   i. Use only one crossing point (< less than approx. 50' - 60' feet that spans the creek with no structures within Bear Creek (similar to several crossings visible from US (Highway 412).

2. **Strategy for Protection through Construction**

   Implementation of the Plan requires protective measures. PUD phasing and areas of disturbance should be documented and considered through the PUD process. Protection practices shall include:

   A. Storm water erosion control applications I.E.

      i. Stormwater Detention Areas,

      ii. natural riparian buffers

      iii. silt fencing

      iv. sediment ponds

      v. Check dams

      vi. Ongoing stormwater monitoring of Environmental Controls of water runoff areas and tributaries

   B. Compliance with CGP, ARAP and NPDES permitting to address the protections that provide additional oversight to the project.

   Throughout the duration of the project, these types of practices within the action areas will ensure environmental compliance with local, state and federal requirements.

3. **Strategy for Protection when construction is completed.**

   Once development is completed permanent storm water detention areas and water out fall locations will be cleaned and stabilized in accordance with the local, state, and federal guidelines.

SHEET INDEX

C0.0	COVER SHEET
C0.01	EXISTING CONDITIONS
C1.0	PHASING PLAN
C2.0	OVERALL PRELIMINARY MASTER DEVELOPMENT PLAN
C2.1	ENLARGED PRELIMINARY MASTER DEVELOPMENT PLAN
C2.2	ENLARGED PRELIMINARY MASTER DEVELOPMENT PLAN
C2.3	ENLARGED PRELIMINARY MASTER DEVELOPMENT PLAN
C2.3	ENLARGED PRELIMINARY MASTER DEVELOPMENT PLAN
C2.4	ENLARGED PRELIMINARY MASTER DEVELOPMENT PLAN
C2.5	ENLARGED PRELIMINARY MASTER DEVELOPMENT PLAN
C2.6	PROPOSED LOT DIAGRAMS
C2.7	STREET SECTIONS
C2.8	TREE CANOPY COVERAGE
C3.00	OVERALL SITE UTILITY PLAN
C3.01	SITE UTILITY PLAN
C3.02	SITE UTILITY PLAN
C3.03	SITE UTILITY PLAN
C3.04	SITE UTILITY PLAN
C4.00	OVERALL GRADING & DRAINAGE PLAN
C4.01	GRADING & DRAINAGE PLAN
C4.02	GRADING & DRAINAGE PLAN
C4.03	GRADING & DRAINAGE PLAN
C4.04	GRADING & DRAINAGE PLAN
C4.05	LOT DRAINAGE DIAGRAMS
L1.0	OVERALL CIVIC SPACE PLAN
L1.1	CIVIC SPACE ENLARGEMENT
L1.2	CIVIC SPACE ENLARGEMENT
L1.3	CIVIC SPACE ENLARGEMENT
L1.4	CIVIC SPACE ENLARGEMENT
L1.5	CIVIC SPACE ENLARGEMENT
L1.6	CIVIC SPACE ENLARGEMENT

JEFFREY A. ROSS
REGISTERED
LANDSCAPE ARCHITECT
TN
12.18.23

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

PRE-APP: August 30, 2023
INITIAL SUBMITTAL: October 16, 2023
RESUBMITTAL: December 18, 2023



CSDG
Planning | Engineering
Landscape Architecture

2305 Kline Ave, Ste 300
Nashville, TN 37211
615.248.9999
csdgtn.com

SEAL

JAMES T. HARRISON
REGISTERED
LANDSCAPE
ARCHITECT
No. 021998
12-16-23
STATE OF TENNESSEE

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

INITIAL SUBMITTAL

ISSUE DATE: 12/18/2023

REVISION HISTORY:

Rev.	Description	Date
1	Initial Submittal	10/16/23
2	Tech Review Comments	12/18/23

DRAWN BY: TWG
CHECKED BY: TWG

EXISTING CONDITIONS PLAN

C0.01

PROJECT NO.: 21-160-01

Dec 20, 2023 - 7:51pm T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C0.01 - Existing Conditions Plan.dwg

PHASING BREAKDWON:

PHASE 1: LOT NUMBERS 100-161 (62 SINGLE FAMILY LOTS)
LOT NUMBERS 200-277 (78 TOWNHOME LOTS)

PHASE 2A: LOT NUMBERS 300-387 (88 TOWNHOME LOTS)
PHASE 2B: LOT NUMBERS 400-445 (46 SINGLE FAMILY LOTS)

PHASE 3A: LOT NUMBERS 500-644 (145 SINGLE FAMILY LOTS)

PHASE 4: LOT NUMBERS 700-848 (149 SINGLE FAMILY LOTS)

PHASE 5: LOT NUMBERS 900-1049 (150 SINGLE FAMILY LOTS)

PHASE 6: LOT NUMBERS 1100-1217 (118 SINGLE FAMILY LOTS)

PROJECTED TIMELINE*:

PHASE 1 (±140 UNITS)	
2024-2025	FINAL MASTER PLAN
2025-2026	BEGIN CONSTRUCTION
2025-2026	PLATTING
2028-2029	VERTICAL CONSTRUCTION COMPLETE
PHASE 2 (±134 UNITS)	
2025-2026	FINAL MASTER PLAN
2026-2027	BEGIN CONSTRUCTION
2026-2027	PLATTING
2029-2030	VERTICAL CONSTRUCTION COMPLETE
PHASE 3 (±145 UNITS)	
2026-2027	FINAL MASTER PLAN
2027-2028	BEGIN CONSTRUCTION
2027-2028	PLATTING
2031-2032	VERTICAL CONSTRUCTION COMPLETE
PHASE 4 (±149 UNITS)	
2027-2028	FINAL MASTER PLAN
2028-2029	BEGIN CONSTRUCTION
2028-2029	PLATTING
2032-2033	VERTICAL CONSTRUCTION COMPLETE
PHASE 5 (±150 UNITS)	
2029-2030	FINAL MASTER PLAN
2031-2032	BEGIN CONSTRUCTION
2031-2032	PLATTING
2033-2034	VERTICAL CONSTRUCTION COMPLETE
PHASE 6 (±118 UNITS)	
2030-2031	FINAL MASTER PLAN
2032-2033	BEGIN CONSTRUCTION
2032-2033	PLATTING
2033-2034	VERTICAL CONSTRUCTION COMPLETE

PROJECTED TIMELINE IS AN ESTIMATE ONLY. TIMING OF ACTUAL COMMENCEMENT OF HORIZONTAL & VERTICAL CONSTRUCTION FOR ALL PHASES WILL BE PREDICATED ON LOCAL AND STATE APPROVALS.

PHASE 0
ENTRANCE AND BRIDGE

PHASE 1
±140 UNITS

PHASE 2A
±88 UNITS

PHASE 2B
±46 UNITS

PHASE 3A
±145 UNITS

PHASE 4
±149 UNITS

PHASE 5
±150 UNITS

PHASE 3B

PHASE 6
±118 UNITS

BEAR CREEK PIKE
U.S. 412 - SR99
(R.O.W. VARIES)

IRON BRIDGE ROAD
(ROW VARIES)

DUCK RIVER

N

0 300 600
SCALE: 1" = 300'

CSDG
Planning | Engineering
Landscape Architecture
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csdgtn.com

SEAL

JAMES T. HARRISON
REGISTERED
ENGINEER
No. 021998
STATE OF TENNESSEE
12-16-23

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
INITIAL SUBMITTAL

ISSUE DATE: 12/18/2023

REVISION HISTORY:

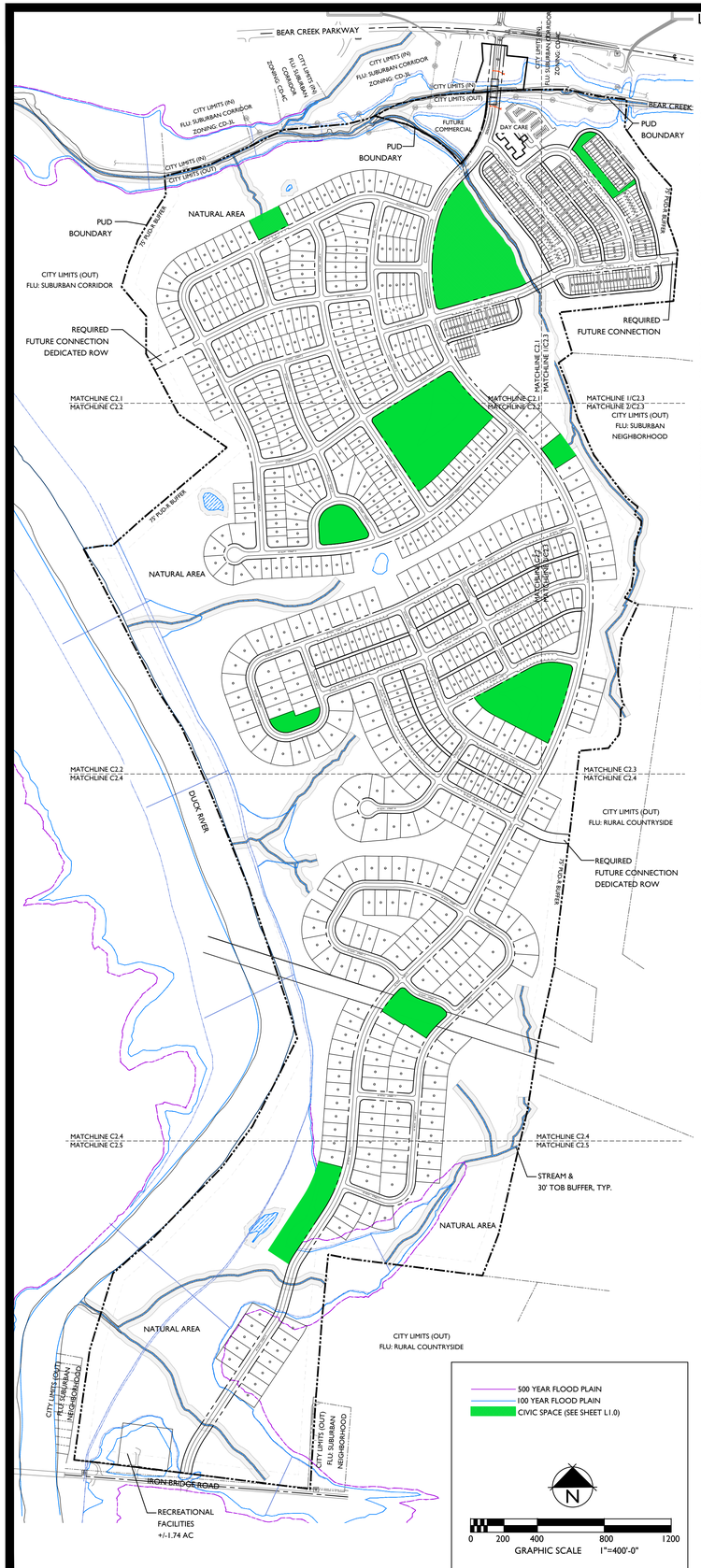
Rev.	Description	Date
1	Initial Submittal	10/16/23
2	Tech Review Comments	12/18/23

DRAWN BY: TWG
CHECKED BY: TWG

PHASING PLAN

C1.00
PROJECT NO.: 21-160-01

Dec 20, 2023 - 7:48pm T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C1.00 - Phasing Plan.dwg



LEGAL DESCRIPTION OF PROPERTY:

LEGAL DESCRIPTION FOR ANNEXATION OF 409.92 ACRES TO PUD
FOR PART OF MAP 90, PARCEL 12.01
DEED BOOK R2051, PAGE 792
BIG BEAR BLUFFS, LLC

LAND LYING IN THE 4TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE, BOUNDED ON THE NORTH BY BEAR CREEK PIKE, ROCK 'N' ROLL JESUS, LLC, AS OF RECORD IN DEED BOOK R2727, PAGE 1242 OF THE REGISTERS OFFICE OF MAURY COUNTY, TENNESSEE (ROMCTN); AMIT J. PATEL AND WIFE, MINAXIBEN G. PATEL AS OF RECORD IN DEED BOOK R2411, PAGE 1348, ROMCTN; HK BIG BEAR BLUFFS, LLC (R BOOK 2878, PAGE 981, ROMCTN; ON THE EAST BY JEFFERY L. HEAD AND ROSE HEAD, WIFE & HUSBAND AS OF RECORD IN DEED BOOK R2230, PAGE 388, ROMCTN, STEVEN CHARLES FOSTER AND REBECCA JANE FOSTER, HUSBAND & WIFE AS OF RECORD IN DEED BOOK R2497, PAGE 1334, ROMCTN, BARRY C. BLACKBURN, TRUSTEE FOR BARRY C. BLACKBURN REVOCABLE TRUST AS OF RECORD IN DEED BOOK R2301, PAGE 1492, ROMCTN, BRENT W. THORNTON AND WIFE TERRI L. THORNTON AS OF RECORD IN DEED BOOK R0396, PAGE 766, ROMCTN, CALVIN DEAN JOHNSON FORMERLY CARL JOHNSON AND WIFE, BARBARA D. JOHNSON AS OF RECORD IN DEED BOOK 375, PAGE 542, ROMCTN, AND CALVIN DEAN JOHNSON AND WIFE SHERYL GAY JOHNSON AS OF RECORD IN DEED BOOK R747, PAGE 602, ROMCTN; ON THE SOUTH BY IRON BRIDGE ROAD; AND ON THE WEST BY JIMMY MATHEWS AS OF RECORD IN DEED BOOK 1311, PAGE 80, DAVID LUNN HARRIS ETUX AS OF RECORD IN DEED BOOK R2415, PAGE 1148, ROMCTN, DUCK RIVER, AND MARK A. SEAGO AND WIFE TINA SEAGO AS OF RECORD DEED BOOK R2369, PAGE 973 ROMCTN, AND CONTINUED TO THE NORTH BY MIKE BIKES AS OF RECORD IN DEED BOOK R1884, PAGE 1052, DWAYNE SAM GOODMAN AS OF RECORD IN DEED BOOK R2732, PAGE 1288, AND IS MORE PARTICULARLY DESCRIBED AS FOLLOWS

TO FIND THE TRUE POINT OF BEGINNING, COMMENCE AT AN 1 INCH IRON PIPE FOUND IN THE SOUTHERN ROW OF BEAR CREEK PIKE, SAID POINT ALSO BEING THE NORTHWEST BOUNDARY OF ROCK 'N' ROLL JESUS, LLC (BK R2727, PG 1242) AND HAVING A TENNESSEE STATE PLANE COORDINATE OF NORTH 475,793.95 EAST 1,872,344.21;

THENCE, WITH THE WEST BOUNDARY OF JESUS, THE FOLLOWING CALLS:

S 05°01'16" W, FOR A DISTANCE OF 269.51 FEET, TO AN IRON PIN FOUND;
S 21°32'47" E, FOR A DISTANCE OF 51.20 FEET TO A THE CENTER OF BEAR CREEK BEING THE SOUTHWEST CORNER OF ROCK N ROLL JESUS;
THENCE, WITH THE SOUTH BOUNDARY OF ROCK 'N' ROLL JESUS, LLC, AMIT J. PATEL & HK BIG BEAR BLUFFS, LLC, AND ALSO BEING THE CENTER OF BEAR CREEK, N 85°53'31" E, 307.86 FEET TO THE TRUE POINT OF BEGINNING;

THENCE, CONTINUING WITH BEAR CREEK, THE FOLLOWING CALLS:

N 85°53'31" E, FOR A DISTANCE OF 85.49 FEET TO A POINT;
N 89°39'27" E, FOR A DISTANCE OF 218.80 FEET TO A POINT;
S 89°57'56" E, FOR A DISTANCE OF 168.93 FEET TO A POINT;
S 78°39'31" E, FOR A DISTANCE OF 77.46 FEET TO A POINT;
S 78°01'13" E, FOR A DISTANCE OF 120.71 FEET TO A POINT;
S 83°35'45" E, FOR A DISTANCE OF 172.70 FEET TO A POINT ALONG THE WEST BOUNDARY OF -JEFFERY L. HEAD;

THENCE, WITH THE WEST BOUNDARY OF HEAD, THE FOLLOWING CALLS:

S 0°56'50" W, FOR A DISTANCE OF 40.52 FEET TO AN IRON PIN;
S 04°40'44" W, FOR A DISTANCE OF 127.32 FEET TO A 1-1/2" PIPE FOUND;
S 34°29'27" E, FOR A DISTANCE OF 153.87 FEET TO A T-POST;
S 35°04'16" E, FOR A DISTANCE OF 55.17 FEET TO A T-POST;
S 39°22'56" E, FOR A DISTANCE OF 84.02 FEET TO A T-POST;
S 42°05'33" E, FOR A DISTANCE OF 106.39 FEET TO A T-POST;
S 42°31'20" E, FOR A DISTANCE OF 55.23 FEET TO AN 1-1/2" PIPE FOUND;
S 7°06'58" W, FOR A DISTANCE OF 101.11 FEET TO A 3" METAL POST;
S 5°45'07" W, FOR A DISTANCE OF 110.19 FEET TO AN 1-1/2" PIPE FOUND;
S 21°14'47" E, FOR A DISTANCE OF 78.14 FEET TO A T-POST;
S 17°34'01" E, FOR A DISTANCE OF 102.59 FEET TO A 24" CEDAR;
S 4°57'22" W, FOR A DISTANCE OF 172.54 FEET TO A T-POST;
S 4°32'31" W, FOR A DISTANCE OF 130.65 FEET TO 36" OAK;
S 84°49'25" W, FOR A DISTANCE OF 270.35 FEET TO 20" MAPLE;
S 84°01'38" W, FOR A DISTANCE OF 414.11 FEET TO A FENCEPOST;
S 17°15'39" E, FOR A DISTANCE OF 254.68 FEET TO A 6" ROTTED HACKBERRY FENCE POST TIED TO THE SOUTHWEST CORNER OF HEAD;

THENCE, WITH THE WEST BOUNDARY OF FOSTER, THE FOLLOWING CALLS:

S 54°11'5" W, FOR A DISTANCE OF 100.29 FEET TO 6' ROTTED HACKBERRY FENCE POST;
S 21°03'18" E, FOR A DISTANCE OF 130.86 FEET TO A CEDAR FENCE POST;
S 17°11'57" E, FOR A DISTANCE OF 221.38 FEET TO A 12" ELM;
S 23°49'07" E, FOR A DISTANCE OF 240.66 FEET TO A T-POST;
S 37°24'05" E, FOR A DISTANCE OF 315.73 FEET TO 14" ELM;
S 50°37'42" E, FOR A DISTANCE OF 91.73 FEET TO 60" TWIN OAK;
S 28°59'39" W, FOR A DISTANCE OF 35.62 FEET TO 60" OAK;
S 40°35'26" W, FOR A DISTANCE OF 9.08 FEET TO A T-POST;
S 42°52'20" E, FOR A DISTANCE OF 62.79 FEET TO A POINT;
S 1°50'17" W, FOR A DISTANCE OF 30.25 FEET TO A POINT;
S 23°53'47" W, FOR A DISTANCE OF 42.59 FEET TO 14" HACKBERRY;
S 11°25'58" W, FOR A DISTANCE OF 117.75 FEET TO A T-POST;
S 2°03'52" W, FOR A DISTANCE OF 130.94 FEET TO ROTTED HACKBERRY;
S 9°12'29" W, FOR A DISTANCE OF 87.18 FEET A POINT;
S 33°58'56" W, FOR A DISTANCE OF 69.04 FEET TO A 30" HACKBERRY;
S 61°19'48" E, FOR A DISTANCE OF 54.74 FEET TO A 24" HACKBERRY;
S 70°11'17" E, FOR A DISTANCE OF 34.53 FEET TO 12" CEDAR POST AT THE SOUTHWEST CORNER OF FOSTER;

THENCE, WITH THE WEST BOUNDARY OF BLACKBURN, THE FOLLOWING CALLS:

S 25°13'18" W, FOR A DISTANCE OF 225.44 FEET TO A 36" HACKBERRY;
S 7°09'46" W, FOR A DISTANCE OF 177.84 FEET TO A 8" DOGWOOD;
S 0°16'28" W, FOR A DISTANCE OF 41.40 FEET TO A 24" HACKBERRY FLAGGED;
S 8°53'22" E, FOR A DISTANCE OF 173.37 FEET TO A T-POST;
S 50°40'30" E, FOR A DISTANCE OF 13.02 FEET TO 6' FENCE POST;
S 39°18'12" W, FOR A DISTANCE OF 34.16 FEET TO A POINT;
S 1°12'16" W, FOR A DISTANCE OF 95.58 FEET TO A 12" OSAGE;
S 7°58'27" W, FOR A DISTANCE OF 43.94 FEET TO A 6" ROTTED TREE;
S 49°43'30" W, FOR A DISTANCE OF 13.75 FEET TO A 4" TREE USED AS FENCE POST;
S 38°17'00" W, FOR A DISTANCE OF 100.34 FEET TO A 14" ROTTEN CEDAR;
S 84°35'04" W, FOR A DISTANCE OF 173.30 FEET TO FENCE CORNER PK FOUND;
S 6°40'35" W, FOR A DISTANCE OF 1187.64 FEET TO A POINT;
S 4°03'46" W, FOR A DISTANCE OF 112.89 FEET TO A 26" CEDAR;
S 12°22'22" W, FOR A DISTANCE OF 465.96 FEET TO A 1" PIPE FOUND;

THENCE, WITH THE WEST BOUNDARY OF BLACKBURN AND CONTINUING TO THORNTON, THE FOLLOWING CALLS:

S 8°47'49" W, FOR A DISTANCE OF 411.13 FEET TO 1" PIPE FOUND;

THENCE, WITH THE WEST BOUNDARY THORNTON, THE FOLLOWING CALLS:

S 13°08'41" W, FOR A DISTANCE OF 759.59 FEET TO 1" PIPE FOUND;
S 21°10'50" W, FOR A DISTANCE OF 265.00 FEET TO 1" PIPE FOUND AT THE SOUTHWEST CORNER OF THORNTON;

THENCE, WITH THE NORTH BOUNDARY OF JOHNSON, THE FOLLOWING CALLS:

N 82°44'49" W, FOR A DISTANCE OF 800.97 FEET TO 1" PIPE FOUND;
N 78°43'22" W, FOR A DISTANCE OF 130.34 FEET TO 1" PIPE FOUND;

THENCE, WITH THE WEST BOUNDARY OF JOHNSON, THE FOLLOWING CALLS:

S 5°33'34" W, FOR A DISTANCE OF 375.75 FEET TO 1" PIPE FOUND;
S 4°27'28" W, FOR A DISTANCE OF 508.55 FEET TO A POINT;
S 5°35'19" W, FOR A DISTANCE OF 523.31 FEET TO 5/8" IRON PIN FOUND AT THE SOUTHWEST CORNER OF THORNTON;

THENCE, WITH THE NORTH BOUNDARY OF IRON BRIDGE ROAD RIGHT-OF-WAY, THE FOLLOWING CALLS:

N 82°45'55" W, FOR A DISTANCE OF 501.29 FEET TO AN 5/8" IRON PIN FOUND;
N 82°46'22" W, FOR A DISTANCE OF 525.64 FEET TO RAILROAD SPIKE PK FOUND;
N 83°23'15" W, FOR A DISTANCE OF 396.04 FEET TO 5/8" IRON PIN FOUND AT SOUTHEAST CORNER OF MATTHEWS;

THENCE, WITH THE EAST BOUNDARY OF MATHEWS, HARRIS AND DUCK RIVER, THE FOLLOWING CALLS:

N 8°06'23" E, FOR A DISTANCE OF 864.54 FEET TO 1/2" IRON PIN FOUND;
N 16°56'08" E, FOR A DISTANCE OF 478.23 FEET TO A POINT;
N 48°48'57" E, FOR A DISTANCE OF 312.04 FEET TO A POINT;
N 44°09'56" E, FOR A DISTANCE OF 600.70 FEET TO A POINT;
N 36°27'00" E, FOR A DISTANCE OF 305.02 FEET TO A POINT;
N 27°21'22" E, FOR A DISTANCE OF 284.82 FEET TO A POINT;
N 26°51'08" E, FOR A DISTANCE OF 301.40 FEET TO 1" PIPE FOUND;

N 15°43'20" W, FOR A DISTANCE OF 197.42 FEET TO A POINT;
N 16°27'24" W, FOR A DISTANCE OF 744.16 FEET TO A POINT;
N 21°56'04" W, FOR A DISTANCE OF 031.16 FEET TO A POINT;
N 23°44'52" W, FOR A DISTANCE OF 409.10 FEET TO A POINT;
N 32°40'41" W, FOR A DISTANCE OF 286.98 FEET TO A POINT;
N 27°28'08" W, FOR A DISTANCE OF 932.36 FEET TO A POINT;

THENCE, DIRECTING RIGHT AWAY FROM CLICK RIVER TO THE SOUTH AND EAST BOUNDARY OF SEAGO, THE FOLLOWING CALLS:

N 85°09'29" E, FOR A DISTANCE OF 22.00 FEET TO A POINT;
N 81°22'35" E, FOR A DISTANCE OF 109.60 FEET TO A POINT;
S 87°39'25" E, FOR A DISTANCE OF 42.46 FEET TO 26" OAK;
N 46°08'47" E, FOR A DISTANCE OF 244.67 FEET TO A POINT;
N 46°58'39" E, FOR A DISTANCE OF 291.18 FEET TO 10" HACKBERRY AND 8" CEDAR;
N 49°46'28" E, FOR A DISTANCE OF 367.28 FEET TO 1" PIPE FOUND;
N 55°27'24" W, FOR A DISTANCE OF 350.42 FEET TO A POINT;
N 28°16'29" W, FOR A DISTANCE OF 411.36 FEET TO A 1" PIPE FOUND;
N 71°17'50" E, FOR A DISTANCE OF 220.64 FEET TO AN IRON PIN FOUND;
N 39°56'42" W, FOR A DISTANCE OF 228.86 FEET TO AN IRON PIN FOUND;
N 16°17'40" E, FOR A DISTANCE OF 158.31 FEET TO A POINT;
N 24°10'55" E, FOR A DISTANCE OF 52.03 FEET TO A POINT;
N 27°26'49" E, FOR A DISTANCE OF 28.14 FEET TO 1" PIPE IRON PIPE;
N 19°40'08" E, FOR A DISTANCE OF 57.72 FEET TO A 12" CEDAR;
N 30°13'56" E, FOR A DISTANCE OF 123.71 FEET TO A POINT;
N 32°10'27" E, FOR A DISTANCE OF 87.89 FEET TO A POINT;
N 33°44'57" E, FOR A DISTANCE OF 105.82 FEET TO 1" PIPE FOUND;
N 3°11'17" W, FOR A DISTANCE OF 118.30 FEET TO A POINT AT THE NORTHEAST CORNER OF SEAGO AND THE CENTER OF BEAR CREEK;

THENCE, ALONG BEAR CREEK AND SOUTHERN BOUNDARY OF MIKES BIKES, THE FOLLOWING CALLS

N 75°48'45" E, FOR A DISTANCE OF 280.14 FEET TO A POINT;
N 85°23'51" E, FOR A DISTANCE OF 281.90 FEET TO A POINT AT THE SOUTHEAST CORNER OF BIKES;

THENCE, ALONG SOUTH BOUNDARY OF GOODMAN, N 83°42'14" E, 199.86 FEET TO A POINT;

THENCE, CREATING A NEW LINE FOR THE ANNEXATION OF 409.92 ACRES. THE FOLLOWING CALLS:

N 84°40'48" E, FOR A DISTANCE OF 385.89 FEET TO A POINT;
N 75°36'41" E, FOR A DISTANCE OF 141.99 FEET TO A POINT;
N 83°11'05" E, FOR A DISTANCE OF 28.87 FEET TO A POINT AT AN INTERSECTION OF MCKAY BRANCH
CONTINUING ALONG MCKAY BRANCH AND CREATING A NEW LINE FOR THE ANNEXATION OF 409.92 ACRES. THE FOLLOWING CALLS:
S 7°51'27" E, FOR A DISTANCE OF 201.23 FEET TO A POINT;
S 85°15'03" E, FOR A DISTANCE OF 74.45 FEET TO A POINT;
S 61°08'47" E, FOR A DISTANCE OF 61.78 FEET TO A POINT;
S 58°09'42" E, FOR A DISTANCE OF 42.46 FEET TO A POINT;
S 61°12'54" E, FOR A DISTANCE OF 88.37 FEET TO A POINT;
S 45°49'08" E, FOR A DISTANCE OF 65.41 FEET TO A POINT;
S 39°48'13" E, FOR A DISTANCE OF 73.31 FEET TO A POINT;

THENCE, LEAVING MCKAY BRANCH AND CREATING A NEW LINE FOR THE ANNEXATION OF 409.92 ACRES. THE FOLLOWING CALLS:

NORTHEASTERLY ALONG A CURVE THROUGH A CENTRAL ANGLE OF 38°33'55", AN ARC DISTANCE OF 380.30 FEET TO A POINT OF TANGENCY, SAID CURVE IS CONCAVE NORTHWESTERLY AND HAS A RADIUS OF 565.50 FEET, CHORD BEARING N 24°33'52" E WITH A CHORD DISTANCE OF 373.16 FEET TO A POINT OF TANGENCY;
N 05°15'54" E, 84.04 FEET TO THE POINT OF BEGINNING CONTAINING 409.92 ACRES (17,855,971 SQ FT.) AND BEING A PORTION OF THE PROPERTY SHOWN ON TAX MAP 90 PARCEL 12.01 CONVEYED TO BIG BEAR BLUFFS, LLC BY DEED OF RECORD IN BOOK R2827, PAGE 287 IN THE REGISTER'S OFFICE OF MAURY COUNTY, TENNESSEE.

ANNEXATION AND REZONING REQUEST:

REQUEST TO ANNEX +/-409.92 ACRES AND REZONE TO PUD-R
FUTURE LAND USE: SUBURBAN NEIGHBORHOOD

CONNECT COLUMBIA FINDINGS:
Annexation should provide for a continuation of orderly, planned development of the City. Lot sizes and development scale should be compatible with surrounding development. If proposed development abuts land that is undeveloped or has low density/intensity, the density and intensity of the proposed development should taper towards the periphery to provide compatibility of the development pattern. Land annexed into the City should follow the transect and Character Area Matrix to provide the most appropriate land uses and zoning for the newly annexed land.
Response: The proposed Columbia Bluffs subdivision is 2 miles from the downtown core. Density and lot size transitions from higher density/intensity at the north, along the Bear Creek Parkway corridor to the south, where a more rural character is appropriate adjacent to Iron Bridge Rd and the Yanahli Park. The properties along Bear Creek Parkway have been identified as "area of change." With the development along this corridor, residential development in close proximity to downtown and new commercial development along Tom Hitch Parkway is a logical progression of development pattern.

Connectivity, directly through street, sidewalks, bikeways, greenways, and trails, and indirectly, through a mixture of housing and business types, should be encouraged throughout Columbia..
Response: In addition to roadway and sidewalk connections, Columbia Bluffs proposes nature trails through out the property. The development will also provide a roadway connection between Bear Creek Parkway and Iron Bridge Road. A variety of housing types are proposed, including an age restricted Active Adult neighborhood.

Suburban Neighborhood: Future development should emphasize connectivity and housing diversity.
Response: Columbia Bluffs proposes a variety of housing styles
Near-term Priorites: HOUSING MIX/TYPES: Promote mastered planned housing opportunities for a "full-life cycle" community to accommodate retirees and young professionals. Review Zoning standards to permit smaller lot and home sizes to encourage such developments.

MODIFICATIONS FROM STANDARD PUD-R ZONING REQUEST:

RESIDENTIAL LOT DIAGRAMS: SEE SHEET C2.6
1. ACTIVE ADULT AND PRIMARY ALLEY LOADED HOMES SIDE-SETBACK REDUCED TO 5'.
2. OTHER PRIMARY RESIDENTIAL SIDE-SETBACK REDUCED TO 7.5'.
3. ACTIVE ADULT, COURTYARD, AND LARGE LOT GARAGE LOCATED IN 2ND LAYER
4. ACTIVE ADULT, COURTYARD, AND LARGE LOT ALLOWED DOUBLE CAR GARAGE DOORS, WITH A MAXIMUM WIDTH OF 16'
5. ACTIVE ADULT DRIVEWAYS TO BE 18' IN FIRST LAYER.
6. COURTYARD AND LARGE LOT DRIVEWAY TO BE 12' IN FIRST LAYER.

THOROUGHFARE STANDARDS:
1. UTILIZATION OF MODIFIED ROWS INSTEAD OF 70' URBAN NEIGHBORHOOD ROW. SEE C2.7.

CIVIC SPACE:
1. ACTIVE ADULT NEIGHBORHOOD TO BE EXCLUDED FROM REQUIRED PLAYGROUND CRITERIA.
2. CIVIC SPACES B, F, AND J ALLOWED TO HAVE LESS THAN 50% OF CIVIC SPACE PERIMETER ALONG A THOROUGHFARE.

ARCHITECTURE:
3. WINDOW SILL HEIGHT REQUIRED TO BE 5' ABOVE AVERAGE GRADE AT FACADE REDUCED TO 3' ABOVE AVERAGE GRADE FOR ACTIVE ADULT HOMES AND COURTYARD HOMES.
4. ACTIVE ADULT HOMES NOT REQUIRED TO HAVE FFE 2.5 FEET ABOVE FINISHED GRADE IN ORDER TO ACCOMMODATE ADA ACCESS.

PROJECT DESCRIPTION AND SITE DATA:

REQUEST TO ANNEX AND REZONE THE COLUMBIA BLUFFS PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN.

THE PUD-R PLAN PROPOSES AN ENVIRONMENTALLY SENSITIVE MASTER PLAN FOR A DIVERSE RESIDENTIAL DEVELOPMENT. APPROXIMATELY ONE-THIRD OF THE PROPOSED DEVELOPMENT IS RESERVED FOR ACTIVE ADULT/AGE RESTRICTED SINGLE-FAMILY HOMES. ADDITIONALLY, TOWN HOMES AND A VARIETY OF DETACHED SINGLE-FAMILY HOMES ARE PROPOSED.

IN ADDITION TO THE RESIDENTIAL COMPONENT, THE PUD-R PLANS PROPOSES A DAY CARE FACILITY AND A VARIETY OF NEIGHBORHOOD AMENITIES.

TOTAL SITE AREA: 409.92 ACRES
FUTURE LAND USE: SUBURBAN NEIGHBORHOOD

TOTAL AREA OF ROWS/ALLEY EASEMENTS: 62.9 AC; 15% OF GROSS AREA
OPEN SPACE: 199.3 AC; 48% OF GROSS AREA
ESTIMATED SITE ISR: 51%

TOTAL DWELLING UNITS: 836 HOMES
OVERALL SITE DENSITY: 2.04 DUA

RESIDENTIAL BREAKDOWN		NON RESIDENTIAL
ACTIVE ADULT HOMES:	299	DAYCARE 12,000 - 14,000 SF
TOWNHOMES:	166	RECREATION FACILITY LOT - 75,789 SF
ALLEY SINGLE-FAMILY:	146	
COURTYARD HOMES:	103	
LARGE LOT HOMES:	122	

EXISTING TREE CANOPY COVERAGE: 262.2 ACS; 64% OF TOTAL SITE
REQUIRED TREE CANOPY RETENTION: 36%; SEE SHEET C2.8

TOTAL OPEN SPACE PROVIDED: 199.3 AC; 48% OF GROSS SITE AREA
OPEN SPACE BREAKDOWN
CIVIC SPACE: 22.8 AC
ENVIRONMENTAL PROTECTION (FLOODWAY, STREAM/BUFFERS, 100 YR FLOOD PLAIN): 75.0 AC
ALL OTHER OPEN SPACE: 101.5 AC

CIVIC SPACE REQUIRED: 5% MINIMUM; 20.5 AC
CIVIC SPACE PROVIDED: 5.4%; 22.2 AC (SEE SHEET L1.0)

PARKING: SEE LOT DIAGRAMS (C2.6) FOR PROPOSED RESIDENTIAL PARKING;
AND SHEETS L1.0-L1.6 FOR CIVIC SPACE PARKING
RESIDENTIAL: 2 PARKING SPACES PER UNIT
DAYCARE: 1 PER STAFF + 0.5 PER CHILD
CIVIC SPACE: 1 PER 5,000 SF

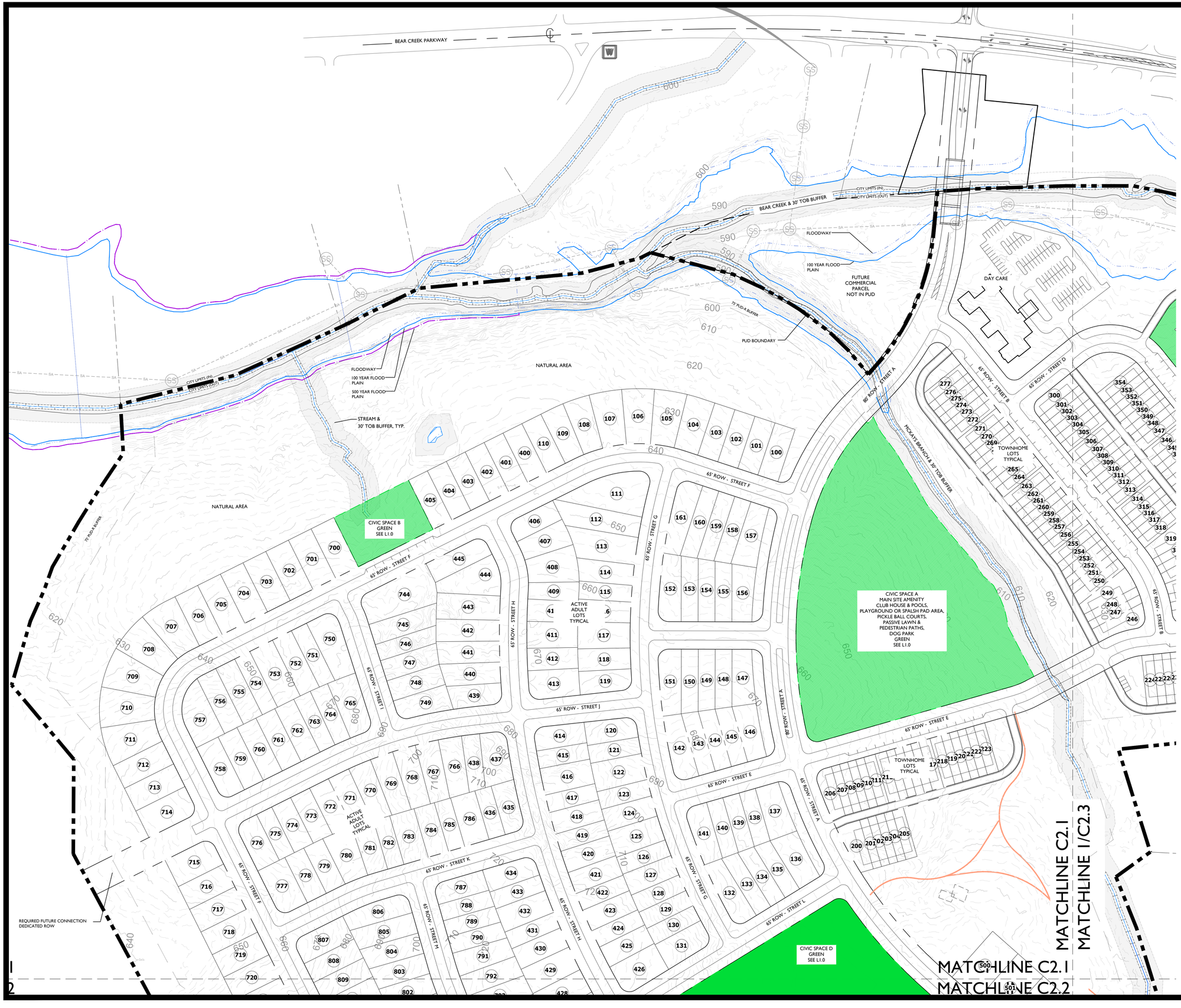
GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT 12.18.23

Date: October 16, 2023
Revision Date
1 December 18, 2023
2
3

OVERALL PUD-R PMDP
SHEET
C2.0



GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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500 YEAR FLOOD PLAIN
100 YEAR FLOOD PLAIN
CIVIC SPACE (SEE SHEET L1.0)
PAVED TRAIL (TO BE FIELD LOCATED)
PRIMITIVE TRAIL (TO BE FIELD LOCATED)

OVERALL CONCEPT DEVELOPMENT PLAN

N

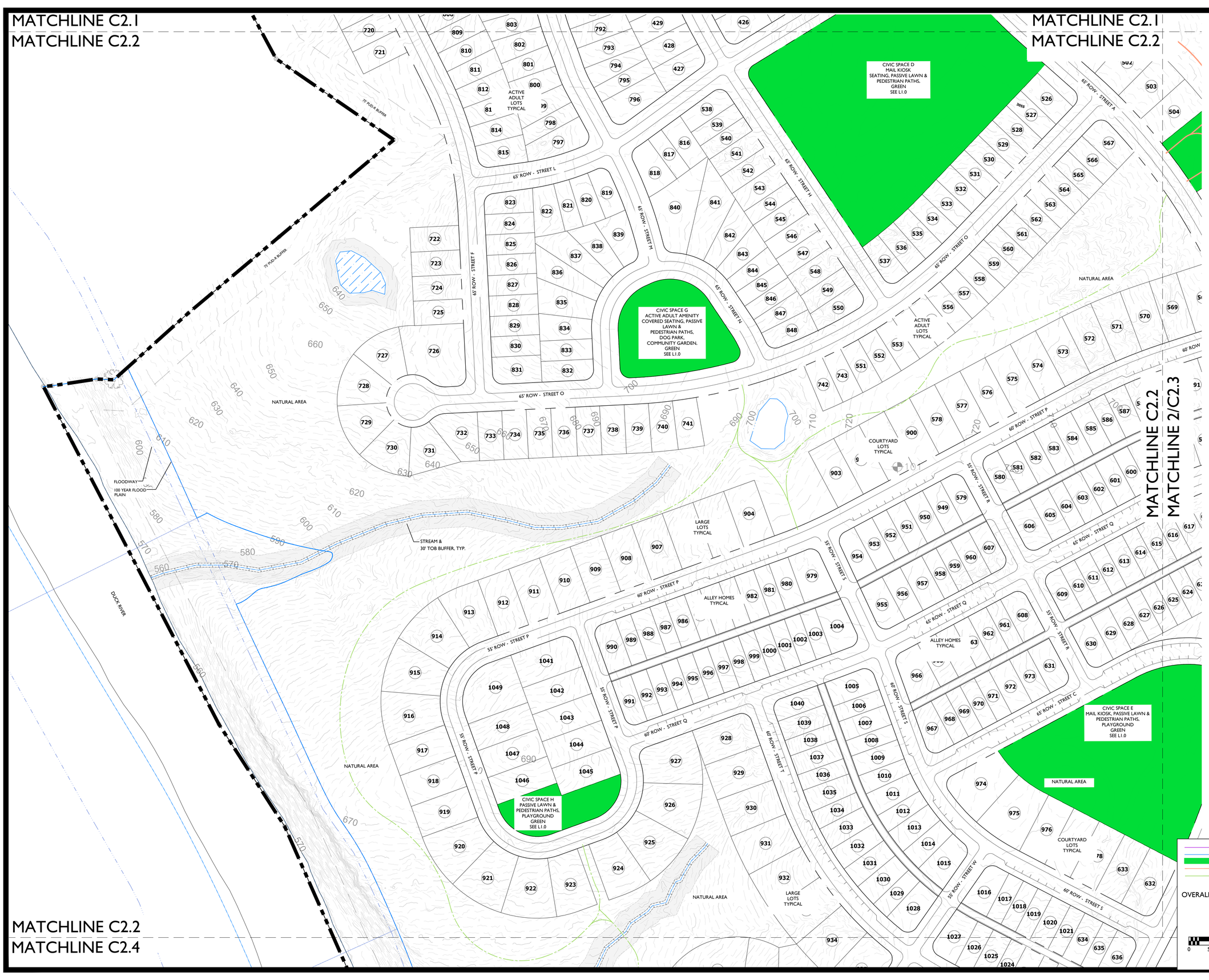
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GRAPHIC SCALE 1"=100'-0"

ENLARGED PUD-R PMDP

SHEET

C2.1

MATCHLINE C2.1
MATCHLINE C2.2



MATCHLINE C2.2
MATCHLINE C2.4

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

MATCHLINE C2.2
MATCHLINE 2/C2.3

JEFFREY A. ROSS
REGISTERED LANDSCAPE ARCHITECT
12.18.23

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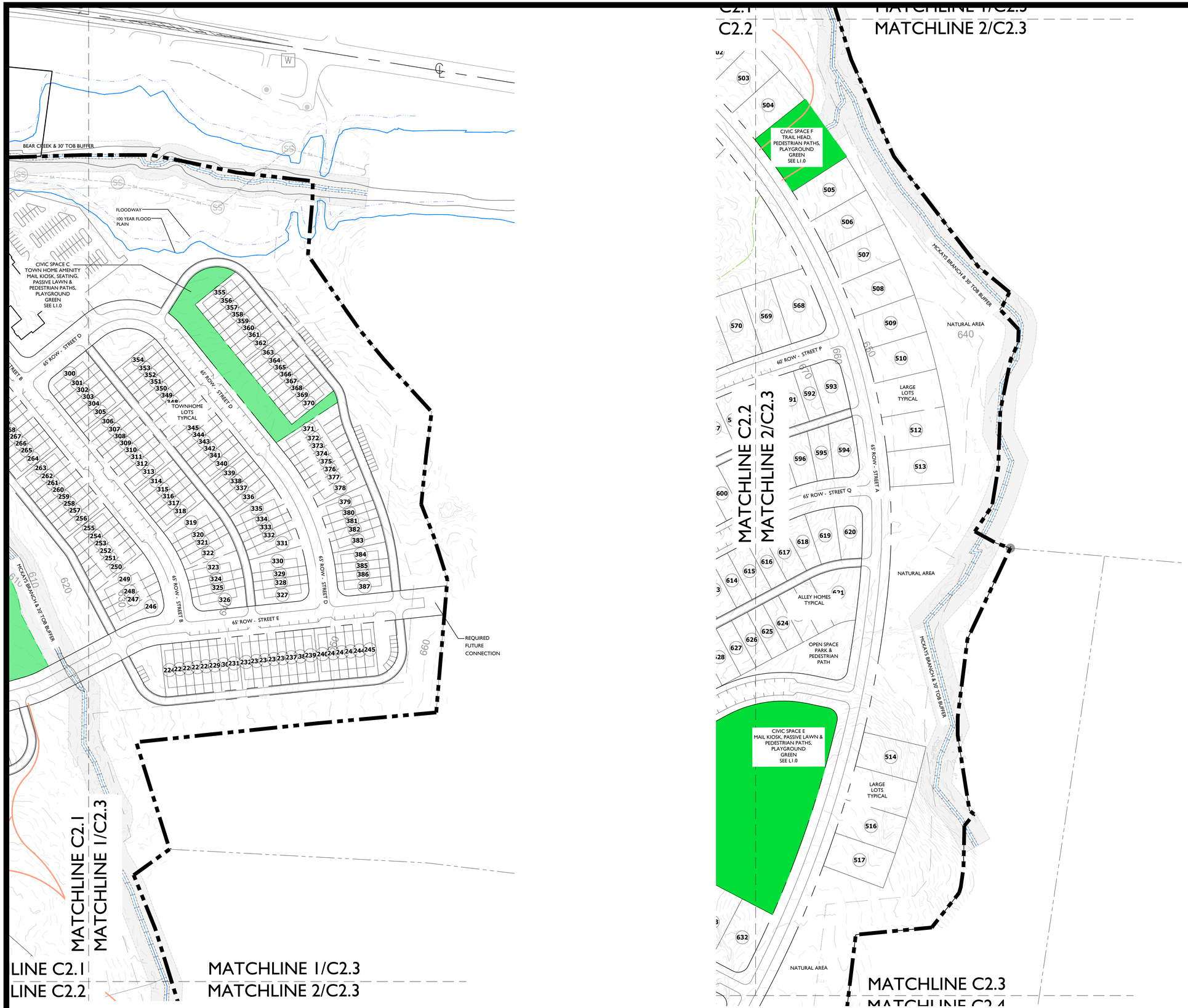
500 YEAR FLOOD PLAIN
100 YEAR FLOOD PLAIN
CIVIC SPACE (SEE SHEET L1.0)
PAVED TRAIL (TO BE FIELD LOCATED)
PRIMITIVE TRAIL (TO BE FIELD LOCATED)

OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300
GRAPHIC SCALE 1"=100'-0"

ENLARGED PUD-R PMDP
SHEET
C2.2



GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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JEFFREY A. ROSS
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STATE OF TENNESSEE
12.18.23

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500 YEAR FLOOD PLAIN
100 YEAR FLOOD PLAIN
CIVIC SPACE (SEE SHEET L1.0)
PAVED TRAIL (TO BE FIELD LOCATED)
PRIMITIVE TRAIL (TO BE FIELD LOCATED)

OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300
GRAPHIC SCALE 1"=100'-0"

ENLARGED
PUD-R PMDP

SHEET
C2.3

MATCHLINE C2.3
MATCHLINE C2.4

NATURAL AREA
75' RIDGE & BUFFER
FLOODWAY
100 YEAR FLOOD PLAIN
DUCK RIVER
LARGE LOTS TYPICAL
55' ROW - STREET W
60' ROW - STREET T
65' ROW - STREET A
COURTYARD LOTS TYPICAL
DEDICATED ROW REQUIRED FUTURE CONNECTION
55' ROW - STREET V
OPEN SPACE
55' ROW - STREET U
55' ROW - STREET X
50' ROW - STREET U
55' ROW - STREET Y
OHE
100' TVA LINE AND EASEMENT
CIVIC SPACE I
MAIL KIOSK, SEATING, PASSIVE LAWN & PEDESTRIAN PATHS, PLAYGROUND GREEN
SEE L1.0
STREAM & 30' TOB BUFFER, TYP.

MATCHLINE C2.4
MATCHLINE C2.5

500 YEAR FLOOD PLAIN
100 YEAR FLOOD PLAIN
CIVIC SPACE (SEE SHEET L1.0)
PAVED TRAIL (TO BE FIELD LOCATED)
PRIMITIVE TRAIL (TO BE FIELD LOCATED)

OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300
GRAPHIC SCALE 1"=100'-0"

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
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12.18.23

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ENLARGED PUD-R PMDP

SHEET
C2.4

MATCHLINE C2.4
MATCHLINE C2.5

NATURAL AREA
DUCK RIVER
65' ROW - STREET A
55' ROW - STREET U
COURTYARD LOTS TYPICAL
LARGE LOTS TYPICAL
CIVIC SPACE J
TRAIL HEAD, SEATING, PASSIVE LAWN & PEDESTRIAN PATHS, GREEN
SEE LI.0
STREAM & 30' TOB BUFFER, TYP.
500 YEAR FLOOD PLAIN
FLOODWAY
100 YEAR FLOOD PLAIN
75' PUD-R BUFFER
RECREATIONAL FACILITIES
37.5' FROM CENTER LINE OF IRON BRIDGE ROAD ROW DEDICATION REQUIRED AT CORNER OF PROPERTY DUE TO STAFF REQUEST FOR ROW MINIMUM DISTANCE OF 37.5' FROM CENTERLINE

500 YEAR FLOOD PLAIN
100 YEAR FLOOD PLAIN
CIVIC SPACE (SEE SHEET L1.0)
PAVED TRAIL (TO BE FIELD LOCATED)
PRIMITIVE TRAIL (TO BE FIELD LOCATED)

OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300
GRAPHIC SCALE 1"=100'-0"

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
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ARCHITECT
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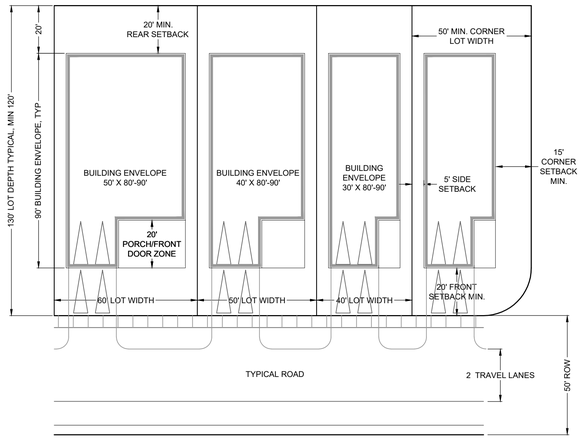
Revision Date
1 December 18, 2023
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ENLARGED PUD-R PMDP

SHEET
C2.5

ACTIVE ADULT/ AGE RESTRICTED DETACHED SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 40' X 120'; 50' X 120'; 60' X 120'

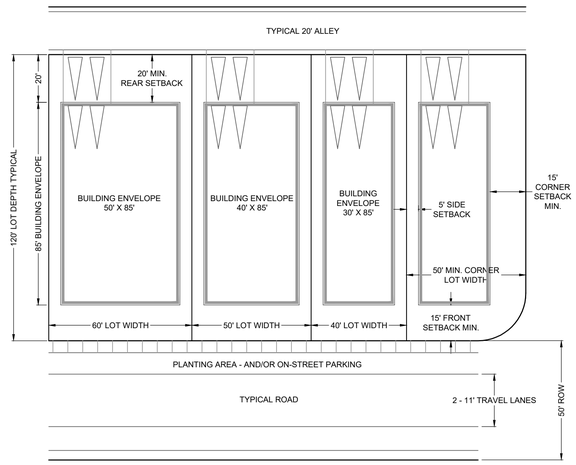
SETBACKS:	MODIFICATION REQUESTS:	LOT DISTRIBUTION:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 5' MIN. CORNER: 15' MIN. REAR: 20' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 5' GARAGE LOCATED IN 2ND LAYER DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16' DRIVEWAY TO BE 18' WIDE IN FIRST LAYER WINDOW SILL HEIGHT 3' ABOVE MIN. GRADE AT FACADE	60' LOTS: 61 50' LOTS: 141 40' LOTS: 97	60%



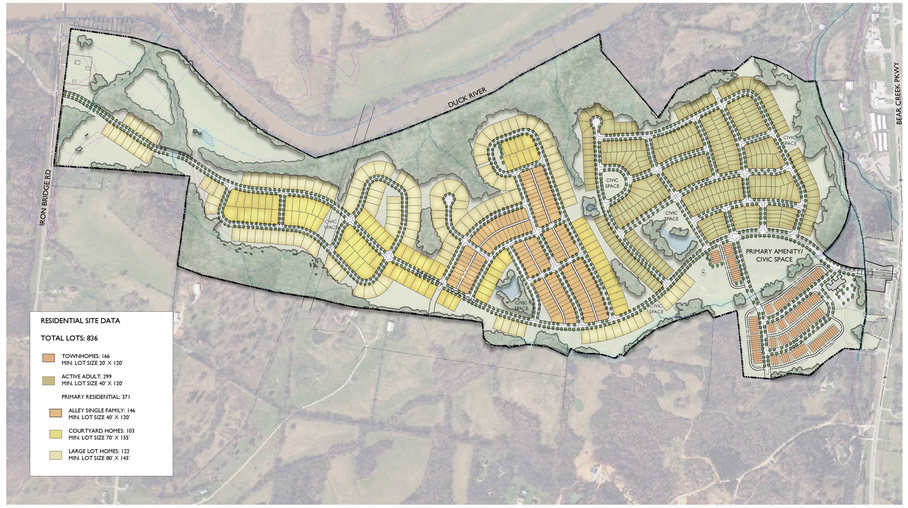
1 C2.6 ACTIVE ADULT LOT DIAGRAM N.T.S

PRIMARY RESIDENTIAL - ALLEY LOADED DETACHED SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 40' X 120'; 50' X 120'; 60' X 120'

SETBACKS:	MODIFICATION REQUESTS:	LOT DISTRIBUTION:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 5' MIN. CORNER: 15' MIN. REAR: 20' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 5'	50' LOTS: 68 40' LOTS: 78	63%



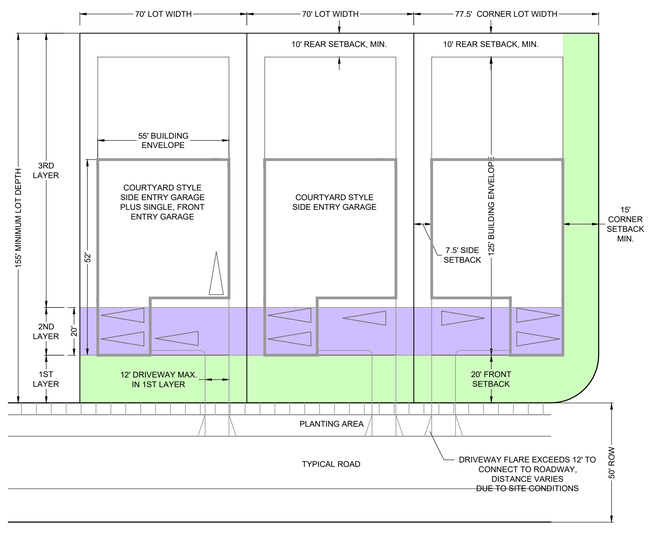
2 C2.6 SINGLE-FAMILY ALLEY LOT DIAGRAM N.T.S



3 C2.6 KEY MAP N.T.S

PRIMARY RESIDENTIAL COURTYARD SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 70' MIN. X 155'

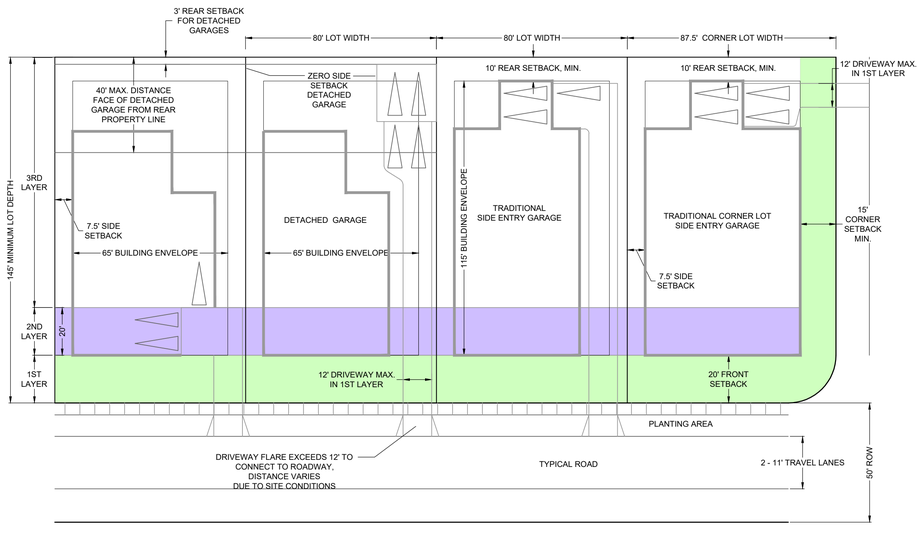
SETBACKS:	MODIFICATION REQUESTS:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 7.5' MIN. CORNER: 15' MIN. REAR: 10' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5' GARAGE LOCATED IN 2ND LAYER DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16' DRIVEWAY TO BE 12' WIDE IN FIRST LAYER WINDOW SILL HEIGHT 3' ABOVE FINISHED GRADE MIN.	30%



4 C2.6 COURTYARD HOME LOT DIAGRAM N.T.S

PRIMARY RESIDENTIAL LARGE LOT SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 80' MIN. X 145'

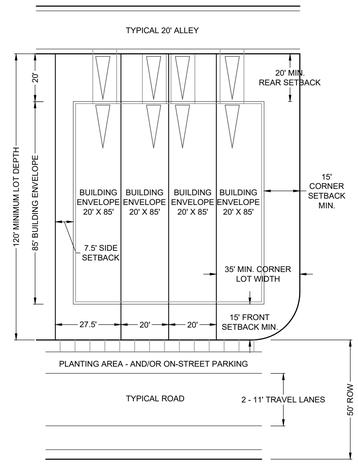
SETBACKS:	MODIFICATION REQUESTS:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 7.5' MIN. CORNER: 15' MIN. REAR: 10' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5' GARAGE LOCATED IN 2ND LAYER DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16' DRIVEWAY TO BE 12' WIDE IN FIRST LAYER	60%



5 C2.6 LARGE LOT HOME LOT DIAGRAM N.T.S

PRIMARY RESIDENTIAL ALLEY LOADED TOWN HOMES
TYPICAL INTERIOR LOT DIMENSIONS 20' MIN. X 120'
UNITS PER BUILDING: 4, 6, 7, OR 8

SETBACKS:	MODIFICATION REQUESTS:	TYPICAL ISR:
FRONT: 15' MIN. SIDE : 7.5' MIN. CORNER: 15' MIN. REAR: 20' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5'	80% INTERIOR UNITS



6 C2.6 TOWN HOME LOT DIAGRAM N.T.S

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT 12.18.23

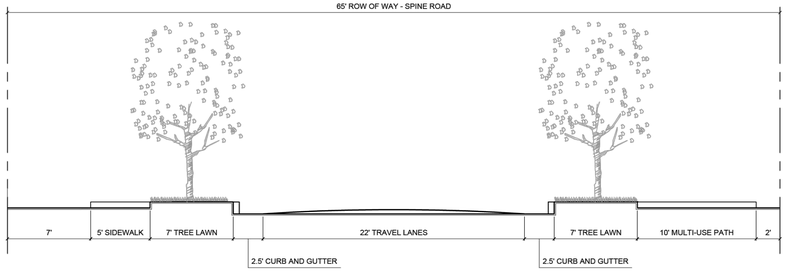
Date: October 16, 2023

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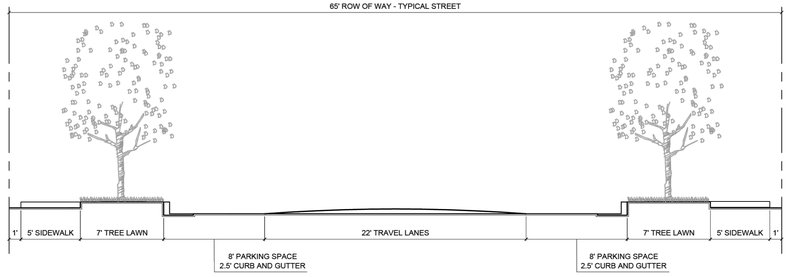
LOT DIAGRAMS

SHEET
C2.6

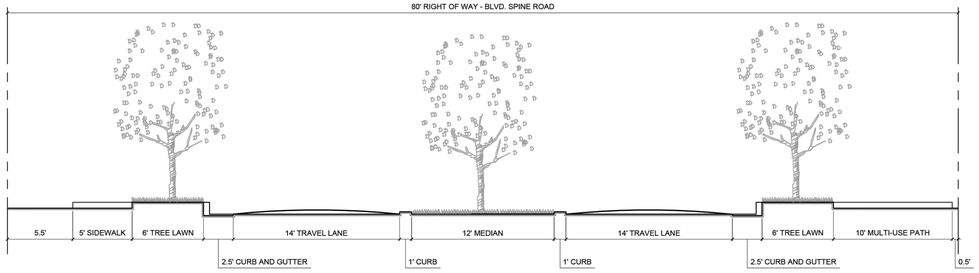
65' ROW OF WAY - SPINE ROAD



65' ROW OF WAY - TYPICAL STREET

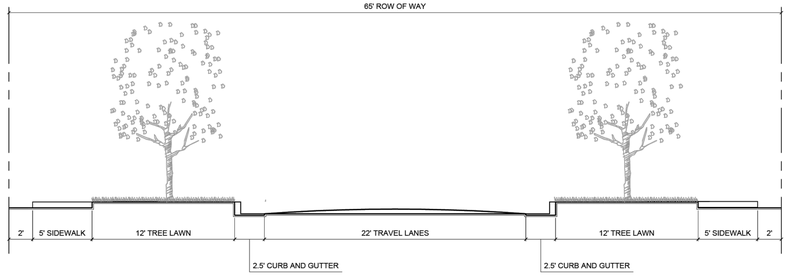


80' RIGHT OF WAY - BLVD. SPINE ROAD

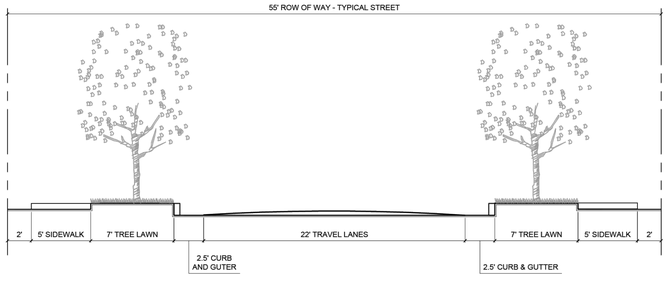


65' ROW - CD4 - NO PARKING

65' ROW OF WAY

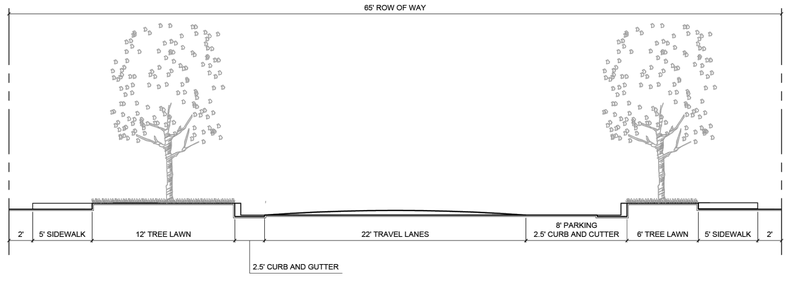


55' ROW OF WAY - TYPICAL STREET

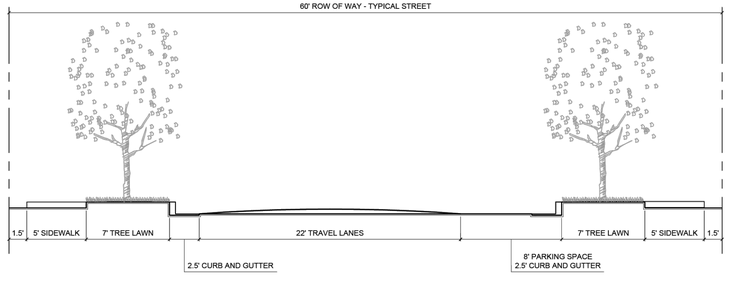


65' ROW - LOCAL CD4
WITH PARKING ONE SIDE

65' ROW OF WAY

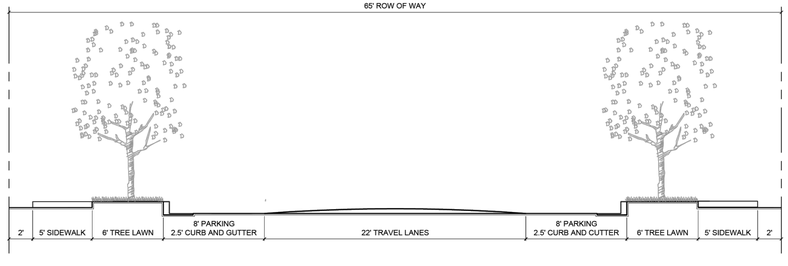


60' ROW OF WAY - TYPICAL STREET



65' ROW - LOCAL CD4
WITH PARKING ONE SIDE

65' ROW OF WAY



GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS
REGISTERED
LANDSCAPE
ARCHITECT
PP
12.18.23

Date: December 18, 2023

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△
△
△

LOT DIAGRAMS

SHEET
C2.7



SITE DATA:

EXISTING TREE CANOPY COVERAGE: 262.2 AC; 64% OF TOTAL SITE
REQUIRED TREE CANOPY RETENTION: 36%; 94.4 AC MIN
ESTIMATED PRESERVATION: 109.63 AC; 42%

ANTICIPATED PRESERVATION AREAS TO BE DETERMINED WITH FINAL GRADING/STORMWATER.

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
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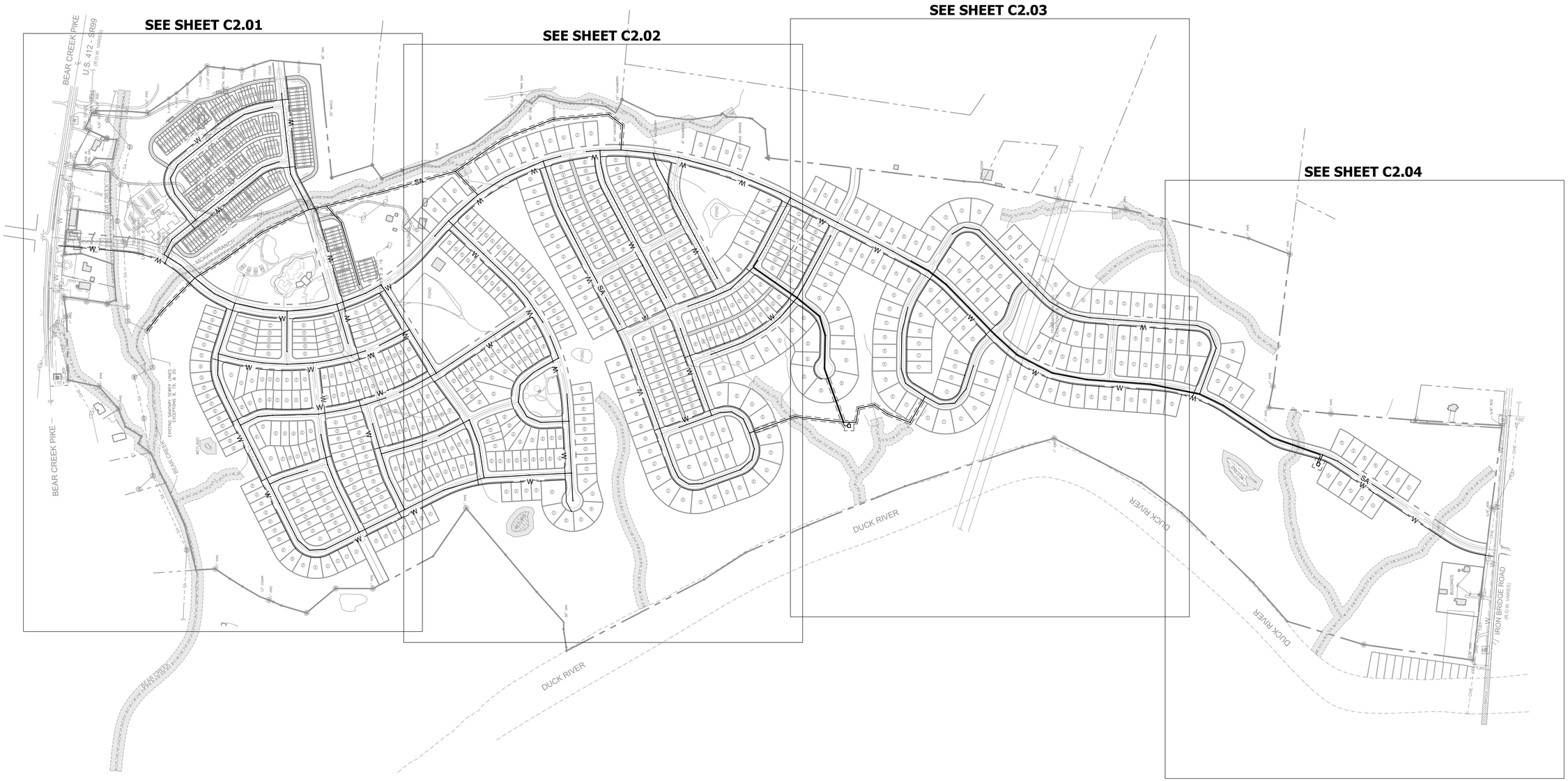
JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT 12.18.23

Date: October 16, 2023

Revision Date
1. December 18, 2023
2.
3.

OVERALL PUD-R PMDP

SHEET
C2.8



N

0 300 600
SCALE: 1"= 300'

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COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

INITIAL SUBMITTAL

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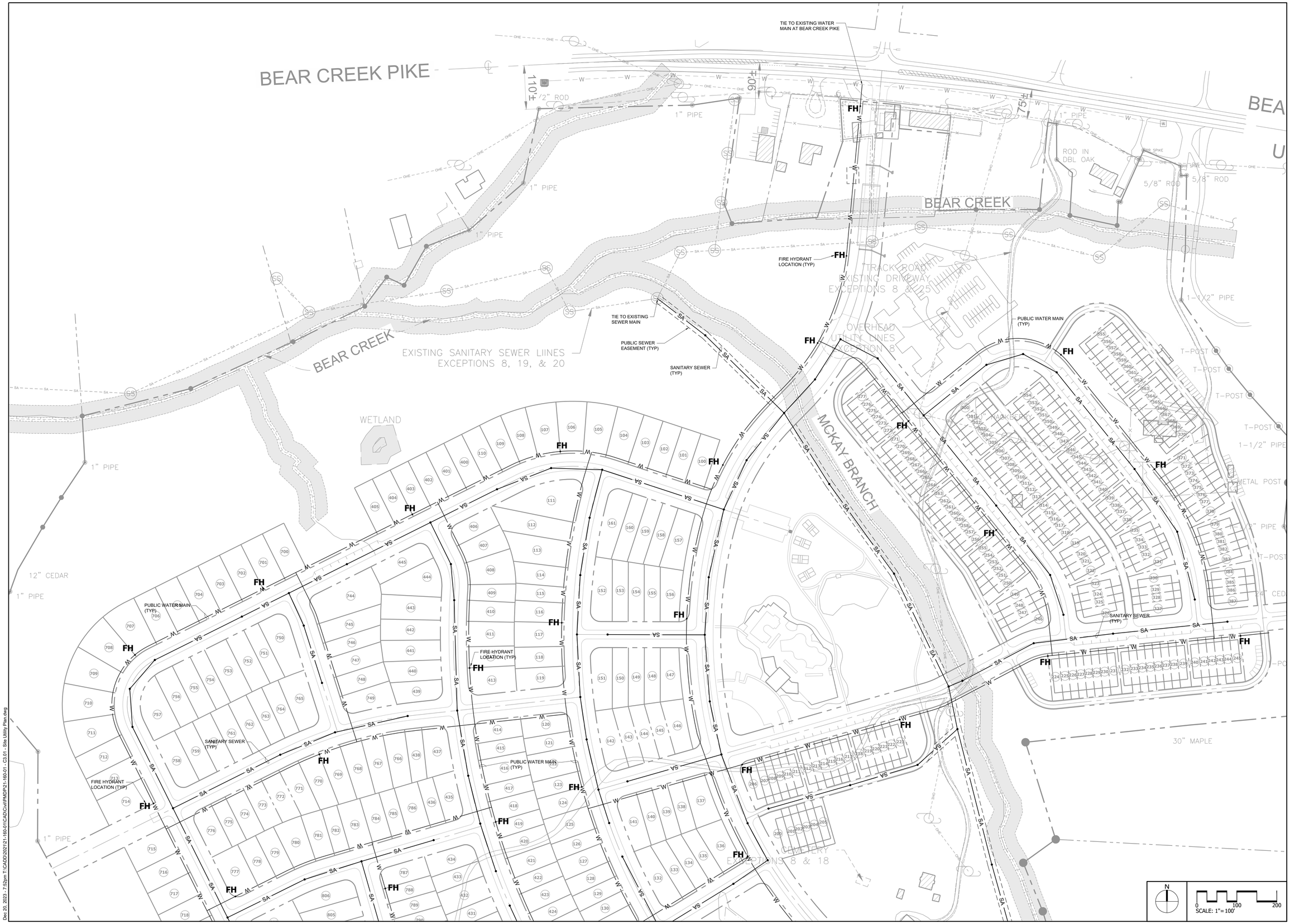
DRAWN BY: TWG
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OVERALL UTILITY PLAN

C3.00

PROJECT NO.: 21-160-01

Dec 20, 2023 - 7:52pm T:\CAD\20\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.00 - Overall Utility Plan.dwg



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SITE UTILITY PLAN

C3.01
PROJECT NO.: 21-160-01

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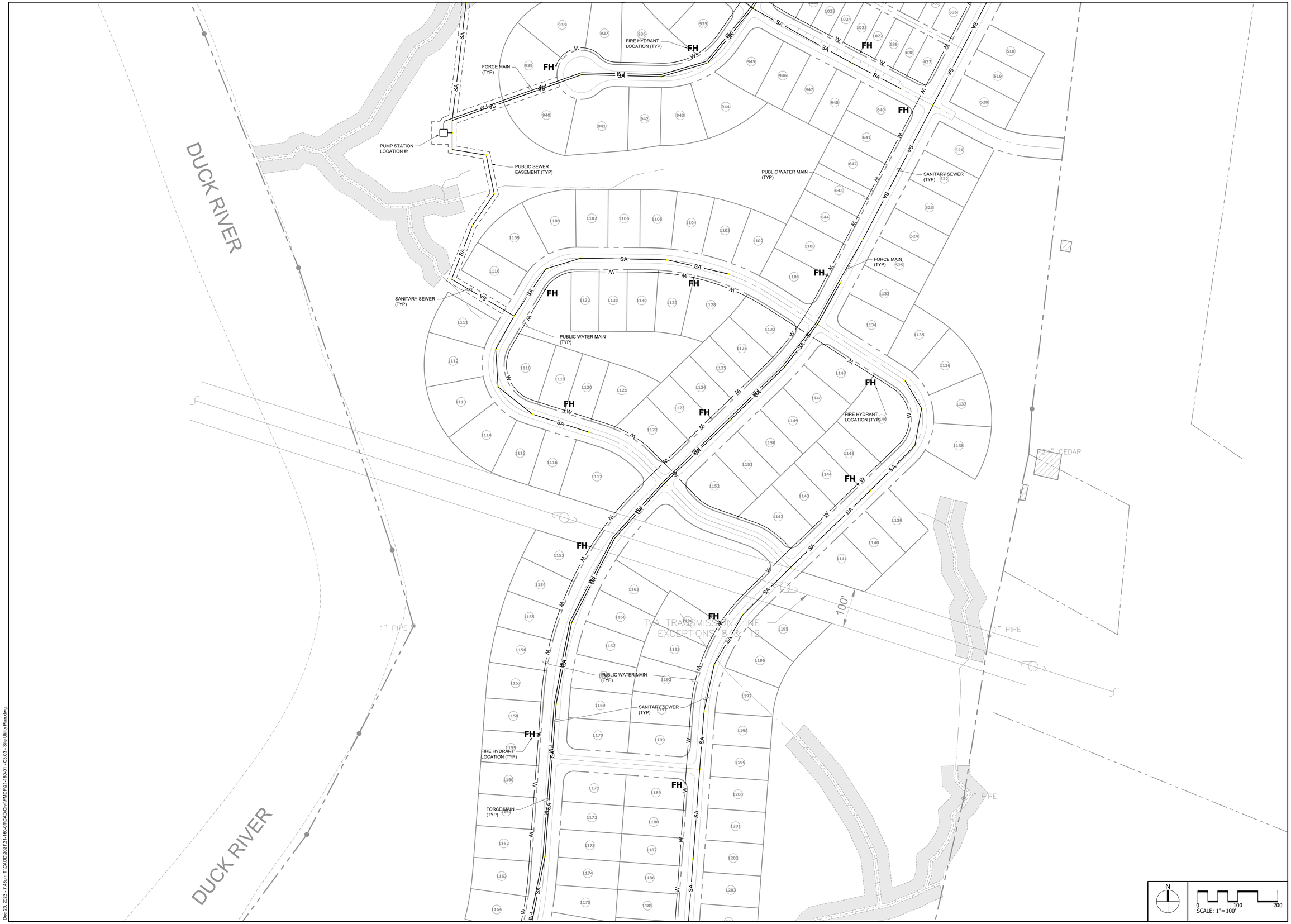
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SITE UTILITY PLAN

C3.02
PROJECT NO.: 21-160-01

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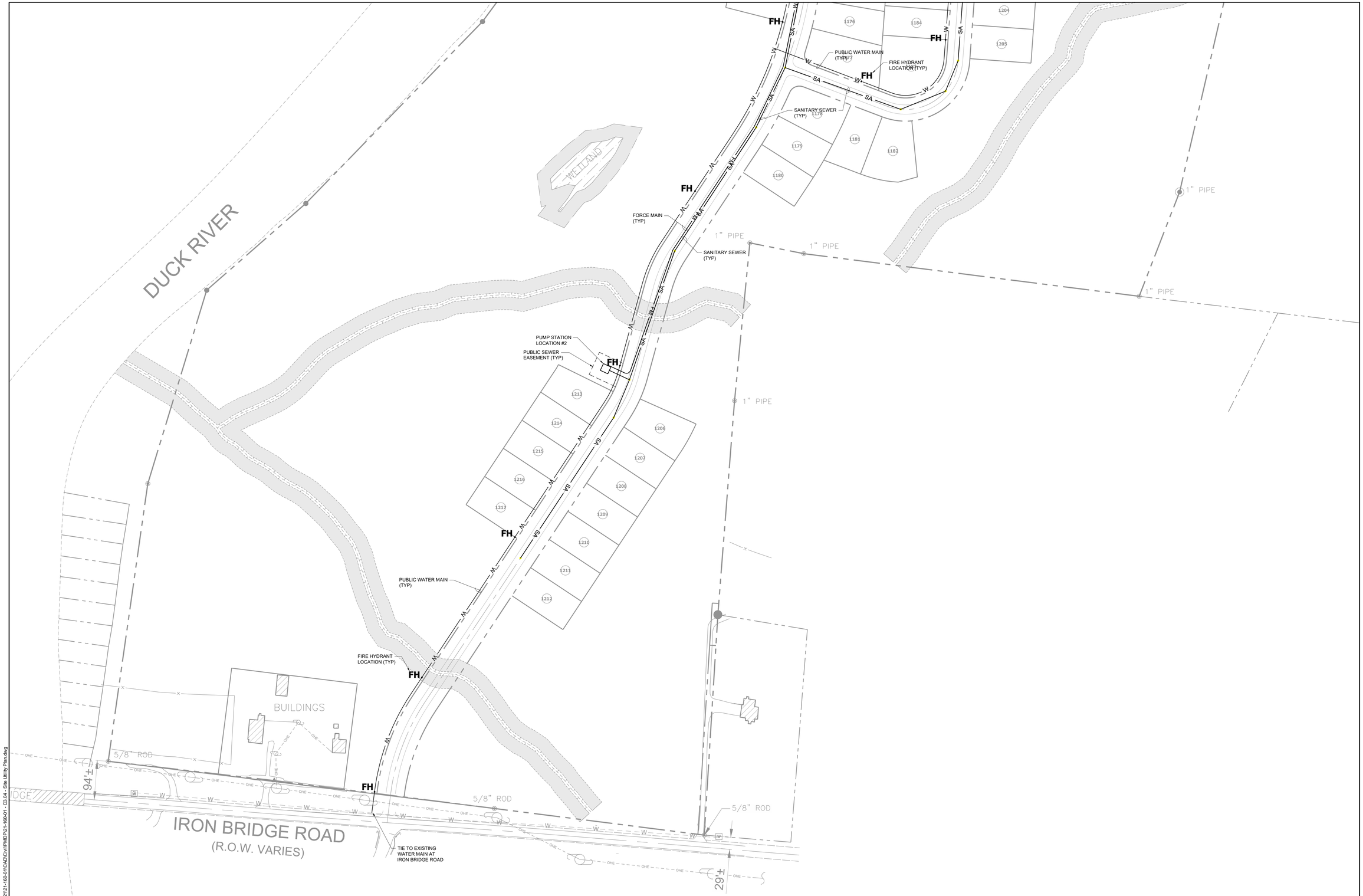
DRAWN BY: TWG
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SITE UTILITY PLAN

C3.03
PROJECT NO.: 21-160-01

N
0 100 200
SCALE: 1"= 100'

Dec 20, 2023 - 7:48pm T:\CAD\20\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.03 - Site Utility Plan.dwg



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SITE UTILITY PLAN

C3.04

PROJECT NO.: 21-160-01

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OVERALL GRADING & DRAINAGE PLAN

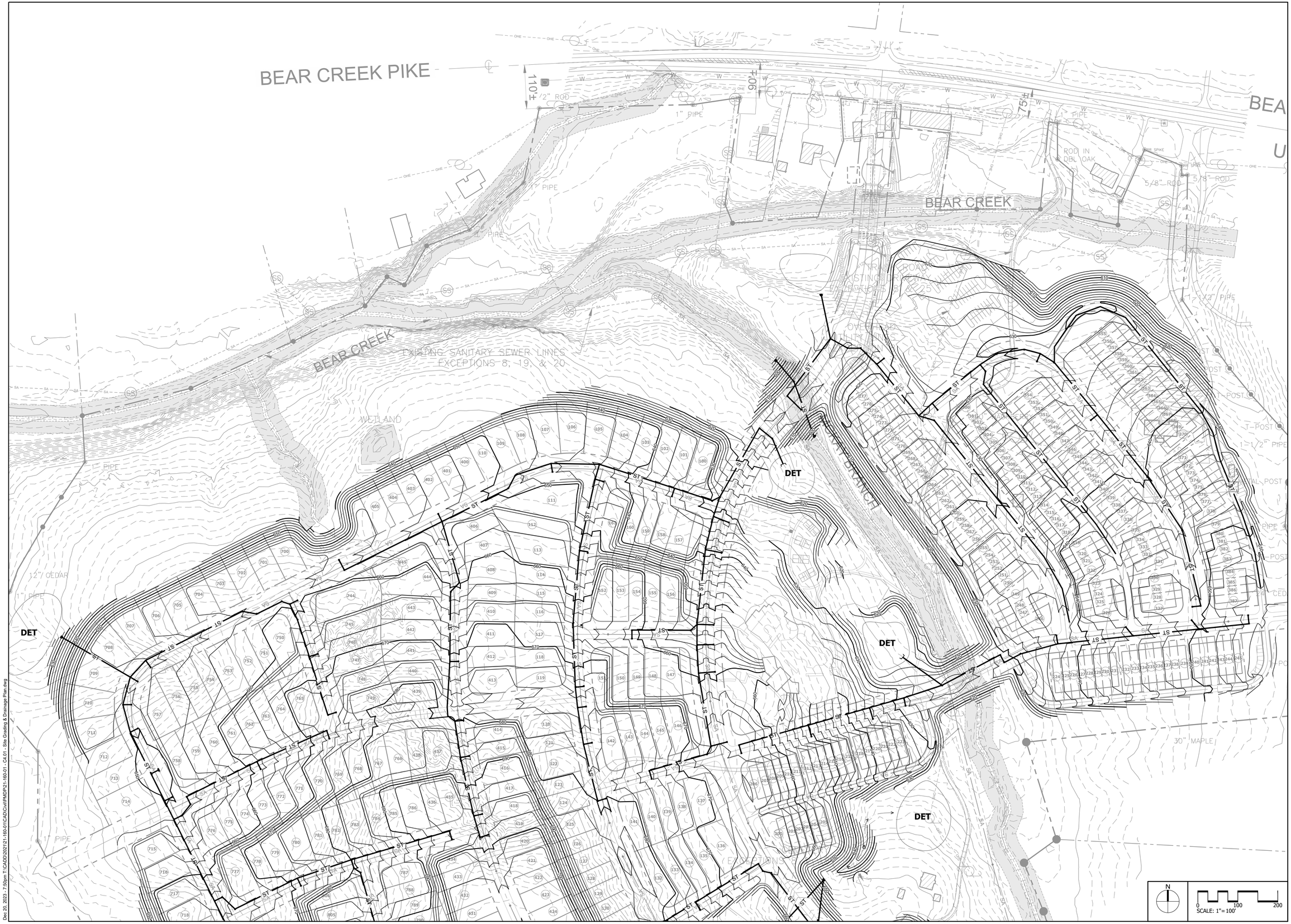
C4.00

PROJECT NO.: 21-160-01

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SCALE: 1"= 300'

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SITE GRADING & DRAINAGE PLAN

C4.01

PROJECT NO.: 21-160-01

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SITE GRADING & DRAINAGE PLAN

C4.02

PROJECT NO.: 21-160-01

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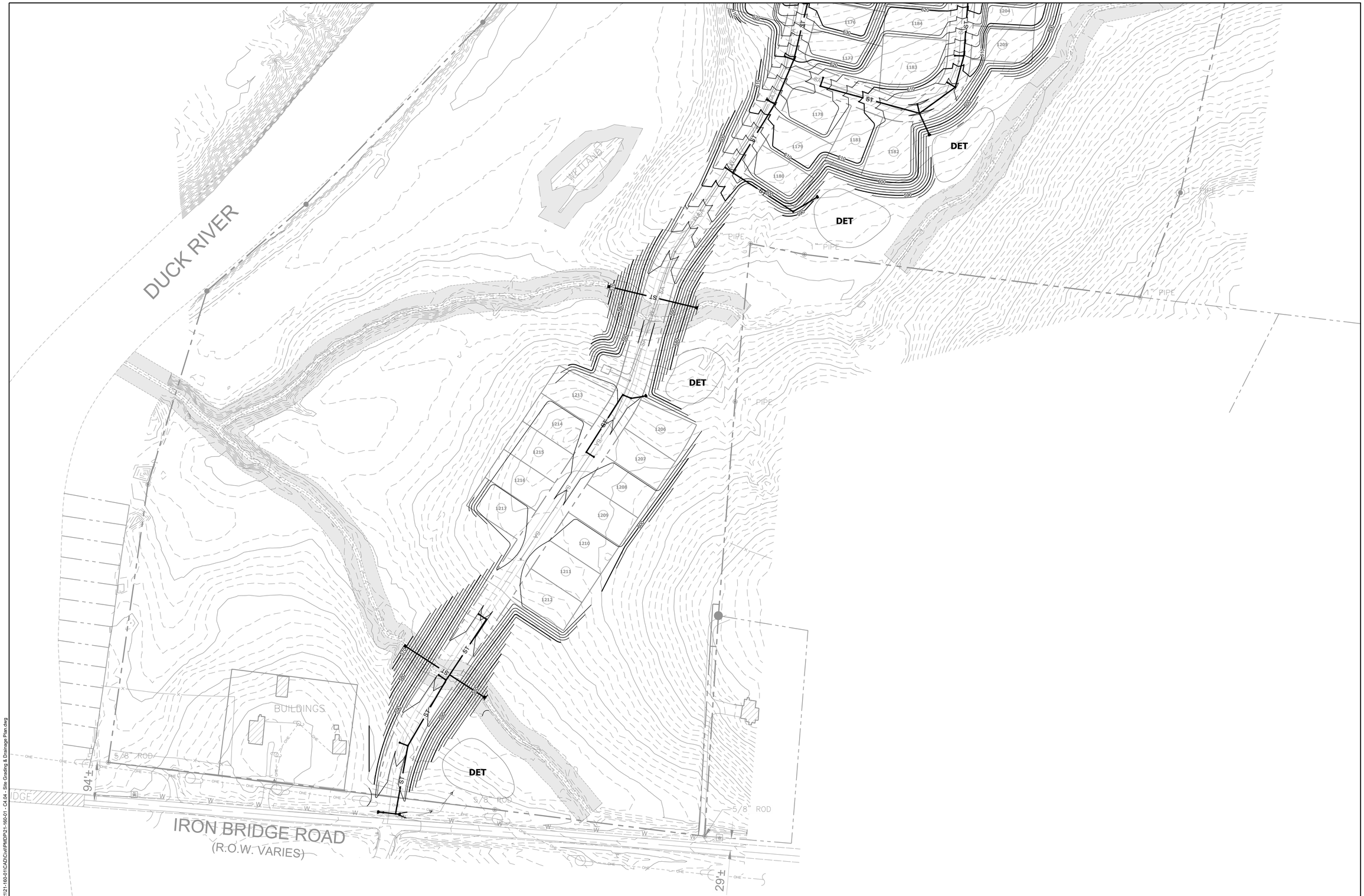
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SITE GRADING & DRAINAGE PLAN

C4.03

PROJECT NO.: 21-160-01

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SITE GRADING & DRAINAGE PLAN

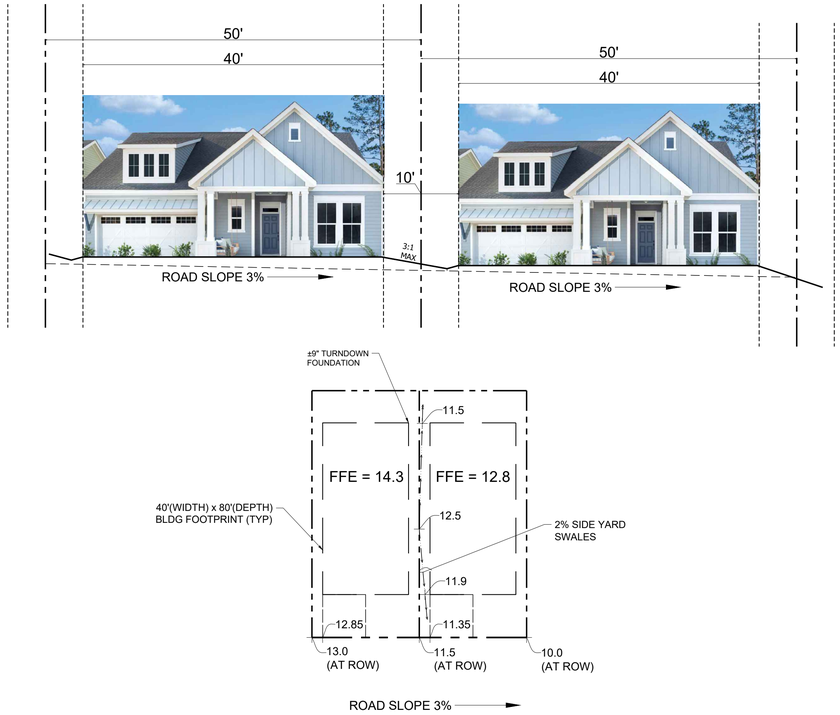
C4.04

PROJECT NO.: 21-160-01

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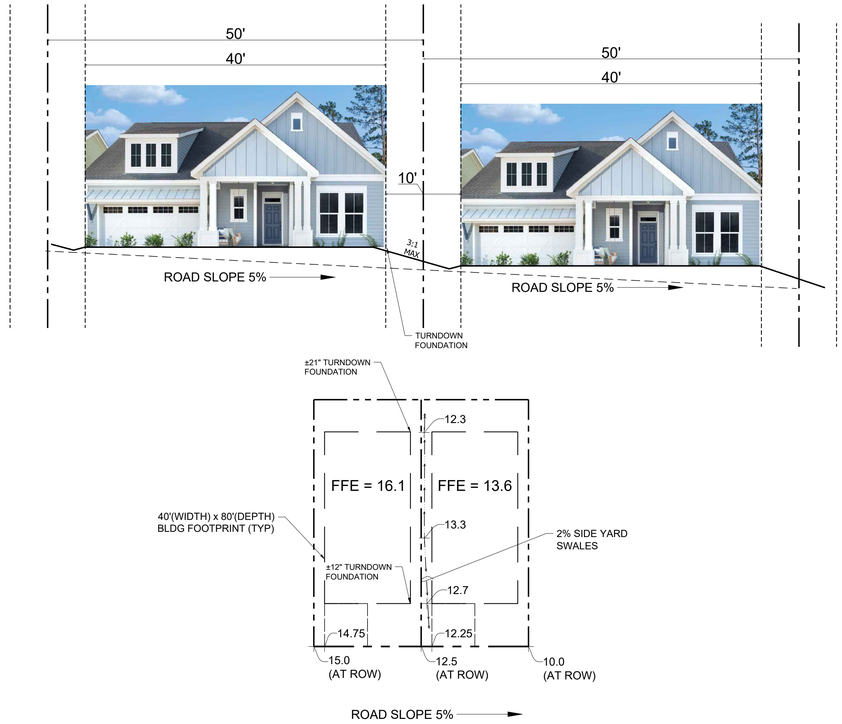
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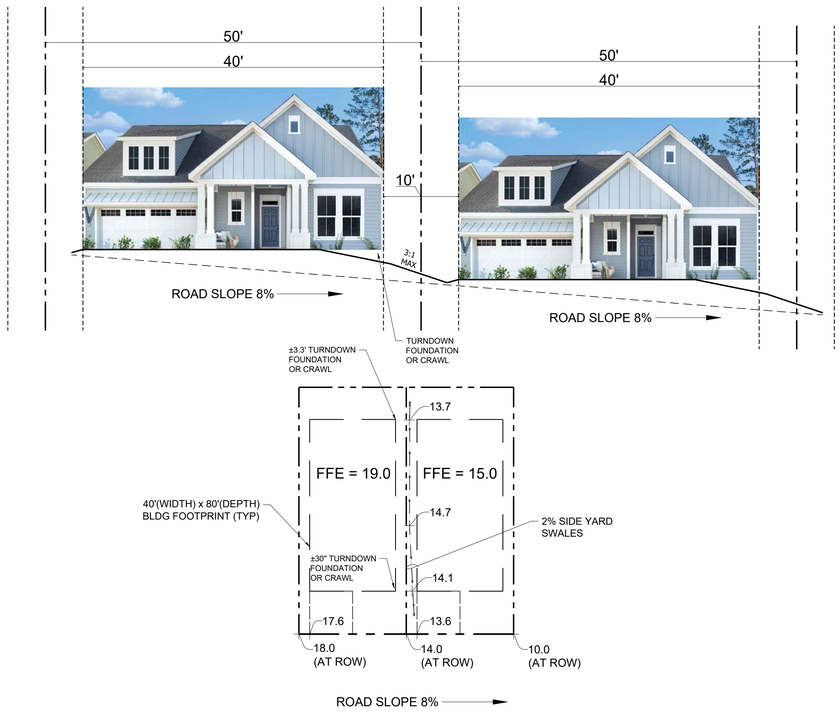
LOT GRADING DIAGRAM - 3% ROAD SLOPE

NTS



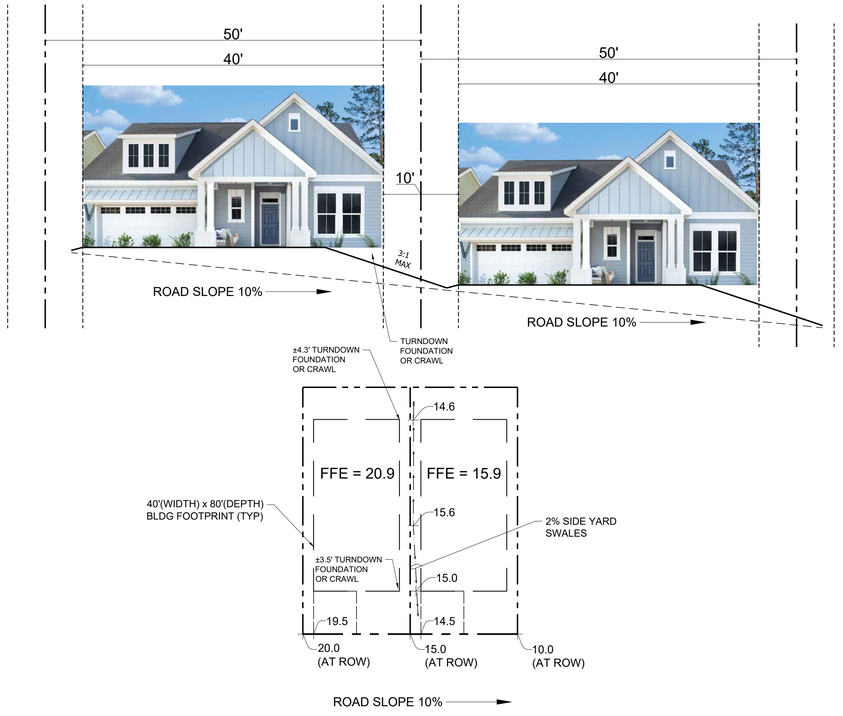
LOT GRADING DIAGRAM - 5% ROAD SLOPE

NTS



LOT GRADING DIAGRAM - 8% ROAD SLOPE

NTS

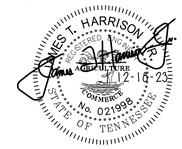


LOT GRADING DIAGRAM - 10% ROAD SLOPE

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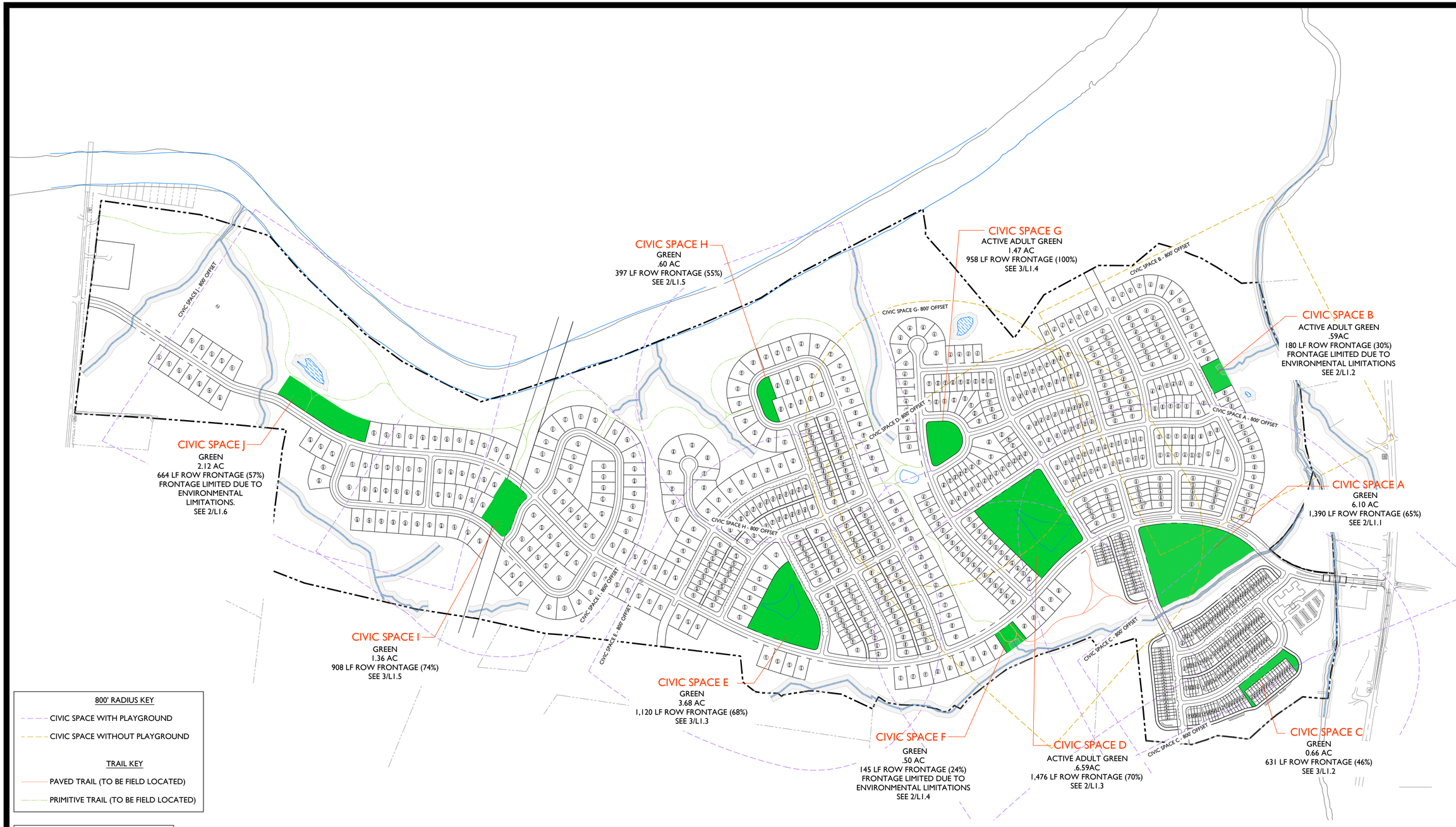
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LOT DRAINAGE DIAGRAMS

C4.05

PROJECT NO.: 21-160-01

Dec 20, 2023 - 7:51pm T:\CAD\20\21\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.05 - Lot Drainage Diagrams.dwg



800' RADIUS KEY

- CIVIC SPACE WITH PLAYGROUND
- CIVIC SPACE WITHOUT PLAYGROUND

TRAIL KEY

- PAVED TRAIL (TO BE FIELD LOCATED)
- PRIMITIVE TRAIL (TO BE FIELD LOCATED)

OVERALL CIVIC SPACE PLAN

N

0 300 600 900

GRAPHIC SCALE 1"=300'-0"

TOTAL OPEN SPACE PROVIDED: 199.8 AC; 48.7% OF GROSS SITE AREA

OPEN SPACE BREAKDOWN

CIVIC SPACE: 22.2 AC

ENVIRONMENTAL PROTECTION (FLOODWAY, STREAM/BUFFERS, 100 YR FLOOD PLAIN): 75.0 AC

ALL OTHER OPEN SPACE: 102.6 AC

CIVIC SPACE REQUIRED: 5% MINIMUM; 20.5 AC

CIVIC SPACE PROVIDED: 5.4%; 22.2 AC (SEE SHEET L1.0)

CIVIC SPACE BREAKDOWN

KEY	SIZE	PLAYGROUND
A	5.89 AC	YES
B	.59 AC	NO
C	.66 AC	YES
D	6.12 AC	NO
E	3.68 AC	YES
F	.50 AC	YES
G	1.24 AC	YES
H	.60 AC	YES
I	1.36 AC	YES
J	2.12 AC	YES

GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT TENNESSEE 12.18.23

Date: December 18, 2023

Revision Date

- △
- △
- △

OVERALL CIVIC SPACE PLAN

SHEET

L1.0



1 LI.1 KEY MAP N.T.S

NEIGHBORHOOD CLUBHOUSE





PICKLE BALL COURTS



DOG PARK

WALKING PATHS





POOL



PICKLE BALL COURTS



SWING BENCH



2 LI.1 CIVIC SPACE - A
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 50' 100'

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OVERALL CIVIC SPACE PLAN
SHEET
LI.1



1 / LI.2 KEY MAP N.T.S



2 / LI.2 CIVIC SPACE - B

CONCEPTUAL PLAN NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'

BENCHES



FORMAL PLANTING





FORMAL LAWN



WALKING PATH



3 / LI.2 CIVIC SPACE - C

CONCEPTUAL PLAN NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'

PLAYGROUND





FORMAL PLANTING

PLAYGROUND



GAMBLE DESIGN COLLABORATIVE

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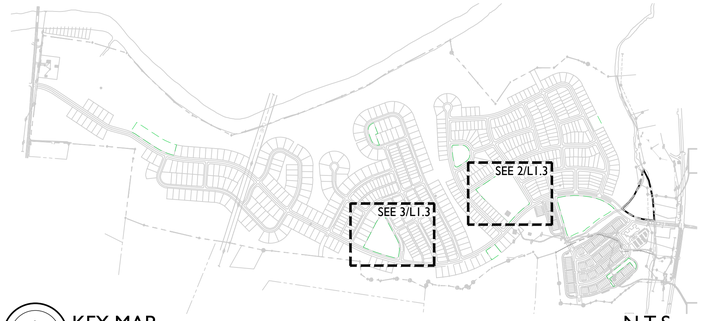
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OVERALL CIVIC SPACE PLAN

SHEET LI.2





1 / L1.3 KEY MAP N.T.S



2 / L1.3 CIVIC SPACE - D
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 50' 100'


POND


TRAIL HEAD

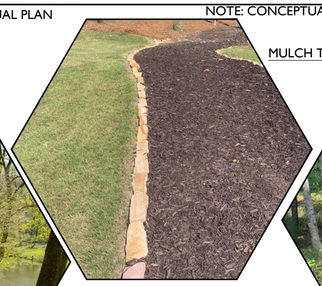

MAIL KIOSK

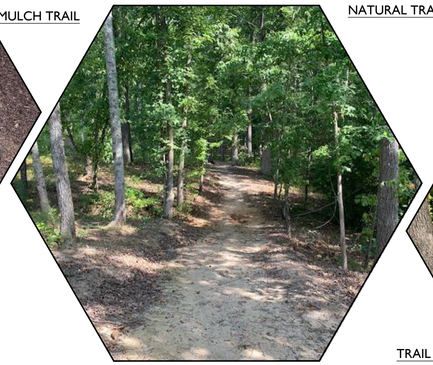
3 / L1.3 CIVIC SPACE - E
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'


NATURAL POND


MULCH TRAIL


NATURAL TRAIL



TRAIL SIGN

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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OVERALL CIVIC SPACE PLAN

SHEET L1.3



2 L1.4 CIVIC SPACE - F

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'



SWINGS



FORMAL PARK



PLAYGROUND



1 L1.4 KEY MAP N.T.S

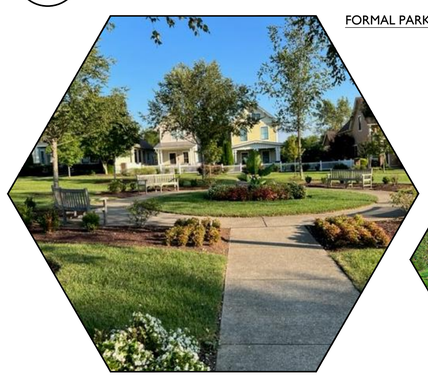


3 L1.4 CIVIC SPACE - G

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

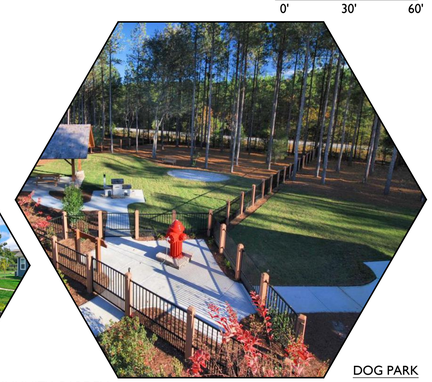
0' 30' 60'



FORMAL PARK



COMMUNITY GARDEN



DOG PARK

GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
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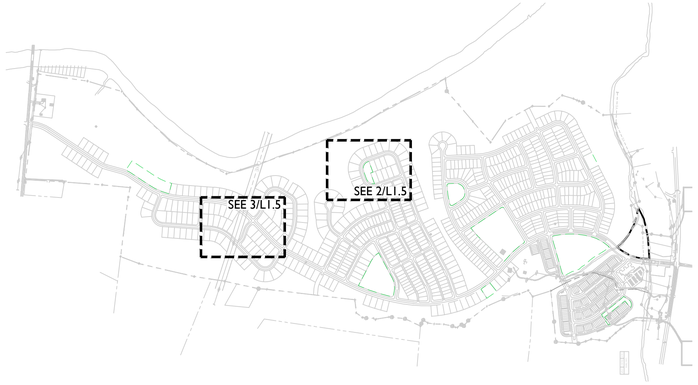
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OVERALL CIVIC SPACE PLAN

SHEET

L1.4



1 / LI.5 KEY MAP N.T.S



2 / LI.5 CIVIC SPACE - H
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'


SWINGS


PLAYGROUND


PLAYGROUND



3 / LI.5 CIVIC SPACE - I
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'


SWINGS


MAIL KIOSK


FORMAL PLANTING

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
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JEFFREY A. ROSS REGISTERED PROFESSIONAL ENGINEER PE 12.18.23

Date: December 18, 2023

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△

OVERALL CIVIC SPACE PLAN

SHEET LI.5



2 / L1.6 CIVIC SPACE - J

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 100' 200'

NOTE: PRIMITIVE WALKING TRAILS TO BE FIELD LOCATED.



OPEN FIELD



TRAIL HEAD



MULTI-PURPOSE FIELD



1 / L1.6 KEY MAP N.T.S

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PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT TENNESSEE 12.18.23

Date: December 18, 2023

Revision	Date
△	
△	
△	

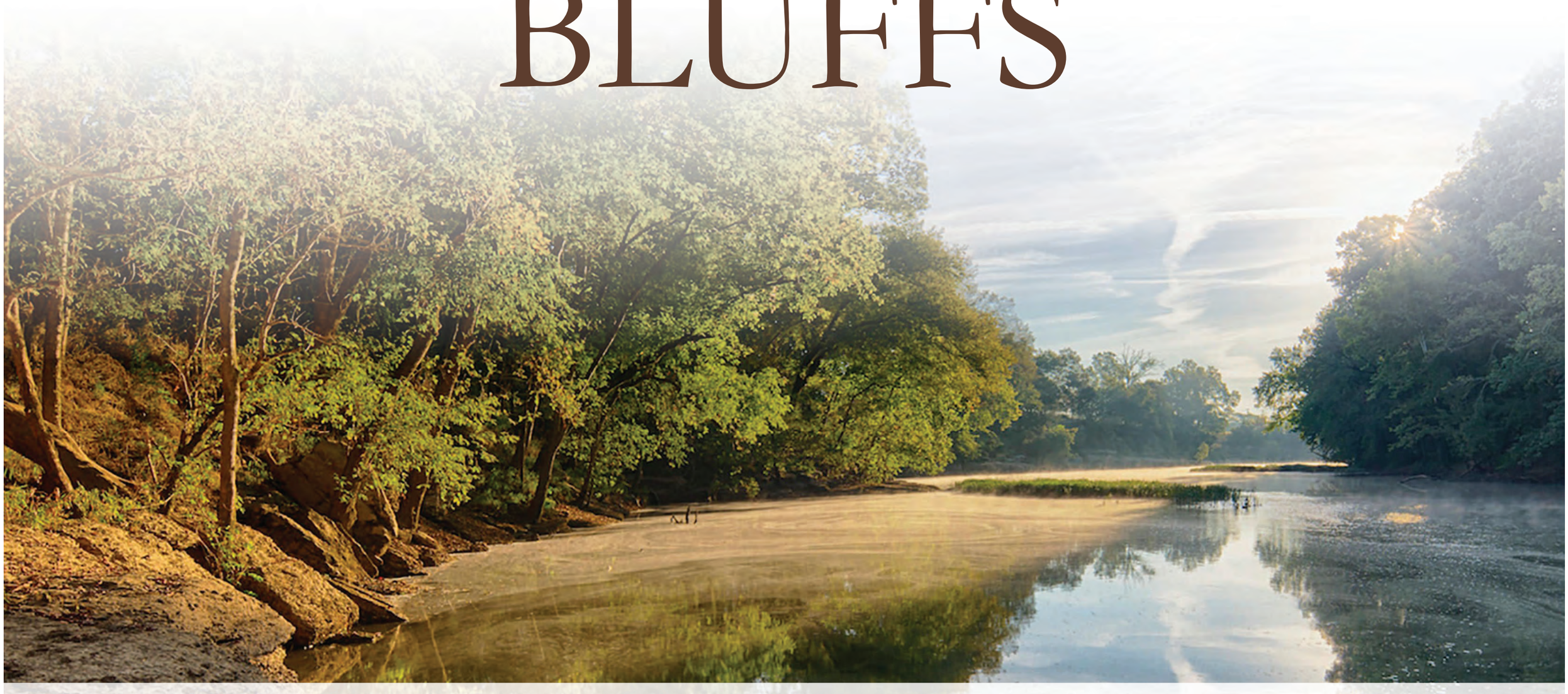
OVERALL CIVIC SPACE PLAN

SHEET L1.6

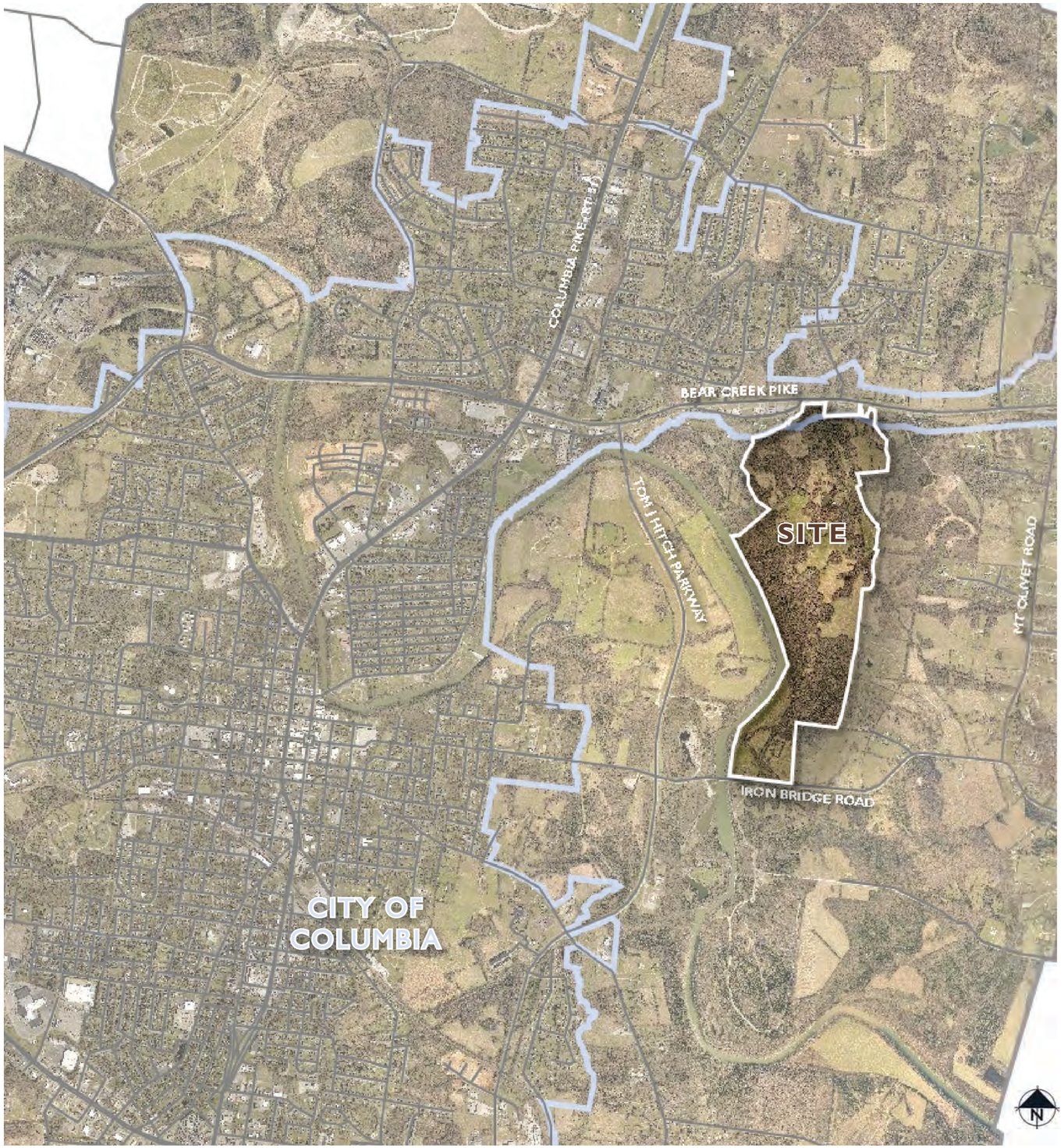
COLUMBIA

City of Columbia, Tennessee

BLUFFS



Architectural Review Team Submittal



COLUMBIA BLUFFS ARCHITECTURE

DEVELOPER
JIM HARVEY
KOLTER LAND
14025 RIVEREDGE DRIVE, SUITE 175
TAMPA, FL 33637

ENGINEER
JIM HARRISON
CIVIL SITE DESIGN GROUP
2305 KLINE AVENUE, SUITE 300
NASHVILLE, TN 37211

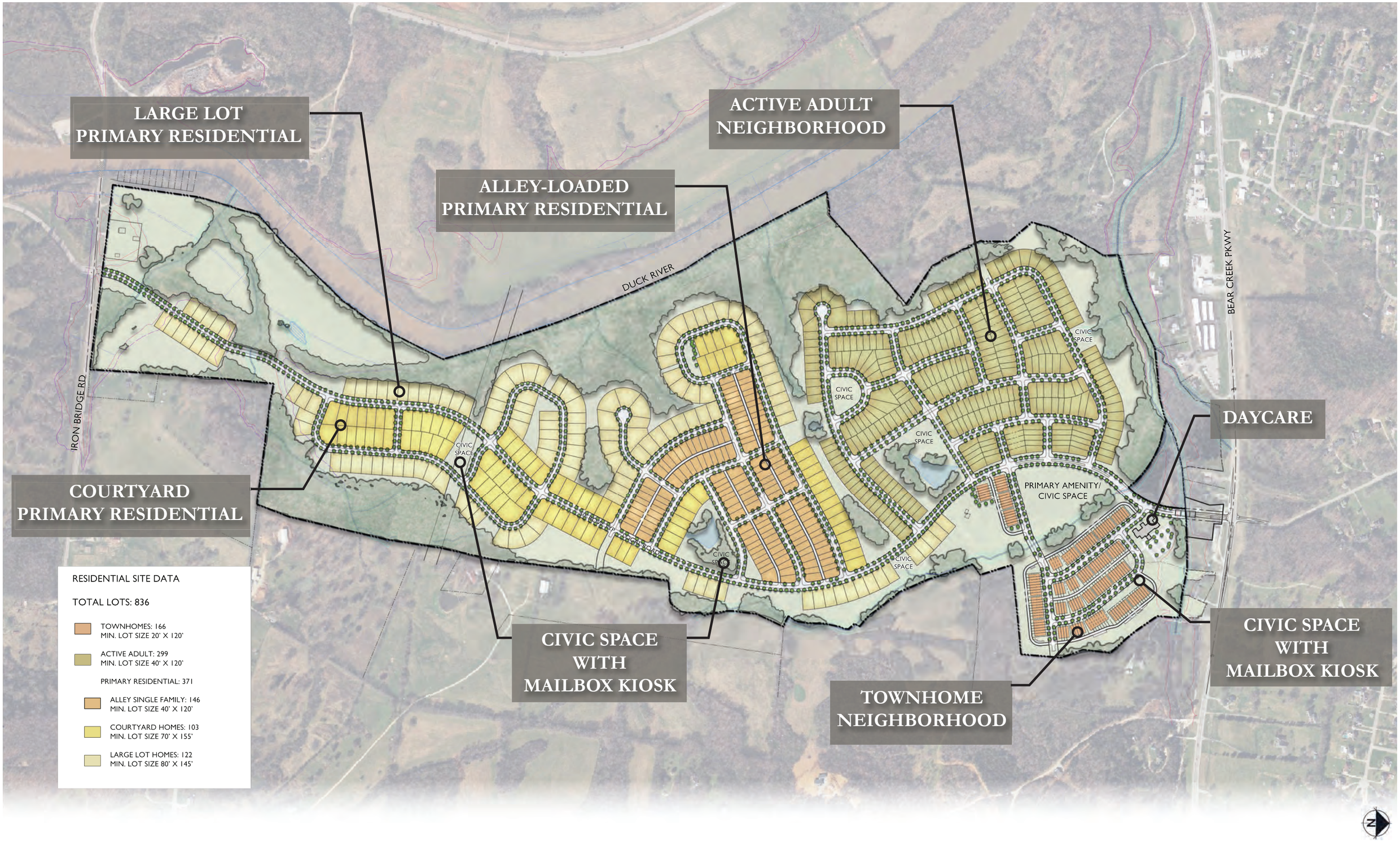
LANDSCAPE ARCHITECT
GREG GAMBLE
GAMBLE DESIGN COLLABORATIVE
3020 STANSBERRY LANE, SUITE 201
FRANKLIN, TN 37069

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13. TOWNHOMES
15. DAYCARE
11. MAIN AMENITY ARCHITECTURE
12. CIVIC SPACE ARCHITECTURE

SUBMITTED: 12/18/2023

DEVELOPMENT TEAM



MASTER DEVELOPMENT PLAN

	Single Family & Townhomes	Active Adult Single Family
Building Height and Massing	• Primarily a mix of 1-story and 2-story, with a maximum of 3-story • Attached garages encouraged	
Building Separation	• Single Family: 10' minimum • Townhomes: 15' minimum	• Single Family: 10' minimum
Street Facades	• Maximize frontage and orientation onto residential streets • Porches should orient to residential streets • Entries visible from residential streets	• Maximize frontage and orientation onto residential streets • Porches should orient to residential streets • Entries visible from residential streets
Building Entries	• Porches minimum 6' deep and 6' wide	
Roof Forms	• Roofs may vary in style, but should be designed to create unity to the full community • All roof forms to be reviewed and approved by the master developer	• Roofs may vary in style, but should be designed to create unity to the full community • All roof forms to be reviewed and approved by the master developer
Roof Detail	• All roofs should create eaves for shadow and rain protection • Where used, gutters should be expressed as positive elements adding desirable detail	• All roofs should create eaves for shadow and rain protection • Where used, gutters should be expressed as positive elements adding desirable detail
Parking	• Garage-parked • Each garage parking space shall be a minimum of 10' x 20' • Garage doors with windows required	• Garage-parked • Each garage parking space shall be a minimum of 10' x 20' • Garage doors should have windows

ARCHITECTURAL GUIDELINE NOTE:

The architectural guidelines and conceptual elevations are intended to convey the architectural quality and design intent. Final elevations and color schemes will be brought back to be approved by the ADRT at final PUD-R Development Plan.

COMPLIANCE NOTE:

The architectural guidelines as shown in this pattern book represent compliance with the standards set by the Zoning Ordinance except in areas requesting a modification of standards which are requeted to be approved through the PUD-R Preliminary Development Plan process.

Architectural Building Materials

In keeping with the upscale project image, the materials used for structures at Columbia Bluffs should be appropriate for the individual building design concepts and shall be consistent with the project theme. Materials shall be selected and used with consideration to building scale, color scheme, mass, and the surrounding environment.

Roofing Materials

Permitted:
- Dimensional Asphalt Shingles
- Laminated Shingles
- Copper Finishes
- Standing Seam Metal Roofs

Not Permitted:
- Rolled Asphalt
- Asbestos Cement Shingles
- Brightly Colored Metal Roofing

Exterior Siding Materials

Permitted:
- Brick
- Stone
- Natural Wood Accents
- Stucco
- Hardie Plank/Panels
- Cementitious Fiber Siding/Cladding

Not Permitted:
- All Plastics (including vinyl)
- Plywood
- Exposed Concrete Block

Awnings

Permitted:
High Quality Heavy Canvas
Illuminated Awnings
Metal Awnings

Colors

Permitted:
- Muted
- Natural
- Earth Tones

Conditional Permitted:
- Bright
- Primary Colors (per review and approval of the Master Developer)

Building Requirements:
- Maximum Height (Stories) 3 stories

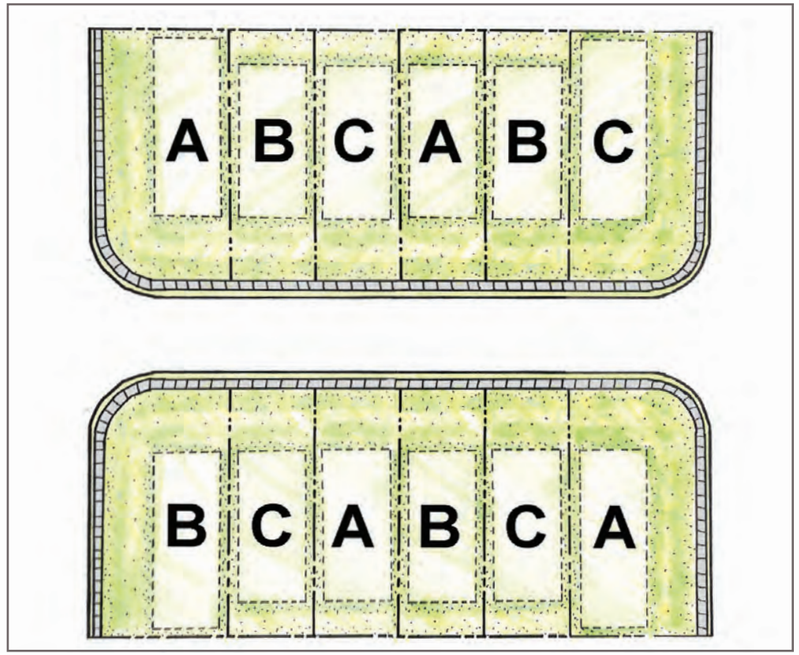








IMAGE OF HOMES REPRESENT AN EXAMPLE OF FACADE VARIETY ALONG SAME STREET. FINAL SELECTION OF MATERIALS AND STYLES TO BE APPROVED AT FMDP.



In order to avoid monotony of architectural design, no approval shall be issued for the construction of a dwelling if it is substantially like any proposed neighboring building for which on approval has already been issued or is being concurrently considered.

- A building shall be considered neighboring if it fronts on the same street as the building under construction or an intersecting street; no building elevation may be repeated across from, adjacent to, or diagonal to a similar building elevation. There shall be a minimum of a 2-lot gap between each similar building elevation (see diagram to above in which A, B, and C represent different elevation styles).
- Vary garage door locations to the front facade of the house when possible. Avoid continuous runs of garages in the same unbroken plain.
- Vary roof orientation, ridge lines, and eave heights between each lot when possible.
- Building facade colors and design elements should vary between each lot with a variation of massing and architectural details on each block.
- Landscaping should vary in composition from building to building when possible.

Final determination of the appropriate elevation pattern and variety is subject to review by the Architectural Design Review Team.

FACADE VARIETY



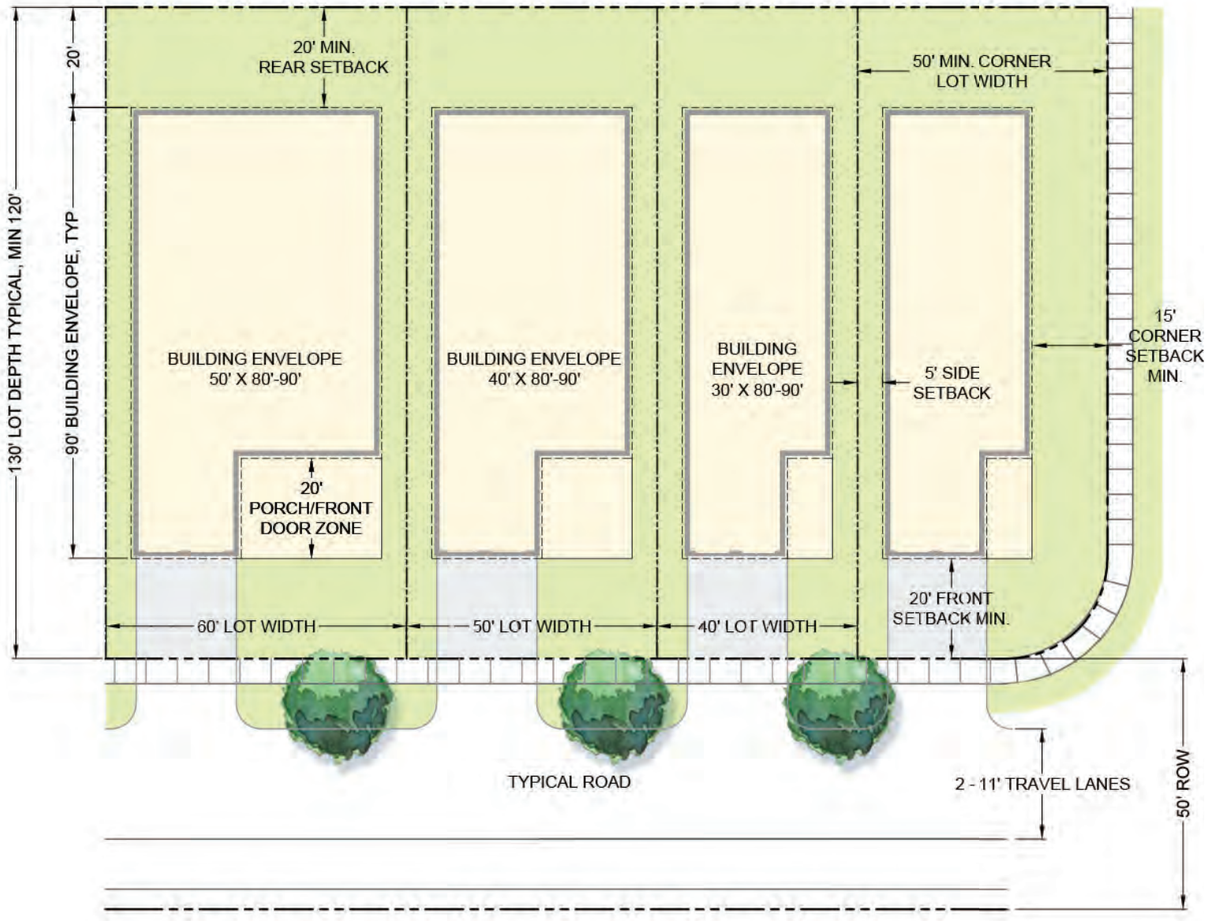






ACTIVE ADULT SINGLE FAMILY

COLOR RENDERING PRESENTS AN
ILLUSTRATIVE DEPICTION OF ARCHITECTURE
AND LANDSCAPE MATERIAL





LOT RANGE: 40’-60’
299 HOMES

BUILDING SETBACKS:
- FRONT: 20’
- REAR: 20’
- SIDE: 5’
- CORNER: 15’

ALL LOTS TO HAVE FRONT LOADED GARAGES
- MINIMUM 20’ OF DRIVEWAY ON LOT
- EACH GARAGE PARKING SPACE SHALL BE A MINIMUM OF 10’ X 20’.

SITE SETBACKS ARE DUE TO ALL INCLUSIVE MAINTENANCE APPLICATION GOVERNED BY THE PROPOSED HOA, TO BE DEED RESTRICTED.

ACTIVE ADULT SINGLE FAMILY







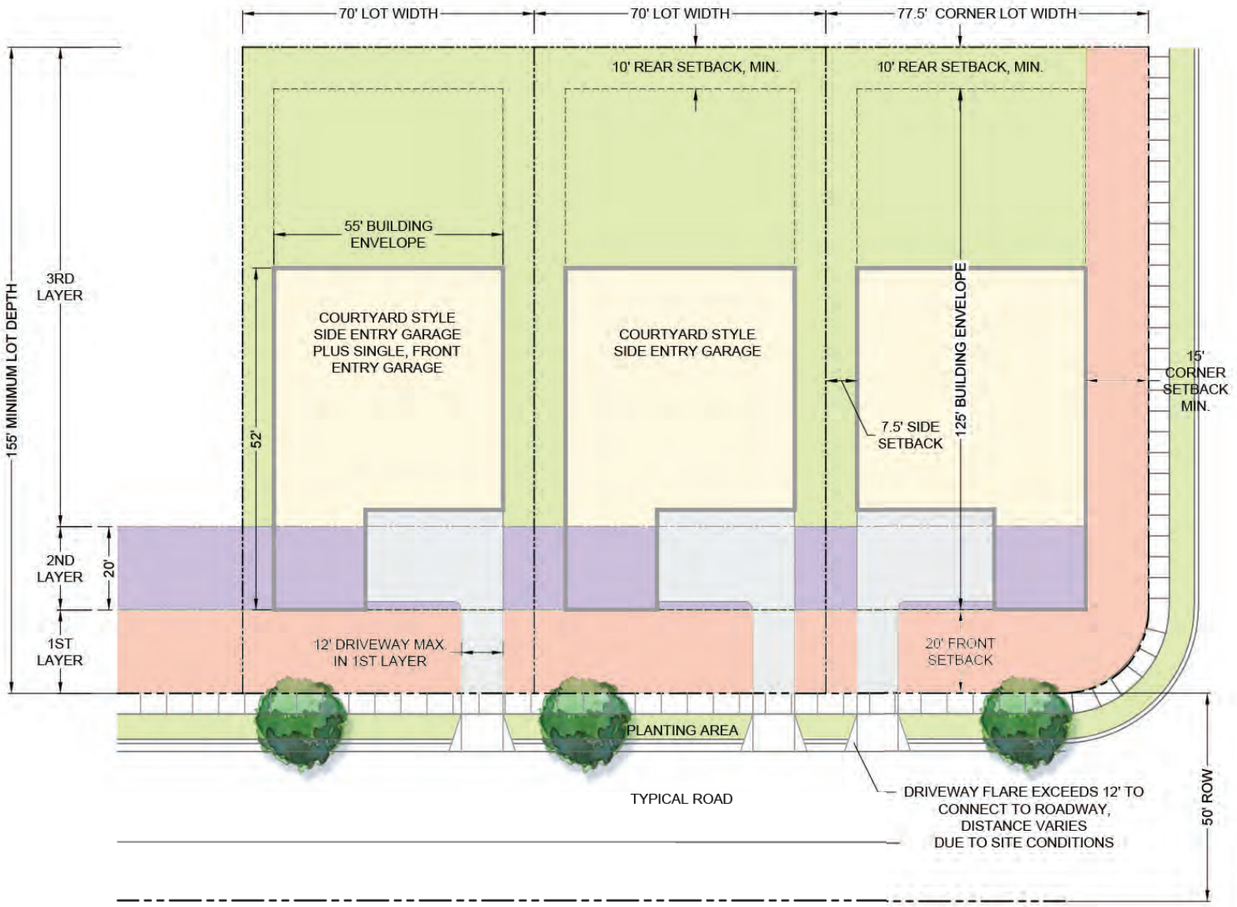






COLOR RENDERING PRESENTS AN
ILLUSTRATIVE DEPICTION OF ARCHITECTURE
AND LANDSCAPE MATERIAL

COURTYARD HOMES





LOT: 70' MINIMUM
103 HOMES

BUILDING SETBACKS:

FRONT:	20'
REAR:	20'
SIDE:	7.5'
CORNER:	15'

ALL LOTS TO HAVE SIDE LOADED GARAGES WITH THE OPTION OF A SINGLE, FRONT-LOADED GARAGE IN THE 3RD LAYER.

- MINIMUM 20' LENGTH OF DRIVEWAY ON LOT
- EACH GARAGE PARKING SPACE SHALL BE A MINIMUM OF 10' X 20'.

COURTYARD HOMES







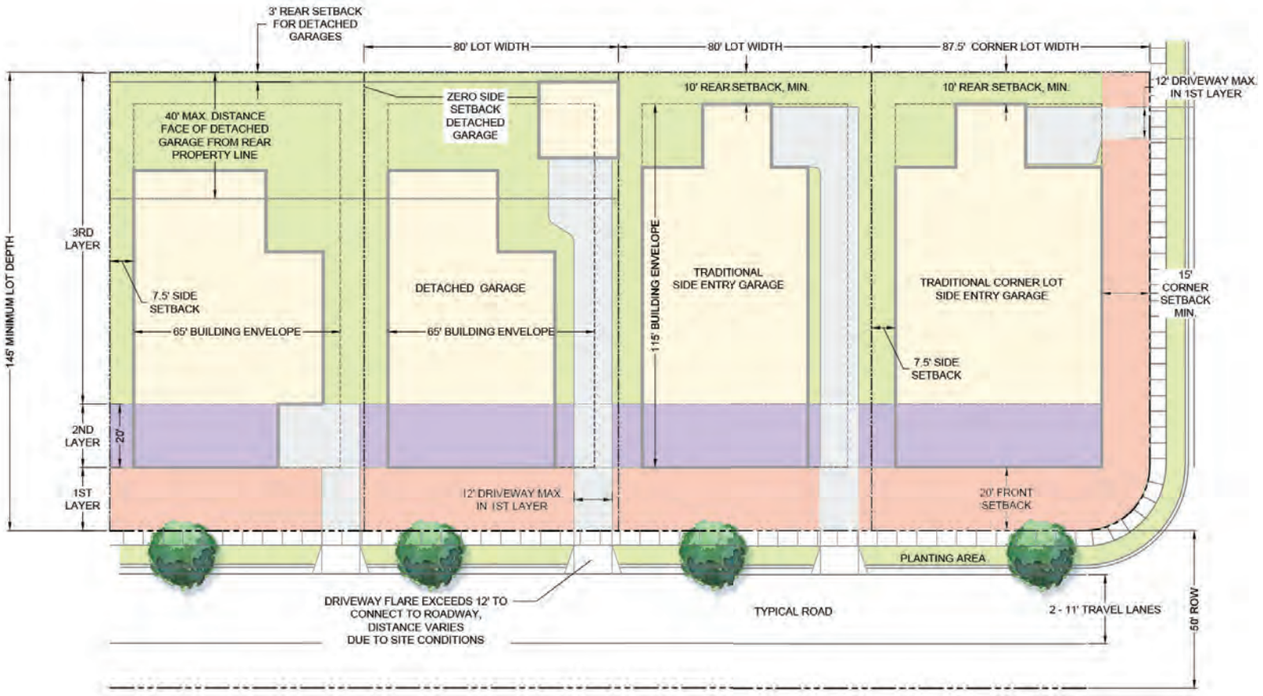






LARGE LOT HOMES

COLOR RENDERING PRESENTS AN
ILLUSTRATIVE DEPICTION OF ARCHITECTURE
AND LANDSCAPE MATERIAL





LOTS: 80' MINIMUM
122 HOMES

BUILDING SETBACKS:
- FRONT: 20'
- REAR: 20'
- SIDE: 7.5'
- CORNER: 15'

LOTS WILL HAVE A MIX OF GARAGE LOCATIONS, ATTACHED AND DETACHED
- MINIMUM 20' OF DRIVEWAY ON LOT
- EACH GARAGE PARKING SPACE SHALL BE A MINIMUM OF 10' X 20'.

LARGE LOT HOMES







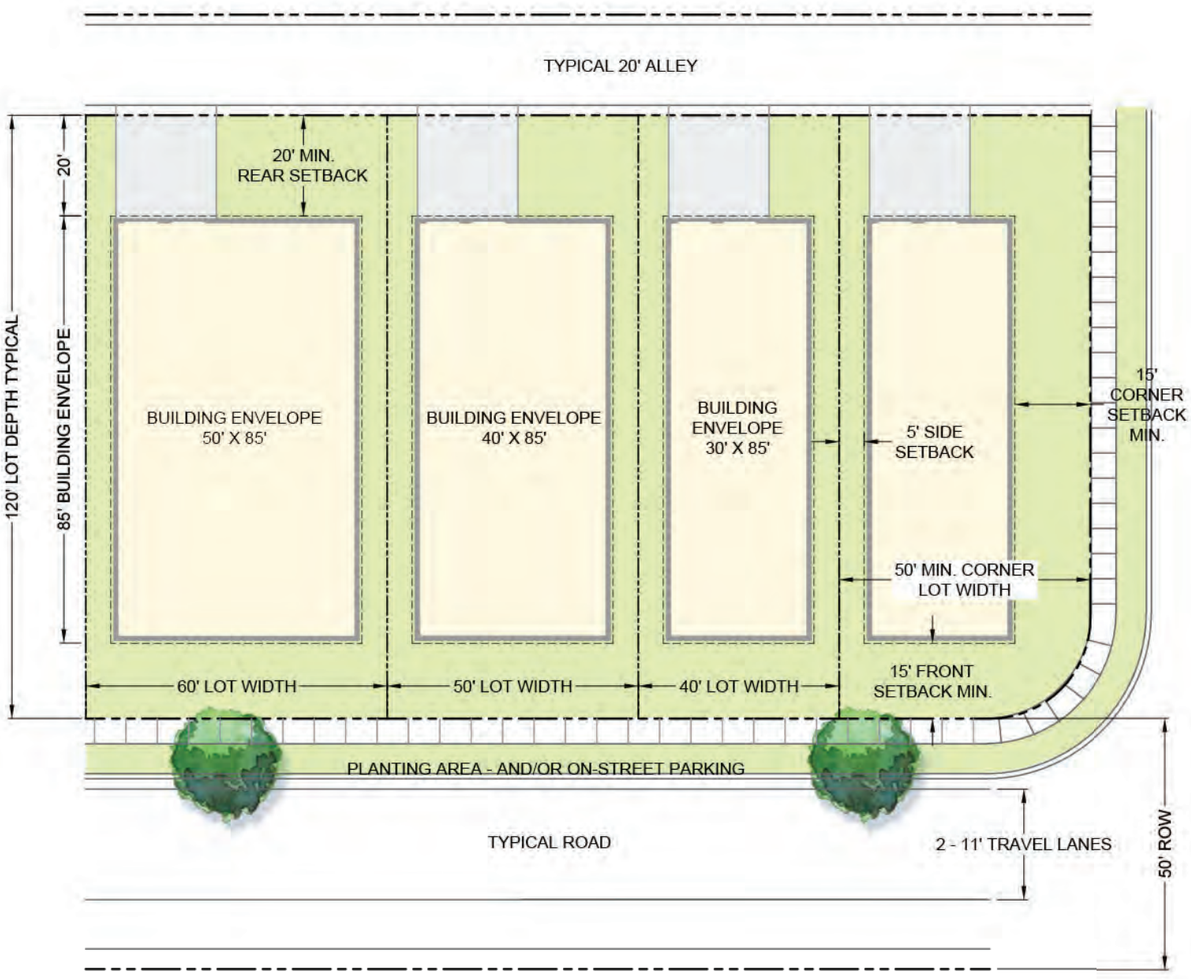


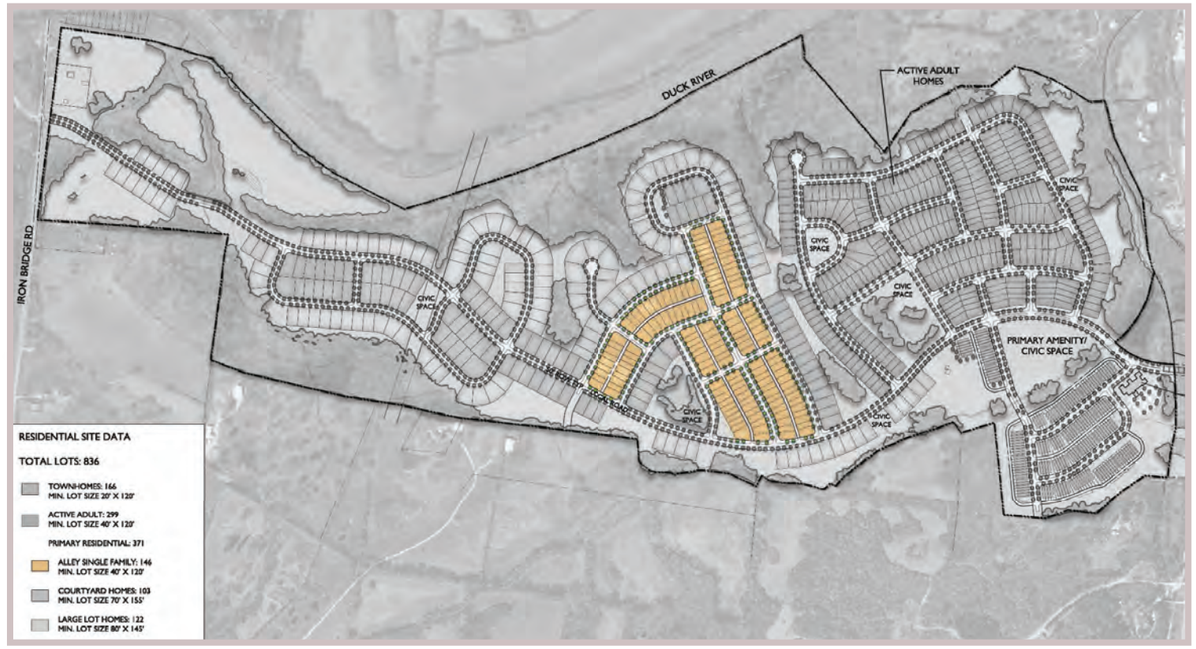




SINGLE-FAMILY ALLEY LOADED

COLOR RENDERING PRESENTS AN ILLUSTRATIVE DEPICTION OF ARCHITECTURE AND LANDSCAPE MATERIAL





LOT RANGE: 40’-60’
146 HOMES

BUILDING SETBACKS:

FRONT:	15’
REAR:	20’
SIDE:	5’
CORNER:	15’

ALL LOTS TO HAVE REAR LOADED GARAGES
- MINIMUM 20’ LENGTH OF DRIVEWAY ON LOT
- EACH GARAGE PARKING SPACE SHALL BE A MINIMUM OF 10’ X 20’.

SINGLE-FAMILY ALLEY LOADED

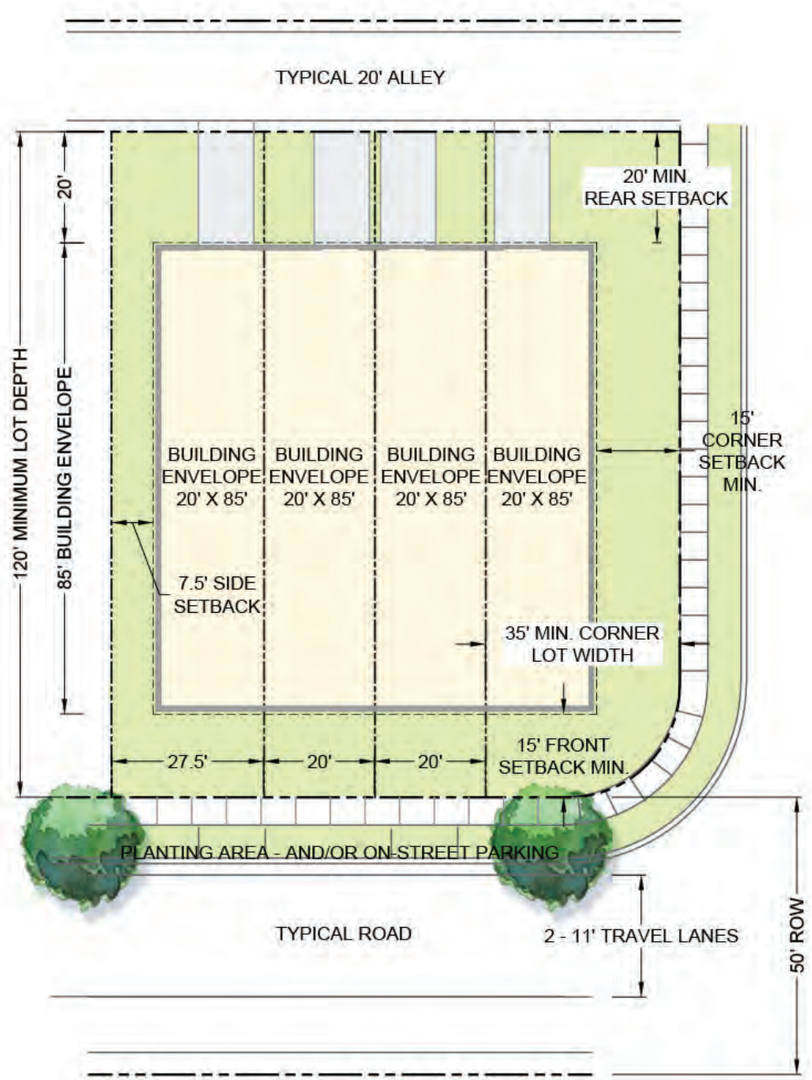






COLOR RENDERING PRESENTS
AN ILLUSTRATIVE DEPICTION OF
ARCHITECTURE AND LANDSCAPE
MATERIAL

TOWNHOMES





LOTS: 20' MINIMUM
166 HOMES

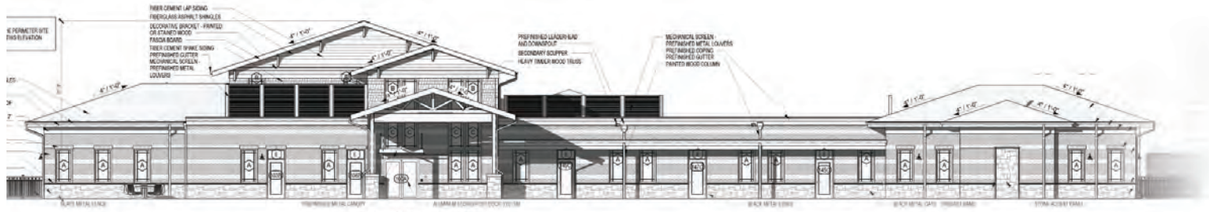
BUILDING SETBACKS:

FRONT:	15'
REAR:	20'
SIDE:	7.5'
CORNER:	15'

ALL LOTS TO HAVE REAR LOADED GARAGES
- MINIMUM 20' LENGTH OF DRIVEWAY ON LOT
- EACH GARAGE PARKING SPACE SHALL BE A MINIMUM OF 10' X 20'.TOWNHOME BUILDINGS

WILL CONSIST OF 4, 6, 7, AND 8 UNIT BUILDINGS.

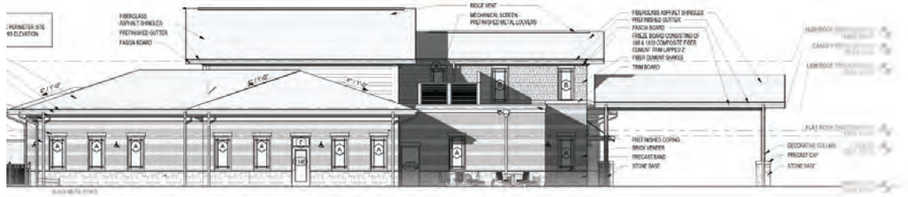
DAYCARE ELEVATIONS



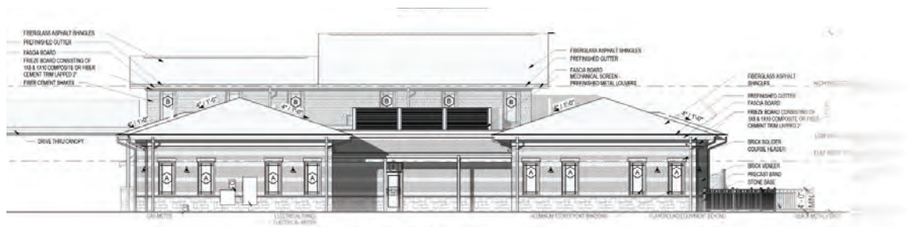
WEST ELEVATION



EAST ELEVATION



SOUTH ELEVATION



NORTH ELEVATION

ELEVATIONS ARE CONCEPTUAL.
FINAL APPROVALS TO BE DETERMINED WITH FMDP.



DAYCARE

CHILD DAYCARE TO BE APPROXIMATELY 12,000-14,000 SQFT., AND WILL SERVE AS A BENEFIT NOT ONLY TO THE LOCAL NEIGHBORHOOD BUT TO THE COMMUNITY AS WELL.

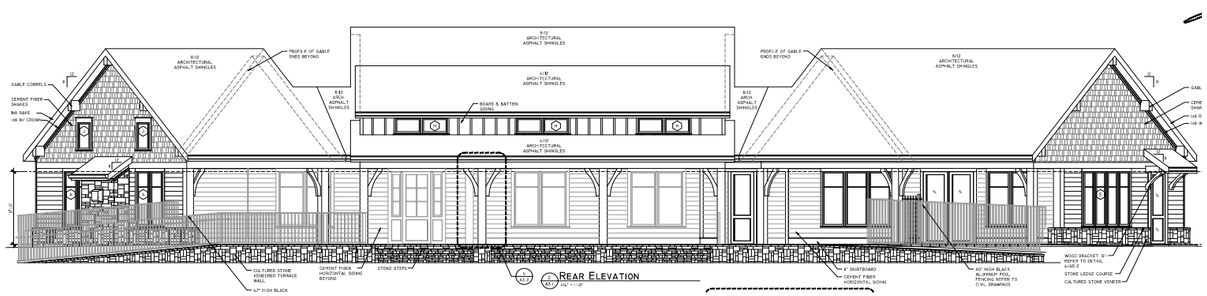
AMENITY PHOTOGRAPHS

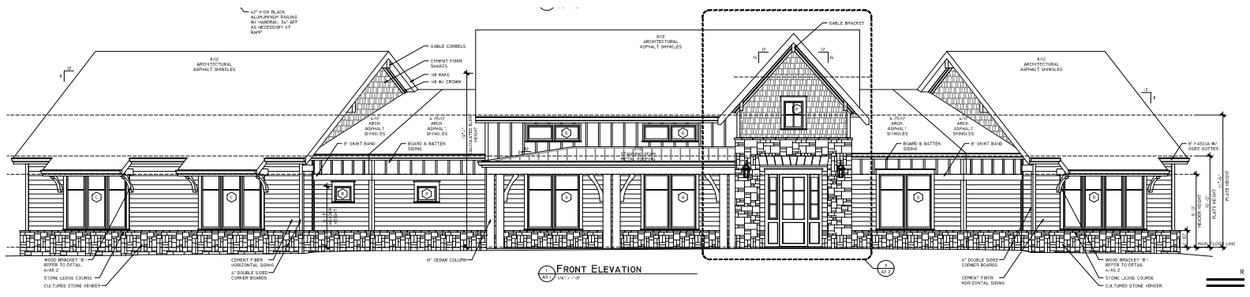




POOL AND CLUBHOUSE FROM SIMILAR KOLTER PROJECT

AMENITY ELEVATIONS





IMAGES AND ELEVATIONS ARE CONCEPTUAL.
FINAL APPROVALS TO BE DETERMINED WITH FMDP.

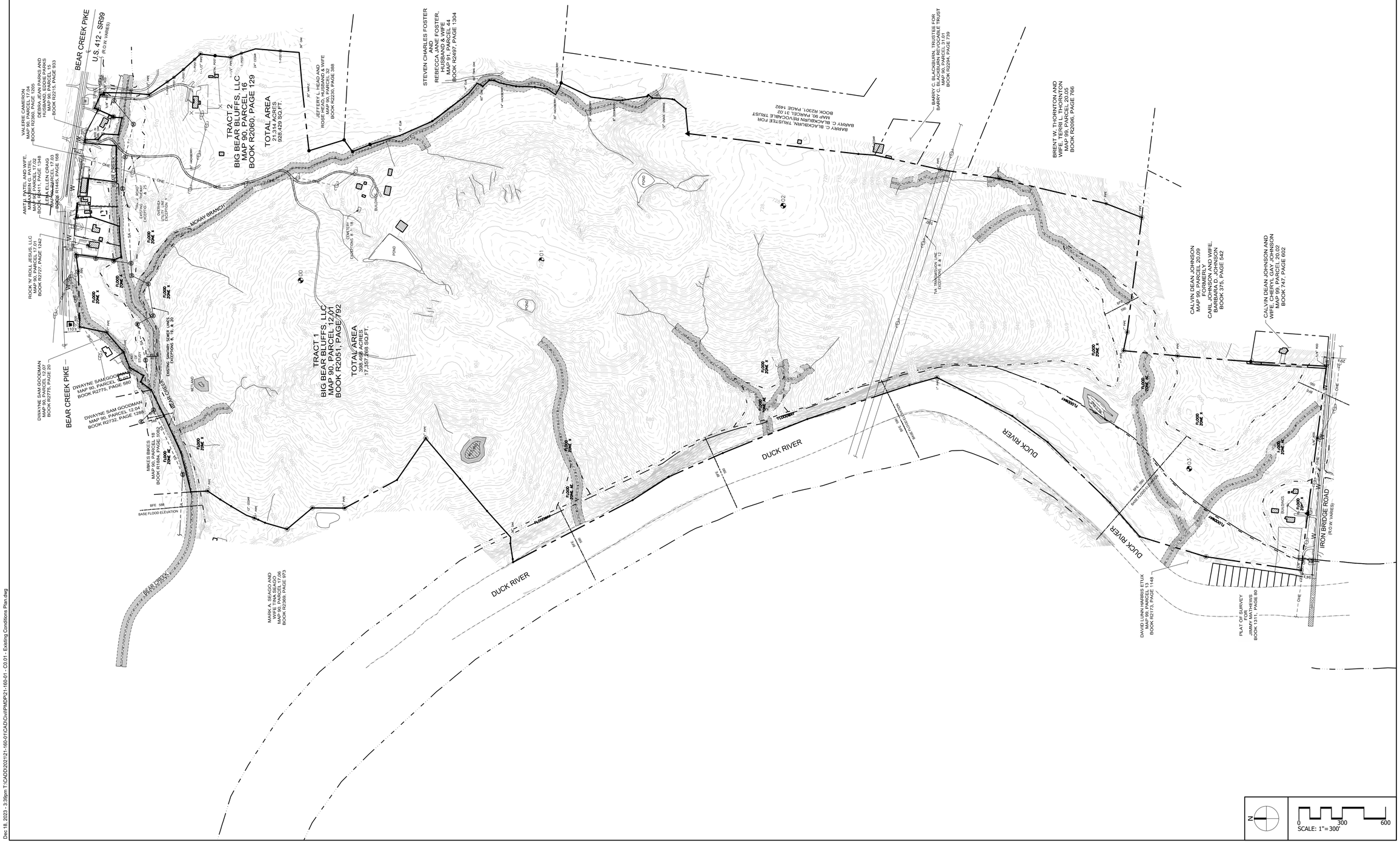




5 CIVIC SPACES ARE PLANNED FOR THIS SITE.

THREE OF THESE SITES WILL HAVE COVERED MAILBOX KIOSKS. COVERED SEATING WILL BE PROVIDED IN MOST PARKS.

IMAGES ARE TO PROVIDE EXAMPLES OF TYPES OF COVERED SEATING AND MAILBOX KIOSKS, BUT COULD BE SUBJECT TO REVISIONS AT FMDP APPROVALS.



CSDG
Planning | Engineering
Landscape Architecture
2305 Kline Ave, Ste 300
Nashville, TN 37211
615.248.9999
csdgtn.com

SEAL

JAMES T. HARRISON
REGISTERED
LANDSCAPE
ARCHITECT
No. 021998
12-18-23
STATE OF TENNESSEE

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

INITIAL SUBMITTAL

ISSUE DATE: 12/18/2023

REVISION HISTORY:

Rev.	Description	Date
1	Initial Submittal	10/16/23
2	Tech Review Comments	12/18/23

DRAWN BY: TWG
CHECKED BY: TWG

EXISTING CONDITIONS PLAN

C0.01

PROJECT NO.: 21-160-01

Dec 18, 2023 - 3:39pm T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C0.01 - Existing Conditions Plan.dwg



PROJECTED TIMELINE*:

PHASE 1 (±139 UNITS)

2024-2025	FINAL MASTER PLAN
2025-2026	BEGIN CONSTRUCTION
2025-2026	PLATTING
2028-2029	VERTICAL CONSTRUCTION COMPLETE

PHASE 2 (±132 UNITS)

2025-2026	FINAL MASTER PLAN
2026-2027	BEGIN CONSTRUCTION
2026-2027	PLATTING
2029-2030	VERTICAL CONSTRUCTION COMPLETE

PHASE 3 (±125 UNITS)

2026-2027	FINAL MASTER PLAN
2027-2028	BEGIN CONSTRUCTION
2027-2028	PLATTING
2031-2032	VERTICAL CONSTRUCTION COMPLETE

PHASE 4 (±151 UNITS)

2027-2028	FINAL MASTER PLAN
2028-2029	BEGIN CONSTRUCTION
2028-2029	PLATTING
2032-2033	VERTICAL CONSTRUCTION COMPLETE

PHASE 5 (±200 UNITS)

2029-2030	FINAL MASTER PLAN
2031-2032	BEGIN CONSTRUCTION
2031-2032	PLATTING
2033-2034	VERTICAL CONSTRUCTION COMPLETE

PHASE 6 (±132 UNITS)

2030-2031	FINAL MASTER PLAN
2032-2033	BEGIN CONSTRUCTION
2032-2033	PLATTING
2033-2034	VERTICAL CONSTRUCTION COMPLETE

*PROJECTED TIMELINE IS AN ESTIMATE ONLY. TIMING OF ACTUAL COMMENCEMENT OF HORIZONTAL & VERTICAL CONSTRUCTION FOR ALL PHASES WILL BE PREDICATED ON LOCAL AND STATE APPROVALS.

N

0 300 600
SCALE: 1" = 300'

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SEAL

JAMES T. HARRISON
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COMMERCE
12-16-23
No. 021998
STATE OF TENNESSEE

COLUMBIA BLUFFS
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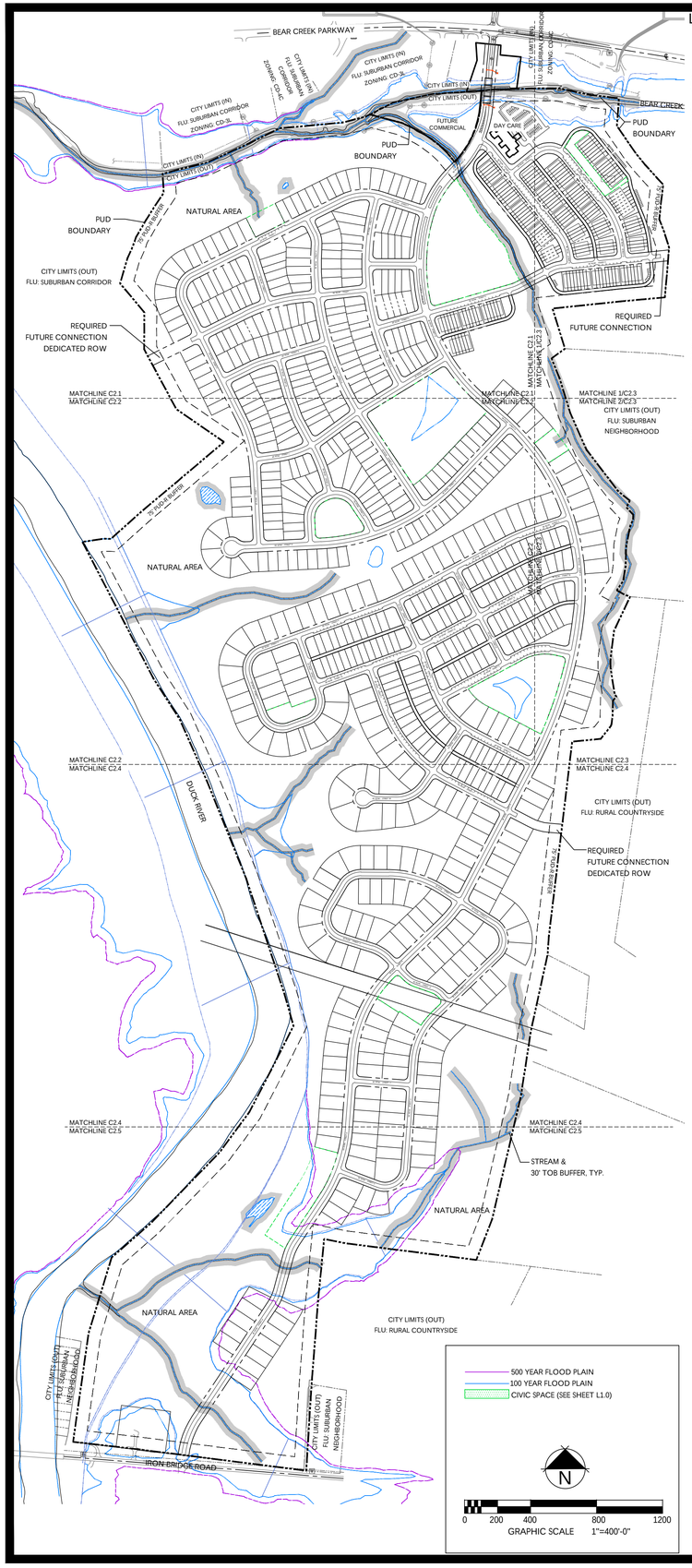
Rev.	Description	Date
1	Initial Submittal	10/16/23
2	Tech Review Comments	12/18/23

DRAWN BY: TWG
CHECKED BY: TWG

PHASING PLAN

C1.00
PROJECT NO.: 21-160-01

Dec 18, 2023 - 3:39pm T:\CAD\D\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C1.00 - Phasing Plan.dwg



LEGAL DESCRIPTION OF PROPERTY:

LEGAL DESCRIPTION FOR ANNEXATION OF 409.92 ACRES TO PUD FOR PART OF MAP 80, PARCEL 12.01 DEED BOOK R2051, PAGE 732 BIG BEAR BLUFFS, LLC

LAND LYING IN THE 4TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE, BOUNDED ON THE NORTH BY BEAR CREEK PVB, BOOK 10 ROLL JESUS, LLC, AS OF RECORD IN DEED BOOK R2727, PAGE 1242 OF THE REGISTERS OFFICE OF MAURY COUNTY, TENNESSEE (ROMCTN), AMIT J. PATEL AND WIFE, MINAXIBEN G. PATEL AS OF RECORD IN DEED BOOK R2411, PAGE 1348, ROMCTN; HK BIG BEAR BLUFF 5, LLC BY BOOK 2878, PAGE 991, ROMCTN; ON THE EAST BY JEFFERY L. HEAD AND ROSIE HEAD WIFE & HUSBAND AS OF RECORD IN DEED BOOK R2338, PAGE 388, ROMCTN, STEVEN CHARLES FOSTER AND REBECCA JANE FOSTER, HUSBAND & WIFE AS OF RECORD IN DEED BOOK R2457, PAGE 1334, ROMCTN, BARRY C. BLACKBURN, TRUSTEE FOR BARRY C. BLACKBURN REVOCABLE TRUST AS OF RECORD IN DEED BOOK R2291, PAGE 1492, ROMCTN, BRENT W. THORNTON AND WIFE TERRI L. THORNTON AS OF RECORD IN DEED BOOK R2699, PAGE 768, ROMCTN, CALVIN DEAN JOHNSON FORMERLY CARL JOHNSON AND WIFE, BARBARA D. JOHNSON AS OF RECORD IN DEED BOOK 316, PAGE 543, ROMCTN, AND CALVIN DEAN JOHNSON AND WIFE CHERYL GAY JOHNSON AS OF RECORD IN DEED BOOK R2747, PAGE 902, ROMCTN; ON THE SOUTH BY IRON BRIDGE ROAD; AND ON THE WEST BY JIMMY MATHEWS AS OF RECORD IN DEED BOOK 5311, PAGE 83, DAVID LINN HARRIS ET UX AS OF RECORD IN DEED BOOK R2125, PAGE 1186, ROMCTN, DUCK RIVER, AND MARK A. SEAGO AND WIFE TINA SEAGO AS OF RECORD DEED BOOK R2365, PAGE 573 ROMCTN; AND CONTINUED TO THE NORTH BY MIKE BIKES AS OF RECORD IN DEED BOOK R1884, PAGE 1982, DWAYNE SAM GOODMAN AS OF RECORD IN DEED BOOK R2722, PAGE 1398, AND BE MORE PARTICULARLY DESCRIBED AS FOLLOWS:

TO FIND THE TRUE POINT OF BEGINNING, COMMENCE AT A ¼" INCH IRON PIPE FOUND IN THE SOUTHERN ROW OF BEAR CREEK PIKE, SAID POINT ALSO BEING THE NORTHWEST BOUNDARY OF BOOK 10 ROLL JESUS, LLC (BK R2727, PG 1242) AND HAVING A TENNESSEE STATE PLANE COORDINATE OF NORTH 475,793.05 EAST 1,817,844.21;

THENCE, WITH THE WEST BOUNDARY OF JESUS, THE FOLLOWING CALLS:

S 69°31'16" W, FOR A DISTANCE OF 269.51 FEET, TO AN IRON PIN FOUND;
S 21°37'47" E, FOR A DISTANCE OF 55.39 FEET TO A THE CENTER OF BEAR CREEK BEING THE SOUTHWEST CORNER OF BOOK 10 ROLL JESUS;
THENCE, WITH THE SOUTH BOUNDARY OF BOOK 10 ROLL JESUS, LLC, AMIT J. PATEL & HK BIG BEAR BLUFF 5, LLC, AND ALSO BEING THE CENTER OF BEAR CREEK, N 65°53'31" E, 307.68 FEET TO THE TRUE POINT OF BEGINNING;

THENCE, CONTINUING WITH BEAR CREEK, THE FOLLOWING CALLS:

N 66°45'31" E, FOR A DISTANCE OF 55.49 FEET TO A POINT,
N 58°59'09" E, FOR A DISTANCE OF 216.86 FEET TO A POINT;
S 89°57'59" E, FOR A DISTANCE OF 168.90 FEET TO A POINT;
S 78°39'55" E, FOR A DISTANCE OF 117.46 FEET TO A POINT;
S 75°01'12" E, FOR A DISTANCE OF 120.71 FEET TO A POINT;
S 83°05'05" E, FOR A DISTANCE OF 172.20 FEET TO A POINT ALONG THE WEST BOUNDARY OF JEFFERY L. HEAD;

THENCE, WITH THE WEST BOUNDARY OF HEAD, THE FOLLOWING CALLS:

S 0°55'55" W, FOR A DISTANCE OF 40.52 FEET TO AN IRON PIN;
S 0°47'44" W, FOR A DISTANCE OF 127.32 FEET TO A 1 ½" PIPE FOUND;
S 34°32'57" E, FOR A DISTANCE OF 152.97 FEET TO A T-POST;
S 35°01'16" E, FOR A DISTANCE OF 55.17 FEET TO A T-POST;
S 39°23'56" E, FOR A DISTANCE OF 54.10 FEET TO A T-POST;
S 42°05'33" E, FOR A DISTANCE OF 106.39 FEET TO A T-POST;
S 42°31'26" E, FOR A DISTANCE OF 55.23 FEET TO AN 1-1/2" PIPE FOUND;
S 7°39'55" W, FOR A DISTANCE OF 161.11 FEET TO A 3" METAL POST;
S 9°45'07" W, FOR A DISTANCE OF 116.19 FEET TO AN 1-1/2" PIPE FOUND;
S 21°41'47" E, FOR A DISTANCE OF 78.14 FEET TO A T-POST;
S 13°31'01" E, FOR A DISTANCE OF 102.59 FEET TO A 24" CEDAR;
S 4°57'22" W, FOR A DISTANCE OF 172.64 FEET TO A T-POST;
S 4°32'31" W, FOR A DISTANCE OF 120.65 FEET TO 26" OAK;
S 84°48'25" W, FOR A DISTANCE OF 270.35 FEET TO 30" MAPLE;
S 81°03'39" W, FOR A DISTANCE OF 414.11 FEET TO A FENCE POST;
S 12°10'08" E, FOR A DISTANCE OF 254.98 FEET TO A 6"ROTTED HACKBERRY FENCE POST TO THE SOUTHWEST CORNER OF HEAD;

THENCE, WITH THE WEST BOUNDARY OF FOSTER, THE FOLLOWING CALLS:

S 54°11'15" W, FOR A DISTANCE OF 160.25 FEET TO 6" ROTTED HACKBERRY FENCE POST;
S 21°57'18" E, FOR A DISTANCE OF 130.86 FEET TO A CEDAR FENCE POST;
S 17°11'57" E, FOR A DISTANCE OF 331.38 FEET TO A 12" ELM;
S 23°58'57" E, FOR A DISTANCE OF 240.66 FEET TO A 14"OAT;
S 31°24'05" E, FOR A DISTANCE OF 215.73 FEET TO 14" ELM;
S 50°37'42" E, FOR A DISTANCE OF 91.73 FEET TO 60" TWIN OAK;
S 26°53'39" W, FOR A DISTANCE OF 35.63 FEET TO 60" OAK;
S 40°35'20" W, FOR A DISTANCE OF 8.68 FEET TO A T-POST;
S 40°42'20" E, FOR A DISTANCE OF 62.79 FEET TO A POINT;
S 15°09'17" W, FOR A DISTANCE OF 26.25 FEET TO A POINT;
S 23°53'47" W, FOR A DISTANCE OF 42.69 FEET TO 14" HACKBERRY;
S 11°29'58" W, FOR A DISTANCE OF 117.73 FEET TO A T-POST;
S 7°38'52" W, FOR A DISTANCE OF 336.04 FEET TO ROTTED HACKBERRY;
S 8°12'29" W, FOR A DISTANCE OF 87.66 FEET A POINT;
S 33°58'56" W, FOR A DISTANCE OF 69.64 FEET TO A 30" HACKBERRY;
S 67°19'48" E, FOR A DISTANCE OF 54.74 FEET TO A 24"HACKBERRY;
S 79°11'17" E, FOR A DISTANCE OF 34.53 FEET TO 12" CEDAR POST AT THE SOUTHWEST CORNER OF FOSTER;

THENCE, WITH THE WEST BOUNDARY OF BLACKBURN, THE FOLLOWING CALLS:

S 25°13'16" W, FOR A DISTANCE OF 335.44 FEET TO A 35"HACKBERRY;
S 7°39'46" W, FOR A DISTANCE OF 377.84 FEET TO A 8" DOGWOOD;
S 6°15'28" W, FOR A DISTANCE OF 414.40 FEET TO A 24" HACKBERRY FLAGGED;
S 8°53'22" E, FOR A DISTANCE OF 172.27 FEET TO A T-POST;
S 55°43'36" E, FOR A DISTANCE OF 13.02 FEET TO 8" FENCE POST;
S 39°13'12" E, FOR A DISTANCE OF 34.16 FEET TO A POINT;
S 71°13'16" W, FOR A DISTANCE OF 95.50 FEET TO A 12" OSAGE;
S 7°58'27" W, FOR A DISTANCE OF 43.94 FEET TO A 8" ROTTED TREE;
S 15°41'05" W, FOR A DISTANCE OF 13.75 FEET TO A 6"TREE USED AS FENCE POST;
S 38°17'07" W, FOR A DISTANCE OF 130.36 FEET TO A 14" ROTTEN CEDAR;
S 84°35'04" W, FOR A DISTANCE OF 172.39 FEET TO FENCE CORNER PKT FOUND;
S 8°49'35" W, FOR A DISTANCE OF 1187.84 FEET TO A POINT;
S 4°39'46" W, FOR A DISTANCE OF 112.89 FEET TO A 24"CEDAR;
S 4°23'22" W, FOR A DISTANCE OF 466.96 FEET TO A 1" PIPE FOUND;

THENCE, WITH THE WEST BOUNDARY OF BLACKBURN AND CONTINUING TO THORNTON, THE FOLLOWING CALLS:

S 8°47'49" W, FOR A DISTANCE OF 411.13 FEET TO 1" PIPE FOUND;

THENCE, WITH THE WEST BOUNDARY THORNTON, THE FOLLOWING CALLS:

S 1°39'41" W, FOR A DISTANCE OF 759.59 FEET TO 1" PIPE FOUND;
S 3°16'05" W, FOR A DISTANCE OF 265.50 FEET TO 1" PIPE FOUND AT THE SOUTHWEST CORNER OF THORNTON;

THENCE, WITH THE NORTH BOUNDARY OF JOHNSON, THE FOLLOWING CALLS:

N 82°44'49" W, FOR A DISTANCE OF 660.97 FEET TO 1" PIPE FOUND;
N 78°47'22" W, FOR A DISTANCE OF 130.34 FEET TO 1" PIPE FOUND;

THENCE, WITH THE WEST BOUNDARY OF JOHNSON, THE FOLLOWING CALLS:

S 9°32'34" W, FOR A DISTANCE OF 375.75 FEET TO 1" PIPE FOUND;
S 4°37'28" W, FOR A DISTANCE OF 588.55 FEET TO A POINT;
S 3°32'16" W, FOR A DISTANCE OF 523.31 FEET TO 5/8" IRON PIN FOUND AT THE SOUTHWEST CORNER OF THORNTON,

THENCE, WITH THE NORTH BOUNDARY OF IRON BRIDGE ROAD RIGHT-OF-WAY, THE FOLLOWING CALLS:

N 82°45'56" W, FOR A DISTANCE OF 561.39 FEET TO AN 5/8" IRON PIN FOUND;
N 82°46'26" W, FOR A DISTANCE OF 525.65 FEET TO RAILROAD SPIKE PK FOUND;
N 83°22'15" W, FOR A DISTANCE OF 398.64 FEET TO 5/8" IRON PIN FOUND AT SOUTHEAST CORNER OF MATTHEWS;

THENCE, WITH THE EAST BOUNDARY OF MATTHEWS, HARRIS AND DUCK RIVER, THE FOLLOWING CALLS:

N 6°56'23" E, FOR A DISTANCE OF 894.54 FEET TO 1/2" IRON PIN FOUND;
N 1°56'06" E, FOR A DISTANCE OF 476.22 FEET TO A POINT;
N 48°48'5" E, FOR A DISTANCE OF 352.94 FEET TO A POINT;
N 44°09'56" E, FOR A DISTANCE OF 690.76 FEET TO A POINT;
N 36°27'06" E, FOR A DISTANCE OF 396.02 FEET TO A POINT;
N 27°37'22" E, FOR A DISTANCE OF 264.62 FEET TO A POINT;
N 26°51'36" E, FOR A DISTANCE OF 391.46 FEET TO 1" PIPE FOUND;

N 15°43'23" W, FOR A DISTANCE OF 197.42 FEET TO A POINT;
N 18°37'24" W, FOR A DISTANCE OF 744.16 FEET TO A POINT;
N 21°50'04" W, FOR A DISTANCE OF 631.16 FEET TO A POINT;
N 23°44'52" W, FOR A DISTANCE OF 409.10 FEET TO A POINT;
N 32°40'41" W, FOR A DISTANCE OF 286.88 FEET TO A POINT;
N 27°20'09" W, FOR A DISTANCE OF 932.26 FEET TO A POINT;

THENCE, DIRECTING RIGHT AWAY FROM DUCK RIVER TO THE SOUTH AND EAST BOUNDARY OF SEAGO, THE FOLLOWING CALLS:

N 65°09'29" E, FOR A DISTANCE OF 23.99 FEET TO A POINT;
N 61°12'35" E, FOR A DISTANCE OF 136.06 FEET TO A POINT;
N 67°29'05" E, FOR A DISTANCE OF 42.46 FEET TO 60" OAK;
N 48°59'47" E, FOR A DISTANCE OF 244.97 FEET TO A POINT;
N 48°55'39" E, FOR A DISTANCE OF 29. 16 FEET TO 10" HACKBERRY AND 8" CEDAR;
N 49°48'29" E, FOR A DISTANCE OF 367.26 FEET TO 1" PIPE FOUND;
N 55°27'24" W, FOR A DISTANCE OF 259.42 FEET TO A POINT;
N 38°16'29" W, FOR A DISTANCE OF 411.36 FEET TO A 1" PIPE FOUND;
N 67°15'9" E, FOR A DISTANCE OF 223.84 FEET TO AN IRON PIN FOUND;
N 29°56'42" W, FOR A DISTANCE OF 228.86 FEET TO AN IRON PIN FOUND;
N 16°17'40" E, FOR A DISTANCE OF 156. 26 FEET TO A POINT;
N 24°10'55" E, FOR A DISTANCE OF 52.93 FEET TO A POINT;
N 23°28'49" E, FOR A DISTANCE OF 29.14 FEET TO 1" PIPE IRON PIPE;
N 16°43'08" E, FOR A DISTANCE OF 57.72 FEET TO A 12" CEDAR;
N 36°17'58" E, FOR A DISTANCE OF 122.71 FEET TO A POINT;
N 33°11'27" E, FOR A DISTANCE OF 87.99 FEET TO A POINT;
N 33°44'57" E, FOR A DISTANCE OF 136.92 FEET TO 1" PIPE FOUND;
N 37°11'17" W, FOR A DISTANCE OF 118.30 FEET TO A POINT AT THE NORTHEAST CORNER OF SEAGO AND THE CENTER OF BEAR CREEK;

THENCE, ALONG BEAR CREEK AND SOUTHERN BOUNDARY OF MIKES BIKES, THE FOLLOWING CALLS:

N 75°40'45" E, FOR A DISTANCE OF 280.14 FEET TO A POINT;
N 67°23'51" E, FOR A DISTANCE OF 281.90 FEET TO A POINT AT THE SOUTHEAST CORNER OF BIKES;

THENCE, ALONG SOUTH BOUNDARY OF GOODMAN, N 67°42'14" E, 199.86 FEET TO A POINT;

THENCE, CREATING A NEW LINE FOR THE ANNEXATION OF 409.92 ACRES, THE FOLLOWING CALLS:

N 64°40'48" E, FOR A DISTANCE OF 395.96 FEET TO A POINT;
N 74°28'41" E, FOR A DISTANCE OF 141.96 FEET TO A POINT;
N 63°11'09" E, FOR A DISTANCE OF 28.87 FEET TO A POINT AT AN INTERSECTION OF MCKAY BRANCH;
CONTINUING ALONG MCKAY BRANCH AND CREATING A NEW LINE FOR THE ANNEXATION OF 409.92 ACRES, THE FOLLOWING CALLS:
S 75°17'27" E, FOR A DISTANCE OF 201.23 FEET TO A POINT;
S 85°15'02" E, FOR A DISTANCE OF 74.45 FEET TO A POINT;
S 81°39'47" E, FOR A DISTANCE OF 81. 78 FEET TO A POINT;
S 69°39'12" E, FOR A DISTANCE OF 42.65 FEET TO A POINT;
S 63°41'25" E, FOR A DISTANCE OF 86.37 FEET TO A POINT;
S 45°49'05" E, FOR A DISTANCE OF 55.43 FEET TO A POINT;
S 29°18'13" E, FOR A DISTANCE OF 73.91 FEET TO A POINT;

THENCE, LEAVING MCKAY BRANCH AND CREATING A NEW LINE FOR THE ANNEXATION OF 409.92 ACRES, THE FOLLOWING CALLS:

NORTHEASTERLY ALONG A CURVE THROUGH A CENTRAL ANGLE OF 30°33'55", AN ARC DISTANCE OF 280.90 FEET TO A POINT OF TANGENCY, SAID CURVE IS CONCAVE NORTHWESTERLY AND HAS A RADIUS OF 589.33 FEET, CHORD BEARING N 24°52'52" E WITH A CHORD DISTANCE OF 373.16 FEET TO A POINT OF TANGENCY;
N 05°51'54" E, 84.94 FEET TO THE POINT OF BEGINNING CONTAINING 409.92 ACRES (17,855,501.50 FT.) AND BEING A PORTION OF THE PROPERTY SHOWN ON TAX MAP 80 PARCEL 12.01 CONVEYED TO BIG BEAR BLUFF 5, LLC BY DEED OF RECORD IN BOOK R2627, PAGE 287 IN THE REGISTER'S OFFICE OF MAURY COUNTY, TENNESSEE.

ANNEXATION AND REZONING REQUEST:

REQUEST TO ANNEX +/-409.92 ACRES AND REZONE TO PUD-R
FUTURE LAND USE: SUBURBAN NEIGHBORHOOD

CONNECT COLUMBIA FINDINGS:

Annexation should provide for a continuation of orderly, planned development of the City. Lot sizes and development scale should be compatible with surrounding development. If proposed development abuts land that is undeveloped or has low density/intensity, the density and intensity of the proposed development should taper towards the periphery to provide compatibility of the development pattern. Land annexed into the City should follow the transect and Character Area Matrix to provide the most appropriate land uses and zoning for the newly annexed land.

Response: The proposed Columbia Bluffs subdivision is 2 miles from the downtown core. Density and lot size transitions from higher density/intensity at the north, along the Bear Creek Parkway corridor to the south, where a more rural character is appropriate adjacent to Iron Bridge Rd and the Yanahli Park. The properties along Bear Creek Parkway have been identified as "area of change." With the development along this corridor, residential development in close proximity to downtown and new commercial development along Tom Hitch Parkway is a logical progression of development pattern.

Connectivity, directly through street, sidewalks, bikeways, greenways, and trails, and indirectly, through a mixture of housing and business types, should be encouraged throughout Columbia..

Response: In addition to roadway and sidewalk connections, Columbia Bluffs proposes nature trails through out the property. The development will also provide a roadway connection between Bear Creek Parkway and Iron Bridge Road. A variety of housing types are proposed, including an age restricted Active Adult neighborhood.

Suburban Neighborhood: Future development should emphasize connectivity and housing diversity.

Response: Columbia Bluffs proposes a variety of housing styles

Near-term Priorites: HOUSING MIX/TYPES: Promote mastered planned housing opportunities for a "full-life cycle" community to accommodate retirees and young professionals. Review Zoning standards to permit smaller lot and home sizes to encourage such developments.

MODIFICATIONS FROM STANDARD PUD-R ZONING REQUEST:

RESIDENTIAL LOT DIAGRAMS: SEE SHEET C2.6

1. ACTIVE ADULT AND PRIMARY ALLEY LOADED HOMES SIDE-SETBACK REDUCED TO 5'.
2. OTHER PRIMARY RESIDENTIAL SIDE-SETBACK REDUCED TO 7.5'.
3. ACTIVE ADULT, COURTYARD, AND LARGE LOT GARAGE LOCATED IN 2ND LAYER
4. ACTIVE ADULT, COURTYARD, AND LARGE LOT ALLOWED DOUBLE CAR GARAGE DOORS, WITH A MAXIMUM WIDTH OF 16'
5. ACTIVE ADULT DRIVEWAYS TO BE 18' IN FIRST LAYER.
6. COURTYARD AND LARGE LOT DRIVEWAY TO BE 12' IN FIRST LAYER.

THOROUGHFARE STANDARDS:

1. UTILIZATION OF MODIFIED ROWS INSTEAD OF 70' URBAN NEIGHBORHOOD ROW.

CIVIC SPACE:

1. ACTIVE ADULT NEIGHBORHOOD TO BE EXCLUDED FROM REQUIRED PLAYGROUND CRITERIA.

ARCHITECTURE:

2. WINDOW SILL HEIGHT REQUIRED TO BE 5' ABOVE AVERAGE GRADE AT FACADE REDUCED TO 3' ABOVE AVERAGE GRADE FOR ACTIVE ADULT HOMES AND COURTYARD HOMES.

PROJECT DESCRIPTION AND SITE DATA:

REQUEST TO ANNEX AND REZONE THE COLUMBIA BLUFFS PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN.

THE PUD-R PLAN PROPOSES AN ENVIRONMENTALLY SENSITIVE MASTER PLAN FOR A DIVERSE RESIDENTIAL DEVELOPMENT. APPROXIMATELY ONE-THIRD OF THE PROPOSED DEVELOPMENT IS RESERVED FOR ACTIVE ADULT/AGE RESTRICTED SINGLE-FAMILY HOMES. ADDITIONALLY, TOWN HOMES AND A VARIETY OF DETACHED SINGLE-FAMILY HOMES ARE PROPOSED.

IN ADDITION TO THE RESIDENTIAL COMPONENT, THE PUD-R PLANS PROPOSES A DAY CARE FACILITY AND A VARIETY OF NEIGHBORHOOD AMENITIES.

TOTAL SITE AREA: 409.92 ACRES
FUTURE LAND USE: SUBURBAN NEIGHBORHOOD

TOTAL AREA OF ROWS/ALLEY EASEMENTS: 62.9 AC; 15% OF GROSS AREA
OPEN SPACE: 199.3 AC; 48% OF GROSS AREA

TOTAL DWELLING UNITS: 836 HOMES
OVERALL SITE DENSITY: 2.04 DUA

RESIDENTIAL BREAKDOWN		NON RESIDENTIAL
ACTIVE ADULT HOMES:	299	DAYCARE 12,000 - 14,000 SF
TOWNHOMES:	166	RECREATION FACILITY LOT - 75,789 SF
ALLEY SINGLE-FAMILY:	146	
COURTYARD HOMES:	103	
LARGE LOT HOMES:	122	

EXISTING TREE CANOPY COVERAGE: 262.2 ACS; 64% OF TOTAL SITE
REQUIRED TREE CANOPY RETENTION: 36%; SEE SHEET C2.8

TOTAL OPEN SPACE PROVIDED: 199.3 AC; 48% OF GROSS SITE AREA

OPEN SPACE BREAKDOWN
CIVIC SPACE: 22.8 AC
ENVIRONMENTAL PROTECTION (FLOODWAY, STREAM/BUFFERS, 100 YR FLOOD PLAIN): 75.0 AC
ALL OTHER OPEN SPACE: 101.5 AC

CIVIC SPACE REQUIRED: 5% MINIMUM; 20.5 AC
CIVIC SPACE PROVIDED: 5.4%; 22.2 AC (SEE SHEET L1.0)

PARKING: SEE LOT DIAGRAMS (C2.6) FOR PROPOSED RESIDENTIAL PARKING;
AND SHEETS L1.0-L1.6 FOR CIVIC SPACE PARKING
RESIDENTIAL: 2 PARKING SPACES PER UNIT
DAYCARE: 1 PER STAFF + 0.5 PER CHILD
CIVIC SPACE: 1 PER 5,000 SF

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

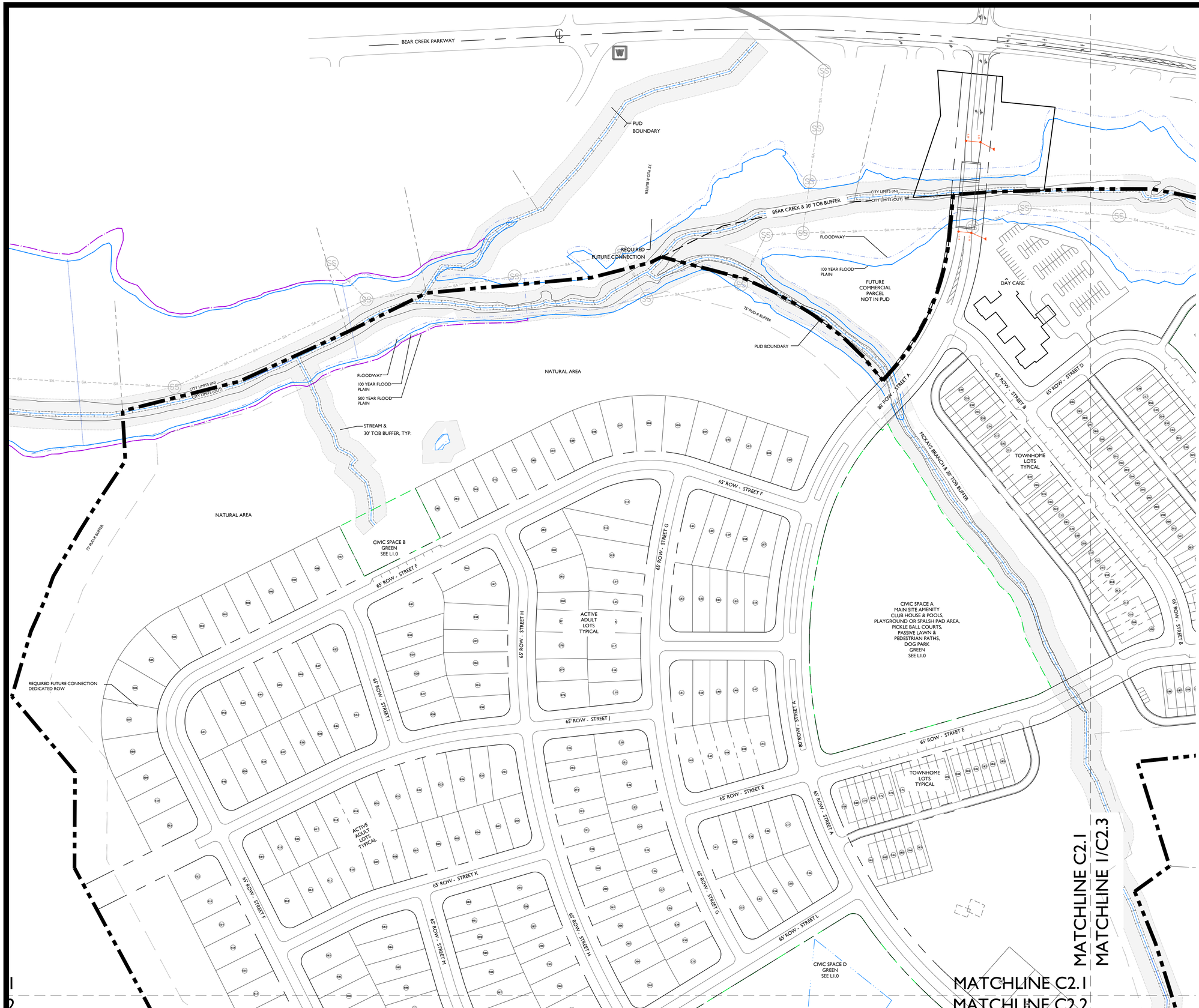
JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT 12.18.23

Date: October 16, 2023

Revision	Date
1	December 18, 2023
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OVERALL PUD-R PMDP

SHEET
C2.0



GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS
REGISTERED
LANDSCAPE ARCHITECT
12.18.23

Date: October 16, 2023

Revision Date

⚠1 December 18, 2023

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OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300

GRAPHIC SCALE 1"=100'-0"

ENLARGED PUD-R PMDP

SHEET

C2.1

MATCHLINE C2.1
MATCHLINE C2.2

MATCHLINE C2.1
MATCHLINE C2.2

75' PUD-A BUFFER

75' PUD-A BUFFER

ACTIVE ADULT LOTS TYPICAL

65' ROW - STREET L

65' ROW - STREET F

65' ROW - STREET H

65' ROW - STREET N

CIVIC SPACE G
ACTIVE ADULT AMENITY
COVERED SEATING, PASSIVE LAWN &
PEDESTRIAN PATHS,
DOG PARK,
COMMUNITY GARDEN,
GREEN
SEE L1.0

65' ROW - STREET O

NATURAL AREA

CIVIC SPACE D
MAIL KIOSK
SEATING, PASSIVE LAWN &
PEDESTRIAN PATHS,
GREEN
SEE L1.0

65' ROW - STREET A

65' ROW - STREET H

60' ROW - STREET O

NATURAL AREA

ACTIVE ADULT LOTS TYPICAL

60' ROW

60' ROW - STREET P

COURTYARD LOTS TYPICAL

55' ROW - STREET R

65' ROW - STREET Q

MATCHLINE C2.2
MATCHLINE C2.3

FLOODWAY
100 YEAR FLOOD PLAIN

STREAM &
30' TOB BUFFER, TYP.

LARGE LOTS TYPICAL

55' ROW - STREET S

60' ROW - STREET P

ALLEY HOMES TYPICAL

DUCK RIVER

55' ROW - STREET P

60' ROW - STREET Q

55' ROW - STREET P

NATURAL AREA

CIVIC SPACE H
PASSIVE LAWN &
PEDESTRIAN PATHS,
PLAYGROUND
GREEN
SEE L1.0

60' ROW - STREET T

60' ROW - STREET S

ALLEY HOMES TYPICAL

65' ROW - STREET C

CIVIC SPACE E
MAIL KIOSK, PASSIVE LAWN &
PEDESTRIAN PATHS,
PLAYGROUND
GREEN
SEE L1.0

NATURAL AREA

NATURAL AREA

LARGE LOTS TYPICAL

COURTYARD LOTS TYPICAL

55' ROW - STREET W

60' ROW - STREET S

MATCHLINE C2.4

OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300
GRAPHIC SCALE 1"=100'-0"

GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

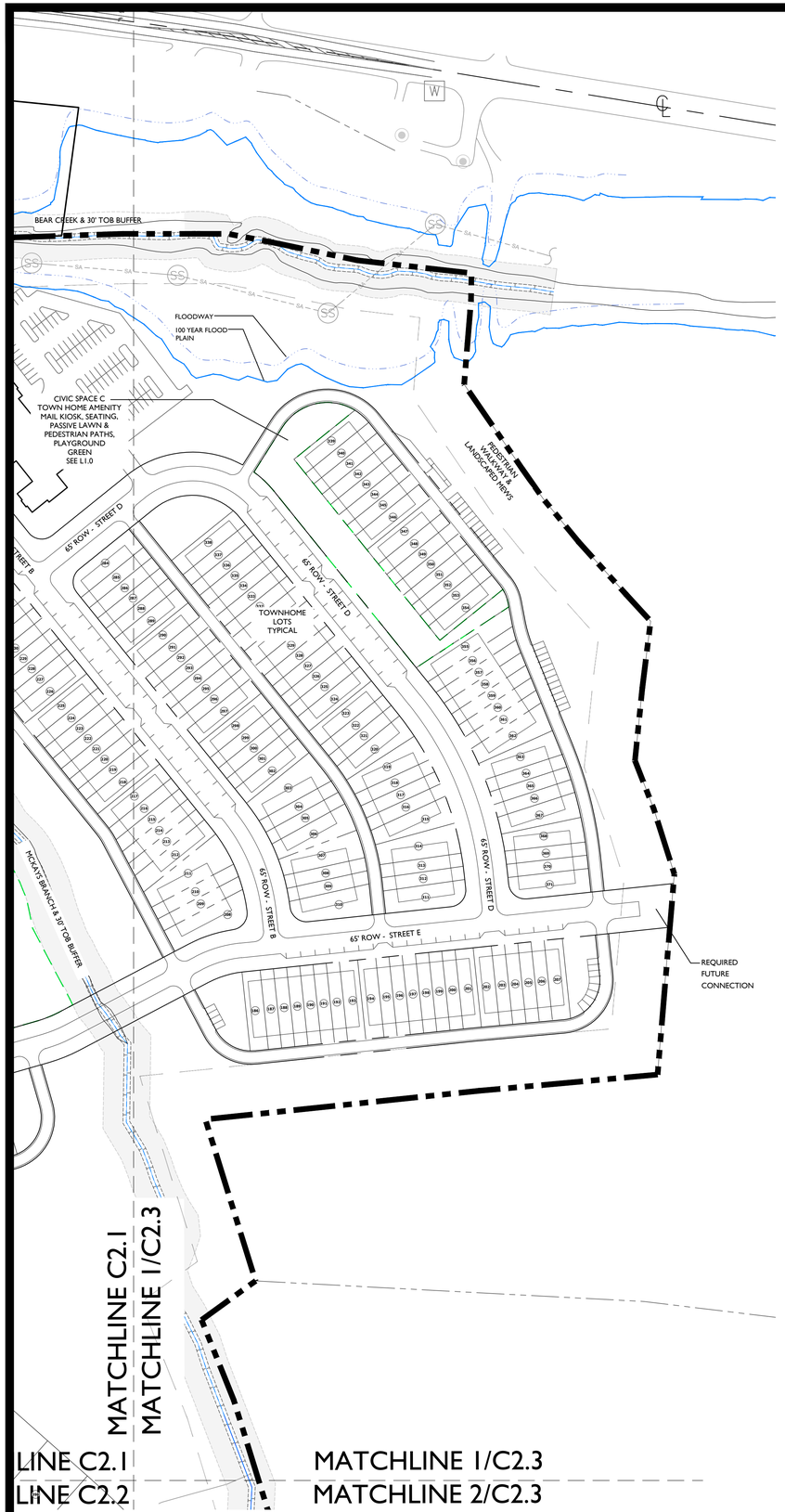
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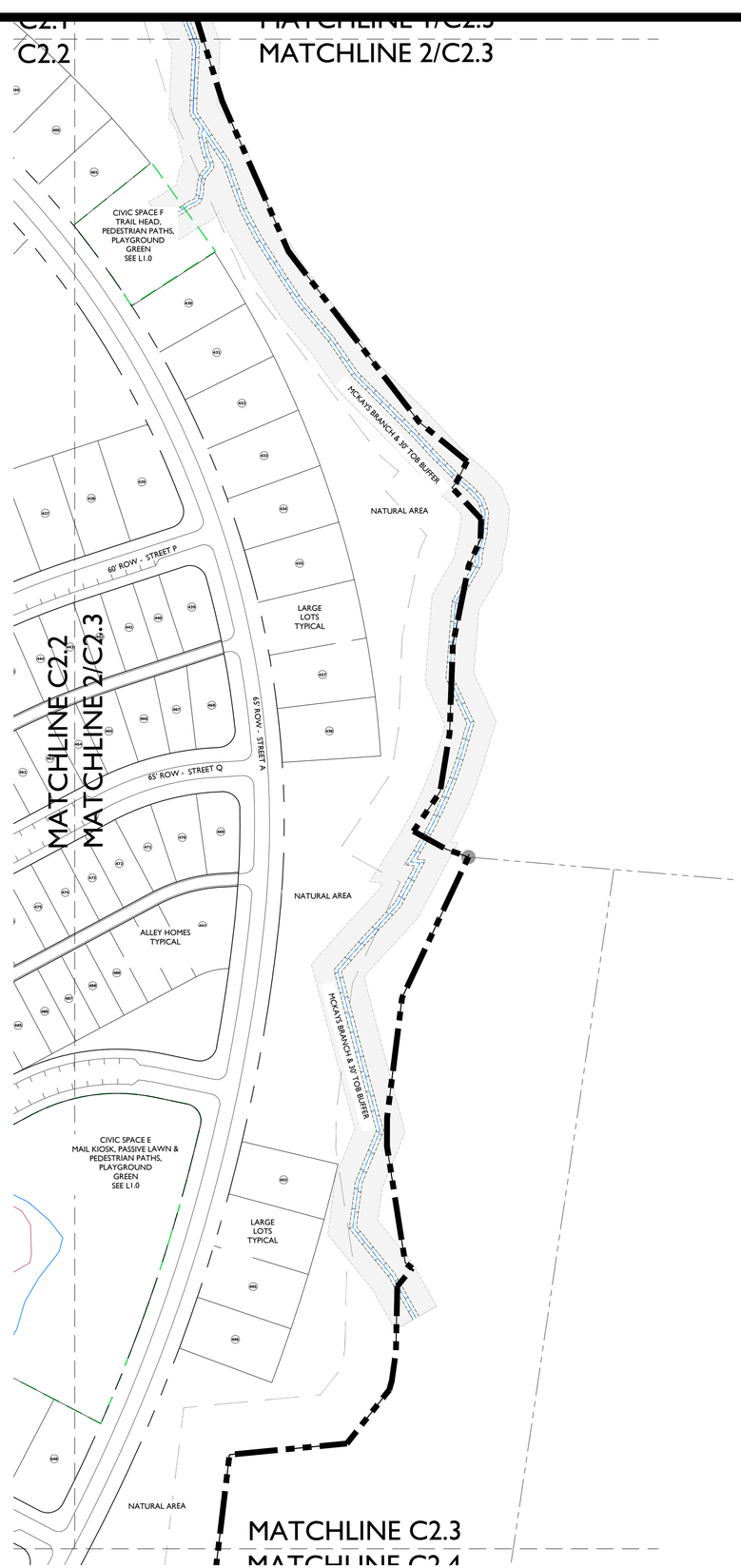
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ENLARGED PUD-R PMDP

SHEET
C2.2





GAMBLE DESIGN COLLABORATIVE

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COLUMBIA BLUFFS
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400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS
REGISTERED LANDSCAPE ARCHITECT
STATE OF TENNESSEE
12.18.23

Date: October 16, 2023

Revision Date
1 December 18, 2023
2
3

OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300

GRAPHIC SCALE 1"=100'-0"

ENLARGED
PUD-R PMDP

SHEET
C2.3

MATCHLINE C2.3
MATCHLINE C2.4

NATURAL AREA

75' FLOOD & BUFFER

FLOODWAY

100 YEAR FLOOD PLAIN

DUCK RIVER

55' ROW - STREET W

60' ROW - STREET T

65' ROW - STREET A

LARGE LOTS TYPICAL

COURTYARD LOTS TYPICAL

55' ROW - STREET V

55' ROW - STREET U

OHE

100' TVA LINE AND EASEMENT

55' ROW - STREET X

50' ROW - STREET U

CIVIC SPACE I
MAIL KIOSK, SEATING, PASSIVE LAWN & PEDESTRIAN PATHS, PLAYGROUND
GREEN
SEE L1.0

STREAM & 30' TOB BUFFER, TYP.

55' ROW - STREET Y

MATCHLINE C2.4
MATCHLINE C2.5

OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300
GRAPHIC SCALE 1"=100'-0"

GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT 12.18.23

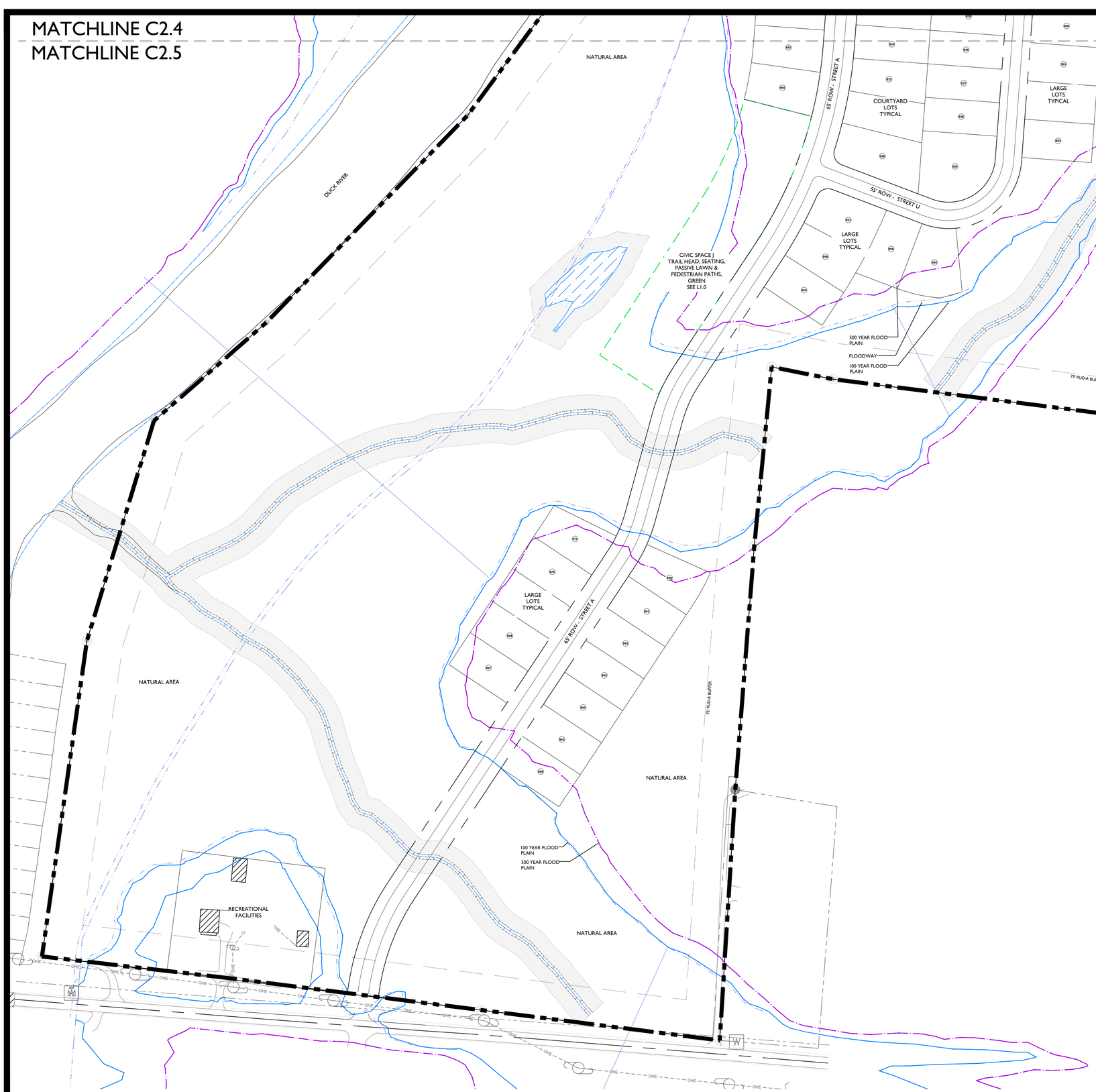
Date: October 16, 2023

Revision Date
⚠ December 18, 2023
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ENLARGED PUD-R PMDP

SHEET
C2.4

MATCHLINE C2.4
MATCHLINE C2.5



OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300
GRAPHIC SCALE 1"=100'-0"

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS
REGISTERED LANDSCAPE ARCHITECT
STATE OF TENNESSEE
No. 329
12.18.23

Date: October 16, 2023

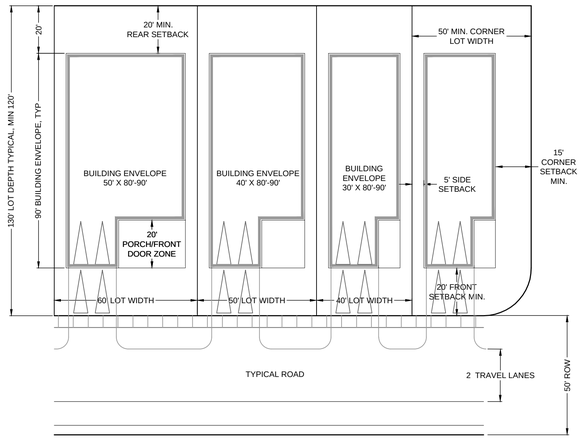
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ENLARGED PUD-R PMDP

SHEET
C2.5

ACTIVE ADULT/ AGE RESTRICTED DETACHED SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 40' X 120'; 50' X 120'; 60' X 120'

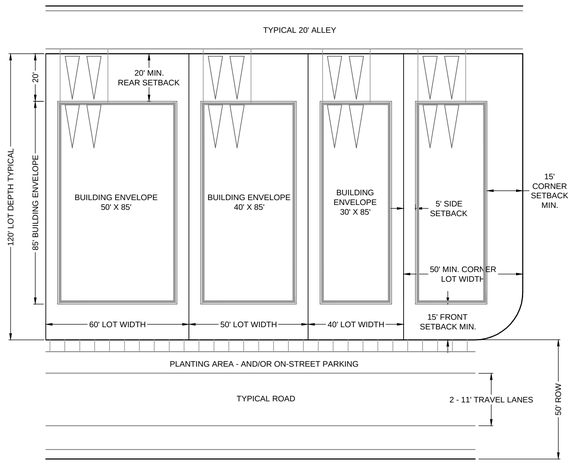
SETBACKS:	MODIFICATION REQUESTS:	LOT DISTRIBUTION:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 5' MIN. CORNER: 15' MIN. REAR: 20' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 5' GARAGE LOCATED IN 2ND LAYER DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16' DRIVEWAY TO BE 18' WIDE IN FIRST LAYER WINDOW SILL HEIGHT 3' ABOVE MIN. GRADE AT FACADE	60' LOTS: 61 50' LOTS: 141 40' LOTS: 97	60%



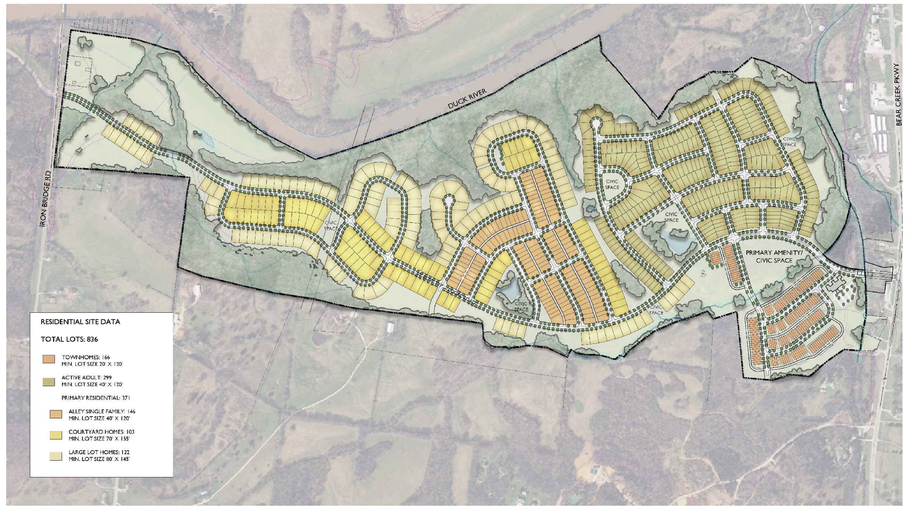
1 C2.6 ACTIVE ADULT LOT DIAGRAM N.T.S

PRIMARY RESIDENTIAL - ALLEY LOADED DETACHED SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 40' X 120'; 50' X 120'; 60' X 120'

SETBACKS:	MODIFICATION REQUESTS:	LOT DISTRIBUTION:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 5' MIN. CORNER: 15' MIN. REAR: 20' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 5'	50' LOTS: 68 40' LOTS: 78	63%



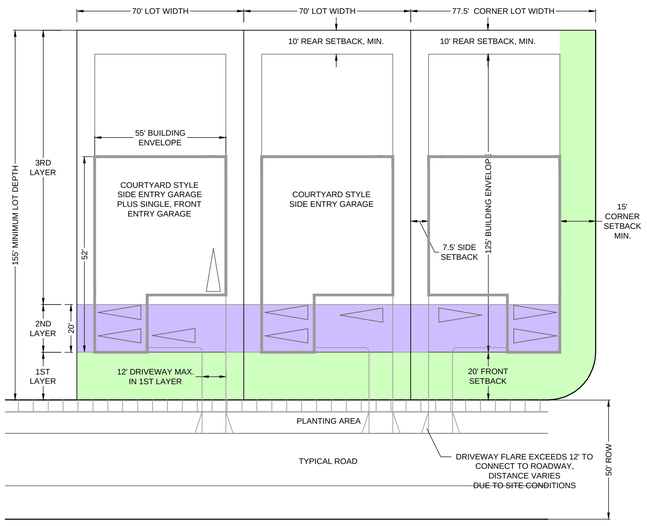
2 C2.6 SINGLE-FAMILY ALLEY LOT DIAGRAM N.T.S



3 C2.6 KEY MAP N.T.S

PRIMARY RESIDENTIAL COURTYARD SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 70' MIN. X 155'

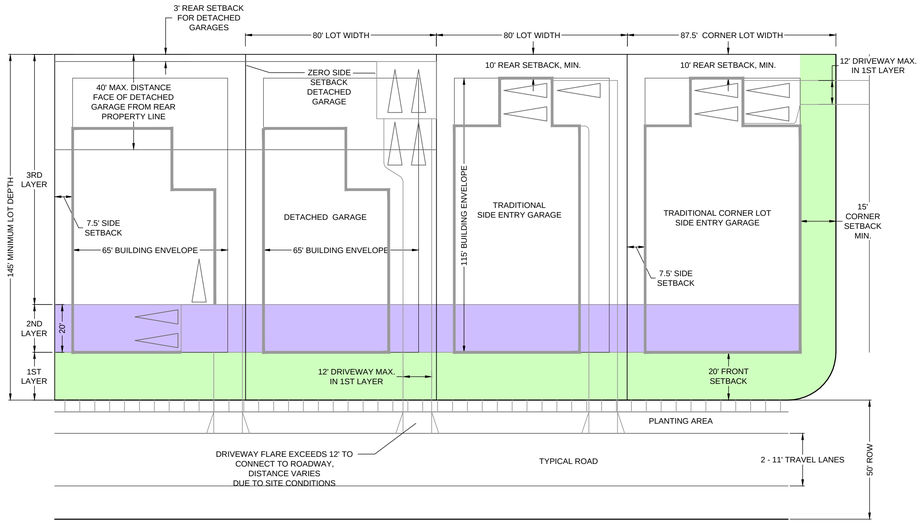
SETBACKS:	MODIFICATION REQUESTS:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 7.5' MIN. CORNER: 15' MIN. REAR: 10' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5' GARAGE LOCATED IN 2ND LAYER DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16' DRIVEWAY TO BE 12' WIDE IN FIRST LAYER WINDOW SILL HEIGHT 3' ABOVE FINISHED GRADE MIN.	30%



4 C2.6 COURTYARD HOME LOT DIAGRAM N.T.S

PRIMARY RESIDENTIAL LARGE LOT SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 80' MIN. X 145'

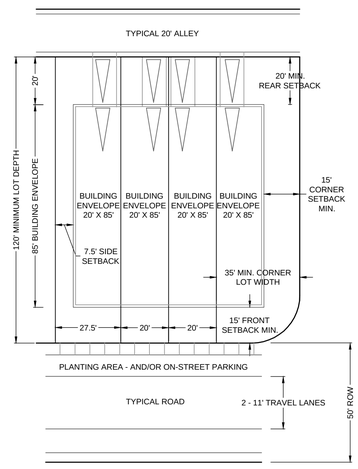
SETBACKS:	MODIFICATION REQUESTS:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 7.5' MIN. CORNER: 15' MIN. REAR: 10' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5' GARAGE LOCATED IN 2ND LAYER DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16' DRIVEWAY TO BE 12' WIDE IN FIRST LAYER	60%



5 C2.6 LARGE LOT HOME LOT DIAGRAM N.T.S

PRIMARY RESIDENTIAL ALLEY LOADED TOWN HOMES
TYPICAL INTERIOR LOT DIMENSIONS 20' MIN. X 120'
UNITS PER BUILDING: 4, 6, 7, OR 8

SETBACKS:	MODIFICATION REQUESTS:	TYPICAL ISR:
FRONT: 15' MIN. SIDE : 7.5' MIN. CORNER: 15' MIN. REAR: 20' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5'	80% INTERIOR UNITS



6 C2.6 TOWN HOME LOT DIAGRAM N.T.S

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT TENNESSEE 12.18.23

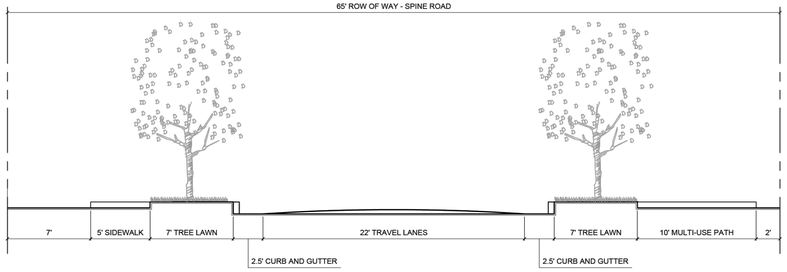
Date: October 16, 2023

Revision Date
1 December 18, 2023
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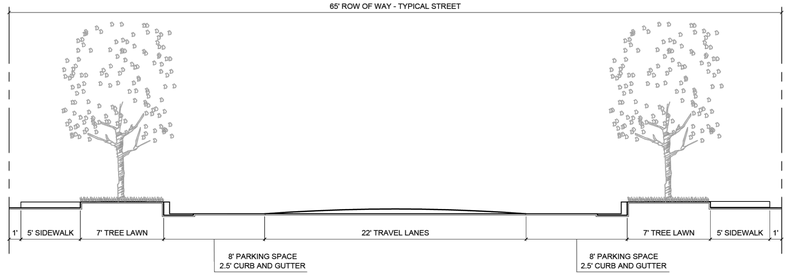
LOT DIAGRAMS

SHEET
C2.6

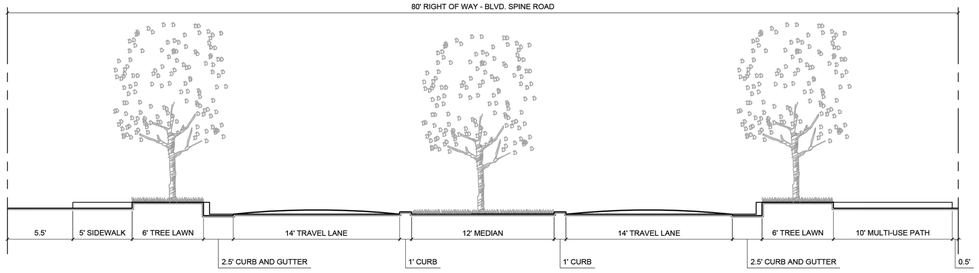
65' ROW OF WAY - SPINE ROAD



65' ROW OF WAY - TYPICAL STREET

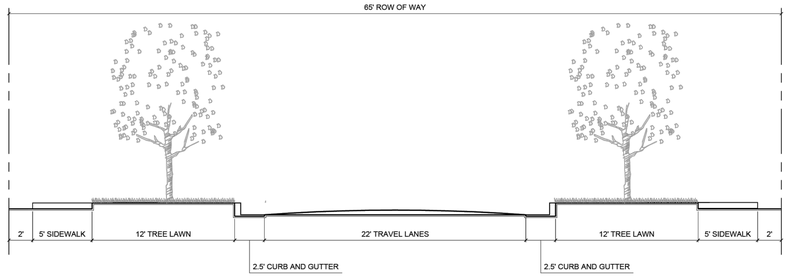


80' RIGHT OF WAY - BLVD. SPINE ROAD

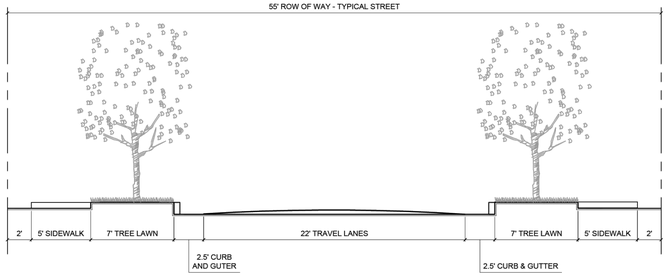


65' ROW - CD4 - NO PARKING

65' ROW OF WAY

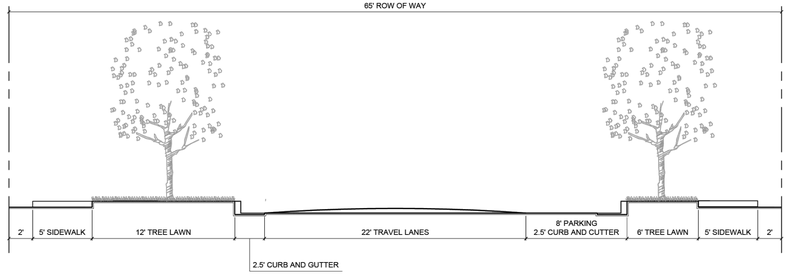


55' ROW OF WAY - TYPICAL STREET

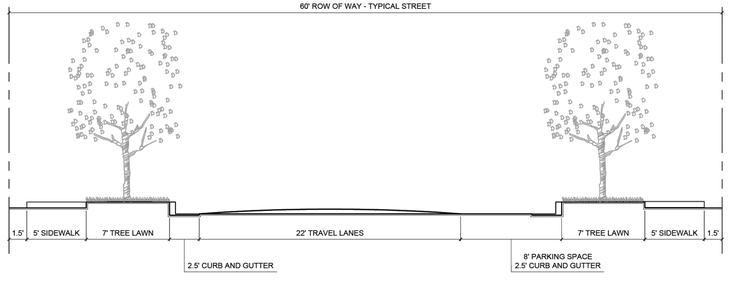


65' ROW - LOCAL CD4
WITH PARKING ONE SIDE

65' ROW OF WAY

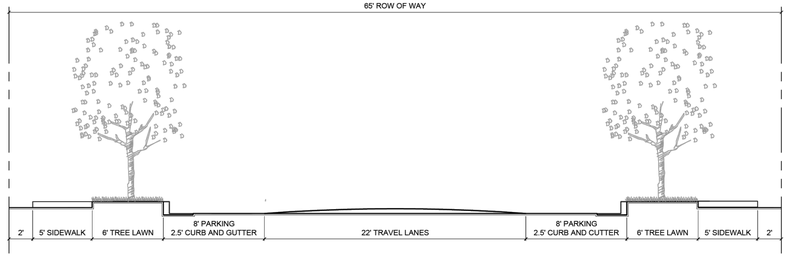


60' ROW OF WAY - TYPICAL STREET



65' ROW - LOCAL CD4
WITH PARKING ONE SIDE

65' ROW OF WAY



GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS
REGISTERED
LANDSCAPE
ARCHITECT
PP
12.18.23

Date: December 18, 2023

Revision Date
△
△
△

LOT DIAGRAMS

SHEET
C2.7



SITE DATA:

EXISTING TREE CANOPY COVERAGE: 262.2 ACS; 64% OF TOTAL SITE
REQUIRED TREE CANOPY RETENTION: 36%;

ANTICIPATED PRESERVATION AREAS TO BE DETERMINED WITH FINAL GRADING/STORMWATER.

GAMBLE DESIGN COLLABORATIVE
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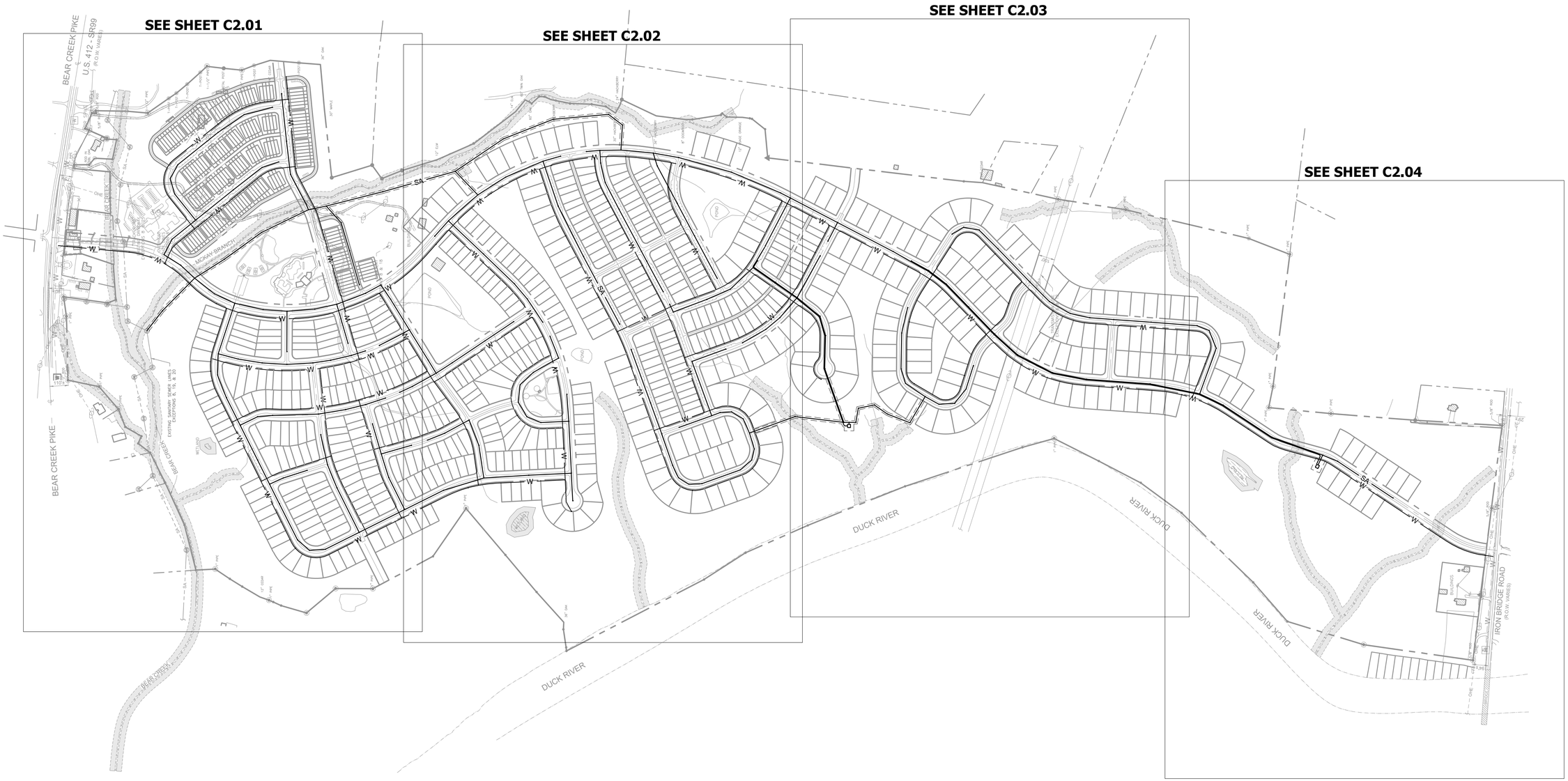
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REGISTERED
LANDSCAPE ARCHITECT
12.18.23

Date: October 16, 2023

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2
3

OVERALL PUD-R PMDP

SHEET
C2.8



N

0 300 600
SCALE: 1"=300'

CSDG
Planning | Engineering
Landscape Architecture
2305 Kline Ave, Ste 300
Nashville, TN 37211
615.248.9999
csdgtn.com

SEAL

JAMES T. HARRISON IV
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 021998
STATE OF TENNESSEE
12-18-23

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

INITIAL SUBMITTAL

ISSUE DATE: 12/18/2023

REVISION HISTORY:

Rev.	Description	Date
1	Initial Submittal	10/16/23
2	Tech Review Comments	12/18/23

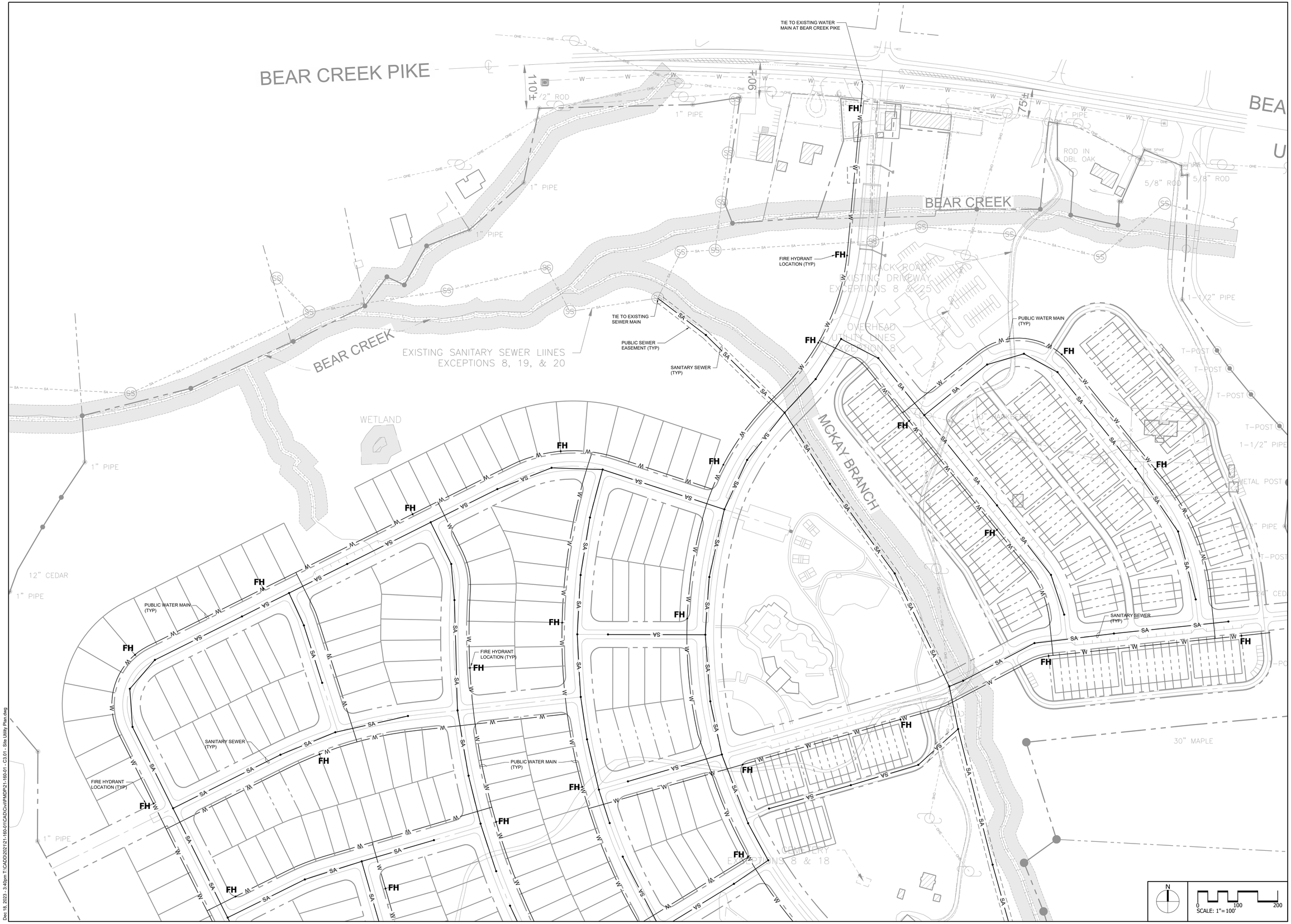
DRAWN BY: TWG
CHECKED BY: TWG

OVERALL UTILITY PLAN

C3.00

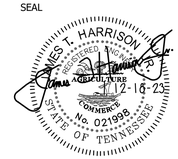
PROJECT NO.: 21-160-01

Dec 18, 2023 - 3:40pm T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.00 - Overall Utility Plan.dwg



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COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

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INITIAL SUBMITTAL

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REVISION HISTORY:

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DRAWN BY: TWG
CHECKED BY: TWG

SITE UTILITY PLAN

C3.01

PROJECT NO.: 21-160-01

Dec 18, 2023 - 3:40pm T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.01 - Site Utility Plan.dwg



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COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

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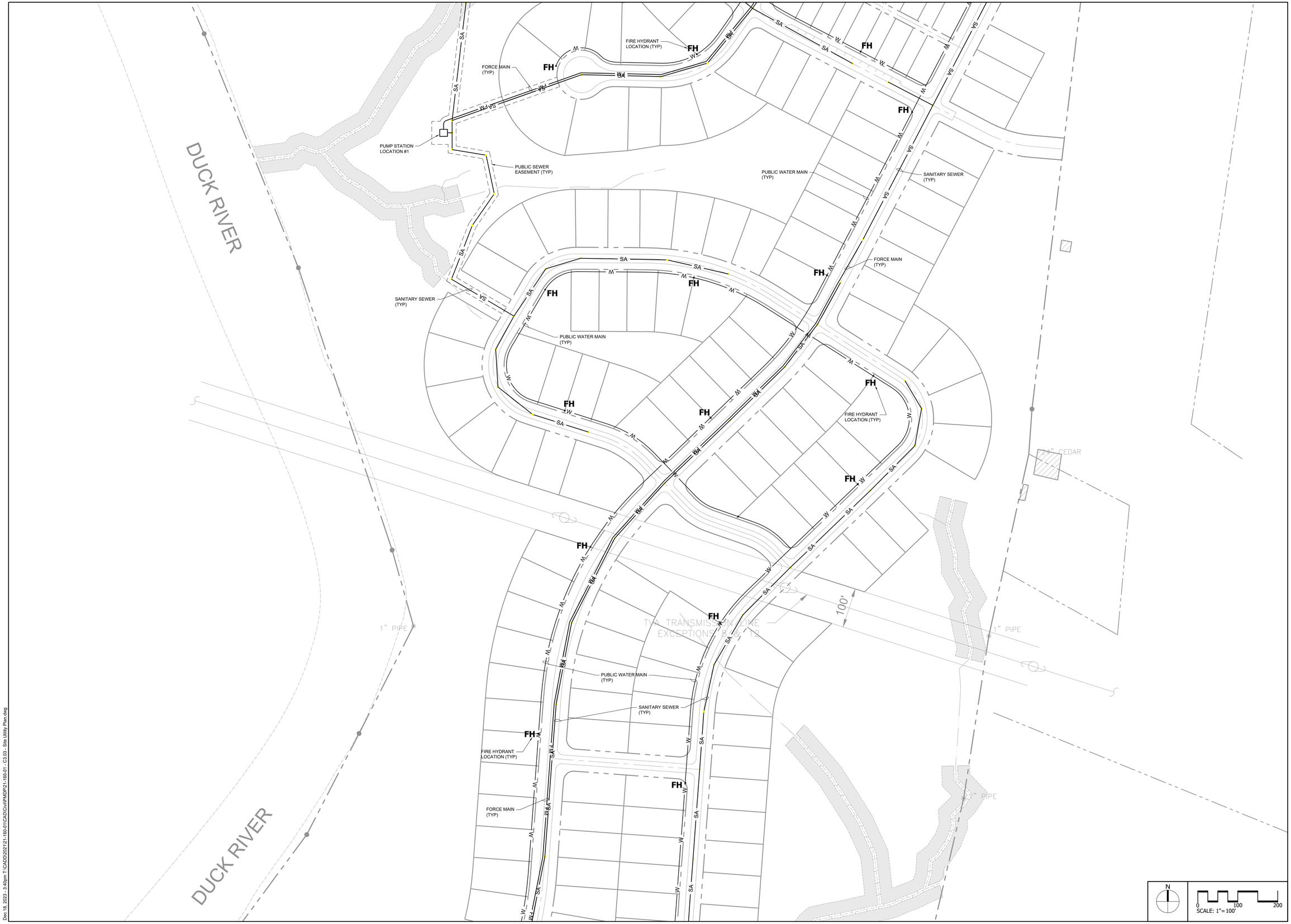
DRAWN BY: TWG
CHECKED BY: TWG

SITE UTILITY PLAN

C3.02

PROJECT NO.: 21-160-01

Dec 18, 2023 - 3:40pm T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.02 - Site Utility Plan.dwg



Dec 18, 2023 - 3:40pm T:\CAD\D\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.03 - Site Utility Plan.dwg

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SEAL

JAMES T. HARRISON IV
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 021998
STATE OF TENNESSEE
12-16-23

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

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REVISION HISTORY:

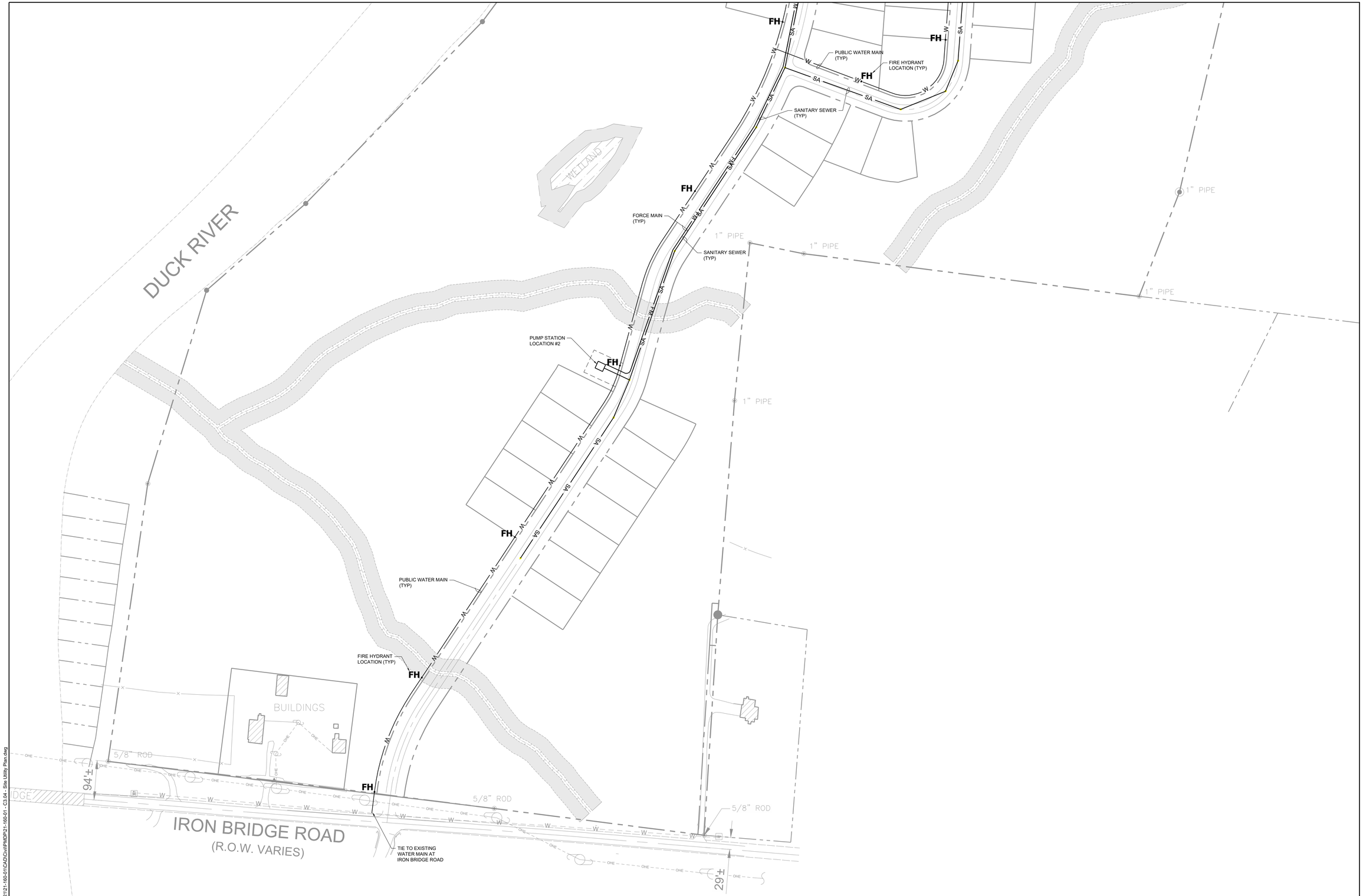
Rev.	Description	Date
1	Initial Submittal	10/16/23
2	Tech Review Comments	12/18/23

DRAWN BY: TWG
CHECKED BY: TWG

SITE UTILITY PLAN

C3.03

PROJECT NO.: 21-160-01



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COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

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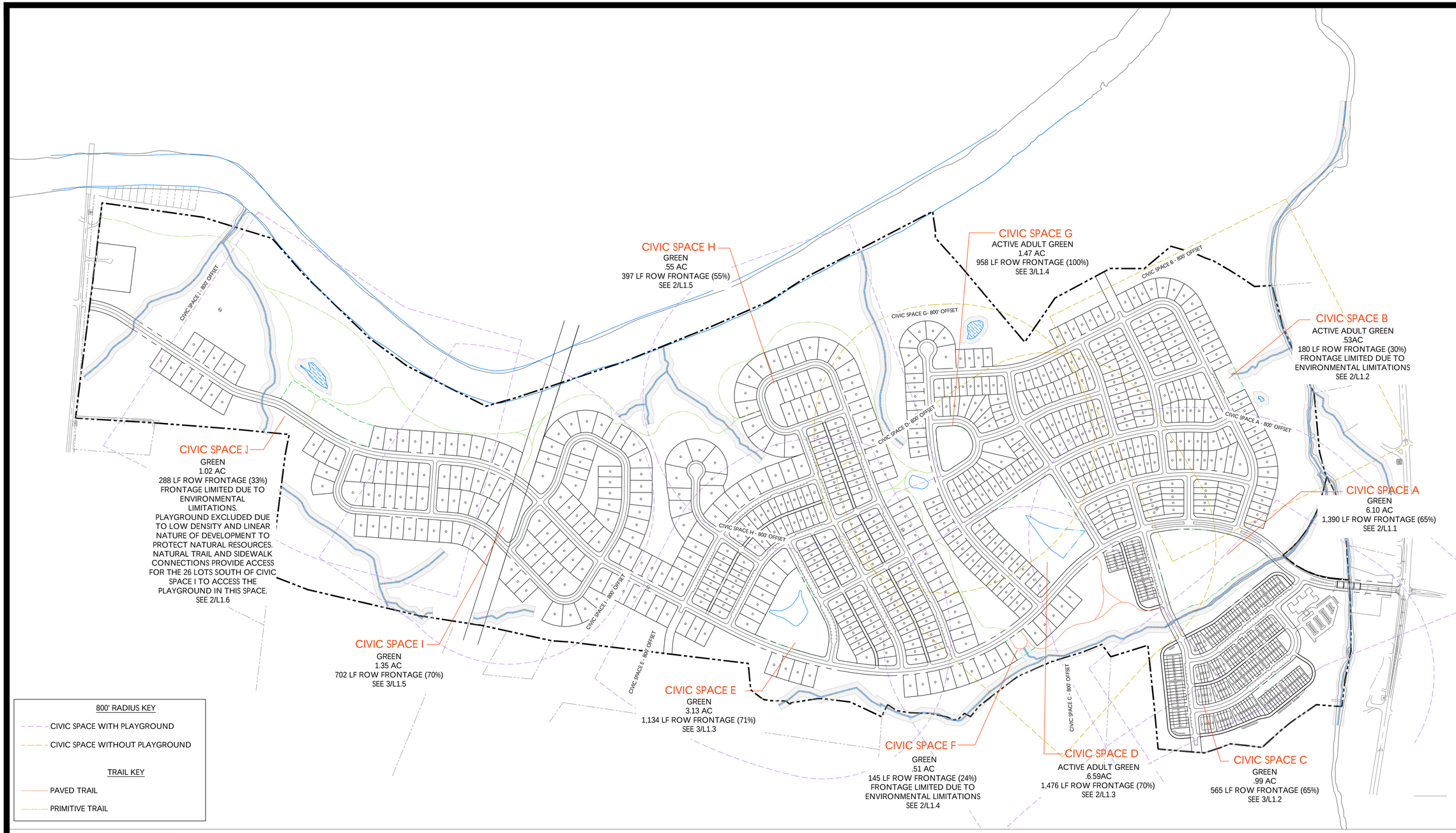
DRAWN BY: TWG
CHECKED BY: TWG

SITE UTILITY PLAN

C3.04
PROJECT NO.: 21-160-01

N
0 100 200
SCALE: 1"= 100'

Dec 18, 2023 - 3:40pm T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.04 - Site Utility Plan.dwg



800' RADIUS KEY

- CIVIC SPACE WITH PLAYGROUND
- CIVIC SPACE WITHOUT PLAYGROUND

TRAIL KEY

- PAVED TRAIL
- PRIMITIVE TRAIL

OVERALL CIVIC SPACE PLAN

N

0 300 600 900

GRAPHIC SCALE 1"=300'-0"

TOTAL OPEN SPACE PROVIDED: 199.8 AC; 48.7% OF GROSS SITE AREA

OPEN SPACE BREAKDOWN

CIVIC SPACE: 22.2 AC
ENVIRONMENTAL PROTECTION (FLOODWAY, STREAM/BUFFERS, 100 YR FLOOD PLAIN): 75.0 AC
ALL OTHER OPEN SPACE: 102.6 AC

CIVIC SPACE REQUIRED: 5% MINIMUM; 20.5 AC
CIVIC SPACE PROVIDED: 5.4%; 22.2 AC (SEE SHEET L1.0)

CIVIC SPACE BREAKDOWN

KEY	SIZE	PLAYGROUND
A	6.10 AC	YES
B	.53 AC	NO
C	.99 AC	YES
D	6.10 AC	NO
E	3.13 AC	YES
F	.51 AC	YES
G	1.47 AC	YES
H	.55 AC	YES
I	1.35 AC	YES
J	1.02 AC	NO

GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS
Registered
TENNESSEE
12.18.23

Date: December 18, 2023

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OVERALL
CIVIC SPACE PLAN

SHEET
L1.0



1 LI.1 KEY MAP N.T.S

NEIGHBORHOOD CLUBHOUSE





PICKLE BALL COURTS



DOG PARK

WALKING PATHS





SWING BENCH



POOL



PICKLE BALL COURTS



2 LI.1 CIVIC SPACE - A
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 50' 100'

GAMBLE DESIGN COLLABORATIVE
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OVERALL CIVIC SPACE PLAN

SHEET LI.1



1 LI.2 KEY MAP N.T.S



2 LI.2 CIVIC SPACE - B

CONCEPTUAL PLAN NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'

BENCHES



FORMAL PLANTING





FORMAL LAWN



WALKING PATH



3 LI.2 CIVIC SPACE - C

CONCEPTUAL PLAN NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'

PLAYGROUND





FORMAL PLANTING

PLAYGROUND



GAMBLE DESIGN COLLABORATIVE

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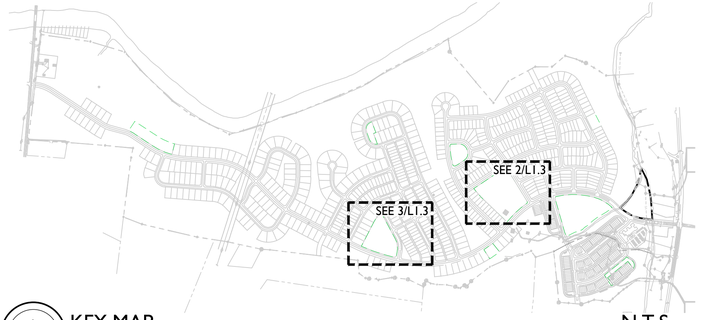
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OVERALL CIVIC SPACE PLAN

SHEET LI.2





1 / L1.3 KEY MAP N.T.S



2 / L1.3 CIVIC SPACE - D
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 50' 100'



POND



TRAIL HEAD



MAIL KIOSK

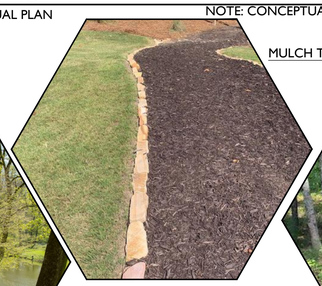
3 / L1.3 CIVIC SPACE - E
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'



NATURAL POND



MULCH TRAIL



NATURAL TRAIL



TRAIL SIGN

GAMBLE DESIGN COLLABORATIVE
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OVERALL CIVIC SPACE PLAN

SHEET L1.3



2 L1.4 CIVIC SPACE - F

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'



SWINGS



FORMAL PARK



PLAYGROUND



1 L1.4 KEY MAP N.T.S

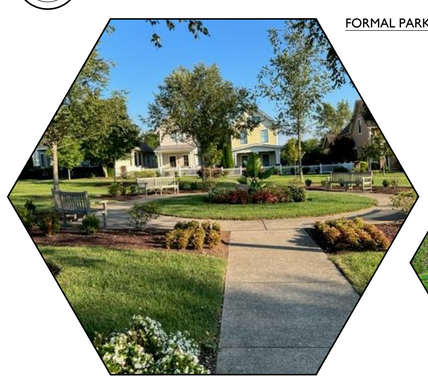


3 L1.4 CIVIC SPACE - G

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

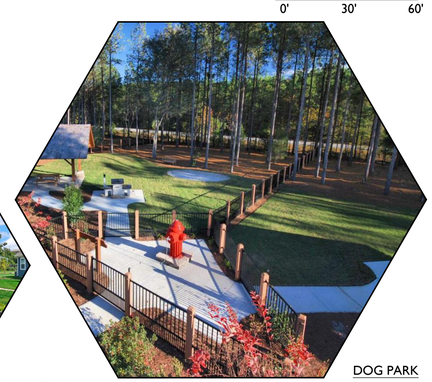
0' 30' 60'



FORMAL PARK



COMMUNITY GARDEN



DOG PARK

GAMBLE DESIGN COLLABORATIVE

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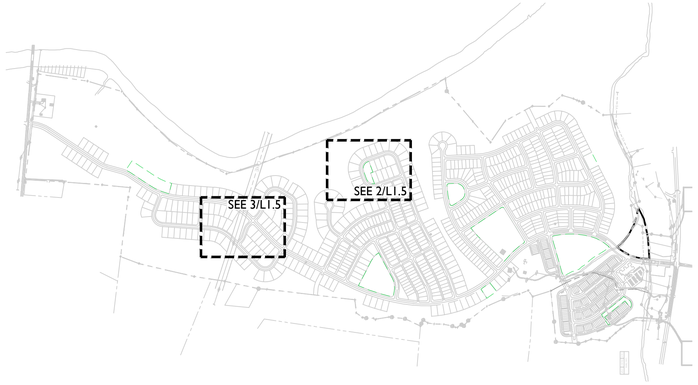
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OVERALL CIVIC SPACE PLAN

SHEET

L1.4



1 / LI.5 KEY MAP N.T.S



2 / LI.5 CIVIC SPACE - H
CONCEPTUAL PLAN
NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.
0' 30' 60'


SWINGS


PLAYGROUND


PLAYGROUND



3 / LI.5 CIVIC SPACE - I
CONCEPTUAL PLAN
NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.
0' 30' 60'


SWINGS


MAIL KIOSK


FORMAL PLANTING

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
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400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT STATE OF TENNESSEE 12.18.23

Date: December 18, 2023
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OVERALL CIVIC SPACE PLAN
SHEET
LI.5



2 / L1.6 CIVIC SPACE - J

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 100' 200'

NOTE: PRIMITIVE WALKING TRAILS TO BE FIELD LOCATED.



OPEN FIELD



TRAIL HEAD



MULTI-PURPOSE FIELD



1 / L1.6 KEY MAP N.T.S

GAMBLE DESIGN COLLABORATIVE

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Date: December 18, 2023

Revision	Date
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△	
△	

OVERALL CIVIC SPACE PLAN

SHEET L1.6

Property and Master Plan Description

Identifying paths for new development, suburban neighborhood development, through *Connect Columbia*

- **Fostered as part of a practice of managed growth that relies on balancing growth, economic development and community development**
  Columbia Bluffs seeks to be a master planned community with diversity of housing options and civic opportunities.

- **Preservation of historic, cultural and environmental assets**
  Columbia Bluffs seeks to build civic areas around the historic/cultural history of the property and utilize proactive measures to protect the natural environmental systems supporting the Duck River.

- **Connectivity**
  Columbia Bluffs seeks to provide a north-south roadway connection between Iron Bridge and Bear Creek Parkway as well as provide stub road opportunities for future development to the east.

- ***Connect Columbia* Top Priorities: allowing a PUD model that will allow flexibility with more assurance of the final outcome**
  Columbia Bluffs seeks to create a master planned neighborhood with commitments on density, architectural character, quality amenities, and protected open space.

- **Suburban Neighborhood goals: future development emphasizing connectivity and housing diversity, pedestrian friendly**
  Columbia Bluffs seeks to development a master plan with all of these goals.

- ***Connect Columbia* Near-Term Priorities: promote master planned housing opportunities for a "full-life cycle" to accommodate retirees and young professionals and to review zoning standards to permit smaller lot and home sizes to encourage such developments.**
  Columbia Bluffs seeks to create a master planned neighborhood with housing opportunities that range from Active Adult age-restricted living, larger lots/homes to support growing families and generational living opportunities, to smaller lots and town homes for young families.

greg.gamble@gdc-tn.com | 615.975.5765 cell | 3020 Stansberry Lane, Suite 201, Franklin, TN 37069

PUD Justification

PUD Zoning is only to be used under certain very specific conditions.

- 2.4.4 – *PUD district may be assigned to an area within a parcel of land over 10 gross acres, only if due to unique site conditions or the necessary and intrinsic uses, size, or form a proposed development* ***cannot under any plan, design, or circumstances conform to one or more of the character districts*** *and standards therefor.*

Environmental Uniqueness. The uniqueness of the land and its proximity to the Duck River provides a unique opportunity to master plan the community with greater environmental protection.

The Duck River may be the most significant natural feature in Columbia. It's the protection and preservation of this resource for aquatic species diversity, wildlife, and a clean Columbia is paramount. Open spaces should be identified and preserved with these specific goals in mind. Based on the Zoning Ordinance Primary Use Table 4.3.9.A-1, open spaces are defined based on the use type. While some uses on this chart are similar, they do not seem to capture the breadth of environmental resource protections and would therefore fall under "other open space use not listed under any use category" which is limited to use within a PUD only. The use of the PUD-R for this property ensures the City's oversight and the design team's plans for development are thought about on the front end and not left to speculation. The property should be developed using Conservation Design Concepts where low impact development is proposed and where conservation is the top priority within sensitive land and around environmental features in order to protect them. These conservation areas include floodplains, steep slopes, natural drainage areas, and areas of established tree canopy along the Duck River.

The Zoning Ordinance does not require a Conservation Plan, nor a development strategy to protect a resource as significant as the Duck River. Section 6.2 Preservation of Natural Features states: Development shall preserve the natural features of the site, such as wetlands, unique wildlife habitats, Historic Structures, major trees and scenic views both from and into the site. This regulation is too vague and not specific enough for the subject property.

The applicant has chosen a PUD-R zoning district instead of CD-3 in order to utilize different neighborhood planning strategies than are allowed under a straight CD-3 zoning project. PUD-R allows for utilization of a cluster development strategy. While Columbia Bluffs is seeking an overall development density of less than what is allowed under CD-3, the PUD-R district allows for smaller lots, lesser lot coverage, and greater impervious surface coverage. The PUD-R also allows for the applicant to ask for modifications to the development standards, which if approved, will further the cluster development design implementation.

Additionally, the applicant is seeking to develop an active adult age restricted neighborhood within the master planned community. While there is no provision in CD-3 that would prohibit the development of an age-restricted neighborhood, many of the zoning criteria in CD-3 are not conducive to the typical design standards utilized in active

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adult age restricted developments. Active adult developments utilize smaller lots and lot coverage in order to reduce the exterior landscape maintenance, which is performed by the HOA. The builders associated with these developments have distinct building programs which cater to the specialized needs of their customers. These homes also tend to require accessible access, which could not be achieved without the ability to seek architectural modification including relief from finished floor level and window sill height at the façade.

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Environmental Protection Strategy

1. **Strategy for Resource Protection utilizing a PUD Planning and Design Approach**

    a. Establish a Limits of Disturbance along the Duck River and its tributaries based upon slopes, natural drainage ways, floodplain areas, and mature tree canopy.
    b. Design new development around open space areas to highlight them as community amenities with pedestrian systems that will connect the entire conservation design open space throughout the community.
    c. Pedestrian circulation and trails are highly encouraged along the river, along stream corridors, and through scenic areas.
    d. The quantity of Open Space preservation should greatly exceed any established base zone district.
    e. New home lots should generally be smaller, clustered areas away from the protected banks of the Duck River.
    f. Document on-site natural resources through a State approved Hydrologist and concurrence reports with local, state, and federal agencies.
    g. Remove debris removal along creek banks to prevent impact to Bear Creek (shoes, clothing, random bottles, containers, fencing, wood)
    h. Use Best Management Practices for Stormwater Pollution Prevention Plans during construction.
    i. Use only one crossing point (< less than approx. 50’ - 60’ feet that spans the creek with no structures within Bear Creek (similar to several crossings visible from US (Highway 412).

2. **Strategy for Protection through Construction**

    Implementation of the Plan requires protective measures. PUD phasing and areas of disturbance should be documented and considered through the PUD process. Protection practices shall include:

    A. Storm water erosion control applications I.E.
        i. Stormwater Detention Areas,
        ii. natural riparian buffers
        iii. silt fencing
        iv. sediment ponds
        v. Check dams

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vi. Ongoing stormwater monitoring of Environmental Controls of water runoff areas and tributaries

B. Compliance with CGP, ARAP and NPDES permitting to address the protections that provide additional oversight to the project.

Throughout the duration of the project, these types of practices within the action areas will ensure environmental compliance with local, state and federal requirements.

3. Strategy for Protection when construction is completed.

Once development is completed permanent storm water detention areas and water out fall locations will be cleaned and stabilized in accordance with the local, state, and federal guidelines.

PUD Standards and the Columbia Bluffs Plans

The Columbia Bluffs Master Plan will address and satisfy the standards for PUD Development as defined in 3.7.1 PUD-R District Standards: **PUD-Residential**: *Specifically, this District is intended for predominantly Residential areas on sites where there are sufficient existing infrastructure, services, and utilities available for a proposed Development. Development in this District:*

a. Is walkable and provides a diverse mixture of housing choices and Building Types,
b. Is necessary to implement and is consistent with the Comprehensive Plan,
c. Cannot under any circumstances, plan, or design conform to one or more of the other Districts and standards therefor due to its necessary and intrinsic Uses or size or form,
d. Provides an innovative plan and design,
e. Is harmonious with and respects the land use, character, and natural or man-made features of both the subject property and Adjacent property,
f. Promotes quality and environmentally sensitive planning and design by taking advantage of special site characteristics, locations and land uses,
g. Provides Civic Space,
h. Is the best use of the site consistent with the goals of protecting and enhancing the natural environment. There are specific Development standards provided for this District, which may be supplemented by additional standards approved as part of the applicable Final Master PUD Development Plan.

PUD-R Justification
Date: December 18, 2023
Project: Columbia Bluffs Preliminary PUD-R Master Development Plan

Modifications of Standards

The following modifications of standards will be requested by the developer to reduce the development footprint and increase the open space held in preservation. The reduction in ROW width, setbacks, and variations in garage locations will provide for a unique, clustered neighborhood experience.

1. Utilization of street sections with smaller ROW impacts than the 70' ROW Urban Neighborhood Street. In coordination with Staff, the applicant is proposing a variety of street sections based on the development intensity and presence of on-street parking. These street sections range from 55' ROW to 80' ROW. This reduced ROW would yield 7 acres of additional open space.
2. Reduction in side setbacks from 10' to 7.5' on front loaded homes and townhomes provides approximately 6.2 acres of additional land placed into open space. (19,920 sf townhomes + 33,655 sf front load x 2 side yards x 2.5' reduction).
3. Reduction in side setbacks from 10' to 5' on detached alley loaded homes and active adult homes provides approximately 12.3 acres of additional land placed into open space. (445 homes x 120' depth x 2 side yards x 5' reduction = 422,400 SF)
4. Allow garage in 2nd layer on courtyard style homes (garage doors not facing frontage in second layer). The courtyard style home provides façade variety while also allowing side and not front facing garage access.
5. Allow double garage doors with a maximum width of 16' wide, single door with windows
6. Allow primary residential driveways to be 12' instead of 10' across the 1st layer and active adult driveways to be 18' across the 1st layer
7. Allow active adult lots to have a finished floor level lower than 18 inches above finished grade at the façade. This provision will allow lot to achieve greater accessibility access.
8. Reduced window sill height at the façade from 5' minimum above average grade at façade to 3' minimum in the active adult and courtyard style homes. This will allow greater accessibility access in the active adult homes, but also allows for windows along the garage façade in courtyard homes.
9. Cul-de-sacs for Street W and Street O. Street O cannot extend further west or reconnect to the south due to the desire to create minimal impacts to the topography and tree canopy in this area new the Duck River. The extension of the cul-de-sac instead of a continuous centerline curve allows for a tee-style intersection and stop condition, as well as an orderly arrangement of residential blocks. Street W cul-de-sac is also necessary due to the topographic, tree canopy and existing natural drainage conveyances in this location. Connecting this roadway to the south would negatively impact these natural conditions.
10. Thoroughfare enfrontment for Civic Space B, F, and J. These three locations have less than the required 50% thoroughfare enfrontment due to their locations. Civic Spaces B and F serve as "greens" and are placed at the perimeter of the proposed development where natural features are present and preserved. Civic Space F also serves as a trail head for a greenway. Civic Space J is a linear "green" which is located primarily in the

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uplands and adjacent to Road A. This “green” creates the trail head and parking area for the primitive walking trails and other low impact amenities adjacent to and in the flood plain associated with the Duck River. Since no cross streets are proposed going west to wards the Duck River, thoroughfare enforcement is limited to one side. Each of these civic spaces provides at least 33% enfrontment.

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December 14, 2023

Mr. Glenn Harper, P.E.
City Engineer
City of Columbia, TN
N. Garden Street
Columbia, TN

RE: Columbia Bluffs (Big Bear Bluff Traffic Impact Study) Concurrence letter to TIS Report

Dear Mr. Glenn Harper,

Kolter Land (Developer) would like to submit this concurrence letter to the City of Columbia and is committed to making the off-site improvements and phasing outlined in the TIS dated 10.16.23.

The following is the projected timing and installations of said improvements:

1. Prior to preliminary acceptance of *Phase 1 (& all subsections) or Final Plat of Phase 2* vertical build out, consisting of +/- 142 dwelling units, the **Bear Creek Pike and Mt Olivet Road/School Lane** improvements will be completed.
    a. Please see aerial image describing improvement and location
2. Prior to preliminary acceptance of *Phase 2(& all Subsections) or Final Plat Phase 3* vertical build out, consisting of a total of+/- 142 dwelling units, the **Bear Creek and Tom J Hitch Parkway** improvements will be completed.
    a. Please see aerial image describing improvement and location
3. Prior to preliminary acceptance of *Phase 3(& all subsections) or Final Plat Phase 4* vertical build out, consisting of +/-143 dwelling units, the **Bear Creek Pike and Patterson Drive/Site Access # 1 & Patterson Drive South Bound Left Turn Lane** improvements will be completed.
    a. Please see aerial image describing improvement and location
4. Prior to preliminary acceptance of *Phase 4(& all subsections) or Final Plat of Phase 5*, upon completion of full vertical buildout of Phase's 1-4, *Phase 4,* consisting of +/-143 dwelling units, the **Iron Bridge Road and Site Access # 2** improvements will be completed.
    a. Please see aerial image describing improvement and location
5. Prior to preliminary acceptance of *Phase 5(& all subsections) or Final Plat Phase 6* vertical build out, consisting of +/-144 dwelling units, the **James Campbell BLVD and Tom J Hitch Parkway** improvements will be completed.
    a. Please see aerial image describing improvement and location
6. Prior to preliminary acceptance of *Phase 6*, consisting of +/- 146 dwelling units, **All Recommended Road Improvements** will be completed for all +/-860 dwelling units.
    a. Please see aerial image describing improvement and location

Please see the attached “Columbia Bluffs Aerial Improvement Map” for reference to locations of said improvements.

All improvements will be designed and constructed in accordance to AASHTO, TDOT, and City of Columbia standards. All projected phase unit counts are subject to change based on final engineering design and utility completion required at time of construction documents review.

Please let me know if you should have any questions.

Respectfully,

Digitally signed by Joshua Gibbs
Reason: I am approving this document
Location: KolterLand
Date: 2023.12.18 10:28:00 -06'00'

Joshua Gibbs
Kolter Land Partners, LLC
Vice President
14025 Riveredge Drive, Suite 175
Tampa, FL 33637
(615) 582-3253

December 18, 2023

Paul Keltner, Director
Development Services
City of Columbia, TN

RE: Project# 23-0414; Re-Submittal 400 Bear Creek Parkway – Annexation Request and PUD-R Rezoning

Dear Mr. Keltner,
The accompanying documents and comment responses below are for the resubmittal of the above referenced project. It is our intention to proceed to the January Development Review Committee Meeting, as staff requested an additional DRC opportunity.

Please note that Staff has provided written comments to the applicants in two separate comment letters. The comment responses listed below include all comments from both letters. Due to the combination of the staff comments, numerical order may not be consistent with the original letters.

Included in the submittal are the following:

1. Online/Digital upload of revised PUD-R documents
2. Comment responses to Development Review Committee (below)
3. Revised PUD justification letter

Staff Comments:

Fire

1. Fire hydrants are to be spaced no more than every 500'. There are a few locations that needs attention.
   Response: Understood, hydrants spaced at no more than 500'.
2. Alleys are not to be used for access for emergency vehicles. An approved fire apparatus road must be within 150' of all structures. A couple locations that need this corrected.
   Response: Townhome layout has been adjusted to accommodate this comment.

Engineering

3. Subject to Construction Plans and Traffic Impact Study.
   Response: Noted.
4. Provide traffic improvement commitment letter with phasing based on improvement identified in the TIS and an overall diagram of all improvements.

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Response: This has been submitted to Engineering and a copy has also been uploaded with this resubmittal.

5. Provide proposed grading at intervals of not more than 2 feet.
   Response: Grading provided at 2' intervals.
6. Overall grading may not support slab on grade foundations. See detail DD-04.
   Response: Development proposed a mix of slab on grade and crawl space foundations to fit development grading.
7. 8% maximum grade on alleys
   Response: Understood, all alleys under 8%
8. Whenever a proposed street intersects a street with an equal or greater classification, a tangent (measured from the edge of travelled way, or the right-of-way line when determined by the City Engineer, along the centerline of the intersecting street) shall be provided. See ESS Table 3 Cul-de-sac on Street C & O and C & D: Cul-de-sacs shall be located a minimum distance away from the connected roadway as to provide a right-of-way section a minimum of twenty-five (25) feet in length parallel to the centerline of the street between the intersected street and the expansion of the right-of-way for the cul-de-sac with a width matching the roadway cross-section. See ESS detail SD-15.
   Response: Please see Sheets C2.0 – C2.6. Tangents have been provided and cul-de-sacs have been adjusted to meet the ESS requirements.
9. Provide and show lot numbers
   Response: Lot numbers have been included with resubmittal.
10. Provide stub to the east roughly 340 ft north of intersection of Street A, U, V
    Response: A stub road to the east has been provided in this general location.
11. Provide alley street section. Provide boulevard street section.
    Response: Based on meetings with Engineering and Planning Staff, the applicant has revised the plan to reflect the CD3, CD4 and Boulevard street sections provided by Engineering Staff. These street sections can be found on Sheet C2.7. Alley Section from ESS has also been included on this sheet.
12. Alley drainage should be located in the center of the roadway. Inlet spacing generally 150 ft. max. Note alleys will have driveway style aprons when intersecting streets.
    Response: Understood. Layout plan will be adjusted to reflect the driveway style aprons. Alley drainage centered in road and generally 150' spaced.
13. Minimum horizontal centerline curvature for alleys is 70 ft.
    Response: The layout plan has been adjusted and all alley centerlines meet this minimum.
14. TVA may have restrictions on the proposed amenities within Civic Space I
    Response: Noted. The applicant will coordinate with TVA prior to final development plan submittal.
15. Hydrologic analysis and permitting required for bridge over Bear Creek. Preliminary assessment appears to adhere to regulations.
    Response: Noted
16. Where a proposed public street intersects an arterial roadway, a minimum of seventy-five (75) feet of right-of-way, two hundred fifty (250) feet in length, shall be provided from the edge of the intersected street's right-of-way.
    Response: Understood, right-of-way provided to comply.
17. Note: Drainage channels within a subdivision providing drainage for the following shall be located on a common or open space lot a minimum of ten (10) feet in width within a dedicated public

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drainage easement or public right-of-way. 1. Eight (8) or more lots, either in whole or a portion of; 2. Public infrastructure; or 3. An area equivalent to two (2.0) acres.
Response: Understood, right-of-way provided to comply

18. Wetland north of cul-de-sac on Street O appears to be a sinkhole. Additionally, there are other small depressions that will require evaluation. See ESS section 5.4 Storm network is incomplete for the southern portion of the site.
Response: Understood, depressions will be evaluated with geotechnical assessment. Preliminary storm network completed for full site.
19. Proposed detention areas appear to be smaller than would be required to satisfy water quality and peak rate of runoff requirements.
Response: Proposed stormwater areas increased. Final water quality and detention areas will meet requirements.
20. Overall site geotechnical assessment and geotechnical analysis and recommendation of all closed depressions will be required at final master plan and preliminary plat.
Response: Noted
21. ROW stub to the western property (Street F) should be set up in a manner to allow for future retrofit into a tee type intersection.
Response: The required western property ROW stub has been shifted one block to the south to accommodate grading and utility concerns. This stub is shown as a tee-type intersection.
22. Provide justification of the usage of all cul-de-sacs. It appears several could be feasibly connected.
Response: Per the suggestion of staff, two of the cul-de-sacs on the south western side of the property have been combined. There are currently two cul-de-sacs (Street O and W) remaining. Street O cannot extend further to the west or reconnect to the south due to the desire to create minimal impacts to the topography and tree canopy in this area near the Duck River. The extension of the cul-de-sac instead of a continuous centerline curve allows for a tee-style intersection and stop condition, as well as an orderly arrangement of residential blocks. Street W cul-de-sac is also necessary due to the topographic, tree canopy and existing natural drainage conveyances in this location. Connecting this roadway to the south would negatively impact these natural conditions.
23. Provide ROW dedication 37.5 ft from the centerline of Iron Bridge Rd.
Response: A line reflecting a 37.5' offset from the centerline of Iron Bridge Road has been added into the layout plan. There is a very small area on the eastern side of the property where ROW will have to be dedicated in order to achieve this offset.
24. Maximum manmade slope 3:1. A few slopes exceed this maximum.
Response: Understood, slopes adjusted to meet 3:1
25. Note: All roadways shall meet geometric requirements of the ESS.
Response: Noted.
26. Proposed street sections are not the typical sections for this particular zoning. Urban Neighborhood Street and the 2 Lane Avenue would generally be appropriate. The proposed section and reduction in ROW width also includes reductions or eliminations of elements such as street trees and on street parking.
Response: The applicant has met with Planning and Engineering Staff to discuss the street sections. Based on the street sections provided by Staff, the applicant has revised to the layout. While the street sections do propose some modifications based on the current Zoning Ordinance, they do provide 6' and 7' grass strips for street trees and on-street parking along the frontage of the alley-loaded homes, where appropriate. Please see the PUD justification letter for additional details on

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the gain of open space based on these reductions and additional justifications for the use of these modified street sections.

27. The appropriate street section for this character district (PUD-R) would be the Urban Neighborhood or Urban Center Street sections. Typically, developments have utilized the Urban Neighborhood Street in residential settings more than the Urban Center Street.
    Response: The applicant has met with Planning and Engineering Staff to discuss the street sections. Based on the street sections provided by Staff, the applicant has revised to the layout. The applicant is proposing a street section that meets more of the intent of the Urban Neighborhood street in northern section of the site with a higher residential density. In the southern portion of the neighborhood, larger lots and less density are utilizing a smaller street section without on-street parking.
28. The Zoning Ordinance permits the Urban Neighborhood Street across multiple character districts (CD-3, CD-4, CD-4C, PUD-R, etc.), but we have recognized after having the code adopted for roughly 1.5 years, there are some distinct character and use-case differences between CD3 and CD4+ style developments. Staff is working on revisions to the street sections to accommodate these differences in character. The Planning Commission and City Council may consider these proposals in 2024 as part of a larger revision to the Zoning Ordinance. Generally, the proposed development has portions that are somewhat consistent with CD3 and some more similar to CD4. The Assistant City Engineer (in consultation with other Planning and Engineering staff) has provided a markup that highlights the streets where parking would be recommended and the (draft) revised street sections for those character areas.
    Response: The applicant has utilized the street sections proposed by Staff, with the exception of the spine road, which has increased by 5' ROW and now includes a multi-use path.
29. It is the intent and the requirement for throughfare assemblies to have parking on one or both sides in CD4 as well as all more dense/intense character districts. The active adult area, as proposed, does not allow for adequate space between driveways to provide parallel parking. See attached markup.
    Response: On-Street parking is provided in the townhome area and for the primary residential alley loaded homes. In other locations, the applicant does not feel that on-street parking should be utilized.

Planning

1. City Planner Kevin McCarthy, AICP and Planner Austin Brass, AICP will jointly prepare the staff report for this item. Please contact kmccarthy@columbiatn.com with question about the development review process, annexation, the PUD justification, development parcel standards, nonresidential uses, thoroughfare assemblies, civic spaces, or technical comments from other reviewers. Please contact abrass@columbiatn.com with questions about lot configurations, façade standards, PUD-R bulk standards, and the mix of residential types. Please copy both case planners on communications related to this request.
   Response: Noted.
2. Due to the size and complexity of this request, the Zoning Administrator requests that this application be reviewed again by the DRC following resubmittal to these comments before advancing to the Planning Commission agenda.

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Response: Noted. The applicant is anticipating this resubmittal to allow placement on the January DRC agenda for additional review.

3. Please expand upon the modification of standards listed on page five of the PUD-R justification letter. The list should include **all** requested deviations from the PUD-R standards at 4.3.1-K, as well as other deviations from standards of the ordinance (e.g. use of cul-de-sacs contrary to 5.2.2.E). For each requested deviation, please explain how the customized standard offers a better built environment to residents of the city of Columbia and/or better implements the Suburban Neighborhood future land use classification than the CD-3L or CD-3 character districts. The revised letter should support an explanation that the public purpose of the standards is satisfied "to equivalent or greater degree" by utilizing the proposed alternative (8.5.21.D; p. 452). Items two and three on the list provided with the application are a good template (i.e. explain the gain in open space from the modification).
   Response: Noted. Please see revised Justification letter provided with this resubmittal.
4. Please add a projected timeline to phasing plan shown on sheet C1.00. The plan should be sufficiently detailed to provide adjacent property owners of the duration of actual construction activity near their property. The phasing plan should comply with section 8.5.21.F (p. 453). The plan should indicate when Final PUD master plan and subsequent plats are projected (8.5.21.R; p. 461). The phasing plan should indicate if any extension requests are anticipated related to the timing of actual construction under 8.5.21.W (p. 464). The phasing timeline may be provided as a separate document if that is easier to prepare.
   Response: Understood, phasing timeline provided on C1.0 to comply.
5. **Advisory**: The applicant has a separate but related application for the upcoming development review cycle. The other application rezones an adjacent parcel to CD-4 for commercial development. It may be advisable to combine these applications into a single large multi-use PUD at resubmittal (this will require review the Architectural Design Review Team).
   Response: The applicant would prefer to keep the applications as two-separate projects. The applicant understands and requests that the CD-4 Annexation/Rezoning should track with the PUD-R project and it's support and approval would be dependent on the approval of the PUD-R project.
6. Please expand upon the Environmental Uniqueness section on page two of the PUD-R justification letter. Please elaborate on the "Commitment to Environmental Stewardship" and explain which strategies could not be utilized under a CD-3 zoning.
   Response: The applicant will continue to work with staff to expand on the environmental strategies.
7. **Advisory**: Consult with the Assistant City Engineer (Douglas Toney) regarding alternative design for segments of Street A.
   Response: The applicant has meet with Staff and is utilizing new sections proposed by Staff.
8. **Advisory**: Please consult with the Director (Mac Reagan: mreagan@columbiatn.com) and Assistant Director (Alex Troje: atroge@columbiatn.com) of the City of Columbia Parks & Recreation department about composition of Civic Spaces (especially LI.6) and potential public access easement/alignment with Parks & Rec goals for level of service in East Columbia. If there are opportunities for public access/public benefit, please identify these in the revised PUD justification letter.
   Response*: The applicant is meeting with Parks & Recreation Staff in the coming days and will be continuing to coordinate with staff to identify these opportunities.*

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9. Please revise phasing plan to provide construction of Road A connecting Bear Creek Pike and Iron Bridge Road in the first phase.
   Response: Connection to Iron Bridge Road shown as Phase 3b to match the traffic impact study ('Site access 2 should be constructed and connected to Iron Bridge Road prior to beginning construction for Phase 4, or comparable number of dwelling units.')
10. Please revise to eliminate the cul-de-sacs in phases 3 and 6 per 5.2.2.E (or request as part of PUD deviations with explanation of equivalent public benefit).
    Response: Please see revised layout and PUD Justification document. Two cul-de-sacs were eliminated and two remain.
11. The zoning ordinance contains contradictions related to PUD-R Civic Space types. Table 4.3.1-K (p. 157) indicates Sport fields are not a permitted Civic Space type in PUD-R. Table 5.3.3-B indicates otherwise. Please add this to the requested deviations and accompanying explanation.
    Response: Please see Sheets L1.0-L1.6. The civic space delineations have been revised for clarity and based on discussions with staff. Currently, the only sports fields shown in a Civic Space are the pickleball courts at the main amenity. The applicant believes that this falls under the allowable use category of "active recreation" and does not constitute a stand-alone sports field as a civic space. Since this use is allowed in the "green" civic space type, the applicant is not requested a deviation from standards.
12. 50' right of way shown on PUD does not conform to Thoroughfare assemblies applicable to PUDs in 5.2.2.G-1. This is addressed in justification letter but please explain why it is necessary throughout the development and why the additional open space is a greater benefit than the omitted elements of the Thoroughfare.
    Response: Street sections have been revised per discussions and additional comments from Staff.
13. Sheet C2.0 indicates a tree save figure. Please provide a tree preservation plan with recent aerial image as described in 4.3.16.L of the zoning ordinance.
    Response: Existing tree canopy and required preservation is provided on a new Sheet.
14. There appears to be small gaps in the pedestrian shed, please revise.
    Response: Site layout adjustments have been made and now, each lot is within 800' of a civic space.
15. Please revise to show bicycle network and bikeway types utilized (5.2.4.A, p. 322-325).
    Response: A 10' wide shared multi-use path, consistent with 5.2.4.B is being provided along the spine road. Please see street sections and layout plan.
16. The parking area serving the daycare is located in the first layer. Please revise.
    Response: The layout plan has been revised to place the parking in the third layer.
17. Please provide greater detail on the lot/building site for the daycare site. This appears to be a through-lot which is prohibited by the ordinance (4.3.3).
    Response: The orientation of the building and parking has been changed to be consistent with code.
18. Please indicate pedestrian connection with townhomes that enfront a pedestrian path. Please ensure that this connection is with a proposed sidewalk.
    Response: Townhome layout has changed. A sidewalk connection is provided for the townhomes that enfront the Civic Space.
19. As reviewed, there has been several waivers requested for setbacks, garage designs, and driveway widths exceeding 10' in first layer. Please coordinate with engineering requiring details of 5' side setbacks and drainage swales.

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Response: Understood, development proposed slab on grade and crawl space style lots to fit development grading and side yard swales.

20. Please indicate the impervious coverage for Development Parcel as a whole, the daycare site, and each typical lot/building site.
Response: Estimates for lots are provided on the lot diagrams in the sheet set. Overall property estimates on found in site data chart.
21. Please revise pattern book to show conforming interior garage dimensions.
Response: all garage parking spaces shall conform to minimum required size of 10' x 20' each. Pattern book has been revised to reflect this.
22. As proposed, the Preliminary Master Plan deviates significantly from the bulk and design standards in Table 4.3.1-K and the development standards of Article 5 of the Zoning Ordinance. The deviations are too numerous and pervasive to list out as a technical review. Please revise mix and dimensions of lots to conform, or propose a specific alternative. We understand that you are proposing a customized set of standards to allow a unique plan of development that can't be accomplished under the prescriptive standards of the ordinance. Please identify each deviation in the revised PUD justification letter with an explanation of how the proposed alternative provides a superior built environment than the character districts of the ordinance. Specifically, the lot widths and driveway prescriptions of the ordinance are calibrated to match the Thoroughfare assemblies in 5.2.2.F and 5.2.2.G-1. The ordinance permits narrower (less than 50' of width at the frontage line) alley-served lots where the throughfare is designed to accommodate on-street parking. In general, narrow lots (less than 65' of width at frontage line) correspond to increased public frontage (sidewalks, plantings, parking) and reduced curb cuts. Please revise the plan based on the comments from Engineering and provide a narrative rationale in the revised PUD justification letter that connects deviations from the standards to unique qualities of the proposal (i.e. reduced environmental impact, demographic targeting, public benefits).
Response: The applicant has revised the street sections based on the Staff recommendations.

Waste Water

23. All sewer improvements including but not limited to off-site improvements, on-site improvements, and pump station and equipment installation shall be completed and functioning to the satisfaction of the Director of the Wastewater Department prior to the filing of any Final Plat with the City of Columbia Municipal Planning Commission, unless specific approval is granted by the Director and a surety of sufficient amount is provided.

    Note: Pump stations will require a building permit and all other required permits from additional entities. All inspections must be completed and certificates of completion granted before Council Agenda Deadline. Please contact the Wastewater Department for standard design details and equipment
    Response: Noted

ATT

1. ATT Plans to serve. Contact AT representative regarding connections to the site.
Response: Noted.

Maury County Schools

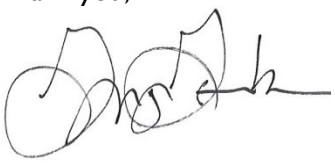
DEVELOPMENT PLANNING
DESIGN
MANAGEMENT

greg.gamble@gdc-tn.com
615.975.5765 cell
3020 Stansberry Lane, Suite 201
Franklin, TN 370

1. Howell Elementary, Cox Middle School, Central High School. Possible rezone to BCHS 24/25SY for 9th/10 grade. See Attached Capacity Numbers. The development combined with current neighborhoods and additional approved developments in these zones may require either new construction or realignment of school zones to accommodate new students.
   Response: Noted.

If there are any questions or additional information needed, please feel free to reach out to me, or Keli Frymire (keli@gdc-tn.com) in my office.

Thank you,



Gamble Design Collaborative
Greg Gamble

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, November 7, 2023

ITEM NO.
23-0414

DESCRIPTION: Annexation request and PUD-R Preliminary Master Development Plan rezoning request for +/-410 acres between Bear Creek and Iron Bridge Road. PUD-R neighborhood to provide a variety of homes including Active Adult/Age restricted area, town homes, and large single-family home lots. PMDP also includes a daycare site and multiple amenities.

RECOMMENDATION: For final recommendation please see staff report.

COMMENTS:

Fire

1. Fire hydrants are to be spaced no more than every 500'. There are a few locations that needs attention
2. Alleys are not to be used for access for emergency vehicles. An approved fire apparatus road must be within 150' of all structures. A couple locations that need this corrected.

Engineering

3. Subject to Construction Plans and Traffic Impact Study.
4. Provide traffic improvement commitment letter with phasing based on improvement identified in the TIS and an overall diagram of all improvements.
5. Provide proposed grading at intervals of not more than 2 feet.
6. Overall grading may not support slab on grade foundations. See detail DD-04.
7. 8% maximum grade on alleys
8. Whenever a proposed street intersects a street with an equal or greater classification, a tangent (measured from the edge of travelled way, or the right-of-way line when determined by the City Engineer, along the centerline of the intersecting street) shall be provided. See ESS Table 3.
9. Cul-de-sac on Street C & O and C & D: Cul-de-sacs shall be located a minimum distance away from the connected roadway as to provide a right-of-way section a minimum of twenty-five (25) feet in length parallel to the centerline of the street between the intersected street and the expansion of the right-of-way for the cul-de-sac with a width matching the roadway cross-section. See ESS detail SD-15.
10. Provide and show lot numbers.
11. Provide stub to the east roughly 340 ft north of intersection of Street A, U, V
12. Provide alley street section. Provide boulevard street section.
13. Alley drainage should be located in the center of the roadway. Inlet spacing generally 150 ft. max. Note alleys will have driveway style aprons when intersecting streets.
14. Minimum horizontal centerline curvature for alleys is 70 ft.

15. TVA may have restrictions on the proposed amenities within Civic Space I
16. Hydrologic analysis and permitting required for bridge over Bear Creek. Preliminary assessment appears to adhere to regulations.
17. Where a proposed public street intersects an arterial roadway, a minimum of seventy-five (75) feet of right-of-way, two hundred fifty (250) feet in length, shall be provided from the edge of the intersected street's right-of-way.
18. Note: Drainage channels within a subdivision providing drainage for the following shall be located on a common or open space lot a minimum of ten (10) feet in width within a dedicated public drainage easement or public right-of-way. 1. Eight (8) or more lots, either in whole or a portion of; 2. Public infrastructure; or 3. An area equivalent to two (2.0) acres.
19. Wetland north of cul-de-sac on Street O appears to be a sinkhole. Additionally, there are other small depressions that will require evaluation. See ESS section 5.4 Storm network is incomplete for the southern portion of the site.
20. Proposed detention areas appear to be smaller than would be required to satisfy water quality and peak rate of runoff requirements.
21. Overall site geotechnical assessment and geotechnical analysis and recommendation of all closed depressions will be required at final master plan and preliminary plat.
22. ROW stub to the western property (Street F) should be set up in a manner to allow for future retrofit into a tee type intersection.
23. Provide justification of the usage of all cul-de-sacs. It appears several could be feasibly connected.
24. Provide ROW dedication 37.5 ft from the centerline of Iron Bridge Rd.
25. Maximum manmade slope 3:1. A few slopes exceed this maximum.
26. Note: All roadways shall meet geometric requirements of the ESS.
27. Proposed street sections are not the typical sections for this particular zoning. Urban Neighborhood Street and the 2 Lane Avenue would generally be appropriate. The proposed section and reduction in ROW width also includes reductions or eliminations of elements such as street trees and on street parking.

Planning

1. City Planner Kevin McCarthy, AICP and Planner Austin Brass, AICP will jointly prepare the staff report for this item. Please contact kmccarthy@columbiatn.com with question about the development review process, annexation, the PUD justification, development parcel standards, nonresidential uses, thoroughfare assemblies, civic spaces, or technical comments from other reviewers. Please contact abrass@columbiatn.com with questions about lot configurations, façade standards, PUD-R bulk standards, and the mix of residential types. Please copy both case planners on communications related to this request.
2. Due to the size and complexity of this request, the Zoning Administrator requests that this application be reviewed again by the DRC following resubmittal to these comments before advancing to the Planning Commission agenda.
3. Please expand upon the modification of standards listed on page five of the PUD-R justification letter. The list should include **all** requested deviations from the PUD-R

standards at 4.3.1-K, as well as other deviations from standards of the ordinance (e.g. use of cul-de-sacs contrary to 5.2.2.E). For each requested deviation, please explain how the customized standard offers a better built environment to residents of the city of Columbia and/or better implements the Suburban Neighborhood future land use classification than the CD-3L or CD-3 character districts. The revised letter should support an explanation that the public purpose of the standards is satisfied "to equivalent or greater degree" by utilizing the proposed alternative (8.5.21.D; p. 452). Items two and three on the list provided with the application are a good template (i.e. explain the gain in open space from the modification).

4. Please add a projected timeline to phasing plan shown on sheet C1.00. The plan should be sufficiently detailed to provide adjacent property owners of the duration of actual construction activity near their property. The phasing plan should comply with section 8.5.21.F (p. 453). The plan should indicate when Final PUD master plan and subsequent plats are projected (8.5.21.R; p. 461). The phasing plan should indicate if any extension requests are anticipated related to the timing of actual construction under 8.5.21.W (p. 464). The phasing timeline may be provided as a separate document if that is easier to prepare.
5. **Advisory**: The applicant has a separate but related application for the upcoming development review cycle. The other application rezones an adjacent parcel to CD-4 for commercial development. It may be advisable to combine these applications into a single large multi-use PUD at resubmittal (this will require review the Architectural Design Review Team).
6. Please expand upon the Environmental Uniqueness section on page two of the PUD-R justification letter. Please elaborate on the “Commitment to Environmental Stewardship” and explain which strategies could not be utilized under a CD-3 zoning.
7. **Advisory**: Consult with the Assistant City Engineer (Douglas Toney) regarding alternative design for segments of Street A.
8. **Advisory**: Please consult with the Director (Mac Reagan: mreagan@columbiatn.com) and Assistant Director (Alex Troje: atroge@columbiatn.com) of the City of Columbia Parks & Recreation department about composition of Civic Spaces (especially LI.6) and potential public access easement/alignment with Parks & Rec goals for level of service in East Columbia. If there are opportunities for public access/public benefit, please identify these in the revised PUD justification letter.
9. Please revise phasing plan to provide construction of Road A connecting Bear Creek Pike and Iron Bridge Road in the first phase.
10. Please revise to eliminate the cul-de-sacs in phases 3 and 6 per 5.2.2.E (or request as part of PUD deviations with explanation of equivalent public benefit).
11. The zoning ordinance contains contradictions related to PUD-R Civic Space types. Table 4.3.1-K (p. 157) indicates Sport fields are not a permitted Civic Space type in PUD-R. Table 5.3.3-B indicates otherwise. Please add this to the requested deviations and accompanying explanation.
12. Road names will require E-911 approval.

13. 50’ right of way shown on PUD does not conform to Thoroughfare assemblies applicable to PUDs in 5.2.2.G-1. This is addressed in justification letter but please explain why it is necessary throughout the development and why the additional open space is a greater benefit than the omitted elements of the Thoroughfare.
14. Sheet C2.0 indicates a tree save figure. Please provide a tree preservation plan with recent aerial image as described in 4.3.16.L of the zoning ordinance.
15. There appears to be small gaps in the pedestrian shed, please revise.
16. Please revise to show bicycle network and bikeway types utilized (5.2.4.A, p. 322-325).
17. The parking area serving the daycare is located in the first layer. Please revise.
18. Please provide greater detail on the lot/building site for the daycare site. This appears to be a through-lot which is prohibited by the ordinance (4.3.3).
19. Please indicate pedestrian connection with townhomes that enfront a pedestrian path. Please ensure that this connection is with a proposed sidewalk.
20. As reviewed, there has been several waivers requested for setbacks, garage designs, and driveway widths exceeding 10' in first layer. Please coordinate with engineering requiring details of 5' side setbacks and drainage swales.
21. Please indicate the impervious coverage for Development Parcel as a whole, the daycare site, and each typical lot/building site.
22. Please revise pattern book to show conforming interior garage dimensions.

Building

28. No comment.

Wastewater

29. All sewer improvements including but not limited to off-site improvements, on-site improvements, and pump station and equipment installation shall be completed and functioning to the satisfaction of the Director of the Wastewater Department prior to the filing of any Final Plat with the City of Columbia Municipal Planning Commission, unless specific approval is granted by the Director and a surety of sufficient amount is provided.

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Maury County Schools

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DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, November 7, 2023

ITEM NO.
23-0414

DESCRIPTION: Annexation request and PUD-R Preliminary Master Development Plan rezoning request for +/-410 acres between Bear Creek and Iron Bridge Road. PUD-R neighborhood to provide a variety of homes including Active Adult/Age restricted area, town homes, and large single-family home lots. PMDP also includes a daycare site and multiple amenities.

COMMENTS: Supplemental Planning and Engineering comments regarding throughfares and lots.

Engineering

1. The appropriate street section for this character district (PUD-R) would be the Urban Neighborhood or Urban Center Street sections. Typically, developments have utilized the Urban Neighborhood Street in residential settings more than the Urban Center Street.
2. The Zoning Ordinance permits the Urban Neighborhood Street across multiple character districts (CD-3, CD-4, CD-4C, PUD-R, etc.), but we have recognized after having the code adopted for roughly 1.5 years, there are some distinct character and use-case differences between CD3 and CD4+ style developments. Staff is working on revisions to the street sections to accommodate these differences in character. The Planning Commission and City Council may consider these proposals in 2024 as part of a larger revision to the Zoning Ordinance. Generally, the proposed development has portions that are somewhat consistent with CD3 and some more similar to CD4. The Assistant City Engineer (in consultation with other Planning and Engineering staff) has provided a markup that highlights the streets where parking would be recommended and the (draft) revised street sections for those character areas.
3. It is the intent and the requirement for throughfare assemblies to have parking on one or both sides in CD4 as well as all more dense/intense character districts. The active adult area, as proposed, does not allow for adequate space between driveways to provide parallel parking. See attached markup.

Planning

4. As proposed, the Preliminary Master Plan deviates significantly from the bulk and design standards in Table 4.3.1-K and the development standards of Article 5 of the Zoning Ordinance. The deviations are too numerous and pervasive to list out as a technical review. Please revise mix and dimensions of lots to conform, or propose a specific alternative. We understand that you are proposing a customized set of standards to allow a unique plan of development that can't be accomplished under the prescriptive standards of the ordinance. Please identify each deviation in the revised PUD justification letter with an explanation of how the proposed

alternative provides a superior built environment than the character districts of the ordinance. Specifically, the lot widths and driveway prescriptions of the ordinance are calibrated to match the Thoroughfare assemblies in 5.2.2.F and 5.2.2.G-1. The ordinance permits narrower (less than 50’ of width at the frontage line) alley-served lots where the throughfare is designed to accommodate on-street parking. In general, narrow lots (less than 65’ of width at frontage line) correspond to increased public frontage (sidewalks, plantings, parking) and reduced curb cuts. Please revise the plan based on the comments from Engineering and provide a narrative rationale in the revised PUD justification letter that connects deviations from the standards to unique qualities of the proposal (i.e. reduced environmental impact, demographic targeting, public benefits).

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RECOMMENDATION: For final recommendation please see staff report.

COMMENTS:

Fire

1. Fire hydrants are to be spaced no more than every 500'. There are a few locations that needs attention
2. Alleys are not to be used for access for emergency vehicles. An approved fire apparatus road must be within 150' of all structures. A couple locations that need this corrected.

Engineering

3. Subject to Construction Plans and Traffic Impact Study.
4. Provide traffic improvement commitment letter with phasing based on improvement identified in the TIS and an overall diagram of all improvements.
5. Provide proposed grading at intervals of not more than 2 feet.
6. Overall grading may not support slab on grade foundations. See detail DD-04.
7. 8% maximum grade on alleys
8. Whenever a proposed street intersects a street with an equal or greater classification, a tangent (measured from the edge of travelled way, or the right-of-way line when determined by the City Engineer, along the centerline of the intersecting street) shall be provided. See ESS Table 3.
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10. Provide and show lot numbers.
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9. Please revise phasing plan to provide construction of Road A connecting Bear Creek Pike and Iron Bridge Road in the first phase.
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11. The zoning ordinance contains contradictions related to PUD-R Civic Space types. Table 4.3.1-K (p. 157) indicates Sport fields are not a permitted Civic Space type in PUD-R. Table 5.3.3-B indicates otherwise. Please add this to the requested deviations and accompanying explanation.
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21. Please indicate the impervious coverage for Development Parcel as a whole, the daycare site, and each typical lot/building site.
22. Please revise pattern book to show conforming interior garage dimensions.

Building

28. No comment.

Wastewater

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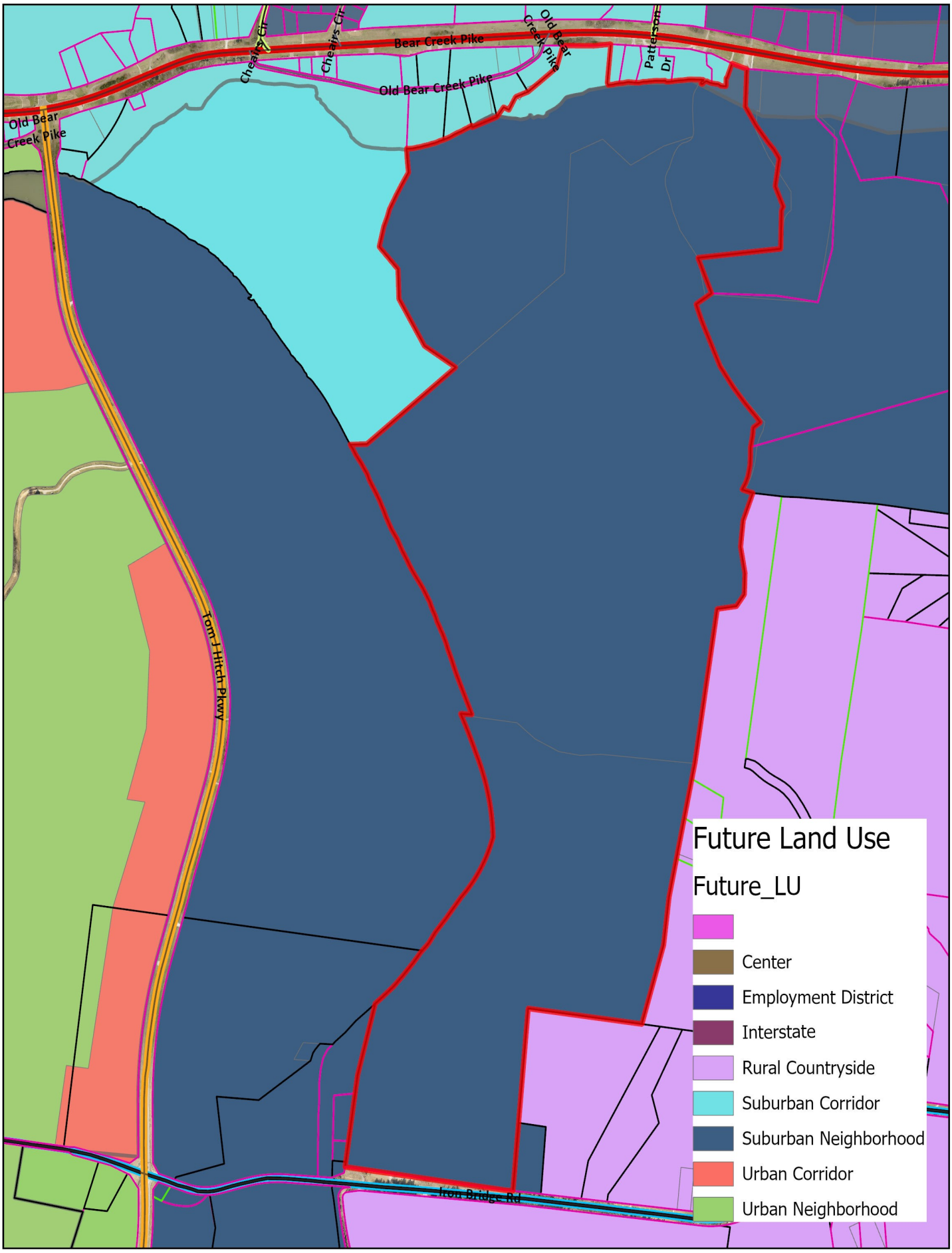
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Maury County Schools

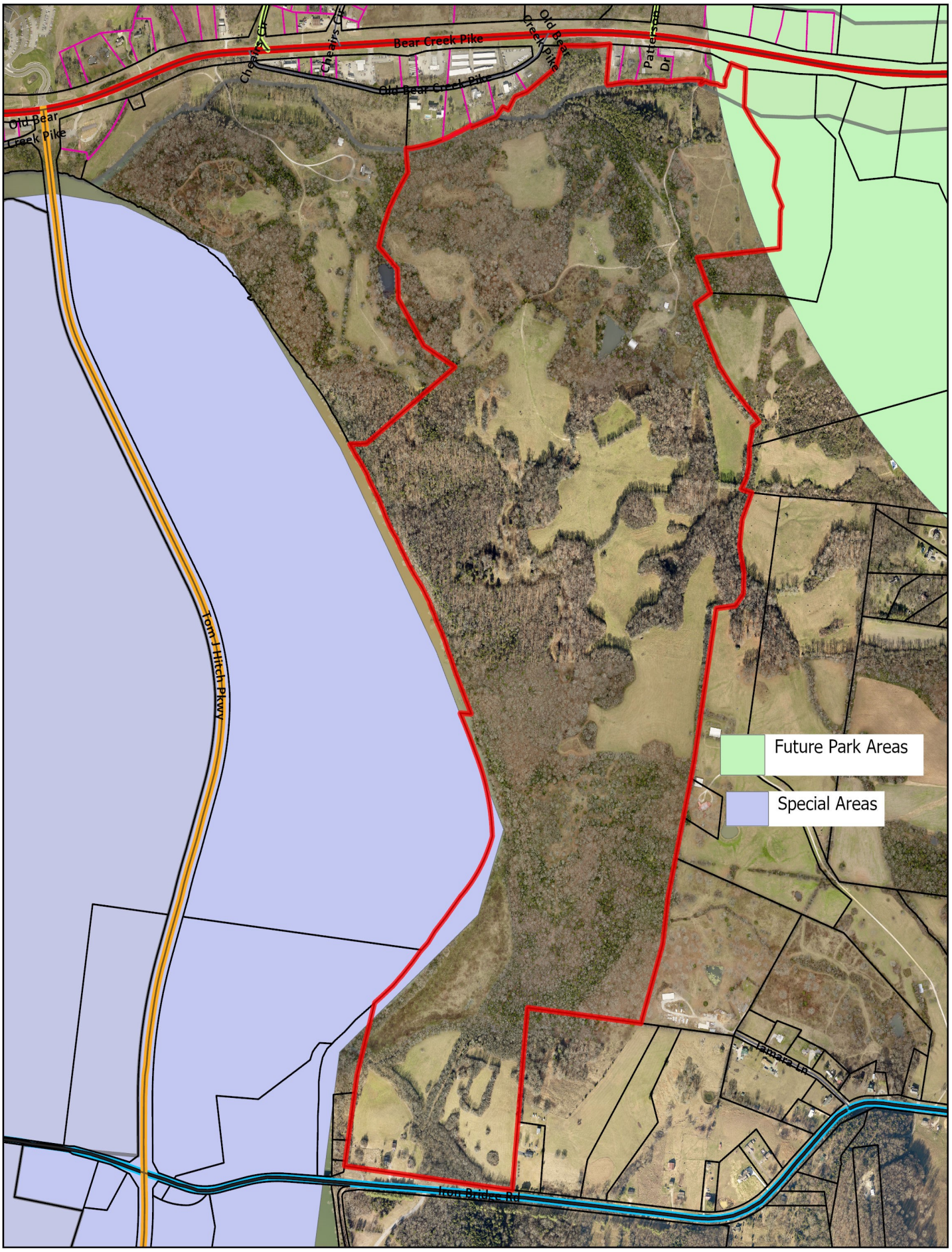
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23-0414
Tax Map 90 Parcel 12.01
Bear Creek Pike/Iron Bridge Rd.

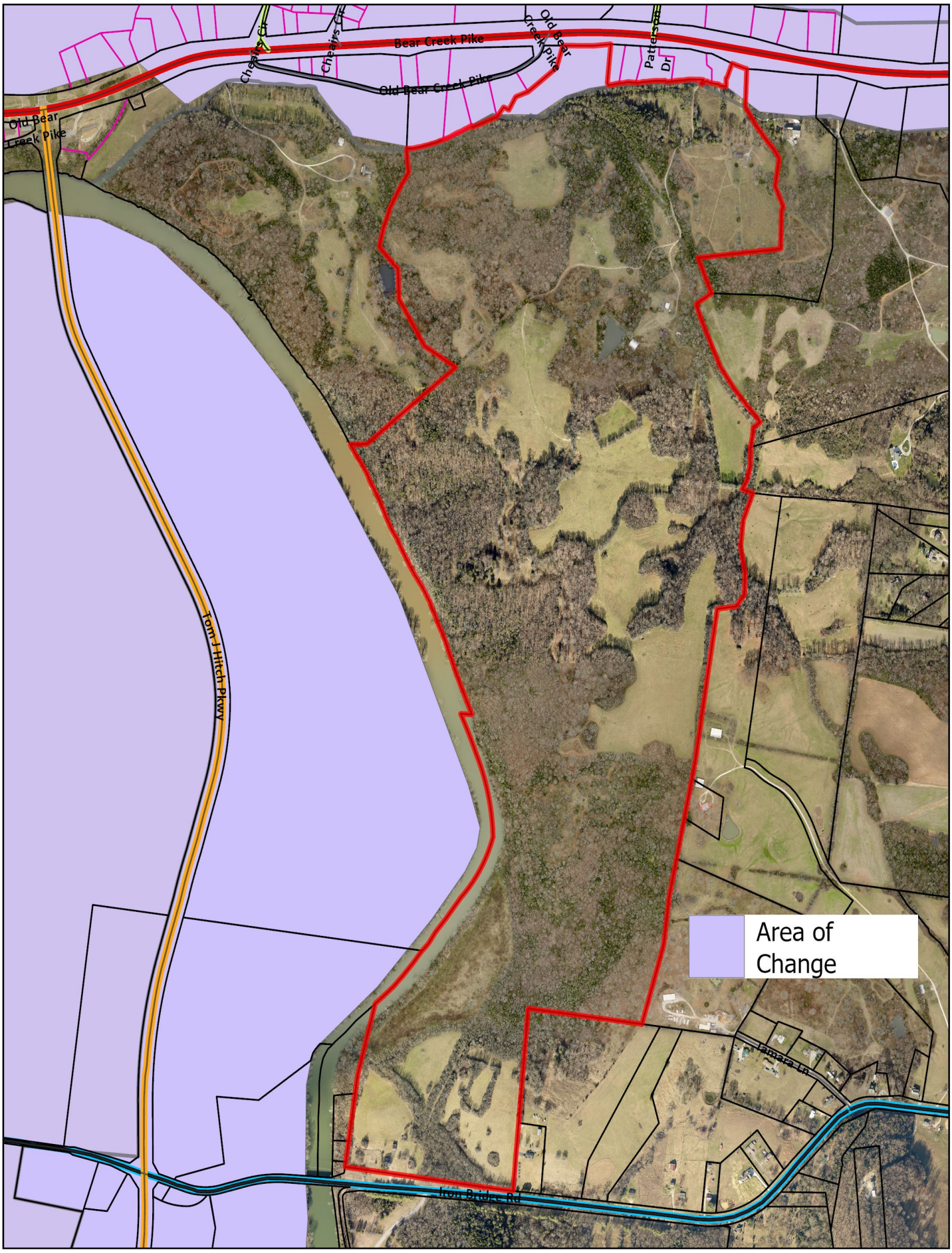
CITY OF COLUMBIA TENNESSEE
DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541



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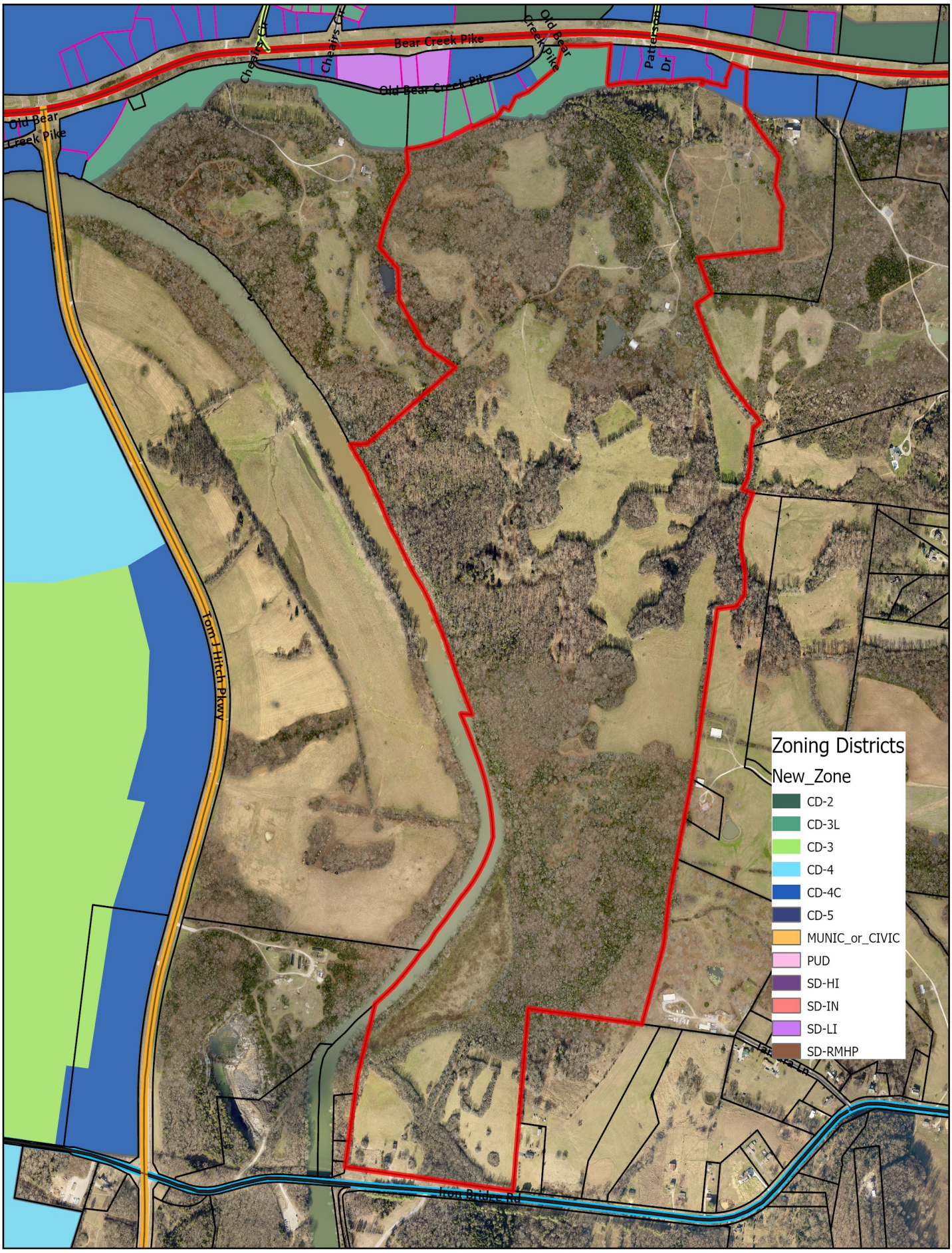
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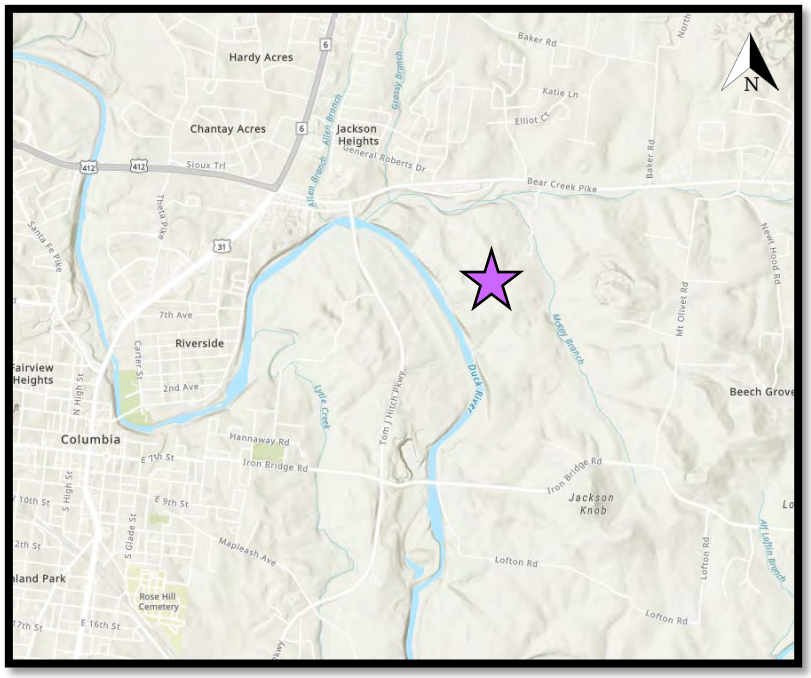
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COLUMBIA BLUFFS

Traffic Impact Study

10/16/2023



Vicinity Map
(Not to Scale)

400 BEAR CREEK PIKE
COLUMBIA, TENNESSEE

Prepared For:
KOLTER GROUP ACQUISITIONS LLC

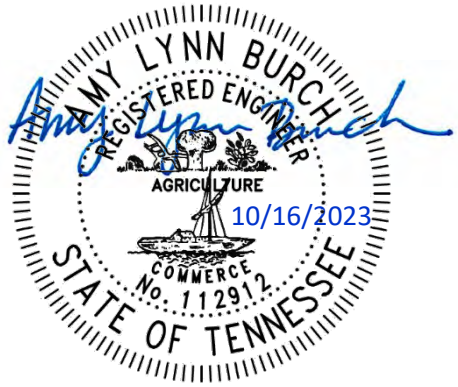
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COLUMBIA BLUFFS
TRAFFIC IMPACT STUDY

PREPARED FOR:

KOLTER GROUP ACQUISITIONS LLC



PREPARED BY:

BURCH TRANSPORTATION, LLC

BURCH TRANSPORTATION

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1. Executive Summary

A TIS for the site (previously named "Big Bear Bluff Master Plan") was submitted 3/21/2022 and revised 4/18/2022. The previous development plan included a total of 810 single-family lots, 300 townhomes, and 300 multifamily units.

The Columbia Bluffs development is proposed to be located between Bear Creek Pike and Iron Bridge Road, east of the Duck River in Columbia, TN. A total of 860 dwelling units (472 single-family lots, 188 townhome units, and 200 active adult units) and a 14,000 square-foot day care center are proposed for the 412-acre property. The property is currently undeveloped farmland that is proposed to be annexed as a planned unit development (PUD). Primary vehicular site access will be located on Bear Creek Pike aligned with Patterson Drive. Secondary vehicular site access will be located on Iron Bridge Road. A development of this size will be constructed over several phases. For the purposes of this traffic study, two development scenarios were analyzed. Per the developer, Kolter Group Acquisitions LLC, Phases 1-3 are expected to be completed in approximately eight years, which corresponds to a 2031 horizon year. The Full Buildout (Phases 1-6) is expected to be completed in approximately eleven years, which corresponds to a 2034 horizon year. The new roadway connection to Iron Bridge Road to the south is not planned to be constructed until after Phase 3.

The analyses presented in this report indicate that the proposed development will generate new vehicular traffic to the study area. Following Full Buildout of the Columbia Bluffs development, the project is expected to generate approximately 7,324 daily trips, 658 AM peak hour trips, and 768 PM peak hour trips. Phases 1-3 of the development will include approximately 50% of the total number of dwelling units and will include the day care center. Phases 1-3 are expected to generate approximately 4,149 daily trips, 399 AM peak hour trips, and 475 PM peak hour trips.

Based on the analyses presented in this study and review of the study area and proposed development information, the following is recommended in order to accommodate the proposed development and provide for efficient traffic operations and safety:

Recommendations Associated with Phases 1-3 Scenario

The initial phases of development will require off-site improvements and as well as improvements to accommodate the primary access onto Bear Creek Pike. The following improvements should be coordinated with the City and could be phased in during construction of Phases 1, 2, and 3 of the development.

#1 Nashville Highway (US 31) and Bear Creek Pike/US 43

Laneage and traffic signal improvements are expected to be completed by the City/TDOT at the intersection of Nashville Highway (US 31) and Bear Creek Pike/US 43. These anticipated improvements were assumed to include the addition of a westbound left turn lane and a southbound left turn lane through restriping and modifying the existing median on Nashville Highway. The provision of dual left turn lanes requires protected only left turn signal phasing for the southbound approach. Additional signal timing adjustments and coordination may be needed for the intersection following the initial phases of development for Columbia Bluffs. Additionally, lead/lag protected only left turn signal phasing is recommended for the eastbound and westbound approaches of Bear Creek Pike.

No other improvements are recommended for the intersection.

#2 Bear Creek Pike and Tom J Hitch Parkway

- Construct a northbound right turn lane on Tom J Hitch Parkway with approximately 100 feet of storage and 60 feet of taper. The northbound right turn lane could be constructed using the existing shoulder and should not extend beyond the start of the bridge over Duck River.
- Restripe the northbound approach to provide one left turn lane and one through lane, plus the recommended right turn lane.
- Modify the traffic signal design to provide a northbound right turn overlap during the westbound left turn phase.
- Optimize and coordinate the signal timing along Bear Creek Pike.

#3 Bear Creek Pike and Patterson Drive/Site Access 1

- Site Access 1 should be constructed and aligned with Patterson Drive at Bear Creek Pike.
- Site Access 1 should be designed to include width for one entering lane and two exiting lanes, which should be a northbound left turn lane and a northbound shared through/right turn lane.
- An eastbound right turn deceleration lane should be constructed for Bear Creek Drive at Site Access 1 to accommodate the project traffic. The eastbound right turn lane should be designed so that the widening and taper does not begin until east of the guardrail over Bear Creek and includes approximately 180 feet of storage and 160 feet of bay taper, or as approved by the City and TDOT.
- A westbound right turn deceleration lane is recommended for Bear Creek Pike at Patterson Drive. The westbound right turn lane should be designed to include approximately 160 feet of storage and 180 feet of bay taper or as approved by the City and TDOT.
- A westbound left turn deceleration lane is recommended for Bear Creek Pike at Site Access 1 to accommodate the project traffic. The westbound left turn lane should be designed to include approximately 225 feet of storage, 180 feet of bay taper, and 270 feet of approach taper assuming the widening is centered on the roadway.
- Install a traffic signal at the intersection of Bear Creek Pike and Patterson Drive/Site Access 1. Signal warrant analyses indicate a traffic signal will be warranted by the traffic volumes generated by the project site prior to completion of Phase 2 (or comparable number of dwelling units) or prior to completion of Phase 1 if Phase 1 includes completion of the day care center. The signal design should include protected/permissive left turn signal phasing for the northbound and westbound approaches and permissive left turn signal phasing for the southbound and eastbound approaches.
- Optimize and coordinate the signal timing along Bear Creek Pike.
- Widen the north leg of Patterson Drive to provide a southbound left turn lane. The widening of Patterson Drive and the construction of Site Access 1 should be designed and constructed such that the northbound and southbound through movements are aligned and the left turn movements can operate concurrently. The southbound left turn lane should include approximately 75 feet of storage.

#4 Bear Creek Pike and Mt Olivet Road/School Access

- Restripe the southbound approach to a shared left turn/through lane and a right turn only lane.
- Modify the traffic signal design for the northbound approach to provide protected/permissive left turn signal phasing.
- Modify the traffic signal design for the southbound approach to provide a right turn overlap during the eastbound left turn phase.

- Optimize and coordinate the signal timing along Bear Creek Pike.

#5 Tom J Hitch Parkway and Iron Bridge Road

The signalized intersection of Tom J Hitch Parkway and Iron Bridge Road is expected to continue to operate acceptably under the future projected conditions.

No improvements are expected to be needed or recommended for the intersection of Tom J Hitch Parkway and Iron Bridge Road.

#6 Iron Bridge Road and Mt Olivet Road

The critical turning movements are expected to continue to operate acceptably at the one-way stop-controlled intersection of Iron Bridge Road and Mt Olivet Road under the future projected conditions.

No improvements are expected to be needed or recommended for the intersection of Iron Bridge Road and Mt Olivet Road.

#7 James Campbell Boulevard and Tom J Hitch Parkway

Tom J Hitch Parkway terminates to the south at James Campbell Boulevard. The T-intersection currently has stop-control for the southbound approach of Tom J Hitch Parkway. The intersection experiences heavy eastbound left turns and the reciprocal southbound right turns during peak hours. The southbound left turn movement currently operates at LOS F during the AM and PM peak hours and is expected to deteriorate with higher levels of delay under the 2031 Background and 2034 Future Projected Conditions with Phases 1-3. According to the City's *Connect Columbia Transportation Plan* adopted in 2018, the intersection is identified to be signalized in the near term (10-year horizon). Preliminary signal warrant analyses indicate the intersection's traffic volumes will meet signal warrants in the near future. The following intersection improvements are recommended to be constructed prior the completion of Phase 3, or comparable number of dwelling units:

- Install a traffic signal at the intersection of James Campbell Boulevard and Tom J Hitch Parkway.
- The traffic signal design should include protected/permissive left turn signal phasing for the eastbound approach and a southbound right turn overlap.

Recommendations Associated with Full Buildout (Phases 1-6) Scenario

As outlined above, the initial phases of development for the Columbia Bluffs project will require fairly significant improvements at many of the study intersections in order to accommodate the project's traffic plus the background traffic growth expected even without the development project's construction. In addition to the recommended improvements associated with Phases 1-3 of the development, the following is recommended for the Full Buildout Scenario:

#8 Iron Bridge Road and Site Access 2

- Site Access 2 should be constructed and connected to Iron Bridge Road prior to beginning construction for Phase 4, or comparable number of dwelling units.
- Site Access 2 should be aligned with the Maury County Yanahli Park Access on Iron Bridge Road.
- At a minimum, Site Access 2 should be designed to include width for one entering lane and one exiting lane.

- Stop-control should be provided for the southbound approach of Site Access 2 at Iron Bridge Road.
- The Site Access 2 should be designed and constructed to allow for sufficient intersection sight distance, clear of any obstructions such as vegetation, landscaping, hardscaping, signs, and fencing within the departure sight triangles.
- An eastbound left turn deceleration lane is recommended for Iron Bridge Road at Site Access 2 to accommodate the project traffic. The eastbound left turn lane should be designed to include approximately 160 feet of storage, 180 feet of bay taper, and 270 feet of approach taper assuming the widening is centered on the roadway, or as approved by the City.

Additional Planned Improvements

According to the City's *Connect Columbia Transportation Plan*, significant roadway improvements have been identified for some of the intersections and roadways in the study area. However, it is important to note that the improvements are not considered to be committed projects until funding has been allocated.

- In the near term, Bear Creek Pike between Nashville Highway and Tom J Hitch Parkway is planned to be widened from 3 lanes to 5 lanes and access management along the segment.
- In the midterm, Iron Bridge Road is planned to be reconstructed to improve the substandard roadway geometry between Fairview Drive and Tom J Hitch Parkway, which would include replacing the bridge/box culvert over Lytle Creek, which currently narrows the roadway to one lane at a sag vertical crest in the roadway.
- In the long-term, Bear Creek Pike is planned to be widened to four lanes between Tom J Hitch Parkway and east of Baker Road. It should be noted that the deceleration lanes recommended for Bear Creek Pike at Site Access 1/Patterson Drive as part of the initial phases of the Columbia Bluffs development will contribute towards this long-term improvement identified along Bear Creek Pike.

<u>#2 Bear Creek Pike and Tom J Hitch Parkway</u>

With the planned widening of Bear Creek Pike between Nashville Highway and Tom J Hitch Parkway, the following improvements should be made:

- Reassign the northbound laneage for Tom J Hitch Parkway to provide one left turn lane, one shared left turn/through lane, and one right turn lane.
- Modify the traffic signal to provide split signal phasing for the northbound and southbound approaches.

Based on the analyses presented in this report, no further improvements are recommended in association with the proposed Columbia Bluffs development in Columbia, TN. The recommended and future laneage at the study intersections is presented in Figure 9. Conceptual layouts of the recommended improvements are presented in Figures 10A-10D.

The analyses presented in this TIS evaluated two future buildout scenarios in order to determine when specific roadway improvements will need to be made. The above recommendations are presented in terms of residential phases of development as currently anticipated by Kolter; however, it is recognized that the actual construction of dwelling units for a development this size often does not occur as initially planned. Therefore, based on the analyses, the recommended improvements above were associated with

unit count occupancy to identify trigger points for when each should be constructed by the developer or others. The Table in Appendix K presents the phasing for the recommended improvements by dwelling unit count.

2. Introduction

The Columbia Bluffs development is proposed to be located at 400 Bear Creek Pike in Columbia, TN. The property is proposed to be annexed into the City of Columbia as a Planned Unit Development (PUD). The property is approximately 412 acres and is currently described as undeveloped, rural farmland. The project site is bound on the north by Bear Creek Pike, on the south by Iron Bridge Road, on the west by Duck River, and on the east by rural farmland and residential land uses.

According to the concept plan prepared by Gamble Design Collaborative, the project's developer Kolter Group Acquisitions LLC proposes approximately 860 total dwelling units (472 single-family lots, 188 townhome units, and 200 active adult units) and a 14,000 square-foot day care center. The development will be internally connected by a street network. Primary vehicular access (Site Access 1) will be provided at the northern end of the property onto Bear Creek Pike at its existing intersection with Patterson Drive. Secondary vehicular access (Site Access 2) will be provided at the southern end of the property onto Iron Bridge Road at its existing intersection with Maury County's Yanahli Park Entrance.

The project will be constructed over several phases and approximately eleven (11) years. Table 1 below presents the anticipated phasing buildout for the Columbia Bluffs development. Phases 1-3 are expected to be completed by 2031, and Phases 4-6 are expected to be completed by 2034. The day care center is expected to be built in the beginning of Phase 4; conservatively, the day care center was included in Phases 1-3 as it will be complete before full buildout. This phasing plan is an estimate for the purpose of preparing a traffic study for the development plan. The phasing and unit count is subject to change based on the market demand and actual construction schedules.

Table 1: Development Program and Phasing Estimate

Phase	Estimated Completion	Density by Land Use & Phase (Dwelling Units)			
		Single Family	Townhome	Active Adult	Total Units
1	2028	78	31	33	142
2	2029	78	31	33	142
3	2031	79	31	33	143
4	2032	79	31	33	143
5	2033	79	31	34	144
6	2034	79	33	34	146
Total	**2034**	**472**	**188**	**200**	**860**

Note: Phasing is presented above for planning purposes and is subject to change.

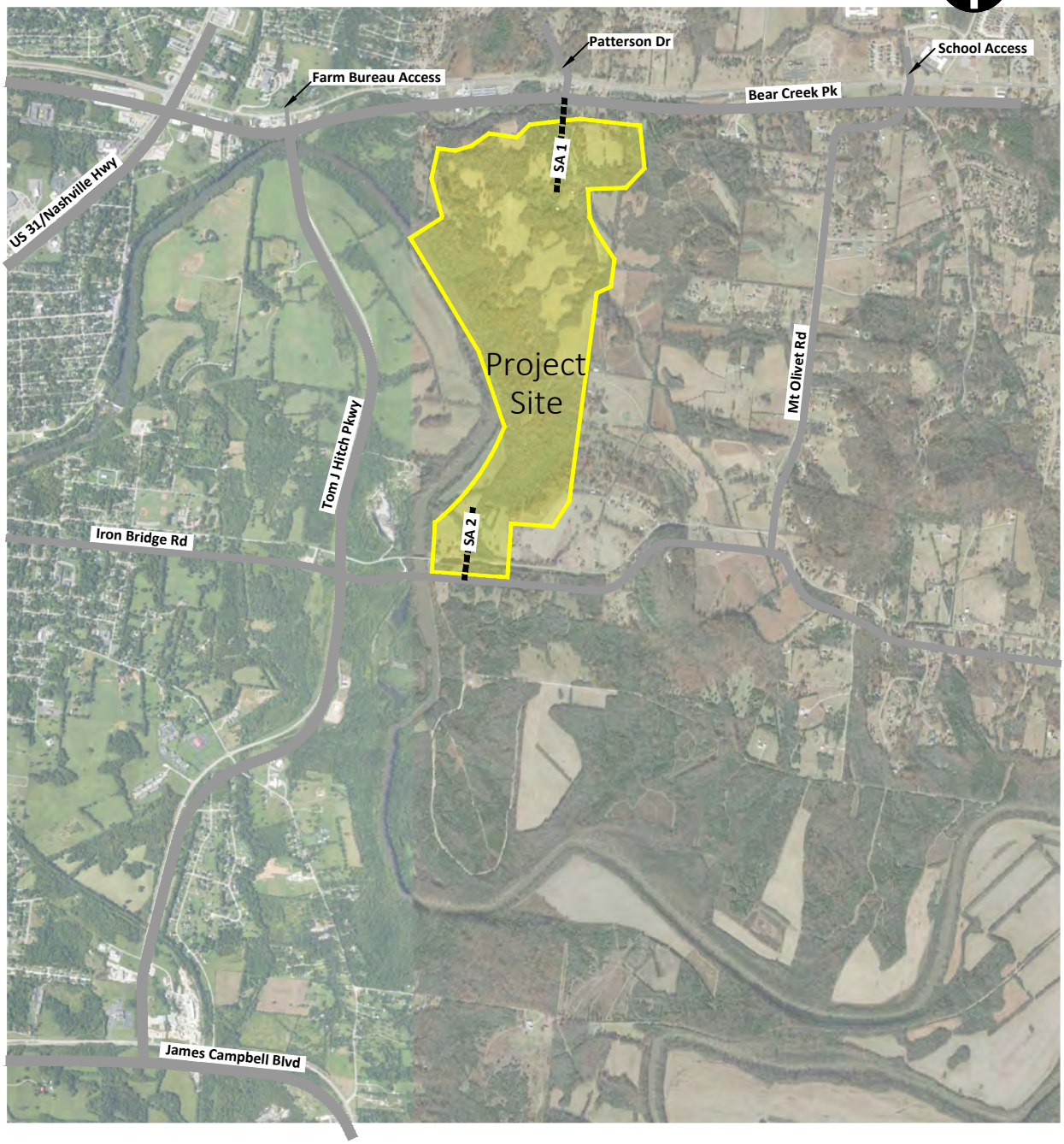
According to Kolter Group Acquisitions LLC, the construction and phasing will begin at the north end of the project site and work towards the south. The connection to Iron Bridge Road is not planned to be constructed until the beginning of Phase 4. Therefore, the following two (2) development scenarios were evaluated in this traffic impact study (TIS):

- 2031 Future Projected (Phases 1-3) plus the daycare without connection to Iron Bridge Road
- 2034 Future Projected (Full Buildout of Phases 1-6) with connection to Iron Bridge Road

The project site location is presented in Figure 1. The site plan concept is included in Appendix A for reference. However, it should be noted that the current site plan is a concept. The intention of this traffic impact study (TIS) is to identify the amount of traffic expected to be generated by the proposed development and evaluate its impact on the surrounding roadways and intersections. The TIS will also

identify appropriate improvements necessary to accommodate the project's vehicular traffic. At the outset of preparing this TIS, Burch Transportation coordinated the scope with the City of Columbia and its third-party traffic engineer. The executed MOU for the TIS is included in Appendix B.

Figure 1: Project Site Location



(Not to Scale)

3. Existing Conditions

The project site is served by Bear Creek Pike, Tom J Hitch Parkway, Nashville Highway (US 31S), Iron Bridge Road, Patterson Drive, and Mt Olivet Road. The following provides a description of the roadways and intersections within the study area and the existing traffic data.

3.1 Roadway Descriptions



Looking East on Bear Creek Pike East of Cheairs Circle

Bear Creek Pike is categorized as a principal arterial according to the Tennessee Department of Transportation's (TDOT) Functional Classification System. The land uses along Bear Creek Pike near the project site are a mix of residential, light commercial, and institutional. Adjacent to the project site, Bear Creek Pike is a two-lane highway that generally travels in an east/west direction. West of the project site, Bear Creek Pike includes a 3-lane section with one lane in each direction and a center two-way left turn lane. Bear Creek Pike provides connection to Interstate 65 to the east and the Nashville Highway (US 31 S) to the west. Bear Creek Pike has 12-foot lanes and 10-foot paved shoulders with edgeline rumble strips. The posted speed limit on Bear Creek Pike in the vicinity of the project site is 45 mph.



Looking North on Tom J Hitch Parkway North of Iron Bridge Road

Tom J Hitch Parkway is categorized as a major collector according to TDOT's Functional Classification System. Tom J Hitch Parkway provides connection to Bear Creek Parkway to the north and James Campbell Boulevard to the south. The land uses along Tom J Hitch Parkway are primarily residential and institutional uses. Tom J Hitch Parkway includes one 12-foot travel lane in each direction with 6-foot paved shoulders. The posted speed limit on Tom J Hitch Parkway is 50 mph. Tom J Hitch Parkway crosses over the Duck River approximately 250 feet south of Bear Creek Pike.

Nashville Highway (US 31S) is categorized as a principal arterial by TDOT. The land uses along Nashville Highway are a mix of commercial and industrial/manufacturing uses. Nashville Highway generally travels in a north/south direction, providing connection between the City of Columbia to the south and the City of Spring Hill to the north. Nashville Highway includes two travel lanes in each direction with a median. Turn lanes are generally provided at intersections. The posted speed limit on Nashville Highway is 45 mph in the study area.



Looking North on Nashville Highway North of Bear Creek Pike

Iron Bridge Road is categorized as a major collector by TDOT. The land uses along Iron Bridge Road are a mix of residential and agricultural uses. Iron Bridge Road generally travels in an east/west direction, providing connection between downtown Columbia to the west and Marshall County to the east. Iron Bridge Road crosses the Duck River just west of the project site. Iron Bridge Road includes one travel lane in each direction. The posted speed limit on Iron Bridge Road is 45 mph in the study area and adjacent to the project site.



Looking West on Iron Bridge Road West of Mt Olivet Road

Patterson Drive is not categorized by TDOT; and therefore, considered a local roadway. The land uses along Patterson Drive are residential. Patterson Drive generally travels in a north/south direction, connecting a neighborhood to Bear Creek Pike. Patterson Drive includes one travel lane in each direction and no shoulders. Patterson Drive has centerline pavement markings. The posted speed limit on Patterson Drive is 25 mph just north of Bear Creek Pike and then changes to 35 mph further north. There are no sidewalks along Patterson Drive.



Looking North on Patterson Drive North of Bear Creek Pike

Mt Olivet Road is not categorized by TDOT; and therefore, considered a local roadway. The land uses along Mt Olivet Road are primarily large-lot residential. Mt Olivet Road generally travels in a north/south direction, providing connection between Bear Creek Pike to the north and Iron Bridge Road to the south. Mt Olivet Road crosses over Bear Creek approximately 200 feet south of the Bear Creek Pike. Mt Olivet Road includes one travel lane in each direction and no shoulders. Mt Olivet Road has centerline and edgeline pavement markings. The posted speed limit on Mt Olivet Road is 45 mph.



Looking North on Mt Olivet Road North of Iron Bridge Road

3.2 Intersection Descriptions

The following seven (7) intersections were studied in this analysis:

- Nashville Highway and Bear Creek Pike (Signal)
- Bear Creek Pike and Tom J Hitch Parkway (Signal)
- Bear Creek Pike and Patterson Drive (One-Way Stop)
- Bear Creek Pike and Mt Olivet Road (Signal)
- Tom J Hitch Parkway and Iron Bridge Road (Signal)
- Iron Bridge Road and Mt Olivet Road (One-Way Stop)
- James Campbell Boulevard and Tom J Hitch Parkway (One-Way Stop)

The intersection of **Nashville Highway/US 43 and Bear Creek Pike** is signalized with four approaches. The northbound approach of Nashville Highway includes one left turn lane with approximately 200 feet of storage, two through lanes, and one channelized right turn lane with approximately 600 feet of storage and with yield control. The southbound approach of Nashville Highway includes one left turn lane with approximately 165 feet of storage, two through lanes, and one channelized right turn lane with approximately 540 feet of storage and with yield-control. The westbound approach of Bear Creek Pike includes one left turn lane with approximately 375 feet of storage, one through lane, and one shared through/right turn lane with right turn channelization and yield-control. The eastbound approach of US 43 includes two left turn lanes with approximately 250 feet of storage, one through lane, and one shared through/right turn lane with right turn channelization and free flow. Split signal phasing is provided for the eastbound and westbound approaches. Protected/permissive left turn signal phasing is provided for the northbound and southbound approaches. Pedestrian crosswalks and signals are not provided at the intersection. Sidewalk and curb ramps are not provided at the intersection. According to the City, a study and design is underway to improve operation and safety at the intersection; however, details of the improvements are not available. For the background and projected analyses, it was assumed that a second left turn lane would be constructed within the existing medians for the southbound and westbound approaches, a westbound right turn lane would be constructed, as well as signal modification to accommodate the additional laneage.

The intersection of **Bear Creek Pike and Tom J Hitch Parkway/Farm Bureau Access** is signalized with four approaches. The eastbound approach of Bear Creek Pike includes one left turn lane with approximately 130 feet of storage and one shared through/right turn lane. The westbound approach of Bear Creek Pike includes one left turn lane with approximately 150 feet of dedicated storage within the center two-way left turn lane, one through lane, and one right turn lane with approximately 90 feet of storage. The northbound approach of Tom J Hitch Parkway includes one left turn lane with approximately 95 feet of storage and one shared through/right turn lane. The southbound approach of the Farm Bureau Access includes one left turn lane with approximately 60 feet of storage, one through lane, and one right turn lane with approximately 60 feet of storage. Protected/permissive left turn signal phasing is provided for all approaches. Pedestrian crosswalks and signals are not provided at the intersection. Sidewalk and curb ramps are not provided at the intersection.

The intersection of **Bear Creek Pike and Patterson Drive** is unsignalized with three approaches. The eastbound approach of Bear Creek Pike includes one left turn deceleration lane with approximately 200 feet of storage and one through lane. The westbound approach of Bear Creek Pike includes one shared through/right turn lane. The southbound approach of Patterson Drive is stop-controlled and includes one shared lane for left turn and right turn movements. The primary access for the project site (Site Access 1) is planned to align with Patterson Drive and will form the fourth leg of the intersection. No pedestrian facilities are provided for the intersection.

The intersection of **Bear Creek Pike and Mt Olivet Road/School Access** is signalized with four approaches. The eastbound approach of Bear Creek Pike includes one left turn lane with approximately 250 feet of storage and one shared through/right turn lane. The westbound approach of Bear Creek Pike includes one left turn lane with approximately 180 feet of storage and one shared through/right turn lane. The northbound approach of Mt Olivet Road includes one left turn lane with approximately 65 feet of storage and one shared through/right turn lane. The north leg of the intersection is formed by the School Access, which provides access to Howell Elementary School and E A Cox Middle School. The southbound approach of the School Access includes one left turn lane and one shared through/right turn lane. Protected/permissive left turn signal phasing is provided for the eastbound and westbound approaches of Bear Creek Pike. Permissive signal phasing is provided for the northbound and southbound approaches. Pedestrian crosswalks and signals are not provided at the intersection.

The intersection of **Tom J Hitch Parkway and Iron Bridge Road** is a signalized intersection with four approaches. The northbound approach of Tom J Hitch Parkway includes one left turn lane with approximately 105 feet of storage, one through lane, and one right turn lane with approximately 145 feet of storage. The southbound approach of Tom J Hitch Parkway includes a left turn lane with approximately 205 feet of storage, one through lane, and one right turn lane with approximately 120 feet of storage. The eastbound approach of Iron Bridge Road includes one left turn lane with approximately 120 feet of storage and one shared through/right turn lane. The westbound approach of Iron Bridge Road includes one left turn lane with approximately 140 feet of storage and one shared through/right turn lane. Protected/permissive left turn signal phasing is provided for the northbound and southbound approaches of Tom J Hitch Parkway. Permissive signal phasing is provided for the eastbound and westbound approaches of Iron Bridge Road. Pedestrian crosswalks and signals are not provided at the intersection.

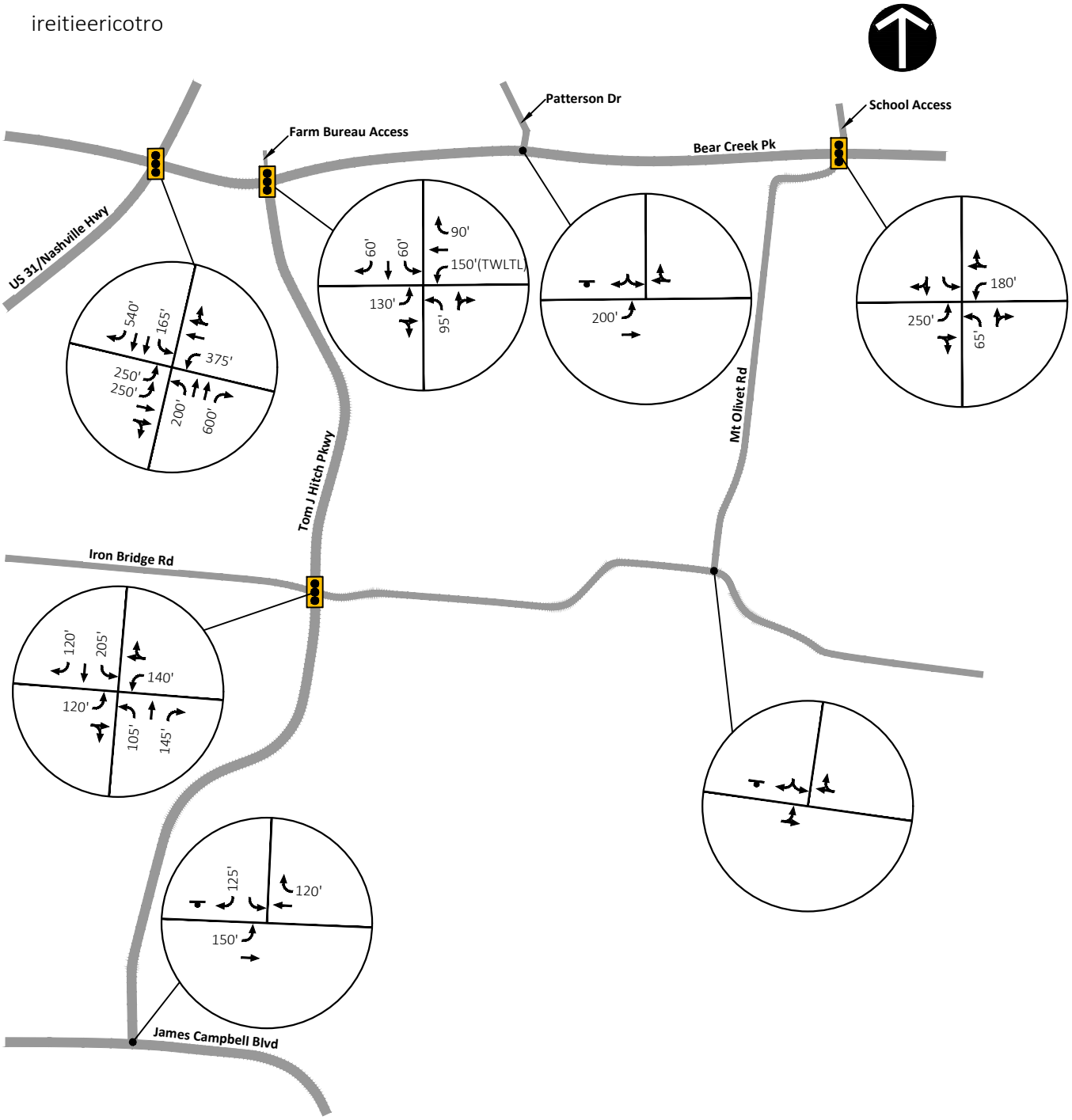
The intersection of **Iron Bridge Road and Mt Olivet Road** is unsignalized with three approaches. The eastbound approach of Iron Bridge Road includes one shared lane for left turn and through movements. The westbound approach of Iron Bridge Road includes one shared lane for through and right turn

movements. The southbound approach of Mt Olivet Road is stop-controlled and includes one shared lane for left turn and right turn movements. No pedestrian facilities are provided for the intersection.

The intersection of **James Campbell Boulevard and Tom J Hitch Parkway** is unsignalized with three approaches. The eastbound approach of James Campbell Boulevard includes one left turn deceleration lane with approximately 150 feet of storage and one through lane. The westbound approach of James Campbell Boulevard includes one through lane and one right turn deceleration lane with 120 feet of storage. The southbound approach of Tom J Hitch Parkway is stop-controlled and includes one left turn lane and one right turn lane with 125 feet of storage. No pedestrian facilities are provided for the intersection.

Figure 2 presents the intersection laneage and traffic control for the existing conditions.

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Legend:

→ Existing Laneage

XXX' Storage Length (feet)

TWLTL Two-way Left-Turn Lane

Stcotro

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ottoSce

3.3 Existing Traffic Volumes

As previously mentioned, a TIS for the site (previously named "Big Bear Bluff Master Plan") was submitted on 4/18/2022. A comparison of the turning movement count data from the original 2022 TIS to the data from the 2023 Dollar General TIS (provided by the City of Columbia) showed comparable traffic data, with the exception of the new Farm Bureau bank driveway movements. Per prior coordination with the City, this TIS utilizes the existing traffic data from the original 2022 TIS, with the addition of the bank traffic volumes from the 2023 Dollar General TIS, as the 2023 existing traffic volumes.

Existing traffic data for the study area roadways were obtained from the Tennessee Department of Transportation (TDOT). The 2022 Annual Average Daily Traffic (AADT) for the study area roadways are presented in Figure 3. The data represents 2022 AADT (vehicles per day) at the count stations. A historical comparison of 2019, 2020, and 2021 data shows that the 2021 daily traffic volumes on the study area roadways had just about returned to pre-pandemic levels. The TDOT count station data is included in Appendix C.

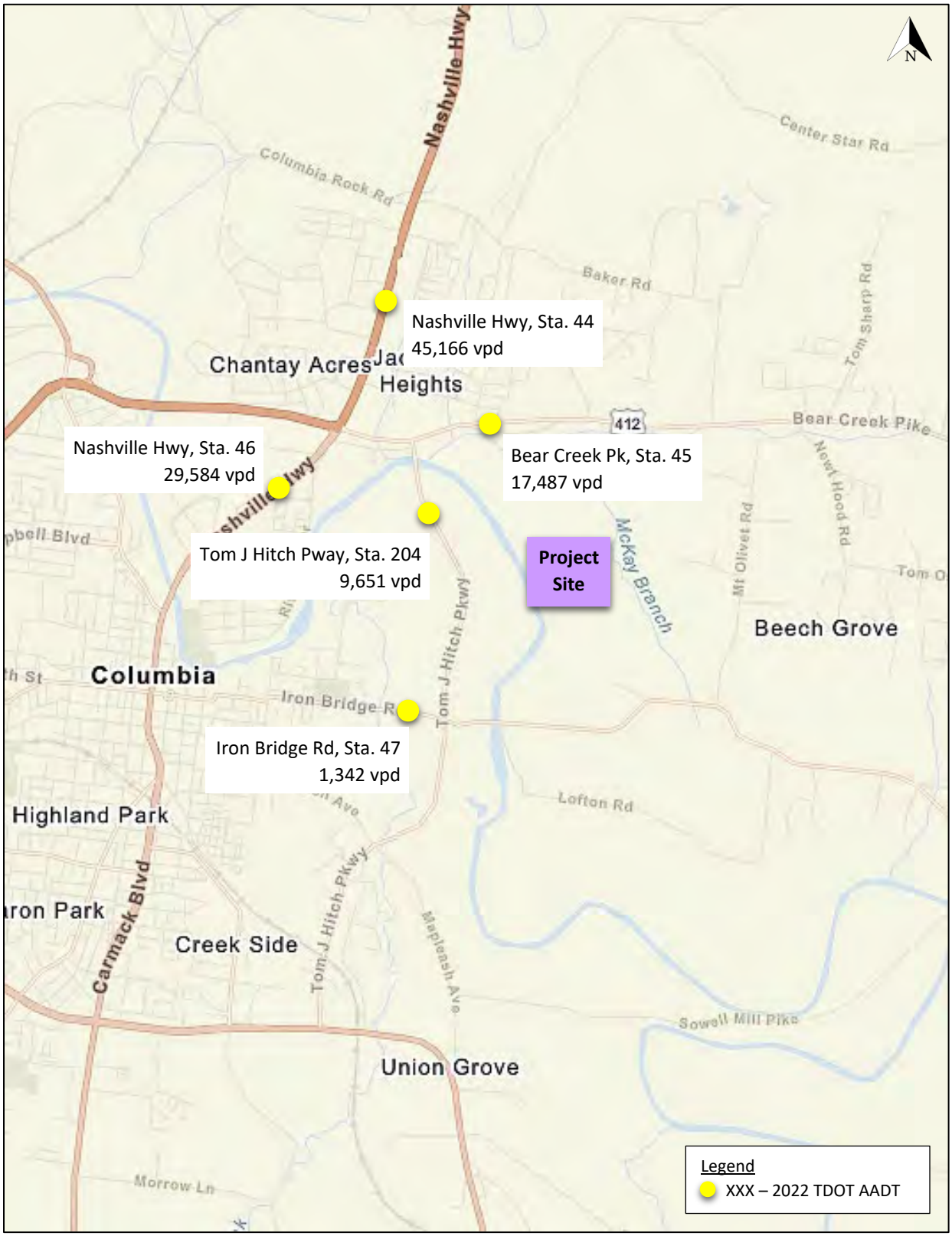
Turning movement count data conducted for the study intersections in May 2021 by Marr Traffic were obtained from a TIS prepared by Ragan-Smith for the same project site. Although the AADT comparison appears to show that traffic volumes in the study area have normalized, a peak hour comparison of the traffic data collected on Bear Creek Pike and Tom J Hitch Parkway in 2021 indicates that the AM peak hour traffic was approximately 7%-8% less than the 2019 data prior to the COVID-19 Pandemic. Therefore a 1.08 factor was applied to the 2021 turning movement counts for the AM peak hour. The same comparison for the PM peak hour traffic showed that the 2021 data was higher than the 2019 PM peak hour traffic. Therefore, no factor was applied to the PM peak hour turning movements at the study intersections. Due to the distance and intersecting driveways and intersections between the study intersections, the turning movement counts were not balanced between intersections.

Since the turning movement count data was collected in May 2021, the Farm Bureau Insurance office access was relocated. The new, relocated driveway forms the fourth leg of the intersection of Bear Creek Pike and Tom J Hitch Parkway. The intersection of Bear Creek Pike and Tom J Hitch Parkway/Farm Bureau Access was analyzed in the Dollar General Traffic Impact Study prepared by Fischbach Transportation Group in March 2023, and the turning movement counts for this study were collected in February 2023. The AM and PM peak hour traffic turning into and out of the relocated access provided in the Dollar General TIS is utilized in this TIS as current 2023 data and is carried through the roadway network.

In addition, the intersection of Tom J Hitch Parkway and Iron Bridge Road has been signalized since the turning movement count data was collected at the intersection in May 2021. Therefore, new turning movement counts were collected at the signalized intersection on Tuesday, August 22, 2023, while Maury County Schools were in session.

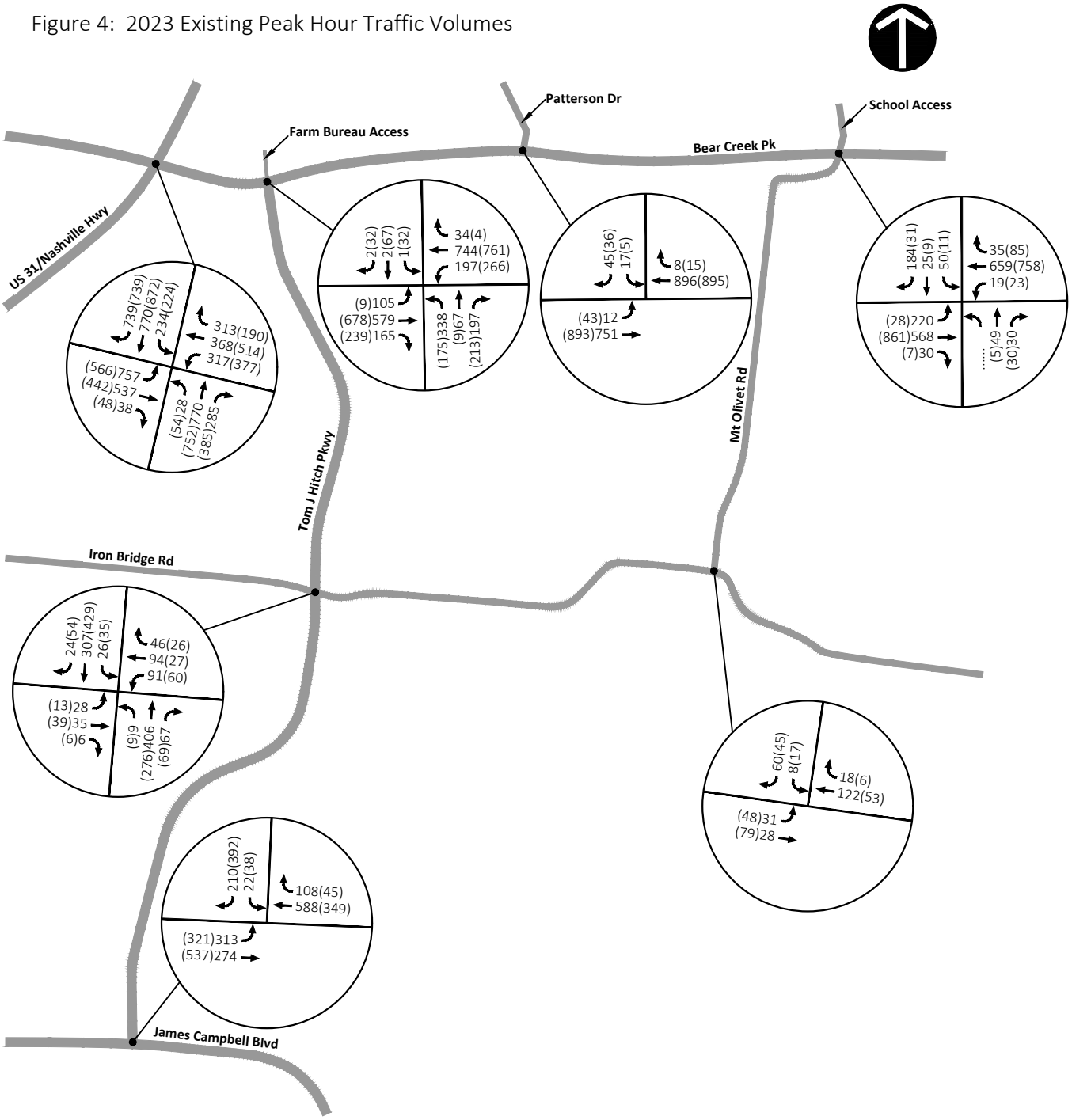
The 2023 Existing Conditions Peak Hour Traffic Volumes are presented in Figure 4. This represents the baseline conditions for the traffic analysis. The turning movement count data that was used to establish baseline conditions is included in Appendix D.

Figure 3: Daily Traffic Volumes



Source: TDOT traffic data, USGS.

Figure 4: 2023 Existing Peak Hour Traffic Volumes



Legend:
XXX - AM Peak Hour Traffic Volumes
(XXX) - PM Peak Hour Traffic Volumes

(Not to Scale)

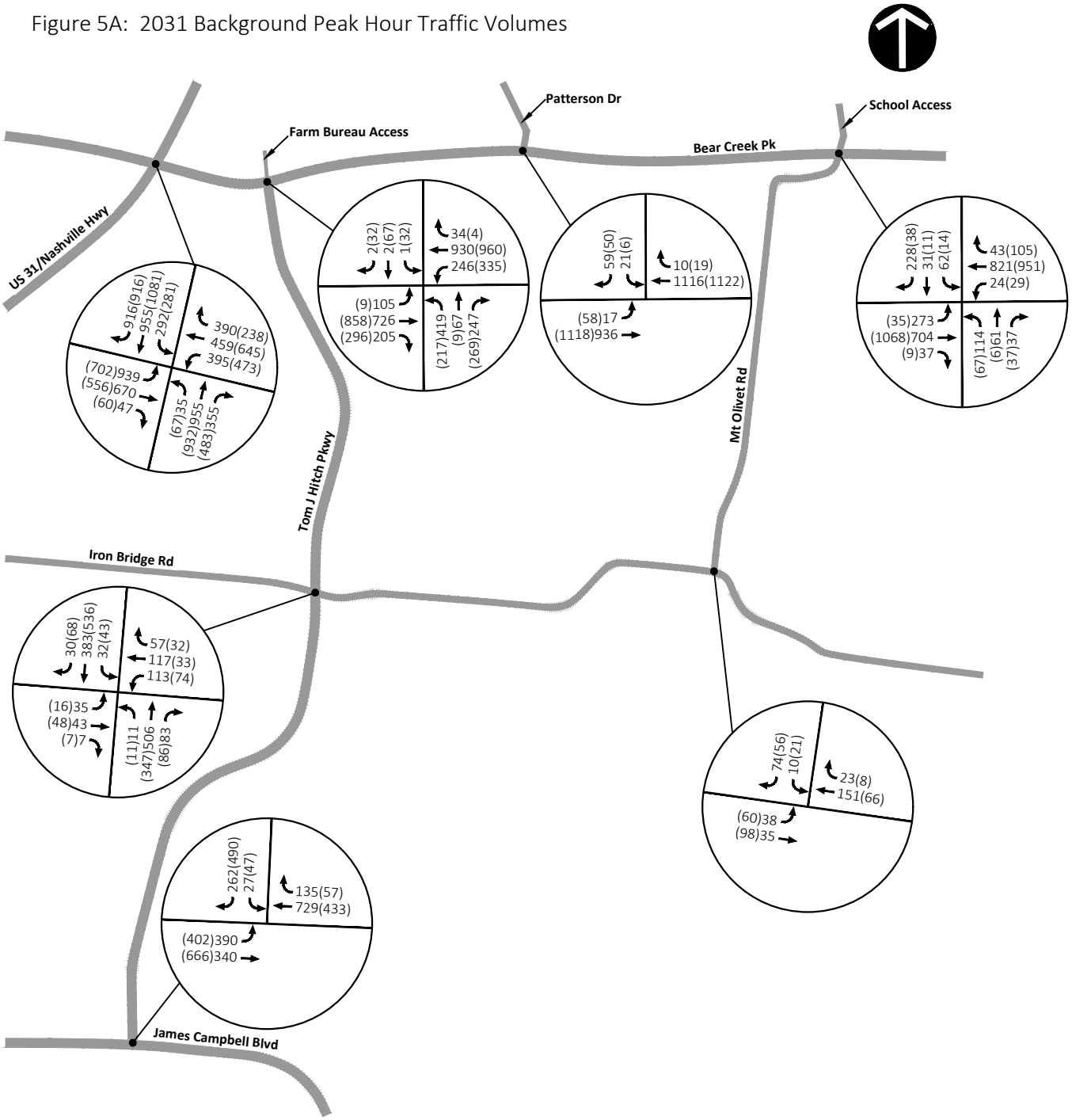
4. Background Conditions

As previously stated, it is assumed that the proposed Columbia Bluffs development located along Bear Creek Pike will be completed in several phases over approximately eleven years. For the purposes of this traffic study, two major phases were evaluated, which corresponds to horizon years 2031 and 2034. To account for additional traffic expected to be traveling on the study roadways in 2031 and 2034 even if the development is not completed, background traffic volumes were established. A growth rate was applied to the 2023 Existing Peak Hour Traffic Volumes. Since the baseline data represents the year 2023 conditions, an 8-year growth projection was applied for horizon year 2031 and an 11-year growth projection was applied for horizon year 2031. Based on an historical analysis and growth trends of the AADTs of the study area roadways, a 3% linear annual growth rate was applied to the 2023 Existing Conditions Peak Hour Traffic Volumes. The TDOT count station data and historical growth is included in Appendix C.

In addition to the general traffic growth in the study area, the site-specific traffic expected to be generated by one approved development was included in the background traffic volumes. The Dollar General project site is located on the north side of Bear Creek Pike west of W. Cheairs Circle. The background project data is included in Appendix E. The traffic calculation worksheets are included in Appendix G.

Figure 5A presents the 2031 Background Conditions Peak Hour Traffic Volumes, and Figure 5B presents the 2031 Background Conditions Peak Hour Traffic Volumes.

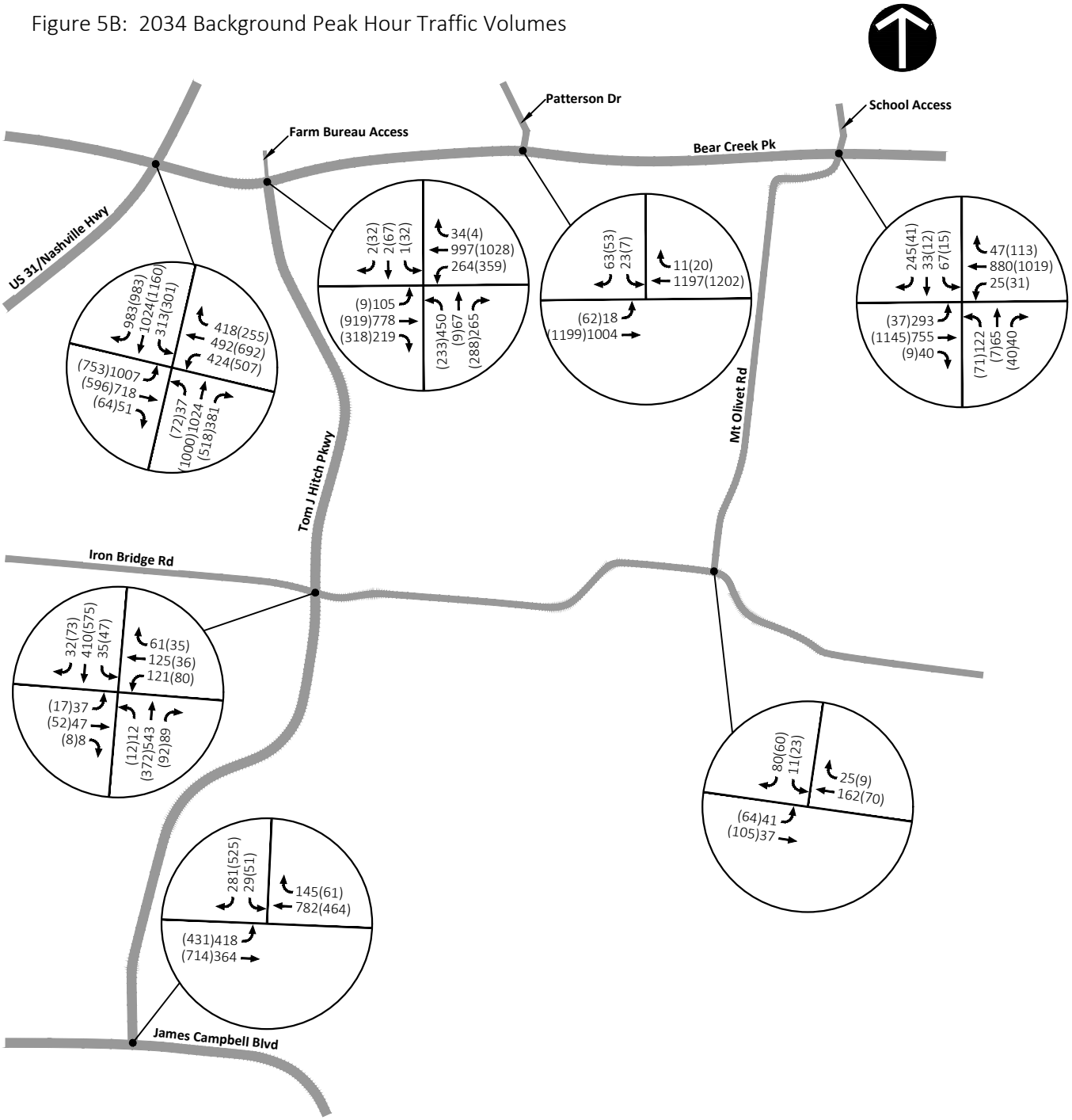
Figure 5A: 2031 Background Peak Hour Traffic Volumes



Legend:
XXX - AM Peak Hour Traffic Volumes
(XXX) - PM Peak Hour Traffic Volumes

(Not to Scale)

Figure 5B: 2034 Background Peak Hour Traffic Volumes



Legend:
XXX - AM Peak Hour Traffic Volumes
(XXX) - PM Peak Hour Traffic Volumes

(Not to Scale)

5. Projected Conditions

A trip generation process was used to estimate the amount of traffic that is expected to be generated by the proposed development. Trip generation rates for the land uses were taken from ITE's *Trip Generation Manual, 11th Edition*. No reductions were applied for alternate modes of transportation.

Table 2 below presents the new vehicular traffic expected to be generated by the proposed Columbia Bluffs project. As shown, the full buildout of the development is expected to generate approximately 7,324 vehicle trips per day, 658 vehicles per hour (vph) during the AM peak hour, and 768 vph during the PM peak hour. The initial phases of development, Phases 1-3, are expected to generate approximately 4,149 vehicle trips per day, 399 vph during the AM peak hour, and 475 vph during the PM peak hour. Trip generation calculations are included in Appendix F.

Table 2: Trip Generation

Land Use	Size	Average Daily Traffic	AM Peak Hour			PM Peak Hour		
			Total	Enter	Exit	Total	Enter	Exit
Phases 1-3								
Single-Family Detached Housing LUC 210	236 du	2,223	163	41	122	223	140	83
Single-Family Attached Housing LUC 215	94 du	666	43	11	32	52	31	21
Single Family Senior Adult Housing LUC 251	100 du	593	39	13	26	44	27	17
Day Care Center LUC 565	14,000 sf	667	154	82	72	156	73	83
Total Phases 1-3	**--**	**4,149**	**399**	**147**	**252**	**475**	**271**	**204**
Full Buildout, Phases 1-6								
Single-Family Detached Housing LUC 210	472 du	4,207	306	77	229	427	269	158
Single-Family Attached Housing LUC 215	188 du	1,382	132	33	99	109	64	45
Single Family Senior Adult Housing LUC 251	200 du	1,068	66	22	44	76	46	30
Day Care Center LUC 565	14,000 sf	667	154	82	72	156	73	83
Total Full Buildout, Phases 1-6	**--**	**7,324**	**658**	**214**	**444**	**768**	**452**	**316**

Source: ITE *Trip Generation Manual, 11th Edition.*

A directional distribution was developed based on the existing traffic counts, street network, and schools as well as the access plan for the development. Table 3 presents the roadways, directions, and percent distribution that traffic is expected to be coming from when entering the site.

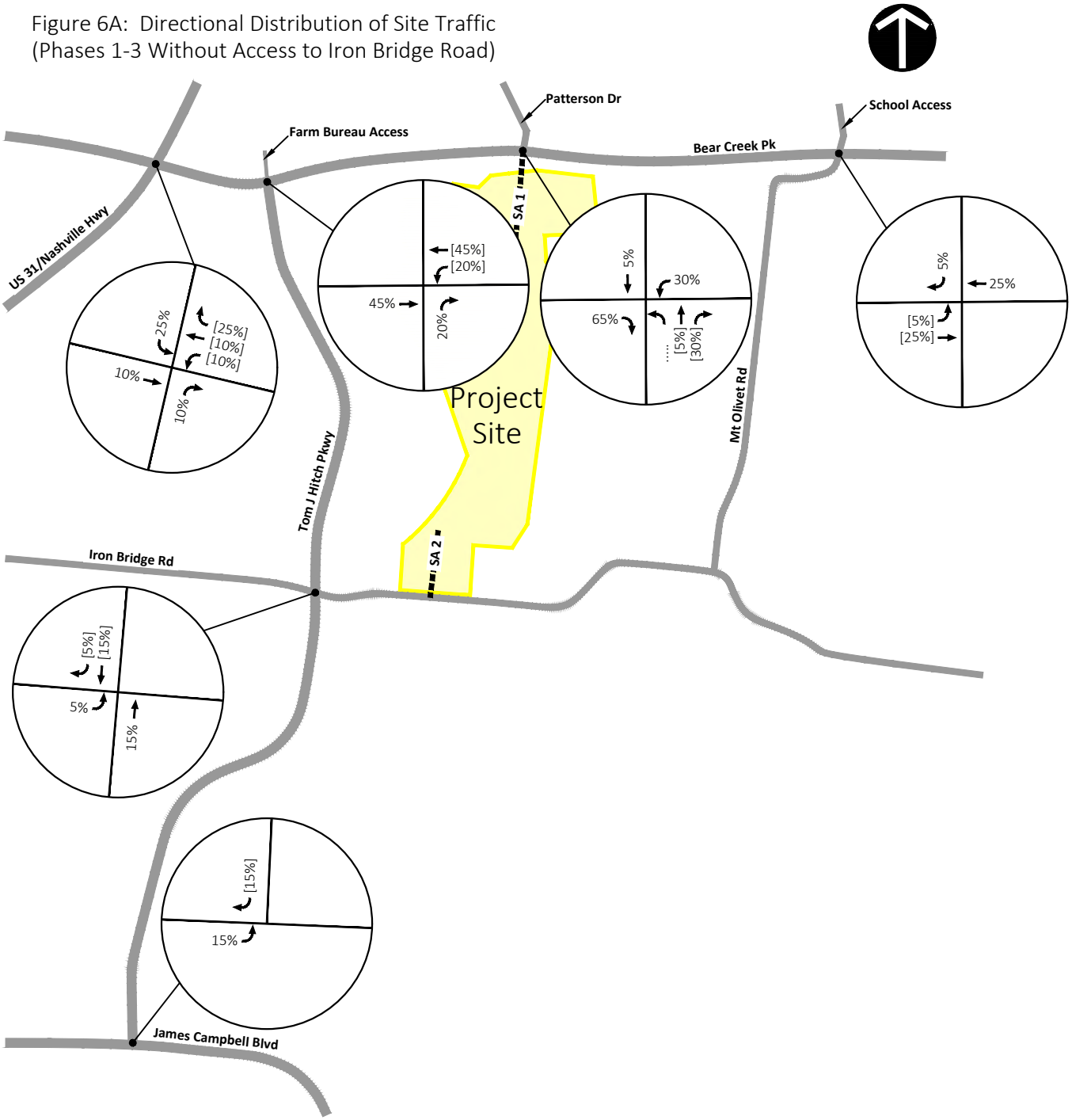
Table 3: Directional Distribution

Roadway	Entering Direction (From – To the Site)	Distribution %
Bear Creek Pike	East	25%
US 43	West	10%
Nashville Highway/US 31 S	North	25%
Nashville Highway/US 31 S	South	10%
James Campbell Boulevard	West	15%
Iron Bridge Road	West	5%
Patterson Drive	North	5%
School Access	Northeast	5%
Total	--	100%

The current site plan includes one full access point on Bear Creek Pike aligned with Patterson Drive and one full access point on Iron Bridge Road aligned with the Maury County Yanahli Park Access. As discussed, the secondary access on Iron Bridge Road is not planned to be constructed until Phase 4 has begun. Therefore, all of the traffic generated by the site will enter and exit at the primary access on Bear Creek Pike during the initial development of Phases 1-3. Based on the directional distribution and the site access plan, the directional distribution was developed for the turning movements at each of the study intersections and site access points. The Directional Distribution for the project site at the study intersections is presented in Figure 6A for the scenario of Phases 1-3 and in Figure 6B for the full buildout scenario.

Using these directional distributions, the traffic generated by the site was assigned to the street network. The traffic assignment for the Phases 1-3 scenario is presented in Figure 7A, and the traffic assignment for the full buildout scenario is presented in Figure 7B. The site traffic was added to the background traffic volumes to obtain the 2031 Future Projected Peak Hour Traffic Volumes, which are presented in Figure 8A and the 2034 Future Projected Peak Hour Traffic Volumes, which are presented in Figure 8B. These volumes represent the total peak hour traffic expected at the study intersections following completion of Phases 1-3 and Full Buildout of the proposed development plan, respectively. The traffic calculation worksheets showing the traffic assignment and volume calculations are included in Appendix G.

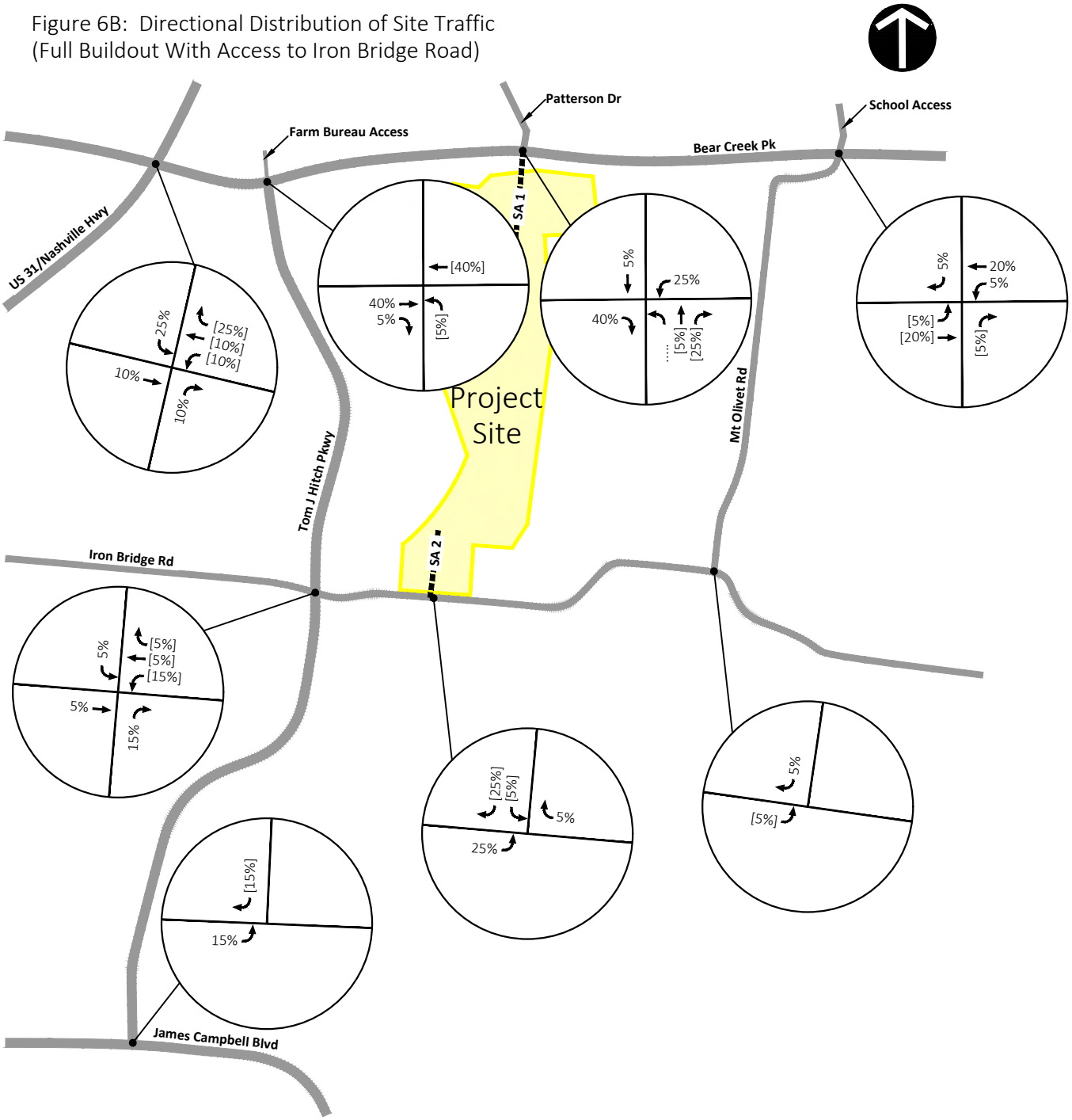
Figure 6A: Directional Distribution of Site Traffic
(Phases 1-3 Without Access to Iron Bridge Road)



Legend:
XX% - Enter
[XX%] - Exit

(Not to Scale)

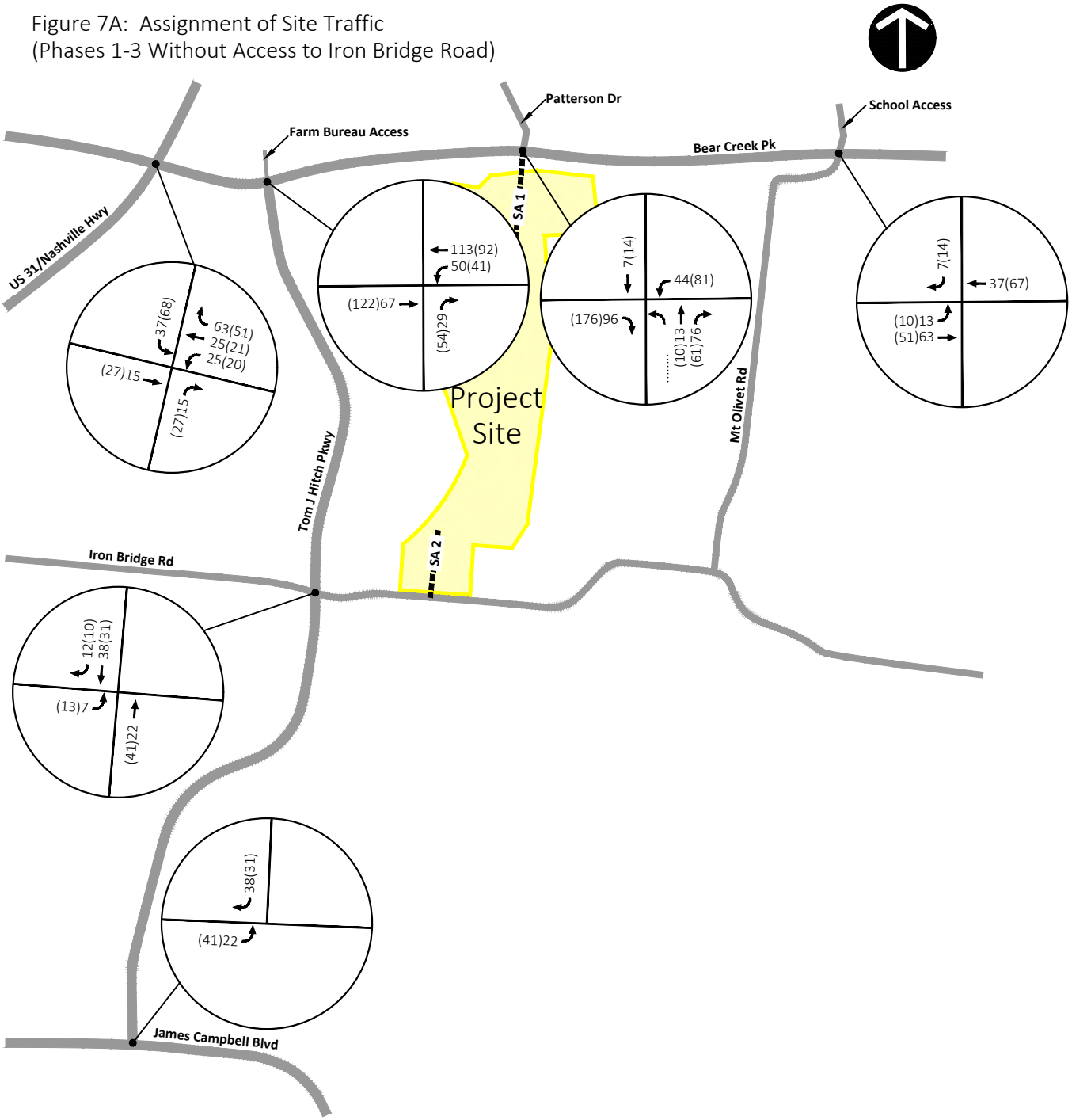
Figure 6B: Directional Distribution of Site Traffic
(Full Buildout With Access to Iron Bridge Road)



Legend:
XX% - Enter
[XX%] - Exit

(Not to Scale)

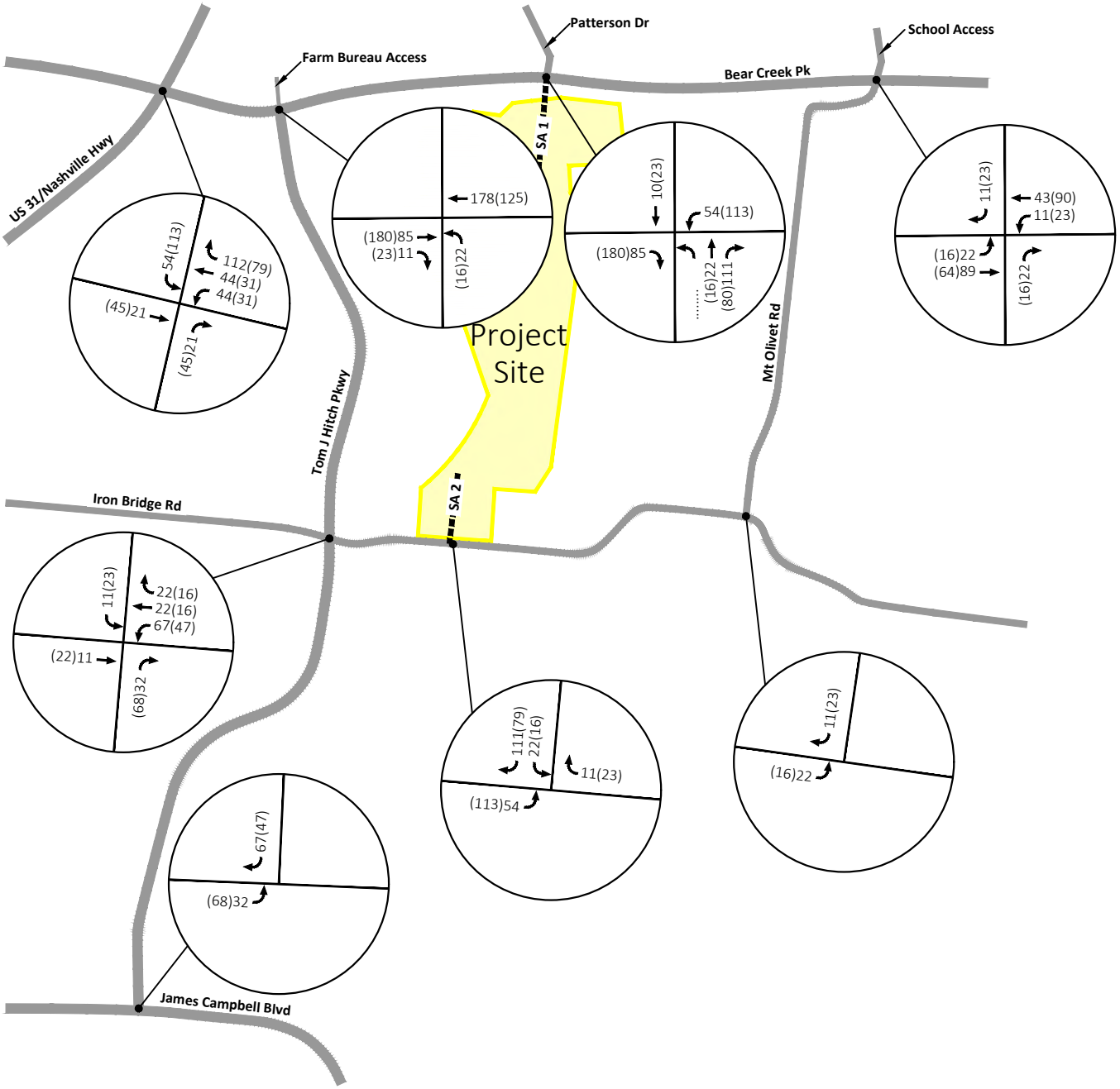
Figure 7A: Assignment of Site Traffic
(Phases 1-3 Without Access to Iron Bridge Road)



Legend:
XXX - AM Peak Hour Traffic Volumes
(XXX) - PM Peak Hour Traffic Volumes

(Not to Scale)

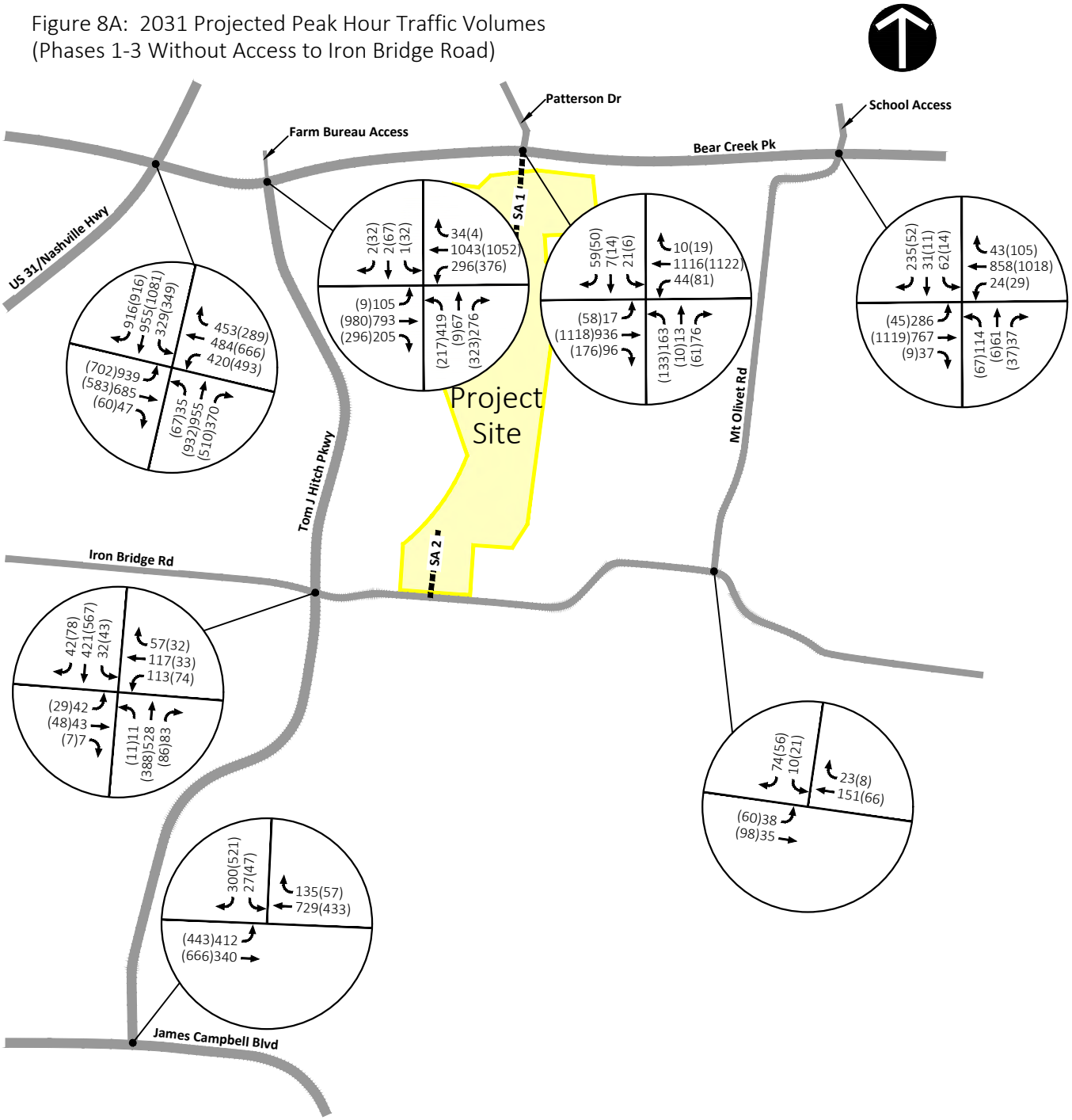
Figure 7B: Assignment of Site Traffic
(Full Buildout With Access to Iron Bridge Road)



Legend:
XXX - AM Peak Hour Traffic Volumes
(XXX) - PM Peak Hour Traffic Volumes

(Not to Scale)

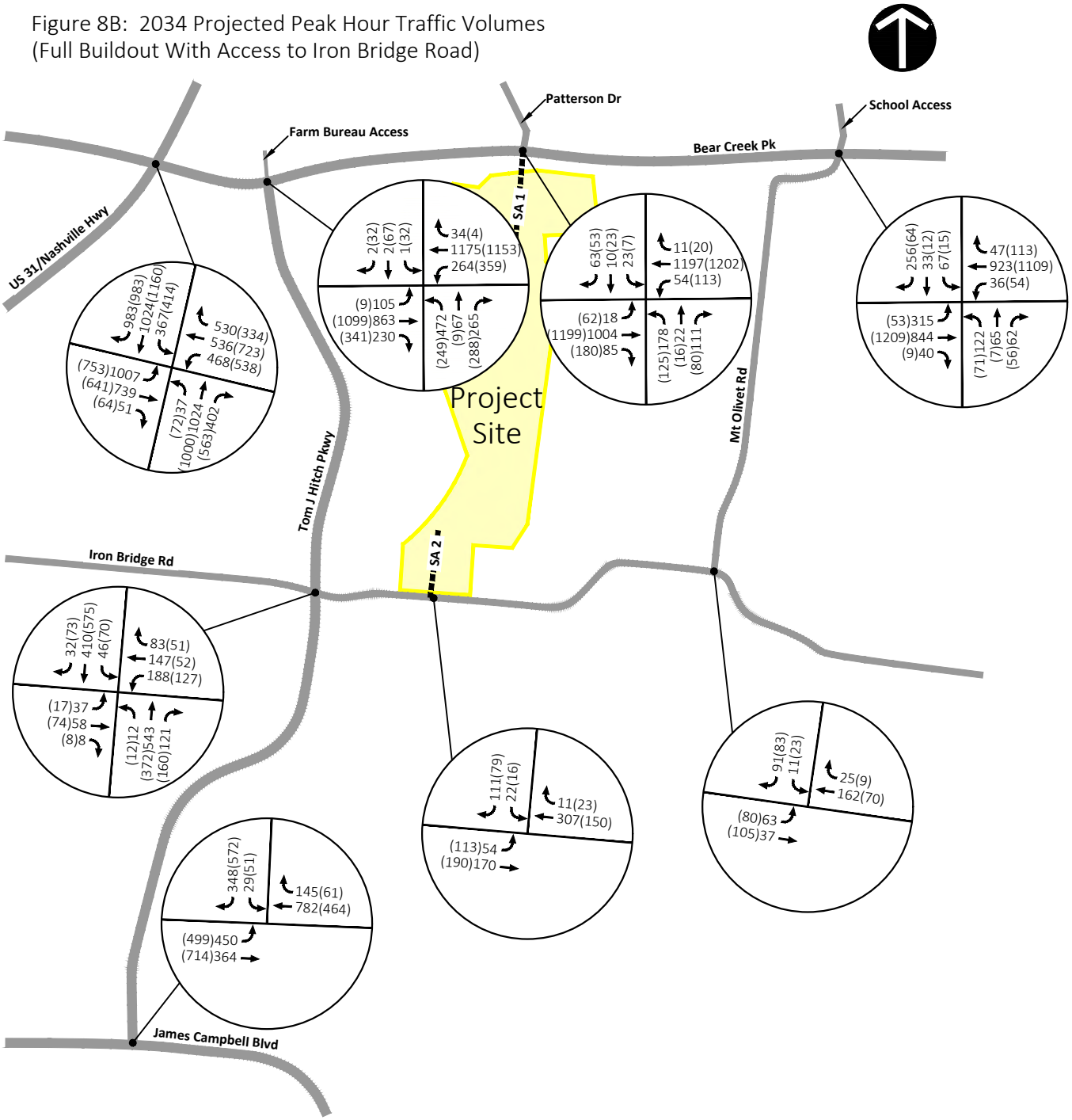
Figure 8A: 2031 Projected Peak Hour Traffic Volumes
(Phases 1-3 Without Access to Iron Bridge Road)



Legend:
XXX - AM Peak Hour Traffic Volumes
(XXX) - PM Peak Hour Traffic Volumes

(Not to Scale)

Figure 8B: 2034 Projected Peak Hour Traffic Volumes
(Full Buildout With Access to Iron Bridge Road)



Legend:
XXX - AM Peak Hour Traffic Volumes
(XXX) - PM Peak Hour Traffic Volumes

(Not to Scale)

6. Traffic Operational Analysis

To evaluate the study intersections under Existing, Background, and Future Projected conditions, capacity analyses were conducted for the study intersections using Synchro 11 software and HCM 6th Edition methodology. The signal timing data for the study intersections was obtained from the City of Columbia and utilized for the capacity analyses. As previously mentioned, the City of Columbia has a study and design underway to improve operation and safety at the intersection of Nashville Highway and Bear Creek Pike; however, details of the improvements are not available. For the background and projected analyses, it was assumed that a second left turn lane would be constructed within the existing medians for the southbound and westbound approaches, a westbound right turn lane would be constructed, as well as signal modification to accommodate the additional laneage.

The capacity analyses result in a control delay and corresponding level of service (LOS). The LOS and control delay are used to describe how well a turning movement and/or intersection operates. LOS A operates with the least amount of delay, and LOS F the worst. In urbanized areas, LOS D is generally considered acceptable. Table 4 presents the descriptions of LOS for unsignalized intersections, and Table 5 presents the descriptions of LOS for signalized intersections.

Table 4: Description of Unsignalized Intersection Level of Service (LOS)

LOS	Control Delay (seconds per vehicle)
A	0 – 10
B	> 10 – 15
C	> 15 – 25
D	> 25 – 35
E	> 35 – 50
F	> 50
Source: *Highway Capacity Manual 6th Edition*	

Table 5: Description of Signalized Intersection Level of Service (LOS)

LOS v/c ≤ 1.0	Control Delay (seconds per vehicle)	Description
A	≤ 10	Volume-to-capacity ratio is low and either progression is exceptionally favorable or cycle length is short.
B	> 10 – 20	Progression is highly favorable or the cycle length is short. More vehicles stop than LOS A.
C	> 20 – 35	Progression is favorable or cycle lengths are moderate. Number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.
D	> 35 – 55	Volume-to-capacity is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.
E	> 55 – 80	Volume-to-capacity is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.
F	> 80	Volume-to-capacity is very high or exceeds 1.0, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.
Source: *Highway Capacity Manual, 6th Edition*		

6.1 Capacity Analysis

Table 6 below presents the results of the AM peak hour analysis, and Table 7 presents the results of the PM peak hour analysis. The tables present a comparison between the analysis scenarios. The overall intersection LOS is presented for signalized intersections, and the LOS for critical turning movements at unsignalized intersections is presented. The Synchro worksheets and complete LOS comparison tables showing all of the turning movements are included in Appendix H. As shown, improvements will be needed at many of the study intersections in order to accommodate the proposed residential development with daycare center. The intersection improvements that are included in the 2031 Projected Phases 1-3 With Improvements scenario and the 2034 Projected Full Buildout With Improvements scenario are outlined in the Conclusions and Recommendations section.

Table 6: Intersection Capacity Analysis – AM Peak Hour

Intersection	Control	Turning Movement	Level of Service (Delay in sec/veh)						
			2023 Existing	2031			2034		
				Background	Projected	Projected w/ Imps	Background	Projected	Projected w/ Imps
Nashville Hwy & US 43/Bear Creek Pk	Signal	Overall Intersection	E (70.5)	F (97.2)	F (104.0)	F (95.0)	F (120.8)	F (134.3)	F (132.2)
Bear Creek Pk & Tom J Hitch Pkwy/ Farm Bureau Access	Signal	Overall Intersection	D (46.7)	F (97.3)	F (135.3)	F (116.2)	F (124.4)	F (165.7)	F (155.9)
Bear Creek Pk & Patterson Dr/ Site Access 1	TWSC	EB Left Turn	B (10.3)	B (11.7)	B (11.7)	--	B (12.3)	B (12.3)	--
		WB Left Turn	--	--	B (11.4)	--	--	B (11.9)	--
		NB Left Turn	--	--	F (600+)	--	--	F (600+)	--
		NB Through/Right Turn	--	--	F (115.1)	--	--	F (444.3)	--
		SB Approach	E (40.9)	F (138.6)	F (600+)	--	F (255.3)	F (600+)	--
	Signal	Overall Intersection	--	--	--	C (32.3)	--	--	D (46.9)
Bear Creek Pk & Mt Olivet Rd/School Access	Signal	Overall Intersection	C (29.2)	E (74.2)	F (85.3)	D (50.6)	F (93.5)	F (112.1)	E (66.0)
Tom J Hitch Pkwy & Iron Bridge Rd	Signal	Overall Intersection	B (14.8)	B (17.2)	B (17.6)	--	B (18.5)	C (23.8)	--
Iron Bridge Rd & Mt Olivet Rd	TWSC	EB Left Turn	A (7.6)	A (7.7)	A (7.7)	--	A (7.7)	A (7.7)	--
		SB Approach	A (9.4)	A (9.7)	A (9.7)	--	A (9.9)	B (10.0)	--
James Campbell Blvd & Tom J Hitch Pkwy	TWSC	EB Left Turn	B (12.0)	C (16.5)	C (17.4)	--	C (19.9)	C (22.1)	--
		SB Left Turn	F (82.6)	F (414.0)	F (496.8)	--	F (600+)	F (600+)	--
		SB Right Turn	C (19.3)	E (35.7)	E (47.3)	--	F (51.5)	F (96.1)	--
	Signal	Overall Intersection	--	--	--	C (24.4)	--	--	C (31.6)
Iron Bridge Rd & Site Access 2	TWSC	EB Left Turn	--	--	--	--	--	A (8.1)	--
		SB Approach	--	--	--	--	--	B (12.4)	--

Note: HCM 6th Edition results reported above for all intersections, with one exception. HCM 2000 results reported for intersection of Nashville Highway and US 43/Bear Creek Pike.

Table 7: Intersection Capacity Analysis – PM Peak Hour

Intersection	Control	Turning Movement	Level of Service (Delay in sec/veh)						
			2023 Existing	2031			2034		
				Background	Projected	Projected w/ Imps	Background	Projected	Projected w/ Imps
Nashville Hwy & US 43/Bear Creek Pk	Signal	Overall Intersection	E (58.1)	E (69.4)	E (72.6)	E (64.1)	F (84.1)	F (90.7)	F (81.9)
Bear Creek Pk & Tom J Hitch Pkwy/ Farm Bureau Access	Signal	Overall Intersection	D (52.4)	F (123.6)	F (173.5)	F (112.6)	F (152.6)	F (198.0)	F (144.7)
Bear Creek Pk & Patterson Dr/ Site Access 1	TWSC	EB Left Turn	B (10.2)	B (11.7)	B (11.7)	--	B (12.3)	B (12.3)	--
		WB Left Turn	--	--	B (13.4)	--	--	C (15.1)	--
		NB Left Turn	--	--	F (600+)	--	--	F (600+)	--
		NB Through/Right Turn	--	--	F (192.1)	--	--	F (600+)	--
		SB Approach	C (24.5)	E (46.9)	F (600+)	--	F (68.4)	F (600+)	--
	Signal	Overall Intersection	--	--	--	C (27.5)	--	--	D (36.3)
Bear Creek Pk & Mt Olivet Rd/School Access	Signal	Overall Intersection	B (16.4)	C (29.9)	D (42.7)	D (37.5)	D (45.3)	E (77.0)	D (41.1)
Tom J Hitch Pkwy & Iron Bridge Rd	Signal	Overall Intersection	B (12.8)	B (14.6)	B (15.4)	--	B (15.5)	B (16.1)	--
Iron Bridge Rd & Mt Olivet Rd	TWSC	EB Left Turn	A (7.4)	A (7.5)	A (7.5)	--	A (7.5)	A (7.5)	--
		SB Approach	A (9.3)	A (9.6)	A (9.6)	--	A (9.7)	B (9.8)	--
James Campbell Blvd & Tom J Hitch Pkwy	TWSC	EB Left Turn	A (9.5)	B (10.8)	B (11.3)	--	B (11.5)	B (12.4)	--
		SB Left Turn	F (90.9)	F (437.1)	F (580.4)	--	F (600+)	F (600+)	--
		SB Right Turn	C (18.6)	E (38.2)	E (46.7)	--	F (57.5)	F (80.5)	--
	Signal	Overall Intersection	--	--	--	C (28.7)	--	--	D (35.5)
Iron Bridge Rd & Site Access 2	TWSC	EB Left Turn	--	--	--	--	--	A (7.8)	--
		SB Approach	--	--	--	--	--	B (10.8)	--

Note: HCM 6th Edition results reported above for all intersections, with one exception. HCM 2000 results reported for intersection of Nashville Highway and US 43/Bear Creek Pike.

According to the City's *Connect Columbia Comprehensive Plan*, which is currently being updated, improvements are planned for the intersection of Nashville Highway and Bear Creek Pike that also include capacity and access management improvements along Bear Creek Pike between Nashville Highway and Tom J Hitch Parkway. Specific design, funding, and schedule of these improvements are unknown. However, it is reasonable to anticipate that the City and/or TDOT will complete these improvements in the next 8-11 years prior to full buildout of the Columbia Bluffs PUD since these improvements were recommended to be completed in the near term (within 10 years) when the Plan was adopted in 2018.

Additional analyses were conducted for the intersection of Bear Creek Pike and Tom J Hitch Parkway assuming that Bear Creek Pike will be widened from 3 to 5 lanes between Nashville Highway and Tom J Hitch Parkway, which is approximately 1,600 linear feet. For this analysis, the additional eastbound lane is assumed to become a right turn only lane and the northbound approach of Tom J Hitch Parkway was assumed to include one left turn lane, one shared left turn/through lane, and one right turn lane. The additional westbound lane on Bear Creek Parkway will allow dual left turn lanes from Tom J Hitch Parkway with split phasing is provided. Table 8 below presents the capacity analysis results for the intersection assuming these future improvements are provided by the City and/or TDOT. As shown, the intersection is expected to operate better than Background Conditions during the AM and PM peak hours under both buildout scenarios.

Table 8: Intersection Capacity Analysis – Bear Creek Pike and Tom J Hitch Parkway with Future Improvements by Others

Turning Movement	Level of Service (Delay in sec/veh)			
	2031		2034	
	AM	PM	AM	PM
Overall Intersection	E (58.3)	E (56.3)	E (79.3)	E (68.8)
Note: HCM 6th Edition results reported above.				

6.2 Signal Warrant Analysis

As previously discussed, the intersection of Bear Creek Pike and Patterson Drive is stop-controlled on the southbound approach of Patterson Drive, and the northbound approach of the proposed development Site Access 1 will be stop-controlled once constructed. The results of the capacity analyses indicate that the northbound and southbound stop-controlled approaches will operate with poor levels of service and long delays during both the AM and PM peak hours under the 2031 Future Projected Conditions. Therefore, the intersection was evaluated to determine whether a traffic signal will be warranted and appropriate to accommodate vehicular traffic at the intersection based on the proposed development's trip generation.

The *Manual on Uniform Traffic Control Devices* (MUTCD) includes nine (9) warrants that should be evaluated based on an engineering study of traffic conditions prior to the installation of a new traffic signal. While there are nine warrants, only one is required to be met in order to consider the need for traffic signal control at an intersection. However, satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. Each warrant sets forth the minimum criteria related to the operation and safety of an intersection that should be met in order to satisfy the warrant.

Warrants 10 software by Trafficware was utilized for the signal warrant analysis based on 2009 Federal Warrants. The traffic volume data, speed limits, and intersection geometry were utilized for the analysis. The signal warrant analysis was based on the 70% warrants since the posted speed limit on Bear Creek Pike is 45 mph. Patterson Drive includes one approach lane in the southbound direction. Bear Creek Pike currently includes one left turn lane and one through lane in the eastbound direction and one shared through/right turn lane in the westbound direction. However, based on the turn lane analysis presented in Section 6.4, additional deceleration turn lanes are recommended on Bear Creek Pike at the intersection. Specifically, an eastbound right turn lane, a westbound right turn lane, and a westbound left turn lane are recommended. Therefore, the analysis is based on two-lane major street approaches. The analysis is based on a two-lane minor street approach since the Site Access 1 approach will include one left turn lane and one shared through/right turn lane and the Site Access 1 approach volumes are roughly balanced between the two lanes. Based on the projected delay for the minor street approaches under two-way stop-control, none of the right turn volume was removed from the analysis since the right turn is shared with the through movement.

In order to obtain hourly 2031 Background Conditions traffic volumes at the intersection, some assumptions were made to account for ambient and approved development traffic in the study area. A 13-hour turning movement count was conducted on Tuesday, February 22, 2022. Similar to the peak hour traffic volumes previously presented, a 3% annual growth was assumed and applied to the hourly 2022 turning movement data, which is a 27% background growth (representing 3% annual for 9 years). Site

specific traffic generated by approved developments was not added to the hourly traffic for this signal warrant analysis.

Finally, the trip generation for the proposed residential development was assigned to the intersection based on the directional distributions presented in Figure 6A. The signal warrant analysis was conducted based on the 2031 Future Projected Conditions for Phases 1-3 without the connection to Iron Bridge Road. The hourly distribution for each land use was taken from ITE's *Trip Generation Manual, 11th Edition*. Table 9 below presents the results of the signal warrant analysis.

Table 9: Signal Warrant Analysis Results – 2031 Future Projected Phases 1-3 Conditions

Bear Creek Pike and Patterson Drive/Site Access 1 (2029 Future Projected Phases 1-3 Conditions)		
Warrant Description	**Warrant Met?**	**Notes**
Warrant 1: 8-Hour Vehicular Volume	Y	13 Hours Met
Warrant 2: 4-Hour Vehicular Volume	Y	13 Hours Met
Warrant 3: Peak Hour	Y	7 Hours Met
Warrant 4: Pedestrian Volume	N/A	--
Warrant 5: School Crossing	N/A	--
Warrant 6: Coordinated Signal System	N/A	--
Warrant 7: Crash Experience	N/A	--
Warrant 8: Roadway Network	Y	--
Warrant 9: Intersection near a Grade Crossing	N/A	--
Notes: 1. Based on 2029 Future Projected Phases 1-3 Conditions. 2. Based on 2 Lane Major Street and 2 Lane Minor Street. 3. Based on 70% Factor Warrants and ≥40 mph approach speed on the Major Street. 4. Crash data was not obtained from the City or evaluated for the warrant.		

Based on these data and analyses, a traffic signal will be warranted under 2031 Future Projected Phases 1-3 Conditions, which includes the traffic generated by the initial residential phases and the daycare for proposed development as well as annual traffic growth in the study area. It should be noted that the signal warrant analysis is based on the trip generation for Phases 1-3 of the Columbia Bluffs development; however, these results indicate that the traffic signal will likely be warranted prior to completion of Phase 2 and/or prior to completion of Phase 1 if the day care center is completed. Therefore, it is recommended to construct and install the traffic signal either prior to completion of Phase 2 (or comparable number of dwelling units) or prior to completion of Phase 1 if Phase 1 includes completion of the day care center. The Warrants 10 summary reports and hourly traffic calculation worksheets are presented in Appendix I.

6.3 Site Access Review

According to the current site plan and the project team, the proposed development will include two vehicular access points. Site Access 1, which will provide primary access to the development, is planned to be located on Bear Creek Pike and aligned with Patterson Drive. The intersection is expected to be signalized during Phase 2 of the development. Site Access 1 will be constructed at the beginning of the project. Site Access 2, which will provide secondary access to the development, is located at the south property boundary on Iron Bridge Road aligned with the Maury County Yanahli Park access. Site Access 2

is planned to be constructed when construction begins for Phase 4. Site Access 1 will include width for one entering lane and two exiting lanes. Site Access 2 will include a minimum width for one entering lane and one exiting lane.

6.4 Turn Lane Analysis

The Site Access 1 was evaluated for the need for left turn and right turn deceleration lanes on Bear Creek Pike based on methodology presented in *NCHRP Report 457, Evaluating Intersection Improvements: An Engineering Study Guide*. Based on the 2031 Future Projected peak hour traffic volumes previously presented, a westbound left turn deceleration lane will be warranted on Bear Creek Pike at Site Access 1. Additionally, an eastbound right turn deceleration lane will be warranted on Bear Creek Pike at Site Access 1. It should also be noted that a westbound right turn deceleration lane is also warranted on Bear Creek Pike at Patterson Drive based on the existing and background peak hour traffic volumes.

Therefore, it is recommended to construct a westbound left turn deceleration lane on Bear Creek Pike at Site Access 1. The left turn deceleration lane should include approximately 225 feet of storage, 180 feet of bay taper, and 270 feet of approach taper, assuming all of the widening is centered along Bear Creek Pike or as required by TDOT. It is also recommended to construct an eastbound right turn deceleration lane on Bear Creek Pike at Site Access 1 and a westbound right turn deceleration lane at Patterson Drive. The eastbound right turn deceleration lane should include approximately 180 feet of storage and 160 feet of bay taper so that the widening for the eastbound right turn lane begins immediately east of the existing guardrail over Bear Creek without requiring modification to the creek crossing structure, or as approved by TDOT. The westbound right turn deceleration lane should include approximately 160 feet of storage and 180 feet of bay taper.

Site Access 2 was evaluated for the need for left turn and right turn deceleration lanes on Iron Bridge Road based on the 2034 Future Projected traffic volumes, which includes full buildout of the development. The turn lane analysis determined that an eastbound left turn deceleration lane will be warranted by the development traffic following full buildout. A westbound right turn deceleration lane will not be warranted. Therefore, it is recommended to construct an eastbound left turn deceleration lane on Iron Bridge Road at Site Access 2. The left turn deceleration lane should include approximately 160 feet of storage, 180 feet of bay taper, and 270 feet of approach taper, assuming all of the widening is centered along Iron Bridge Road or as required by the City or County. Details of the turn lane analysis are included in Appendix J.

6.5 Intersection Sight Distance

According to the current concept plan, Site Access 1 will be located on Bear Creek Pike aligned with Patterson Drive, and Site Access 2 will be located on Iron Bridge Road aligned with the Yanahli Park Access. Both of the Site Access points were evaluated to make sure that sufficient intersection sight distance will be available for vehicles exiting the proposed residential development.

For a 45-mph speed as posted on Bear Creek Pike and Iron Bridge Road, the guidelines from the American Association of State Highway and Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets*, call for a minimum stopping sight distance of 360 feet. This is the distance required for a driver to detect an object in the roadway that requires a stop and be able to stop in time before reaching the object. AASHTO also identifies the minimum intersection sight distance, which is the distance

a driver can see approaching vehicles before the line of sight is blocked by an object or roadway curvature. Sufficient intersection sight distance allows for adequate time gap for a driver to turn across opposing traffic from a stopped condition without requiring on-coming traffic to significantly slow down. For a speed of 45 mph, the design value for a driver turning left from a stop onto a three-lane roadway as recommended is 530 feet and for a driver turning right from a stop is 430 feet. Therefore, it is desirable to provide a minimum of 530 feet looking to the east and 430 feet looking to the west from Site Access 1 on Bear Creek Pike. At Site Access 2, it is desirable to provide a minimum of 530 feet looking to the west and 430 feet looking to the east on Iron Bridge Road.

Based on site visits at the currently proposed site access locations, it was determined that the available intersection sight distance will be sufficient to accommodate left and right turns onto Bear Creek Pike and Iron Bridge Road.

7. Conclusions and Recommendations

The Columbia Bluffs development is proposed to be located between Bear Creek Pike and Iron Bridge Road, east of the Duck River in Columbia, TN. A total of 860 dwelling units (472 single-family lots, 188 townhome units, and 200 active adult units) and a 14,000 square-foot day care center are proposed for the 412-acre property. The property is currently undeveloped farmland that is proposed to be annexed as a planned unit development (PUD). Primary vehicular site access will be located on Bear Creek Pike aligned with Patterson Drive. Secondary vehicular site access will be located on Iron Bridge Road. A development of this size will be constructed over several phases. For the purposes of this traffic study, two development scenarios were analyzed. Per the developer, Kolter Group Acquisitions LLC, Phases 1-3 are expected to be completed in approximately eight years, which corresponds to a 2031 horizon year. The Full Buildout (Phases 1-6) is expected to be completed in approximately eleven years, which corresponds to a 2034 horizon year. The new roadway connection to Iron Bridge Road to the south is not planned to be constructed until after Phase 3.

The analyses presented in this report indicate that the proposed development will generate new vehicular traffic to the study area. Following Full Buildout of the Columbia Bluffs development, the project is expected to generate approximately 7,324 daily trips, 658 AM peak hour trips, and 768 PM peak hour trips. Phases 1-3 of the development will include approximately 50% of the total number of dwelling units and will include the day care center. Phases 1-3 are expected to generate approximately 4,149 daily trips, 399 AM peak hour trips, and 475 PM peak hour trips.

Based on the analyses presented in this study and review of the study area and proposed development information, the following is recommended in order to accommodate the proposed development and provide for efficient traffic operations and safety:

Recommendations Associated with Phases 1-3 Scenario

The initial phases of development will require off-site improvements and as well as improvements to accommodate the primary access onto Bear Creek Pike. The following improvements should be coordinated with the City and could be phased in during construction of Phases 1, 2, and 3 of the development.

<u>#1 Nashville Highway (US 31) and Bear Creek Pike/US 43</u>

Laneage and traffic signal improvements are expected to be completed by the City/TDOT at the intersection of Nashville Highway (US 31) and Bear Creek Pike/US 43. These anticipated improvements were assumed to include the addition of a westbound left turn lane and a southbound left turn lane through restriping and modifying the existing median on Nashville Highway. The provision of dual left turn lanes requires protected only left turn signal phasing for the southbound approach. Additional signal timing adjustments and coordination may be needed for the intersection following the initial phases of development for Columbia Bluffs. Additionally, lead/lag protected only left turn signal phasing is recommended for the eastbound and westbound approaches of Bear Creek Pike.

No other improvements are recommended for the intersection.

#2 Bear Creek Pike and Tom J Hitch Parkway

- Construct a northbound right turn lane on Tom J Hitch Parkway with approximately 100 feet of storage and 60 feet of taper. The northbound right turn lane could be constructed using the existing shoulder and should not extend beyond the start of the bridge over Duck River.
- Restripe the northbound approach to provide one left turn lane and one through lane, plus the recommended right turn lane.
- Modify the traffic signal design to provide a northbound right turn overlap during the westbound left turn phase.
- Optimize and coordinate the signal timing along Bear Creek Pike.

#3 Bear Creek Pike and Patterson Drive/Site Access 1

- Site Access 1 should be constructed and aligned with Patterson Drive at Bear Creek Pike.
- Site Access 1 should be designed to include width for one entering lane and two exiting lanes, which should be a northbound left turn lane and a northbound shared through/right turn lane.
- An eastbound right turn deceleration lane should be constructed for Bear Creek Drive at Site Access 1 to accommodate the project traffic. The eastbound right turn lane should be designed so that the widening and taper does not begin until east of the guardrail over Bear Creek and includes approximately 180 feet of storage and 160 feet of bay taper, or as approved by the City and TDOT.
- A westbound right turn deceleration lane is recommended for Bear Creek Pike at Patterson Drive. The westbound right turn lane should be designed to include approximately 160 feet of storage and 180 feet of bay taper or as approved by the City and TDOT.
- A westbound left turn deceleration lane is recommended for Bear Creek Pike at Site Access 1 to accommodate the project traffic. The westbound left turn lane should be designed to include approximately 225 feet of storage, 180 feet of bay taper, and 270 feet of approach taper assuming the widening is centered on the roadway.
- Install a traffic signal at the intersection of Bear Creek Pike and Patterson Drive/Site Access 1. Signal warrant analyses indicate a traffic signal will be warranted by the traffic volumes generated by the project site prior to completion of Phase 2 (or comparable number of dwelling units) or prior to completion of Phase 1 if Phase 1 includes completion of the day care center. The signal design should include protected/permissive left turn signal phasing for the northbound and westbound approaches and permissive left turn signal phasing for the southbound and eastbound approaches.
- Optimize and coordinate the signal timing along Bear Creek Pike.
- Widen the north leg of Patterson Drive to provide a southbound left turn lane. The widening of Patterson Drive and the construction of Site Access 1 should be designed and constructed such that the northbound and southbound through movements are aligned and the left turn movements can operate concurrently. The southbound left turn lane should include approximately 75 feet of storage.

#4 Bear Creek Pike and Mt Olivet Road/School Access

- Restripe the southbound approach to a shared left turn/through lane and a right turn only lane.
- Modify the traffic signal design for the northbound approach to provide protected/permissive left turn signal phasing.
- Modify the traffic signal design for the southbound approach to provide a right turn overlap during the eastbound left turn phase.
- Optimize and coordinate the signal timing along Bear Creek Pike.

#5 Tom J Hitch Parkway and Iron Bridge Road

The signalized intersection of Tom J Hitch Parkway and Iron Bridge Road is expected to continue to operate acceptably under the future projected conditions.

No improvements are expected to be needed or recommended for the intersection of Tom J Hitch Parkway and Iron Bridge Road.

#6 Iron Bridge Road and Mt Olivet Road

The critical turning movements are expected to continue to operate acceptably at the one-way stop-controlled intersection of Iron Bridge Road and Mt Olivet Road under the future projected conditions.

No improvements are expected to be needed or recommended for the intersection of Iron Bridge Road and Mt Olivet Road.

#7 James Campbell Boulevard and Tom J Hitch Parkway

Tom J Hitch Parkway terminates to the south at James Campbell Boulevard. The T-intersection currently has stop-control for the southbound approach of Tom J Hitch Parkway. The intersection experiences heavy eastbound left turns and the reciprocal southbound right turns during peak hours. The southbound left turn movement currently operates at LOS F during the AM and PM peak hours and is expected to deteriorate with higher levels of delay under the 2031 Background and 2034 Future Projected Conditions with Phases 1-3. According to the City's *Connect Columbia Transportation Plan* adopted in 2018, the intersection is identified to be signalized in the near term (10-year horizon). Preliminary signal warrant analyses indicate the intersection's traffic volumes will meet signal warrants in the near future. The following intersection improvements are recommended to be constructed prior the completion of Phase 3, or comparable number of dwelling units:

- Install a traffic signal at the intersection of James Campbell Boulevard and Tom J Hitch Parkway.
- The traffic signal design should include protected/permissive left turn signal phasing for the eastbound approach and a southbound right turn overlap.

Recommendations Associated with Full Buildout (Phases 1-6) Scenario

As outlined above, the initial phases of development for the Columbia Bluffs project will require fairly significant improvements at many of the study intersections in order to accommodate the project's traffic plus the background traffic growth expected even without the development project's construction. In addition to the recommended improvements associated with Phases 1-3 of the development, the following is recommended for the Full Buildout Scenario:

#8 Iron Bridge Road and Site Access 2

- Site Access 2 should be constructed and connected to Iron Bridge Road prior to beginning construction for Phase 4, or comparable number of dwelling units.
- Site Access 2 should be aligned with the Maury County Yanahli Park Access on Iron Bridge Road.
- At a minimum, Site Access 2 should be designed to include width for one entering lane and one exiting lane.
- Stop-control should be provided for the southbound approach of Site Access 2 at Iron Bridge Road.

- The Site Access 2 should be designed and constructed to allow for sufficient intersection sight distance, clear of any obstructions such as vegetation, landscaping, hardscaping, signs, and fencing within the departure sight triangles.
- An eastbound left turn deceleration lane is recommended for Iron Bridge Road at Site Access 2 to accommodate the project traffic. The eastbound left turn lane should be designed to include approximately 160 feet of storage, 180 feet of bay taper, and 270 feet of approach taper assuming the widening is centered on the roadway, or as approved by the City.

Additional Planned Improvements

According to the City's *Connect Columbia Transportation Plan*, significant roadway improvements have been identified for some of the intersections and roadways in the study area. However, it is important to note that the improvements are not considered to be committed projects until funding has been allocated.

- In the near term, Bear Creek Pike between Nashville Highway and Tom J Hitch Parkway is planned to be widened from 3 lanes to 5 lanes and access management along the segment.
- In the midterm, Iron Bridge Road is planned to be reconstructed to improve the substandard roadway geometry between Fairview Drive and Tom J Hitch Parkway, which would include replacing the bridge/box culvert over Lytle Creek, which currently narrows the roadway to one lane at a sag vertical crest in the roadway.
- In the long-term, Bear Creek Pike is planned to be widened to four lanes between Tom J Hitch Parkway and east of Baker Road. It should be noted that the deceleration lanes recommended for Bear Creek Pike at Site Access 1/Patterson Drive as part of the initial phases of the Columbia Bluffs development will contribute towards this long-term improvement identified along Bear Creek Pike.

<u>#2 Bear Creek Pike and Tom J Hitch Parkway</u>

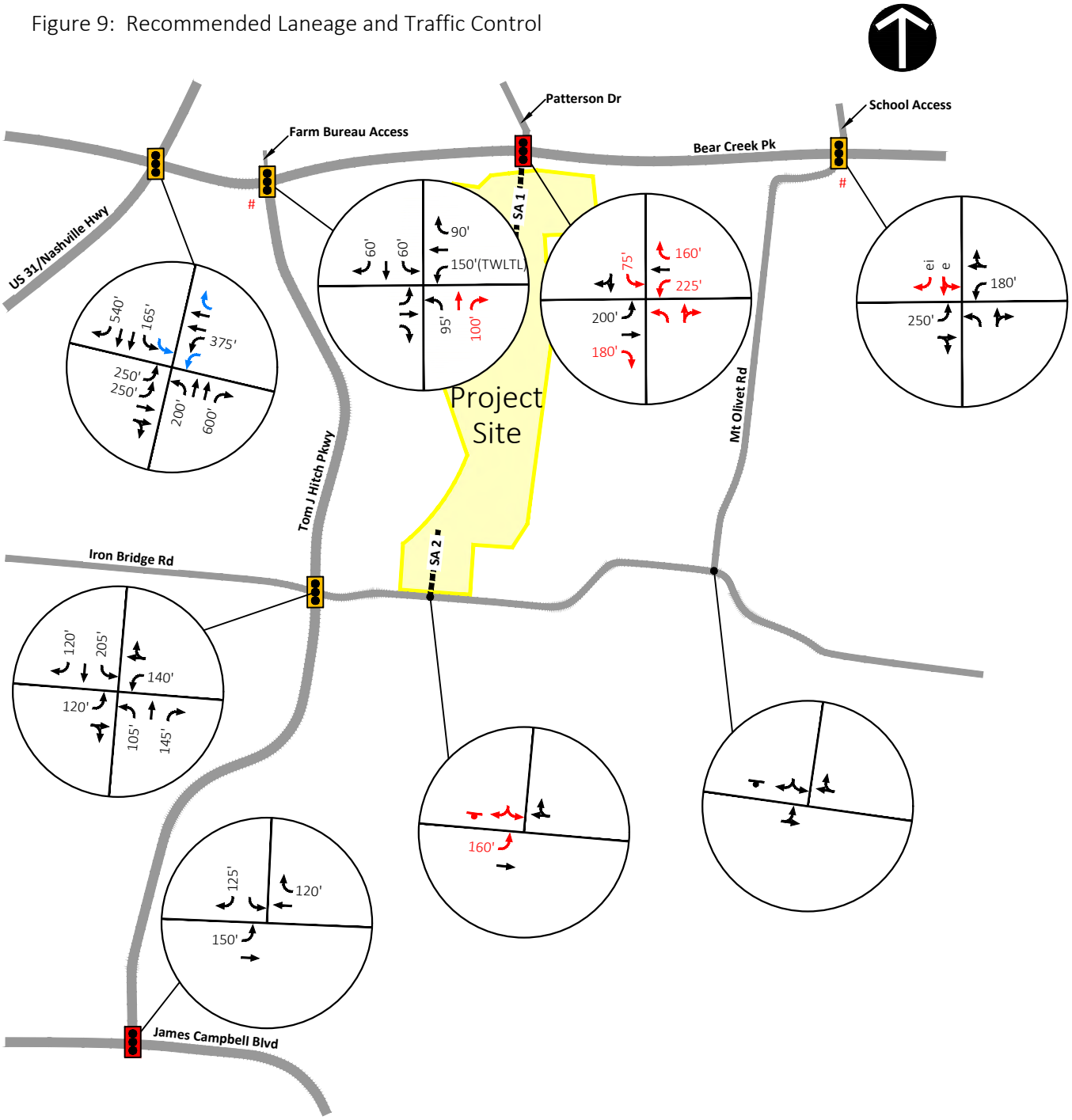
With the planned widening of Bear Creek Pike between Nashville Highway and Tom J Hitch Parkway, the following improvements should be made:

- Reassign the northbound laneage for Tom J Hitch Parkway to provide one left turn lane, one shared left turn/through lane, and one right turn lane.
- Modify the traffic signal to provide split signal phasing for the northbound and southbound approaches.

Based on the analyses presented in this report, no further improvements are recommended in association with the proposed Columbia Bluffs development in Columbia, TN. The recommended and future laneage at the study intersections is presented in Figure 9. Conceptual layouts of the recommended improvements are presented in Figures 10A-10D.

The analyses presented in this TIS evaluated two future buildout scenarios in order to determine when specific roadway improvements will need to be made. The above recommendations are presented in terms of residential phases of development as currently anticipated by Kolter; however, it is recognized that the actual construction of dwelling units for a development this size often does not occur as initially planned. Therefore, based on the analyses, the recommended improvements above were associated with unit count occupancy to identify trigger points for when each should be constructed by the developer or others. The Table in Appendix K presents the phasing for the recommended improvements by dwelling unit count.

Figure 9: Recommended Laneage and Traffic Control



Legend:
- Existing Laneage
- Future Laneage (Planned By Others)
- Future Laneage (Recommended)
- XXX' Storage Length (feet)
- Si
- icSiPeter
- trericSiecoee
- #Sioiictioecoee

(Not to Scale)

Figure 10A: Conceptual Layout of Recommended Improvements at Bear Creek Pike and Tom J Hitch Parkway/Farm Bureau Access

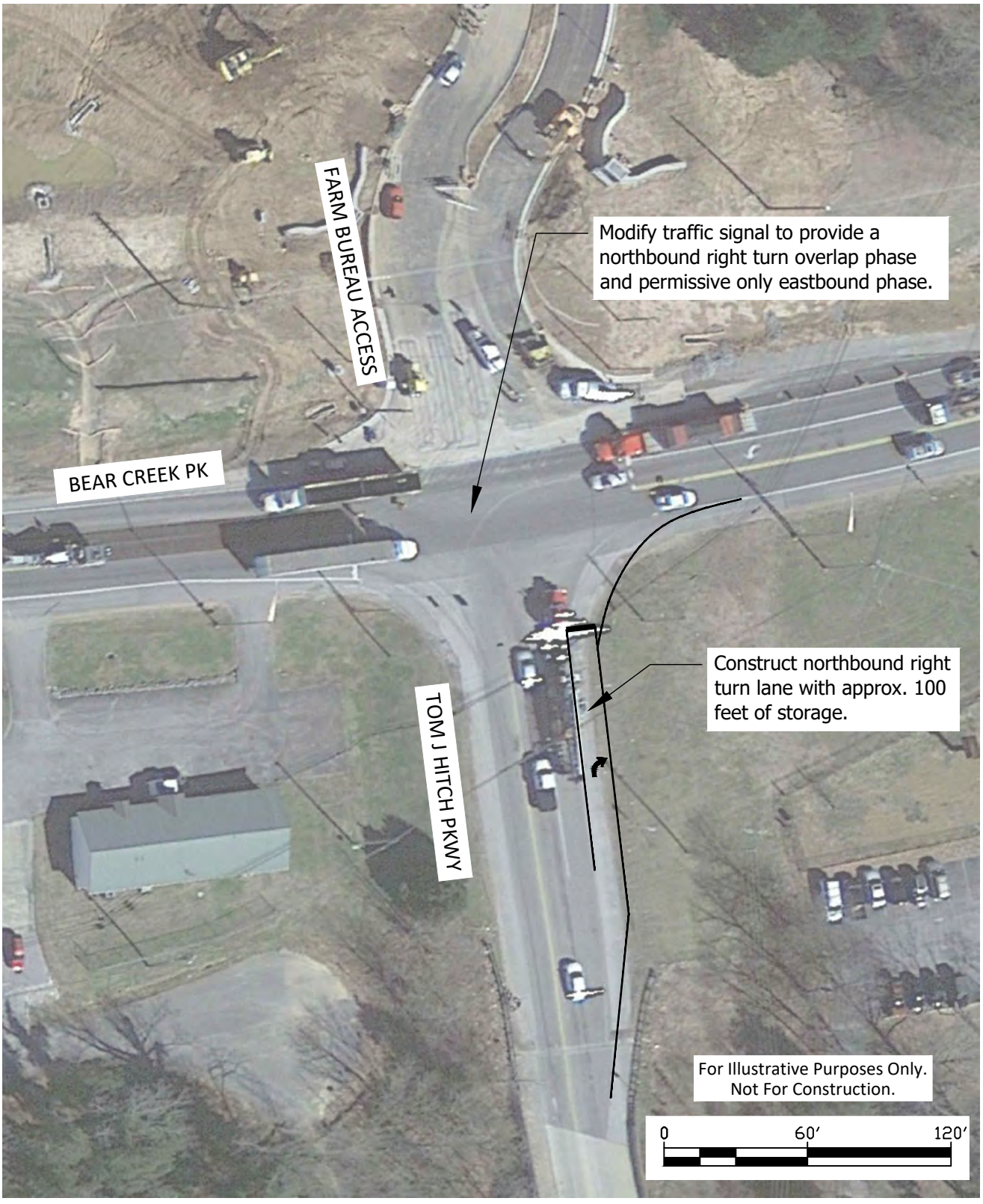


Figure 10B: Conceptual Layout of Recommended Improvements at Bear Creek Pike and Patterson Drive/Site Access 1

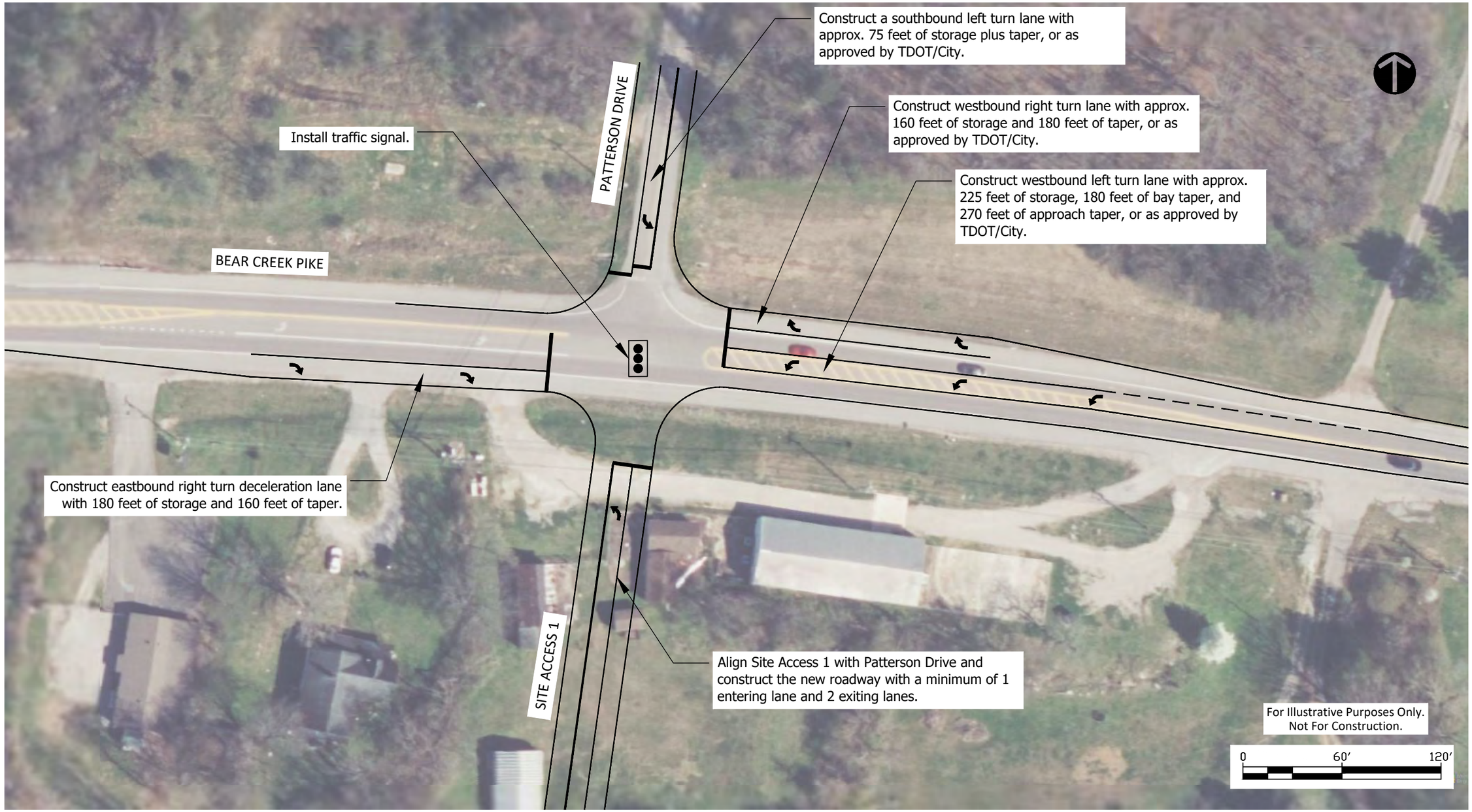


Figure 10C: Conceptual Layout of Recommended Improvements at Bear Creek Pike and Mt Olivet Road/School Access

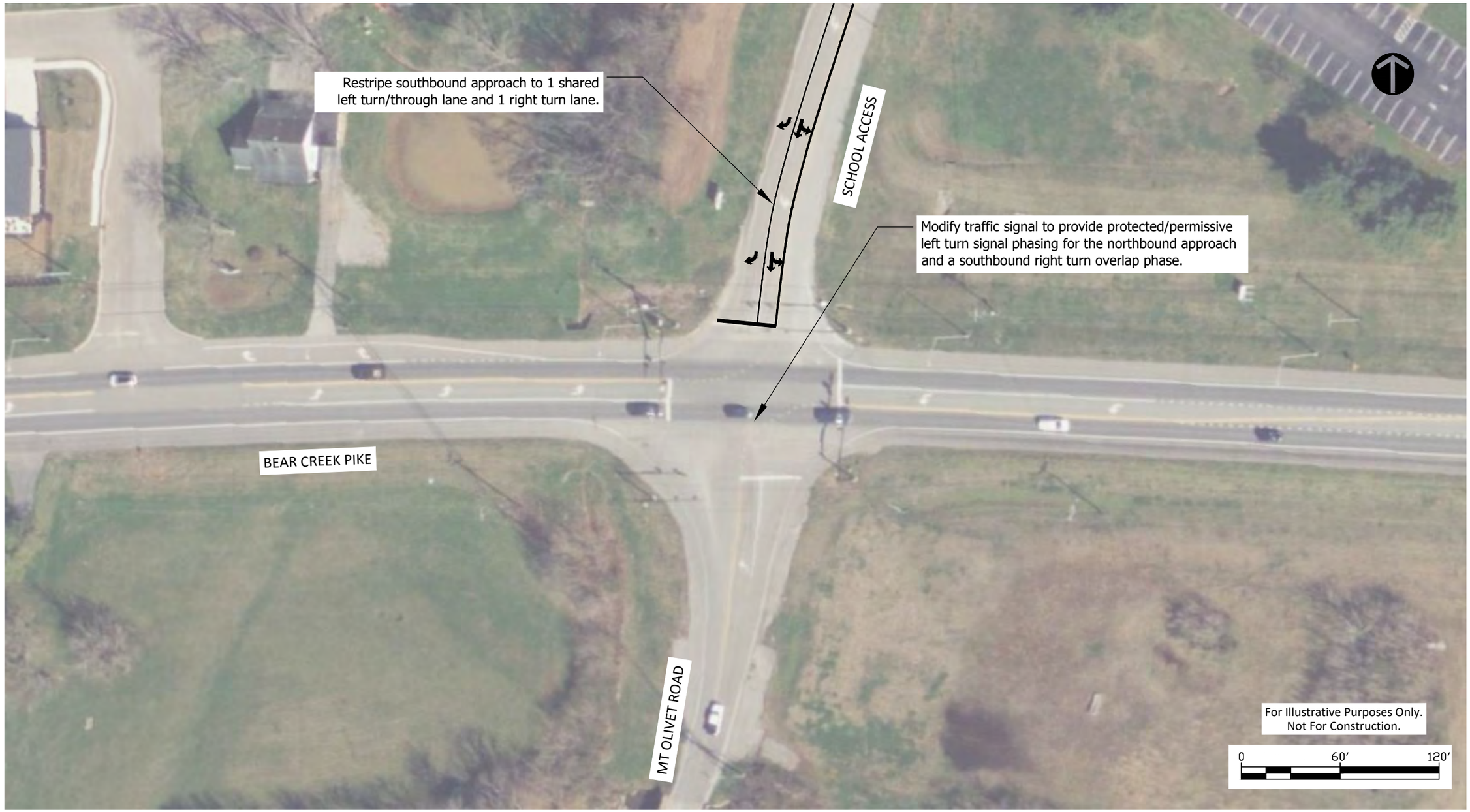


Figure 10D: Conceptual Layout of Recommended Improvements at Iron Bridge Road and Site Access 2



APPENDIX A
CURRENT SITE PLAN

DUCK RIVER

IRON BRIDGE RD

BEAR CREEK PKWY

CIVIC SPACE

CIVIC SPACE

CIVIC SPACE

CIVIC SPACE

CIVIC SPACE

50' ROW TYP. - LOCAL ROAD

50' ROW TYP. - LOCAL ROAD

50' ROW TYP. - LOCAL ROAD

PRIMARY AMENITY/ CIVIC SPACE

DAYCARE
+/- 2.3 ACRES

RESIDENTIAL INFORMATION

TOTAL LOTS: 865

- TOWNHOMES: 188
  MIN. LOT SIZE 20' X 120'
- ALLEY SINGLE FAMILY: 355
  MIN. LOT SIZE 40' X 120'
- FRONT LOADED SINGLE FAMILY: 312
  - COURTYARD HOMES: 143
    MIN. LOT SIZE 70' X 155'
  - LARGE LOT HOMES: 97
    MIN. LOT SIZE 80' X 145'
  - EITHER: 72
    MIN. LOT SIZE 80' X 155'

N

0 300 600
GRAPHIC SCALE

COLUMBIA BLUFFS

PUD-R CONCEPT PLAN

August 22, 2023

GAMBLE DESIGN COLLABORATIVE

APPENDIX B
TIS SCOPE MOU

CITY OF COLUMBIA – DEVELOPMENT SERVICES

TRAFFIC IMPACT STUDY (TIS) MEMORANDUM OF UNDERSTANDING (MOU) & AGREEMENT

CONTACT INFO (Identify primary point of contact)			
DEVELOPER/OWNER	[X] PRIMARY CONTACT	CIVIL CONSULTANT	[ ] PRIMARY CONTACT
Contact Name: Joshua Gibbs		Contact Name: Jim Harrison	
Company: Kolter Land		Company: CSDG	
Address: 1704 Tellico Drive Thompsons Station, TN 37179		Address: 2305 Kline Avenue, Suite 300 Nashville, TN 37211	
Email: jgibbs@kolter.com		Email: jimh@csdgtn.com	
Phone: 615-582-3253		Phone: 615-248-9999	

DEVELOPERS TIS CONSULTANT CONTACT INFO: *complete if study was completed by Developer's consultant.*			
Contact Name: Amy Burch		Company: Burch Transportation, LLC	
Address: 1114 17th Avenue South, Ste. 103, Nashville, TN 37212			
Email: amyburch@burchtransportation.com		Phone: 615-258-8551	

INDICATE THE LEVEL OF TIS REVIEW TO BE PERFORMED BY 3RD PARTY CONSULTANT AND CORRESPONDING FEE (SUBJECT TO STAFF CONFIRMATION):

* Level of TIS determined by the number of Daily & Peak Hour Trips per estimated trip generation calculation.

[ ] Traffic Access Study ($2,900) [ ] Level I TIS ($3,900) [ ] Level II TIS ($4,800) [X] Level III TIS (Fee TBD)
$5,500 per call with City & Volkert on 8/15/2023

TRANSPORTATION IMPACT STUDY – MEMORANDUM OF UNDERSTANDING (MOU)

This MOU acknowledges that the transportation impact study for the following project will be prepared in accordance with the latest version of the City of Columbia Land Development Regulations.

PROJECT INFORMATION:

Name:	Columbia Bluffs (Formerly Big Bear Bluff)
Address:	400 Bear Creek Pike
Description:	Property located between Bear Creek Pike and Iron Bridge Road, east of Duck River
Existing Land Use (be specific):	Undeveloped, farmland
Proposed Land Use (be specific):	Primarily Residential with some commercial amenities/services
Reason for Request: (Planned Unit Development, Site Plan, Rezoning)	Planned Unit Development
Potential Development Yield (number of residential units; building square footage, projected number of employees, hours of operations):	+/- 500 Detached single-family units +/- 300 Attached single-family units Up to 800 Total residential dwelling units* Up to 30,000 Total square feet of commercial space* +/- 12,000 sf day care center +/- 18,000 sf retail strip center **Estimates based on current project planning.*

[X] Attach a site map and a trip generation table with a description of the proposed land uses, ITE rates, estimated daily, morning, and afternoon peak hour volumes (ins/outs/totals), proposed trip credits, etc.

[X] Attach a conceptual development plan showing all access points and adjacent streets.

Project Buildout Year: 2029 for Phases 1-3 2033 for Full Buildout	Ambient or CMP Growth Rate (% Per Year): 3%

STUDY INTERSECTIONS: *use additional pages as necessary	
1. Bear Creek Pike & Nashville Highway	9.
2. Bear Creek Pike & Tom J. Hitch Parkway	10.
3. Bear Creek Pike & Patterson Drive	11.
4. Bear Creek Pike & Mt. Olivet Road	12.
5. Tom J. Hitch Parkway & Iron Bridge Road	13.
6. Iron Bridge Road & Mt. Olivet Road	14.
7. E. James M. Campbell Pkwy & Tom J. Hitch Pkwy	15.
8.	16.

TRIP CREDITS (EXACT AMOUNT OF CREDIT SUBJECT TO APPROVAL BY CITY OF COLUMBIA):

	YES	(indicate ___% of total trips)	NO
Transit Usage	☐	%	☒
Existing Active Land Use	☐	%	☒
Previous Land Use	☐	%	☒
Internal Trip	☐	%	☒
Pass-By Trip	☐	%	☒

3RD PARTY TRAFFIC CONSULTANT CONTACT INFO:	☐ NEEL SCHAFFER	☒ VOLKERT
NEEL SCHAFFER - GREG JUDY		VOLKERT – DYAN DAMRON
201 E. Main Street, Suite 325 Murfreesboro, TN 37130		302 Innovation Drive, Suite 100 Franklin, TN 37067
greg.judy@neel-schaffer.com	615-217-0500	dyan.damron@volkert.com	615-656-1845

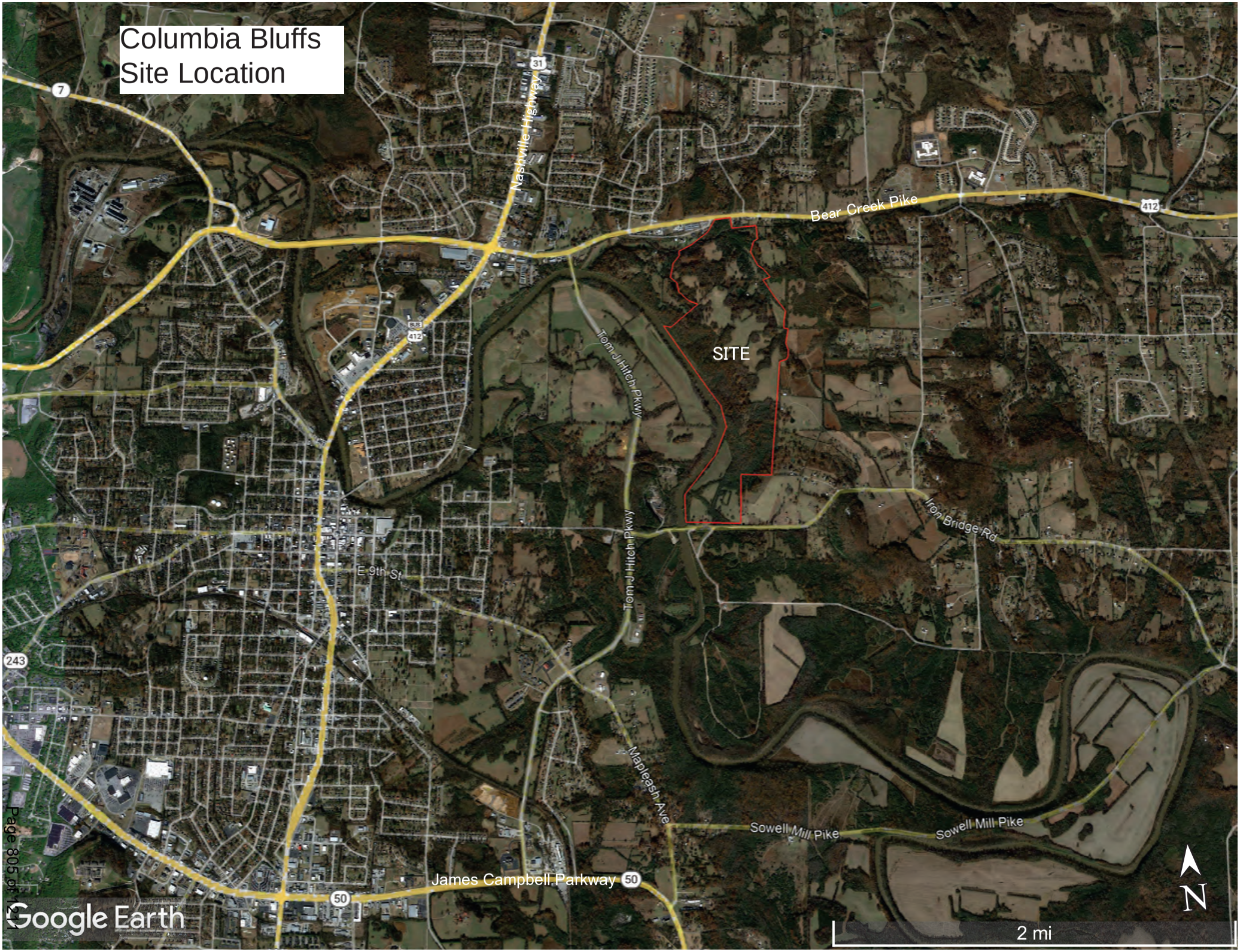
MEMORANDUM OF UNDERSTANDING SIGN OFF:

	Name	Signature	Date
APPLICANT:	Joshua Gibbs	Digitally signed by Joshua Gibbs Reason: I am approving this document Location: KolterLand Date: 2023.08.18 10:39:16 -05'00'	8.18.23

*As applicant, I agree to pay 100% of the review fee. *Paid to the City of Columbia.*
I understand that no work will commence until FULL payment is received and that it is NON-REFUNDABLE.

	Name	Signature	Date
3RD PARTY TRAFFIC CONSULTANT:	Dyan Damron, PE, PTP	Dyan C Damron	8/18/23
CITY ENGINEER:	GLENN HARPER		8/22/23
DIRECTOR OF DEVELOPMENT SERVICES:	Paul Kelther		8/22/23

Questions may be submitted and the completed form shall be emailed for review to: Glenn Harper, City Engineer gharper@columbiatn.com.


Columbia Bluffs
Site Location
SITE
Bear Creek Pike
Nashville Highway
Tom J Hitch Pkwy
Iron Bridge Rd
E 9th St
Mapleash Ave
Sowell Mill Pike
James Campbell Parkway
Google Earth
2 mi
N

Columbia Bluffs
Trip Generation Calculations

Base Trip Generation

Land Use	Size	Unit	Weekday ADT	AM Peak Hour			PM Peak Hour		
				Total	Enter	Exit	Total	Enter	Exit
Single-Family Detached Housing LUC 210	500	DU	4,436	322	81	241	451	284	167
Single-Family Attached Housing LUC 215	300	DU	2,236	150	38	112	176	104	72
Day Care Center LUC 565	12,000	SF	571	132	70	62	133	63	70
Strip Retail Plaza (<40 k) LUC 822	18,000	SF	989	42	25	17	118	59	59
Total Development	**--**	**--**	**8,232**	**646**	**214**	**432**	**878**	**510**	**368**

Source: *ITE Trip Generation Manual, 11th Edition*

APPENDIX C
TDOT COUNT DATA & HISTORICAL ANALYSIS

TDOT Count Station Data Historical Growth Analysis (AADT)

Station No.	Station 204	Annual	Station 45	Annual	Station 47	Annual	Station 44	Annual	Station 46	Annual		Annual
Street	Tom J Hitch Pkwy	%	Bear Creek Pk	%	Iron Bridge Rd	%	Nashville Hwy	%	Nashville Hwy	%		%
Location	South of Bear Creek Pike	Growth	East of Tom J Hitch Pkwy	Growth	West of Tom J Hitch Pkwy	Growth	North of Bear Creek Pike	Growth	South of Bear Creek Pike	Growth	Total	Growth
Year												
2022	9651	-1.0%	17487	3.1%	1342	4.1%	45166	11.8%	29584	12.4%	103230	9.0%
2021	9751	2.1%	16963	-0.2%	1289	-11.9%	40382	6.3%	26329	-5.1%	94714	1.1%
2020	9546	-8.3%	17002	1.0%	1463	-2.1%	37972	-12.4%	27741	1.0%	93724	-5.8%
2019	10410	36.7%	16834	2.3%	1495	-4.5%	43329	5.9%	27466	2.1%	99534	6.5%
2018	7613	-17.6%	16449	-7.5%	1565	4.3%	40922	-7.5%	26893	3.8%	93442	-5.3%
2017	9234	4.2%	17774	34.1%	1501	39.6%	44228	3.7%	25904	-0.8%	98641	7.3%
2016	8858	21.9%	13258	1.0%	1075	-1.5%	42666	13.6%	26101	12.1%	91958	11.7%
2015	7269	-3.0%	13127	-1.6%	1091	3.0%	37557	5.5%	23291	-5.2%	82335	0.3%
2014	7493	15.0%	13345	10.5%	1059	5.3%	35584	3.3%	24575	3.8%	82056	5.6%
2013	6516	-4.9%	12078	-7.8%	1006	-4.3%	34432	4.8%	23686	8.9%	77718	2.8%
2012	6851	-0.2%	13102	-2.4%	1051	3.0%	32860	-3.4%	21745	-1.3%	75609	-2.2%
2011	6863		13419		1020		34003		22040		77345	
With 2021 Data:												
10-year Annual Avg Growth		4.5%		3.5%		3.2%		3.5%		3.3%		3.3%
5-year Annual Avg Growth		2.4%		-0.3%		-2.0%		0.8%		2.8%		1.1%
3-year Annual Avg Growth		-2.4%		1.3%		-3.3%		1.9%		2.8%		1.4%
Pre-2021 Data:												
9-year Annual Avg Growth		4.9%		3.3%		4.8%		1.5%		2.7%		2.3%
5-year Annual Avg Growth		7.4%		6.2%		7.2%		0.7%		3.7%		2.9%
3-year Annual Avg Growth		3.6%		-1.4%		-0.8%		-4.7%		2.3%		-1.5%
Pre-pandemic Data:												
8-year Annual Avg Growth		6.5%		3.6%		5.6%		3.2%		2.9%		3.3%
5-year Annual Avg Growth		8.5%		5.7%		8.2%		4.2%		2.4%		4.1%
3-year Annual Avg Growth		7.8%		9.6%		13.1%		0.7%		1.7%		2.8%

APPENDIX D
TURNING MOVEMENT COUNTS

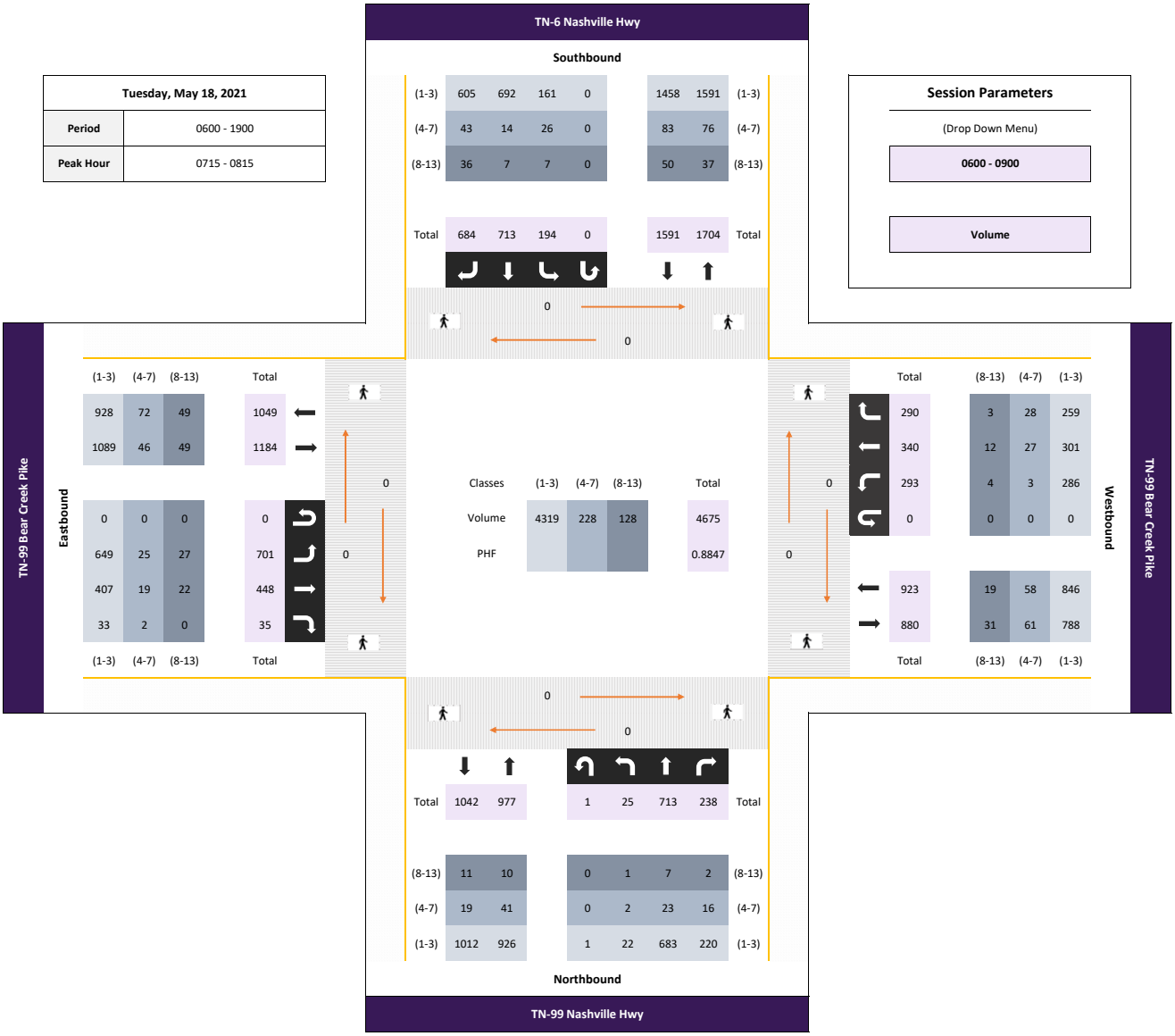
Click here for Map

Peak Hour Turning Movement Count

Columbia, TN

Marr Traffic DATA COLLECTION

www.marrtraffic.com



Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	0715 - 0815

Session Parameters

(Drop Down Menu)

0600 - 0900

Volume

All vehicles

	Northbound					Southbound					Eastbound					Westbound					
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	5.1	5.2	5.3	5.4	Total	5.5	5.6	5.7	5.8	Total	5.9	5.10	5.11	5.12	Total	5.13	5.14	5.15	5.16	Total	Total
0715 - 0730	9	152	60	0	221	49	137	170	0	356	176	127	9	0	312	81	78	75	0	234	1123
0730 - 0745	9	192	73	1	275	55	194	160	0	409	164	93	10	0	267	68	89	70	0	227	1178
0745 - 0800	5	229	61	0	295	43	229	180	0	452	174	132	11	0	317	72	102	83	0	257	1321
0800 - 0815	2	140	44	0	186	47	153	174	0	374	187	96	5	0	288	72	71	62	0	205	1053
Total	25	713	238	1	977	194	713	684	0	1591	701	448	35	0	1184	293	340	290	0	923	4675
Approach %	2.56	72.98	24.36	0.10	-	12.19	44.81	42.99	0.00	-	59.21	37.84	2.96	0.00	-	31.74	36.84	31.42	0.00	-	
PHF	0.69	0.78	0.82	0.25	**0.83**	0.88	0.78	0.95	0.00	**0.88**	0.94	0.85	0.80	0.00	**0.93**	0.90	0.83	0.87	0.00	**0.90**	**0.88**

Bikes

	Northbound					Southbound					Eastbound					Westbound					
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	5.1	5.2	5.3	5.4	Total	5.5	5.6	5.7	5.8	Total	5.9	5.10	5.11	5.12	Total	5.13	5.14	5.15	5.16	Total	Total
0715 - 0730	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0730 - 0745	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0745 - 0800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0800 - 0815	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Passenger Vehicles (1-3)

	Northbound					Southbound					Eastbound					Westbound					
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	5.1	5.2	5.3	5.4	Total	5.5	5.6	5.7	5.8	Total	5.9	5.10	5.11	5.12	Total	5.13	5.14	5.15	5.16	Total	Total
0715 - 0730	8	147	57	0	212	43	133	148	0	324	168	116	9	0	293	80	73	63	0	216	1045
0730 - 0745	7	185	68	1	261	49	185	141	0	375	152	92	9	0	253	67	81	60	0	208	1097
0745 - 0800	5	217	55	0	277	36	223	161	0	420	155	119	11	0	285	71	88	74	0	233	1215
0800 - 0815	2	134	40	0	176	33	151	155	0	339	174	80	4	0	258	68	59	62	0	189	962
Total	22	683	220	1	926	161	692	605	0	1458	649	407	33	0	1089	286	301	259	0	846	4319
Approach %	2.38	73.76	23.76	0.11	-	11.04	47.46	41.50	0.00	-	59.60	37.37	3.03	0.00	-	33.81	35.58	30.61	0.00	-	
PHF	0.69	0.79	0.81	0.25	**0.84**	0.82	0.78	0.94	0.00	**0.87**	0.93	0.86	0.75	0.00	**0.93**	0.89	0.86	0.88	0.00	**0.91**	**0.89**

Single Unit Trucks (4-7)

	Northbound					Southbound					Eastbound					Westbound					
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	5.1	5.2	5.3	5.4	Total	5.5	5.6	5.7	5.8	Total	5.9	5.10	5.11	5.12	Total	5.13	5.14	5.15	5.16	Total	Total
0715 - 0730	1	2	3	0	6	4	2	12	0	18	5	5	0	0	10	1	3	9	0	13	47
0730 - 0745	1	6	4	0	11	6	6	6	0	18	4	0	1	0	5	0	5	10	0	15	49
0745 - 0800	0	10	5	0	15	7	5	10	0	22	12	9	0	0	21	0	14	9	0	23	81
0800 - 0815	0	5	4	0	9	9	1	15	0	25	4	5	1	0	10	2	5	0	0	7	51
Total	2	23	16	0	41	26	14	43	0	83	25	19	2	0	46	3	27	28	0	58	228
Approach %	4.88	56.10	39.02	0.00	-	31.33	16.87	51.81	0.00	-	54.35	41.30	4.35	0.00	-	5.17	46.55	48.28	0.00	-	
PHF	0.50	0.58	0.80	0.00	**0.68**	0.72	0.58	0.72	0.00	**0.83**	0.52	0.53	0.50	0.00	**0.55**	0.38	0.48	0.70	0.00	**0.63**	**0.70**

Combination Trucks (8-13)

	Northbound					Southbound					Eastbound					Westbound					
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	5.1	5.2	5.3	5.4	Total	5.5	5.6	5.7	5.8	Total	5.9	5.10	5.11	5.12	Total	5.13	5.14	5.15	5.16	Total	Total
0715 - 0730	0	3	0	0	3	2	2	10	0	14	3	6	0	0	9	0	2	3	0	5	31
0730 - 0745	1	1	1	0	3	0	3	13	0	16	8	1	0	0	9	1	3	0	0	4	32
0745 - 0800	0	2	1	0	3	0	1	9	0	10	7	4	0	0	11	1	0	0	0	1	25
0800 - 0815	0	1	0	0	1	5	1	4	0	10	9	11	0	0	20	2	7	0	0	9	40
Total	1	7	2	0	10	7	7	36	0	50	27	22	0	0	49	4	12	3	0	19	128
Approach %	10.00	70.00	20.00	0.00	-	14.00	14.00	72.00	0.00	-	55.10	44.90	0.00	0.00	-	21.05	63.16	15.79	0.00	-	
PHF	0.25	0.58	0.50	0.00	**0.83**	0.35	0.58	0.69	0.00	**0.78**	0.75	0.50	0.00	0.00	**0.61**	0.50	0.43	0.25	0.00	**0.53**	**0.80**

Pedestrians

	Northbound					Southbound					Eastbound					Westbound					
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	EB	WB			App	EB	WB			App	NB	SB			App	NB	SB			App	Int
Time	5a	5b			Total	5c	5d			Total	5e	5f			Total	5g	5h			Total	Total
0715 - 0730	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0730 - 0745	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0745 - 0800	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0800 - 0815	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

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Peak Hour Turning Movement Count

Columbia, TN

Marr Traffic DATA COLLECTION

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Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	1630 - 1730

Session Parameters

(Drop Down Menu)

1400 - 1830

Volume



All vehicles

	Northbound					Southbound					Eastbound					Westbound					
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	5.1	5.2	5.3	5.4	Total	5.5	5.6	5.7	5.8	Total	5.9	5.10	5.11	5.12	Total	5.13	5.14	5.15	5.16	Total	Total
1630 - 1645	14	185	93	0	292	49	211	163	0	423	149	93	2	0	244	93	146	43	0	282	1241
1645 - 1700	13	143	98	0	254	53	223	182	0	458	118	85	14	0	217	103	117	44	0	264	1193
1700 - 1715	16	192	102	0	310	60	210	171	0	441	129	182	18	0	329	92	131	48	0	271	1351
1715 - 1730	11	232	89	0	332	60	228	223	0	511	170	78	14	0	262	78	105	49	0	232	1337
Total	54	752	382	0	1188	222	872	739	0	1833	566	438	48	0	1052	366	499	184	0	1049	5122
Approach %	4.55	63.30	32.15	0.00	-	12.11	47.57	40.32	0.00	-	53.80	41.63	4.56	0.00	-	34.89	47.57	17.54	0.00	-	
PHF	0.84	0.81	0.94	0.00	**0.89**	0.93	0.96	0.83	0.00	**0.90**	0.83	0.60	0.67	0.00	**0.80**	0.89	0.85	0.94	0.00	**0.93**	**0.95**

Bikes

	Northbound					Southbound					Eastbound					Westbound					
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	5.1	5.2	5.3	5.4	Total	5.5	5.6	5.7	5.8	Total	5.9	5.10	5.11	5.12	Total	5.13	5.14	5.15	5.16	Total	Total
1630 - 1645	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1645 - 1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700 - 1715	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1715 - 1730	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Passenger Vehicles (1-3)

	Northbound					Southbound					Eastbound					Westbound					
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	5.1	5.2	5.3	5.4	Total	5.5	5.6	5.7	5.8	Total	5.9	5.10	5.11	5.12	Total	5.13	5.14	5.15	5.16	Total	Total
1630 - 1645	14	179	91	0	284	46	202	151	0	399	144	88	2	0	234	93	136	40	0	269	1186
1645 - 1700	13	139	97	0	249	48	219	175	0	442	114	81	14	0	209	103	110	40	0	253	1153
1700 - 1715	16	190	100	0	306	59	199	163	0	421	126	157	17	0	300	89	126	44	0	259	1286
1715 - 1730	11	227	89	0	327	58	223	218	0	499	163	72	14	0	249	77	98	46	0	221	1296
Total	54	735	377	0	1166	211	843	707	0	1761	547	398	47	0	992	362	470	170	0	1002	4921
Approach %	4.63	63.04	32.33	0.00	-	11.98	47.87	40.15	0.00	-	55.14	40.12	4.74	0.00	-	36.13	46.91	16.97	0.00	-	
PHF	0.84	0.81	0.94	0.00	**0.89**	0.89	0.95	0.81	0.00	**0.88**	0.84	0.63	0.69	0.00	**0.83**	0.88	0.86	0.92	0.00	**0.93**	**0.95**

Single Unit Trucks (4-7)

	Northbound					Southbound					Eastbound					Westbound					
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	5.1	5.2	5.3	5.4	Total	5.5	5.6	5.7	5.8	Total	5.9	5.10	5.11	5.12	Total	5.13	5.14	5.15	5.16	Total	Total
1630 - 1645	0	5	2	0	7	3	9	3	0	15	1	2	0	0	3	0	5	3	0	8	33
1645 - 1700	0	2	1	0	3	2	2	6	0	10	4	2	0	0	6	0	4	3	0	7	26
1700 - 1715	0	1	2	0	3	1	9	4	0	14	0	11	1	0	12	2	5	3	0	10	39
1715 - 1730	0	4	0	0	4	1	5	3	0	9	4	4	0	0	8	1	6	2	0	9	30
Total	0	12	5	0	17	7	25	16	0	48	9	19	1	0	29	3	20	11	0	34	128
Approach %	0.00	70.59	29.41	0.00	-	14.58	52.08	33.33	0.00	-	31.03	65.52	3.45	0.00	-	8.82	58.82	32.35	0.00	-	
PHF	0.00	0.60	0.63	0.00	**0.61**	0.58	0.69	0.67	0.00	**0.80**	0.56	0.43	0.25	0.00	**0.60**	0.38	0.83	0.92	0.00	**0.85**	**0.82**

Combination Trucks (8-13)

	Northbound					Southbound					Eastbound					Westbound					
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	5.1	5.2	5.3	5.4	Total	5.5	5.6	5.7	5.8	Total	5.9	5.10	5.11	5.12	Total	5.13	5.14	5.15	5.16	Total	Total
1630 - 1645	0	1	0	0	1	0	0	9	0	9	4	3	0	0	7	0	5	0	0	5	22
1645 - 1700	0	2	0	0	2	3	2	1	0	6	0	2	0	0	2	0	3	1	0	4	14
1700 - 1715	0	1	0	0	1	0	2	4	0	6	3	14	0	0	17	1	0	1	0	2	26
1715 - 1730	0	1	0	0	1	1	0	2	0	3	3	2	0	0	5	0	1	1	0	2	11
Total	0	5	0	0	5	4	4	16	0	24	10	21	0	0	31	1	9	3	0	13	73
Approach %	0.00	100.00	0.00	0.00	-	16.67	16.67	66.67	0.00	-	32.26	67.74	0.00	0.00	-	7.69	69.23	23.08	0.00	-	
PHF	0.00	0.63	0.00	0.00	**0.63**	0.33	0.50	0.44	0.00	**0.67**	0.63	0.38	0.00	0.00	**0.46**	0.25	0.45	0.75	0.00	**0.65**	**0.70**

Pedestrians

	Northbound					Southbound					Eastbound					Westbound					
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	EB	WB			App	EB	WB			App	NB	SB			App	NB	SB			App	Int
Time	5a	5b			Total	5c	5d			Total	5e	5f			Total	5g	5h			Total	Total
1630 - 1645	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1645 - 1700	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1700 - 1715	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1715 - 1730	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

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Peak Hour Turning Movement Count

Columbia, TN

Marr Traffic DATA COLLECTION

www.marrtraffic.com

Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	0715 - 0815

Session Parameters

(Drop Down Menu)

0600 - 0900

Volume



All vehicles

	Northbound										Eastbound					Westbound					
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
Time	Left 6.1		Right 6.2	U-Turn 6.3	App Total					App Total		Thru 6.4	Right 6.5	U-Turn 6.6	App Total	Left 6.7	Thru 6.8		U-Turn 6.9	App Total	Int Total
0715 - 0730	89	-	57	0	146	-	-	-	-	0	-	135	37	0	172	37	156	-	0	193	511
0730 - 0745	86	-	49	0	135	-	-	-	-	0	-	139	41	0	180	40	183	-	0	223	538
0745 - 0800	90	-	51	0	141	-	-	-	-	0	-	130	41	0	171	64	200	-	0	264	576
0800 - 0815	48	-	25	0	73	-	-	-	-	0	-	132	34	0	166	41	150	-	0	191	430
Total	313	0	182	0	495	0	0	0	0	0	0	536	153	0	689	182	689	0	0	871	2055
Approach %	63.23	0.00	36.77	0.00	-	0.00	0.00	0.00	0.00	-	0.00	77.79	22.21	0.00	-	20.90	79.10	0.00	0.00	-	
PHF	0.87	0.00	0.80	0.00	**0.85**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.96	0.93	0.00	**0.96**	0.71	0.86	0.00	0.00	**0.82**	**0.89**

Bikes

	Northbound										Eastbound					Westbound					
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
Time	Left 6.1		Right 6.2	U-Turn 6.3	App Total					App Total		Thru 6.4	Right 6.5	U-Turn 6.6	App Total	Left 6.7	Thru 6.8		U-Turn 6.9	App Total	Int Total
0715 - 0730	0	-	0	0	0	-	-	-	-	0	-	0	0	0	0	0	0	-	0	0	0
0730 - 0745	0	-	0	0	0	-	-	-	-	0	-	0	0	0	0	0	0	-	0	0	0
0745 - 0800	0	-	0	0	0	-	-	-	-	0	-	0	0	0	0	0	0	-	0	0	0
0800 - 0815	0	-	0	0	0	-	-	-	-	0	-	0	0	0	0	0	0	-	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Passenger Vehicles (1-3)

	Northbound										Eastbound					Westbound					
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
Time	Left 6.1		Right 6.2	U-Turn 6.3	App Total					App Total		Thru 6.4	Right 6.5	U-Turn 6.6	App Total	Left 6.7	Thru 6.8		U-Turn 6.9	App Total	Int Total
0715 - 0730	78	-	54	0	132	-	-	-	-	0	-	122	33	0	155	35	145	-	0	180	467
0730 - 0745	78	-	45	0	123	-	-	-	-	0	-	125	40	0	165	38	167	-	0	205	493
0745 - 0800	87	-	48	0	135	-	-	-	-	0	-	112	40	0	152	63	184	-	0	247	534
0800 - 0815	44	-	24	0	68	-	-	-	-	0	-	112	24	0	136	37	139	-	0	176	380
Total	287	0	171	0	458	0	0	0	0	0	0	471	137	0	608	173	635	0	0	808	1874
Approach %	62.66	0.00	37.34	0.00	-	0.00	0.00	0.00	0.00	-	0.00	77.47	22.53	0.00	-	21.41	78.59	0.00	0.00	-	
PHF	0.82	0.00	0.79	0.00	**0.85**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.94	0.86	0.00	**0.92**	0.69	0.86	0.00	0.00	**0.82**	**0.88**

Single Unit Trucks (4-7)

	Northbound										Eastbound					Westbound					
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
Time	Left 6.1		Right 6.2	U-Turn 6.3	App Total					App Total		Thru 6.4	Right 6.5	U-Turn 6.6	App Total	Left 6.7	Thru 6.8		U-Turn 6.9	App Total	Int Total
0715 - 0730	9	-	3	0	12	-	-	-	-	0	-	8	3	0	11	2	7	-	0	9	32
0730 - 0745	8	-	4	0	12	-	-	-	-	0	-	9	1	0	10	2	14	-	0	16	38
0745 - 0800	3	-	2	0	5	-	-	-	-	0	-	13	1	0	14	1	15	-	0	16	35
0800 - 0815	3	-	1	0	4	-	-	-	-	0	-	7	8	0	15	4	3	-	0	7	26
Total	23	0	10	0	33	0	0	0	0	0	0	37	13	0	50	9	39	0	0	48	131
Approach %	69.70	0.00	30.30	0.00	-	0.00	0.00	0.00	0.00	-	0.00	74.00	26.00	0.00	-	18.75	81.25	0.00	0.00	-	
PHF	0.64	0.00	0.63	0.00	**0.69**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.71	0.41	0.00	**0.83**	0.56	0.65	0.00	0.00	**0.75**	**0.86**

Combination Trucks (8-13)

	Northbound										Eastbound					Westbound					
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
Time	Left 6.1		Right 6.2	U-Turn 6.3	App Total					App Total		Thru 6.4	Right 6.5	U-Turn 6.6	App Total	Left 6.7	Thru 6.8		U-Turn 6.9	App Total	Int Total
0715 - 0730	2	-	0	0	2	-	-	-	-	0	-	5	1	0	6	0	4	-	0	4	12
0730 - 0745	0	-	0	0	0	-	-	-	-	0	-	5	0	0	5	0	2	-	0	2	7
0745 - 0800	0	-	1	0	1	-	-	-	-	0	-	5	0	0	5	0	1	-	0	1	7
0800 - 0815	1	-	0	0	1	-	-	-	-	0	-	13	2	0	15	0	8	-	0	8	24
Total	3	0	1	0	4	0	0	0	0	0	0	28	3	0	31	0	15	0	0	15	50
Approach %	75.00	0.00	25.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	90.32	9.68	0.00	-	0.00	100.00	0.00	0.00	-	
PHF	0.38	0.00	0.25	0.00	**0.50**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.54	0.38	0.00	**0.52**	0.00	0.47	0.00	0.00	**0.47**	**0.52**

Pedestrians

	Northbound										Eastbound					Westbound					
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
Time	EB 6a	WB 6b			App Total					App Total	NB 6e	SB 6f			App Total	NB 6g	SB 6h			App Total	Int Total
0715 - 0730	0	0	-	-	0	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0730 - 0745	0	0	-	-	0	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0745 - 0800	0	0	-	-	0	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0800 - 0815	0	0	-	-	0	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Click here for Map

Peak Hour Turning Movement Count

Columbia, TN

Marr Traffic DATA COLLECTION

www.marrtraffic.com

Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	1615 - 1715

Session Parameters

(Drop Down Menu)

1400 - 1830

Volume



All vehicles

	Northbound										Eastbound					Westbound					
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left		Right	U-Turn	App					App		Thru	Right	U-Turn	App	Left	Thru		U-Turn	App	Int
Time	6.1		6.2	6.3	Total					Total		6.4	6.5	6.6	Total	6.7	6.8		6.9	Total	Total
1615 - 1630	48	-	57	0	105	-	-	-	-	0	-	159	51	0	210	59	198	-	0	257	572
1630 - 1645	37	-	55	0	92	-	-	-	-	0	-	188	76	0	264	65	178	-	0	243	599
1645 - 1700	37	-	52	0	89	-	-	-	-	0	-	175	62	0	237	57	192	-	0	249	575
1700 - 1715	53	-	49	0	102	-	-	-	-	0	-	156	50	0	206	85	193	-	0	278	586
Total	175	0	213	0	388	0	0	0	0	0	0	678	239	0	917	266	761	0	0	1027	2332
Approach %	45.10	0.00	54.90	0.00	-	0.00	0.00	0.00	0.00	-	0.00	73.94	26.06	0.00	-	25.90	74.10	0.00	0.00	-	
PHF	0.83	0.00	0.93	0.00	**0.92**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.90	0.79	0.00	**0.87**	0.78	0.96	0.00	0.00	**0.92**	**0.97**

Bikes

	Northbound										Eastbound					Westbound					
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left		Right	U-Turn	App					App		Thru	Right	U-Turn	App	Left	Thru		U-Turn	App	Int
Time	6.1		6.2	6.3	Total					Total		6.4	6.5	6.6	Total	6.7	6.8		6.9	Total	Total
1615 - 1630	0	-	0	0	0	-	-	-	-	0	-	0	0	0	0	0	0	-	0	0	0
1630 - 1645	0	-	0	0	0	-	-	-	-	0	-	0	0	0	0	0	0	-	0	0	0
1645 - 1700	0	-	0	0	0	-	-	-	-	0	-	0	0	0	0	0	0	-	0	0	0
1700 - 1715	0	-	0	0	0	-	-	-	-	0	-	0	0	0	0	0	0	-	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Passenger Vehicles (1-3)

	Northbound										Eastbound					Westbound					
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left		Right	U-Turn	App					App		Thru	Right	U-Turn	App	Left	Thru		U-Turn	App	Int
Time	6.1		6.2	6.3	Total					Total		6.4	6.5	6.6	Total	6.7	6.8		6.9	Total	Total
1615 - 1630	45	-	53	0	98	-	-	-	-	0	-	144	48	0	192	57	189	-	0	246	536
1630 - 1645	33	-	53	0	86	-	-	-	-	0	-	181	72	0	253	62	166	-	0	228	567
1645 - 1700	36	-	49	0	85	-	-	-	-	0	-	165	59	0	224	55	186	-	0	241	550
1700 - 1715	51	-	47	0	98	-	-	-	-	0	-	141	50	0	191	77	183	-	0	260	549
Total	165	0	202	0	367	0	0	0	0	0	0	631	229	0	860	251	724	0	0	975	2202
Approach %	44.96	0.00	55.04	0.00	-	0.00	0.00	0.00	0.00	-	0.00	73.37	26.63	0.00	-	25.74	74.26	0.00	0.00	-	
PHF	0.81	0.00	0.95	0.00	**0.94**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.87	0.80	0.00	**0.85**	0.81	0.96	0.00	0.00	**0.94**	**0.97**

Single Unit Trucks (4-7)

	Northbound										Eastbound					Westbound					
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left		Right	U-Turn	App					App		Thru	Right	U-Turn	App	Left	Thru		U-Turn	App	Int
Time	6.1		6.2	6.3	Total					Total		6.4	6.5	6.6	Total	6.7	6.8		6.9	Total	Total
1615 - 1630	3	-	1	0	4	-	-	-	-	0	-	4	2	0	6	1	2	-	0	3	13
1630 - 1645	4	-	1	0	5	-	-	-	-	0	-	5	3	0	8	2	8	-	0	10	23
1645 - 1700	1	-	2	0	3	-	-	-	-	0	-	5	3	0	8	1	2	-	0	3	14
1700 - 1715	1	-	1	0	2	-	-	-	-	0	-	10	0	0	10	7	10	-	0	17	29
Total	9	0	5	0	14	0	0	0	0	0	0	24	8	0	32	11	22	0	0	33	79
Approach %	64.29	0.00	35.71	0.00	-	0.00	0.00	0.00	0.00	-	0.00	75.00	25.00	0.00	-	33.33	66.67	0.00	0.00	-	
PHF	0.56	0.00	0.63	0.00	**0.70**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.60	0.67	0.00	**0.80**	0.39	0.55	0.00	0.00	**0.49**	**0.68**

Combination Trucks (8-13)

	Northbound										Eastbound					Westbound					
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left		Right	U-Turn	App					App		Thru	Right	U-Turn	App	Left	Thru		U-Turn	App	Int
Time	6.1		6.2	6.3	Total					Total		6.4	6.5	6.6	Total	6.7	6.8		6.9	Total	Total
1615 - 1630	0	-	3	0	3	-	-	-	-	0	-	11	1	0	12	1	7	-	0	8	23
1630 - 1645	0	-	1	0	1	-	-	-	-	0	-	2	1	0	3	1	4	-	0	5	9
1645 - 1700	0	-	1	0	1	-	-	-	-	0	-	5	0	0	5	1	4	-	0	5	11
1700 - 1715	1	-	1	0	2	-	-	-	-	0	-	5	0	0	5	1	0	-	0	1	8
Total	1	0	6	0	7	0	0	0	0	0	0	23	2	0	25	4	15	0	0	19	51
Approach %	14.29	0.00	85.71	0.00	-	0.00	0.00	0.00	0.00	-	0.00	92.00	8.00	0.00	-	21.05	78.95	0.00	0.00	-	
PHF	0.25	0.00	0.50	0.00	**0.58**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.52	0.50	0.00	**0.52**	1.00	0.54	0.00	0.00	**0.59**	**0.55**

Pedestrians

	Northbound										Eastbound					Westbound					
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	EB	WB			App					App	NB	SB			App	NB	SB			App	Int
Time	6a	6b			Total					Total	6e	6f			Total	6g	6h			Total	Total
1615 - 1630	0	0	-	-	0	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1630 - 1645	0	0	-	-	0	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1645 - 1700	0	0	-	-	0	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1700 - 1715	0	0	-	-	0	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Click here for Map

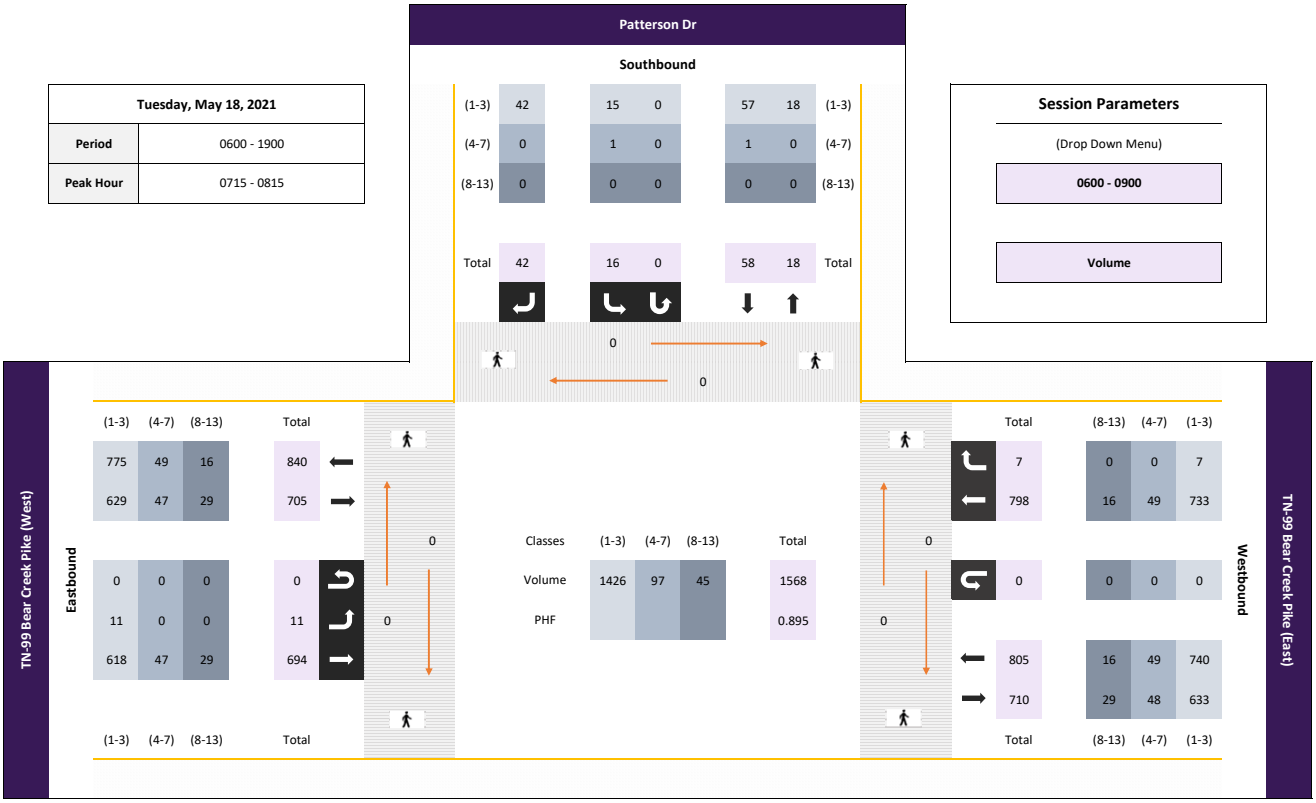
Peak Hour Turning Movement Count

Columbia, TN

Marr Traffic DATA COLLECTION

www.marrtraffic.com

Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	0715 - 0815



All vehicles

	Southbound					Eastbound					Westbound					
	Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
Time					App Total	Left 2.1		Right 2.2	U-Turn 2.3	App Total	Left 2.4	Thru 2.5		U-Turn 2.6	App Total		Thru 2.7	Right 2.8	U-Turn 2.9	App Total	Int Total
0715 - 0730	-	-	-	-	0	5	-	8	0	13	1	187	-	0	188	-	182	1	0	183	384
0730 - 0745	-	-	-	-	0	6	-	17	0	23	5	176	-	0	181	-	230	4	0	234	438
0745 - 0800	-	-	-	-	0	2	-	11	0	13	3	171	-	0	174	-	206	2	0	208	395
0800 - 0815	-	-	-	-	0	3	-	6	0	9	2	160	-	0	162	-	180	0	0	180	351
Total	0	0	0	0	0	16	0	42	0	58	11	694	0	0	705	0	798	7	0	805	1568
Approach %	0.00	0.00	0.00	0.00	-	27.59	0.00	72.41	0.00	-	1.56	98.44	0.00	0.00	-	0.00	99.13	0.87	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.67	0.00	0.62	0.00	**0.63**	0.55	0.93	0.00	0.00	**0.94**	0.00	0.87	0.44	0.00	**0.86**	**0.89**

Bikes

	Southbound					Eastbound					Westbound					
	Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
Time					App Total	Left 2.1		Right 2.2	U-Turn 2.3	App Total	Left 2.4	Thru 2.5		U-Turn 2.6	App Total		Thru 2.7	Right 2.8	U-Turn 2.9	App Total	Int Total
0715 - 0730	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
0730 - 0745	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
0745 - 0800	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
0800 - 0815	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Passenger Vehicles (1-3)

	Southbound					Eastbound					Westbound					
	Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
Time					App Total	Left 2.1		Right 2.2	U-Turn 2.3	App Total	Left 2.4	Thru 2.5		U-Turn 2.6	App Total		Thru 2.7	Right 2.8	U-Turn 2.9	App Total	Int Total
0715 - 0730	-	-	-	-	0	5	-	8	0	13	1	170	-	0	171	-	166	1	0	167	351
0730 - 0745	-	-	-	-	0	5	-	17	0	22	5	157	-	0	162	-	216	4	0	220	404
0745 - 0800	-	-	-	-	0	2	-	11	0	13	3	154	-	0	157	-	189	2	0	191	361
0800 - 0815	-	-	-	-	0	3	-	6	0	9	2	137	-	0	139	-	162	0	0	162	310
Total	0	0	0	0	0	15	0	42	0	57	11	618	0	0	629	0	733	7	0	740	1426
Approach %	0.00	0.00	0.00	0.00	-	26.32	0.00	73.68	0.00	-	1.75	98.25	0.00	0.00	-	0.00	99.05	0.95	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.75	0.00	0.62	0.00	**0.65**	0.55	0.91	0.00	0.00	**0.92**	0.00	0.85	0.44	0.00	**0.84**	**0.88**

Single Unit Trucks (4-7)

	Southbound					Eastbound					Westbound					
	Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
Time					App Total	Left 2.1		Right 2.2	U-Turn 2.3	App Total	Left 2.4	Thru 2.5		U-Turn 2.6	App Total		Thru 2.7	Right 2.8	U-Turn 2.9	App Total	Int Total
0715 - 0730	-	-	-	-	0	0	-	0	0	0	0	12	-	0	12	-	12	0	0	12	24
0730 - 0745	-	-	-	-	0	1	-	0	0	1	0	14	-	0	14	-	12	0	0	12	27
0745 - 0800	-	-	-	-	0	0	-	0	0	0	0	11	-	0	11	-	15	0	0	15	26
0800 - 0815	-	-	-	-	0	0	-	0	0	0	0	10	-	0	10	-	10	0	0	10	20
Total	0	0	0	0	0	1	0	0	0	1	0	47	0	0	47	0	49	0	0	49	97
Approach %	0.00	0.00	0.00	0.00	-	100.00	0.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.25	0.00	0.00	0.00	**0.25**	0.00	0.84	0.00	0.00	**0.84**	0.00	0.82	0.00	0.00	**0.82**	**0.90**

Combination Trucks (8-13)

	Southbound					Eastbound					Westbound					
	Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
Time					App Total	Left 2.1		Right 2.2	U-Turn 2.3	App Total	Left 2.4	Thru 2.5		U-Turn 2.6	App Total		Thru 2.7	Right 2.8	U-Turn 2.9	App Total	Int Total
0715 - 0730	-	-	-	-	0	0	-	0	0	0	0	5	-	0	5	-	4	0	0	4	9
0730 - 0745	-	-	-	-	0	0	-	0	0	0	0	5	-	0	5	-	2	0	0	2	7
0745 - 0800	-	-	-	-	0	0	-	0	0	0	0	6	-	0	6	-	2	0	0	2	8
0800 - 0815	-	-	-	-	0	0	-	0	0	0	0	13	-	0	13	-	8	0	0	8	21
Total	0	0	0	0	0	0	0	0	0	0	0	29	0	0	29	0	16	0	0	16	45
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.56	0.00	0.00	**0.56**	0.00	0.50	0.00	0.00	**0.50**	**0.54**

Pedestrians

	Southbound					Eastbound					Westbound					
	Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
Time					App Total	EB 2c	WB 2d			App Total	NB 2e	SB 2f			App Total	NB 2g	SB 2h			App Total	Int Total
0715 - 0730	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0730 - 0745	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0745 - 0800	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0800 - 0815	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Click here for Map

Peak Hour Turning Movement Count

Columbia, TN

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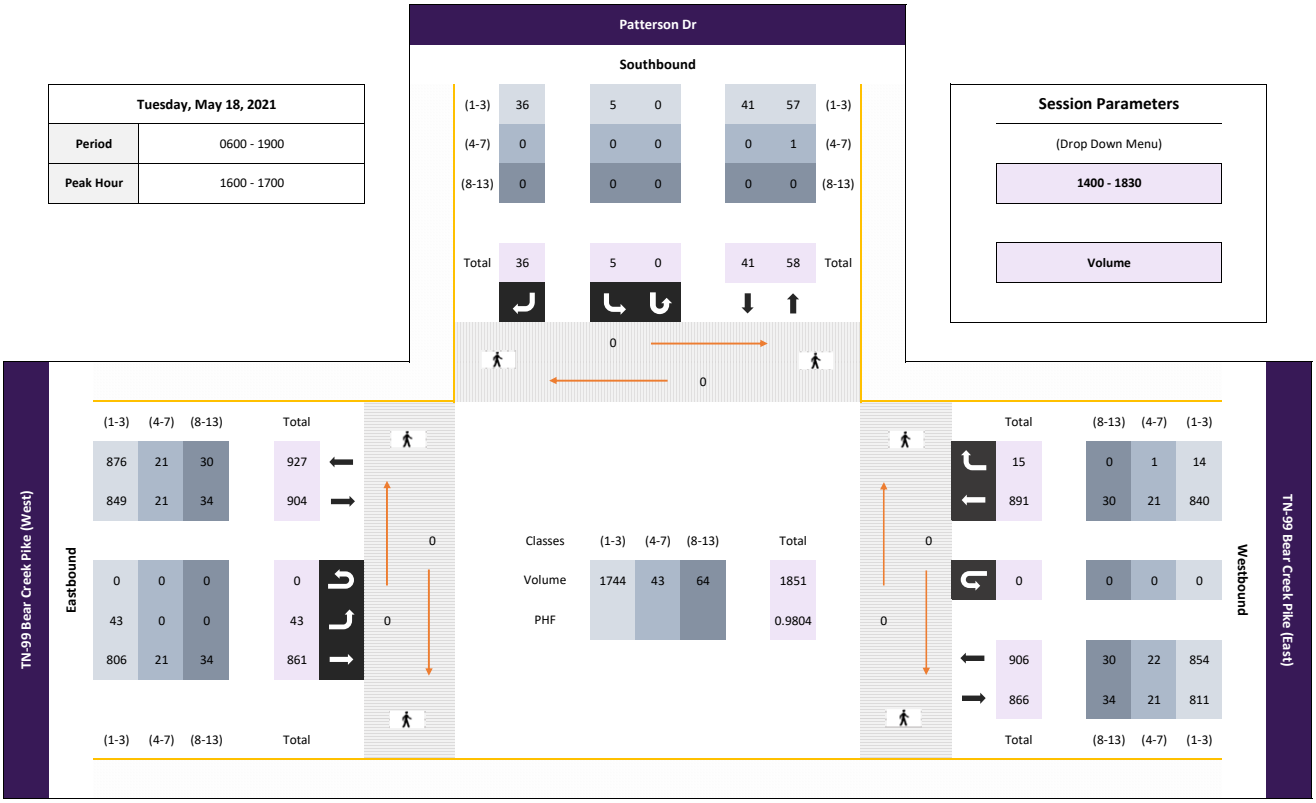
Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	1600 - 1700

Session Parameters

(Drop Down Menu)

1400 - 1830

Volume



Southbound	(1-3)	(4-7)	(8-13)	Total
	36	0	0	36
	5	0	0	5
	0	0	0	0
	41	0	0	41
	57	1	0	58
	(1-3)	(4-7)	(8-13)	Total

Eastbound	(1-3)	(4-7)	(8-13)	Total
	876	21	30	927
	849	21	34	904
	0	0	0	0
	43	0	0	43
	806	21	34	861
	(1-3)	(4-7)	(8-13)	Total

Westbound	(8-13)	(4-7)	(1-3)	Total
	0	1	14	15
	30	21	840	891
	0	0	0	0
	30	22	854	906
	34	21	811	866
	(8-13)	(4-7)	(1-3)	Total

Classes	(1-3)	(4-7)	(8-13)	Total
Volume	1744	43	64	1851
PHF				0.9804

All vehicles

	Southbound					Patterson Dr					Eastbound					TN-99 Bear Creek Pike (West)					Westbound					TN-99 Bear Creek Pike (East)	
Time					App Total	Left 2.1		Right 2.2	U-Turn 2.3	App Total	Left 2.4	Thru 2.5		U-Turn 2.6	App Total		Thru 2.7	Right 2.8	U-Turn 2.9	App Total	Int Total
1600 - 1615	-	-	-	-	0	1	-	6	0	7	10	223	-	0	233	-	216	4	0	220	460
1615 - 1630	-	-	-	-	0	2	-	9	0	11	15	203	-	0	218	-	240	3	0	243	472
1630 - 1645	-	-	-	-	0	2	-	8	0	10	9	226	-	0	235	-	202	1	0	203	448
1645 - 1700	-	-	-	-	0	0	-	13	0	13	9	209	-	0	218	-	233	7	0	240	471
Total	0	0	0	0	0	5	0	36	0	41	43	861	0	0	904	0	891	15	0	906	1851
Approach %	0.00	0.00	0.00	0.00	-	12.20	0.00	87.80	0.00	-	4.76	95.24	0.00	0.00	-	0.00	98.34	1.66	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.63	0.00	0.69	0.00	**0.79**	0.72	0.95	0.00	0.00	**0.96**	0.00	0.93	0.54	0.00	**0.93**	**0.98**

Bikes

	Southbound					Patterson Dr					Eastbound					TN-99 Bear Creek Pike (West)					Westbound					TN-99 Bear Creek Pike (East)	
Time					App Total	Left 2.1		Right 2.2	U-Turn 2.3	App Total	Left 2.4	Thru 2.5		U-Turn 2.6	App Total		Thru 2.7	Right 2.8	U-Turn 2.9	App Total	Int Total
1600 - 1615	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
1615 - 1630	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
1630 - 1645	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
1645 - 1700	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Passenger Vehicles (1-3)

	Southbound					Patterson Dr					Eastbound					TN-99 Bear Creek Pike (West)					Westbound					TN-99 Bear Creek Pike (East)	
Time					App Total	Left 2.1		Right 2.2	U-Turn 2.3	App Total	Left 2.4	Thru 2.5		U-Turn 2.6	App Total		Thru 2.7	Right 2.8	U-Turn 2.9	App Total	Int Total
1600 - 1615	-	-	-	-	0	1	-	6	0	7	10	207	-	0	217	-	198	4	0	202	426
1615 - 1630	-	-	-	-	0	2	-	9	0	11	15	186	-	0	201	-	231	3	0	234	446
1630 - 1645	-	-	-	-	0	2	-	8	0	10	9	214	-	0	223	-	192	1	0	193	426
1645 - 1700	-	-	-	-	0	0	-	13	0	13	9	199	-	0	208	-	219	6	0	225	446
Total	0	0	0	0	0	5	0	36	0	41	43	806	0	0	849	0	840	14	0	854	1744
Approach %	0.00	0.00	0.00	0.00	-	12.20	0.00	87.80	0.00	-	5.06	94.94	0.00	0.00	-	0.00	98.36	1.64	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.63	0.00	0.69	0.00	**0.79**	0.72	0.94	0.00	0.00	**0.95**	0.00	0.91	0.58	0.00	**0.91**	**0.98**

Single Unit Trucks (4-7)

	Southbound					Patterson Dr					Eastbound					TN-99 Bear Creek Pike (West)					Westbound					TN-99 Bear Creek Pike (East)	
Time					App Total	Left 2.1		Right 2.2	U-Turn 2.3	App Total	Left 2.4	Thru 2.5		U-Turn 2.6	App Total		Thru 2.7	Right 2.8	U-Turn 2.9	App Total	Int Total
1600 - 1615	-	-	-	-	0	0	-	0	0	0	0	6	-	0	6	-	6	0	0	6	12
1615 - 1630	-	-	-	-	0	0	-	0	0	0	0	2	-	0	2	-	4	0	0	4	6
1630 - 1645	-	-	-	-	0	0	-	0	0	0	0	8	-	0	8	-	4	0	0	4	12
1645 - 1700	-	-	-	-	0	0	-	0	0	0	0	5	-	0	5	-	7	1	0	8	13
Total	0	0	0	0	0	0	0	0	0	0	0	21	0	0	21	0	21	1	0	22	43
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	0.00	95.45	4.55	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.66	0.00	0.00	**0.66**	0.00	0.75	0.25	0.00	**0.69**	**0.83**

Combination Trucks (8-13)

	Southbound					Patterson Dr					Eastbound					TN-99 Bear Creek Pike (West)					Westbound					TN-99 Bear Creek Pike (East)	
Time					App Total	Left 2.1		Right 2.2	U-Turn 2.3	App Total	Left 2.4	Thru 2.5		U-Turn 2.6	App Total		Thru 2.7	Right 2.8	U-Turn 2.9	App Total	Int Total
1600 - 1615	-	-	-	-	0	0	-	0	0	0	0	10	-	0	10	-	12	0	0	12	22
1615 - 1630	-	-	-	-	0	0	-	0	0	0	0	15	-	0	15	-	5	0	0	5	20
1630 - 1645	-	-	-	-	0	0	-	0	0	0	0	4	-	0	4	-	6	0	0	6	10
1645 - 1700	-	-	-	-	0	0	-	0	0	0	0	5	-	0	5	-	7	0	0	7	12
Total	0	0	0	0	0	0	0	0	0	0	0	34	0	0	34	0	30	0	0	30	64
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.57	0.00	0.00	**0.57**	0.00	0.63	0.00	0.00	**0.63**	**0.73**

Pedestrians

	Southbound					Patterson Dr					Eastbound					TN-99 Bear Creek Pike (West)					Westbound					TN-99 Bear Creek Pike (East)	
Time					App Total	EB 2c	WB 2d			App Total	NB 2e	SB 2f			App Total	NB 2g	SB 2h			App Total	Int Total
1600 - 1615	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1615 - 1630	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1630 - 1645	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1645 - 1700	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

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Peak Hour Turning Movement Count

Columbia, TN

Marr Traffic DATA COLLECTION

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Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	0715 - 0815

Session Parameters

(Drop Down Menu)

0600 - 0900

Volume

All vehicles

	Northbound					Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	7.1	7.2	7.3	7.4	Total	7.5	7.6	7.7	7.8	Total	7.9	7.10	7.11	7.12	Total	7.13	7.14	7.15	7.16	Total	Total
0715 - 0730	34	10	7	0	51	2	1	25	0	28	68	132	3	0	203	5	134	10	0	149	431
0730 - 0745	16	12	9	0	37	22	9	68	0	99	57	137	6	0	200	3	156	8	0	167	503
0745 - 0800	16	11	6	0	33	11	4	42	0	57	44	128	7	0	179	4	161	4	0	169	438
0800 - 0815	18	12	6	0	36	11	9	35	0	55	35	128	12	0	175	6	128	10	0	144	410
Total	84	45	28	0	157	46	23	170	0	239	204	525	28	0	757	18	579	32	0	629	1782
Approach %	53.50	28.66	17.83	0.00	-	19.25	9.62	71.13	0.00	-	26.95	69.35	3.70	0.00	-	2.86	92.05	5.09	0.00	-	
PHF	0.62	0.94	0.78	0.00	**0.77**	0.52	0.64	0.63	0.00	**0.60**	0.75	0.96	0.58	0.00	**0.93**	0.75	0.90	0.80	0.00	**0.93**	**0.89**

Bikes

	Northbound					Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	7.1	7.2	7.3	7.4	Total	7.5	7.6	7.7	7.8	Total	7.9	7.10	7.11	7.12	Total	7.13	7.14	7.15	7.16	Total	Total
0715 - 0730	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0730 - 0745	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0745 - 0800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0800 - 0815	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Passenger Vehicles (1-3)

	Northbound					Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	7.1	7.2	7.3	7.4	Total	7.5	7.6	7.7	7.8	Total	7.9	7.10	7.11	7.12	Total	7.13	7.14	7.15	7.16	Total	Total
0715 - 0730	34	10	7	0	51	2	1	23	0	26	63	120	3	0	186	4	122	10	0	136	399
0730 - 0745	16	11	9	0	36	22	9	66	0	97	53	118	6	0	177	3	141	8	0	152	462
0745 - 0800	16	11	6	0	33	11	4	37	0	52	43	112	7	0	162	4	150	4	0	158	405
0800 - 0815	18	12	6	0	36	11	9	35	0	55	34	107	12	0	153	6	111	10	0	127	371
Total	84	44	28	0	156	46	23	161	0	230	193	457	28	0	678	17	524	32	0	573	1637
Approach %	53.85	28.21	17.95	0.00	-	20.00	10.00	70.00	0.00	-	28.47	67.40	4.13	0.00	-	2.97	91.45	5.58	0.00	-	
PHF	0.62	0.92	0.78	0.00	**0.76**	0.52	0.64	0.61	0.00	**0.59**	0.77	0.95	0.58	0.00	**0.91**	0.71	0.87	0.80	0.00	**0.91**	**0.89**

Single Unit Trucks (4-7)

	Northbound					Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	7.1	7.2	7.3	7.4	Total	7.5	7.6	7.7	7.8	Total	7.9	7.10	7.11	7.12	Total	7.13	7.14	7.15	7.16	Total	Total
0715 - 0730	0	0	0	0	0	0	0	2	0	2	5	7	0	0	12	1	9	0	0	10	24
0730 - 0745	0	1	0	0	1	0	0	2	0	2	4	12	0	0	16	0	12	0	0	12	31
0745 - 0800	0	0	0	0	0	0	0	5	0	5	1	11	0	0	12	0	8	0	0	8	25
0800 - 0815	0	0	0	0	0	0	0	0	0	0	1	9	0	0	10	0	9	0	0	9	19
Total	0	1	0	0	1	0	0	9	0	9	11	39	0	0	50	1	38	0	0	39	99
Approach %	0.00	100.00	0.00	0.00	-	0.00	0.00	100.00	0.00	-	22.00	78.00	0.00	0.00	-	2.56	97.44	0.00	0.00	-	
PHF	0.00	0.25	0.00	0.00	**0.25**	0.00	0.00	0.45	0.00	**0.45**	0.55	0.81	0.00	0.00	**0.78**	0.25	0.79	0.00	0.00	**0.81**	**0.80**

Combination Trucks (8-13)

	Northbound					Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	7.1	7.2	7.3	7.4	Total	7.5	7.6	7.7	7.8	Total	7.9	7.10	7.11	7.12	Total	7.13	7.14	7.15	7.16	Total	Total
0715 - 0730	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	0	3	0	0	3	8
0730 - 0745	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7	0	3	0	0	3	10
0745 - 0800	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	0	3	0	0	3	8
0800 - 0815	0	0	0	0	0	0	0	0	0	0	0	12	0	0	12	0	8	0	0	8	20
Total	0	0	0	0	0	0	0	0	0	0	0	29	0	0	29	0	17	0	0	17	46
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.60	0.00	0.00	**0.60**	0.00	0.53	0.00	0.00	**0.53**	**0.58**

Pedestrians

	Northbound					Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	EB	WB			App	EB	WB			App	NB	SB			App	NB	SB			App	Int
Time	7a	7b			Total	7c	7d			Total	7e	7f			Total	7g	7h			Total	Total
0715 - 0730	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0730 - 0745	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0745 - 0800	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0800 - 0815	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

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Peak Hour Turning Movement Count

Columbia, TN

Marr Traffic DATA COLLECTION

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Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	1615 - 1715

Session Parameters

(Drop Down Menu)

1400 - 1830

Volume

All vehicles

	Northbound					Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	7.1	7.2	7.3	7.4	Total	7.5	7.6	7.7	7.8	Total	7.9	7.10	7.11	7.12	Total	7.13	7.14	7.15	7.16	Total	Total
1615 - 1630	6	1	7	0	14	3	0	7	0	10	4	203	12	0	219	6	223	1	0	230	473
1630 - 1645	10	1	7	0	18	4	3	12	0	19	7	189	25	0	221	9	187	2	0	198	456
1645 - 1700	15	3	9	0	27	0	1	6	0	7	7	179	22	0	208	6	208	3	0	217	459
1700 - 1715	22	0	7	0	29	4	5	6	0	15	5	183	26	0	214	7	211	1	0	219	477
Total	53	5	30	0	88	11	9	31	0	51	23	754	85	0	862	28	829	7	0	864	1865
Approach %	60.23	5.68	34.09	0.00	-	21.57	17.65	60.78	0.00	-	2.67	87.47	9.86	0.00	-	3.24	95.95	0.81	0.00	-	
PHF	0.60	0.42	0.83	0.00	**0.76**	0.69	0.45	0.65	0.00	**0.67**	0.82	0.93	0.82	0.00	**0.98**	0.78	0.93	0.58	0.00	**0.94**	**0.98**

Bikes

	Northbound					Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	7.1	7.2	7.3	7.4	Total	7.5	7.6	7.7	7.8	Total	7.9	7.10	7.11	7.12	Total	7.13	7.14	7.15	7.16	Total	Total
1615 - 1630	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1630 - 1645	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1645 - 1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700 - 1715	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Passenger Vehicles (1-3)

	Northbound					Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	7.1	7.2	7.3	7.4	Total	7.5	7.6	7.7	7.8	Total	7.9	7.10	7.11	7.12	Total	7.13	7.14	7.15	7.16	Total	Total
1615 - 1630	6	1	7	0	14	3	0	7	0	10	4	180	12	0	196	6	214	1	0	221	441
1630 - 1645	10	1	7	0	18	4	3	12	0	19	7	180	25	0	212	9	176	2	0	187	436
1645 - 1700	15	3	9	0	27	0	1	6	0	7	7	170	22	0	199	6	195	3	0	204	437
1700 - 1715	22	0	7	0	29	4	5	6	0	15	5	172	25	0	202	7	199	1	0	207	453
Total	53	5	30	0	88	11	9	31	0	51	23	702	84	0	809	28	784	7	0	819	1767
Approach %	60.23	5.68	34.09	0.00	-	21.57	17.65	60.78	0.00	-	2.84	86.77	10.38	0.00	-	3.42	95.73	0.85	0.00	-	
PHF	0.60	0.42	0.83	0.00	**0.76**	0.69	0.45	0.65	0.00	**0.67**	0.82	0.98	0.84	0.00	**0.95**	0.78	0.92	0.58	0.00	**0.93**	**0.98**

Single Unit Trucks (4-7)

	Northbound					Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	7.1	7.2	7.3	7.4	Total	7.5	7.6	7.7	7.8	Total	7.9	7.10	7.11	7.12	Total	7.13	7.14	7.15	7.16	Total	Total
1615 - 1630	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	0	5	0	0	5	11
1630 - 1645	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	4	0	0	4	7
1645 - 1700	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	0	6	0	0	6	12
1700 - 1715	0	0	0	0	0	0	0	0	0	0	0	4	1	0	5	0	11	0	0	11	16
Total	0	0	0	0	0	0	0	0	0	0	0	19	1	0	20	0	26	0	0	26	46
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	95.00	5.00	0.00	-	0.00	100.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.79	0.25	0.00	**0.83**	0.00	0.59	0.00	0.00	**0.59**	**0.72**

Combination Trucks (8-13)

	Northbound					Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	7.1	7.2	7.3	7.4	Total	7.5	7.6	7.7	7.8	Total	7.9	7.10	7.11	7.12	Total	7.13	7.14	7.15	7.16	Total	Total
1615 - 1630	0	0	0	0	0	0	0	0	0	0	0	17	0	0	17	0	4	0	0	4	21
1630 - 1645	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	0	7	0	0	7	13
1645 - 1700	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	7	0	0	7	10
1700 - 1715	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7	0	1	0	0	1	8
Total	0	0	0	0	0	0	0	0	0	0	0	33	0	0	33	0	19	0	0	19	52
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.49	0.00	0.00	**0.49**	0.00	0.68	0.00	0.00	**0.68**	**0.62**

Pedestrians

	Northbound					Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	EB	WB			App	EB	WB			App	NB	SB			App	NB	SB			App	Int
Time	7a	7b			Total	7c	7d			Total	7e	7f			Total	7g	7h			Total	Total
1615 - 1630	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1630 - 1645	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1645 - 1700	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1700 - 1715	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

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Peak Hour Turning Movement Count

Columbia, TN

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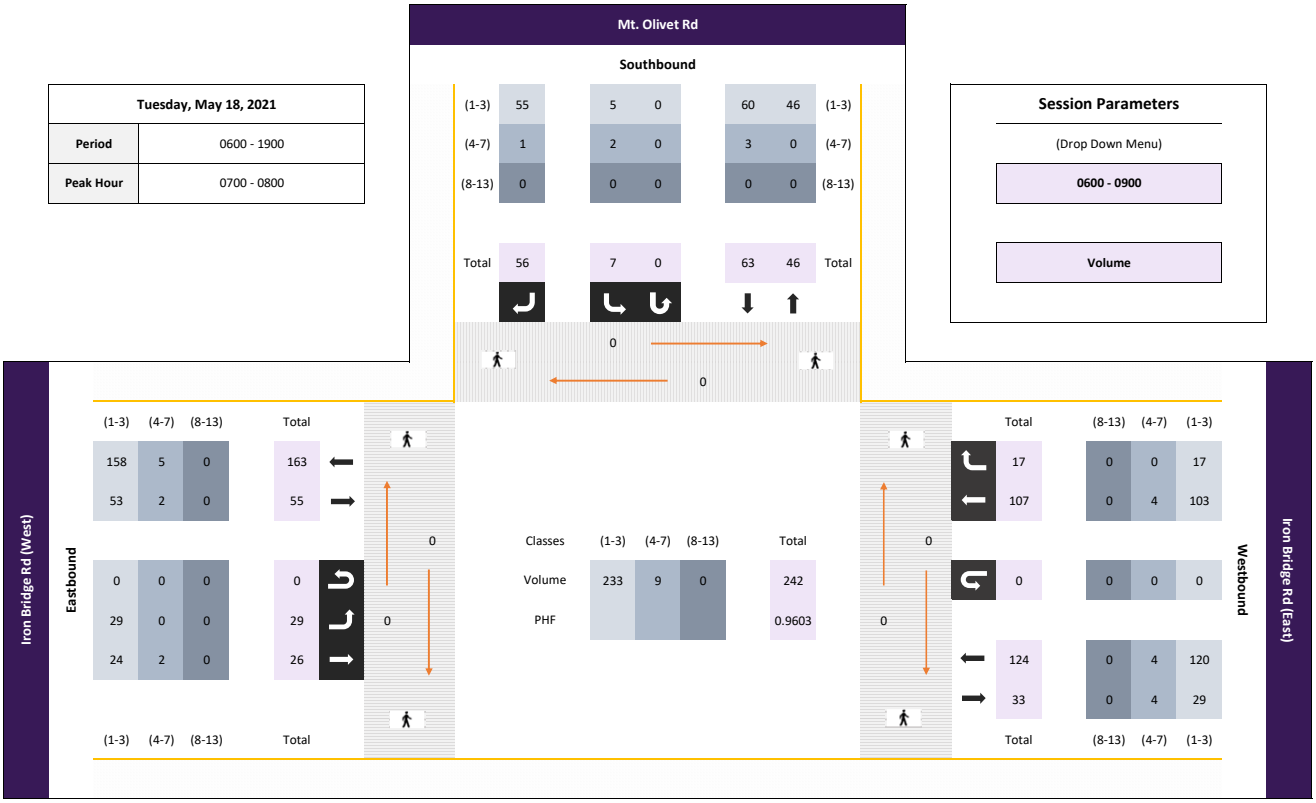
Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	0700 - 0800

Session Parameters

(Drop Down Menu)

0600 - 0900

Volume



All vehicles

	Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
Time					App Total	Left 8.1		Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5		U-Turn 8.6	App Total	
0700 - 0715	-	-	-	-	0	2	-	9	0	11	7	5	-	0	12	-
0715 - 0730	-	-	-	-	0	1	-	10	0	11	8	6	-	0	14	-
0730 - 0745	-	-	-	-	0	3	-	17	0	20	10	4	-	0	14	-
0745 - 0800	-	-	-	-	0	1	-	20	0	21	4	11	-	0	15	-
Total	0	0	0	0	0	7	0	56	0	63	29	26	0	0	55	0
Approach %	0.00	0.00	0.00	0.00	-	11.11	0.00	88.89	0.00	-	52.73	47.27	0.00	0.00	-	0.00
PHF	0.00	0.00	0.00	0.00	**0.00**	0.58	0.00	0.70	0.00	**0.75**	0.73	0.59	0.00	0.00	**0.92**	0.00

	Westbound					
	Iron Bridge Rd (East)					
Time	Thru 8.7	Right 8.8	U-Turn 8.9	App Total	Int Total	
0700 - 0715	33	1	0	34	57	
0715 - 0730	30	5	0	35	60	
0730 - 0745	23	6	0	29	63	
0745 - 0800	21	5	0	26	62	
Total	107	17	0	124	242	
Approach %	86.29	13.71	0.00	-		
PHF	0.81	0.71	0.00	**0.89**	**0.96**	

Bikes

	Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
Time					App Total	Left 8.1		Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5		U-Turn 8.6	App Total	
0700 - 0715	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-
0715 - 0730	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-
0730 - 0745	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-
0745 - 0800	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00

	Westbound					
	Iron Bridge Rd (East)					
Time	Thru 8.7	Right 8.8	U-Turn 8.9	App Total	Int Total	
0700 - 0715	0	0	0	0	0	
0715 - 0730	0	0	0	0	0	
0730 - 0745	0	0	0	0	0	
0745 - 0800	0	0	0	0	0	
Total	0	0	0	0	0	
Approach %	0.00	0.00	0.00	-		
PHF	0.00	0.00	0.00	**0.00**	**0.00**	

Passenger Vehicles (1-3)

	Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
Time					App Total	Left 8.1		Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5		U-Turn 8.6	App Total	
0700 - 0715	-	-	-	-	0	1	-	9	0	10	7	4	-	0	11	-
0715 - 0730	-	-	-	-	0	0	-	10	0	10	8	5	-	0	13	-
0730 - 0745	-	-	-	-	0	3	-	17	0	20	10	4	-	0	14	-
0745 - 0800	-	-	-	-	0	1	-	19	0	20	4	11	-	0	15	-
Total	0	0	0	0	0	5	0	55	0	60	29	24	0	0	53	0
Approach %	0.00	0.00	0.00	0.00	-	8.33	0.00	91.67	0.00	-	54.72	45.28	0.00	0.00	-	0.00
PHF	0.00	0.00	0.00	0.00	**0.00**	0.42	0.00	0.72	0.00	**0.75**	0.73	0.55	0.00	0.00	**0.88**	0.00

	Westbound					
	Iron Bridge Rd (East)					
Time	Thru 8.7	Right 8.8	U-Turn 8.9	App Total	Int Total	
0700 - 0715	32	1	0	33	54	
0715 - 0730	28	5	0	33	56	
0730 - 0745	22	6	0	28	62	
0745 - 0800	21	5	0	26	61	
Total	103	17	0	120	233	
Approach %	85.83	14.17	0.00	-		
PHF	0.80	0.71	0.00	**0.91**	**0.94**	

Single Unit Trucks (4-7)

	Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
Time					App Total	Left 8.1		Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5		U-Turn 8.6	App Total	
0700 - 0715	-	-	-	-	0	1	-	0	0	1	0	1	-	0	1	-
0715 - 0730	-	-	-	-	0	1	-	0	0	1	0	1	-	0	1	-
0730 - 0745	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-
0745 - 0800	-	-	-	-	0	0	-	1	0	1	0	0	-	0	0	-
Total	0	0	0	0	0	2	0	1	0	3	0	2	0	0	2	0
Approach %	0.00	0.00	0.00	0.00	-	66.67	0.00	33.33	0.00	-	0.00	100.00	0.00	0.00	-	0.00
PHF	0.00	0.00	0.00	0.00	**0.00**	0.50	0.00	0.25	0.00	**0.75**	0.00	0.50	0.00	0.00	**0.50**	0.00

	Westbound					
	Iron Bridge Rd (East)					
Time	Thru 8.7	Right 8.8	U-Turn 8.9	App Total	Int Total	
0700 - 0715	1	0	0	1	3	
0715 - 0730	2	0	0	2	4	
0730 - 0745	1	0	0	1	1	
0745 - 0800	0	0	0	0	1	
Total	4	0	0	4	9	
Approach %	100.00	0.00	0.00	-		
PHF	0.50	0.00	0.00	**0.50**	**0.56**	

Combination Trucks (8-13)

	Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
Time					App Total	Left 8.1		Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5		U-Turn 8.6	App Total	
0700 - 0715	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-
0715 - 0730	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-
0730 - 0745	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-
0745 - 0800	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00

	Westbound					
	Iron Bridge Rd (East)					
Time	Thru 8.7	Right 8.8	U-Turn 8.9	App Total	Int Total	
0700 - 0715	0	0	0	0	0	
0715 - 0730	0	0	0	0	0	
0730 - 0745	0	0	0	0	0	
0745 - 0800	0	0	0	0	0	
Total	0	0	0	0	0	
Approach %	0.00	0.00	0.00	-		
PHF	0.00	0.00	0.00	**0.00**	**0.00**	

Pedestrians

	Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
Time					App Total	EB 8c	WB 8d			App Total	NB 8e	SB 8f			App Total	
0700 - 0715	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0715 - 0730	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0730 - 0745	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0745 - 0800	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00

	Westbound					
	Iron Bridge Rd (East)					
Time	NB 8g	SB 8h			App Total	Int Total
0700 - 0715	0	0	-	-	0	0
0715 - 0730	0	0	-	-	0	0
0730 - 0745	0	0	-	-	0	0
0745 - 0800	0	0	-	-	0	0
Total	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Click here for Map

Peak Hour Turning Movement Count

Columbia, TN

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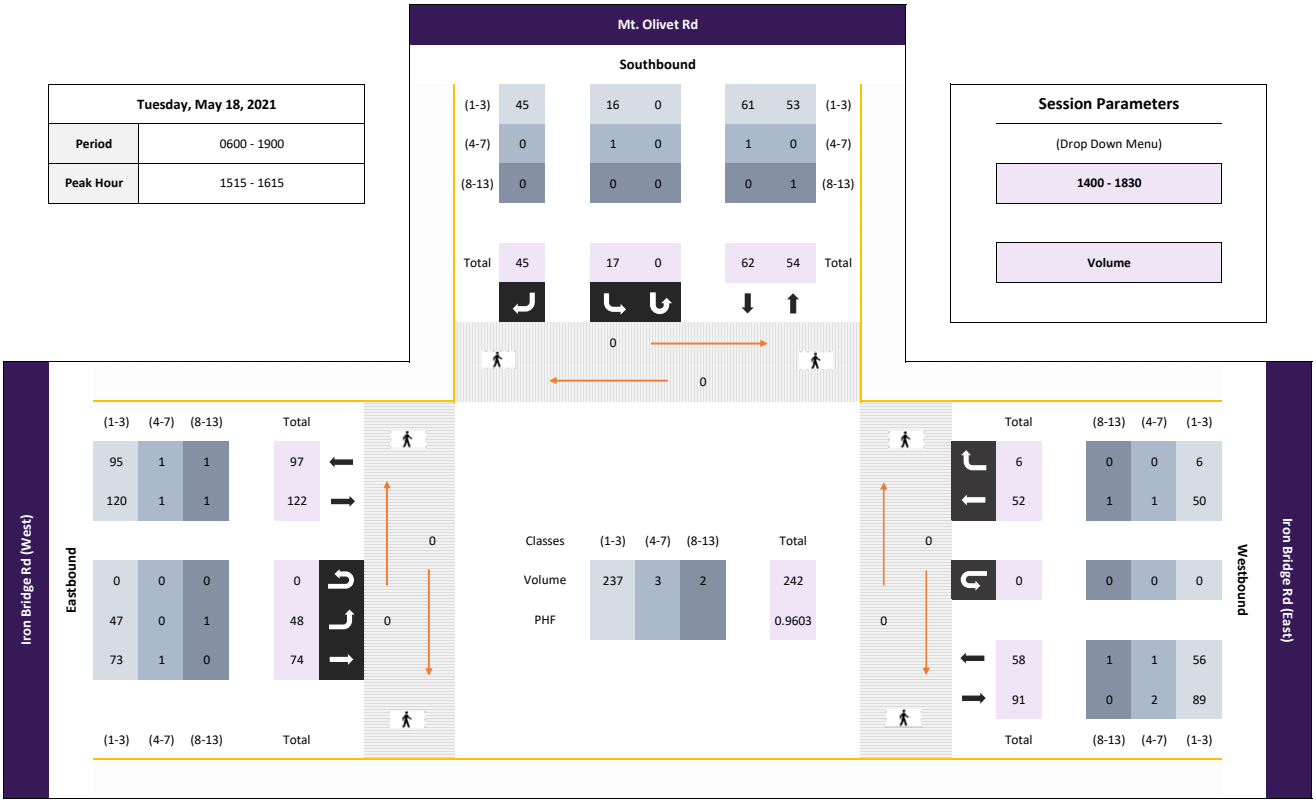
Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	1515 - 1615

Session Parameters

(Drop Down Menu)

1400 - 1830

Volume



All vehicles

	Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
Time					App Total	Left 8.1		Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5		U-Turn 8.6	App Total		Thru 8.7	Right 8.8	U-Turn 8.9	App Total	Int Total
1515 - 1530	-	-	-	-	0	4	-	12	0	16	14	16	-	0	30	-	13	3	0	16	62
1530 - 1545	-	-	-	-	0	7	-	17	0	24	11	13	-	0	24	-	14	1	0	15	63
1545 - 1600	-	-	-	-	0	1	-	10	0	11	10	22	-	0	32	-	13	1	0	14	57
1600 - 1615	-	-	-	-	0	5	-	6	0	11	13	23	-	0	36	-	12	1	0	13	60
Total	0	0	0	0	0	17	0	45	0	62	48	74	0	0	122	0	52	6	0	58	242
Approach %	0.00	0.00	0.00	0.00	-	27.42	0.00	72.58	0.00	-	39.34	60.66	0.00	0.00	-	0.00	89.66	10.34	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.61	0.00	0.66	0.00	**0.65**	0.86	0.80	0.00	0.00	**0.85**	0.00	0.93	0.50	0.00	**0.91**	**0.96**

Bikes

	Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
Time					App Total	Left 8.1		Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5		U-Turn 8.6	App Total		Thru 8.7	Right 8.8	U-Turn 8.9	App Total	Int Total
1515 - 1530	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
1530 - 1545	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
1545 - 1600	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
1600 - 1615	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Passenger Vehicles (1-3)

	Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
Time					App Total	Left 8.1		Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5		U-Turn 8.6	App Total		Thru 8.7	Right 8.8	U-Turn 8.9	App Total	Int Total
1515 - 1530	-	-	-	-	0	3	-	12	0	15	13	16	-	0	29	-	13	3	0	16	60
1530 - 1545	-	-	-	-	0	7	-	17	0	24	11	13	-	0	24	-	12	1	0	13	61
1545 - 1600	-	-	-	-	0	1	-	10	0	11	10	21	-	0	31	-	13	1	0	14	56
1600 - 1615	-	-	-	-	0	5	-	6	0	11	13	23	-	0	36	-	12	1	0	13	60
Total	0	0	0	0	0	16	0	45	0	61	47	73	0	0	120	0	50	6	0	56	237
Approach %	0.00	0.00	0.00	0.00	-	26.23	0.00	73.77	0.00	-	39.17	60.83	0.00	0.00	-	0.00	89.29	10.71	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.57	0.00	0.66	0.00	**0.64**	0.90	0.79	0.00	0.00	**0.83**	0.00	0.96	0.50	0.00	**0.88**	**0.97**

Single Unit Trucks (4-7)

	Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
Time					App Total	Left 8.1		Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5		U-Turn 8.6	App Total		Thru 8.7	Right 8.8	U-Turn 8.9	App Total	Int Total
1515 - 1530	-	-	-	-	0	1	-	0	0	1	0	0	-	0	0	-	0	0	0	0	1
1530 - 1545	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	1	0	0	1	1
1545 - 1600	-	-	-	-	0	0	-	0	0	0	0	1	-	0	1	-	0	0	0	0	1
1600 - 1615	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0	1	0	0	1	3
Approach %	0.00	0.00	0.00	0.00	-	100.00	0.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.25	0.00	0.00	0.00	**0.25**	0.00	0.25	0.00	0.00	**0.25**	0.00	0.25	0.00	0.00	**0.25**	**0.75**

Combination Trucks (8-13)

	Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
Time					App Total	Left 8.1		Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5		U-Turn 8.6	App Total		Thru 8.7	Right 8.8	U-Turn 8.9	App Total	Int Total
1515 - 1530	-	-	-	-	0	0	-	0	0	0	1	0	-	0	1	-	0	0	0	0	1
1530 - 1545	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	1	0	0	1	1
1545 - 1600	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
1600 - 1615	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	2
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	100.00	0.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.25	0.00	0.00	0.00	**0.25**	0.00	0.25	0.00	0.00	**0.25**	**0.50**

Pedestrians

	Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
Time					App Total	EB 8c	WB 8d			App Total	NB 8e	SB 8f			App Total	NB 8g	SB 8h			App Total	Int Total
1515 - 1530	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1530 - 1545	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1545 - 1600	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1600 - 1615	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Click here for Map

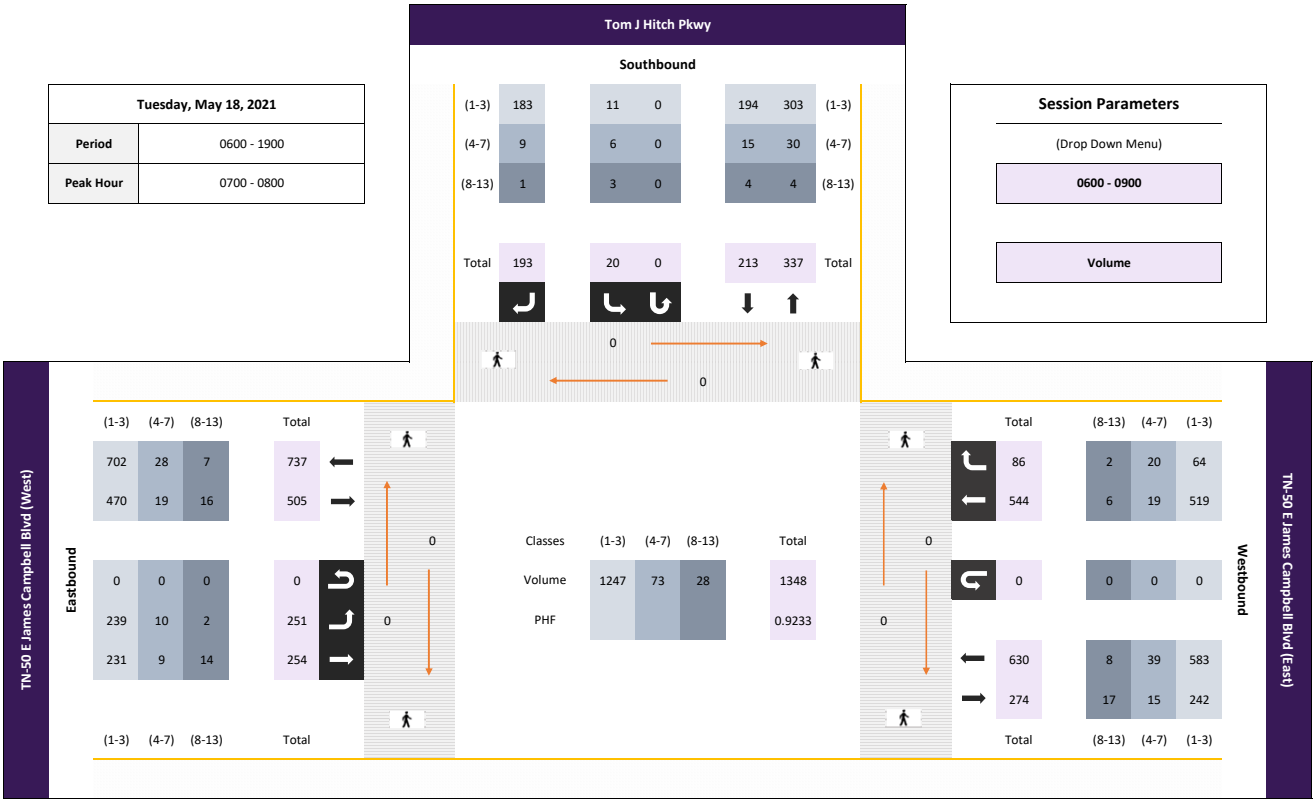
Peak Hour Turning Movement Count

Columbia, TN

Marr Traffic DATA COLLECTION

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Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	0700 - 0800



Session Parameters

(Drop Down Menu)

0600 - 0900

Volume

All vehicles

						Southbound					Eastbound					Westbound					
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	4.1		4.2	4.3	Total	4.4	4.5		4.6	Total		4.7	4.8	4.9	Total	Total
0700 - 0715	-	-	-	-	0	7	-	40	0	47	60	70	-	0	130	-	111	12	0	123	300
0715 - 0730	-	-	-	-	0	5	-	29	0	34	69	65	-	0	134	-	142	19	0	161	329
0730 - 0745	-	-	-	-	0	5	-	58	0	63	63	65	-	0	128	-	144	30	0	174	365
0745 - 0800	-	-	-	-	0	3	-	66	0	69	59	54	-	0	113	-	147	25	0	172	354
Total	0	0	0	0	0	20	0	193	0	213	251	254	0	0	505	0	544	86	0	630	1348
Approach %	0.00	0.00	0.00	0.00	-	9.39	0.00	90.61	0.00	-	49.70	50.30	0.00	0.00	-	0.00	86.35	13.65	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.71	0.00	0.73	0.00	**0.77**	0.91	0.91	0.00	0.00	**0.94**	0.00	0.93	0.72	0.00	**0.91**	**0.92**

Bikes

						Southbound					Eastbound					Westbound					
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	4.1		4.2	4.3	Total	4.4	4.5		4.6	Total		4.7	4.8	4.9	Total	Total
0700 - 0715	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
0715 - 0730	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
0730 - 0745	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
0745 - 0800	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Passenger Vehicles (1-3)

						Southbound					Eastbound					Westbound					
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	4.1		4.2	4.3	Total	4.4	4.5		4.6	Total		4.7	4.8	4.9	Total	Total
0700 - 0715	-	-	-	-	0	5	-	39	0	44	57	62	-	0	119	-	100	6	0	106	269
0715 - 0730	-	-	-	-	0	2	-	27	0	29	67	62	-	0	129	-	139	12	0	151	309
0730 - 0745	-	-	-	-	0	1	-	53	0	54	61	60	-	0	121	-	137	25	0	162	337
0745 - 0800	-	-	-	-	0	3	-	64	0	67	54	47	-	0	101	-	143	21	0	164	332
Total	0	0	0	0	0	11	0	183	0	194	239	231	0	0	470	0	519	64	0	583	1247
Approach %	0.00	0.00	0.00	0.00	-	5.67	0.00	94.33	0.00	-	50.85	49.15	0.00	0.00	-	0.00	89.02	10.98	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.55	0.00	0.71	0.00	**0.72**	0.89	0.93	0.00	0.00	**0.91**	0.00	0.91	0.64	0.00	**0.89**	**0.93**

Single Unit Trucks (4-7)

						Southbound					Eastbound					Westbound					
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	4.1		4.2	4.3	Total	4.4	4.5		4.6	Total		4.7	4.8	4.9	Total	Total
0700 - 0715	-	-	-	-	0	1	-	1	0	2	3	3	-	0	6	-	10	5	0	15	23
0715 - 0730	-	-	-	-	0	2	-	2	0	4	2	1	-	0	3	-	2	6	0	8	15
0730 - 0745	-	-	-	-	0	3	-	4	0	7	2	1	-	0	3	-	4	5	0	9	19
0745 - 0800	-	-	-	-	0	0	-	2	0	2	3	4	-	0	7	-	3	4	0	7	16
Total	0	0	0	0	0	6	0	9	0	15	10	9	0	0	19	0	19	20	0	39	73
Approach %	0.00	0.00	0.00	0.00	-	40.00	0.00	60.00	0.00	-	52.63	47.37	0.00	0.00	-	0.00	48.72	51.28	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.50	0.00	0.56	0.00	**0.54**	0.83	0.56	0.00	0.00	**0.68**	0.00	0.48	0.83	0.00	**0.65**	**0.79**

Combination Trucks (8-13)

						Southbound					Eastbound					Westbound					
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	4.1		4.2	4.3	Total	4.4	4.5		4.6	Total		4.7	4.8	4.9	Total	Total
0700 - 0715	-	-	-	-	0	1	-	0	0	1	0	5	-	0	5	-	1	1	0	2	8
0715 - 0730	-	-	-	-	0	1	-	0	0	1	0	2	-	0	2	-	1	1	0	2	5
0730 - 0745	-	-	-	-	0	1	-	1	0	2	0	4	-	0	4	-	3	0	0	3	9
0745 - 0800	-	-	-	-	0	0	-	0	0	0	2	3	-	0	5	-	1	0	0	1	6
Total	0	0	0	0	0	3	0	1	0	4	2	14	0	0	16	0	6	2	0	8	28
Approach %	0.00	0.00	0.00	0.00	-	75.00	0.00	25.00	0.00	-	12.50	87.50	0.00	0.00	-	0.00	75.00	25.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.75	0.00	0.25	0.00	**0.50**	0.25	0.70	0.00	0.00	**0.80**	0.00	0.50	0.50	0.00	**0.67**	**0.78**

Pedestrians

						Southbound					Eastbound					Westbound					
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
		WB			App	EB	WB			App	NB	SB			App	NB	SB			App	Int
Time		4b			Total	4c	4d			Total	4e	4f			Total	4g	4h			Total	Total
0700 - 0715	-	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0715 - 0730	-	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0730 - 0745	-	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0745 - 0800	-	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Peak Hour Turning Movement Count

Columbia, TN

Click here for Map

Marr Traffic DATA COLLECTION

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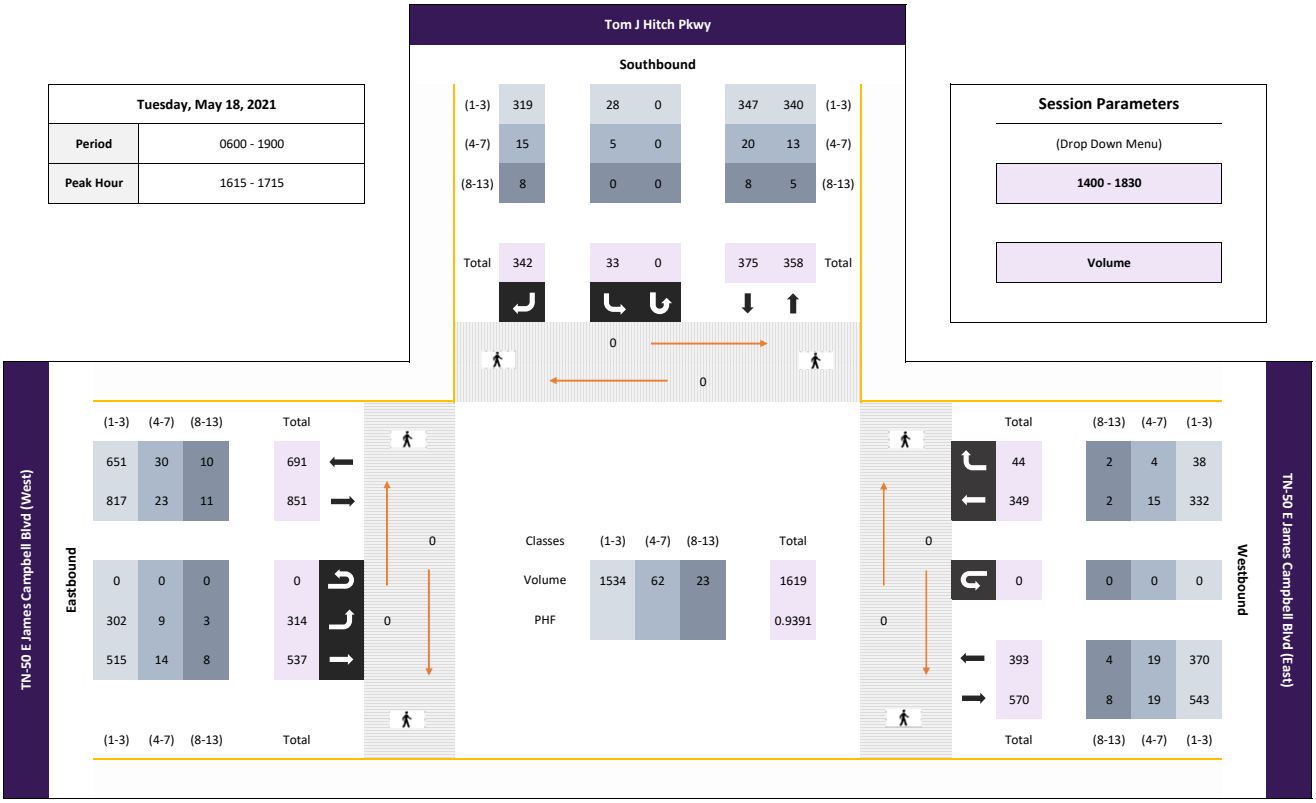
Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	1615 - 1715

Session Parameters

(Drop Down Menu)

1400 - 1830

Volume



All vehicles

						Southbound					Eastbound					Westbound					
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	4.1		4.2	4.3	Total	4.4	4.5		4.6	Total		4.7	4.8	4.9	Total	Total
1615 - 1630	-	-	-	-	0	5	-	81	0	86	74	145	-	0	219	-	78	11	0	89	394
1630 - 1645	-	-	-	-	0	12	-	81	0	93	82	132	-	0	214	-	84	8	0	92	399
1645 - 1700	-	-	-	-	0	8	-	84	0	92	73	121	-	0	194	-	95	14	0	109	395
1700 - 1715	-	-	-	-	0	8	-	96	0	104	85	139	-	0	224	-	92	11	0	103	431
Total	0	0	0	0	0	33	0	342	0	375	314	537	0	0	851	0	349	44	0	393	1619
Approach %	0.00	0.00	0.00	0.00	-	8.80	0.00	91.20	0.00	-	36.90	63.10	0.00	0.00	-	0.00	88.80	11.20	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.69	0.00	0.89	0.00	**0.90**	0.92	0.93	0.00	0.00	**0.95**	0.00	0.92	0.79	0.00	**0.90**	**0.94**

Bikes

						Southbound					Eastbound					Westbound					
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	4.1		4.2	4.3	Total	4.4	4.5		4.6	Total		4.7	4.8	4.9	Total	Total
1615 - 1630	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
1630 - 1645	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
1645 - 1700	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
1700 - 1715	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Passenger Vehicles (1-3)

						Southbound					Eastbound					Westbound					
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	4.1		4.2	4.3	Total	4.4	4.5		4.6	Total		4.7	4.8	4.9	Total	Total
1615 - 1630	-	-	-	-	0	3	-	77	0	80	71	135	-	0	206	-	77	10	0	87	373
1630 - 1645	-	-	-	-	0	9	-	76	0	85	78	128	-	0	206	-	78	6	0	84	375
1645 - 1700	-	-	-	-	0	8	-	78	0	86	69	117	-	0	186	-	91	12	0	103	375
1700 - 1715	-	-	-	-	0	8	-	88	0	96	84	135	-	0	219	-	86	10	0	96	411
Total	0	0	0	0	0	28	0	319	0	347	302	515	0	0	817	0	332	38	0	370	1534
Approach %	0.00	0.00	0.00	0.00	-	8.07	0.00	91.93	0.00	-	36.96	63.04	0.00	0.00	-	0.00	89.73	10.27	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.78	0.00	0.91	0.00	**0.90**	0.90	0.95	0.00	0.00	**0.93**	0.00	0.91	0.79	0.00	**0.90**	**0.93**

Single Unit Trucks (4-7)

						Southbound					Eastbound					Westbound					
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	4.1		4.2	4.3	Total	4.4	4.5		4.6	Total		4.7	4.8	4.9	Total	Total
1615 - 1630	-	-	-	-	0	2	-	3	0	5	2	6	-	0	8	-	1	1	0	2	15
1630 - 1645	-	-	-	-	0	3	-	2	0	5	3	2	-	0	5	-	5	1	0	6	16
1645 - 1700	-	-	-	-	0	0	-	5	0	5	3	3	-	0	6	-	3	2	0	5	16
1700 - 1715	-	-	-	-	0	0	-	5	0	5	1	3	-	0	4	-	6	0	0	6	15
Total	0	0	0	0	0	5	0	15	0	20	9	14	0	0	23	0	15	4	0	19	62
Approach %	0.00	0.00	0.00	0.00	-	25.00	0.00	75.00	0.00	-	39.13	60.87	0.00	0.00	-	0.00	78.95	21.05	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.42	0.00	0.75	0.00	**1.00**	0.75	0.58	0.00	0.00	**0.72**	0.00	0.63	0.50	0.00	**0.79**	**0.97**

Combination Trucks (8-13)

						Southbound					Eastbound					Westbound					
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	4.1		4.2	4.3	Total	4.4	4.5		4.6	Total		4.7	4.8	4.9	Total	Total
1615 - 1630	-	-	-	-	0	0	-	1	0	1	1	4	-	0	5	-	0	0	0	0	6
1630 - 1645	-	-	-	-	0	0	-	3	0	3	1	2	-	0	3	-	1	1	0	2	8
1645 - 1700	-	-	-	-	0	0	-	1	0	1	1	1	-	0	2	-	1	0	0	1	4
1700 - 1715	-	-	-	-	0	0	-	3	0	3	0	1	-	0	1	-	0	1	0	1	5
Total	0	0	0	0	0	0	0	8	0	8	3	8	0	0	11	0	2	2	0	4	23
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	100.00	0.00	-	27.27	72.73	0.00	0.00	-	0.00	50.00	50.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.67	0.00	**0.67**	0.75	0.50	0.00	0.00	**0.55**	0.00	0.50	0.50	0.00	**0.50**	**0.72**

Pedestrians

						Southbound					Eastbound					Westbound					
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
		WB			App	EB	WB			App	NB	SB			App	NB	SB			App	Int
Time		4b			Total	4c	4d			Total	4e	4f			Total	4g	4h			Total	Total
1615 - 1630	-	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1630 - 1645	-	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1645 - 1700	-	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1700 - 1715	-	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Peak Hour Turning Movement Count

Columbia, TN

Click here for Map

Marr Traffic DATA COLLECTION

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Tuesday, February 22, 2022	
Period	0600 - 1900
Peak Hour	0700 - 0800

* the Peak Hour Diagram does not include Bikes



Session Parameters
(Drop Down Menu)
Peak Hour
Volume

All vehicles

	Northbound					Southbound					Eastbound					Westbound					
	Driveway					Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	1.1	1.2	1.3	1.4	Total	1.5	1.6	1.7	1.8	Total	1.9	1.10	1.11	1.12	Total	1.13	1.14	1.15	1.16	Total	Total
0700 - 0715	0	0	0	0	0	1	0	13	0	14	1	186	0	0	187	0	168	0	0	168	369
0715 - 0730	0	0	0	0	0	7	0	8	0	15	4	221	1	0	226	0	189	1	0	190	431
0730 - 0745	0	0	0	0	0	1	0	14	0	15	1	185	0	0	186	0	241	0	0	241	442
0745 - 0800	0	0	0	0	0	3	0	15	0	18	3	177	0	0	180	0	239	1	0	240	438
Total	0	0	0	0	0	12	0	50	0	62	9	769	1	0	779	0	837	2	0	839	1680
Approach %	0.00	0.00	0.00	0.00	-	19.35	0.00	80.65	0.00	-	1.16	98.72	0.13	0.00	-	0.00	99.76	0.24	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.43	0.00	0.83	0.00	**0.86**	0.56	0.87	0.25	0.00	**0.86**	0.00	0.87	0.50	0.00	**0.87**	**0.95**

Passenger Vehicles (1-3)

	Northbound					Southbound					Eastbound					Westbound					
	Driveway					Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	1.1	1.2	1.3	1.4	Total	1.5	1.6	1.7	1.8	Total	1.9	1.10	1.11	1.12	Total	1.13	1.14	1.15	1.16	Total	Total
0700 - 0715	0	0	0	0	0	1	0	13	0	14	1	168	0	0	169	0	148	0	0	148	331
0715 - 0730	0	0	0	0	0	6	0	8	0	14	4	203	1	0	208	0	179	1	0	180	402
0730 - 0745	0	0	0	0	0	1	0	14	0	15	1	169	0	0	170	0	220	0	0	220	405
0745 - 0800	0	0	0	0	0	3	0	15	0	18	3	164	0	0	167	0	222	1	0	223	408
Total	0	0	0	0	0	11	0	50	0	61	9	704	1	0	714	0	769	2	0	771	1546
Approach %	0.00	0.00	0.00	0.00	-	18.03	0.00	81.97	0.00	-	1.26	98.60	0.14	0.00	-	0.00	99.74	0.26	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.46	0.00	0.83	0.00	**0.85**	0.56	0.87	0.25	0.00	**0.86**	0.00	0.87	0.50	0.00	**0.86**	**0.95**

Single Unit Trucks (4-7)

	Northbound					Southbound					Eastbound					Westbound					
	Driveway					Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	1.1	1.2	1.3	1.4	Total	1.5	1.6	1.7	1.8	Total	1.9	1.10	1.11	1.12	Total	1.13	1.14	1.15	1.16	Total	Total
0700 - 0715	0	0	0	0	0	0	0	0	0	0	0	13	0	0	13	0	14	0	0	14	27
0715 - 0730	0	0	0	0	0	1	0	0	0	1	0	16	0	0	16	0	8	0	0	8	25
0730 - 0745	0	0	0	0	0	0	0	0	0	0	0	11	0	0	11	0	14	0	0	14	25
0745 - 0800	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7	0	11	0	0	11	18
Total	0	0	0	0	0	1	0	0	0	1	0	47	0	0	47	0	47	0	0	47	95
Approach %	0.00	0.00	0.00	0.00	-	100.00	0.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.25	0.00	0.00	0.00	**0.25**	0.00	0.73	0.00	0.00	**0.73**	0.00	0.84	0.00	0.00	**0.84**	**0.88**

Combination Trucks (8-13)

	Northbound					Southbound					Eastbound					Westbound					
	Driveway					Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	1.1	1.2	1.3	1.4	Total	1.5	1.6	1.7	1.8	Total	1.9	1.10	1.11	1.12	Total	1.13	1.14	1.15	1.16	Total	Total
0700 - 0715	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	0	6	0	0	6	11
0715 - 0730	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	2	0	0	2	4
0730 - 0745	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	0	7	0	0	7	12
0745 - 0800	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	0	6	0	0	6	12
Total	0	0	0	0	0	0	0	0	0	0	0	18	0	0	18	0	21	0	0	21	39
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.75	0.00	0.00	**0.75**	0.00	0.75	0.00	0.00	**0.75**	**0.81**

Bikes

	Northbound					Southbound					Eastbound					Westbound					
	Driveway					Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	1.1	1.2	1.3	1.4	Total	1.5	1.6	1.7	1.8	Total	1.9	1.10	1.11	1.12	Total	1.13	1.14	1.15	1.16	Total	Total
0700 - 0715	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0715 - 0730	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0730 - 0745	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0745 - 0800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Pedestrians

	Northbound					Southbound					Eastbound					Westbound					
	Driveway					Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	EB	WB			App	EB	WB			App	NB	SB			App	NB	SB			App	Int
Time	1a	1b			Total	1c	1d			Total	1e	1f			Total	1g	1h			Total	Total
0700 - 0715	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0715 - 0730	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0730 - 0745	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0745 - 0800	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Classified Turn Movement Count || All vehicles

Columbia, TN

Marr Traffic DATA COLLECTION
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Site 1 of 1
Driveway
Patterson Dr
TN-99 Bear Creek Pike (West)
TN-99 Bear Creek Pike (East)

Date
Tuesday, February 22, 2022

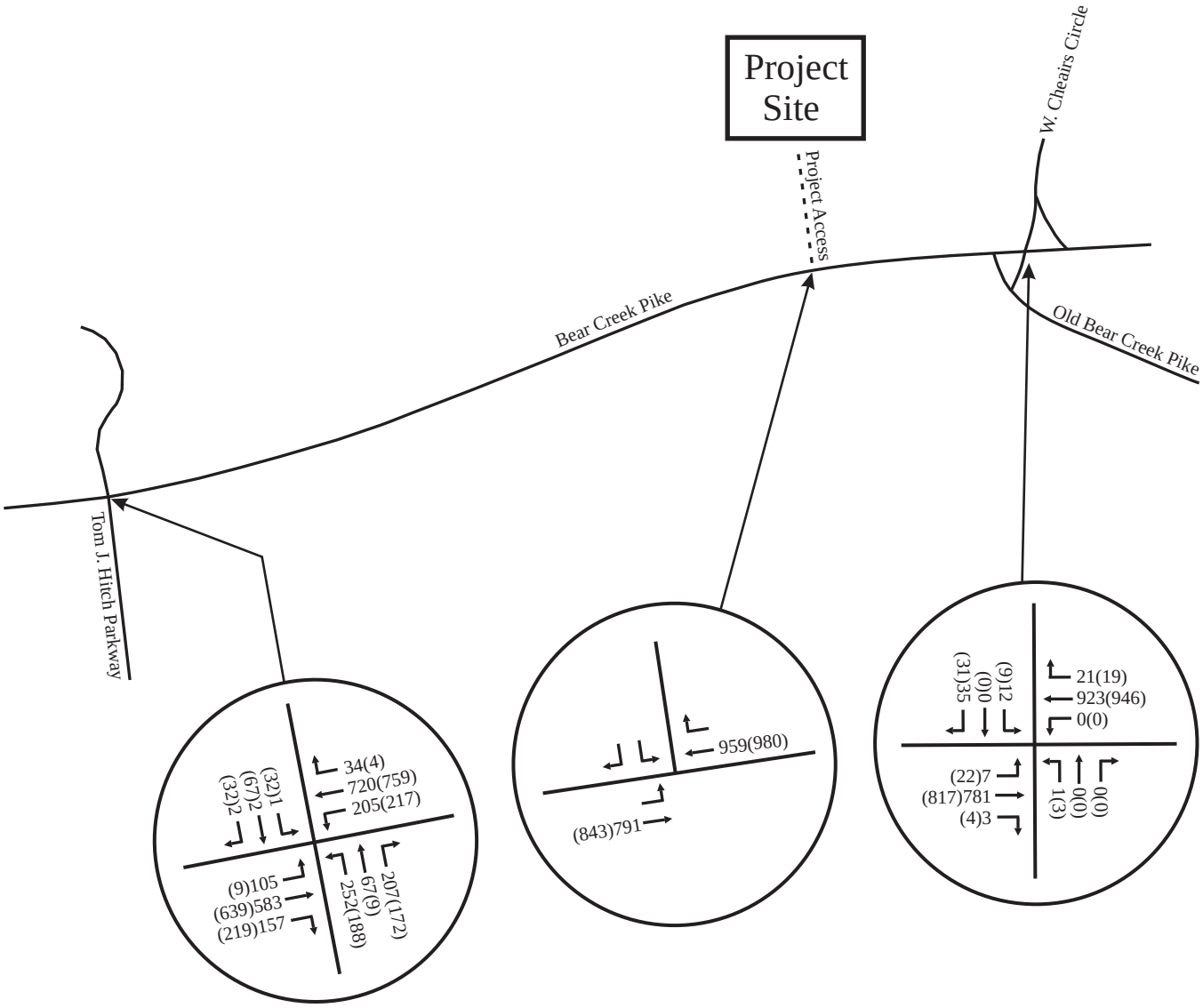
Weather
Cloudy
60°F

Lat/Long
35.636515°, -86.993469°

0600 - 1900 (Weekday 13h Session) (02-22-2022)
All vehicles

	Northbound					Southbound					Eastbound					Westbound					
	Driveway					Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
TIME	1.1	1.2	1.3	1.4	Total	1.5	1.6	1.7	1.8	Total	1.9	1.10	1.11	1.12	Total	1.13	1.14	1.15	1.16	Total	Total
0600 - 0615	0	0	0	0	0	1	0	2	0	3	0	118	0	0	118	0	62	0	0	62	183
0615 - 0630	0	0	0	0	0	2	0	5	0	7	1	120	2	1	124	0	93	0	0	93	224
0630 - 0645	0	0	0	0	0	1	0	4	0	5	0	147	0	0	147	0	108	0	0	108	260
0645 - 0700	0	0	0	0	0	4	0	8	0	12	1	167	0	0	168	0	124	0	0	124	304
Hourly Total	0	0	0	0	**0**	8	0	19	0	**27**	2	552	2	1	**557**	0	387	0	0	**387**	**971**
0700 - 0715	0	0	0	0	0	1	0	13	0	14	1	186	0	0	187	0	168	0	0	168	369
0715 - 0730	0	0	0	0	0	7	0	8	0	15	4	221	1	0	226	0	189	1	0	190	431
0730 - 0745	0	0	0	0	0	1	0	14	0	15	1	185	0	0	186	0	241	0	0	241	442
0745 - 0800	0	0	0	0	0	3	0	15	0	18	3	177	0	0	180	0	239	1	0	240	438
Hourly Total	0	0	0	0	**0**	12	0	50	0	**62**	9	769	1	0	**779**	0	837	2	0	**839**	**1680**
0800 - 0815	0	0	0	0	0	2	0	3	0	5	6	150	0	0	156	0	186	1	0	187	348
0815 - 0830	0	0	0	0	0	1	0	8	0	9	3	135	0	0	138	0	163	1	0	164	311
0830 - 0845	0	0	0	0	0	1	0	6	0	7	4	125	0	0	129	0	150	2	0	152	288
0845 - 0900	0	0	0	0	0	1	0	3	0	4	5	88	0	0	93	0	129	0	0	129	226
Hourly Total	0	0	0	0	**0**	5	0	20	0	**25**	18	498	0	0	**516**	0	628	4	0	**632**	**1173**
0900 - 0915	0	0	0	0	0	4	0	12	0	16	4	95	0	0	99	0	117	0	0	117	232
0915 - 0930	0	0	0	0	0	0	0	7	0	7	5	111	0	0	116	0	95	3	0	98	221
0930 - 0945	0	0	0	0	0	0	0	5	0	5	3	109	0	0	112	0	127	0	0	127	244
0945 - 1000	0	0	0	0	0	0	0	9	0	9	6	113	1	0	120	0	127	2	0	129	258
Hourly Total	0	0	0	0	**0**	4	0	33	0	**37**	18	428	1	0	**447**	0	466	5	0	**471**	**955**
1000 - 1015	0	0	0	0	0	1	0	11	0	12	3	127	0	0	130	0	105	0	0	105	247
1015 - 1030	0	0	0	0	0	0	0	7	0	7	8	116	0	0	124	0	114	0	0	114	245
1030 - 1045	0	0	0	0	0	3	0	5	0	8	6	109	0	0	115	0	147	0	0	147	270
1045 - 1100	0	0	0	0	0	1	0	3	0	4	3	117	0	0	120	0	87	1	0	88	212
Hourly Total	0	0	0	0	**0**	5	0	26	0	**31**	20	469	0	0	**489**	0	453	1	0	**454**	**974**
1100 - 1115	0	0	0	0	0	3	0	4	0	7	8	117	0	0	125	0	110	1	0	111	243
1115 - 1130	1	0	0	0	1	0	0	4	0	4	10	128	0	0	138	0	114	1	0	115	258
1130 - 1145	0	0	0	0	0	0	0	2	0	2	2	113	0	0	115	0	108	0	0	108	225
1145 - 1200	0	0	0	0	0	2	0	10	0	12	7	106	0	0	113	0	96	0	0	96	221
Hourly Total	1	0	0	0	**1**	5	0	20	0	**25**	27	464	0	0	**491**	0	428	2	0	**430**	**947**
1200 - 1215	0	0	0	0	0	0	0	3	0	3	7	121	0	0	128	0	109	0	0	109	240
1215 - 1230	0	0	1	0	1	1	0	8	0	9	10	119	0	0	129	0	130	0	0	130	269
1230 - 1245	0	0	0	0	0	1	0	10	0	11	4	126	0	0	130	0	128	0	0	128	269
1245 - 1300	1	0	0	0	1	0	0	3	0	3	7	104	0	0	111	0	113	0	0	113	228
Hourly Total	1	0	1	0	**2**	2	0	24	0	**26**	28	470	0	0	**498**	0	480	0	0	**480**	**1006**
1300 - 1315	0	0	0	0	0	2	0	3	0	5	7	123	0	0	130	0	101	0	0	101	236
1315 - 1330	0	0	0	0	0	0	0	4	0	4	4	104	1	0	109	0	125	2	0	127	240
1330 - 1345	0	0	0	0	0	1	0	4	0	5	5	112	0	0	117	0	115	1	0	116	238
1345 - 1400	0	0	0	0	0	1	0	8	0	9	1	101	1	0	103	0	115	2	0	117	229
Hourly Total	0	0	0	0	**0**	4	0	19	0	**23**	17	440	2	0	**459**	0	456	5	0	**461**	**943**
1400 - 1415	0	0	0	0	0	0	0	4	0	4	4	134	0	0	138	0	114	0	0	114	256
1415 - 1430	0	0	0	0	0	0	0	4	0	4	7	156	0	0	163	0	122	0	0	122	289
1430 - 1445	0	0	0	0	0	1	0	15	0	16	3	150	0	0	153	0	174	4	0	178	347
1445 - 1500	0	0	0	0	0	0	0	7	0	7	3	149	1	0	153	0	154	1	0	155	315
Hourly Total	0	0	0	0	**0**	1	0	30	0	**31**	17	589	1	0	**607**	0	564	5	0	**569**	**1207**
1500 - 1515	0	0	0	0	0	4	0	8	0	12	6	152	0	0	158	0	168	1	0	169	339
1515 - 1530	0	0	0	0	0	1	0	6	0	7	11	154	1	0	166	0	189	0	0	189	362
1530 - 1545	1	0	0	0	1	0	0	6	0	6	12	190	1	0	203	0	194	4	0	198	408
1545 - 1600	0	0	0	0	0	0	0	8	0	8	9	174	0	0	183	0	171	1	0	172	363
Hourly Total	1	0	0	0	**1**	5	0	28	0	**33**	38	670	2	0	**710**	0	722	6	0	**728**	**1472**
1600 - 1615	1	0	0	0	1	1	0	14	0	15	7	152	0	0	159	0	171	3	0	174	349
1615 - 1630	0	0	0	0	0	1	0	6	0	7	10	173	0	0	183	0	206	3	0	209	399
1630 - 1645	0	0	0	0	0	0	0	6	0	6	9	153	0	0	162	0	202	2	0	204	372
1645 - 1700	0	0	1	0	1	1	0	4	0	5	8	174	0	0	182	0	207	5	0	212	400
Hourly Total	1	0	1	0	**2**	3	0	30	0	**33**	34	652	0	0	**686**	0	786	13	0	**799**	**1520**
1700 - 1715	0	0	0	0	0	1	0	4	0	5	15	158	0	0	173	0	197	2	0	199	377
1715 - 1730	0	0	0	0	0	0	0	6	0	6	14	161	0	0	175	0	138	2	0	140	321
1730 - 1745	0	0	0	0	0	0	0	5	0	5	11	132	0	0	143	0	176	1	0	177	325
1745 - 1800	0	0	0	0	0	2	0	1	0	3	5	105	0	0	110	0	124	2	0	126	239
Hourly Total	0	0	0	0	**0**	3	0	16	0	**19**	45	556	0	0	**601**	0	635	7	0	**642**	**1262**
1800 - 1815	0	0	0	0	0	0	0	3	0	3	10	87	0	0	97	0	152	0	0	152	252
1815 - 1830	0	0	0	0	0	1	0	5	0	6	9	76	0	0	85	0	103	2	0	105	196
1830 - 1845	0	0	0	0	0	1	0	5	0	6	7	67	0	0	74	0	83	3	0	86	166
1845 - 1900	0	0	0	0	0	0	0	5	0	5	5	56	0	0	61	0	61	0	0	61	127
Hourly Total	0	0	0	0	**0**	2	0	18	0	**20**	31	286	0	0	**317**	0	399	5	0	**404**	**741**
Grand Total	4	0	2	0	**6**	59	0	333	0	**392**	304	6843	9	1	**7157**	0	7241	55	0	**7296**	**14851**
Approach %	66.67	0.00	33.33	0.00	-	15.05	0.00	84.95	0.00	-	4.25	95.61	0.13	0.01	-	0.00	99.25	0.75	0.00	-	
Intersection %	0.03	0.00	0.01	0.00	0.04	0.40	0.00	2.24	0.00	2.64	2.05	46.08	0.06	0.01	48.19	0.00	48.76	0.37	0.00	49.13	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.43	0.00	0.83	0.00	**0.86**	0.56	0.87	0.25	0.00	**0.86**	0.00	0.87	0.50	0.00	**0.87**	**0.95**

Fischbach
Transportation Group, LLC
Traffic Engineering and Planning



N

No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 4.
Existing Year 2023 Peak Hour Traffic Volumes

Peak Hour Turning Movement Count

Columbia, TN

Click here for Map

Marr Traffic DATA COLLECTION

www.marrtraffic.com

Tuesday, August 22, 2023	
Period	0600 - 0900
Peak Hour	0715 - 0815

* the Peak Hour Diagram does not include Bikes



All vehicles

	Northbound						Southbound						Eastbound						Westbound						
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Int
Time	1.1	1.2	1.3		1.4	Total	1.5	1.6	1.7		1.8	Total	1.9	1.10	1.11		1.12	Total	1.13	1.14	1.15		1.16	Total	Total
0715 - 0730	1	95	24	-	0	120	5	68	6	-	0	79	7	5	1	-	0	13	14	17	20	-	0	51	263
0730 - 0745	3	107	11	-	0	121	8	74	7	-	0	89	8	12	3	-	0	23	25	32	11	-	0	68	301
0745 - 0800	2	125	18	-	0	145	9	79	3	-	0	91	9	7	1	-	0	17	35	27	7	-	0	69	322
0800 - 0815	3	79	14	-	0	96	4	86	8	-	0	98	4	11	1	-	0	16	17	18	8	-	0	43	253
Total	9	406	67	0	0	482	26	307	24	0	0	357	28	35	6	0	0	69	91	94	46	0	0	231	1139
Approach %	1.87	84.23	13.90	0.00	0.00	-	7.28	85.99	6.72	0.00	0.00	-	40.58	50.72	8.70	0.00	0.00	-	39.39	40.69	19.91	0.00	0.00	-	
PHF	0.75	0.81	0.70	0.00	0.00	**0.83**	0.72	0.89	0.75	0.00	0.00	**0.91**	0.78	0.73	0.50	0.00	0.00	**0.75**	0.65	0.73	0.58	0.00	0.00	**0.84**	**0.88**

Passenger Vehicles (1-3)

	Northbound						Southbound						Eastbound						Westbound						
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Int
Time	1.1	1.2	1.3		1.4	Total	1.5	1.6	1.7		1.8	Total	1.9	1.10	1.11		1.12	Total	1.13	1.14	1.15		1.16	Total	Total
0715 - 0730	1	88	22	-	0	111	5	65	6	-	0	76	7	5	0	-	0	12	14	17	19	-	0	50	249
0730 - 0745	3	99	11	-	0	113	8	69	6	-	0	83	8	11	3	-	0	22	25	32	11	-	0	68	286
0745 - 0800	2	116	18	-	0	136	8	75	3	-	0	86	9	7	1	-	0	17	34	27	7	-	0	68	307
0800 - 0815	3	67	14	-	0	84	4	79	7	-	0	90	4	10	1	-	0	15	17	17	6	-	0	40	229
Total	9	370	65	0	0	444	25	288	22	0	0	335	28	33	5	0	0	66	90	93	43	0	0	226	1071
Approach %	2.03	83.33	14.64	0.00	0.00	-	7.46	85.97	6.57	0.00	0.00	-	42.42	50.00	7.58	0.00	0.00	-	39.82	41.15	19.03	0.00	0.00	-	
PHF	0.75	0.80	0.74	0.00	0.00	**0.82**	0.78	0.91	0.79	0.00	0.00	**0.93**	0.78	0.75	0.42	0.00	0.00	**0.75**	0.66	0.73	0.57	0.00	0.00	**0.83**	**0.87**

Single Unit Trucks (4-7)

	Northbound						Southbound						Eastbound						Westbound						
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Int
Time	1.1	1.2	1.3		1.4	Total	1.5	1.6	1.7		1.8	Total	1.9	1.10	1.11		1.12	Total	1.13	1.14	1.15		1.16	Total	Total
0715 - 0730	0	5	2	-	0	7	0	3	0	-	0	3	0	0	1	-	0	1	0	0	0	-	0	0	11
0730 - 0745	0	7	0	-	0	7	0	4	1	-	0	5	0	1	0	-	0	1	0	0	0	-	0	0	13
0745 - 0800	0	7	0	-	0	7	1	4	0	-	0	5	0	0	0	-	0	0	0	0	0	-	0	0	12
0800 - 0815	0	9	0	-	0	9	0	6	1	-	0	7	0	1	0	-	0	1	0	1	2	-	0	3	20
Total	0	28	2	0	0	30	1	17	2	0	0	20	0	2	1	0	0	3	0	1	2	0	0	3	56
Approach %	0.00	93.33	6.67	0.00	0.00	-	5.00	85.00	10.00	0.00	0.00	-	0.00	66.67	33.33	0.00	0.00	-	0.00	33.33	66.67	0.00	0.00	-	
PHF	0.00	0.78	0.25	0.00	0.00	**0.83**	0.25	0.71	0.50	0.00	0.00	**0.71**	0.00	0.50	0.25	0.00	0.00	**0.75**	0.00	0.25	0.25	0.00	0.00	**0.25**	**0.70**

Combination Trucks (8-13)

	Northbound						Southbound						Eastbound						Westbound						
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Int
Time	1.1	1.2	1.3		1.4	Total	1.5	1.6	1.7		1.8	Total	1.9	1.10	1.11		1.12	Total	1.13	1.14	1.15		1.16	Total	Total
0715 - 0730	0	2	0	-	0	2	0	0	0	-	0	0	0	0	0	-	0	0	0	0	1	-	0	1	3
0730 - 0745	0	1	0	-	0	1	0	1	0	-	0	1	0	0	0	-	0	0	0	0	0	-	0	0	2
0745 - 0800	0	2	0	-	0	2	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	0	1	3
0800 - 0815	0	3	0	-	0	3	0	1	0	-	0	1	0	0	0	-	0	0	0	0	0	-	0	0	4
Total	0	8	0	0	0	8	0	2	0	0	0	2	0	0	0	0	0	0	1	0	1	0	0	2	12
Approach %	0.00	100.00	0.00	0.00	0.00	-	0.00	100.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-	50.00	0.00	50.00	0.00	0.00	-	
PHF	0.00	0.67	0.00	0.00	0.00	**0.67**	0.00	0.50	0.00	0.00	0.00	**0.50**	0.00	0.00	0.00	0.00	0.00	**0.00**	0.25	0.00	0.25	0.00	0.00	**0.50**	**0.75**

Bikes

	Northbound						Southbound						Eastbound						Westbound						
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Int
Time	1.1	1.2	1.3		1.4	Total	1.5	1.6	1.7		1.8	Total	1.9	1.10	1.11		1.12	Total	1.13	1.14	1.15		1.16	Total	Total
0715 - 0730	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0
0730 - 0745	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0
0745 - 0800	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0
0800 - 0815	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Peak Hour Turning Movement Count

Columbia, TN

Click here for Map

Marr Traffic DATA COLLECTION

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Tuesday, August 22, 2023	
Period	1600 - 1800
Peak Hour	1600 - 1700

* the Peak Hour Diagram does not include Bikes



All vehicles

	Northbound						Southbound						Eastbound						Westbound						
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Int
Time	1.1	1.2	1.3		1.4	Total	1.5	1.6	1.7		1.8	Total	1.9	1.10	1.11		1.12	Total	1.13	1.14	1.15		1.16	Total	Total
1600 - 1615	4	74	21	-	0	99	6	111	18	-	0	135	2	14	1	-	0	17	14	3	4	-	0	21	272
1615 - 1630	2	60	20	-	0	82	6	99	12	-	0	117	2	8	3	-	0	13	19	6	8	-	0	33	245
1630 - 1645	2	68	14	-	0	84	13	126	13	-	0	152	4	6	2	-	0	12	15	13	10	-	0	38	286
1645 - 1700	1	74	14	-	0	89	10	93	11	-	0	114	5	11	0	-	0	16	12	5	4	-	0	21	240
Total	9	276	69	0	0	354	35	429	54	0	0	518	13	39	6	0	0	58	60	27	26	0	0	113	1043
Approach %	2.54	77.97	19.49	0.00	0.00	-	6.76	82.82	10.42	0.00	0.00	-	22.41	67.24	10.34	0.00	0.00	-	53.10	23.89	23.01	0.00	0.00	-	
PHF	0.56	0.93	0.82	0.00	0.00	**0.89**	0.67	0.85	0.75	0.00	0.00	**0.85**	0.65	0.70	0.50	0.00	0.00	**0.85**	0.79	0.52	0.65	0.00	0.00	**0.74**	**0.91**

Passenger Vehicles (1-3)

	Northbound						Southbound						Eastbound						Westbound						
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Int
Time	1.1	1.2	1.3		1.4	Total	1.5	1.6	1.7		1.8	Total	1.9	1.10	1.11		1.12	Total	1.13	1.14	1.15		1.16	Total	Total
1600 - 1615	4	66	19	-	0	89	6	109	18	-	0	133	2	14	1	-	0	17	14	2	4	-	0	20	259
1615 - 1630	2	56	20	-	0	78	5	94	11	-	0	110	2	8	3	-	0	13	16	6	8	-	0	30	231
1630 - 1645	2	67	14	-	0	83	13	118	13	-	0	144	4	6	2	-	0	12	15	13	10	-	0	38	277
1645 - 1700	1	74	14	-	0	89	10	88	11	-	0	109	5	11	0	-	0	16	12	5	4	-	0	21	235
Total	9	263	67	0	0	339	34	409	53	0	0	496	13	39	6	0	0	58	57	26	26	0	0	109	1002
Approach %	2.65	77.58	19.76	0.00	0.00	-	6.85	82.46	10.69	0.00	0.00	-	22.41	67.24	10.34	0.00	0.00	-	52.29	23.85	23.85	0.00	0.00	-	
PHF	0.56	0.89	0.84	0.00	0.00	**0.95**	0.65	0.87	0.74	0.00	0.00	**0.86**	0.65	0.70	0.50	0.00	0.00	**0.85**	0.89	0.50	0.65	0.00	0.00	**0.72**	**0.90**

Single Unit Trucks (4-7)

	Northbound						Southbound						Eastbound						Westbound						
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Int
Time	1.1	1.2	1.3		1.4	Total	1.5	1.6	1.7		1.8	Total	1.9	1.10	1.11		1.12	Total	1.13	1.14	1.15		1.16	Total	Total
1600 - 1615	0	6	2	-	0	8	0	2	0	-	0	2	0	0	0	-	0	0	0	1	0	-	0	1	11
1615 - 1630	0	3	0	-	0	3	1	5	1	-	0	7	0	0	0	-	0	0	2	0	0	-	0	2	12
1630 - 1645	0	1	0	-	0	1	0	7	0	-	0	7	0	0	0	-	0	0	0	0	0	-	0	0	8
1645 - 1700	0	0	0	-	0	0	0	2	0	-	0	2	0	0	0	-	0	0	0	0	0	-	0	0	2
Total	0	10	2	0	0	12	1	16	1	0	0	18	0	0	0	0	0	0	2	1	0	0	0	3	33
Approach %	0.00	83.33	16.67	0.00	0.00	-	5.56	88.89	5.56	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-	66.67	33.33	0.00	0.00	0.00	-	
PHF	0.00	0.42	0.25	0.00	0.00	**0.38**	0.25	0.57	0.25	0.00	0.00	**0.64**	0.00	0.00	0.00	0.00	0.00	**0.00**	0.25	0.25	0.00	0.00	0.00	**0.38**	**0.69**

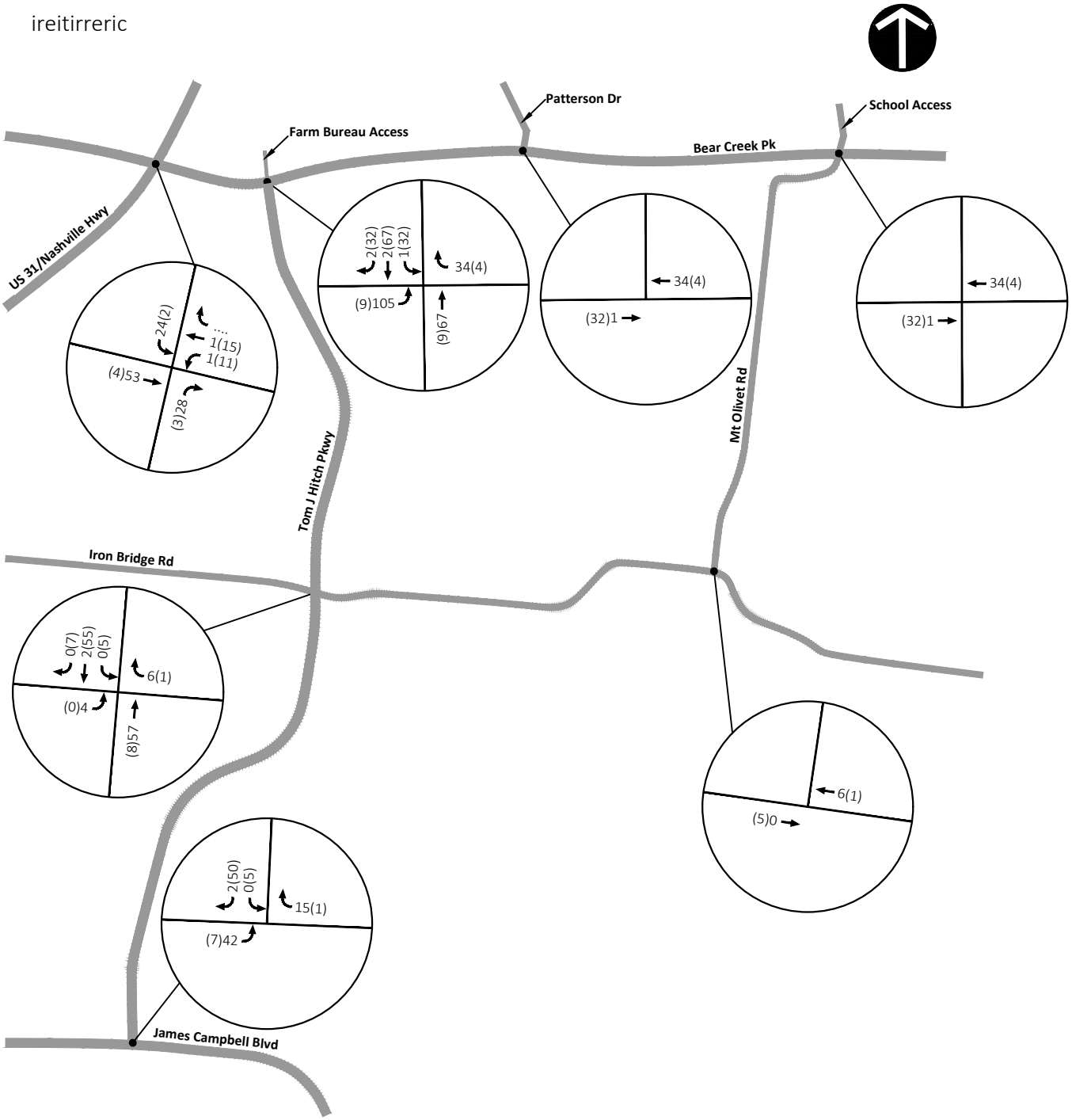
Combination Trucks (8-13)

	Northbound						Southbound						Eastbound						Westbound						
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Int
Time	1.1	1.2	1.3		1.4	Total	1.5	1.6	1.7		1.8	Total	1.9	1.10	1.11		1.12	Total	1.13	1.14	1.15		1.16	Total	Total
1600 - 1615	0	2	0	-	0	2	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	2
1615 - 1630	0	1	0	-	0	1	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	0	1	2
1630 - 1645	0	0	0	-	0	0	0	1	0	-	0	1	0	0	0	-	0	0	0	0	0	-	0	0	1
1645 - 1700	0	0	0	-	0	0	0	3	0	-	0	3	0	0	0	-	0	0	0	0	0	-	0	0	3
Total	0	3	0	0	0	3	0	4	0	0	0	4	0	0	0	0	0	0	1	0	0	0	0	1	8
Approach %	0.00	100.00	0.00	0.00	0.00	-	0.00	100.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-	100.00	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.38	0.00	0.00	0.00	**0.38**	0.00	0.33	0.00	0.00	0.00	**0.33**	0.00	0.00	0.00	0.00	0.00	**0.00**	0.25	0.00	0.00	0.00	0.00	**0.25**	**0.67**

Bikes

	Northbound						Southbound						Eastbound						Westbound						
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Left	Thru	Right		U-Turn	App	Int
Time	1.1	1.2	1.3		1.4	Total	1.5	1.6	1.7		1.8	Total	1.9	1.10	1.11		1.12	Total	1.13	1.14	1.15		1.16	Total	Total
1600 - 1615	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0
1615 - 1630	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0
1630 - 1645	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0
1645 - 1700	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**

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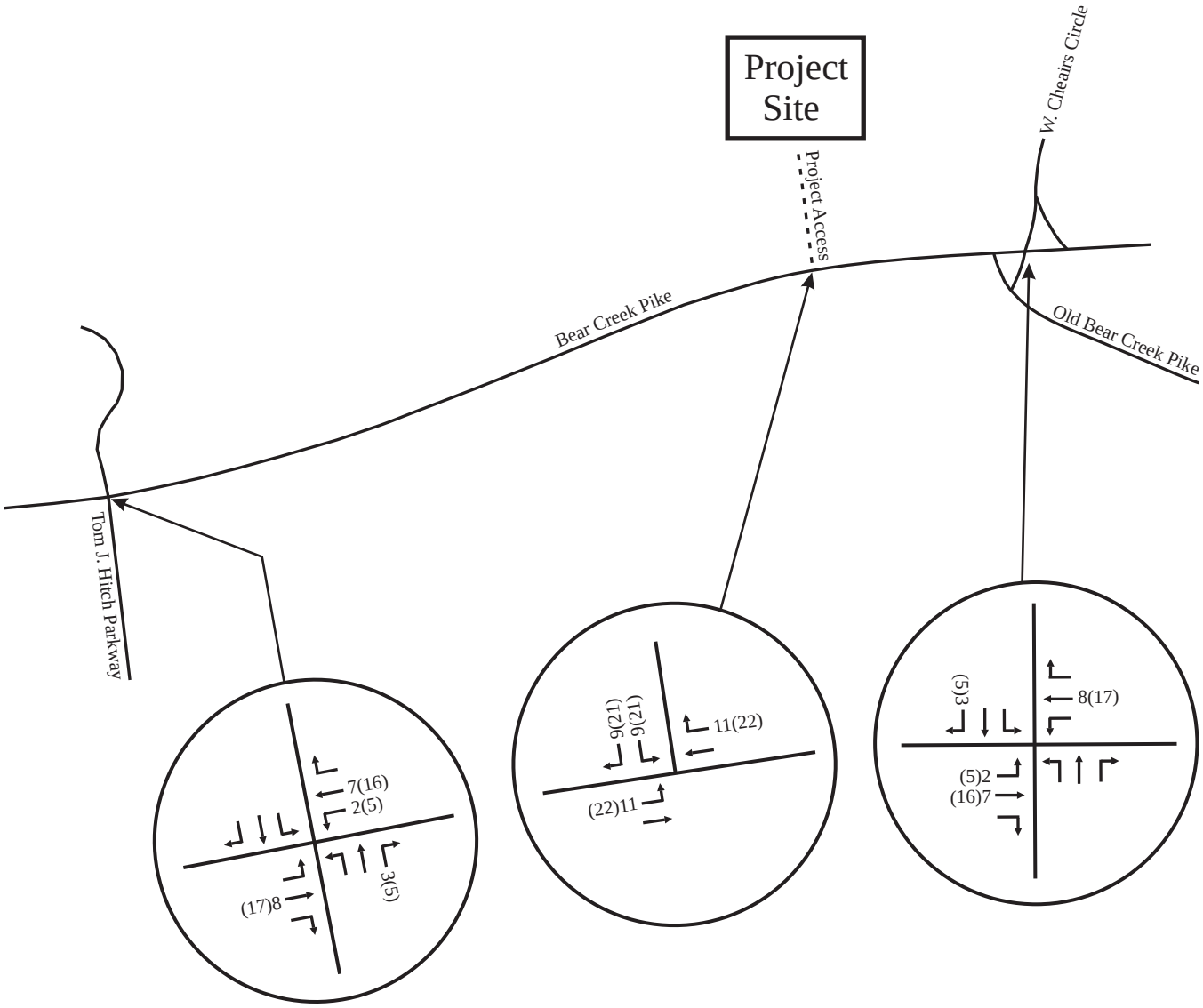


Legend:
XXX - AM Peak Hour Traffic Volumes
(XXX) - PM Peak Hour Traffic Volumes

(Not to Scale)

APPENDIX E
BACKGROUND PROJECT DATA

F i s c h b a c h
Transportation Group, LLC
Traffic Engineering and Planning



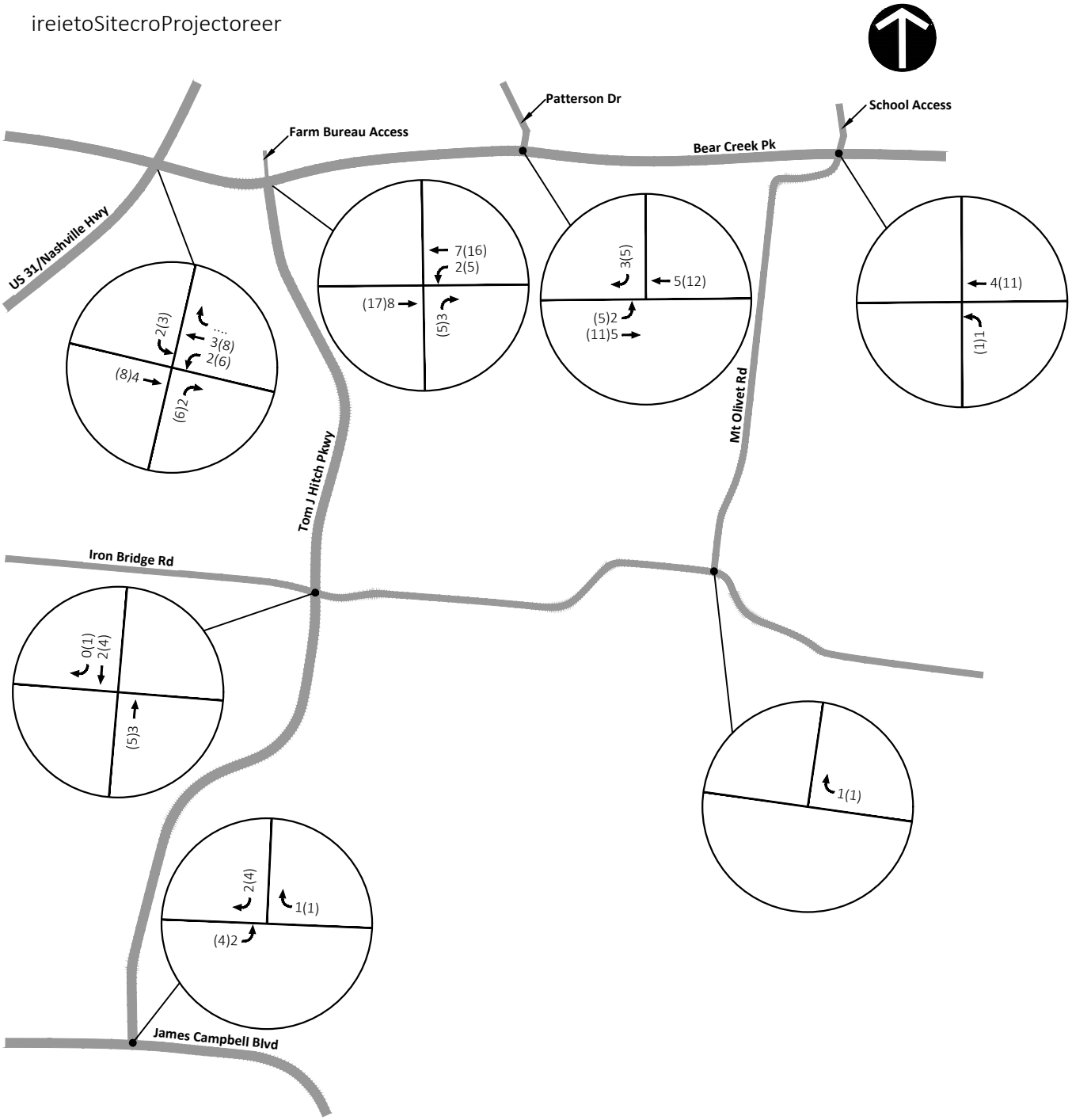
N

No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 7.
Peak Hour Traffic Volumes Generated by the Proposed Project

ireietoSitecroProjectoreer



Legend:
XXX - AM Peak Hour Traffic Volumes
(XXX) - PM Peak Hour Traffic Volumes

(Not to Scale)

APPENDIX F
TRIP GENERATION CALCULATIONS

Single-Family Detached Housing
(210)

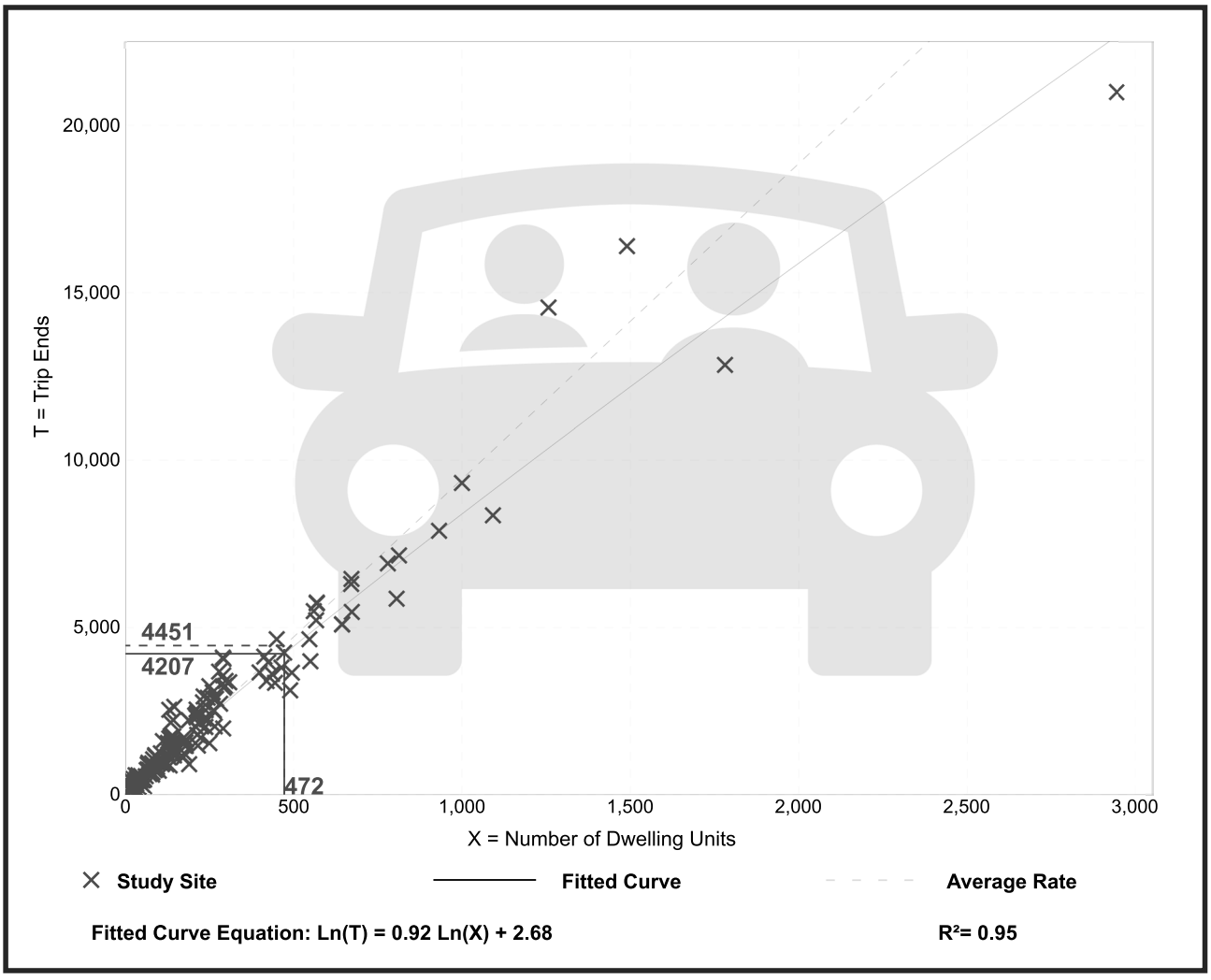
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 174
Avg. Num. of Dwelling Units: 246
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



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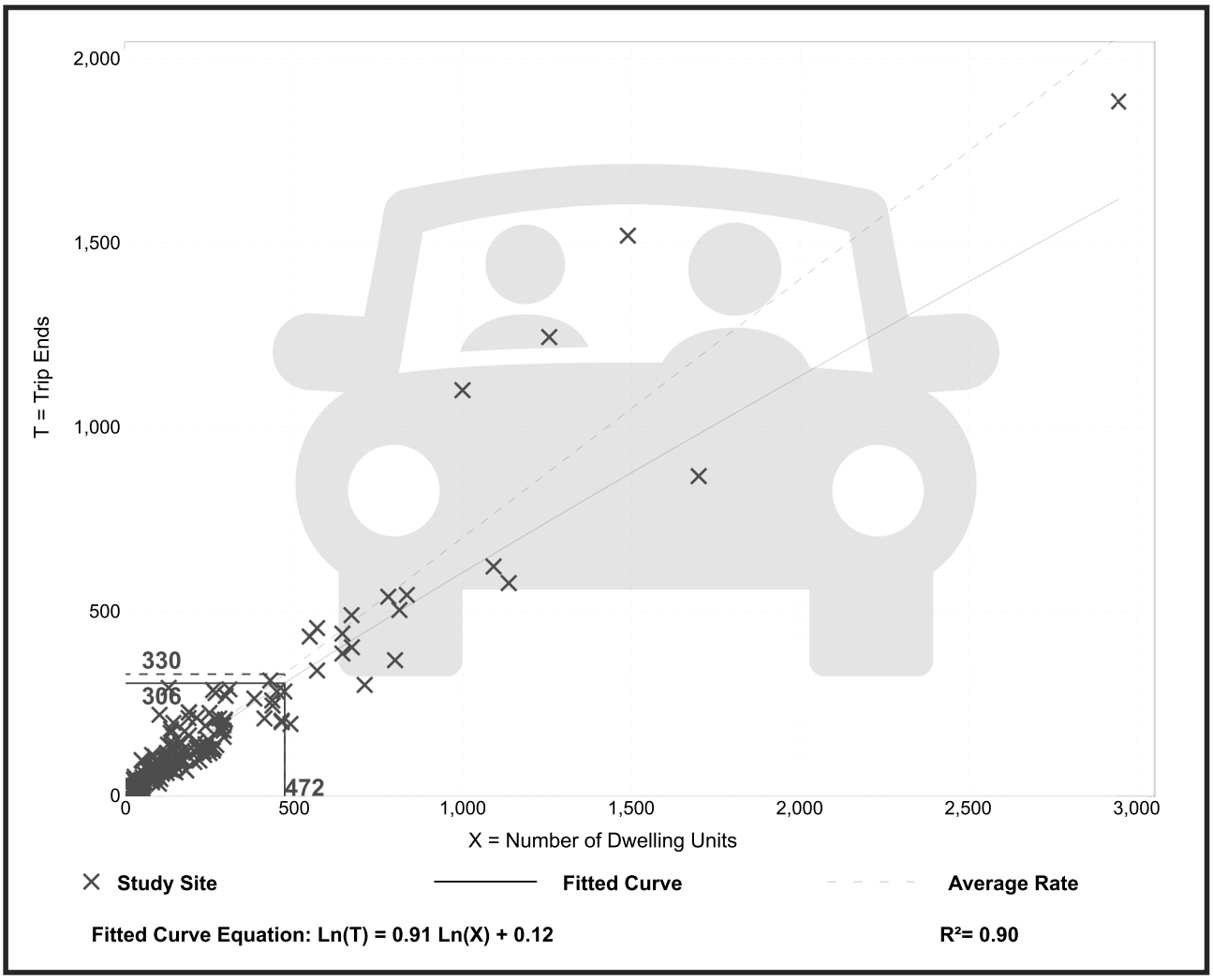
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 192
Avg. Num. of Dwelling Units: 226
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



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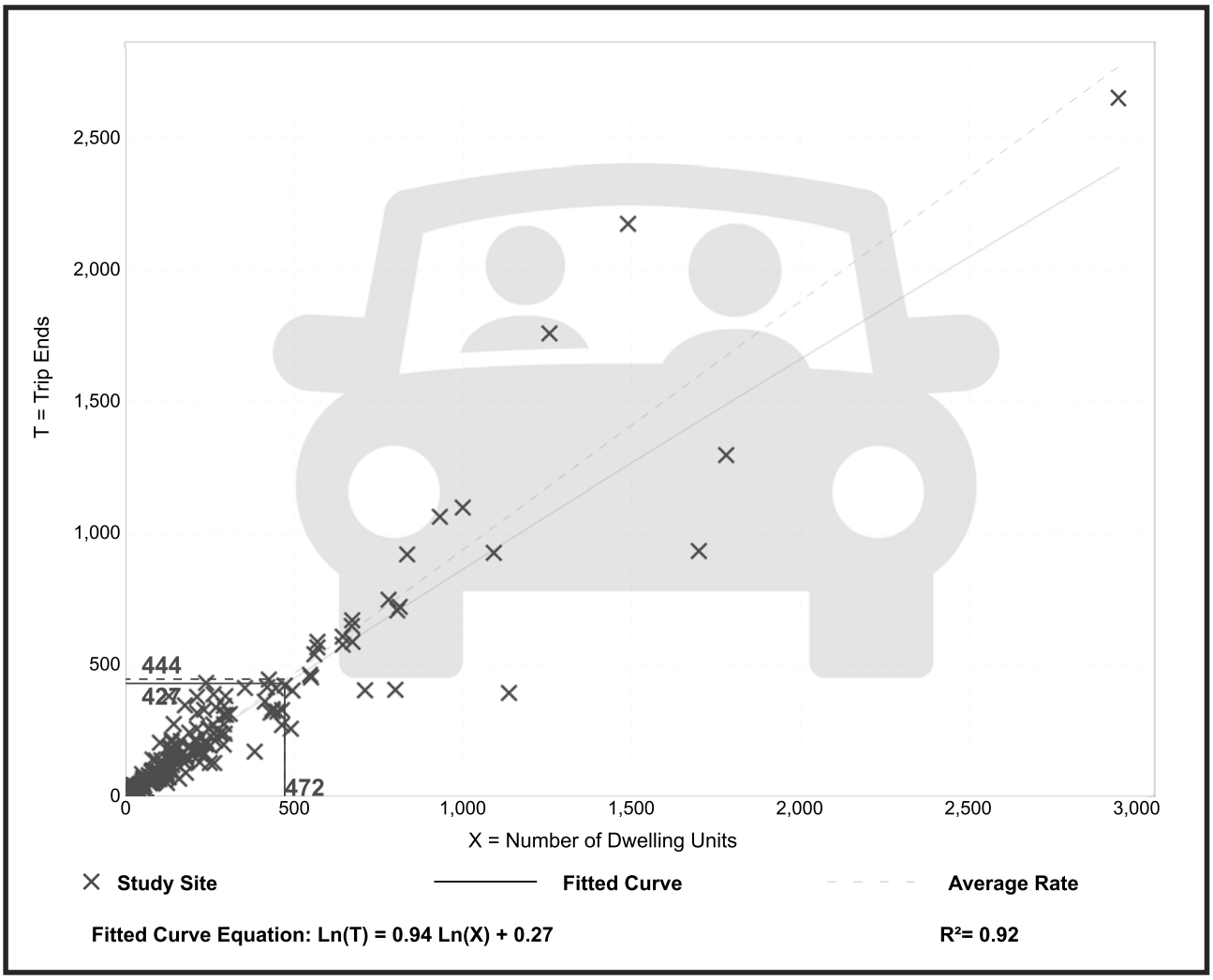
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 208
Avg. Num. of Dwelling Units: 248
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



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Single-Family Attached Housing
(215)

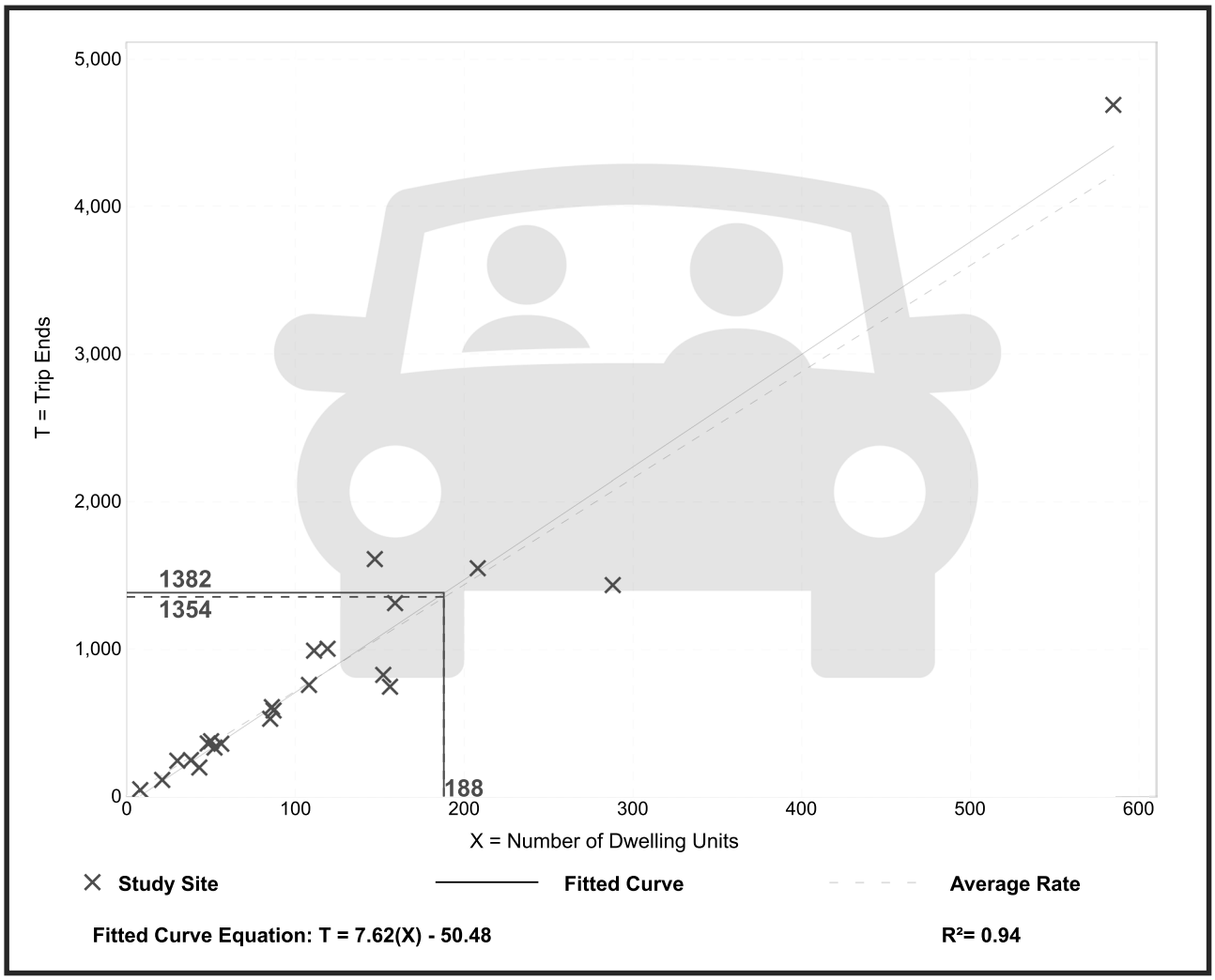
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 22
Avg. Num. of Dwelling Units: 120
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.20	4.70 - 10.97	1.61

Data Plot and Equation



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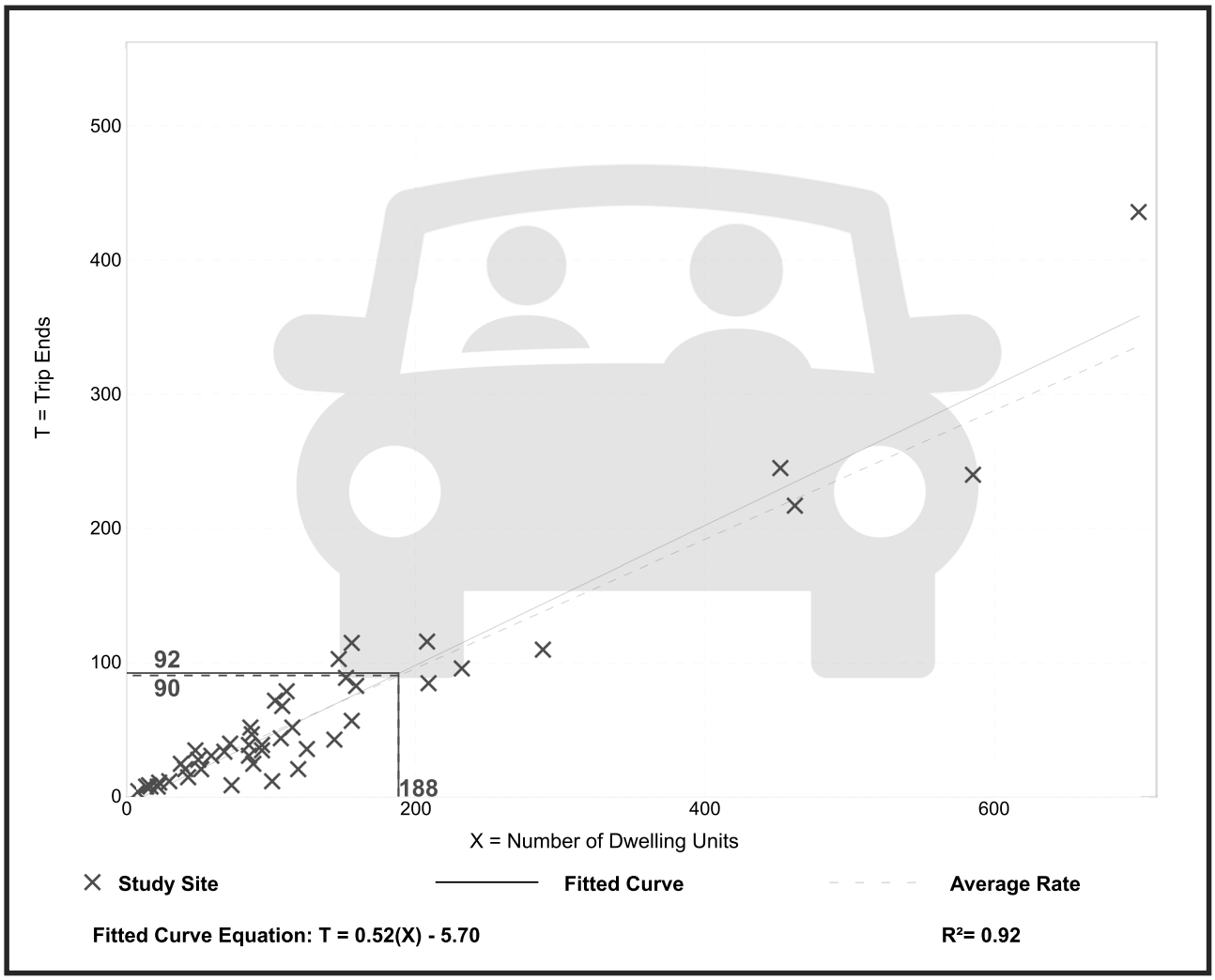
Single-Family Attached Housing
(215)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 46
Avg. Num. of Dwelling Units: 135
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation



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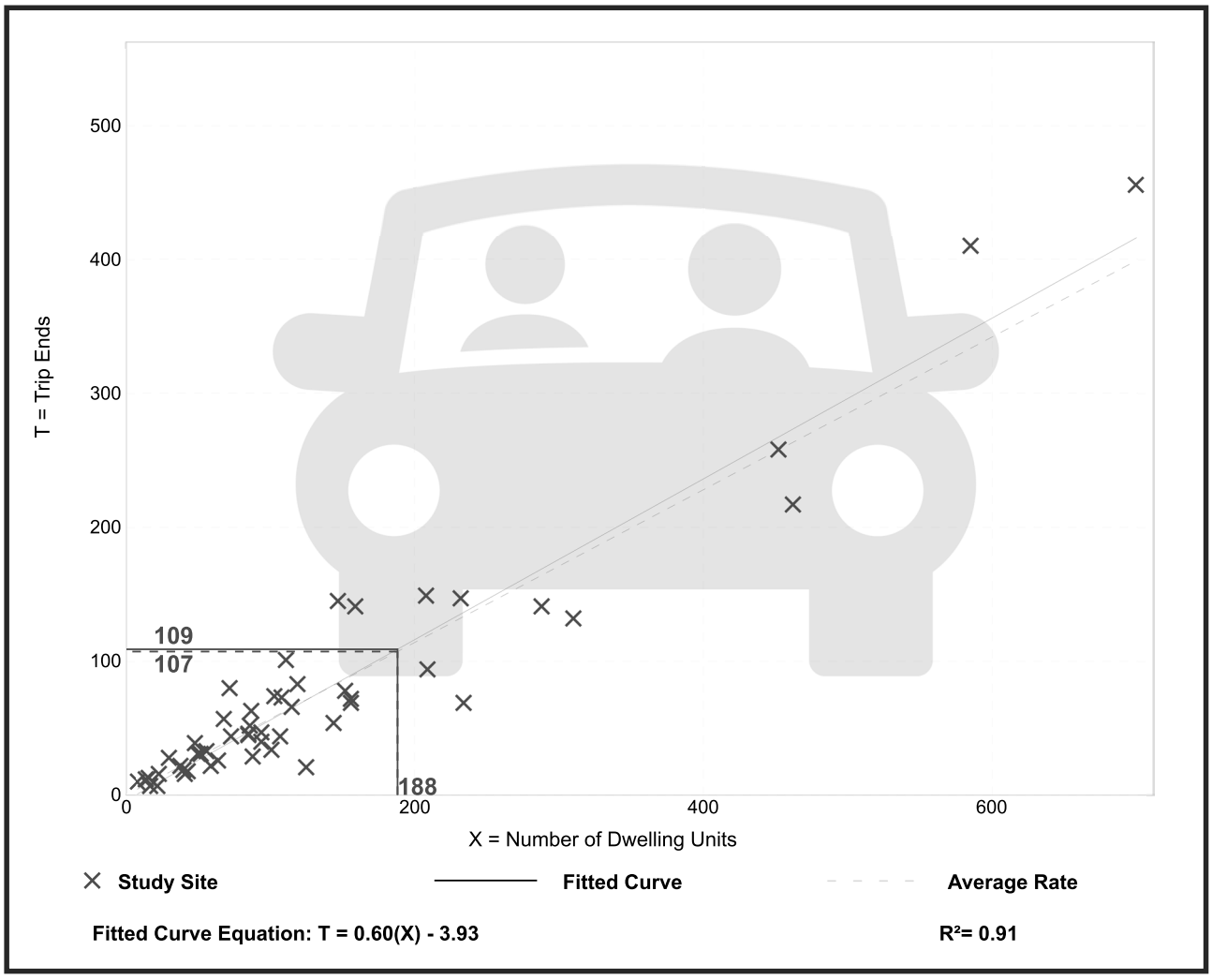
Single-Family Attached Housing
(215)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 51
Avg. Num. of Dwelling Units: 136
Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



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Senior Adult Housing - Single-Family
(251)

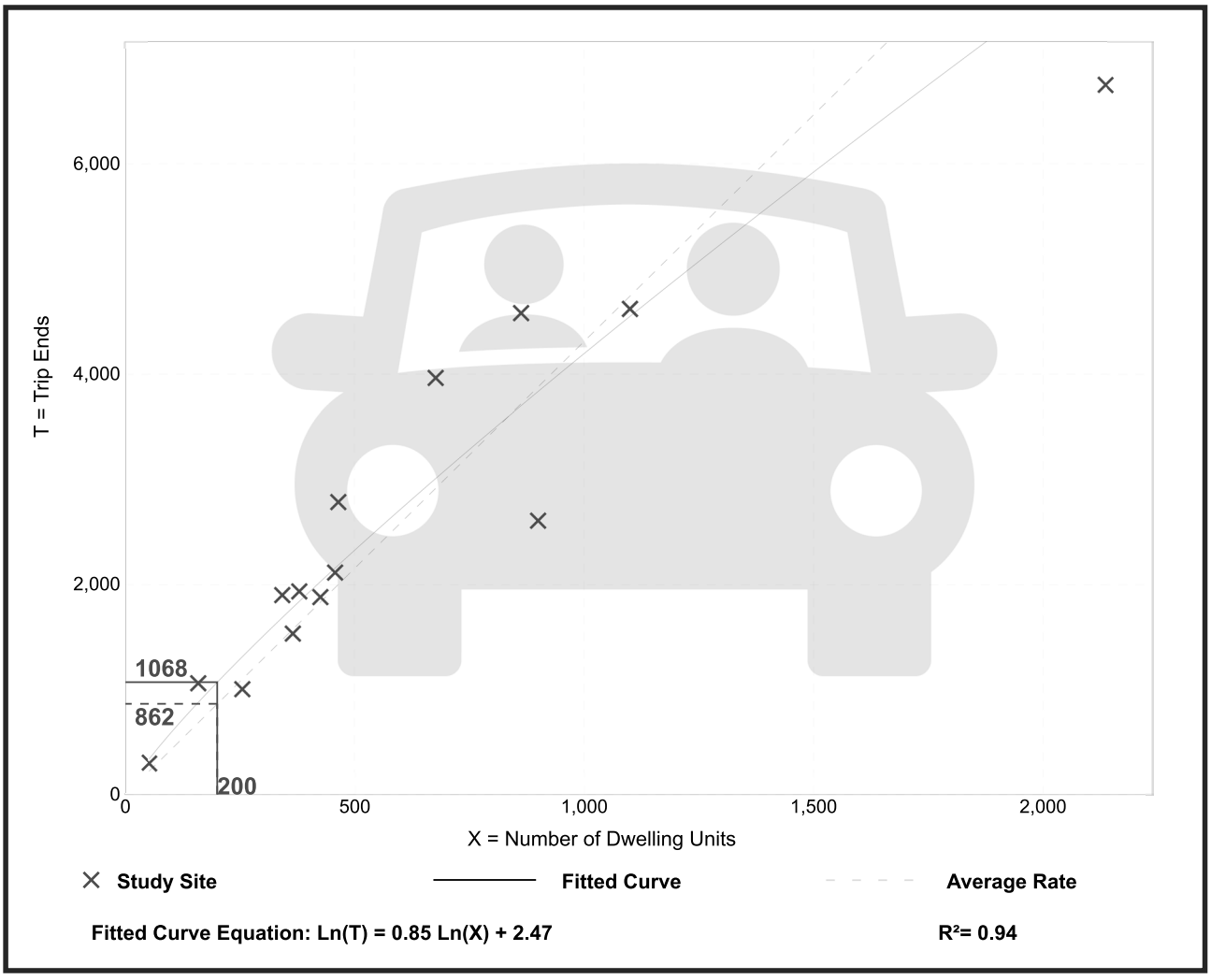
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 15
Avg. Num. of Dwelling Units: 646
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.31	2.90 - 6.66	1.07

Data Plot and Equation



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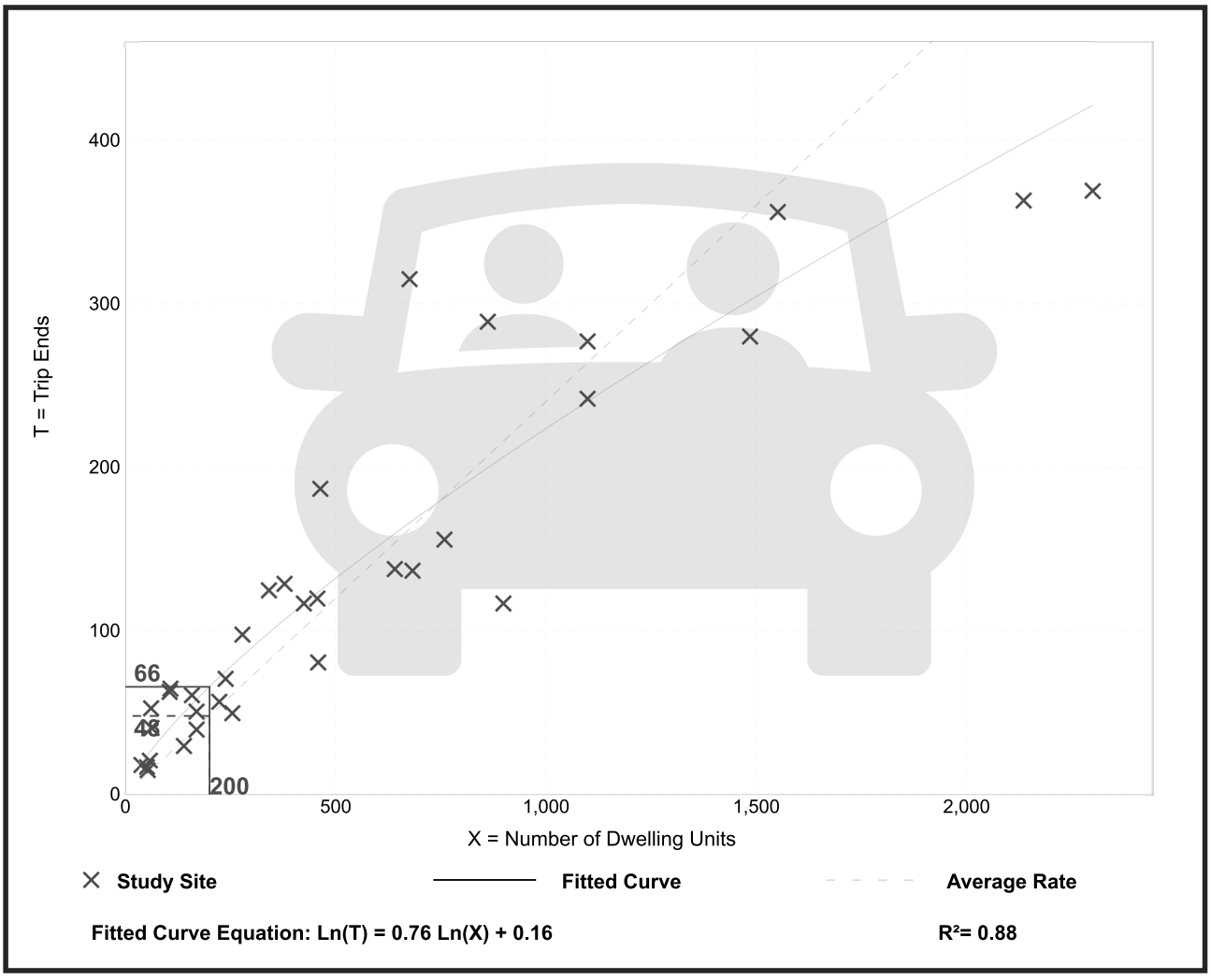
Senior Adult Housing - Single-Family
(251)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 34
Avg. Num. of Dwelling Units: 557
Directional Distribution: 33% entering, 67% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.24	0.13 - 0.84	0.10

Data Plot and Equation



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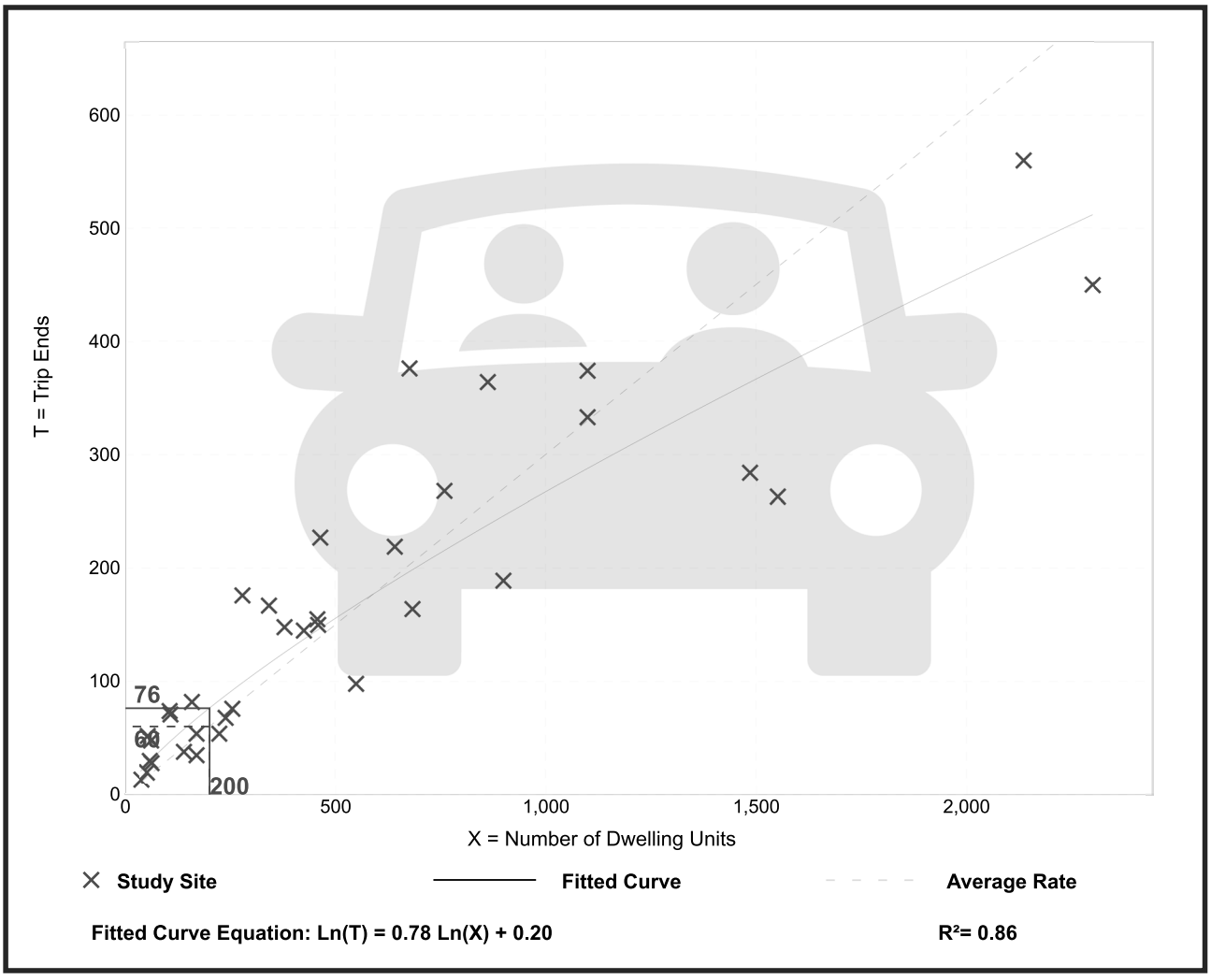
Senior Adult Housing - Single-Family
(251)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 35
Avg. Num. of Dwelling Units: 556
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.30	0.17 - 0.95	0.12

Data Plot and Equation



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Single-Family Detached Housing
(210)

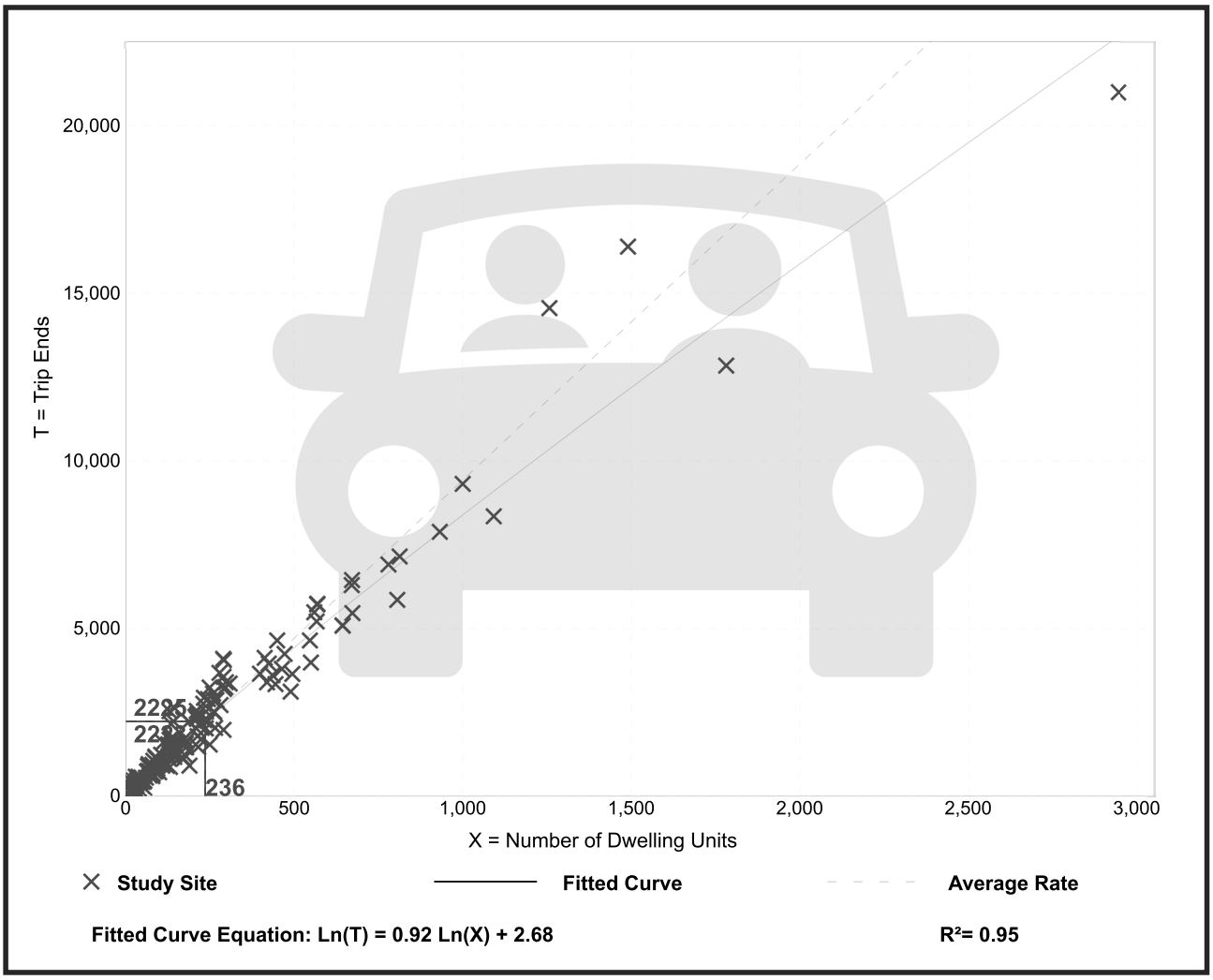
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On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 174
Avg. Num. of Dwelling Units: 246
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



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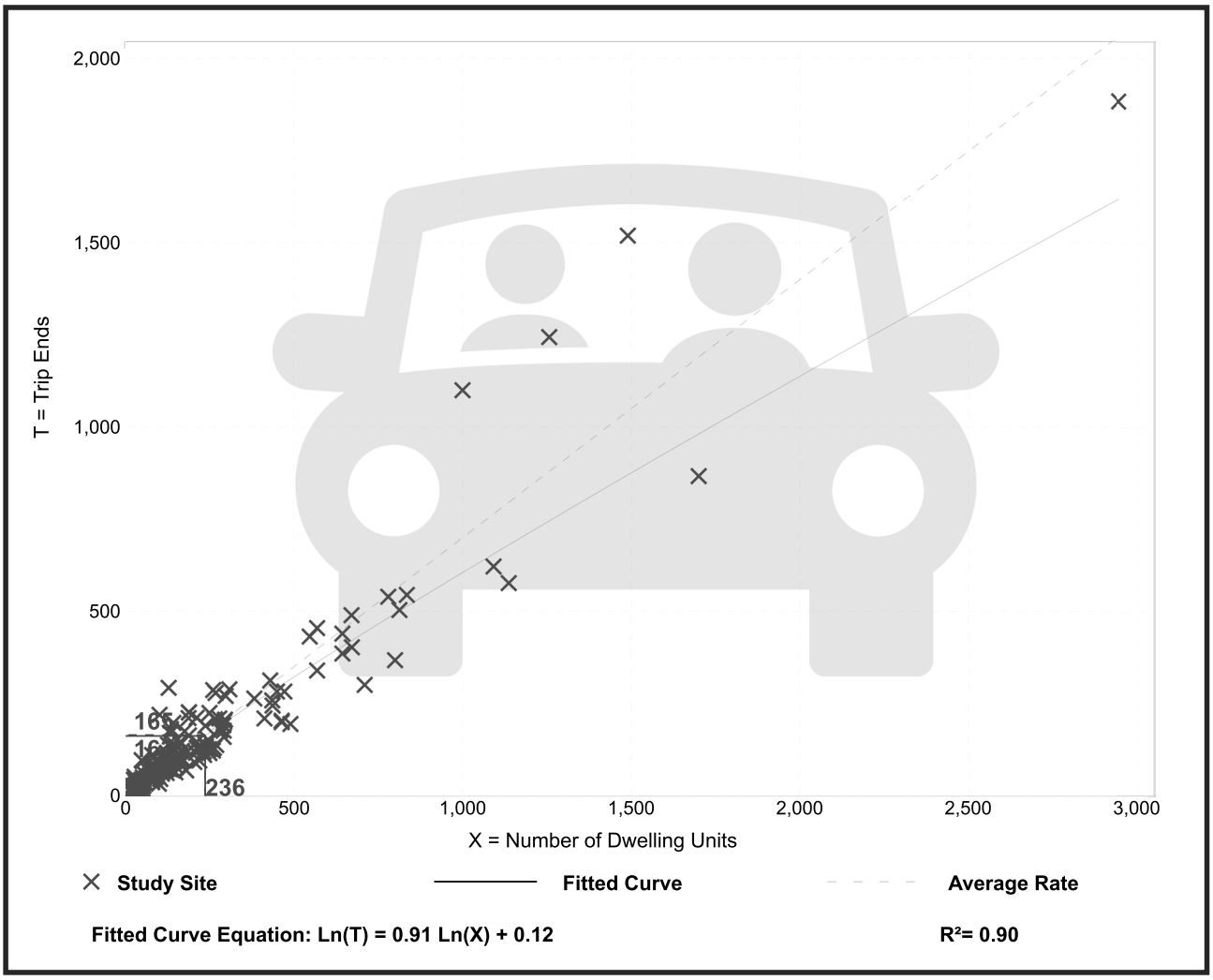
Single-Family Detached Housing
(210)

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Number of Studies: 192
Avg. Num. of Dwelling Units: 226
Directional Distribution: 25% entering, 75% exiting

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Average Rate	Range of Rates	Standard Deviation
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Data Plot and Equation



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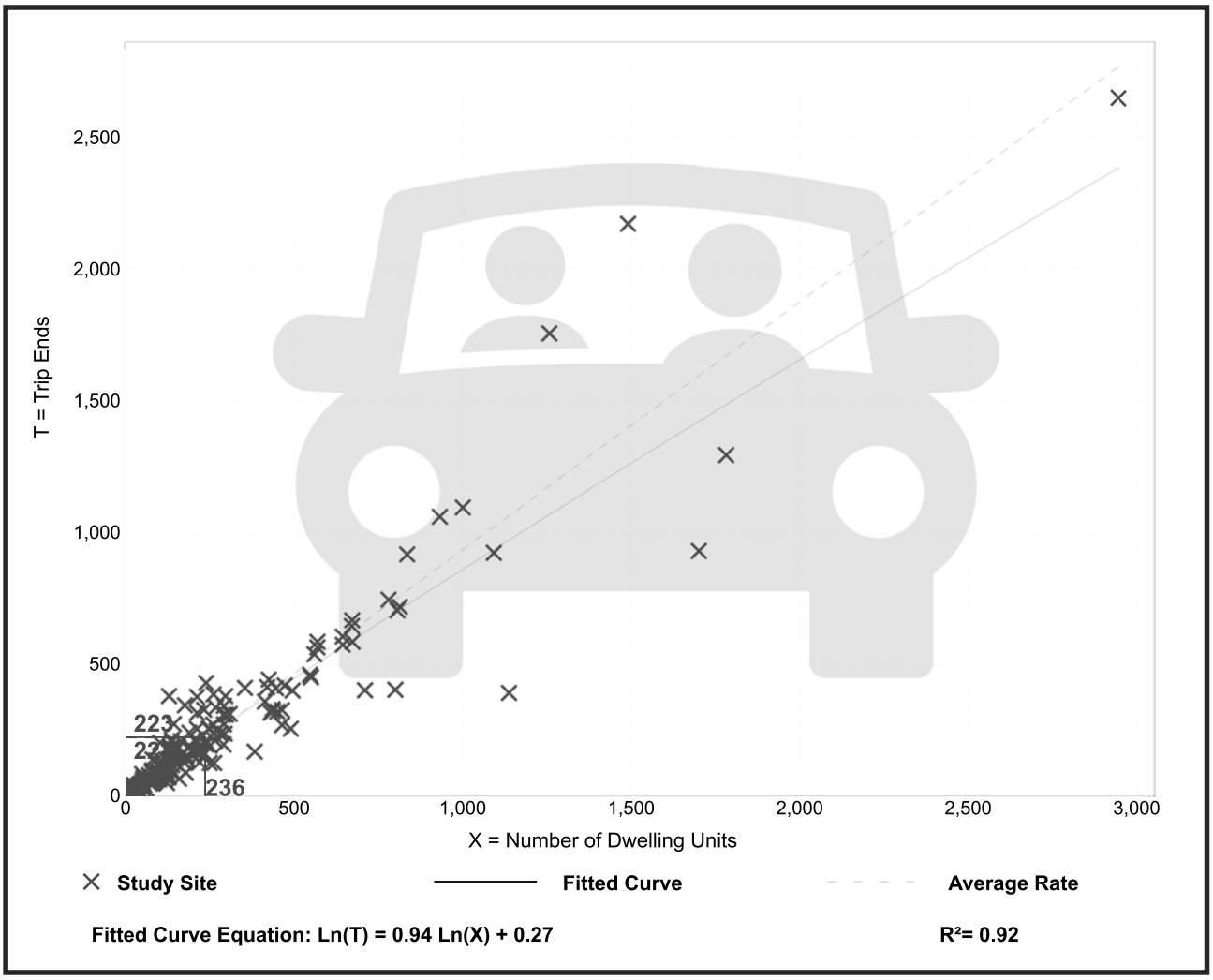
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
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Avg. Num. of Dwelling Units: 248
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Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
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Data Plot and Equation



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Single-Family Attached Housing
(215)

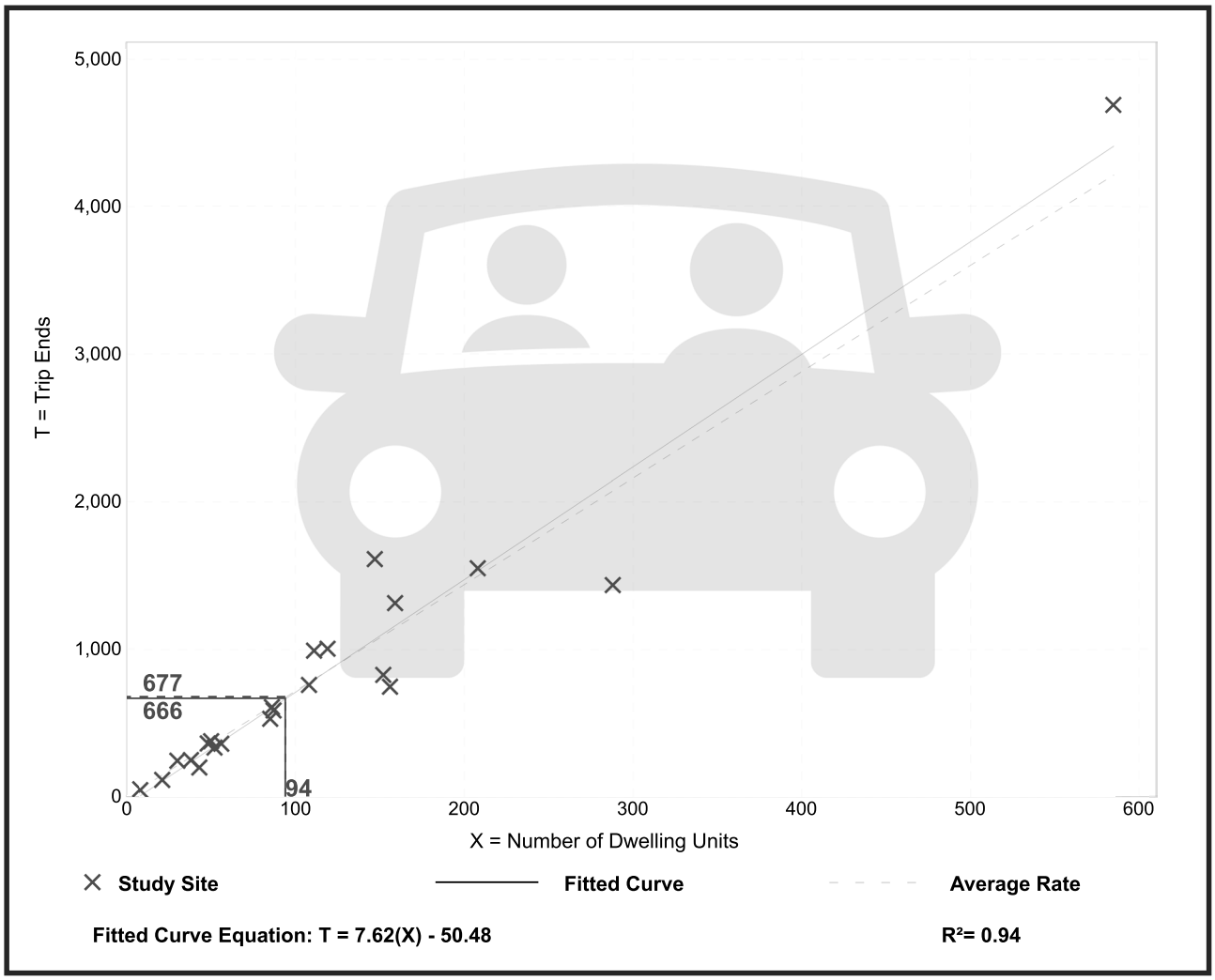
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 22
Avg. Num. of Dwelling Units: 120
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.20	4.70 - 10.97	1.61

Data Plot and Equation



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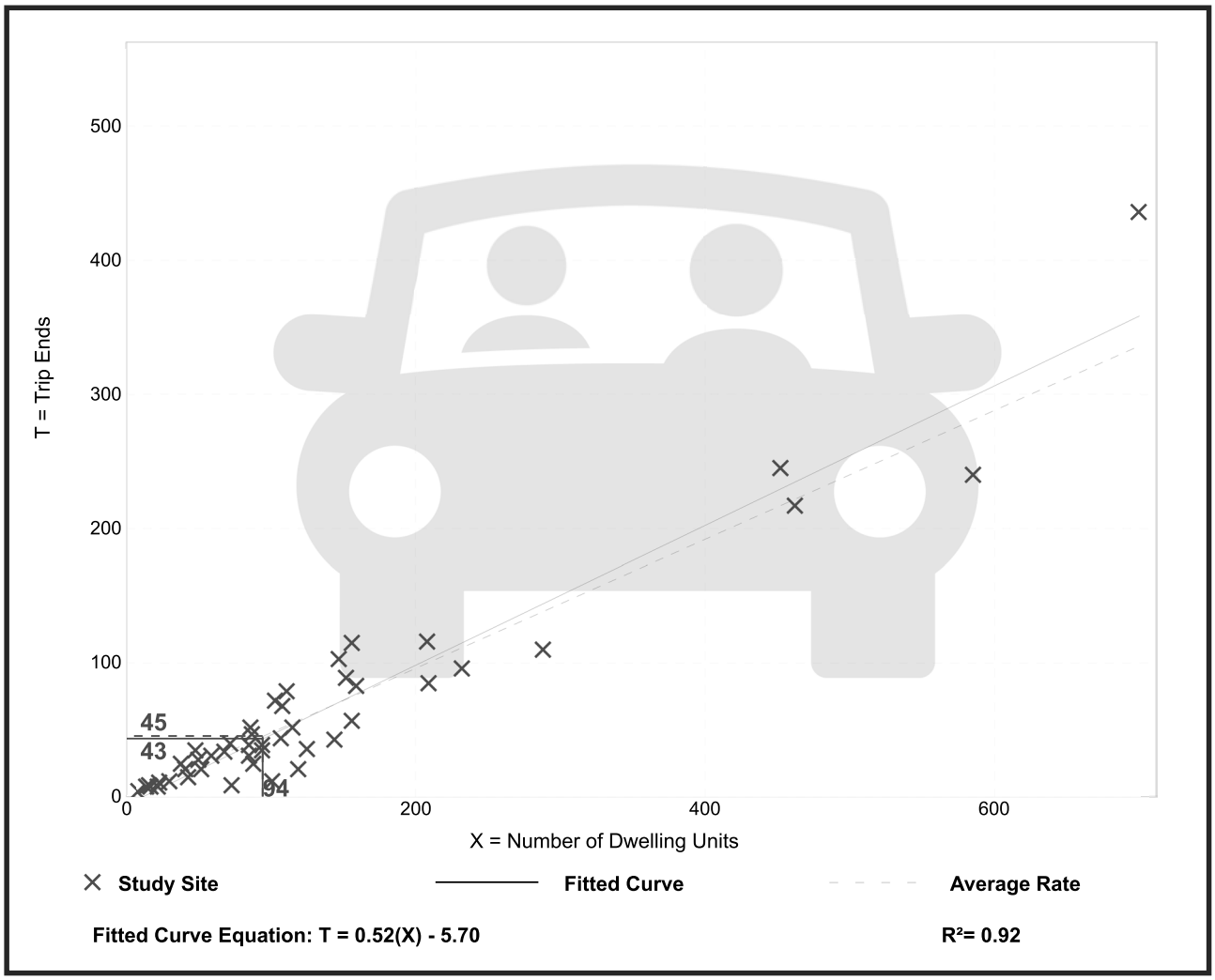
Single-Family Attached Housing
(215)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 46
Avg. Num. of Dwelling Units: 135
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation



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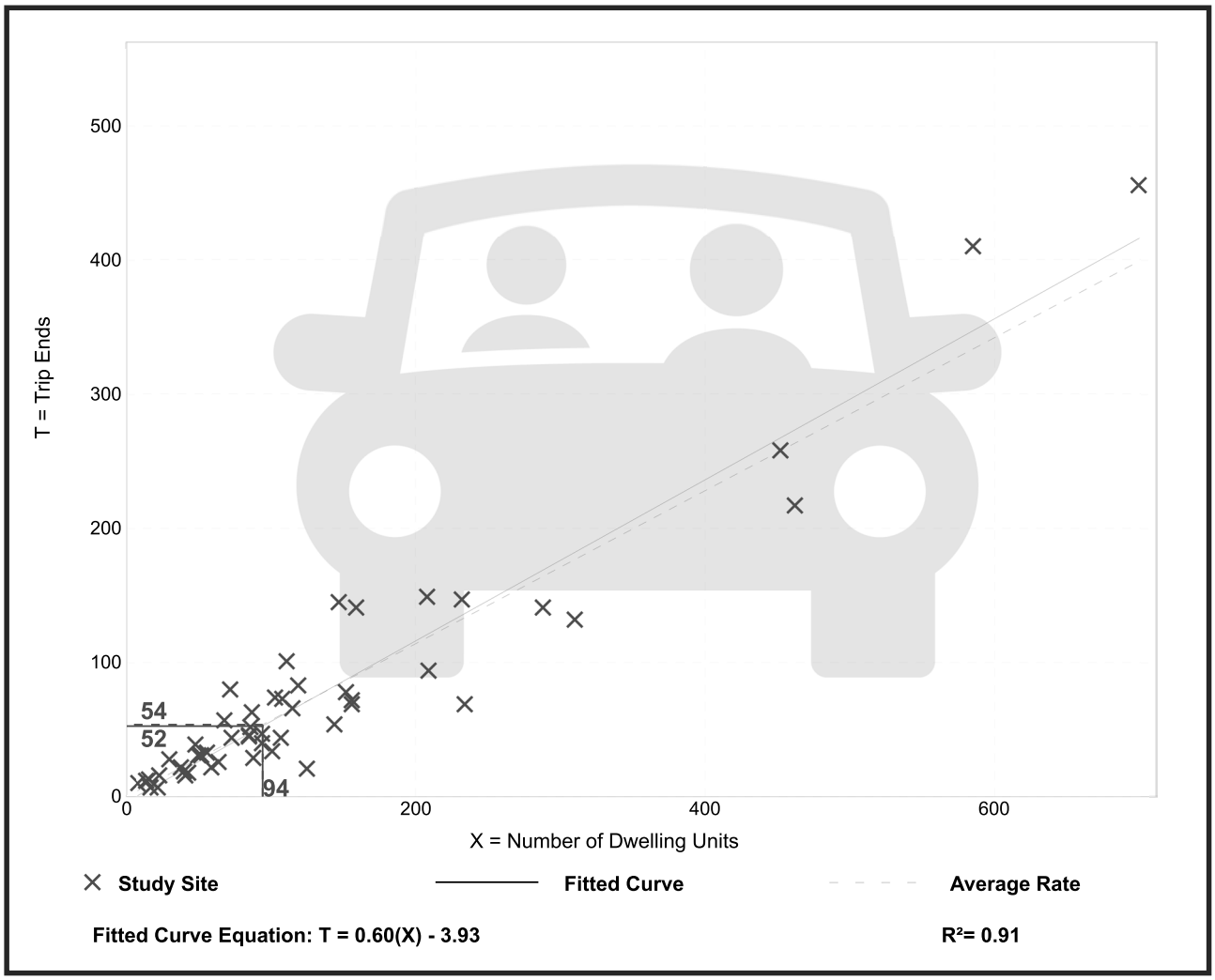
Single-Family Attached Housing
(215)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	51
Avg. Num. of Dwelling Units:	136
Directional Distribution:	59% entering, 41% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



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Day Care Center
(565)

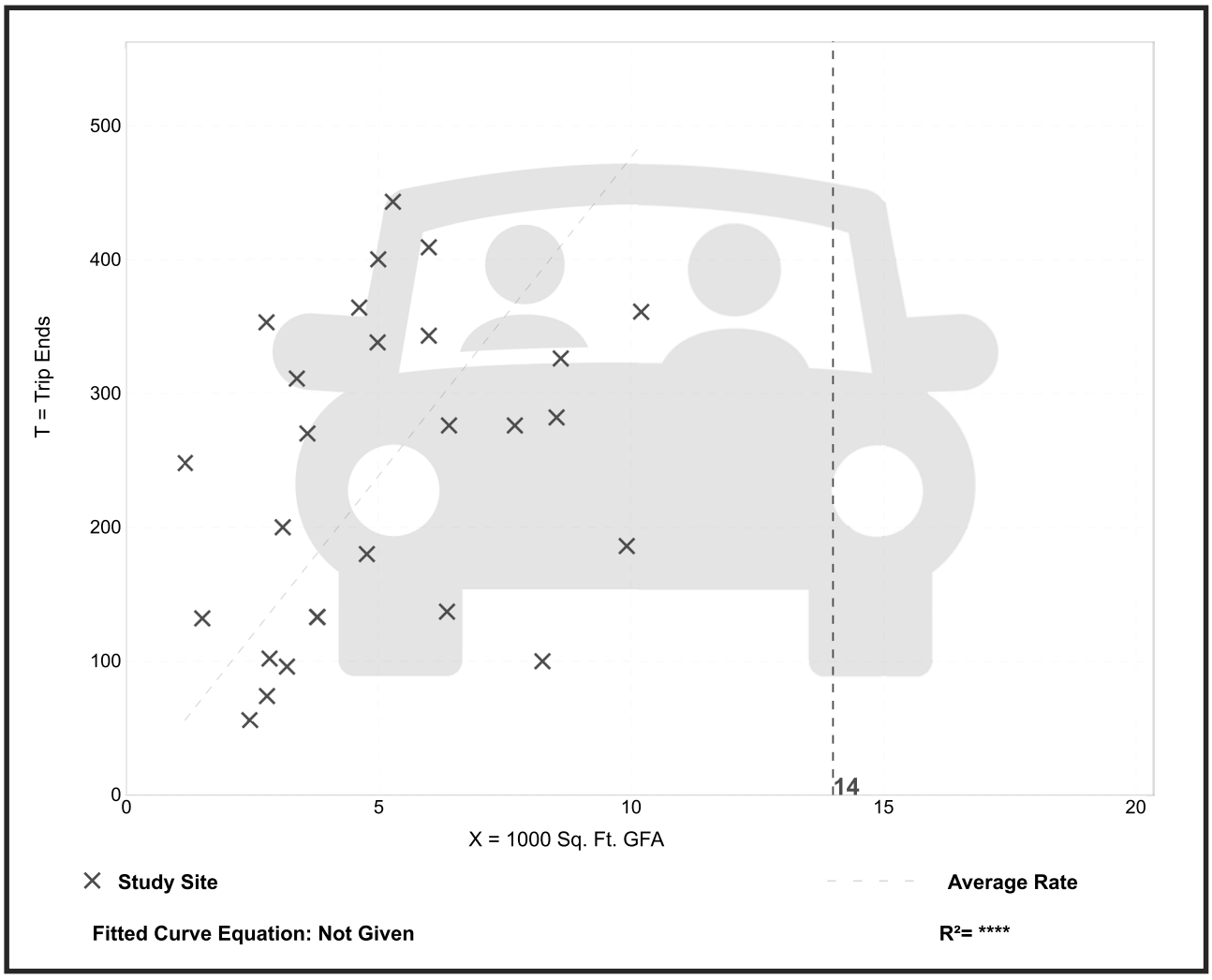
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 27
Avg. 1000 Sq. Ft. GFA: 5
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
47.62	12.12 - 211.06	29.78

Data Plot and Equation



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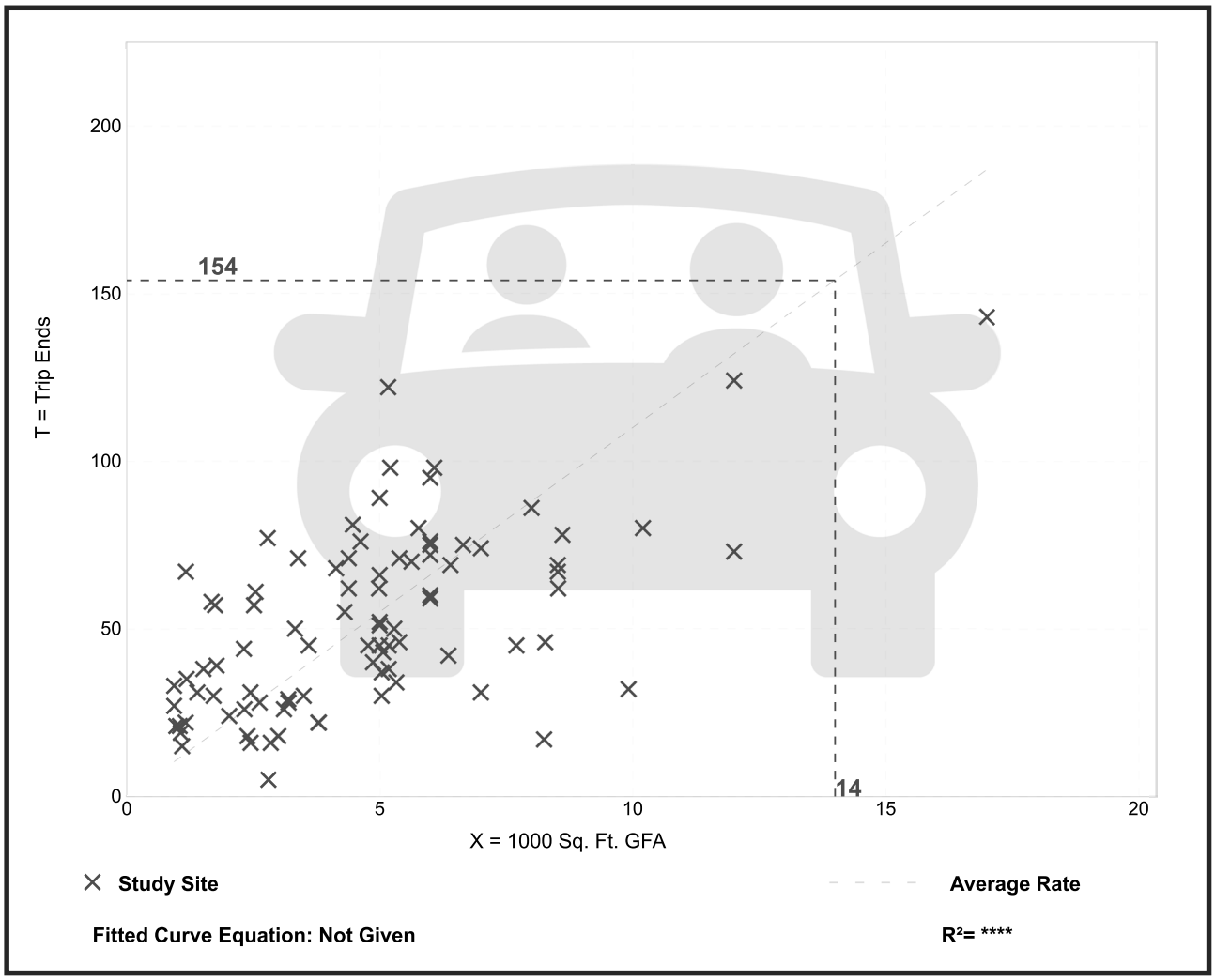
Day Care Center
(565)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 89
Avg. 1000 Sq. Ft. GFA: 5
Directional Distribution: 53% entering, 47% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
11.00	1.79 - 57.02	6.08

Data Plot and Equation



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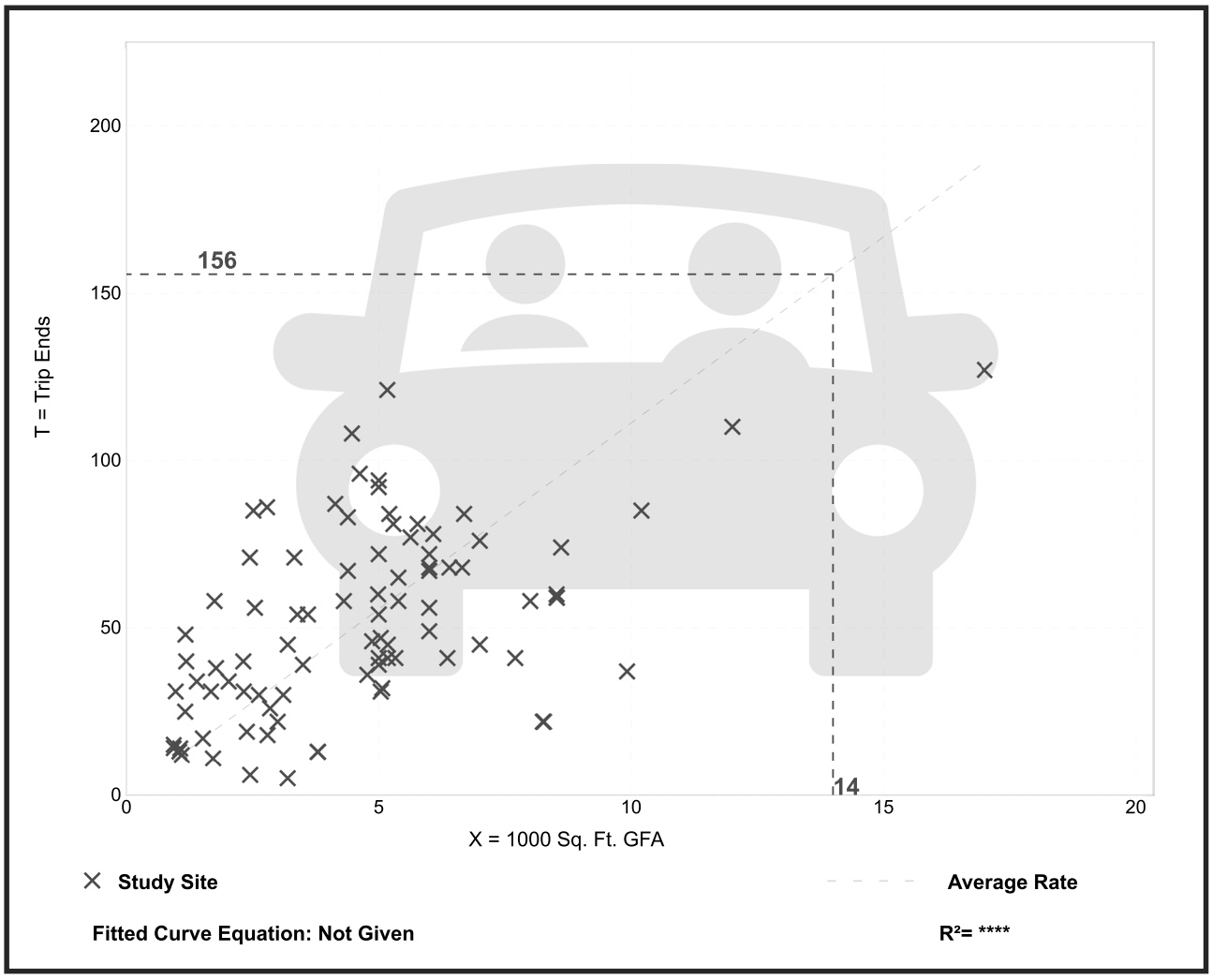
Day Care Center
(565)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 90
Avg. 1000 Sq. Ft. GFA: 5
Directional Distribution: 47% entering, 53% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
11.12	1.56 - 40.85	6.28

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Senior Adult Housing - Single-Family
(251)

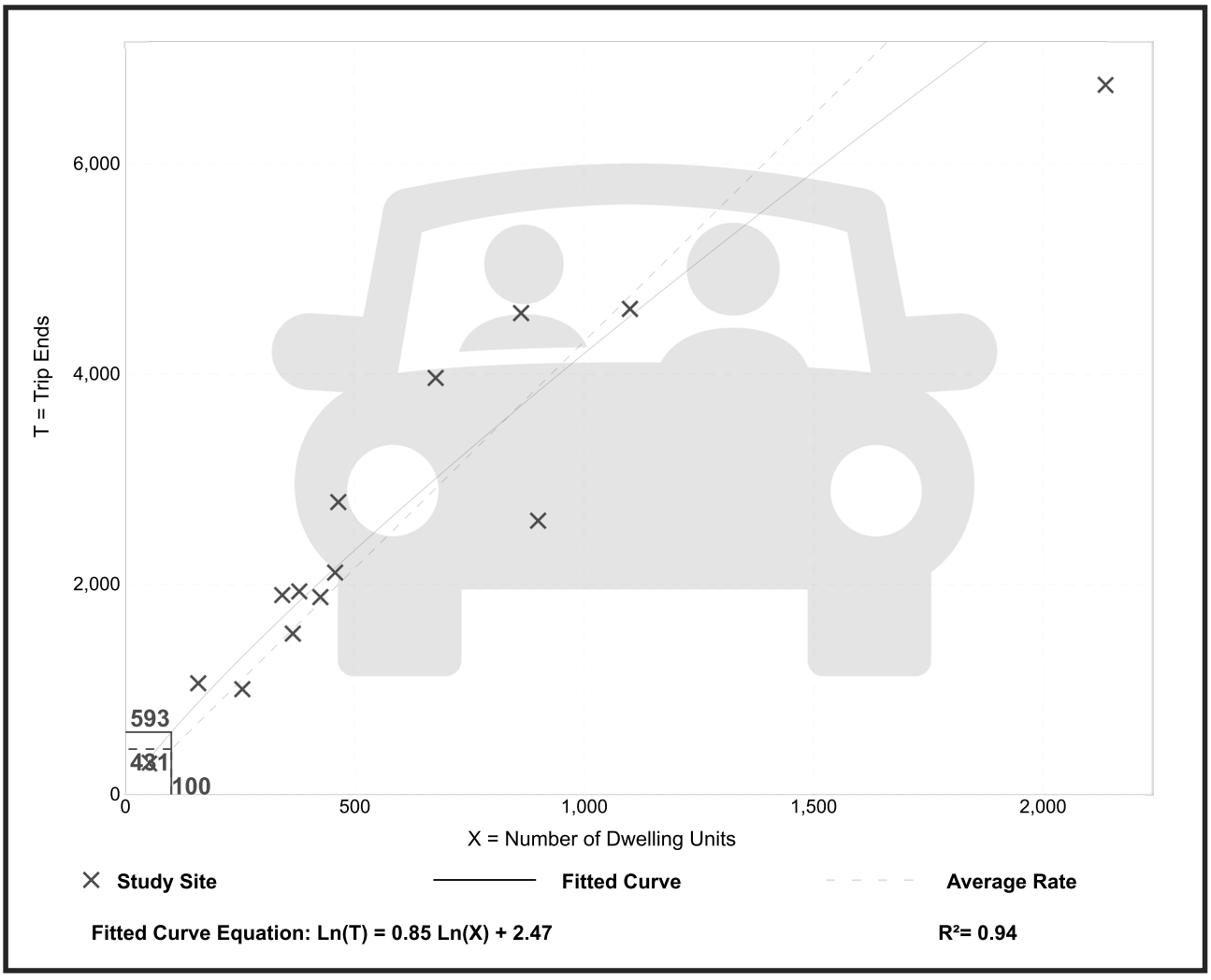
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 15
Avg. Num. of Dwelling Units: 646
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.31	2.90 - 6.66	1.07

Data Plot and Equation



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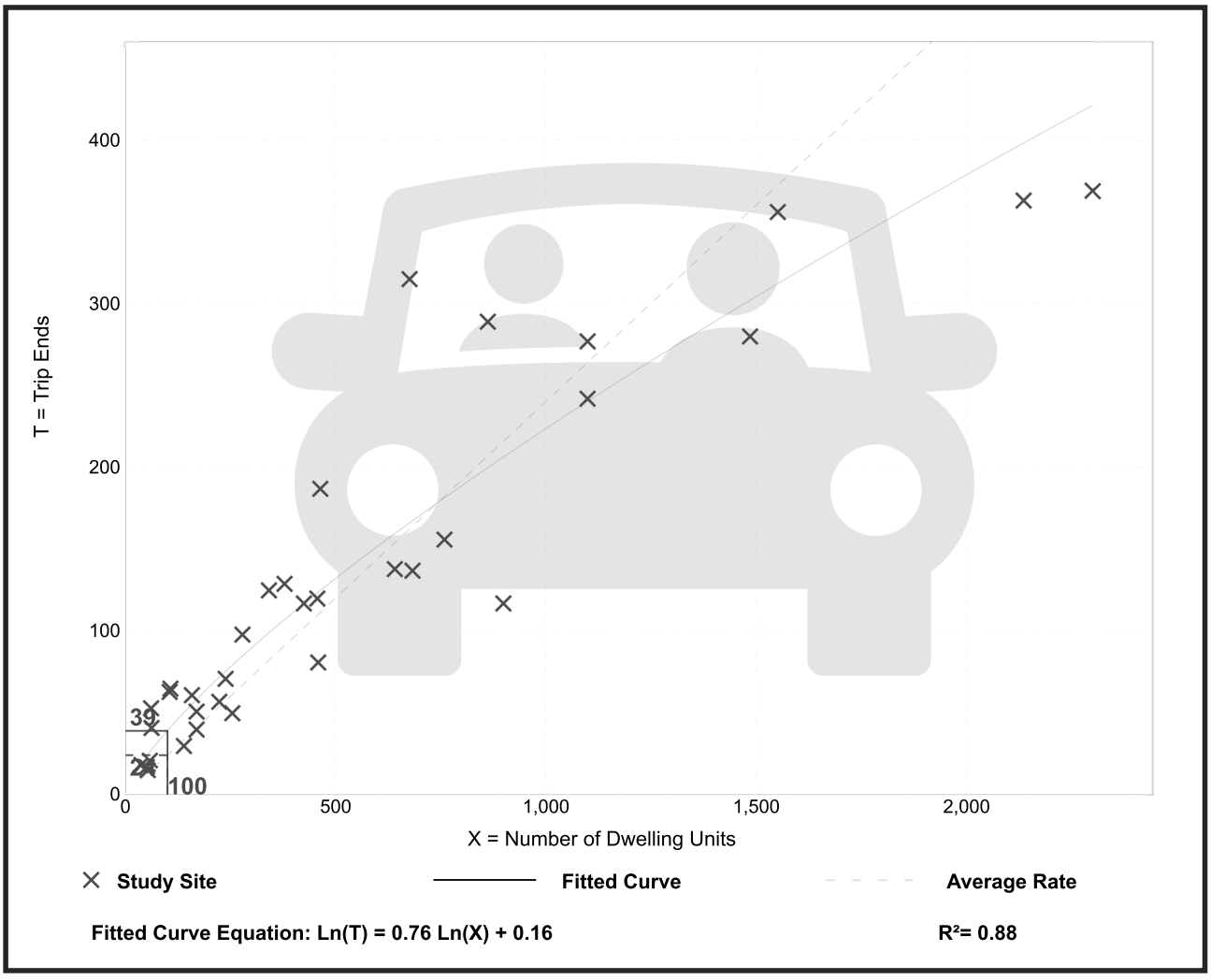
Senior Adult Housing - Single-Family
(251)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 34
Avg. Num. of Dwelling Units: 557
Directional Distribution: 33% entering, 67% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.24	0.13 - 0.84	0.10

Data Plot and Equation



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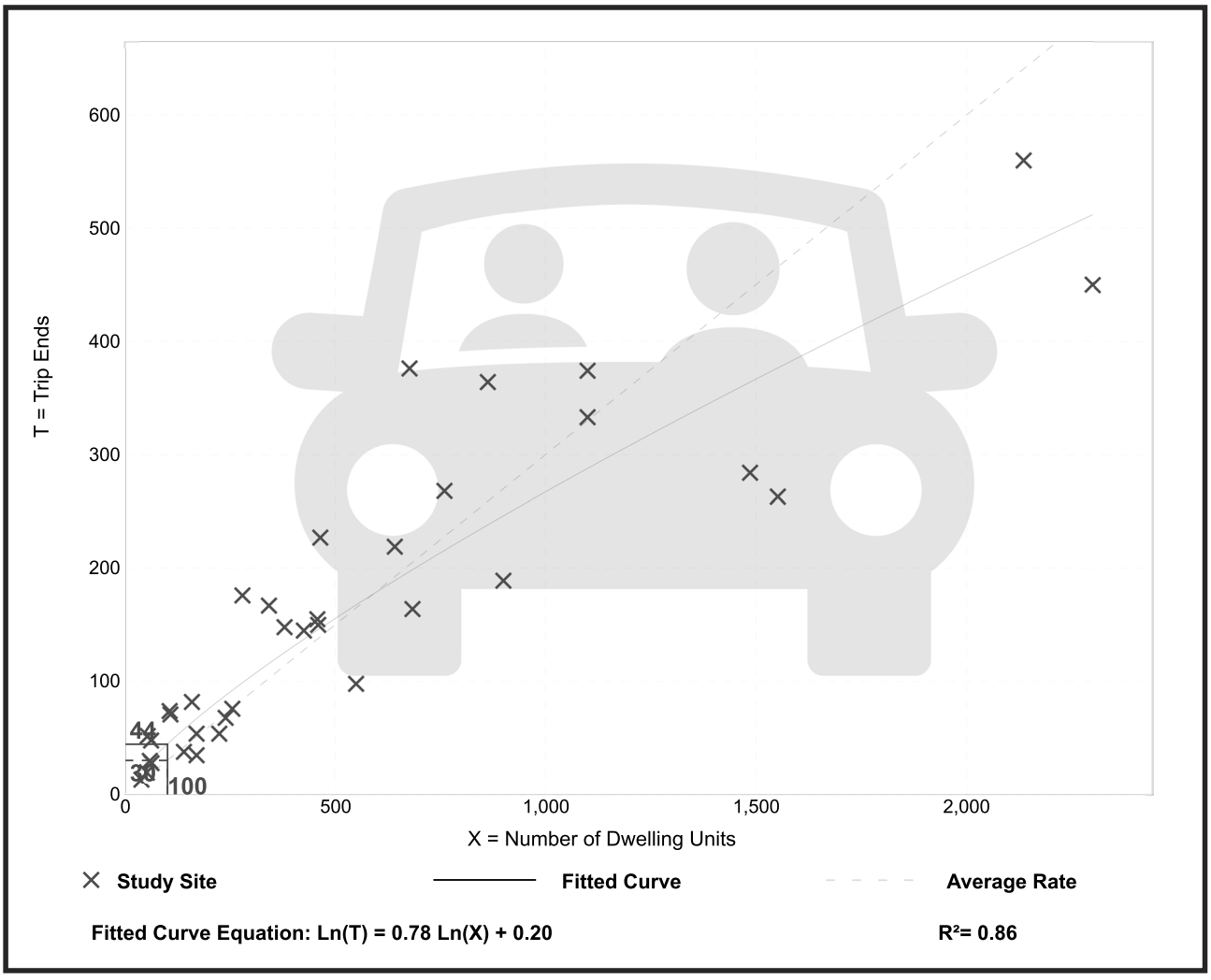
Senior Adult Housing - Single-Family
(251)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 35
Avg. Num. of Dwelling Units: 556
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.30	0.17 - 0.95	0.12

Data Plot and Equation



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APPENDIX G
TRAFFIC CALCULATION WORKSHEETS

Traffic Volume Calculations
#1 US 31 S at Bear Creek Pk/US 43

AM Peak Hour

Condition	Eastbound US 43			Westbound Bear Creek Pk			Northbound US 31 S			Southbound US 31 S		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2021 Existing Traffic Volumes (Unadjusted)	701	448	35	293	340	290	26	713	238	194	713	684
Adjustment Factor	1.080	1.080	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
2021 Existing Traffic Volumes (Adjusted)	757	484	38	316	367	313	28	770	257	210	770	739
Farm Bureau Traffic		53		1	1				28	24		
2023 Existing Traffic Volumes	757	537	38	317	368	313	28	770	285	234	770	739
2031 Background Growth (Phases 1-3)												
Growth Rate (3% Annual for 8 Years)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Background Growth Volumes	182	129	9	76	88	75	7	185	68	56	185	177
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Background Growth Volumes	250	177	13	105	121	103	9	254	94	77	254	244
Approved Off-Site Developments:												
Dollar General Assignment		4		2	3	2			2	2		
2031 Background Traffic Volumes (Phases 1-3)	939	670	47	395	459	390	35	955	355	292	955	916
2034 Background Traffic Voumes (Full Buildout)	1007	718	51	424	492	418	37	1024	381	313	1024	983
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter		10%							10%	25%		
Exit				10%	10%	25%						
Traffic Assignment												
Enter 147	0	15	0	0	0	0	0	0	15	37	0	0
Exit 252	0	0	0	25	25	63	0	0	0	0	0	0
Total Assignment	0	15	0	25	25	63	0	0	15	37	0	0
2031 Total Projected Traffic Volumes (Phase 1-3)	939	685	47	420	484	453	35	955	370	329	955	916
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter		10%							10%	25%		
Exit				10%	10%	25%						
Traffic Assignment												
Enter 214	0	21	0	0	0	0	0	0	21	54	0	0
Exit 444	0	0	0	44	44	111	0	0	0	0	0	0
Total Assignment	0	21	0	44	44	112	0	0	21	54	0	0
2034 Total Projected Traffic Volumes (Full Buildout)	1007	739	51	468	536	530	37	1024	402	367	1024	983

PM Peak Hour

Condition	Eastbound US 43			Westbound Bear Creek Pk			Northbound US 31 S			Southbound US 31 S		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2021 Existing Traffic Volumes (Unadjusted)	566	438	48	366	499	184	54	752	382	222	872	739
Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2021 Existing Traffic Volumes (Adjusted)	566	438	48	366	499	184	54	752	382	222	872	739
Farm Bureau Traffic		4		11	15	6			3	2		
2023 Existing Traffic Volumes	566	442	48	377	514	190	54	752	385	224	872	739
2031 Background Growth (Phases 1-3)												
Growth Rate (3% Annual for 8 Years)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Background Growth Volumes	136	106	12	90	123	46	13	180	92	54	209	177
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Background Growth Volumes	187	146	16	124	170	63	18	248	127	74	288	244
Approved Developments:												
Dollar General Assignment		8		6	8	2			6	3		
2031 Background Traffic Volumes (Phases 1-3)	702	556	60	473	645	238	67	932	483	281	1081	916
2034 Background Traffic Voumes (Full Buildout)	753	596	64	507	692	255	72	1000	518	301	1160	983
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter	0%	10%	0%	0%	0%	0%	0%	0%	10%	25%	0%	0%
Exit	0%	0%	0%	10%	10%	25%	0%	0%	0%	0%	0%	0%
Traffic Assignment												
Enter 271	0	27	0	0	0	0	0	0	27	68	0	0
Exit 204	0	0	0	20	20	51	0	0	0	0	0	0
Total Assignment	0	27	0	20	21	51	0	0	27	68	0	0
2031 Total Projected Traffic Volumes (Phase 1-3)	702	583	60	493	666	289	67	932	510	349	1081	916
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter	0%	10%	0%	0%	0%	0%	0%	0%	10%	25%	0%	0%
Exit	0%	0%	0%	10%	10%	25%	0%	0%	0%	0%	0%	0%
Traffic Assignment												
Enter 452	0	45	0	0	0	0	0	0	45	113	0	0
Exit 316	0	0	0	31	31	79	0	0	0	0	0	0
Total Assignment	0	45	0	31	31	79	0	0	45	113	0	0
2034 Total Projected Traffic Volumes (Full Buildout)	753	641	64	538	723	334	72	1000	563	414	1160	983

**Adjusted for rounding errors.*

Traffic Volume Calculations
#2 Bear Creek Pk & Tom J Hitch Pkwy

AM Peak Hour

Condition	Eastbound Bear Creek Pk			Westbound Bear Creek Pk			Northbound Tom J Hitch Pkway			Southbound Farm Bureau Access		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2021 Existing Traffic Volumes (Unadjusted)		536	153	182	689		313		182			
Adjustment Factor	1.080	1.080	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
2021 Existing Traffic Volumes (Adjusted)	0	579	165	197	744	0	338	0	197	0	0	0
Farm Bureau Traffic	105					34		67		1	2	2
2023 Existing Traffic Volumes	105	579	165	197	744	34	338	67	197	1	2	2
2031 Background Growth (Phases 1-3)												
Growth Rate (3% Annual for 8 Years)	0	0.24	0.24	0.24	0.24	0	0.24	0	0.24	0	0	0
Background Growth Volumes	0	139	40	47	179	0	81	0	47	0	0	0
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.00	0.33	0.33	0.33	0.33	0.00	0.33	0.00	0.33	0.00	0.00	0.00
Background Growth Volumes	0	191	54	65	246	0	112	0	65	0	0	0
Approved Developments:												
Dollar General Assignment		8		2	7				3			
2031 Background Traffic Volumes (Phases 1-3)	105	726	205	246	930	34	419	67	247	1	2	2
2034 Background Traffic Voumes (Full Buildout)	105	778	219	264	997	34	450	67	265	1	2	2
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter		45%							20%			
Exit				20%	45%							
Traffic Assignment												
Enter 147	0	66	0	0	0	0	0	0	29	0	0	0
Exit 252	0	0	0	50	113	0	0	0	0	0	0	0
Total Assignment	0	67	0	50	113	0	0	0	29	0	0	0
2031 Total Projected Traffic Volumes (Phase 1-3)	105	793	205	296	1043	34	419	67	276	1	2	2
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter		40%	5%									
Exit					40%		5%					
Traffic Assignment												
Enter 214	0	87	11	0	0	0	0	0	0	0	0	0
Exit 444	0	0	0	0	178	0	22	0	0	0	0	0
Total Assignment	0	85	11	0	178	0	22	0	0	0	0	0
2034 Total Projected Traffic Volumes (Full Buildout)	105	863	230	264	1175	34	472	67	265	1	2	2

PM Peak Hour

Condition	Eastbound Bear Creek Pk			Westbound Bear Creek Pk			Northbound Tom J Hitch Pkway			Southbound Farm Bureau Access		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2021 Existing Traffic Volumes (Unadjusted)		678	239	266	761		175		213			
Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2021 Existing Traffic Volumes (Adjusted)	0	678	239	266	761	0	175	0	213	0	0	0
Farm Bureau Traffic	9					4		9		32	67	32
2023 Existing Traffic Volumes	9	678	239	266	761	4	175	9	213	32	67	32
2031 Background Growth (Phases 1-3)												
Growth Rate (3% Annual for 8 Years)	0	0.24	0.24	0.24	0.24	0	0.24	0	0.24	0	0	0
Background Growth Volumes	0	163	57	64	183	0	42	0	51	0	0	0
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.00	0.33	0.33	0.33	0.33	0.00	0.33	0.00	0.33	0.00	0.00	0.00
Background Growth Volumes	0	224	79	88	251	0	58	0	70	0	0	0
Approved Developments:												
Dollar General Assignment		17		5	16				5			
2031 Background Traffic Volumes (Phases 1-3)	9	858	296	335	960	4	217	9	269	32	67	32
2034 Background Traffic Voumes (Full Buildout)	9	919	318	359	1028	4	233	9	288	32	67	32
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter	0%	45%	0%	0%	0%	0%	0%	0%	20%	0%	0%	0%
Exit	0%	0%	0%	20%	45%	0%	0%	0%	0%	0%	0%	0%
Traffic Assignment												
Enter 271	0	122	0	0	0	0	0	0	54	0	0	0
Exit 204	0	0	0	41	92	0	0	0	0	0	0	0
Total Assignment	0	122	0	41	92	0	0	0	54	0	0	0
2031 Total Projected Traffic Volumes (Phase 1-3)	9	980	296	376	1052	4	217	9	323	32	67	32
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter	0%	40%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Exit	0%	0%	0%	0%	40%	0%	5%	0%	0%	0%	0%	0%
Traffic Assignment												
Enter 452	0	181	23	0	0	0	0	0	0	0	0	0
Exit 316	0	0	0	0	125	0	16	0	0	0	0	0
Total Assignment	0	180	23	0	125	0	16	0	0	0	0	0
2034 Total Projected Traffic Volumes (Full Buildout)	9	1099	341	359	1153	4	249	9	288	32	67	32

**Adjusted for rounding errors.*

Traffic Volume Calculations
#3 Bear Creek Pk & Patterson Drive/Site Access 1

AM Peak Hour

Condition	Eastbound Bear Creek Pk			Westbound Bear Creek Pk			Northbound Site Access 1			Southbound Patterson Dr		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2021 Existing Traffic Volumes (Unadjusted)	11	694			798	7				16		42
Adjustment Factor	1.080	1.080	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
2021 Existing Traffic Volumes (Adjusted)	12	750	0	0	862	8	0	0	0	17	0	45
Farm Bureau Traffic		1			34							
2023 Existing Traffic Volumes	12	751	0	0	896	8	0	0	0	17	0	45
2031 Background Growth (Phases 1-3)												
Growth Rate (3% Annual for 8 Years)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Background Growth Volumes	3	180	0	0	215	2	0	0	0	4	0	11
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Background Growth Volumes	4	248	0	0	296	3	0	0	0	6	0	15
Approved Developments:												
Dollar General Assignment	2	5			5							3
2031 Background Traffic Volumes (Phases 1-3)	17	936	0	0	1116	10	0	0	0	21	0	59
2034 Background Traffic Voumes (Full Buildout)	18	1004	0	0	1197	11	0	0	0	23	0	63
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter			65%	30%							5%	
Exit							65%	5%	30%			
Traffic Assignment												
Enter 147	0	0	96	44	0	0	0	0	0	0	7	0
Exit 252	0	0	0	0	0	0	164	13	76	0	0	0
Total Assignment	0	0	96	44	0	0	163	13	76	0	7	0
2031 Total Projected Traffic Volumes (Phase 1-3)	17	936	96	44	1116	10	163	13	76	21	7	59
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter			40%	25%							5%	
Exit							40%	5%	25%			
Traffic Assignment												
Enter 214	0	0	87	54	0	0	0	0	0	0	11	0
Exit 444	0	0	0	0	0	0	178	22	111	0	0	0
Total Assignment	0	0	85	54	0	0	178	22	111	0	10	0
2034 Total Projected Traffic Volumes (Full Buildout)	18	1004	85	54	1197	11	178	22	111	23	10	63

PM Peak Hour

Condition	Eastbound Bear Creek Pk			Westbound Bear Creek Pk			Northbound Site Access 1			Southbound Patterson Dr		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2021 Existing Traffic Volumes (Unadjusted)	43	861			891	15				5		36
Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2021 Existing Traffic Volumes (Adjusted)	43	861	0	0	891	15	0	0	0	5	0	36
Farm Bureau Traffic		32			4							
2023 Existing Traffic Volumes	43	893	0	0	895	15	0	0	0	5	0	36
2031 Background Growth (Phases 1-3)												
Growth Rate (3% Annual for 8 Years)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Background Growth Volumes	10	214	0	0	215	4	0	0	0	1	0	9
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Background Growth Volumes	14	295	0	0	295	5	0	0	0	2	0	12
Approved Developments:												
Dollar General Assignment	5	11			12							5
2031 Background Traffic Volumes (Phases 1-3)	58	1118	0	0	1122	19	0	0	0	6	0	50
2034 Background Traffic Voumes (Full Buildout)	62	1199	0	0	1202	20	0	0	0	7	0	53
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter	0%	0%	65%	30%	0%	0%	0%	0%	0%	0%	5%	0%
Exit	0%	0%	0%	0%	0%	0%	65%	5%	30%	0%	0%	0%
Traffic Assignment												
Enter 271	0	0	176	81	0	0	0	0	0	0	14	0
Exit 204	0	0	0	0	0	0	133	10	61	0	0	0
Total Assignment	0	0	176	81	0	0	133	10	61	0	14	0
2031 Total Projected Traffic Volumes (Phase 1-3)	58	1118	176	81	1122	19	133	10	61	6	14	50
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter	0%	0%	40%	25%	0%	0%	0%	0%	0%	0%	5%	0%
Exit	0%	0%	0%	0%	0%	0%	40%	5%	25%	0%	0%	0%
Traffic Assignment												
Enter 452	0	0	181	113	0	0	0	0	0	0	23	0
Exit 316	0	0	0	0	0	0	125	16	79	0	0	0
Total Assignment	0	0	180	113	0	0	125	16	80	0	23	0
2034 Total Projected Traffic Volumes (Full Buildout)	62	1199	180	113	1202	20	125	16	80	7	23	53

**Adjusted for rounding errors.*

Traffic Volume Calculations
#4 Bear Creek Pk & Mt Olivet Rd

AM Peak Hour

Condition	Eastbound Bear Creek Pk			Westbound Bear Creek Pk			Northbound Mt Olivet Rd			Southbound Mt Olivet Rd		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2021 Existing Traffic Volumes (Unadjusted)	204	525	28	18	579	32	84	45	28	46	23	170
Adjustment Factor	1.080	1.080	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
2021 Existing Traffic Volumes (Adjusted)	220	567	30	19	625	35	91	49	30	50	25	184
Farm Bureau Traffic		1			34							
2023 Existing Traffic Volumes	220	568	30	19	659	35	91	49	30	50	25	184
2031 Background Growth (Phases 1-3)												
Growth Rate (3% Annual for 8 Years)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Background Growth Volumes	53	136	7	5	158	8	22	12	7	12	6	44
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Background Growth Volumes	73	187	10	6	217	12	30	16	10	17	8	61
Approved Developments:												
Dollar General Assignment					4		1					
2031 Background Traffic Volumes (Phases 1-3)	273	704	37	24	821	43	114	61	37	62	31	228
2034 Background Traffic Voumes (Full Buildout)	293	755	40	25	880	47	122	65	40	67	33	245
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter					25%							5%
Exit	5%	25%										
Traffic Assignment												
Enter 147	0	0	0	0	37	0	0	0	0	0	0	7
Exit 252	13	63	0	0	0	0	0	0	0	0	0	0
Total Assignment	13	63	0	0	37	0	0	0	0	0	0	7
2031 Total Projected Traffic Volumes (Phase 1-3)	286	767	37	24	858	43	114	61	37	62	31	235
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter				5%	20%							5%
Exit	5%	20%							5%			
Traffic Assignment												
Enter 214	0	0	0	11	43	0	0	0	0	0	0	11
Exit 444	22	89	0	0	0	0	0	0	22	0	0	0
Total Assignment	22	89	0	11	43	0	0	0	22	0	0	11
2034 Total Projected Traffic Volumes (Full Buildout)	315	844	40	36	923	47	122	65	62	67	33	256

PM Peak Hour

Condition	Eastbound Bear Creek Pk			Westbound Bear Creek Pk			Northbound Mt Olivet Rd			Southbound Mt Olivet Rd		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2021 Existing Traffic Volumes (Unadjusted)	28	829	7	23	754	85	53	5	30	11	9	31
Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2021 Existing Traffic Volumes (Adjusted)	28	829	7	23	754	85	53	5	30	11	9	31
Farm Bureau Traffic		32			4							
2023 Existing Traffic Volumes	28	861	7	23	758	85	53	5	30	11	9	31
2031 Background Growth (Phases 1-3)												
Growth Rate (3% Annual for 8 Years)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Background Growth Volumes	7	207	2	6	182	20	13	1	7	3	2	7
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Background Growth Volumes	9	284	2	8	250	28	17	2	10	4	3	10
Approved Developments:												
Dollar General Assignment					11		1					
2031 Background Traffic Volumes (Phases 1-3)	35	1068	9	29	951	105	67	6	37	14	11	38
2034 Background Traffic Voumes (Full Buildout)	37	1145	9	31	1019	113	71	7	40	15	12	41
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%	5%
Exit	5%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Traffic Assignment												
Enter 271	0	0	0	0	68	0	0	0	0	0	0	14
Exit 204	10	51	0	0	0	0	0	0	0	0	0	0
Total Assignment	10	51	0	0	67	0	0	0	0	0	0	14
2031 Total Projected Traffic Volumes (Phase 1-3)	45	1119	9	29	1018	105	67	6	37	14	11	52
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter	0%	0%	0%	5%	20%	0%	0%	0%	0%	0%	0%	5%
Exit	5%	20%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%
Traffic Assignment												
Enter 452	0	0	0	23	90	0	0	0	0	0	0	23
Exit 316	16	63	0	0	0	0	0	0	16	0	0	0
Total Assignment	16	64	0	23	90	0	0	0	16	0	0	23
2034 Total Projected Traffic Volumes (Full Buildout)	53	1209	9	54	1109	113	71	7	56	15	12	64

**Adjusted for rounding errors.*

Traffic Volume Calculations
#5 Tom J Hitch Pkwy & Iron Bridge Rd

AM Peak Hour

Condition	Eastbound Iron Bridge Rd			Westbound Iron Bridge Rd			Northbound Tom J Hitch Pkwy			Southbound Tom J Hitch Pkwy		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2023 Existing Traffic Volumes	28	35	6	91	94	46	9	406	67	26	307	24
2031 Background Growth (Phases 1-3)												
Growth Rate (3% Annual for 8 Years)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Background Growth Volumes	7	8	1	22	23	11	2	97	16	6	74	6
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Background Growth Volumes	9	12	2	30	31	15	3	134	22	9	101	8
Approved Developments:												
Dollar General Assignment								3			2	
2031 Background Traffic Volumes (Phases 1-3)	35	43	7	113	117	57	11	506	83	32	383	30
2034 Background Traffic Voumes (Full Buildout)	37	47	8	121	125	61	12	543	89	35	410	32
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter	5%							15%				
Exit											15%	5%
Traffic Assignment												
Enter 147	7	0	0	0	0	0	0	22	0	0	0	0
Exit 252	0	0	0	0	0	0	0	0	0	0	38	13
Total Assignment	7	0	0	0	0	0	0	22	0	0	38	12
2031 Total Projected Traffic Volumes (Phase 1-3)	42	43	7	113	117	57	11	528	83	32	421	42
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter		5%							15%	5%		
Exit				15%	5%	5%						
Traffic Assignment												
Enter 214	0	11	0	0	0	0	0	0	32	11	0	0
Exit 444	0	0	0	67	22	22	0	0	0	0	0	0
Total Assignment	0	11	0	67	22	22	0	0	32	11	0	0
2034 Total Projected Traffic Volumes (Full Buildout)	37	58	8	188	147	83	12	543	121	46	410	32

PM Peak Hour

Condition	Eastbound Iron Bridge Rd			Westbound Iron Bridge Rd			Northbound Tom J Hitch Pkwy			Southbound Tom J Hitch Pkwy		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2023 Existing Traffic Volumes	13	39	6	60	27	26	9	276	69	35	429	54
2031 Background Growth (Phases 1-3)												
Growth Rate (3% Annual for 8 Years)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Background Growth Volumes	3	9	1	14	6	6	2	66	17	8	103	13
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Background Growth Volumes	4	13	2	20	9	9	3	91	23	12	142	18
Approved Developments:												
Dollar General Assignment								5			4	1
2031 Background Traffic Volumes (Phases 1-3)	16	48	7	74	33	32	11	347	86	43	536	68
2034 Background Traffic Voumes (Full Buildout)	17	52	8	80	36	35	12	372	92	47	575	73
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter	5%	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%
Exit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	5%
Traffic Assignment												
Enter 271	14	0	0	0	0	0	0	41	0	0	0	0
Exit 204	0	0	0	0	0	0	0	0	0	0	31	10
Total Assignment	13	0	0	0	0	0	0	41	0	0	31	10
2031 Total Projected Traffic Volumes (Phase 1-3)	29	48	7	74	33	32	11	388	86	43	567	78
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter	0%	5%	0%	0%	0%	0%	0%	0%	15%	5%	0%	0%
Exit	0%	0%	0%	15%	5%	5%	0%	0%	0%	0%	0%	0%
Traffic Assignment												
Enter 452	0	23	0	0	0	0	0	0	68	23	0	0
Exit 316	0	0	0	47	16	16	0	0	0	0	0	0
Total Assignment	0	22	0	47	16	16	0	0	68	23	0	0
2034 Total Projected Traffic Volumes (Full Buildout)	17	74	8	127	52	51	12	372	160	70	575	73

**Adjusted for rounding errors.*

Traffic Volume Calculations
#6 Iron Bridge Rd & Mt Olivet Rd

AM Peak Hour

Condition	Eastbound Iron Bridge Rd			Westbound Iron Bridge Rd			Northbound			Southbound Mt Olivet Rd		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2021 Existing Traffic Volumes (Unadjusted)	29	26			107	17				7		56
Adjustment Factor	1.080	1.080	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
2021 Existing Traffic Volumes (Adjusted)	31	28	0	0	116	18	0	0	0	8	0	60
Farm Bureau Traffic					6							
2023 Existing Traffic Volumes	31	28	0	0	122	18	0	0	0	8	0	60
2031 Background Growth (Phases 1-3)												
Growth Rate (3% Annual for 8 Years)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Background Growth Volumes	7	7	0	0	29	4	0	0	0	2	0	14
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Background Growth Volumes	10	9	0	0	40	6	0	0	0	3	0	20
Approved Developments:												
Dollar General Assignment						1						
2031 Background Traffic Volumes (Phases 1-3)	38	35	0	0	151	23	0	0	0	10	0	74
2034 Background Traffic Voumes (Full Buildout)	41	37	0	0	162	25	0	0	0	11	0	80
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter												
Exit												
Traffic Assignment												
Enter 147	0	0	0	0	0	0	0	0	0	0	0	0
Exit 252	0	0	0	0	0	0	0	0	0	0	0	0
Total Assignment	0	0	0	0	0	0	0	0	0	0	0	0
2031 Total Projected Traffic Volumes (Phase 1-3)	38	35	0	0	151	23	0	0	0	10	0	74
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter												5%
Exit	5%											
Traffic Assignment												
Enter 214	0	0	0	0	0	0	0	0	0	0	0	11
Exit 444	22	0	0	0	0	0	0	0	0	0	0	0
Total Assignment	22	0	0	0	0	0	0	0	0	0	0	11
2034 Total Projected Traffic Volumes (Full Buildout)	63	37	0	0	162	25	0	0	0	11	0	91

PM Peak Hour

Condition	Eastbound Iron Bridge Rd			Westbound Iron Bridge Rd			Northbound 0			Southbound Mt Olivet Rd		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2021 Existing Traffic Volumes (Unadjusted)	48	74			52	6				17		45
Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2021 Existing Traffic Volumes (Adjusted)	48	74	0	0	52	6	0	0	0	17	0	45
Farm Bureau Traffic		5			1							
2023 Existing Traffic Volumes	48	79	0	0	53	6	0	0	0	17	0	45
2031 Background Growth (Phases 1-3)												
Growth Rate (3% Annual for 8 Years)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Background Growth Volumes	12	19	0	0	13	1	0	0	0	4	0	11
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Background Growth Volumes	16	26	0	0	17	2	0	0	0	6	0	15
Approved Developments:												
Dollar General Assignment						1						
2031 Background Traffic Volumes (Phases 1-3)	60	98	0	0	66	8	0	0	0	21	0	56
2034 Background Traffic Voumes (Full Buildout)	64	105	0	0	70	9	0	0	0	23	0	60
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Exit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Traffic Assignment												
Enter 271	0	0	0	0	0	0	0	0	0	0	0	0
Exit 204	0	0	0	0	0	0	0	0	0	0	0	0
Total Assignment	0	0	0	0	0	0	0	0	0	0	0	0
2031 Total Projected Traffic Volumes (Phase 1-3)	60	98	0	0	66	8	0	0	0	21	0	56
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%
Exit	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Traffic Assignment												
Enter 452	0	0	0	0	0	0	0	0	0	0	0	23
Exit 316	16	0	0	0	0	0	0	0	0	0	0	0
Total Assignment	16	0	0	0	0	0	0	0	0	0	0	23
2034 Total Projected Traffic Volumes (Full Buildout)	80	105	0	0	70	9	0	0	0	23	0	83

**Adjusted for rounding errors.*

Traffic Volume Calculations
#7 James Campbell Blvd & Tom J Hitch Pkwy

AM Peak Hour

Condition	Eastbound James Campbell Blvd			Westbound James Campbell Blvd			Northbound			Southbound Tom J Hitch Pkwy		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2021 Existing Traffic Volumes (Unadjusted)	251	254			544	86				20		193
Adjustment Factor	1.080	1.080	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
2021 Existing Traffic Volumes (Adjusted)	271	274	0	0	588	93	0	0	0	22	0	208
Farm Bureau Traffic	42					15						2
2023 Existing Traffic Volumes	313	274	0	0	588	108	0	0	0	22	0	210
2031 Background Growth (Phases 1-3)												
Growth Rate (3% Annual for 8 Years)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Background Growth Volumes	75	66	0	0	141	26	0	0	0	5	0	50
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Background Growth Volumes	103	90	0	0	194	36	0	0	0	7	0	69
Approved Developments:												
Dollar General Assignment	2					1						2
2031 Background Traffic Volumes (Phases 1-3)	390	340	0	0	729	135	0	0	0	27	0	262
2034 Background Traffic Voumes (Full Buildout)	418	364	0	0	782	145	0	0	0	29	0	281
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter	15%											
Exit												15%
Traffic Assignment												
Enter 147	22	0	0	0	0	0	0	0	0	0	0	0
Exit 252	0	0	0	0	0	0	0	0	0	0	0	38
Total Assignment	22	0	0	0	0	0	0	0	0	0	0	38
2031 Total Projected Traffic Volumes (Phase 1-3)	412	340	0	0	729	135	0	0	0	27	0	300
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter	15%											
Exit												15%
Traffic Assignment												
Enter 214	32	0	0	0	0	0	0	0	0	0	0	0
Exit 444	0	0	0	0	0	0	0	0	0	0	0	67
Total Assignment	32	0	0	0	0	0	0	0	0	0	0	67
2034 Total Projected Traffic Volumes (Full Buildout)	450	364	0	0	782	145	0	0	0	29	0	348

PM Peak Hour

Condition	Eastbound James Campbell Blvd			Westbound James Campbell Blvd			Northbound 0			Southbound Tom J Hitch Pkwy		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2021 Existing Traffic Volumes (Unadjusted)	314	537			349	44				33		342
Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2021 Existing Traffic Volumes (Adjusted)	314	537	0	0	349	44	0	0	0	33	0	342
Farm Bureau Traffic	7					1				5		50
2023 Existing Traffic Volumes	321	537	0	0	349	45	0	0	0	38	0	392
2031 Background Growth (Phases 1-3)												
Growth Rate (3% Annual for 8 Years)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Background Growth Volumes	77	129	0	0	84	11	0	0	0	9	0	94
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Background Growth Volumes	106	177	0	0	115	15	0	0	0	13	0	129
Approved Developments:												
Dollar General Assignment	4					1						4
2031 Background Traffic Volumes (Phases 1-3)	402	666	0	0	433	57	0	0	0	47	0	490
2034 Background Traffic Voumes (Full Buildout)	431	714	0	0	464	61	0	0	0	51	0	525
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Exit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%
Traffic Assignment												
Enter 271	41	0	0	0	0	0	0	0	0	0	0	0
Exit 204	0	0	0	0	0	0	0	0	0	0	0	31
Total Assignment	41	0	0	0	0	0	0	0	0	0	0	31
2031 Total Projected Traffic Volumes (Phase 1-3)	443	666	0	0	433	57	0	0	0	47	0	521
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Exit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%
Traffic Assignment												
Enter 452	68	0	0	0	0	0	0	0	0	0	0	0
Exit 316	0	0	0	0	0	0	0	0	0	0	0	47
Total Assignment	68	0	0	0	0	0	0	0	0	0	0	47
2034 Total Projected Traffic Volumes (Full Buildout)	499	714	0	0	464	61	0	0	0	51	0	572

**Adjusted for rounding errors.*

Traffic Volume Calculations
#8 Iron Bridge Rd & Site Access 2

AM Peak Hour

Condition	Eastbound Iron Bridge Rd			Westbound Iron Bridge Rd			Northbound			Southbound Site Access 2		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2023 Existing Traffic Volumes		128			231							
2031 Background Growth (Phase 1-3)												
Growth Rate (3% Annual for 8 Years)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Background Growth Volumes	0	31	0	0	55	0	0	0	0	0	0	0
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Background Growth Volumes	0	42	0	0	76	0	0	0	0	0	0	0
Approved Developments:												
Dollar General Assignment												
2031 Background Traffic Volumes (Phases 1-3)	0	159	0	0	286	0	0	0	0	0	0	0
2034 Background Traffic Voumes (Full Buildout)	0	170	0	0	307	0	0	0	0	0	0	0
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter												
Exit												
Traffic Assignment												
Enter 147	0	0	0	0	0	0	0	0	0	0	0	0
Exit 252	0	0	0	0	0	0	0	0	0	0	0	0
Total Assignment	0	0	0	0	0	0	0	0	0	0	0	0
2031 Total Projected Traffic Volumes (Phase 1-3)	0	159	0	0	286	0	0	0	0	0	0	0
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter	25%					5%						
Exit										5%		25%
Traffic Assignment												
Enter 214	54	0	0	0	0	11	0	0	0	0	0	0
Exit 444	0	0	0	0	0	0	0	0	0	22	0	111
Total Assignment	54	0	0	0	0	11	0	0	0	22	0	111
2034 Total Projected Traffic Volumes (Full Buildout)	54	170	0	0	307	11	0	0	0	22	0	111

PM Peak Hour

Condition	Eastbound Iron Bridge Rd			Westbound Iron Bridge Rd			Northbound 0			Southbound Site Access 2		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2023 Existing Traffic Volumes		143			113							
2031 Background Growth (Phase 1-3)												
Growth Rate (3% Annual for 8 Years)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Background Growth Volumes	0	34	0	0	27	0	0	0	0	0	0	0
2034 Background Growth (Full Buildout)												
Growth Rate (3% Annual for 11 Years)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Background Growth Volumes	0	47	0	0	37	0	0	0	0	0	0	0
Approved Developments:												
Dollar General Assignment												
2031 Background Traffic Volumes (Phases 1-3)	0	177	0	0	140	0	0	0	0	0	0	0
2034 Background Traffic Voumes (Full Buildout)	0	190	0	0	150	0	0	0	0	0	0	0
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Exit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Traffic Assignment												
Enter 271	0	0	0	0	0	0	0	0	0	0	0	0
Exit 204	0	0	0	0	0	0	0	0	0	0	0	0
Total Assignment	0	0	0	0	0	0	0	0	0	0	0	0
2031 Total Projected Traffic Volumes (Phase 1-3)	0	177	0	0	140	0	0	0	0	0	0	0
New Site Traffic (Full Buildout)												
Directional Distribution												
Enter	25%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%
Exit	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	25%
Traffic Assignment												
Enter 452	113	0	0	0	0	23	0	0	0	0	0	0
Exit 316	0	0	0	0	0	0	0	0	0	16	0	79
Total Assignment	113	0	0	0	0	23	0	0	0	16	0	79
2034 Total Projected Traffic Volumes (Full Buildout)	113	190	0	0	150	23	0	0	0	16	0	79

**Adjusted for rounding errors.*

APPENDIX H
CAPACITY ANALYSIS WORKSHEETS

AM PEAK HOUR									
Intersection	Control	Turning Movement	Level of Service (Delay in sec/veh)						
			2023 Existing	2031			2034		
				Background	Projected	Projected w/ Imps	Background	Projected	Projected w/ Imps
Nashville Hwy & US 43/Bear Creek Pk	Signal	EB Left Turn	F (88.2)	F (169.7)	F (173.2)	F (140.8)	F (210.2)	F (213.2)	F (195.5)
		EB Through/Right Turn	E (59.7)	E (72.3)	E (76.6)	E (55.9)	F (86.0)	F (94.8)	E (64.0)
		WB Left Turn	F (100.2)	E (60.9)	E (62.1)	E (57.5)	E (62.2)	E (65.3)	E (67.7)
		WB Through/Right Turn	F (92.3)	--	--	--	--	--	--
		WB Through	--	E (63.4)	E (64.9)	E (62.2)	E (65.3)	E (69.7)	E (63.7)
		WB Right Turn	--	F (99.1)	F (163.4)	F (237.0)	F (124.1)	F (272.9)	F (287.7)
		NB Left Turn	D (42.3)	D (43.9)	D (44.6)	C (33.1)	D (46.0)	D (46.3)	D (42.5)
		NB Through	E (69.7)	F (113.4)	F (121.2)	E (74.0)	F (149.8)	F (154.8)	F (147.3)
		NB Right Turn	D (46.5)	F (46.0)	D (47.0)	D (35.6)	D (47.1)	D (48.6)	D (44.8)
		SB Left Turn	F (116.5)	F (89.5)	F (98.8)	F (217.6)	F (95.2)	F (119.7)	F (191.8)
		SB Through	D (44.9)	D (51.7)	D (51.7)	D (44.9)	E (56.6)	E (55.9)	E (60.7)
		SB Right Turn	D (51.0)	F (129.2)	F (129.3)	F (100.0)	F (184.4)	F (182.8)	F (182.3)
		Overall Intersection	**E (70.5)**	**F (97.2)**	**F (104.0)**	**F (95.0)**	**F (120.8)**	**F (134.3)**	**F (132.2)**
Bear Creek Pk & Tom J Hitch Pkwy/ Farm Bureau Access	Signal	EB Left Turn	C (26.6)	D (45.8)	E (58.9)	F (92.1)	E (58.9)	E (58.9)	F (92.9)
		EB Through/Right Turn	D (48.5)	F (98.7)	F (128.6)	F (145.0)	F (129.4)	F (176.7)	F (179.4)
		WB Left Turn	E (69.1)	F (257.8)	F (379.3)	F (189.6)	F (301.7)	F (301.7)	F (235.1)
		WB Through	C (34.2)	E (55.2)	F (98.3)	F (75.9)	F (80.5)	F (156.1)	F (140.9)
		WB Right Turn	B (15.9)	B (14.9)	B (15.4)	B (12.9)	B (15.4)	B (15.4)	B (13.8)
		NB Left Turn	E (58.9)	F (120.1)	F (120.1)	F (168.4)	F (147.2)	F (167.8)	F (195.7)
		NB Through/Right Turn	E (56.1)	F (87.0)	F (109.4)	--	F (100.3)	F (100.3)	--
		NB Through	--	--	--	D (49.7)	--	--	D (48.0)
		NB Right Turn	--	--	--	D (44.0)	--	--	D (45.3)
		SB Left Turn	E (66.3)	E (71.9)	E (72.0)	E (68.0)	E (72.0)	E (72.0)	E (68.0)
		SB Through	E (66.7)	E (72.1)	E (72.1)	E (68.3)	E (72.1)	E (72.1)	E (68.3)
		SB Right Turn	E (66.7)	E (72.2)	E (72.2)	E (68.4)	E (72.2)	E (72.2)	E (68.4)
		Overall Intersection	**D (46.7)**	**F (97.3)**	**F (135.3)**	**F (116.2)**	**F (124.4)**	**F (165.7)**	**F (155.9)**
Bear Creek Pk & Patterson Dr/ Site Access 1	TWSC	EB Left Turn	B (10.3)	B (11.7)	B (11.7)	--	B (12.3)	B (12.3)	--
		WB Left Turn	--	--	B (11.4)	--	--	B (11.9)	--
		NB Left Turn	--	--	F (600+)	--	--	F (600+)	--
		NB Through/Right Turn	--	--	F (115.1)	--	--	F (444.3)	--
		SB Approach	E (40.9)	F (138.6)	F (600+)	--	F (255.3)	F (600+)	--
	Signal	EB Left Turn	--	--	--	E (58.7)	--	--	E (74.3)
		EB Through	--	--	--	C (34.4)	--	--	D (50.4)
		EB Right Turn	--	--	--	B (10.3)	--	--	B (10.5)
		WB Left Turn	--	--	--	C (25.1)	--	--	C (30.8)
		WB Through	--	--	--	C (25.7)	--	--	F (43.0)
		WB Right Turn	--	--	--	A (5.9)	--	--	A (6.0)
		NB Left Turn	--	--	--	D (52.1)	--	--	E (56.0)
		NB Through/Right Turn	--	--	--	D (51.3)	--	--	E (59.3)
		SB Left Turn	--	--	--	D (49.0)	--	--	D (48.9)
		SB Through/Right Turn	--	--	--	E (68.9)	--	--	E (71.9)
		Overall Intersection	**--**	**--**	**--**	**C (32.3)**	**--**	**--**	**D (46.9)**
Bear Creek Pk & Mt Olivet Rd/School Access	Signal	EB Left Turn	C (29.9)	F (112.8)	F (129.3)	F (87.6)	F (139.4)	F (173.0)	F (116.2)
		EB Through/Right Turn	B (18.5)	C (27.4)	C (33.7)	B (16.7)	C (32.7)	F (53.6)	B (19.1)
		WB Left Turn	B (14.4)	C (20.1)	C (22.3)	B (15.0)	C (22.0)	C (26.8)	B (17.5)
		WB Through/Right Turn	D (35.5)	F (121.7)	F (142.5)	F (62.3)	F (158.1)	F (182.9)	F (79.7)
		NB Left Turn	D (42.3)	E (67.7)	E (72.8)	F (99.7)	F (96.6)	F (118.4)	F (187.4)
		NB Through/Right Turn	C (28.6)	C (32.5)	C (32.5)	D (49.7)	C (32.7)	C (33.3)	E (60.2)
		SB Left Turn	C (31.4)	D (36.7)	D (36.7)	--	D (37.2)	D (38.6)	--
		SB Through/Right Turn	C (33.0)	D (41.8)	D (42.8)	--	D (44.6)	D (46.8)	--
		SB Through/Left Turn	--	--	--	E (66.0)	--	--	F (85.8)
		SB Right Turn	--	--	--	D (50.6)	--	--	E (58.3)
		Overall Intersection	**C (29.2)**	**E (74.2)**	**F (85.3)**	**D (50.6)**	**F (93.5)**	**F (112.1)**	**E (66.0)**
Tom J Hitch Pkwy & Iron Bridge Rd	Signal	EB Left Turn	C (24.5)	C (26.5)	C (26.8)	--	C (27.3)	C (29.8)	--
		EB Through/Right Turn	C (20.1)	C (20.4)	C (20.4)	--	C (20.7)	C (21.1)	--
		WB Left Turn	C (22.8)	C (24.0)	C (24.0)	--	C (24.7)	D (35.1)	--
		WB Through/Right Turn	C (23.3)	C (27.7)	C (27.7)	--	C (30.5)	D (52.1)	--
		NB Left Turn	A (7.8)	A (8.2)	A (8.4)	--	A (8.3)	A (8.4)	--
		NB Through	B (13.0)	B (16.1)	B (16.9)	--	B (17.7)	B (18.3)	--
		SB Left Turn	A (8.0)	A (9.0)	A (9.3)	--	A (9.5)	A (9.7)	--
		SB Through	B (10.3)	B (11.5)	B (12.3)	--	B (12.0)	B (11.9)	--
		Overall Intersection	**B (14.8)**	**B (17.2)**	**B (17.6)**	**--**	**B (18.5)**	**C (23.8)**	**--**
Iron Bridge Rd & Mt Olivet Rd	TWSC	EB Left Turn	A (7.6)	A (7.7)	A (7.7)	--	A (7.7)	A (7.7)	--
		SB Approach	A (9.4)	A (9.7)	A (9.7)	--	A (9.9)	B (10.0)	--
James Campbell Blvd & Tom J Hitch Pkwy	TWSC	EB Left Turn	B (12.0)	C (16.5)	C (17.4)	--	C (19.9)	C (22.1)	--
		SB Left Turn	F (82.6)	F (414.0)	F (496.8)	--	F (600+)	F (600+)	--
		SB Right Turn	C (19.3)	E (35.7)	E (47.3)	--	F (51.5)	F (96.1)	--
	Signal	EB Left Turn	--	--	--	D (36.4)	--	--	D (50.7)
		EB Through	--	--	--	A (3.3)	--	--	A (3.0)
		WB Through	--	--	--	C (24.4)	--	--	C (33.7)
		WB Right Turn	--	--	--	B (10.9)	--	--	B (12.8)
		SB Left Turn	--	--	--	C (34.4)	--	--	D (39.8)
		SB Right Turn	--	--	--	D (37.3)	--	--	D (39.2)
		Overall Intersection	**--**	**--**	**--**	**C (24.4)**	**--**	**--**	**C (31.6)**
Iron Bridge Rd & Site Access 2	TWSC	EB Left Turn	--	--	--	--	--	A (8.1)	--
		SB Approach	--	--	--	--	--	B (12.4)	--

Note: HCM 6th Edition results reported above for all intersections, with one exception. HCM 2000 results reported for intersection of Nashville Highway and US 43/Bear Creek Pike.

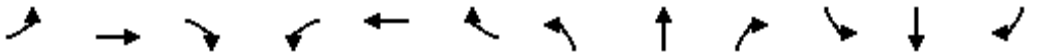
PM PEAK HOUR									
Intersection	Control	Turning Movement	Level of Service (Delay in sec/veh)						
			2023 Existing	2031			2034		
				Background	Projected	Projected w/ Imps	Background	Projected	Projected w/ Imps
Nashville Hwy & US 43/Bear Creek Pk	Signal	EB Left Turn	E (59.7)	E (68.2)	E (68.2)	F (93.3)	E (73.5)	E (73.5)	F (117.1)
		EB Through/Right Turn	E (55.4)	E (60.1)	E (61.8)	E (58.2)	E (61.9)	E (65.3)	E (68.6)
		WB Left Turn	F (98.5)	E (62.3)	E (63.0)	E (58.7)	E (64.6)	E (66.7)	F (80.5)
		WB Through/Right Turn	E (75.0)	--	--	--	--	--	--
		WB Through	--	E (77.2)	F (80.7)	F (95.5)	F (89.6)	F (101.1)	F (116.3)
		WB Right Turn	--	E (55.6)	E (58.3)	D (46.8)	E (57.0)	E (64.3)	E (61.6)
		NB Left Turn	D (40.7)	E (61.6)	E (62.7)	D (35.2)	E (74.5)	E (74.0)	D (53.3)
		NB Through	E (58.3)	E (74.5)	F (85.9)	D (51.4)	F (100.0)	F (116.6)	E (71.9)
		NB Right Turn	D (44.2)	D (47.7)	D (50.8)	D (35.2)	D (50.7)	E (56.7)	D (48.1)
		SB Left Turn	E (64.4)	F (83.9)	F (94.6)	F (99.8)	F (86.8)	F (129.7)	F (109.9)
		SB Through	D (43.7)	E (55.4)	E (55.7)	D (39.6)	E (65.3)	E (65.3)	D (47.1)
		SB Right Turn	D (44.9)	F (97.2)	F (98.5)	E (78.3)	F (143.7)	F (144.2)	F (108.1)
		Overall Intersection	**E (58.1)**	**E (69.4)**	**E (72.6)**	**E (64.1)**	**F (84.1)**	**F (90.7)**	**F (81.9)**
Bear Creek Pk & Tom J Hitch Pkwy/ Farm Bureau Access	Signal	EB Left Turn	B (16.2)	C (25.9)	D (36.6)	B (18.4)	C (32.2)	D (39.0)	C (25.2)
		EB Through/Right Turn	D (49.3)	F (151.9)	F (225.6)	F (161.0)	F (199.6)	F (295.0)	F (213.4)
		WB Left Turn	F (135.1)	F (390.1)	F (509.3)	F (202.7)	F (456.2)	F (456.2)	F (275.4)
		WB Through	F (18.4)	C (31.9)	E (51.6)	C (19.7)	D (42.6)	F (71.8)	C (28.4)
		WB Right Turn	A (9.6)	B (11.5)	B (13.0)	A (6.4)	B (12.2)	B (12.2)	A (6.8)
		NB Left Turn	D (53.3)	D (54.0)	D (52.1)	F (195.6)	D (54.2)	E (56.1)	F (219.9)
		NB Through/Right Turn	E (77.2)	F (90.1)	F (109.9)	--	F (93.7)	F (93.7)	--
		NB Through	--	--	--	E (62.2)	--	--	E (60.9)
		NB Right Turn	--	--	--	F (76.8)	--	--	E (74.3)
		SB Left Turn	E (60.3)	E (63.1)	E (61.7)	E (66.1)	E (63.6)	E (64.2)	E (65.7)
		SB Through	E (66.2)	E (67.9)	E (65.2)	F (118.5)	E (68.1)	E (70.0)	F (106.5)
		SB Right Turn	E (63.8)	E (65.9)	E (63.7)	E (74.3)	E (66.2)	E (67.9)	E (73.3)
		Overall Intersection	**D (52.4)**	**F (123.6)**	**F (173.5)**	**F (112.6)**	**F (152.6)**	**F (198.0)**	**F (144.7)**
Bear Creek Pk & Patterson Dr/ Site Access 1	TWSC	EB Left Turn	B (10.2)	B (11.7)	B (11.7)	--	B (12.3)	B (12.3)	--
		WB Left Turn	--	--	B (13.4)	--	--	C (15.1)	--
		NB Left Turn	--	--	F (600+)	--	--	F (600+)	--
		NB Through/Right Turn	--	--	F (192.1)	--	--	F (600+)	--
		SB Approach	C (24.5)	E (46.9)	F (600+)	--	F (68.4)	F (600+)	--
	Signal	EB Left Turn	--	--	--	C (32.5)	--	--	D (43.9)
		EB Through	--	--	--	C (29.3)	--	--	D (41.1)
		EB Right Turn	--	--	--	A (8.4)	--	--	A (8.5)
		WB Left Turn	--	--	--	C (28.2)	--	--	E (55.4)
		WB Through	--	--	--	B (12.5)	--	--	B (14.6)
		WB Right Turn	--	--	--	A (4.0)	--	--	A (4.0)
		NB Left Turn	--	--	--	F (89.5)	--	--	F (90.2)
		NB Through/Right Turn	--	--	--	F (88.2)	--	--	F (126.4)
		SB Left Turn	--	--	--	D (54.3)	--	--	D (54.7)
		SB Through/Right Turn	--	--	--	F (104.0)	--	--	F (127.4)
		Overall Intersection	**--**	**--**	**--**	**C (27.5)**	**--**	**--**	**D (36.3)**
Bear Creek Pk & Mt Olivet Rd/School Access	Signal	EB Left Turn	B (10.1)	B (17.4)	C (20.4)	C (27.4)	C (20.3)	C (20.5)	D (35.9)
		EB Through/Right Turn	B (15.7)	C (29.5)	D (40.2)	C (34.5)	F (46.2)	F (79.4)	D (37.1)
		WB Left Turn	B (10.2)	B (17.1)	C (20.4)	C (24.6)	C (20.4)	C (20.5)	C (34.0)
		WB Through/Right Turn	B (15.8)	C (30.3)	F (48.0)	D (39.8)	F (47.7)	F (87.3)	D (41.6)
		NB Left Turn	C (28.3)	D (35.9)	D (37.1)	D (43.4)	D (36.7)	D (37.6)	D (54.2)
		NB Through/Right Turn	C (26.6)	C (32.8)	C (33.1)	D (40.2)	C (33.3)	C (33.5)	D (51.2)
		SB Left Turn	C (26.8)	C (33.4)	C (33.8)	--	C (34.0)	C (34.5)	--
		SB Through/Right Turn	C (26.8)	C (33.0)	C (34.0)	--	C (33.5)	C (34.0)	--
		SB Through/Left Turn	--	--	--	D (48.3)			E (58.9)
		SB Right Turn	--	--	--	D (53.3)			F (86.0)
		Overall Intersection	**B (16.4)**	**C (29.9)**	**D (42.7)**	**D (37.5)**	**D (45.3)**	**E (77.0)**	**D (41.1)**
Tom J Hitch Pkwy & Iron Bridge Rd	Signal	EB Left Turn	B (18.6)	B (19.0)	B (19.2)	--	B (19.2)	C (20.4)	--
		EB Through/Right Turn	B (17.9)	B (18.1)	B (18.1)	--	B (18.2)	B (18.8)	--
		WB Left Turn	B (19.2)	B (19.8)	B (19.8)	--	C (20.1)	C (22.3)	--
		WB Through/Right Turn	B (18.1)	B (18.3)	B (18.3)	--	B (18.5)	B (19.4)	--
		NB Left Turn	A (8.6)	A (9.4)	A (9.6)	--	A (9.7)	A (10.0)	--
		NB Through	B (11.1)	B (12.6)	B (13.4)	--	B (13.2)	B (13.9)	--
		SB Left Turn	A (7.7)	A (8.1)	A (8.3)	--	A (8.3)	A (8.5)	--
		SB Through	B (12.2)	A (14.9)	B (16.0)	--	B (16.3)	B (16.1)	--
		Overall Intersection	**B (12.8)**	**B (14.6)**	**B (15.4)**	**--**	**B (15.5)**	**B (16.1)**	**--**
Iron Bridge Rd & Mt Olivet Rd	TWSC	EB Left Turn	A (7.4)	A (7.5)	A (7.5)	--	A (7.5)	A (7.5)	--
		SB Approach	A (9.3)	A (9.6)	A (9.6)	--	A (9.7)	A (9.8)	--
James Campbell Blvd & Tom J Hitch Pkwy	TWSC	EB Left Turn	A (9.5)	B (10.8)	B (11.3)	--	B (11.5)	B (12.4)	--
		SB Left Turn	F (90.9)	F (437.1)	F (580.4)	--	F (600+)	F (600+)	--
		SB Right Turn	C (18.6)	E (38.2)	E (46.7)	--	F (57.5)	F (80.5)	--
	Signal	EB Left Turn	--	--	--	B (13.6)	--	--	B (16.0)
		EB Through	--	--	--	A (7.3)	--	--	A (7.1)
		WB Through	--	--	--	C (20.7)	--	--	C (23.5)
		WB Right Turn	--	--	--	B (12.7)	--	--	B (13.2)
		SB Left Turn	--	--	--	C (23.6)	--	--	C (24.8)
		SB Right Turn	--	--	--	F (77.9)	--	--	F (101.0)
		Overall Intersection	**--**	**--**	**--**	**C (28.7)**	**--**	**--**	**D (35.5)**
Iron Bridge Rd & Site Access 2	TWSC	EB Left Turn	--	--	--	--	--	A (7.8)	--
		SB Approach	--	--	--	--	--	B (10.8)	--

Note: HCM 6th Edition results reported above for all intersections, with one exception. HCM 2000 results reported for intersection of Nashville Highway and US 43/Bear Creek Pike.

INTERSECTION CAPACITY ANALYSIS: INTERSECTION OF BEAR CREEK PIKE AND TOM J HITCH PARKWAY WITH FUTURE IMPROVEMENTS BY OTHERS

AM PEAK HOUR				
Turning Movement	**Level of Service (Delay in sec/veh)**			
	2031		**2034**	
	AM	**PM**	**AM**	**PM**
EB Left Turn	E (67.2)	C (20.2)	F (109.2)	C (25.2)
EB Through	D (53.4)	F (65.4)	E (57.7)	F (85.1)
EB Right Turn	A (9.8)	B (14.6)	A (8.5)	B (13.2)
WB Left Turn	E (79.1)	F (120.4)	F (108.1)	F (160.5)
WB Through	F (62.3)	C (21.0)	F (100.2)	C (28.4)
WB Right Turn	B (11.3)	A (6.7)	B (10.7)	A (6.8)
NB Left Turn	E (76.2)	F (96.9)	F (99.7)	F (116.8)
NB Right Turn	D (43.4)	E (67.9)	D (47.4)	E (69.8)
SB Left Turn	E (72.3)	E (71.7)	E (72.6)	E (72.0)
SB Through	E (73.9)	F (101.6)	E (74.2)	F (106.5)
SB Right Turn	E (75.2)	E (72.8)	E (75.6)	E (73.3)
Overall Intersection	**E (58.3)**	**E (56.3)**	**E (79.3)**	**E (68.8)**
Note: HCM 6th Edition results reported above.				

2023 EXISTING CONDITIONS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	757	537	38	317	368	313	28	770	285	234	770	739
Future Volume (vph)	757	537	38	317	368	313	28	770	285	234	770	739
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.99		1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3504		1770	3295		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.23	1.00	1.00	0.08	1.00	1.00
Satd. Flow (perm)	3433	3504		1770	3295		420	3539	1583	148	3539	1583
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	860	610	43	360	418	356	32	875	324	266	875	840
RTOR Reduction (vph)	0	3	0	0	94	0	0	0	235	0	0	400
Lane Group Flow (vph)	860	650	0	360	680	0	32	875	89	266	875	440
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	1		2	2		3	8		7	4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	42.0	42.0		35.0	35.0		49.2	45.2	45.2	70.2	61.2	61.2
Effective Green, g (s)	42.0	42.0		35.0	35.0		49.2	45.2	45.2	70.2	61.2	61.2
Actuated g/C Ratio	0.25	0.25		0.21	0.21		0.30	0.27	0.27	0.42	0.37	0.37
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0		1.5	4.0	4.0	1.5	4.0	4.0
Lane Grp Cap (vph)	872	890		375	698		157	968	433	259	1311	586
v/s Ratio Prot	c0.25	0.19		0.20	c0.21		0.00	0.25		c0.12	0.25	
v/s Ratio Perm							0.06		0.06	c0.31		0.28
v/c Ratio	0.99	0.73		0.96	0.97		0.20	0.90	0.20	1.03	0.67	0.75
Uniform Delay, d1	61.3	56.4		64.4	64.7		42.1	57.9	46.2	53.4	43.5	45.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.9	3.3		35.8	27.7		0.2	11.8	0.3	63.1	1.4	5.7
Delay (s)	88.2	59.7		100.2	92.3		42.3	69.7	46.5	116.5	44.9	51.0
Level of Service	F	E		F	F		D	E	D	F	D	D
Approach Delay (s)		75.9			94.8			62.9			57.1	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	70.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	165.2	Sum of lost time (s)	23.0
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	579	165	197	744	34	338	67	197	1	2	2
Future Volume (veh/h)	105	579	165	197	744	34	338	67	197	1	2	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	651	185	221	836	37	380	73	221	1	2	2
Peak Hour Factor	0.92	0.89	0.89	0.89	0.89	0.92	0.89	0.92	0.89	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	236	702	199	243	1010	856	477	102	309	103	89	76
Arrive On Green	0.04	0.50	0.50	0.08	0.54	0.54	0.20	0.25	0.25	0.00	0.05	0.05
Sat Flow, veh/h	1781	1401	398	1781	1870	1585	1781	409	1238	1781	1870	1585
Grp Volume(v), veh/h	114	0	836	221	836	37	380	0	294	1	2	2
Grp Sat Flow(s),veh/h/ln	1781	0	1799	1781	1870	1585	1781	0	1647	1781	1870	1585
Q Serve(g_s), s	4.6	0.0	63.6	10.3	54.5	1.6	29.2	0.0	23.9	0.1	0.1	0.2
Cycle Q Clear(g_c), s	4.6	0.0	63.6	10.3	54.5	1.6	29.2	0.0	23.9	0.1	0.1	0.2
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.75	1.00		1.00
Lane Grp Cap(c), veh/h	236	0	901	243	1010	856	477	0	411	103	89	76
V/C Ratio(X)	0.48	0.00	0.93	0.91	0.83	0.04	0.80	0.00	0.71	0.01	0.02	0.03
Avail Cap(c_a), veh/h	321	0	1019	259	1060	898	477	0	411	402	375	318
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	0.0	34.1	37.9	28.1	15.9	50.4	0.0	50.3	66.3	66.6	66.6
Incr Delay (d2), s/veh	0.6	0.0	14.4	31.1	6.1	0.0	8.5	0.0	5.8	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.3	0.0	38.7	15.3	32.8	1.0	19.8	0.0	15.5	0.1	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.6	0.0	48.5	69.1	34.2	15.9	58.9	0.0	56.1	66.3	66.7	66.7
LnGrp LOS	C	A	D	E	C	B	E	A	E	E	E	E
Approach Vol, veh/h		950			1094			674			5	
Approach Delay, s/veh		45.9			40.6			57.7			66.6	
Approach LOS		D			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.7	80.3	35.0	12.6	13.0	86.1	5.4	42.2
Change Period (Y+Rc), s	6.4	6.9	5.2	5.6	6.4	6.9	5.2	5.6
Max Green Setting (Gmax), s	13.6	83.1	29.8	29.4	13.6	83.1	24.8	34.4
Max Q Clear Time (g_c+I1), s	12.3	65.6	31.2	2.2	6.6	56.5	2.1	25.9
Green Ext Time (p_c), s	0.0	7.9	0.0	0.0	0.1	9.9	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	46.7
HCM 6th LOS	D

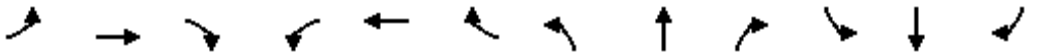
Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	751	896	8	17	45
Future Vol, veh/h	12	751	896	8	17	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	205	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	834	996	9	19	50

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1005	0	-	0	1861	1001
Stage 1	-	-	-	-	1001	-
Stage 2	-	-	-	-	860	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	689	-	-	-	80	295
Stage 1	-	-	-	-	355	-
Stage 2	-	-	-	-	414	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	689	-	-	-	78	295
Mov Cap-2 Maneuver	-	-	-	-	78	-
Stage 1	-	-	-	-	348	-
Stage 2	-	-	-	-	414	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	40.9
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	689	-	-	-	167
HCM Lane V/C Ratio	0.019	-	-	-	0.413
HCM Control Delay (s)	10.3	-	-	-	40.9
HCM Lane LOS	B	-	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	-	1.8



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	568	30	19	659	35	91	49	30	50	25	184
Future Volume (veh/h)	220	568	30	19	659	35	91	49	30	50	25	184
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	247	638	34	21	740	39	102	55	34	56	28	207
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	292	938	50	322	817	43	206	261	161	340	46	343
Arrive On Green	0.09	0.53	0.53	0.02	0.46	0.46	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1781	1760	94	1781	1761	93	1145	1081	669	1308	192	1422
Grp Volume(v), veh/h	247	0	672	21	0	779	102	0	89	56	0	235
Grp Sat Flow(s),veh/h/ln	1781	0	1853	1781	0	1854	1145	0	1750	1308	0	1614
Q Serve(g_s), s	6.4	0.0	24.9	0.6	0.0	36.4	8.1	0.0	3.8	3.3	0.0	12.1
Cycle Q Clear(g_c), s	6.4	0.0	24.9	0.6	0.0	36.4	20.2	0.0	3.8	7.1	0.0	12.1
Prop In Lane	1.00		0.05	1.00		0.05	1.00		0.38	1.00		0.88
Lane Grp Cap(c), veh/h	292	0	988	322	0	860	206	0	423	340	0	390
V/C Ratio(X)	0.85	0.00	0.68	0.07	0.00	0.91	0.50	0.00	0.21	0.16	0.00	0.60
Avail Cap(c_a), veh/h	386	0	988	539	0	971	278	0	533	422	0	492
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.0	0.0	16.0	14.4	0.0	23.2	40.5	0.0	28.4	31.2	0.0	31.5
Incr Delay (d2), s/veh	9.9	0.0	2.5	0.0	0.0	12.3	1.8	0.0	0.2	0.2	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.3	0.0	14.2	0.4	0.0	22.9	4.3	0.0	2.9	1.9	0.0	8.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.9	0.0	18.5	14.4	0.0	35.5	42.3	0.0	28.6	31.4	0.0	33.0
LnGrp LOS	C	A	B	B	A	D	D	A	C	C	A	C
Approach Vol, veh/h		919			800			191			291	
Approach Delay, s/veh		21.6			35.0			35.9			32.7	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	55.9		29.1	15.1	49.4		29.1				
Change Period (Y+Rc), s	6.5	6.0		6.5	6.5	6.0		6.5				
Max Green Setting (Gmax), s	13.5	49.0		28.5	13.5	49.0		28.5				
Max Q Clear Time (g_c+I1), s	2.6	26.9		14.1	8.4	38.4		22.2				
Green Ext Time (p_c), s	0.0	6.3		1.1	0.2	5.0		0.4				

Intersection Summary			
HCM 6th Ctrl Delay		29.2	
HCM 6th LOS		C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	35	6	91	94	46	9	406	67	26	307	24
Future Volume (veh/h)	28	35	6	91	94	46	9	406	67	26	307	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	42	7	108	112	55	11	483	0	31	365	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	235	274	46	333	207	102	530	887		453	925	
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.01	0.47	0.00	0.03	0.49	0.00
Sat Flow, veh/h	1218	1563	260	1356	1184	582	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	33	0	49	108	0	167	11	483	0	31	365	0
Grp Sat Flow(s),veh/h/ln	1218	0	1823	1356	0	1766	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	1.4	0.0	1.3	4.2	0.0	4.9	0.2	10.4	0.0	0.5	7.0	0.0
Cycle Q Clear(g_c), s	6.3	0.0	1.3	5.5	0.0	4.9	0.2	10.4	0.0	0.5	7.0	0.0
Prop In Lane	1.00		0.14	1.00		0.33	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	235	0	319	333	0	309	530	887		453	925	
V/C Ratio(X)	0.14	0.00	0.15	0.32	0.00	0.54	0.02	0.54		0.07	0.39	
Avail Cap(c_a), veh/h	236	0	320	334	0	310	661	887		549	925	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.3	0.0	19.9	22.2	0.0	21.4	7.8	10.6	0.0	8.0	9.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.2	0.6	0.0	1.9	0.0	2.4	0.0	0.1	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	0.0	0.9	2.2	0.0	3.4	0.1	6.4	0.0	0.2	4.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.5	0.0	20.1	22.8	0.0	23.3	7.8	13.0	0.0	8.0	10.3	0.0
LnGrp LOS	C	A	C	C	A	C	A	B		A	B	
Approach Vol, veh/h		82			275			494			396	
Approach Delay, s/veh		21.9			23.1			12.9			10.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	33.0		16.0	6.8	34.1		16.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	27.0		10.0	5.0	27.0		10.0				
Max Q Clear Time (g_c+I1), s	2.5	12.4		8.3	2.2	9.0		7.5				
Green Ext Time (p_c), s	0.0	1.6		0.0	0.0	1.2		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	28	122	18	8	60
Future Vol, veh/h	31	28	122	18	8	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	29	127	19	8	63

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	146	0	-	0	230	137
Stage 1	-	-	-	-	137	-
Stage 2	-	-	-	-	93	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1436	-	-	-	758	911
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	931	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1436	-	-	-	741	911
Mov Cap-2 Maneuver	-	-	-	-	741	-
Stage 1	-	-	-	-	870	-
Stage 2	-	-	-	-	931	-

Approach	EB	WB	SB
HCM Control Delay, s	4	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1436	-	-	-	887
HCM Lane V/C Ratio	0.022	-	-	-	0.08
HCM Control Delay (s)	7.6	0	-	-	9.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

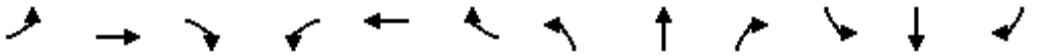
Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	313	274	588	108	22	210
Future Vol, veh/h	313	274	588	108	22	210
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	120	0	125
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	340	298	639	117	24	228

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	756	0	-	0	1617	639
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	978	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	855	-	-	-	114	476
Stage 1	-	-	-	-	526	-
Stage 2	-	-	-	-	364	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	855	-	-	-	69	476
Mov Cap-2 Maneuver	-	-	-	-	69	-
Stage 1	-	-	-	-	317	-
Stage 2	-	-	-	-	364	-

Approach	EB	WB	SB
HCM Control Delay, s	6.4	0	25.3
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	855	-	-	-	69	476
HCM Lane V/C Ratio	0.398	-	-	-	0.347	0.48
HCM Control Delay (s)	12	-	-	-	82.6	19.3
HCM Lane LOS	B	-	-	-	F	C
HCM 95th %tile Q(veh)	1.9	-	-	-	1.3	2.6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	566	442	48	377	514	190	54	752	385	224	872	739
Future Volume (vph)	566	442	48	377	514	190	54	752	385	224	872	739
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.99		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3487		1770	3396		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.20	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)	3433	3487		1770	3396		367	3539	1583	199	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	596	465	51	397	541	200	57	792	405	236	918	778
RTOR Reduction (vph)	0	5	0	0	22	0	0	0	294	0	0	381
Lane Group Flow (vph)	596	511	0	397	719	0	57	792	111	236	918	397
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	1		2	2		3	8		7	4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	35.5	35.5		35.3	35.3		46.0	42.1	42.1	65.4	56.5	56.5
Effective Green, g (s)	35.5	35.5		35.3	35.3		46.0	42.1	42.1	65.4	56.5	56.5
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.30	0.27	0.27	0.42	0.37	0.37
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0		1.5	4.0	4.0	1.5	4.0	4.0
Lane Grp Cap (vph)	790	802		405	777		144	966	432	270	1296	580
v/s Ratio Prot	c0.17	0.15		c0.22	0.21		0.01	0.22		c0.10	0.26	
v/s Ratio Perm							0.11		0.07	c0.27		0.25
v/c Ratio	0.75	0.64		0.98	0.92		0.40	0.82	0.26	0.87	0.71	0.68
Uniform Delay, d1	55.3	53.5		59.1	58.2		40.1	52.5	43.8	39.7	41.8	41.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	1.9		39.4	16.9		0.7	5.8	0.4	24.7	1.9	3.6
Delay (s)	59.7	55.4		98.5	75.0		40.7	58.3	44.2	64.4	43.7	44.9
Level of Service	E	E		F	E		D	E	D	E	D	D
Approach Delay (s)		57.7			83.2			53.0			46.7	
Approach LOS		E			F			D			D	

Intersection Summary			
HCM 2000 Control Delay	58.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	154.2	Sum of lost time (s)	23.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	678	239	266	761	4	175	9	213	32	67	32
Future Volume (veh/h)	9	678	239	266	761	4	175	9	213	32	67	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	699	246	274	785	4	180	10	220	35	73	35
Peak Hour Factor	0.92	0.97	0.97	0.97	0.97	0.92	0.97	0.92	0.97	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	327	731	257	248	1189	1008	294	11	244	118	149	126
Arrive On Green	0.01	0.55	0.55	0.09	0.64	0.64	0.11	0.16	0.16	0.03	0.08	0.08
Sat Flow, veh/h	1781	1322	465	1781	1870	1585	1781	69	1526	1781	1870	1585
Grp Volume(v), veh/h	10	0	945	274	785	4	180	0	230	35	73	35
Grp Sat Flow(s),veh/h/ln	1781	0	1787	1781	1870	1585	1781	0	1596	1781	1870	1585
Q Serve(g_s), s	0.4	0.0	72.5	13.6	38.1	0.1	13.0	0.0	20.5	2.6	5.4	3.0
Cycle Q Clear(g_c), s	0.4	0.0	72.5	13.6	38.1	0.1	13.0	0.0	20.5	2.6	5.4	3.0
Prop In Lane	1.00		0.26	1.00		1.00	1.00		0.96	1.00		1.00
Lane Grp Cap(c), veh/h	327	0	988	248	1189	1008	294	0	255	118	149	126
V/C Ratio(X)	0.03	0.00	0.96	1.11	0.66	0.00	0.61	0.00	0.90	0.30	0.49	0.28
Avail Cap(c_a), veh/h	474	0	1027	248	1189	1008	471	0	380	377	380	322
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.2	0.0	30.6	46.9	16.5	9.6	51.7	0.0	59.6	59.2	63.7	62.6
Incr Delay (d2), s/veh	0.0	0.0	18.6	88.2	1.8	0.0	1.5	0.0	17.6	1.0	2.5	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.0	43.5	22.2	22.1	0.1	9.7	0.0	14.3	2.2	4.8	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.2	0.0	49.3	135.1	18.4	9.6	53.3	0.0	77.2	60.3	66.2	63.8
LnGrp LOS	B	A	D	F	B	A	D	A	E	E	E	E
Approach Vol, veh/h		955			1063			410			143	
Approach Delay, s/veh		48.9			48.4			66.7			64.1	
Approach LOS		D			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	86.9	20.6	17.1	8.1	98.8	9.0	28.7
Change Period (Y+Rc), s	6.4	6.9	5.2	5.6	6.4	6.9	5.2	5.6
Max Green Setting (Gmax), s	13.6	83.1	29.8	29.4	13.6	83.1	24.8	34.4
Max Q Clear Time (g_c+I1), s	15.6	74.5	15.0	7.4	2.4	40.1	4.6	22.5
Green Ext Time (p_c), s	0.0	5.5	0.4	0.3	0.0	10.1	0.1	0.7

Intersection Summary	
HCM 6th Ctrl Delay	52.4
HCM 6th LOS	D

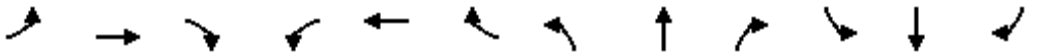
Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	43	893	895	15	5	36
Future Vol, veh/h	43	893	895	15	5	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	205	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	911	913	15	5	37

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	928	0	-	0	1920	921
Stage 1	-	-	-	-	921	-
Stage 2	-	-	-	-	999	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	737	-	-	-	74	328
Stage 1	-	-	-	-	388	-
Stage 2	-	-	-	-	356	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	737	-	-	-	70	328
Mov Cap-2 Maneuver	-	-	-	-	70	-
Stage 1	-	-	-	-	365	-
Stage 2	-	-	-	-	356	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	24.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	737	-	-	-	226
HCM Lane V/C Ratio	0.06	-	-	-	0.185
HCM Control Delay (s)	10.2	-	-	-	24.5
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	861	7	23	758	85	53	5	30	11	9	31
Future Volume (veh/h)	28	861	7	23	758	85	53	5	30	11	9	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	29	879	7	23	773	87	54	5	31	11	9	32
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	287	1055	8	275	932	105	222	23	142	226	37	131
Arrive On Green	0.03	0.57	0.57	0.03	0.56	0.56	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1781	1853	15	1781	1651	186	1366	225	1394	1372	360	1280
Grp Volume(v), veh/h	29	0	886	23	0	860	54	0	36	11	0	41
Grp Sat Flow(s),veh/h/ln	1781	0	1868	1781	0	1837	1366	0	1619	1372	0	1640
Q Serve(g_s), s	0.4	0.0	24.4	0.3	0.0	24.1	2.4	0.0	1.3	0.5	0.0	1.4
Cycle Q Clear(g_c), s	0.4	0.0	24.4	0.3	0.0	24.1	3.8	0.0	1.3	1.8	0.0	1.4
Prop In Lane	1.00		0.01	1.00		0.10	1.00		0.86	1.00		0.78
Lane Grp Cap(c), veh/h	287	0	1064	275	0	1037	222	0	165	226	0	167
V/C Ratio(X)	0.10	0.00	0.83	0.08	0.00	0.83	0.24	0.00	0.22	0.05	0.00	0.25
Avail Cap(c_a), veh/h	613	0	1455	610	0	1431	702	0	734	708	0	743
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.1	0.0	11.1	10.1	0.0	11.2	27.8	0.0	25.9	26.7	0.0	26.0
Incr Delay (d2), s/veh	0.1	0.0	4.6	0.0	0.0	4.6	0.6	0.0	0.7	0.1	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	0.0	11.7	0.1	0.0	11.6	1.4	0.0	0.9	0.3	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.1	0.0	15.7	10.2	0.0	15.8	28.3	0.0	26.6	26.8	0.0	26.8
LnGrp LOS	B	A	B	B	A	B	C	A	C	C	A	C
Approach Vol, veh/h		915			883			90			52	
Approach Delay, s/veh		15.5			15.6			27.6			26.8	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.2	41.8		12.9	8.5	41.5		12.9				
Change Period (Y+Rc), s	6.5	6.0		6.5	6.5	6.0		6.5				
Max Green Setting (Gmax), s	13.5	49.0		28.5	13.5	49.0		28.5				
Max Q Clear Time (g_c+I1), s	2.3	26.4		3.8	2.4	26.1		5.8				
Green Ext Time (p_c), s	0.0	9.4		0.1	0.0	9.1		0.3				

Intersection Summary			
HCM 6th Ctrl Delay		16.4	
HCM 6th LOS		B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	39	6	60	27	26	9	276	69	35	429	54
Future Volume (veh/h)	13	39	6	60	27	26	9	276	69	35	429	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	14	41	6	62	28	27	9	288	0	36	447	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	346	287	42	355	157	152	432	804		566	855	
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.01	0.43	0.00	0.04	0.46	0.00
Sat Flow, veh/h	1349	1595	233	1359	875	844	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	14	0	47	62	0	55	9	288	0	36	447	0
Grp Sat Flow(s),veh/h/ln	1349	0	1828	1359	0	1719	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.5	0.0	1.1	2.1	0.0	1.4	0.1	5.3	0.0	0.6	8.7	0.0
Cycle Q Clear(g_c), s	1.8	0.0	1.1	3.2	0.0	1.4	0.1	5.3	0.0	0.6	8.7	0.0
Prop In Lane	1.00		0.13	1.00		0.49	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	346	0	329	355	0	309	432	804		566	855	
V/C Ratio(X)	0.04	0.00	0.14	0.17	0.00	0.18	0.02	0.36		0.06	0.52	
Avail Cap(c_a), veh/h	367	0	357	377	0	336	585	804		670	855	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.6	0.0	17.7	19.0	0.0	17.8	8.6	9.8	0.0	7.7	9.9	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.2	0.2	0.0	0.3	0.0	1.2	0.0	0.0	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	0.0	0.7	1.0	0.0	0.9	0.1	3.2	0.0	0.3	5.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.6	0.0	17.9	19.2	0.0	18.1	8.6	11.1	0.0	7.7	12.2	0.0
LnGrp LOS	B	A	B	B	A	B	A	B		A	B	
Approach Vol, veh/h		61			117			297			483	
Approach Delay, s/veh		18.0			18.7			11.0			11.9	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.0	28.0		15.2	6.6	29.4		15.2				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	22.0		10.0	5.0	22.0		10.0				
Max Q Clear Time (g_c+I1), s	2.6	7.3		3.8	2.1	10.7		5.2				
Green Ext Time (p_c), s	0.0	0.8		0.1	0.0	1.3		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	12.8
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	48	79	53	6	17	45
Future Vol, veh/h	48	79	53	6	17	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	82	55	6	18	47

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	61	0	-	0	240	58
Stage 1	-	-	-	-	58	-
Stage 2	-	-	-	-	182	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1542	-	-	-	748	1008
Stage 1	-	-	-	-	965	-
Stage 2	-	-	-	-	849	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1542	-	-	-	723	1008
Mov Cap-2 Maneuver	-	-	-	-	723	-
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	849	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1542	-	-	-	910
HCM Lane V/C Ratio	0.032	-	-	-	0.071
HCM Control Delay (s)	7.4	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection	
Int Delay, s/veh	8.2

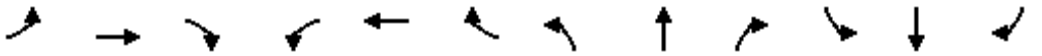
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	321	537	349	45	38	392
Future Vol, veh/h	321	537	349	45	38	392
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	120	0	125
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	341	571	371	48	40	417

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	419	0	-	0	1624	371
Stage 1	-	-	-	-	371	-
Stage 2	-	-	-	-	1253	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1140	-	-	-	113	675
Stage 1	-	-	-	-	698	-
Stage 2	-	-	-	-	269	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1140	-	-	-	79	675
Mov Cap-2 Maneuver	-	-	-	-	79	-
Stage 1	-	-	-	-	489	-
Stage 2	-	-	-	-	269	-

Approach	EB	WB	SB
HCM Control Delay, s	3.6	0	25
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1140	-	-	-	79	675
HCM Lane V/C Ratio	0.3	-	-	-	0.512	0.618
HCM Control Delay (s)	9.5	-	-	-	90.9	18.6
HCM Lane LOS	A	-	-	-	F	C
HCM 95th %tile Q(veh)	1.3	-	-	-	2.2	4.3

2031 BACKGROUND CONDITIONS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	939	670	47	395	459	390	35	955	355	292	955	916
Future Volume (vph)	939	670	47	395	459	390	35	955	355	292	955	916
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3505		3433	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.11	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3505		3433	3539	1583	198	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	1067	761	53	449	522	443	40	1085	403	332	1085	1041
RTOR Reduction (vph)	0	3	0	0	0	130	0	0	289	0	0	380
Lane Group Flow (vph)	1067	811	0	449	522	313	40	1085	114	332	1085	661
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	1		2	2		3	8		7	4	
Permitted Phases						2	8		8			4
Actuated Green, G (s)	42.0	42.0		34.6	34.6	34.6	50.5	46.5	46.5	18.4	60.9	60.9
Effective Green, g (s)	42.0	42.0		34.6	34.6	34.6	50.5	46.5	46.5	18.4	60.9	60.9
Actuated g/C Ratio	0.26	0.26		0.21	0.21	0.21	0.31	0.28	0.28	0.11	0.37	0.37
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0
Lane Grp Cap (vph)	876	894		722	744	332	99	1000	447	383	1310	586
v/s Ratio Prot	c0.31	0.23		0.13	0.15		0.01	0.31		c0.10	0.31	
v/s Ratio Perm						c0.20	0.11		0.07			c0.42
v/c Ratio	1.22	0.91		0.62	0.70	0.94	0.40	1.08	0.25	0.87	0.83	1.13
Uniform Delay, d1	61.2	59.4		59.0	60.2	64.0	43.0	59.0	45.6	71.8	47.0	51.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	108.5	12.9		1.9	3.2	35.1	1.0	54.4	0.4	17.7	4.7	77.4
Delay (s)	169.7	72.3		60.9	63.4	99.1	43.9	113.4	46.0	89.5	51.7	129.2
Level of Service	F	E		E	E	F	D	F	D	F	D	F
Approach Delay (s)		127.6			73.8			93.8			89.6	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	97.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	164.5	Sum of lost time (s)	23.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	726	205	246	930	34	419	67	247	1	2	2
Future Volume (veh/h)	105	726	205	246	930	34	419	67	247	1	2	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	816	230	276	1045	37	471	73	278	1	2	2
Peak Hour Factor	0.92	0.89	0.89	0.89	0.89	0.92	0.89	0.92	0.89	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	136	740	209	199	1069	906	444	79	301	71	83	70
Arrive On Green	0.04	0.53	0.53	0.09	0.57	0.57	0.19	0.23	0.23	0.00	0.04	0.04
Sat Flow, veh/h	1781	1404	396	1781	1870	1585	1781	340	1297	1781	1870	1585
Grp Volume(v), veh/h	114	0	1046	276	1045	37	471	0	351	1	2	2
Grp Sat Flow(s),veh/h/ln	1781	0	1799	1781	1870	1585	1781	0	1637	1781	1870	1585
Q Serve(g_s), s	4.6	0.0	83.1	13.6	85.5	1.6	29.8	0.0	33.0	0.1	0.2	0.2
Cycle Q Clear(g_c), s	4.6	0.0	83.1	13.6	85.5	1.6	29.8	0.0	33.0	0.1	0.2	0.2
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.79	1.00		1.00
Lane Grp Cap(c), veh/h	136	0	949	199	1069	906	444	0	380	71	83	70
V/C Ratio(X)	0.84	0.00	1.10	1.38	0.98	0.04	1.06	0.00	0.92	0.01	0.02	0.03
Avail Cap(c_a), veh/h	214	0	949	199	1069	906	444	0	380	349	349	296
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.2	0.0	37.3	56.9	32.8	14.8	60.2	0.0	59.1	71.8	72.0	72.0
Incr Delay (d2), s/veh	8.6	0.0	61.5	200.9	22.4	0.0	59.9	0.0	27.9	0.0	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.6	0.0	67.5	28.9	53.3	1.0	16.1	0.0	22.9	0.1	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.8	0.0	98.7	257.8	55.2	14.9	120.1	0.0	87.0	71.9	72.1	72.2
LnGrp LOS	D	A	F	F	E	B	F	A	F	E	E	E
Approach Vol, veh/h		1160			1358			822			5	
Approach Delay, s/veh		93.5			95.3			106.0			72.1	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	90.0	35.0	12.6	13.1	96.9	5.4	42.2
Change Period (Y+Rc), s	6.4	6.9	5.2	5.6	6.4	6.9	5.2	5.6
Max Green Setting (Gmax), s	13.6	83.1	29.8	29.4	13.6	83.1	24.8	34.4
Max Q Clear Time (g_c+I1), s	15.6	85.1	31.8	2.2	6.6	87.5	2.1	35.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	97.3
HCM 6th LOS	F

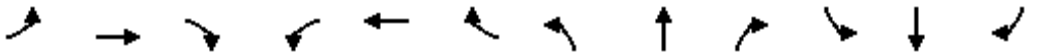
Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	936	1116	10	21	59
Future Vol, veh/h	17	936	1116	10	21	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	205	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	1040	1240	11	23	66

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1251	0	-	0	2324	1246
Stage 1	-	-	-	-	1246	-
Stage 2	-	-	-	-	1078	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	556	-	-	-	41	212
Stage 1	-	-	-	-	271	-
Stage 2	-	-	-	-	327	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	556	-	-	-	40	212
Mov Cap-2 Maneuver	-	-	-	-	40	-
Stage 1	-	-	-	-	262	-
Stage 2	-	-	-	-	327	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	138.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	556	-	-	-	100
HCM Lane V/C Ratio	0.034	-	-	-	0.889
HCM Control Delay (s)	11.7	-	-	-	138.6
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	5.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	273	704	37	24	821	43	114	61	37	62	31	228
Future Volume (veh/h)	273	704	37	24	821	43	114	61	37	62	31	228
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	307	791	42	27	922	48	128	69	42	70	35	256
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	284	955	51	223	785	41	170	282	172	333	50	368
Arrive On Green	0.12	0.54	0.54	0.03	0.45	0.45	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1781	1760	93	1781	1762	92	1088	1089	663	1282	194	1420
Grp Volume(v), veh/h	307	0	833	27	0	970	128	0	111	70	0	291
Grp Sat Flow(s),veh/h/ln	1781	0	1854	1781	0	1854	1088	0	1751	1282	0	1615
Q Serve(g_s), s	13.5	0.0	41.1	0.9	0.0	49.0	10.6	0.0	5.5	5.0	0.0	17.9
Cycle Q Clear(g_c), s	13.5	0.0	41.1	0.9	0.0	49.0	28.5	0.0	5.5	10.5	0.0	17.9
Prop In Lane	1.00		0.05	1.00		0.05	1.00		0.38	1.00		0.88
Lane Grp Cap(c), veh/h	284	0	1006	223	0	826	170	0	454	333	0	418
V/C Ratio(X)	1.08	0.00	0.83	0.12	0.00	1.17	0.75	0.00	0.24	0.21	0.00	0.70
Avail Cap(c_a), veh/h	284	0	1006	396	0	826	170	0	454	333	0	418
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.2	0.0	20.9	20.0	0.0	30.5	50.7	0.0	32.2	36.4	0.0	36.8
Incr Delay (d2), s/veh	76.6	0.0	6.5	0.1	0.0	91.2	17.0	0.0	0.3	0.3	0.0	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	14.4	0.0	23.6	0.6	0.0	56.7	7.8	0.0	4.3	2.9	0.0	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	112.8	0.0	27.4	20.1	0.0	121.7	67.7	0.0	32.5	36.7	0.0	41.8
LnGrp LOS	F	A	C	C	A	F	E	A	C	D	A	D
Approach Vol, veh/h		1140			997			239			361	
Approach Delay, s/veh		50.4			119.0			51.4			40.8	
Approach LOS		D			F			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	65.7		35.0	20.0	55.0		35.0				
Change Period (Y+Rc), s	6.5	6.0		6.5	6.5	6.0		6.5				
Max Green Setting (Gmax), s	13.5	49.0		28.5	13.5	49.0		28.5				
Max Q Clear Time (g_c+I1), s	2.9	43.1		19.9	15.5	51.0		30.5				
Green Ext Time (p_c), s	0.0	3.4		1.1	0.0	0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			74.2									
HCM 6th LOS			E									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	43	7	113	117	57	11	506	83	32	383	30
Future Volume (veh/h)	35	43	7	113	117	57	11	506	83	32	383	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	42	51	8	135	139	68	13	602	0	38	456	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	202	276	43	323	207	101	465	882		377	925	
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.02	0.47	0.00	0.04	0.49	0.00
Sat Flow, veh/h	1175	1578	248	1344	1186	580	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	42	0	59	135	0	207	13	602	0	38	456	0
Grp Sat Flow(s),veh/h/ln	1175	0	1826	1344	0	1766	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.0	0.0	1.6	5.5	0.0	6.3	0.2	14.4	0.0	0.6	9.3	0.0
Cycle Q Clear(g_c), s	8.3	0.0	1.6	7.0	0.0	6.3	0.2	14.4	0.0	0.6	9.3	0.0
Prop In Lane	1.00		0.14	1.00		0.33	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	202	0	319	323	0	308	465	882		377	925	
V/C Ratio(X)	0.21	0.00	0.19	0.42	0.00	0.67	0.03	0.68		0.10	0.49	
Avail Cap(c_a), veh/h	202	0	319	323	0	308	592	882		462	925	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.0	0.0	20.2	23.2	0.0	22.1	8.1	11.8	0.0	8.9	9.7	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.3	0.9	0.0	5.6	0.0	4.3	0.0	0.1	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	0.0	1.1	2.8	0.0	4.9	0.1	8.9	0.0	0.3	5.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.5	0.0	20.4	24.0	0.0	27.7	8.2	16.1	0.0	9.0	11.5	0.0
LnGrp LOS	C	A	C	C	A	C	A	B		A	B	
Approach Vol, veh/h		101			342			615			494	
Approach Delay, s/veh		22.9			26.2			15.9			11.3	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	33.0		16.0	6.9	34.3		16.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.3	27.0		10.0	5.0	27.0		10.0				
Max Q Clear Time (g_c+I1), s	2.6	16.4		10.3	2.2	11.3		9.0				
Green Ext Time (p_c), s	0.0	1.9		0.0	0.0	1.5		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	17.2
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	38	35	151	23	10	74
Future Vol, veh/h	38	35	151	23	10	74
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	36	157	24	10	77

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	181	0	-	0	285	169
Stage 1	-	-	-	-	169	-
Stage 2	-	-	-	-	116	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1394	-	-	-	705	875
Stage 1	-	-	-	-	861	-
Stage 2	-	-	-	-	909	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1394	-	-	-	685	875
Mov Cap-2 Maneuver	-	-	-	-	685	-
Stage 1	-	-	-	-	836	-
Stage 2	-	-	-	-	909	-

Approach	EB	WB	SB
HCM Control Delay, s	4	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1394	-	-	-	847
HCM Lane V/C Ratio	0.028	-	-	-	0.103
HCM Control Delay (s)	7.7	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	14.3

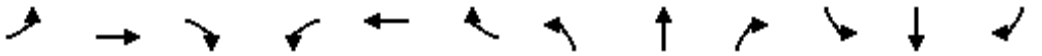
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	390	340	729	135	27	262
Future Vol, veh/h	390	340	729	135	27	262
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	120	0	125
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	424	370	792	147	29	285

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	939	0	-	0	2010	792
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	1218	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	730	-	-	-	65	389
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	280	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	730	-	-	-	~ 27	389
Mov Cap-2 Maneuver	-	-	-	-	~ 27	-
Stage 1	-	-	-	-	187	-
Stage 2	-	-	-	-	280	-

Approach	EB	WB	SB
HCM Control Delay, s	8.8	0	71
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	730	-	-	-	27	389
HCM Lane V/C Ratio	0.581	-	-	-	1.087	0.732
HCM Control Delay (s)	16.5	-	-	-	$ 414	35.7
HCM Lane LOS	C	-	-	-	F	E
HCM 95th %tile Q(veh)	3.8	-	-	-	3.5	5.7

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	702	556	60	473	645	238	67	932	483	281	1081	916
Future Volume (vph)	702	556	60	473	645	238	67	932	483	281	1081	916
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3488		3433	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3488		3433	3539	1583	156	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	739	585	63	498	679	251	71	981	508	296	1138	964
RTOR Reduction (vph)	0	5	0	0	0	135	0	0	315	0	0	365
Lane Group Flow (vph)	739	643	0	498	679	116	71	981	193	296	1138	599
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	1		2	2		3	8		7	4	
Permitted Phases						2	8		8			4
Actuated Green, G (s)	40.8	40.8		34.8	34.8	34.8	52.7	47.7	47.7	17.4	60.1	60.1
Effective Green, g (s)	40.8	40.8		34.8	34.8	34.8	52.7	47.7	47.7	17.4	60.1	60.1
Actuated g/C Ratio	0.25	0.25		0.21	0.21	0.21	0.32	0.29	0.29	0.11	0.37	0.37
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0
Lane Grp Cap (vph)	855	869		729	752	336	99	1031	461	364	1299	581
v/s Ratio Prot	c0.22	0.18		0.15	c0.19		0.02	0.28		c0.09	0.32	
v/s Ratio Perm						0.07	0.21		0.12			c0.38
v/c Ratio	0.86	0.74		0.68	0.90	0.34	0.72	0.95	0.42	0.81	0.88	1.03
Uniform Delay, d1	58.8	56.6		59.4	62.8	54.8	43.1	56.9	46.8	71.6	48.3	51.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.4	3.6		2.9	14.4	0.8	18.5	17.6	0.8	12.3	7.1	45.4
Delay (s)	68.2	60.1		62.3	77.2	55.6	61.6	74.5	47.7	83.9	55.4	97.2
Level of Service	E	E		E	E	E	E	E	D	F	E	F
Approach Delay (s)		64.4			68.2			65.2			75.8	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	69.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	163.7	Sum of lost time (s)	23.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	858	296	335	960	4	217	9	269	32	67	32
Future Volume (veh/h)	9	858	296	335	960	4	217	9	269	32	67	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	885	305	345	990	4	224	10	277	35	73	35
Peak Hour Factor	0.92	0.97	0.97	0.97	0.97	0.92	0.97	0.92	0.97	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	169	715	246	203	1149	974	343	11	297	109	173	146
Arrive On Green	0.01	0.54	0.54	0.09	0.61	0.61	0.13	0.19	0.19	0.03	0.09	0.09
Sat Flow, veh/h	1781	1330	458	1781	1870	1585	1781	56	1538	1781	1870	1585
Grp Volume(v), veh/h	10	0	1190	345	990	4	224	0	287	35	73	35
Grp Sat Flow(s),veh/h/ln	1781	0	1788	1781	1870	1585	1781	0	1594	1781	1870	1585
Q Serve(g_s), s	0.4	0.0	83.1	13.6	67.1	0.2	17.1	0.0	27.4	2.7	5.7	3.2
Cycle Q Clear(g_c), s	0.4	0.0	83.1	13.6	67.1	0.2	17.1	0.0	27.4	2.7	5.7	3.2
Prop In Lane	1.00		0.26	1.00		1.00	1.00		0.97	1.00		1.00
Lane Grp Cap(c), veh/h	169	0	961	203	1149	974	343	0	308	109	173	146
V/C Ratio(X)	0.06	0.00	1.24	1.70	0.86	0.00	0.65	0.00	0.93	0.32	0.42	0.24
Avail Cap(c_a), veh/h	306	0	961	203	1149	974	461	0	355	350	356	301
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.9	0.0	35.7	56.1	24.4	11.5	52.4	0.0	61.3	61.9	66.3	65.1
Incr Delay (d2), s/veh	0.1	0.0	116.2	333.9	7.4	0.0	1.6	0.0	28.7	1.2	1.6	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.0	91.6	41.0	38.7	0.1	12.2	0.0	19.2	2.3	5.1	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.9	0.0	151.9	390.1	31.9	11.5	54.0	0.0	90.1	63.1	67.9	65.9
LnGrp LOS	C	A	F	F	C	B	D	A	F	E	E	E
Approach Vol, veh/h		1200			1339			511			143	
Approach Delay, s/veh		150.8			124.1			74.3			66.2	
Approach LOS		F			F			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	90.0	24.7	19.9	8.1	101.9	9.1	35.5
Change Period (Y+Rc), s	6.4	6.9	5.2	5.6	6.4	6.9	5.2	5.6
Max Green Setting (Gmax), s	13.6	83.1	29.8	29.4	13.6	83.1	24.8	34.4
Max Q Clear Time (g_c+I1), s	15.6	85.1	19.1	7.7	2.4	69.1	4.7	29.4
Green Ext Time (p_c), s	0.0	0.0	0.4	0.3	0.0	8.3	0.1	0.5

Intersection Summary	
HCM 6th Ctrl Delay	123.6
HCM 6th LOS	F

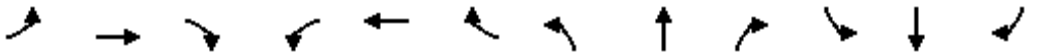
Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	58	1118	1122	19	6	50
Future Vol, veh/h	58	1118	1122	19	6	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	205	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	59	1141	1145	19	6	51

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1164	0	-	0	2414	1155
Stage 1	-	-	-	-	1155	-
Stage 2	-	-	-	-	1259	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	600	-	-	-	36	240
Stage 1	-	-	-	-	300	-
Stage 2	-	-	-	-	267	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	600	-	-	-	32	240
Mov Cap-2 Maneuver	-	-	-	-	32	-
Stage 1	-	-	-	-	271	-
Stage 2	-	-	-	-	267	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	46.9
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	600	-	-	-	141
HCM Lane V/C Ratio	0.099	-	-	-	0.405
HCM Control Delay (s)	11.7	-	-	-	46.9
HCM Lane LOS	B	-	-	-	E
HCM 95th %tile Q(veh)	0.3	-	-	-	1.8



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	1068	9	29	951	105	67	6	37	14	11	38
Future Volume (veh/h)	35	1068	9	29	951	105	67	6	37	14	11	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	36	1090	9	30	970	107	68	6	38	14	11	39
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	192	1148	9	187	1019	112	197	23	147	201	38	134
Arrive On Green	0.03	0.62	0.62	0.03	0.62	0.62	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1781	1852	15	1781	1655	183	1355	221	1398	1362	361	1279
Grp Volume(v), veh/h	36	0	1099	30	0	1077	68	0	44	14	0	50
Grp Sat Flow(s),veh/h/ln	1781	0	1868	1781	0	1838	1355	0	1619	1362	0	1640
Q Serve(g_s), s	0.6	0.0	42.2	0.5	0.0	42.3	3.8	0.0	1.9	0.7	0.0	2.2
Cycle Q Clear(g_c), s	0.6	0.0	42.2	0.5	0.0	42.3	6.0	0.0	1.9	2.7	0.0	2.2
Prop In Lane	1.00		0.01	1.00		0.10	1.00		0.86	1.00		0.78
Lane Grp Cap(c), veh/h	192	0	1158	187	0	1132	197	0	170	201	0	172
V/C Ratio(X)	0.19	0.00	0.95	0.16	0.00	0.95	0.35	0.00	0.26	0.07	0.00	0.29
Avail Cap(c_a), veh/h	440	0	1177	441	0	1158	551	0	594	558	0	601
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.2	0.0	13.6	16.9	0.0	13.9	34.9	0.0	32.0	33.2	0.0	32.1
Incr Delay (d2), s/veh	0.2	0.0	15.9	0.1	0.0	16.5	1.0	0.0	0.8	0.1	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	0.0	23.0	0.5	0.0	23.0	2.3	0.0	1.4	0.4	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.4	0.0	29.5	17.1	0.0	30.3	35.9	0.0	32.8	33.4	0.0	33.0
LnGrp LOS	B	A	C	B	A	C	D	A	C	C	A	C
Approach Vol, veh/h		1135			1107			112			64	
Approach Delay, s/veh		29.1			30.0			34.7			33.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.9	54.2		14.7	9.2	53.9		14.7				
Change Period (Y+Rc), s	6.5	6.0		6.5	6.5	6.0		6.5				
Max Green Setting (Gmax), s	13.5	49.0		28.5	13.5	49.0		28.5				
Max Q Clear Time (g_c+I1), s	2.5	44.2		4.7	2.6	44.3		8.0				
Green Ext Time (p_c), s	0.0	3.7		0.2	0.0	3.6		0.4				

Intersection Summary			
HCM 6th Ctrl Delay		29.9	
HCM 6th LOS		C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	48	7	74	33	32	11	347	86	43	536	68
Future Volume (veh/h)	16	48	7	74	33	32	11	347	86	43	536	68
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	17	50	7	77	34	33	11	361	0	45	558	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	340	296	41	351	161	156	354	792		512	851	
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.01	0.42	0.00	0.05	0.46	0.00
Sat Flow, veh/h	1334	1605	225	1346	872	846	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	17	0	57	77	0	67	11	361	0	45	558	0
Grp Sat Flow(s),veh/h/ln	1334	0	1830	1346	0	1718	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.6	0.0	1.4	2.7	0.0	1.7	0.2	7.2	0.0	0.7	12.0	0.0
Cycle Q Clear(g_c), s	2.3	0.0	1.4	4.0	0.0	1.7	0.2	7.2	0.0	0.7	12.0	0.0
Prop In Lane	1.00		0.12	1.00		0.49	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	340	0	337	351	0	316	354	792		512	851	
V/C Ratio(X)	0.05	0.00	0.17	0.22	0.00	0.21	0.03	0.46		0.09	0.66	
Avail Cap(c_a), veh/h	351	0	352	362	0	331	500	792		601	851	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.0	0.0	17.8	19.5	0.0	18.0	9.3	10.7	0.0	8.0	11.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.3	0.0	0.3	0.0	1.9	0.0	0.1	3.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.0	0.9	1.3	0.0	1.1	0.1	4.4	0.0	0.3	7.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.0	0.0	18.1	19.8	0.0	18.3	9.4	12.6	0.0	8.1	14.9	0.0
LnGrp LOS	B	A	B	B	A	B	A	B		A	B	
Approach Vol, veh/h		74			144			372			603	
Approach Delay, s/veh		18.3			19.1			12.5			14.4	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.4	28.0		15.6	6.7	29.7		15.6
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	22.0		10.0	5.0	22.0		10.0
Max Q Clear Time (g_c+I1), s	2.7	9.2		4.3	2.2	14.0		6.0
Green Ext Time (p_c), s	0.0	1.0		0.1	0.0	1.4		0.1

Intersection Summary	
HCM 6th Ctrl Delay	14.6
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	98	66	8	21	56
Future Vol, veh/h	60	98	66	8	21	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	102	69	8	22	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	77	0	-	0	301	73
Stage 1	-	-	-	-	73	-
Stage 2	-	-	-	-	228	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1522	-	-	-	691	989
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	810	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1522	-	-	-	661	989
Mov Cap-2 Maneuver	-	-	-	-	661	-
Stage 1	-	-	-	-	908	-
Stage 2	-	-	-	-	810	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1522	-	-	-	871
HCM Lane V/C Ratio	0.041	-	-	-	0.092
HCM Control Delay (s)	7.5	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	20.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	402	666	433	57	47	490
Future Vol, veh/h	402	666	433	57	47	490
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	120	0	125
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	428	709	461	61	50	521

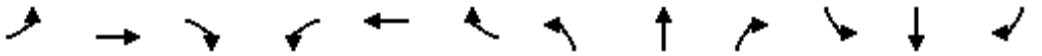
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	522	0	-	0	2026	461
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	1565	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1044	-	-	-	63	600
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	189	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1044	-	-	-	~ 37	600
Mov Cap-2 Maneuver	-	-	-	-	~ 37	-
Stage 1	-	-	-	-	375	-
Stage 2	-	-	-	-	189	-

Approach	EB	WB	SB
HCM Control Delay, s	4.1	0	73.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1044	-	-	-	37	600
HCM Lane V/C Ratio	0.41	-	-	-	1.351	0.869
HCM Control Delay (s)	10.8	-	-	-	$ 437.1	38.2
HCM Lane LOS	B	-	-	-	F	E
HCM 95th %tile Q(veh)	2	-	-	-	5.2	9.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

2031 FUTURE PROJECTED CONDITIONS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	939	685	47	420	484	453	35	955	370	329	955	916
Future Volume (vph)	939	685	47	420	484	453	35	955	370	329	955	916
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3505		3433	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.11	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3505		3433	3539	1583	204	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	1067	778	53	477	550	515	40	1085	420	374	1085	1041
RTOR Reduction (vph)	0	3	0	0	0	129	0	0	303	0	0	378
Lane Group Flow (vph)	1067	828	0	477	550	386	40	1085	117	374	1085	663
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	1		2	2		3	8		7	4	
Permitted Phases						2	8		8			4
Actuated Green, G (s)	42.0	42.0		35.0	35.0	35.0	50.0	46.0	46.0	19.5	61.5	61.5
Effective Green, g (s)	42.0	42.0		35.0	35.0	35.0	50.0	46.0	46.0	19.5	61.5	61.5
Actuated g/C Ratio	0.25	0.25		0.21	0.21	0.21	0.30	0.28	0.28	0.12	0.37	0.37
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0
Lane Grp Cap (vph)	871	889		726	748	334	99	983	439	404	1315	588
v/s Ratio Prot	c0.31	0.24		0.14	0.16		0.01	0.31		c0.11	0.31	
v/s Ratio Perm						c0.24	0.11		0.07			c0.42
v/c Ratio	1.23	0.93		0.66	0.74	1.15	0.40	1.10	0.27	0.93	0.83	1.13
Uniform Delay, d1	61.8	60.3		59.8	60.9	65.2	43.6	59.8	46.6	72.3	47.1	52.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	111.5	16.2		2.4	4.0	98.2	1.0	61.5	0.4	26.5	4.6	77.3
Delay (s)	173.2	76.6		62.1	64.9	163.4	44.6	121.2	47.0	98.8	51.7	129.3
Level of Service	F	E		E	E	F	D	F	D	F	D	F
Approach Delay (s)		130.9			97.0			99.1			91.0	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	104.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	165.5	Sum of lost time (s)	23.0
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	793	205	296	1043	34	419	67	276	1	2	2
Future Volume (veh/h)	105	793	205	296	1043	34	419	67	276	1	2	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	891	230	333	1172	37	471	73	310	1	2	2
Peak Hour Factor	0.92	0.89	0.89	0.89	0.89	0.92	0.89	0.92	0.89	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	135	756	195	199	1054	893	444	72	307	48	83	70
Arrive On Green	0.05	0.53	0.53	0.09	0.56	0.56	0.19	0.23	0.23	0.00	0.04	0.04
Sat Flow, veh/h	1781	1434	370	1781	1870	1585	1781	311	1321	1781	1870	1585
Grp Volume(v), veh/h	114	0	1121	333	1172	37	471	0	383	1	2	2
Grp Sat Flow(s),veh/h/ln	1781	0	1804	1781	1870	1585	1781	0	1633	1781	1870	1585
Q Serve(g_s), s	5.9	0.0	83.1	13.6	88.8	1.6	29.8	0.0	36.6	0.1	0.2	0.2
Cycle Q Clear(g_c), s	5.9	0.0	83.1	13.6	88.8	1.6	29.8	0.0	36.6	0.1	0.2	0.2
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.81	1.00		1.00
Lane Grp Cap(c), veh/h	135	0	951	199	1054	893	444	0	379	48	83	70
V/C Ratio(X)	0.84	0.00	1.18	1.67	1.11	0.04	1.06	0.00	1.01	0.02	0.02	0.03
Avail Cap(c_a), veh/h	199	0	951	199	1054	893	444	0	379	326	349	296
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.0	0.0	37.3	56.8	34.4	15.4	60.2	0.0	60.5	71.9	72.0	72.0
Incr Delay (d2), s/veh	12.9	0.0	91.4	322.5	63.9	0.0	59.9	0.0	48.9	0.1	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.9	0.0	80.9	39.9	74.9	1.1	16.1	0.0	27.4	0.1	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.9	0.0	128.6	379.3	98.3	15.4	120.1	0.0	109.4	72.0	72.1	72.2
LnGrp LOS	E	A	F	F	F	B	F	A	F	E	E	E
Approach Vol, veh/h		1235			1542			854			5	
Approach Delay, s/veh		122.2			157.0			115.3			72.1	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	90.0	35.0	12.6	14.3	95.7	5.4	42.2
Change Period (Y+Rc), s	6.4	6.9	5.2	5.6	6.4	6.9	5.2	5.6
Max Green Setting (Gmax), s	13.6	83.1	29.8	29.4	13.6	83.1	24.8	34.4
Max Q Clear Time (g_c+I1), s	15.6	85.1	31.8	2.2	7.9	90.8	2.1	38.6
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	135.3
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	638.2

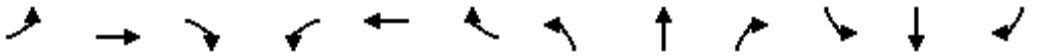
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	936	96	44	1116	10	163	13	76	21	7	59
Future Vol, veh/h	17	936	96	44	1116	10	163	13	76	21	7	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	205	-	-	205	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	92	92	90	90	92	92	92	90	92	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	19	1040	104	48	1240	11	177	14	83	23	8	66

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1251	0	0	1144	0	0	2509	2477	1092	2521	2524	1246
Stage 1	-	-	-	-	-	-	1130	1130	-	1342	1342	-
Stage 2	-	-	-	-	-	-	1379	1347	-	1179	1182	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	556	-	-	611	-	-	~ 19	30	261	~ 19	28	212
Stage 1	-	-	-	-	-	-	248	279	-	188	221	-
Stage 2	-	-	-	-	-	-	179	220	-	232	263	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	556	-	-	611	-	-	~ 9	27	261	~ 7	25	212
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 9	27	-	~ 7	25	-
Stage 1	-	-	-	-	-	-	240	270	-	182	204	-
Stage 2	-	-	-	-	-	-	~ 110	203	-	145	254	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.4	$ 6001.7	$ 1691
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	9	115	556	-	-	611	-	-	24
HCM Lane V/C Ratio	19.686	0.841	0.034	-	-	0.078	-	-	4.021
HCM Control Delay (s)	$ 9215.9	115.1	11.7	-	-	11.4	-	-	$ 1691
HCM Lane LOS	F	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	23.8	5	0.1	-	-	0.3	-	-	12.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	286	767	37	24	858	43	114	61	37	62	31	235
Future Volume (veh/h)	286	767	37	24	858	43	114	61	37	62	31	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	321	862	42	27	964	48	128	69	42	70	35	264
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	284	960	47	177	787	39	163	282	172	333	49	369
Arrive On Green	0.12	0.54	0.54	0.03	0.45	0.45	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1781	1769	86	1781	1767	88	1080	1089	663	1282	189	1425
Grp Volume(v), veh/h	321	0	904	27	0	1012	128	0	111	70	0	299
Grp Sat Flow(s),veh/h/ln	1781	0	1855	1781	0	1855	1080	0	1751	1282	0	1614
Q Serve(g_s), s	13.5	0.0	47.8	0.9	0.0	49.0	10.0	0.0	5.5	5.0	0.0	18.5
Cycle Q Clear(g_c), s	13.5	0.0	47.8	0.9	0.0	49.0	28.5	0.0	5.5	10.5	0.0	18.5
Prop In Lane	1.00		0.05	1.00		0.05	1.00		0.38	1.00		0.88
Lane Grp Cap(c), veh/h	284	0	1007	177	0	826	163	0	454	333	0	418
V/C Ratio(X)	1.13	0.00	0.90	0.15	0.00	1.23	0.78	0.00	0.24	0.21	0.00	0.72
Avail Cap(c_a), veh/h	284	0	1007	351	0	826	163	0	454	333	0	418
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.2	0.0	22.4	22.2	0.0	30.5	51.2	0.0	32.2	36.4	0.0	37.1
Incr Delay (d2), s/veh	93.1	0.0	11.3	0.1	0.0	112.0	21.6	0.0	0.3	0.3	0.0	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	16.3	0.0	28.2	0.6	0.0	64.4	8.0	0.0	4.3	2.9	0.0	12.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	129.3	0.0	33.7	22.3	0.0	142.5	72.8	0.0	32.5	36.7	0.0	42.8
LnGrp LOS	F	A	C	C	A	F	E	A	C	D	A	D
Approach Vol, veh/h		1225			1039			239			369	
Approach Delay, s/veh		58.8			139.4			54.1			41.6	
Approach LOS		E			F			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	65.7		35.0	20.0	55.0		35.0				
Change Period (Y+Rc), s	6.5	6.0		6.5	6.5	6.0		6.5				
Max Green Setting (Gmax), s	13.5	49.0		28.5	13.5	49.0		28.5				
Max Q Clear Time (g_c+I1), s	2.9	49.8		20.5	15.5	51.0		30.5				
Green Ext Time (p_c), s	0.0	0.0		1.0	0.0	0.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		85.3	
HCM 6th LOS		F	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	43	7	113	117	57	11	528	83	32	421	42
Future Volume (veh/h)	42	43	7	113	117	57	11	528	83	32	421	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	50	51	8	135	139	68	13	629	0	38	501	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	202	276	43	323	207	101	433	882		359	925	
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.02	0.47	0.00	0.04	0.49	0.00
Sat Flow, veh/h	1175	1578	248	1344	1186	580	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	50	0	59	135	0	207	13	629	0	38	501	0
Grp Sat Flow(s),veh/h/ln	1175	0	1826	1344	0	1766	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.4	0.0	1.6	5.5	0.0	6.3	0.2	15.3	0.0	0.6	10.6	0.0
Cycle Q Clear(g_c), s	8.7	0.0	1.6	7.0	0.0	6.3	0.2	15.3	0.0	0.6	10.6	0.0
Prop In Lane	1.00		0.14	1.00		0.33	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	202	0	319	323	0	308	433	882		359	925	
V/C Ratio(X)	0.25	0.00	0.19	0.42	0.00	0.67	0.03	0.71		0.11	0.54	
Avail Cap(c_a), veh/h	202	0	319	323	0	308	559	882		444	925	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.1	0.0	20.2	23.2	0.0	22.1	8.3	12.1	0.0	9.2	10.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.3	0.9	0.0	5.6	0.0	4.9	0.0	0.1	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.1	0.0	1.1	2.8	0.0	4.9	0.1	9.4	0.0	0.3	6.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	0.0	20.4	24.0	0.0	27.7	8.4	16.9	0.0	9.3	12.3	0.0
LnGrp LOS	C	A	C	C	A	C	A	B		A	B	
Approach Vol, veh/h		109			342			642			539	
Approach Delay, s/veh		23.3			26.2			16.8			12.0	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.3	33.0		16.0	6.9	34.3		16.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.3	27.0		10.0	5.0	27.0		10.0
Max Q Clear Time (g_c+I1), s	2.6	17.3		10.7	2.2	12.6		9.0
Green Ext Time (p_c), s	0.0	1.9		0.0	0.0	1.7		0.1

Intersection Summary	
HCM 6th Ctrl Delay	17.6
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	38	35	151	23	10	74
Future Vol, veh/h	38	35	151	23	10	74
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	36	157	24	10	77

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	181	0	-	0	285	169
Stage 1	-	-	-	-	169	-
Stage 2	-	-	-	-	116	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1394	-	-	-	705	875
Stage 1	-	-	-	-	861	-
Stage 2	-	-	-	-	909	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1394	-	-	-	685	875
Mov Cap-2 Maneuver	-	-	-	-	685	-
Stage 1	-	-	-	-	836	-
Stage 2	-	-	-	-	909	-

Approach	EB	WB	SB
HCM Control Delay, s	4	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1394	-	-	-	847
HCM Lane V/C Ratio	0.028	-	-	-	0.103
HCM Control Delay (s)	7.7	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	17.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	412	340	729	135	27	300
Future Vol, veh/h	412	340	729	135	27	300
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	120	0	125
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	448	370	792	147	29	326

Major/Minor	Major1			Major2		
					Minor2	
Conflicting Flow All	939	0	-	0	2058	792
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	1266	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	730	-	-	-	61	389
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	265	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	730	-	-	-	~ 24	389
Mov Cap-2 Maneuver	-	-	-	-	~ 24	-
Stage 1	-	-	-	-	172	-
Stage 2	-	-	-	-	265	-

Approach	EB	WB	SB
HCM Control Delay, s	9.6	0	84.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	730	-	-	-	24	389
HCM Lane V/C Ratio	0.613	-	-	-	1.223	0.838
HCM Control Delay (s)	17.4	-	-	-	$ 496.8	47.3
HCM Lane LOS	C	-	-	-	F	E
HCM 95th %tile Q(veh)	4.2	-	-	-	3.7	7.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	702	583	60	493	666	289	67	932	510	349	1081	916
Future Volume (vph)	702	583	60	493	666	289	67	932	510	349	1081	916
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3490		3433	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.09	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3490		3433	3539	1583	163	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	739	614	63	519	701	304	71	981	537	367	1138	964
RTOR Reduction (vph)	0	5	0	0	0	135	0	0	315	0	0	365
Lane Group Flow (vph)	739	672	0	519	701	169	71	981	222	367	1138	599
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	1		2	2		3	8		7	4	
Permitted Phases						2	8		8			4
Actuated Green, G (s)	40.8	40.8		35.0	35.0	35.0	50.7	45.7	45.7	19.3	60.0	60.0
Effective Green, g (s)	40.8	40.8		35.0	35.0	35.0	50.7	45.7	45.7	19.3	60.0	60.0
Actuated g/C Ratio	0.25	0.25		0.21	0.21	0.21	0.31	0.28	0.28	0.12	0.37	0.37
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0
Lane Grp Cap (vph)	855	869		733	756	338	99	987	441	404	1296	579
v/s Ratio Prot	c0.22	0.19		0.15	c0.20		0.02	0.28		c0.11	0.32	
v/s Ratio Perm						0.11	0.20		0.14			c0.38
v/c Ratio	0.86	0.77		0.71	0.93	0.50	0.72	0.99	0.50	0.91	0.88	1.03
Uniform Delay, d1	58.9	57.2		59.7	63.2	56.7	44.2	58.9	49.5	71.4	48.5	51.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.4	4.6		3.4	17.5	1.6	18.5	27.0	1.2	23.2	7.2	46.6
Delay (s)	68.2	61.8		63.0	80.7	58.3	62.7	85.9	50.8	94.6	55.7	98.5
Level of Service	E	E		E	F	E	E	F	D	F	E	F
Approach Delay (s)		65.1			70.2			73.0			78.2	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	72.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	163.8	Sum of lost time (s)	23.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	980	296	376	1052	4	217	9	323	32	67	32
Future Volume (veh/h)	9	980	296	376	1052	4	217	9	323	32	67	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	1010	305	388	1085	4	224	10	333	35	73	35
Peak Hour Factor	0.92	0.97	0.97	0.97	0.97	0.92	0.97	0.92	0.97	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	85	720	217	197	1116	945	370	10	334	90	221	188
Arrive On Green	0.01	0.52	0.52	0.09	0.60	0.60	0.12	0.22	0.22	0.02	0.12	0.12
Sat Flow, veh/h	1781	1379	416	1781	1870	1585	1781	46	1546	1781	1870	1585
Grp Volume(v), veh/h	10	0	1315	388	1085	4	224	0	343	35	73	35
Grp Sat Flow(s),veh/h/ln	1781	0	1795	1781	1870	1585	1781	0	1592	1781	1870	1585
Q Serve(g_s), s	0.4	0.0	83.1	13.6	88.7	0.2	17.1	0.0	34.3	2.7	5.7	3.2
Cycle Q Clear(g_c), s	0.4	0.0	83.1	13.6	88.7	0.2	17.1	0.0	34.3	2.7	5.7	3.2
Prop In Lane	1.00		0.23	1.00		1.00	1.00		0.97	1.00		1.00
Lane Grp Cap(c), veh/h	85	0	938	197	1116	945	370	0	344	90	221	188
V/C Ratio(X)	0.12	0.00	1.40	1.96	0.97	0.00	0.61	0.00	1.00	0.39	0.33	0.19
Avail Cap(c_a), veh/h	218	0	938	197	1116	945	485	0	344	324	346	293
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	0.0	38.0	57.4	30.9	13.0	50.9	0.0	62.3	60.7	64.4	63.2
Incr Delay (d2), s/veh	0.2	0.0	187.6	452.0	20.7	0.0	1.2	0.0	47.5	1.0	0.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.0	123.4	44.9	54.1	0.1	12.1	0.0	25.0	2.3	5.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.6	0.0	225.6	509.3	51.6	13.0	52.1	0.0	109.9	61.7	65.2	63.7
LnGrp LOS	D	A	F	F	D	B	D	A	F	E	E	E
Approach Vol, veh/h		1325			1477			567			143	
Approach Delay, s/veh		224.2			171.7			87.1			64.0	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	90.0	24.7	24.4	8.2	101.8	9.1	40.0
Change Period (Y+Rc), s	6.4	6.9	5.2	5.6	6.4	6.9	5.2	5.6
Max Green Setting (Gmax), s	13.6	83.1	29.8	29.4	13.6	83.1	24.8	34.4
Max Q Clear Time (g_c+I1), s	15.6	85.1	19.1	7.7	2.4	90.7	4.7	36.3
Green Ext Time (p_c), s	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	173.5
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	35

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	58	1118	176	81	1122	19	133	10	61	6	14	50
Future Vol, veh/h	58	1118	176	81	1122	19	133	10	61	6	14	50
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	205	-	-	205	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	92	92	98	98	92	92	92	98	92	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	59	1141	191	88	1145	19	145	11	66	6	15	51

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1164	0	0	1332	0	0	2719	2695	1237	2724	2781	1155
Stage 1	-	-	-	-	-	-	1355	1355	-	1331	1331	-
Stage 2	-	-	-	-	-	-	1364	1340	-	1393	1450	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	600	-	-	518	-	-	~ 14	22	215	13	19	240
Stage 1	-	-	-	-	-	-	184	218	-	190	224	-
Stage 2	-	-	-	-	-	-	182	221	-	175	196	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	600	-	-	518	-	-	-	16	215	~ 3	~ 14	240
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	16	-	~ 3	~ 14	-
Stage 1	-	-	-	-	-	-	166	197	-	171	186	-
Stage 2	-	-	-	-	-	-	~ 109	183	-	103	177	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.9		$ 1396.1
HCM LOS			-	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	78	600	-	-	518	-	-	22
HCM Lane V/C Ratio	-	0.989	0.099	-	-	0.17	-	-	3.289
HCM Control Delay (s)	-	192.1	11.7	-	-	13.4	-	-	$ 1396.1
HCM Lane LOS	-	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	-	5.3	0.3	-	-	0.6	-	-	9.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	1119	9	29	1018	105	67	6	37	14	11	52
Future Volume (veh/h)	45	1119	9	29	1018	105	67	6	37	14	11	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	46	1142	9	30	1039	107	68	6	38	14	11	53
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	161	1148	9	148	1017	105	193	25	158	210	32	153
Arrive On Green	0.04	0.62	0.62	0.03	0.61	0.61	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1781	1853	15	1781	1668	172	1338	221	1398	1362	280	1348
Grp Volume(v), veh/h	46	0	1151	30	0	1146	68	0	44	14	0	64
Grp Sat Flow(s),veh/h/ln	1781	0	1868	1781	0	1839	1338	0	1619	1362	0	1628
Q Serve(g_s), s	0.7	0.0	49.1	0.5	0.0	49.0	4.0	0.0	2.0	0.8	0.0	2.9
Cycle Q Clear(g_c), s	0.7	0.0	49.1	0.5	0.0	49.0	6.9	0.0	2.0	2.7	0.0	2.9
Prop In Lane	1.00		0.01	1.00		0.09	1.00		0.86	1.00		0.83
Lane Grp Cap(c), veh/h	161	0	1157	148	0	1122	193	0	184	210	0	185
V/C Ratio(X)	0.29	0.00	0.99	0.20	0.00	1.02	0.35	0.00	0.24	0.07	0.00	0.35
Avail Cap(c_a), veh/h	389	0	1157	393	0	1122	516	0	574	539	0	578
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.0	0.0	15.1	20.2	0.0	15.7	36.0	0.0	32.4	33.7	0.0	32.9
Incr Delay (d2), s/veh	0.4	0.0	25.1	0.2	0.0	32.3	1.1	0.0	0.7	0.1	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.8	0.0	29.1	0.5	0.0	32.2	2.4	0.0	1.4	0.5	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	0.0	40.2	20.4	0.0	48.0	37.1	0.0	33.1	33.8	0.0	34.0
LnGrp LOS	C	A	D	C	A	F	D	A	C	C	A	C
Approach Vol, veh/h		1197			1176			112			78	
Approach Delay, s/veh		39.5			47.3			35.6			33.9	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.9	55.8		15.6	9.7	55.0		15.6				
Change Period (Y+Rc), s	6.5	6.0		6.5	6.5	6.0		6.5				
Max Green Setting (Gmax), s	13.5	49.0		28.5	13.5	49.0		28.5				
Max Q Clear Time (g_c+I1), s	2.5	51.1		4.9	2.7	51.0		8.9				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.4				

Intersection Summary			
HCM 6th Ctrl Delay		42.7	
HCM 6th LOS		D	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	48	7	74	33	32	11	388	86	43	567	78
Future Volume (veh/h)	29	48	7	74	33	32	11	388	86	43	567	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	30	50	7	77	34	33	11	404	0	45	591	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	342	298	42	353	162	157	331	791		479	850	
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.01	0.42	0.00	0.05	0.45	0.00
Sat Flow, veh/h	1334	1605	225	1346	872	846	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	30	0	57	77	0	67	11	404	0	45	591	0
Grp Sat Flow(s),veh/h/ln	1334	0	1830	1346	0	1718	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	1.0	0.0	1.4	2.7	0.0	1.7	0.2	8.3	0.0	0.7	13.1	0.0
Cycle Q Clear(g_c), s	2.7	0.0	1.4	4.0	0.0	1.7	0.2	8.3	0.0	0.7	13.1	0.0
Prop In Lane	1.00		0.12	1.00		0.49	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	342	0	339	353	0	318	331	791		479	850	
V/C Ratio(X)	0.09	0.00	0.17	0.22	0.00	0.21	0.03	0.51		0.09	0.70	
Avail Cap(c_a), veh/h	351	0	352	362	0	330	477	791		568	850	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.1	0.0	17.8	19.5	0.0	18.0	9.6	11.1	0.0	8.2	11.3	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.3	0.0	0.3	0.0	2.4	0.0	0.1	4.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	0.0	0.9	1.3	0.0	1.1	0.1	5.2	0.0	0.3	8.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.2	0.0	18.1	19.8	0.0	18.3	9.6	13.4	0.0	8.3	16.0	0.0
LnGrp LOS	B	A	B	B	A	B	A	B		A	B	
Approach Vol, veh/h		87			144			415			636	
Approach Delay, s/veh		18.5			19.1			13.3			15.4	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.4	28.0		15.6	6.7	29.7		15.6
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	22.0		10.0	5.0	22.0		10.0
Max Q Clear Time (g_c+I1), s	2.7	10.3		4.7	2.2	15.1		6.0
Green Ext Time (p_c), s	0.0	1.2		0.1	0.0	1.4		0.1

Intersection Summary	
HCM 6th Ctrl Delay	15.4
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	98	66	8	21	56
Future Vol, veh/h	60	98	66	8	21	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	102	69	8	22	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	77	0	-	0	301	73
Stage 1	-	-	-	-	73	-
Stage 2	-	-	-	-	228	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1522	-	-	-	691	989
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	810	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1522	-	-	-	661	989
Mov Cap-2 Maneuver	-	-	-	-	661	-
Stage 1	-	-	-	-	908	-
Stage 2	-	-	-	-	810	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1522	-	-	-	871
HCM Lane V/C Ratio	0.041	-	-	-	0.092
HCM Control Delay (s)	7.5	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	26.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	443	666	433	57	47	521
Future Vol, veh/h	443	666	433	57	47	521
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	120	0	125
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	471	709	461	61	50	554

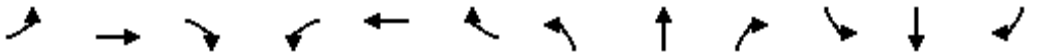
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	522	0	-	0	2112	461
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	1651	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1044	-	-	-	56	600
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	172	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1044	-	-	-	~ 31	600
Mov Cap-2 Maneuver	-	-	-	-	~ 31	-
Stage 1	-	-	-	-	349	-
Stage 2	-	-	-	-	172	-

Approach	EB	WB	SB
HCM Control Delay, s	4.5	0	90.9
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1044	-	-	-	31	600
HCM Lane V/C Ratio	0.451	-	-	-	1.613	0.924
HCM Control Delay (s)	11.3	-	-	-	$ 580.4	46.7
HCM Lane LOS	B	-	-	-	F	E
HCM 95th %tile Q(veh)	2.4	-	-	-	5.7	11.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

2031 FUTURE PROJECTED CONDITIONS WITH INTERSECTION IMPROVEMENTS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	939	685	47	420	484	453	35	955	370	329	955	916
Future Volume (vph)	939	685	47	420	484	453	35	955	370	329	955	916
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		4.5	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3505		3433	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.10	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3505		3433	3539	1583	186	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	1067	778	53	477	550	515	40	1085	420	374	1085	1041
RTOR Reduction (vph)	0	4	0	0	0	120	0	0	265	0	0	434
Lane Group Flow (vph)	1067	827	0	477	550	395	40	1085	155	374	1085	607
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2	8		8			4
Actuated Green, G (s)	34.5	35.1		23.4	24.0	24.0	44.0	40.0	40.0	11.0	47.0	47.0
Effective Green, g (s)	34.5	35.1		23.4	24.0	24.0	44.0	40.0	40.0	11.0	47.0	47.0
Actuated g/C Ratio	0.26	0.27		0.18	0.18	0.18	0.34	0.31	0.31	0.08	0.36	0.36
Clearance Time (s)	4.5	6.0		4.5	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0
Lane Grp Cap (vph)	904	939		613	648	290	110	1080	483	288	1269	567
v/s Ratio Prot	c0.31	0.24		0.14	0.16		0.01	0.31		c0.11	0.31	
v/s Ratio Perm						c0.25	0.11		0.10			c0.38
v/c Ratio	1.18	0.88		0.78	0.85	1.36	0.36	1.00	0.32	1.30	0.86	1.07
Uniform Delay, d1	48.2	46.0		51.3	51.7	53.5	32.4	45.5	35.0	60.0	38.8	42.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	92.6	10.0		6.2	10.5	183.5	0.7	28.5	0.5	157.6	6.0	58.0
Delay (s)	140.8	55.9		57.5	62.2	237.0	33.1	74.0	35.6	217.6	44.9	100.0
Level of Service	F	E		E	E	F	C	E	D	F	D	F
Approach Delay (s)		103.6			119.2			62.5			93.7	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	95.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	131.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	95.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	793	205	296	1043	34	419	67	276	1	2	2
Future Volume (veh/h)	105	793	205	296	1043	34	419	67	276	1	2	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	891	230	333	1172	37	471	73	310	1	2	2
Peak Hour Factor	0.92	0.89	0.89	0.89	0.89	0.92	0.89	0.92	0.89	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	126	731	189	269	1104	935	395	382	520	97	87	74
Arrive On Green	0.04	0.51	0.51	0.12	0.59	0.59	0.16	0.20	0.20	0.00	0.05	0.05
Sat Flow, veh/h	1781	1434	370	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	114	0	1121	333	1172	37	471	73	310	1	2	2
Grp Sat Flow(s),veh/h/ln	1781	0	1804	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.5	0.0	76.5	18.6	88.5	1.5	23.8	4.8	24.5	0.1	0.2	0.2
Cycle Q Clear(g_c), s	5.5	0.0	76.5	18.6	88.5	1.5	23.8	4.8	24.5	0.1	0.2	0.2
Prop In Lane	1.00		0.21	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	126	0	920	269	1104	935	395	382	520	97	87	74
V/C Ratio(X)	0.90	0.00	1.22	1.24	1.06	0.04	1.19	0.19	0.60	0.01	0.02	0.03
Avail Cap(c_a), veh/h	126	0	920	269	1104	935	395	382	520	154	87	74
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.8	0.0	36.8	54.6	30.7	12.9	59.5	49.5	42.1	68.0	68.2	68.2
Incr Delay (d2), s/veh	50.3	0.0	108.3	135.0	45.2	0.0	108.9	0.2	1.9	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.8	0.0	83.3	29.6	65.2	0.9	23.3	4.1	14.7	0.1	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	92.1	0.0	145.0	189.6	75.9	12.9	168.4	49.7	44.0	68.0	68.3	68.4
LnGrp LOS	F	A	F	F	F	B	F	D	D	E	E	E
Approach Vol, veh/h		1235			1542			854			5	
Approach Delay, s/veh		140.1			99.0			113.1			68.3	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	83.4	29.0	12.6	13.0	95.4	5.4	36.2
Change Period (Y+Rc), s	6.4	6.9	5.2	5.6	6.4	6.9	5.2	5.6
Max Green Setting (Gmax), s	8.6	76.5	23.8	7.0	6.6	88.5	5.0	25.8
Max Q Clear Time (g_c+I1), s	20.6	78.5	25.8	2.2	7.5	90.5	2.1	26.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	116.2
HCM 6th LOS	F



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	936	96	44	1116	10	163	13	76	21	7	59
Future Volume (veh/h)	17	936	96	44	1116	10	163	13	76	21	7	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	19	1040	104	48	1240	11	177	14	83	23	8	66
Peak Hour Factor	0.90	0.90	0.92	0.92	0.90	0.90	0.92	0.92	0.92	0.90	0.92	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	93	1131	958	173	1287	1090	261	28	167	215	11	89
Arrive On Green	0.60	0.60	0.60	0.03	0.69	0.69	0.10	0.12	0.12	0.04	0.06	0.06
Sat Flow, veh/h	444	1870	1585	1781	1870	1585	1781	234	1387	1781	174	1437
Grp Volume(v), veh/h	19	1040	104	48	1240	11	177	0	97	23	0	74
Grp Sat Flow(s),veh/h/ln	444	1870	1585	1781	1870	1585	1781	0	1621	1781	0	1612
Q Serve(g_s), s	5.0	59.4	3.3	1.1	73.7	0.3	10.9	0.0	6.7	1.4	0.0	5.4
Cycle Q Clear(g_c), s	68.6	59.4	3.3	1.1	73.7	0.3	10.9	0.0	6.7	1.4	0.0	5.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.86	1.00		0.89
Lane Grp Cap(c), veh/h	93	1131	958	173	1287	1090	261	0	195	215	0	100
V/C Ratio(X)	0.20	0.92	0.11	0.28	0.96	0.01	0.68	0.00	0.50	0.11	0.00	0.74
Avail Cap(c_a), veh/h	93	1131	958	188	1287	1090	261	0	230	215	0	134
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.34	0.34	0.34	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.7	21.1	10.0	24.8	17.3	5.9	45.2	0.0	49.4	48.8	0.0	55.3
Incr Delay (d2), s/veh	4.9	13.3	0.2	0.3	8.4	0.0	6.9	0.0	2.0	0.2	0.0	13.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	34.0	1.9	1.3	31.5	0.1	9.1	0.0	5.1	1.2	0.0	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.7	34.4	10.3	25.1	25.7	5.9	52.1	0.0	51.3	49.0	0.0	68.9
LnGrp LOS	E	C	B	C	C	A	D	A	D	D	A	E
Approach Vol, veh/h		1163			1299			274			97	
Approach Delay, s/veh		32.7			25.5			51.9			64.2	
Approach LOS		C			C			D			E	

Timer - Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	11.0	20.4	10.0	78.6	18.0	13.4		88.6
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	17.0	5.0	69.0	12.0	10.0		80.0
Max Q Clear Time (g_c+I1), s	13.4	8.7	3.1	70.6	12.9	7.4		75.7
Green Ext Time (p_c), s	0.0	0.2	0.0	0.0	0.0	0.0		2.6

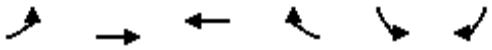
Intersection Summary	
HCM 6th Ctrl Delay	32.3
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	286	767	37	24	858	43	114	61	37	62	31	235
Future Volume (veh/h)	286	767	37	24	858	43	114	61	37	62	31	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	321	862	42	27	964	48	128	69	42	70	35	264
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	331	1182	58	316	950	47	144	176	107	127	40	379
Arrive On Green	0.15	0.67	0.67	0.02	0.54	0.54	0.04	0.16	0.16	0.08	0.08	0.08
Sat Flow, veh/h	1781	1769	86	1781	1767	88	1781	1089	663	955	477	1585
Grp Volume(v), veh/h	321	0	904	27	0	1012	128	0	111	105	0	264
Grp Sat Flow(s),veh/h/ln	1781	0	1855	1781	0	1855	1781	0	1751	1432	0	1585
Q Serve(g_s), s	19.2	0.0	41.0	0.9	0.0	69.9	5.5	0.0	7.4	9.4	0.0	11.0
Cycle Q Clear(g_c), s	19.2	0.0	41.0	0.9	0.0	69.9	5.5	0.0	7.4	9.4	0.0	11.0
Prop In Lane	1.00		0.05	1.00		0.05	1.00		0.38	0.67		1.00
Lane Grp Cap(c), veh/h	331	0	1240	316	0	997	144	0	283	167	0	379
V/C Ratio(X)	0.97	0.00	0.73	0.09	0.00	1.01	0.89	0.00	0.39	0.63	0.00	0.70
Avail Cap(c_a), veh/h	331	0	1240	343	0	997	144	0	283	167	0	379
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.4	0.0	13.9	15.0	0.0	30.1	55.6	0.0	48.8	58.8	0.0	45.1
Incr Delay (d2), s/veh	41.2	0.0	2.7	0.0	0.0	32.3	44.1	0.0	0.9	7.2	0.0	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	19.3	0.0	21.3	0.6	0.0	46.7	5.9	0.0	6.0	6.8	0.0	13.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	87.6	0.0	16.7	15.0	0.0	62.3	99.7	0.0	49.7	66.0	0.0	50.6
LnGrp LOS	F	A	B	B	A	F	F	A	D	E	A	D
Approach Vol, veh/h		1225			1039			239			369	
Approach Delay, s/veh		35.2			61.1			76.5			55.0	
Approach LOS		D			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	92.9	10.0	17.5	26.6	75.9		27.5
Change Period (Y+Rc), s	6.5	6.0	4.5	6.5	6.5	6.0		6.5
Max Green Setting (Gmax), s	5.1	84.9	5.5	11.0	20.1	69.9		21.0
Max Q Clear Time (g_c+I1), s	2.9	43.0	7.5	13.0	21.2	71.9		9.4
Green Ext Time (p_c), s	0.0	12.5	0.0	0.0	0.0	0.0		0.3

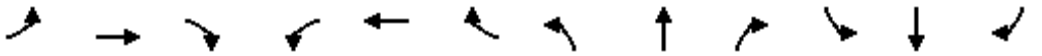
Intersection Summary	
HCM 6th Ctrl Delay	50.6
HCM 6th LOS	D



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	412	340	729	135	27	300
Future Volume (veh/h)	412	340	729	135	27	300
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	448	370	792	147	29	326
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	493	1426	961	815	156	414
Arrive On Green	0.17	0.76	0.51	0.51	0.09	0.09
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	448	370	792	147	29	326
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	11.2	4.7	28.6	4.0	1.2	7.0
Cycle Q Clear(g_c), s	11.2	4.7	28.6	4.0	1.2	7.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	493	1426	961	815	156	414
V/C Ratio(X)	0.91	0.26	0.82	0.18	0.19	0.79
Avail Cap(c_a), veh/h	562	1426	961	815	156	414
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.9	2.8	16.4	10.4	33.9	27.5
Incr Delay (d2), s/veh	17.4	0.4	8.0	0.5	0.6	9.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.2	1.7	17.8	2.3	0.9	19.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	36.4	3.3	24.4	10.9	34.4	37.3
LnGrp LOS	D	A	C	B	C	D
Approach Vol, veh/h		818	939		355	
Approach Delay, s/veh		21.4	22.3		37.0	
Approach LOS		C	C		D	

Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			67.0		13.0	19.9	47.1
Change Period (Y+Rc), s			6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s			61.0		7.0	17.0	38.0
Max Q Clear Time (g_c+I1), s			6.7		9.0	13.2	30.6
Green Ext Time (p_c), s			1.4		0.0	0.7	2.6

Intersection Summary	
HCM 6th Ctrl Delay	24.4
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	702	583	60	493	666	289	67	932	510	349	1081	916
Future Volume (vph)	702	583	60	493	666	289	67	932	510	349	1081	916
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3490		3433	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.11	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3490		3433	3539	1583	201	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	739	614	63	519	701	304	71	981	537	367	1138	964
RTOR Reduction (vph)	0	6	0	0	0	140	0	0	304	0	0	353
Lane Group Flow (vph)	739	671	0	519	701	164	71	981	233	367	1138	611
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2	8		8			4
Actuated Green, G (s)	25.0	26.3		21.7	23.0	23.0	41.0	37.0	37.0	13.0	46.0	46.0
Effective Green, g (s)	25.0	26.3		21.7	23.0	23.0	41.0	37.0	37.0	13.0	46.0	46.0
Actuated g/C Ratio	0.21	0.22		0.18	0.19	0.19	0.34	0.31	0.31	0.11	0.38	0.38
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0
Lane Grp Cap (vph)	709	758		615	672	300	119	1082	484	368	1345	601
v/s Ratio Prot	c0.22	0.19		0.15	c0.20		0.02	0.28		c0.11	0.32	
v/s Ratio Perm						0.10	0.18		0.15			c0.39
v/c Ratio	1.04	0.88		0.84	1.04	0.55	0.60	0.91	0.48	1.00	0.85	1.02
Uniform Delay, d1	48.0	45.9		48.0	49.0	44.3	30.0	40.3	34.2	54.0	34.3	37.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	45.3	12.3		10.7	46.5	2.5	5.3	11.0	1.0	45.8	5.3	40.8
Delay (s)	93.3	58.2		58.7	95.5	46.8	35.2	51.4	35.2	99.8	39.6	78.3
Level of Service	F	E		E	F	D	D	D	D	F	D	E
Approach Delay (s)		76.5			73.2			45.2			63.6	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	64.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	121.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	980	296	376	1052	4	217	9	323	32	67	32
Future Volume (veh/h)	9	980	296	376	1052	4	217	9	323	32	67	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	1010	305	388	1085	4	224	10	333	35	73	35
Peak Hour Factor	0.92	0.97	0.97	0.97	0.97	0.92	0.97	0.92	0.97	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	228	795	240	305	1327	1124	186	174	376	159	87	74
Arrive On Green	0.01	0.58	0.58	0.14	0.71	0.71	0.07	0.09	0.09	0.03	0.05	0.05
Sat Flow, veh/h	1781	1379	416	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	10	0	1315	388	1085	4	224	10	333	35	73	35
Grp Sat Flow(s),veh/h/ln	1781	0	1795	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.3	0.0	86.5	21.6	60.2	0.1	10.8	0.7	14.0	2.8	5.8	3.2
Cycle Q Clear(g_c), s	0.3	0.0	86.5	21.6	60.2	0.1	10.8	0.7	14.0	2.8	5.8	3.2
Prop In Lane	1.00		0.23	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	228	0	1035	305	1327	1124	186	174	376	159	87	74
V/C Ratio(X)	0.04	0.00	1.27	1.27	0.82	0.00	1.20	0.06	0.89	0.22	0.84	0.47
Avail Cap(c_a), veh/h	267	0	1035	305	1327	1124	186	174	376	184	87	74
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.3	0.0	31.8	56.2	15.1	6.4	65.1	62.0	55.3	65.8	70.9	69.7
Incr Delay (d2), s/veh	0.0	0.0	129.2	146.5	4.6	0.0	130.5	0.1	21.6	0.3	47.6	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	0.0	102.3	34.8	31.9	0.1	14.1	0.6	20.2	2.3	7.1	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.4	0.0	161.0	202.7	19.7	6.4	195.6	62.2	76.8	66.1	118.5	74.3
LnGrp LOS	B	A	F	F	B	A	F	E	E	E	F	E
Approach Vol, veh/h		1325			1477			567			143	
Approach Delay, s/veh		159.9			67.8			123.5			94.9	
Approach LOS		F			E			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.0	93.4	16.0	12.6	8.1	113.3	9.0	19.6
Change Period (Y+Rc), s	6.4	6.9	5.2	5.6	6.4	6.9	5.2	5.6
Max Green Setting (Gmax), s	21.6	86.5	10.8	7.0	5.0	103.1	5.9	11.9
Max Q Clear Time (g_c+I1), s	23.6	88.5	12.8	7.8	2.3	62.2	4.8	16.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	18.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	112.6
HCM 6th LOS	F



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	1118	176	81	1122	19	133	10	61	6	14	50
Future Volume (veh/h)	58	1118	176	81	1122	19	133	10	61	6	14	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	59	1141	191	88	1145	19	145	11	66	6	15	51
Peak Hour Factor	0.98	0.98	0.92	0.92	0.98	0.98	0.92	0.92	0.92	0.98	0.92	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	1255	1063	198	1410	1195	170	16	96	154	20	68
Arrive On Green	0.67	0.67	0.67	0.04	0.75	0.75	0.05	0.07	0.07	0.04	0.05	0.05
Sat Flow, veh/h	482	1870	1585	1781	1870	1585	1781	231	1389	1781	373	1269
Grp Volume(v), veh/h	59	1141	191	88	1145	19	145	0	77	6	0	66
Grp Sat Flow(s),veh/h/ln	482	1870	1585	1781	1870	1585	1781	0	1620	1781	0	1642
Q Serve(g_s), s	11.5	66.9	5.9	1.9	50.5	0.4	7.0	0.0	6.0	0.4	0.0	5.2
Cycle Q Clear(g_c), s	51.2	66.9	5.9	1.9	50.5	0.4	7.0	0.0	6.0	0.4	0.0	5.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.86	1.00		0.77
Lane Grp Cap(c), veh/h	232	1255	1063	198	1410	1195	170	0	112	154	0	88
V/C Ratio(X)	0.25	0.91	0.18	0.44	0.81	0.02	0.85	0.00	0.69	0.04	0.00	0.75
Avail Cap(c_a), veh/h	232	1255	1063	201	1410	1195	170	0	112	154	0	88
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.44	0.44	0.44	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.8	18.1	8.0	27.5	10.2	4.0	57.9	0.0	59.1	53.8	0.0	60.6
Incr Delay (d2), s/veh	2.6	11.3	0.4	0.7	2.4	0.0	31.6	0.0	29.1	0.5	0.0	43.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	35.5	3.3	3.0	19.6	0.2	5.1	0.0	6.1	0.4	0.0	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.5	29.3	8.4	28.2	12.5	4.0	89.5	0.0	88.2	54.3	0.0	104.0
LnGrp LOS	C	C	A	C	B	A	F	A	F	D	A	F
Approach Vol, veh/h		1391			1252			222			72	
Approach Delay, s/veh		26.6			13.5			89.1			99.9	
Approach LOS		C			B			F			F	

Timer - Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	11.0	15.0	10.8	93.2	13.0	13.0		104.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	9.0	5.0	87.0	7.0	7.0		98.0
Max Q Clear Time (g_c+I1), s	2.4	8.0	3.9	68.9	9.0	7.2		52.5
Green Ext Time (p_c), s	0.0	0.0	0.0	7.5	0.0	0.0		7.5

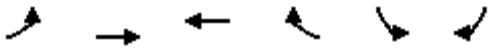
Intersection Summary	
HCM 6th Ctrl Delay	27.5
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	1119	9	29	1018	105	67	6	37	14	11	52
Future Volume (veh/h)	45	1119	9	29	1018	105	67	6	37	14	11	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	46	1142	9	30	1039	107	68	6	38	14	11	53
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	147	1194	9	152	1063	109	217	33	212	95	59	100
Arrive On Green	0.03	0.64	0.64	0.03	0.64	0.64	0.05	0.15	0.15	0.06	0.06	0.06
Sat Flow, veh/h	1781	1853	15	1781	1668	172	1781	221	1398	679	938	1585
Grp Volume(v), veh/h	46	0	1151	30	0	1146	68	0	44	25	0	53
Grp Sat Flow(s),veh/h/ln	1781	0	1868	1781	0	1839	1781	0	1619	1617	0	1585
Q Serve(g_s), s	0.9	0.0	61.4	0.6	0.0	64.5	3.7	0.0	2.6	0.0	0.0	3.5
Cycle Q Clear(g_c), s	0.9	0.0	61.4	0.6	0.0	64.5	3.7	0.0	2.6	1.4	0.0	3.5
Prop In Lane	1.00		0.01	1.00		0.09	1.00		0.86	0.56		1.00
Lane Grp Cap(c), veh/h	147	0	1204	152	0	1172	217	0	245	155	0	100
V/C Ratio(X)	0.31	0.00	0.96	0.20	0.00	0.98	0.31	0.00	0.18	0.16	0.00	0.53
Avail Cap(c_a), veh/h	170	0	1204	187	0	1180	222	0	254	159	0	105
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.0	0.0	17.7	24.4	0.0	18.8	42.6	0.0	39.8	47.8	0.0	48.8
Incr Delay (d2), s/veh	0.4	0.0	16.8	0.2	0.0	21.0	0.8	0.0	0.3	0.5	0.0	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	0.0	33.8	0.8	0.0	36.3	3.0	0.0	1.9	1.2	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.4	0.0	34.5	24.6	0.0	39.8	43.4	0.0	40.2	48.3	0.0	53.3
LnGrp LOS	C	A	C	C	A	D	D	A	D	D	A	D
Approach Vol, veh/h		1197			1176			112			78	
Approach Delay, s/veh		34.2			39.4			42.1			51.7	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	9.5	75.3	9.5	13.3	10.2	74.6		22.8
Change Period (Y+Rc), s	6.5	6.0	4.5	6.5	6.5	6.0		6.5
Max Green Setting (Gmax), s	5.1	69.0	5.3	7.1	5.1	69.0		16.9
Max Q Clear Time (g_c+I1), s	2.6	63.4	5.7	5.5	2.9	66.5		4.6
Green Ext Time (p_c), s	0.0	4.4	0.0	0.0	0.0	2.1		0.1

Intersection Summary	
HCM 6th Ctrl Delay	37.5
HCM 6th LOS	D

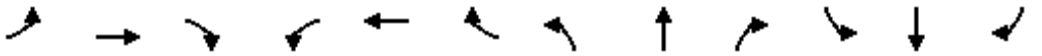


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	443	666	433	57	47	521
Future Volume (veh/h)	443	666	433	57	47	521
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	471	709	461	61	50	554
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	614	1247	695	589	238	520
Arrive On Green	0.19	0.67	0.37	0.37	0.13	0.13
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	471	709	461	61	50	554
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	8.6	12.2	12.3	1.5	1.5	8.0
Cycle Q Clear(g_c), s	8.6	12.2	12.3	1.5	1.5	8.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	614	1247	695	589	238	520
V/C Ratio(X)	0.77	0.57	0.66	0.10	0.21	1.06
Avail Cap(c_a), veh/h	771	1247	695	589	238	520
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.9	5.4	15.7	12.3	23.2	20.2
Incr Delay (d2), s/veh	3.7	1.9	4.9	0.4	0.4	57.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.7	5.2	8.9	0.9	1.0	31.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.6	7.3	20.7	12.7	23.6	77.9
LnGrp LOS	B	A	C	B	C	F
Approach Vol, veh/h		1180	522		604	
Approach Delay, s/veh		9.8	19.7		73.4	
Approach LOS		A	B		E	

Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			46.0		14.0	17.7	28.3
Change Period (Y+Rc), s			6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s			40.0		8.0	17.0	17.0
Max Q Clear Time (g_c+I1), s			14.2		10.0	10.6	14.3
Green Ext Time (p_c), s			3.1		0.0	1.1	0.6

Intersection Summary		
HCM 6th Ctrl Delay		28.7
HCM 6th LOS		C

2031 FUTURE PROJECTED CONDITIONS WITH INTERSECTION IMPROVEMENTS AND WIDENING



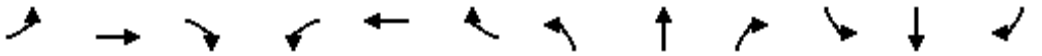
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	793	205	296	1043	34	419	67	276	1	2	2
Future Volume (veh/h)	105	793	205	296	1043	34	419	67	276	1	2	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	891	230	333	1172	37	523	0	310	1	2	2
Peak Hour Factor	0.92	0.89	0.89	0.89	0.89	0.92	0.89	0.92	0.89	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	136	936	1051	353	1139	966	580	0	508	16	16	14
Arrive On Green	0.05	0.50	0.50	0.16	0.61	0.61	0.16	0.00	0.16	0.01	0.01	0.01
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	3563	0	1585	1781	1870	1585
Grp Volume(v), veh/h	114	891	230	333	1172	37	523	0	310	1	2	2
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	0	1585	1781	1870	1585
Q Serve(g_s), s	5.0	65.3	8.2	20.6	87.5	1.3	20.7	0.0	23.4	0.1	0.2	0.2
Cycle Q Clear(g_c), s	5.0	65.3	8.2	20.6	87.5	1.3	20.7	0.0	23.4	0.1	0.2	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	136	936	1051	353	1139	966	580	0	508	16	16	14
V/C Ratio(X)	0.84	0.95	0.22	0.94	1.03	0.04	0.90	0.00	0.61	0.06	0.12	0.14
Avail Cap(c_a), veh/h	144	939	1054	358	1139	966	580	0	508	87	91	77
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.8	34.3	9.5	46.8	28.1	11.2	59.0	0.0	41.2	70.6	70.6	70.6
Incr Delay (d2), s/veh	29.4	19.2	0.2	32.2	34.2	0.0	17.2	0.0	2.1	1.7	3.2	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.7	42.2	7.9	21.1	58.5	0.8	15.8	0.0	14.3	0.1	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.2	53.4	9.8	79.1	62.3	11.3	76.2	0.0	43.4	72.3	73.9	75.2
LnGrp LOS	E	D	A	E	F	B	E	A	D	E	E	E
Approach Vol, veh/h		1235			1542			833			5	
Approach Delay, s/veh		46.6			64.7			64.0			74.1	
Approach LOS		D			E			E			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.0	78.7		6.9	13.4	94.4		29.0				
Change Period (Y+Rc), s	6.4	6.9		5.6	6.4	6.9		5.6				
Max Green Setting (Gmax), s	23.0	72.1		7.0	7.6	87.5		23.4				
Max Q Clear Time (g_c+I1), s	22.6	67.3		2.2	7.0	89.5		25.4				
Green Ext Time (p_c), s	0.0	3.5		0.0	0.0	0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		58.3
HCM 6th LOS		E

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	980	296	376	1052	4	217	9	323	32	67	32
Future Volume (veh/h)	9	980	296	376	1052	4	217	9	323	32	67	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	1010	305	388	1085	4	231	0	333	35	73	35
Peak Hour Factor	0.92	0.97	0.97	0.97	0.97	0.92	0.97	0.92	0.97	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	218	1001	965	364	1312	1112	261	0	397	90	95	80
Arrive On Green	0.01	0.54	0.54	0.18	0.70	0.70	0.07	0.00	0.07	0.05	0.05	0.05
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	3563	0	1585	1781	1870	1585
Grp Volume(v), veh/h	10	1010	305	388	1085	4	231	0	333	35	73	35
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	0	1585	1781	1870	1585
Q Serve(g_s), s	0.4	80.3	14.0	26.6	61.9	0.1	9.6	0.0	11.0	2.9	5.8	3.2
Cycle Q Clear(g_c), s	0.4	80.3	14.0	26.6	61.9	0.1	9.6	0.0	11.0	2.9	5.8	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	218	1001	965	364	1312	1112	261	0	397	90	95	80
V/C Ratio(X)	0.05	1.01	0.32	1.07	0.83	0.00	0.88	0.00	0.84	0.39	0.77	0.44
Avail Cap(c_a), veh/h	257	1001	965	364	1312	1112	261	0	397	90	95	80
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.2	34.8	14.2	54.5	15.9	6.7	68.9	0.0	53.3	68.9	70.3	69.1
Incr Delay (d2), s/veh	0.0	30.6	0.4	65.9	5.0	0.0	28.0	0.0	14.6	2.7	31.3	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	53.7	10.1	27.9	33.0	0.1	9.1	0.0	19.1	2.5	6.5	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.2	65.4	14.6	120.4	21.0	6.7	96.9	0.0	67.9	71.7	101.6	72.8
LnGrp LOS	C	F	B	F	C	A	F	A	E	E	F	E
Approach Vol, veh/h		1325			1477			564			143	
Approach Delay, s/veh		53.4			47.0			79.8			87.2	
Approach LOS		D			D			E			F	

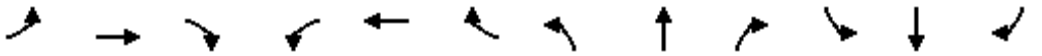
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	33.0	87.2		13.2	8.1	112.1		16.6				
Change Period (Y+Rc), s	6.4	6.9		5.6	6.4	6.9		5.6				
Max Green Setting (Gmax), s	26.6	80.3		7.6	5.0	101.9		11.0				
Max Q Clear Time (g_c+I1), s	28.6	82.3		7.8	2.4	63.9		13.0				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	17.5		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		56.3
HCM 6th LOS		E

Notes

User approved volume balancing among the lanes for turning movement.

2034 BACKGROUND CONDITIONS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1007	718	51	424	492	418	37	1024	381	313	1024	983
Future Volume (vph)	1007	718	51	424	492	418	37	1024	381	313	1024	983
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3504		3433	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.09	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3504		3433	3539	1583	161	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	1144	816	58	482	559	475	42	1164	433	356	1164	1117
RTOR Reduction (vph)	0	3	0	0	0	128	0	0	305	0	0	376
Lane Group Flow (vph)	1144	871	0	482	559	347	42	1164	128	356	1164	741
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	1		2	2		3	8		7	4	
Permitted Phases						2	8		8			4
Actuated Green, G (s)	42.0	42.0		35.0	35.0	35.0	50.2	46.2	46.2	19.0	61.2	61.2
Effective Green, g (s)	42.0	42.0		35.0	35.0	35.0	50.2	46.2	46.2	19.0	61.2	61.2
Actuated g/C Ratio	0.25	0.25		0.21	0.21	0.21	0.30	0.28	0.28	0.12	0.37	0.37
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0
Lane Grp Cap (vph)	872	890		727	749	335	87	989	442	394	1311	586
v/s Ratio Prot	c0.33	0.25		0.14	0.16		0.01	0.33		c0.10	0.33	
v/s Ratio Perm						c0.22	0.13		0.08			c0.47
v/c Ratio	1.31	0.98		0.66	0.75	1.04	0.48	1.18	0.29	0.90	0.89	1.26
Uniform Delay, d1	61.6	61.2		59.7	60.9	65.1	44.5	59.5	46.6	72.2	48.8	52.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	148.6	24.8		2.5	4.3	59.0	1.5	90.3	0.5	23.0	7.8	132.4
Delay (s)	210.2	86.0		62.2	65.3	124.1	46.0	149.8	47.1	95.2	56.6	184.4
Level of Service	F	F		E	E	F	D	F	D	F	E	F
Approach Delay (s)		156.4			82.7			120.0			115.9	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	120.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	165.2	Sum of lost time (s)	23.0
Intersection Capacity Utilization	98.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	778	219	264	997	34	450	67	265	1	2	2
Future Volume (veh/h)	105	778	219	264	997	34	450	67	265	1	2	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	874	246	297	1120	37	506	73	298	1	2	2
Peak Hour Factor	0.92	0.89	0.89	0.89	0.89	0.92	0.89	0.92	0.89	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	135	740	208	199	1054	893	444	75	305	55	83	70
Arrive On Green	0.05	0.53	0.53	0.09	0.56	0.56	0.19	0.23	0.23	0.00	0.04	0.04
Sat Flow, veh/h	1781	1404	395	1781	1870	1585	1781	322	1313	1781	1870	1585
Grp Volume(v), veh/h	114	0	1120	297	1120	37	506	0	371	1	2	2
Grp Sat Flow(s),veh/h/ln	1781	0	1799	1781	1870	1585	1781	0	1634	1781	1870	1585
Q Serve(g_s), s	5.9	0.0	83.1	13.6	88.8	1.6	29.8	0.0	35.5	0.1	0.2	0.2
Cycle Q Clear(g_c), s	5.9	0.0	83.1	13.6	88.8	1.6	29.8	0.0	35.5	0.1	0.2	0.2
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.80	1.00		1.00
Lane Grp Cap(c), veh/h	135	0	949	199	1054	893	444	0	379	55	83	70
V/C Ratio(X)	0.84	0.00	1.18	1.49	1.06	0.04	1.14	0.00	0.98	0.02	0.02	0.03
Avail Cap(c_a), veh/h	199	0	949	199	1054	893	444	0	379	333	349	296
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.0	0.0	37.3	56.8	34.4	15.4	60.2	0.0	60.1	71.9	72.0	72.0
Incr Delay (d2), s/veh	12.9	0.0	92.2	245.0	46.1	0.0	87.0	0.0	40.2	0.0	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.9	0.0	81.0	33.1	66.2	1.1	21.1	0.0	25.6	0.1	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.9	0.0	129.4	301.7	80.5	15.4	147.2	0.0	100.3	72.0	72.1	72.2
LnGrp LOS	E	A	F	F	F	B	F	A	F	E	E	E
Approach Vol, veh/h		1234			1454			877			5	
Approach Delay, s/veh		122.9			124.0			127.4			72.1	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	90.0	35.0	12.6	14.3	95.7	5.4	42.2
Change Period (Y+Rc), s	6.4	6.9	5.2	5.6	6.4	6.9	5.2	5.6
Max Green Setting (Gmax), s	13.6	83.1	29.8	29.4	13.6	83.1	24.8	34.4
Max Q Clear Time (g_c+I1), s	15.6	85.1	31.8	2.2	7.9	90.8	2.1	37.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	124.4
HCM 6th LOS	F

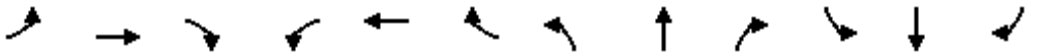
Intersection	
Int Delay, s/veh	9.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	1004	1197	11	23	63
Future Vol, veh/h	18	1004	1197	11	23	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	205	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	1116	1330	12	26	70

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1342	0	-	0	2492	1336
Stage 1	-	-	-	-	1336	-
Stage 2	-	-	-	-	1156	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	514	-	-	-	32	188
Stage 1	-	-	-	-	245	-
Stage 2	-	-	-	-	300	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	514	-	-	-	31	188
Mov Cap-2 Maneuver	-	-	-	-	31	-
Stage 1	-	-	-	-	235	-
Stage 2	-	-	-	-	300	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	255.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	514	-	-	-	80
HCM Lane V/C Ratio	0.039	-	-	-	1.194
HCM Control Delay (s)	12.3	-	-	-	255.3
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	7



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	293	755	40	25	880	47	122	65	40	67	33	245
Future Volume (veh/h)	293	755	40	25	880	47	122	65	40	67	33	245
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	329	848	45	28	989	53	137	73	45	75	37	275
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	284	954	51	184	784	42	153	281	173	327	50	369
Arrive On Green	0.12	0.54	0.54	0.03	0.45	0.45	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1781	1760	93	1781	1759	94	1067	1083	667	1274	191	1423
Grp Volume(v), veh/h	329	0	893	28	0	1042	137	0	118	75	0	312
Grp Sat Flow(s),veh/h/ln	1781	0	1854	1781	0	1853	1067	0	1750	1274	0	1614
Q Serve(g_s), s	13.5	0.0	46.8	0.9	0.0	49.0	9.0	0.0	5.9	5.5	0.0	19.5
Cycle Q Clear(g_c), s	13.5	0.0	46.8	0.9	0.0	49.0	28.5	0.0	5.9	11.4	0.0	19.5
Prop In Lane	1.00		0.05	1.00		0.05	1.00		0.38	1.00		0.88
Lane Grp Cap(c), veh/h	284	0	1005	184	0	826	153	0	453	327	0	418
V/C Ratio(X)	1.16	0.00	0.89	0.15	0.00	1.26	0.90	0.00	0.26	0.23	0.00	0.75
Avail Cap(c_a), veh/h	284	0	1005	357	0	826	153	0	453	327	0	418
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.2	0.0	22.3	21.8	0.0	30.5	52.1	0.0	32.4	36.9	0.0	37.4
Incr Delay (d2), s/veh	103.2	0.0	10.4	0.1	0.0	127.6	44.4	0.0	0.3	0.4	0.0	7.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	17.6	0.0	27.5	0.6	0.0	70.2	9.6	0.0	4.6	3.1	0.0	13.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	139.4	0.0	32.7	22.0	0.0	158.1	96.6	0.0	32.7	37.2	0.0	44.6
LnGrp LOS	F	A	C	C	A	F	F	A	C	D	A	D
Approach Vol, veh/h		1222			1070			255			387	
Approach Delay, s/veh		61.4			154.6			67.0			43.2	
Approach LOS		E			F			E			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.4	65.6		35.0	20.0	55.0		35.0				
Change Period (Y+Rc), s	6.5	6.0		6.5	6.5	6.0		6.5				
Max Green Setting (Gmax), s	13.5	49.0		28.5	13.5	49.0		28.5				
Max Q Clear Time (g_c+I1), s	2.9	48.8		21.5	15.5	51.0		30.5				
Green Ext Time (p_c), s	0.0	0.1		1.0	0.0	0.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		93.5	
HCM 6th LOS		F	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	47	8	121	125	61	12	543	89	35	410	32
Future Volume (veh/h)	37	47	8	121	125	61	12	543	89	35	410	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	44	56	10	144	149	73	14	646	0	42	488	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	189	269	48	316	206	101	444	879		350	926	
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.02	0.47	0.00	0.04	0.50	0.00
Sat Flow, veh/h	1159	1545	276	1335	1185	581	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	44	0	66	144	0	222	14	646	0	42	488	0
Grp Sat Flow(s),veh/h/ln	1159	0	1821	1335	0	1766	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.1	0.0	1.8	5.9	0.0	6.8	0.2	16.1	0.0	0.7	10.2	0.0
Cycle Q Clear(g_c), s	9.0	0.0	1.8	7.7	0.0	6.8	0.2	16.1	0.0	0.7	10.2	0.0
Prop In Lane	1.00		0.15	1.00		0.33	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	189	0	317	316	0	307	444	879		350	926	
V/C Ratio(X)	0.23	0.00	0.21	0.46	0.00	0.72	0.03	0.73		0.12	0.53	
Avail Cap(c_a), veh/h	189	0	317	316	0	307	568	879		430	926	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.6	0.0	20.3	23.6	0.0	22.4	8.3	12.3	0.0	9.4	9.9	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.3	1.0	0.0	8.1	0.0	5.4	0.0	0.2	2.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.0	0.0	1.2	3.1	0.0	5.6	0.1	9.9	0.0	0.3	6.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	0.0	20.7	24.7	0.0	30.5	8.3	17.7	0.0	9.5	12.0	0.0
LnGrp LOS	C	A	C	C	A	C	A	B		A	B	
Approach Vol, veh/h		110			366			660			530	
Approach Delay, s/veh		23.3			28.2			17.5			11.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	33.0		16.0	7.0	34.4		16.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	27.0		10.0	5.0	27.0		10.0				
Max Q Clear Time (g_c+I1), s	2.7	18.1		11.0	2.2	12.2		9.7				
Green Ext Time (p_c), s	0.0	1.9		0.0	0.0	1.6		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	18.5
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	41	37	162	25	11	80
Future Vol, veh/h	41	37	162	25	11	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	39	169	26	11	83

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	195	0	-	0	307	182
Stage 1	-	-	-	-	182	-
Stage 2	-	-	-	-	125	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1378	-	-	-	685	861
Stage 1	-	-	-	-	849	-
Stage 2	-	-	-	-	901	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1378	-	-	-	663	861
Mov Cap-2 Maneuver	-	-	-	-	663	-
Stage 1	-	-	-	-	822	-
Stage 2	-	-	-	-	901	-

Approach	EB	WB	SB
HCM Control Delay, s	4	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1378	-	-	-	831
HCM Lane V/C Ratio	0.031	-	-	-	0.114
HCM Control Delay (s)	7.7	0	-	-	9.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Int Delay, s/veh	22.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	418	364	782	145	29	281
Future Vol, veh/h	418	364	782	145	29	281
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	120	0	125
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	454	396	850	158	32	305

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1008	0	-	0	2154	850
Stage 1	-	-	-	-	850	-
Stage 2	-	-	-	-	1304	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	687	-	-	-	53	360
Stage 1	-	-	-	-	419	-
Stage 2	-	-	-	-	254	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	687	-	-	-	~ 18	360
Mov Cap-2 Maneuver	-	-	-	-	~ 18	-
Stage 1	-	-	-	-	142	-
Stage 2	-	-	-	-	254	-

Approach	EB	WB	SB
HCM Control Delay, s	10.6	0	122
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	687	-	-	-	18	360
HCM Lane V/C Ratio	0.661	-	-	-	1.751	0.848
HCM Control Delay (s)	19.9	-	-	-	$ 805.5	51.5
HCM Lane LOS	C	-	-	-	F	F
HCM 95th %tile Q(veh)	5	-	-	-	4.4	7.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

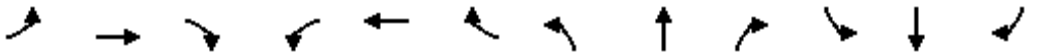
Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	128	231	0	0	0
Future Vol, veh/h	0	128	231	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	139	251	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	251	0	-	0	390	251
Stage 1	-	-	-	-	251	-
Stage 2	-	-	-	-	139	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1314	-	-	-	614	788
Stage 1	-	-	-	-	791	-
Stage 2	-	-	-	-	888	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1314	-	-	-	614	788
Mov Cap-2 Maneuver	-	-	-	-	614	-
Stage 1	-	-	-	-	791	-
Stage 2	-	-	-	-	888	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1314	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	753	596	64	507	692	255	72	1000	518	301	1160	983
Future Volume (vph)	753	596	64	507	692	255	72	1000	518	301	1160	983
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3488		3433	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.09	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3488		3433	3539	1583	159	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	793	627	67	534	728	268	76	1053	545	317	1221	1035
RTOR Reduction (vph)	0	5	0	0	0	133	0	0	313	0	0	365
Lane Group Flow (vph)	793	689	0	534	728	135	76	1053	232	317	1221	670
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	1		2	2		3	8		7	4	
Permitted Phases						2	8		8			4
Actuated Green, G (s)	41.8	41.8		35.0	35.0	35.0	51.9	46.9	46.9	18.1	60.0	60.0
Effective Green, g (s)	41.8	41.8		35.0	35.0	35.0	51.9	46.9	46.9	18.1	60.0	60.0
Actuated g/C Ratio	0.25	0.25		0.21	0.21	0.21	0.31	0.28	0.28	0.11	0.36	0.36
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0
Lane Grp Cap (vph)	870	884		729	751	336	98	1007	450	377	1288	576
v/s Ratio Prot	c0.23	0.20		0.16	c0.21		0.02	0.30		c0.09	0.34	
v/s Ratio Perm						0.09	0.22		0.15			c0.42
v/c Ratio	0.91	0.78		0.73	0.97	0.40	0.78	1.05	0.51	0.84	0.95	1.16
Uniform Delay, d1	59.7	57.2		60.5	64.4	55.9	45.8	59.0	49.4	71.9	50.9	52.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.8	4.7		4.1	25.3	1.1	28.7	41.0	1.3	14.9	14.4	91.3
Delay (s)	73.5	61.9		64.6	89.6	57.0	74.5	100.0	50.7	86.8	65.3	143.7
Level of Service	E	E		E	F	E	E	F	D	F	E	F
Approach Delay (s)		68.1			75.2			82.8			99.5	
Approach LOS		E			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	84.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	164.8	Sum of lost time (s)	23.0
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	919	318	359	1028	4	233	9	288	32	67	32
Future Volume (veh/h)	9	919	318	359	1028	4	233	9	288	32	67	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	947	328	370	1060	4	240	10	297	35	73	35
Peak Hour Factor	0.92	0.97	0.97	0.97	0.97	0.92	0.97	0.92	0.97	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	704	244	200	1132	960	360	11	315	106	180	153
Arrive On Green	0.01	0.53	0.53	0.09	0.61	0.61	0.13	0.20	0.20	0.02	0.10	0.10
Sat Flow, veh/h	1781	1328	460	1781	1870	1585	1781	52	1541	1781	1870	1585
Grp Volume(v), veh/h	10	0	1275	370	1060	4	240	0	307	35	73	35
Grp Sat Flow(s),veh/h/ln	1781	0	1788	1781	1870	1585	1781	0	1593	1781	1870	1585
Q Serve(g_s), s	0.4	0.0	83.1	13.6	80.9	0.2	18.5	0.0	29.8	2.8	5.8	3.2
Cycle Q Clear(g_c), s	0.4	0.0	83.1	13.6	80.9	0.2	18.5	0.0	29.8	2.8	5.8	3.2
Prop In Lane	1.00		0.26	1.00		1.00	1.00		0.97	1.00		1.00
Lane Grp Cap(c), veh/h	113	0	947	200	1132	960	360	0	326	106	180	153
V/C Ratio(X)	0.09	0.00	1.35	1.85	0.94	0.00	0.67	0.00	0.94	0.33	0.41	0.23
Avail Cap(c_a), veh/h	248	0	947	200	1132	960	461	0	349	344	351	297
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.1	0.0	36.9	56.7	28.2	12.2	52.2	0.0	61.4	62.3	66.6	65.5
Incr Delay (d2), s/veh	0.1	0.0	162.7	399.5	14.4	0.0	1.9	0.0	32.3	1.3	1.5	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.0	112.4	46.2	48.0	0.1	13.0	0.0	20.9	2.3	5.1	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.2	0.0	199.6	456.2	42.6	12.2	54.2	0.0	93.7	63.6	68.1	66.2
LnGrp LOS	C	A	F	F	D	B	D	A	F	E	E	E
Approach Vol, veh/h		1285			1434			547			143	
Approach Delay, s/veh		198.3			149.3			76.4			66.6	
Approach LOS		F			F			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	90.0	26.1	20.7	8.2	101.8	9.1	37.7
Change Period (Y+Rc), s	6.4	6.9	5.2	5.6	6.4	6.9	5.2	5.6
Max Green Setting (Gmax), s	13.6	83.1	29.8	29.4	13.6	83.1	24.8	34.4
Max Q Clear Time (g_c+I1), s	15.6	85.1	20.5	7.8	2.4	82.9	4.8	31.8
Green Ext Time (p_c), s	0.0	0.0	0.4	0.3	0.0	0.1	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	152.6
HCM 6th LOS	F

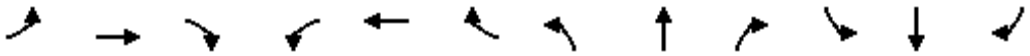
Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	62	1199	1202	20	7	53
Future Vol, veh/h	62	1199	1202	20	7	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	205	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	1223	1227	20	7	54

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1247	0	-	0	2586	1237
Stage 1	-	-	-	-	1237	-
Stage 2	-	-	-	-	1349	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	558	-	-	-	28	215
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	242	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	558	-	-	-	25	215
Mov Cap-2 Maneuver	-	-	-	-	25	-
Stage 1	-	-	-	-	243	-
Stage 2	-	-	-	-	242	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	68.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	558	-	-	-	114
HCM Lane V/C Ratio	0.113	-	-	-	0.537
HCM Control Delay (s)	12.3	-	-	-	68.4
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0.4	-	-	-	2.5



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	1145	9	31	1019	113	71	7	40	15	12	41
Future Volume (veh/h)	37	1145	9	31	1019	113	71	7	40	15	12	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	1168	9	32	1040	115	72	7	41	15	12	42
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	154	1148	9	147	1018	113	199	26	153	203	40	141
Arrive On Green	0.04	0.62	0.62	0.03	0.62	0.62	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1781	1854	14	1781	1654	183	1350	236	1385	1357	365	1276
Grp Volume(v), veh/h	38	0	1177	32	0	1155	72	0	48	15	0	54
Grp Sat Flow(s),veh/h/ln	1781	0	1868	1781	0	1837	1350	0	1621	1357	0	1641
Q Serve(g_s), s	0.6	0.0	49.3	0.5	0.0	49.0	4.1	0.0	2.2	0.8	0.0	2.4
Cycle Q Clear(g_c), s	0.6	0.0	49.3	0.5	0.0	49.0	6.5	0.0	2.2	3.0	0.0	2.4
Prop In Lane	1.00		0.01	1.00		0.10	1.00		0.85	1.00		0.78
Lane Grp Cap(c), veh/h	154	0	1156	147	0	1131	199	0	179	203	0	181
V/C Ratio(X)	0.25	0.00	1.02	0.22	0.00	1.02	0.36	0.00	0.27	0.07	0.00	0.30
Avail Cap(c_a), veh/h	392	0	1156	392	0	1131	533	0	580	539	0	587
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.0	0.0	15.2	20.1	0.0	15.3	35.6	0.0	32.5	33.8	0.0	32.6
Incr Delay (d2), s/veh	0.3	0.0	31.0	0.3	0.0	32.3	1.1	0.0	0.8	0.2	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	0.0	31.8	0.6	0.0	31.9	2.5	0.0	1.6	0.5	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.3	0.0	46.2	20.4	0.0	47.7	36.7	0.0	33.3	34.0	0.0	33.5
LnGrp LOS	C	A	F	C	A	F	D	A	C	C	A	C
Approach Vol, veh/h		1215			1187			120			69	
Approach Delay, s/veh		45.3			46.9			35.3			33.6	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.0	55.3		15.3	9.3	55.0		15.3				
Change Period (Y+Rc), s	6.5	6.0		6.5	6.5	6.0		6.5				
Max Green Setting (Gmax), s	13.5	49.0		28.5	13.5	49.0		28.5				
Max Q Clear Time (g_c+I1), s	2.5	51.3		5.0	2.6	51.0		8.5				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.4				

Intersection Summary			
HCM 6th Ctrl Delay		45.3	
HCM 6th LOS		D	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	52	8	80	36	35	12	372	92	47	575	73
Future Volume (veh/h)	17	52	8	80	36	35	12	372	92	47	575	73
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	18	54	8	83	38	36	12	388	0	49	599	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	335	295	44	348	164	155	327	788		493	850	
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.02	0.42	0.00	0.05	0.45	0.00
Sat Flow, veh/h	1326	1592	236	1340	883	837	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	18	0	62	83	0	74	12	388	0	49	599	0
Grp Sat Flow(s),veh/h/ln	1326	0	1828	1340	0	1720	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.6	0.0	1.5	2.9	0.0	1.9	0.2	7.9	0.0	0.8	13.4	0.0
Cycle Q Clear(g_c), s	2.5	0.0	1.5	4.4	0.0	1.9	0.2	7.9	0.0	0.8	13.4	0.0
Prop In Lane	1.00		0.13	1.00		0.49	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	335	0	339	348	0	319	327	788		493	850	
V/C Ratio(X)	0.05	0.00	0.18	0.24	0.00	0.23	0.04	0.49		0.10	0.70	
Avail Cap(c_a), veh/h	343	0	350	356	0	329	470	788		577	850	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.2	0.0	17.9	19.8	0.0	18.1	9.7	11.0	0.0	8.2	11.4	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.3	0.3	0.0	0.4	0.0	2.2	0.0	0.1	4.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.0	1.0	1.4	0.0	1.2	0.1	4.9	0.0	0.4	8.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.2	0.0	18.2	20.1	0.0	18.5	9.7	13.2	0.0	8.3	16.3	0.0
LnGrp LOS	B	A	B	C	A	B	A	B		A	B	
Approach Vol, veh/h		80			157			400			648	
Approach Delay, s/veh		18.4			19.4			13.1			15.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.5	28.0		15.7	6.8	29.7		15.7
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	22.0		10.0	5.0	22.0		10.0
Max Q Clear Time (g_c+I1), s	2.8	9.9		4.5	2.2	15.4		6.4
Green Ext Time (p_c), s	0.0	1.1		0.1	0.0	1.4		0.2

Intersection Summary	
HCM 6th Ctrl Delay	15.5
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	64	105	70	9	23	60
Future Vol, veh/h	64	105	70	9	23	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	67	109	73	9	24	63

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	82	0	-	0	321	78
Stage 1	-	-	-	-	78	-
Stage 2	-	-	-	-	243	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1515	-	-	-	673	983
Stage 1	-	-	-	-	945	-
Stage 2	-	-	-	-	797	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1515	-	-	-	641	983
Mov Cap-2 Maneuver	-	-	-	-	641	-
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	797	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1515	-	-	-	856
HCM Lane V/C Ratio	0.044	-	-	-	0.101
HCM Control Delay (s)	7.5	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	32.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	431	714	464	61	51	525
Future Vol, veh/h	431	714	464	61	51	525
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	120	0	125
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	459	760	494	65	54	559

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	559	0	-	0	2172	494
Stage 1	-	-	-	-	494	-
Stage 2	-	-	-	-	1678	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1012	-	-	-	~ 51	575
Stage 1	-	-	-	-	613	-
Stage 2	-	-	-	-	166	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1012	-	-	-	~ 28	575
Mov Cap-2 Maneuver	-	-	-	-	~ 28	-
Stage 1	-	-	-	-	335	-
Stage 2	-	-	-	-	166	-

Approach	EB	WB	SB
HCM Control Delay, s	4.3	0	118
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1012	-	-	-	28	575
HCM Lane V/C Ratio	0.453	-	-	-	1.938	0.971
HCM Control Delay (s)	11.5	-	-	-	$ 740.3	57.5
HCM Lane LOS	B	-	-	-	F	F
HCM 95th %tile Q(veh)	2.4	-	-	-	6.4	13.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0

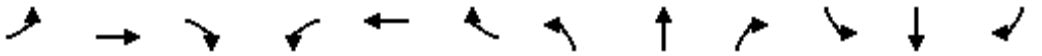
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	143	113	0	0	0
Future Vol, veh/h	0	143	113	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	155	123	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	123	0	-	0	278	123
Stage 1	-	-	-	-	123	-
Stage 2	-	-	-	-	155	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1464	-	-	-	712	928
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	873	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1464	-	-	-	712	928
Mov Cap-2 Maneuver	-	-	-	-	712	-
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	873	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1464	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

2034 FUTURE PROJECTED CONDITIONS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1007	739	51	468	536	530	37	1024	402	367	1024	983
Future Volume (vph)	1007	739	51	468	536	530	37	1024	402	367	1024	983
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3505		3433	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.09	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3505		3433	3539	1583	162	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	1144	840	58	532	609	602	42	1164	457	417	1164	1117
RTOR Reduction (vph)	0	3	0	0	0	128	0	0	305	0	0	372
Lane Group Flow (vph)	1144	895	0	532	609	474	42	1164	152	417	1164	745
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	1		2	2		3	8		7	4	
Permitted Phases						2	8		8			4
Actuated Green, G (s)	42.0	42.0		35.0	35.0	35.0	50.0	46.0	46.0	20.0	62.0	62.0
Effective Green, g (s)	42.0	42.0		35.0	35.0	35.0	50.0	46.0	46.0	20.0	62.0	62.0
Actuated g/C Ratio	0.25	0.25		0.21	0.21	0.21	0.30	0.28	0.28	0.12	0.37	0.37
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0
Lane Grp Cap (vph)	868	886		723	746	333	87	980	438	413	1321	591
v/s Ratio Prot	c0.33	0.26		0.15	0.17		0.01	0.33		c0.12	0.33	
v/s Ratio Perm						c0.30	0.13		0.10			c0.47
v/c Ratio	1.32	1.01		0.74	0.82	1.42	0.48	1.19	0.35	1.01	0.88	1.26
Uniform Delay, d1	62.0	62.0		61.2	62.4	65.5	44.8	60.0	48.0	73.0	48.6	52.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	151.2	32.8		4.2	7.2	207.4	1.5	94.8	0.7	46.7	7.4	130.8
Delay (s)	213.2	94.8		65.3	69.7	272.9	46.3	154.8	48.6	119.7	55.9	182.8
Level of Service	F	F		E	E	F	D	F	D	F	E	F
Approach Delay (s)		161.1			138.6			122.9			118.3	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	134.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	166.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	863	230	264	1175	34	472	67	265	1	2	2
Future Volume (veh/h)	105	863	230	264	1175	34	472	67	265	1	2	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	970	258	297	1320	37	530	73	298	1	2	2
Peak Hour Factor	0.92	0.89	0.89	0.89	0.89	0.92	0.89	0.92	0.89	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	135	751	200	199	1054	893	444	75	305	55	83	70
Arrive On Green	0.05	0.53	0.53	0.09	0.56	0.56	0.19	0.23	0.23	0.00	0.04	0.04
Sat Flow, veh/h	1781	1424	379	1781	1870	1585	1781	322	1313	1781	1870	1585
Grp Volume(v), veh/h	114	0	1228	297	1320	37	530	0	371	1	2	2
Grp Sat Flow(s),veh/h/ln	1781	0	1802	1781	1870	1585	1781	0	1634	1781	1870	1585
Q Serve(g_s), s	5.9	0.0	83.1	13.6	88.8	1.6	29.8	0.0	35.5	0.1	0.2	0.2
Cycle Q Clear(g_c), s	5.9	0.0	83.1	13.6	88.8	1.6	29.8	0.0	35.5	0.1	0.2	0.2
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.80	1.00		1.00
Lane Grp Cap(c), veh/h	135	0	950	199	1054	893	444	0	379	55	83	70
V/C Ratio(X)	0.84	0.00	1.29	1.49	1.25	0.04	1.19	0.00	0.98	0.02	0.02	0.03
Avail Cap(c_a), veh/h	199	0	950	199	1054	893	444	0	379	333	349	296
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.0	0.0	37.3	56.8	34.4	15.4	60.2	0.0	60.1	71.9	72.0	72.0
Incr Delay (d2), s/veh	12.9	0.0	139.4	245.0	121.7	0.0	107.7	0.0	40.2	0.0	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.9	0.0	102.4	33.1	103.5	1.1	24.9	0.0	25.6	0.1	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.9	0.0	176.7	301.7	156.1	15.4	167.8	0.0	100.3	72.0	72.1	72.2
LnGrp LOS	E	A	F	F	F	B	F	A	F	E	E	E
Approach Vol, veh/h		1342			1654			901			5	
Approach Delay, s/veh		166.7			179.1			140.0			72.1	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	90.0	35.0	12.6	14.3	95.7	5.4	42.2
Change Period (Y+Rc), s	6.4	6.9	5.2	5.6	6.4	6.9	5.2	5.6
Max Green Setting (Gmax), s	13.6	83.1	29.8	29.4	13.6	83.1	24.8	34.4
Max Q Clear Time (g_c+I1), s	15.6	85.1	31.8	2.2	7.9	90.8	2.1	37.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	165.7
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	1475.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	1004	85	54	1197	11	178	22	111	23	10	63
Future Vol, veh/h	18	1004	85	54	1197	11	178	22	111	23	10	63
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	205	-	-	205	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	92	92	90	90	92	92	92	90	92	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	1116	92	59	1330	12	193	24	121	26	11	70

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1342	0	0	1208	0	0	2697	2662	1162	2729	2702	1336
Stage 1	-	-	-	-	-	-	1202	1202	-	1454	1454	-
Stage 2	-	-	-	-	-	-	1495	1460	-	1275	1248	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	514	-	-	578	-	-	~ 14	~ 23	237	~ 13	21	188
Stage 1	-	-	-	-	-	-	225	258	-	162	195	-
Stage 2	-	-	-	-	-	-	~ 153	194	-	205	245	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	514	-	-	578	-	-	~ 4	~ 20	237	-	18	188
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 4	~ 20	-	-	18	-
Stage 1	-	-	-	-	-	-	216	248	-	156	175	-
Stage 2	-	-	-	-	-	-	~ 81	174	-	87	235	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.5	$ 13413.4	
HCM LOS			F	-

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	4	85	514	-	-	578	-	-	-
HCM Lane V/C Ratio	48.37	1.701	0.039	-	-	0.102	-	-	-
HCM Control Delay (s)	$ 23103.8	$ 444.3	12.3	-	-	11.9	-	-	-
HCM Lane LOS	F	F	B	-	-	B	-	-	-
HCM 95th %tile Q(veh)	26.4	12	0.1	-	-	0.3	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	315	844	40	36	923	47	122	65	62	67	33	256
Future Volume (veh/h)	315	844	40	36	923	47	122	65	62	67	33	256
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	354	948	45	40	1037	53	137	73	70	75	37	288
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	284	950	45	124	786	40	142	227	218	304	48	370
Arrive On Green	0.12	0.54	0.54	0.03	0.45	0.45	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1781	1771	84	1781	1764	90	1055	877	841	1245	184	1429
Grp Volume(v), veh/h	354	0	993	40	0	1090	137	0	143	75	0	325
Grp Sat Flow(s),veh/h/ln	1781	0	1855	1781	0	1854	1055	0	1719	1245	0	1613
Q Serve(g_s), s	13.5	0.0	58.8	1.3	0.0	49.0	7.9	0.0	7.4	5.7	0.0	20.6
Cycle Q Clear(g_c), s	13.5	0.0	58.8	1.3	0.0	49.0	28.5	0.0	7.4	13.1	0.0	20.6
Prop In Lane	1.00		0.05	1.00		0.05	1.00		0.49	1.00		0.89
Lane Grp Cap(c), veh/h	284	0	995	124	0	826	142	0	445	304	0	418
V/C Ratio(X)	1.25	0.00	1.00	0.32	0.00	1.32	0.97	0.00	0.32	0.25	0.00	0.78
Avail Cap(c_a), veh/h	284	0	995	285	0	826	142	0	445	304	0	418
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.2	0.0	25.5	26.3	0.0	30.5	52.8	0.0	32.9	38.2	0.0	37.8
Incr Delay (d2), s/veh	136.8	0.0	28.1	0.6	0.0	152.4	65.6	0.0	0.4	0.4	0.0	9.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.6	0.0	38.4	0.9	0.0	79.5	10.5	0.0	5.6	3.2	0.0	14.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	173.0	0.0	53.6	26.8	0.0	182.9	118.4	0.0	33.3	38.6	0.0	46.8
LnGrp LOS	F	A	D	C	A	F	F	A	C	D	A	D
Approach Vol, veh/h		1347			1130			280			400	
Approach Delay, s/veh		85.0			177.3			75.0			45.3	
Approach LOS		F			F			E			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	65.0		35.0	20.0	55.0		35.0				
Change Period (Y+Rc), s	6.5	6.0		6.5	6.5	6.0		6.5				
Max Green Setting (Gmax), s	13.5	49.0		28.5	13.5	49.0		28.5				
Max Q Clear Time (g_c+I1), s	3.3	60.8		22.6	15.5	51.0		30.5				
Green Ext Time (p_c), s	0.0	0.0		0.9	0.0	0.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		112.1	
HCM 6th LOS		F	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	58	8	188	147	83	12	543	121	46	410	32
Future Volume (veh/h)	37	58	8	188	147	83	12	543	121	46	410	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	44	69	10	224	175	99	14	646	0	55	488	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	146	276	40	303	194	110	448	872		359	934	
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.02	0.47	0.00	0.05	0.50	0.00
Sat Flow, veh/h	1105	1597	231	1320	1122	635	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	44	0	79	224	0	274	14	646	0	55	488	0
Grp Sat Flow(s),veh/h/ln	1105	0	1829	1320	0	1756	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	1.1	0.0	2.2	7.8	0.0	8.9	0.2	16.3	0.0	0.9	10.2	0.0
Cycle Q Clear(g_c), s	10.0	0.0	2.2	10.0	0.0	8.9	0.2	16.3	0.0	0.9	10.2	0.0
Prop In Lane	1.00		0.13	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	146	0	316	303	0	303	448	872		359	934	
V/C Ratio(X)	0.30	0.00	0.25	0.74	0.00	0.90	0.03	0.74		0.15	0.52	
Avail Cap(c_a), veh/h	146	0	316	303	0	303	571	872		423	934	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.7	0.0	20.7	25.8	0.0	23.5	8.4	12.6	0.0	9.5	9.8	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.4	9.3	0.0	28.6	0.0	5.6	0.0	0.2	2.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.1	0.0	1.5	6.4	0.0	9.4	0.1	10.2	0.0	0.4	6.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.8	0.0	21.1	35.1	0.0	52.1	8.4	18.3	0.0	9.7	11.9	0.0
LnGrp LOS	C	A	C	D	A	D	A	B		A	B	
Approach Vol, veh/h		123			498			660			543	
Approach Delay, s/veh		24.2			44.4			18.0			11.7	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.9	33.0		16.0	7.0	34.9		16.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	27.0		10.0	5.0	27.0		10.0
Max Q Clear Time (g_c+I1), s	2.9	18.3		12.0	2.2	12.2		12.0
Green Ext Time (p_c), s	0.0	1.8		0.0	0.0	1.6		0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.8
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	63	37	162	25	11	91
Future Vol, veh/h	63	37	162	25	11	91
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	66	39	169	26	11	95

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	195	0	-	0	353	182
Stage 1	-	-	-	-	182	-
Stage 2	-	-	-	-	171	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1378	-	-	-	645	861
Stage 1	-	-	-	-	849	-
Stage 2	-	-	-	-	859	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1378	-	-	-	613	861
Mov Cap-2 Maneuver	-	-	-	-	613	-
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	859	-

Approach	EB	WB	SB
HCM Control Delay, s	4.9	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1378	-	-	-	825
HCM Lane V/C Ratio	0.048	-	-	-	0.129
HCM Control Delay (s)	7.7	0	-	-	10
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Int Delay, s/veh	35.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	450	364	782	145	29	348
Future Vol, veh/h	450	364	782	145	29	348
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	120	0	125
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	489	396	850	158	32	378

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1008	0	-	0	2224	850
Stage 1	-	-	-	-	850	-
Stage 2	-	-	-	-	1374	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	687	-	-	-	48	~ 360
Stage 1	-	-	-	-	419	-
Stage 2	-	-	-	-	235	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	687	-	-	-	~ 14	~ 360
Mov Cap-2 Maneuver	-	-	-	-	~ 14	-
Stage 1	-	-	-	-	121	-
Stage 2	-	-	-	-	235	-

Approach	EB	WB	SB
HCM Control Delay, s	12.2	0	175.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	687	-	-	-	14	360
HCM Lane V/C Ratio	0.712	-	-	-	2.252	1.051
HCM Control Delay (s)	22.1	-	-	-	$ 1126.7	96.1
HCM Lane LOS	C	-	-	-	F	F
HCM 95th %tile Q(veh)	6	-	-	-	4.7	13.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

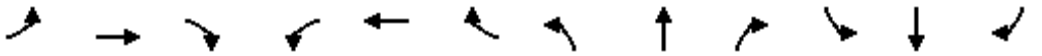
Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	54	170	307	11	22	111
Future Vol, veh/h	54	170	307	11	22	111
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	59	185	334	12	24	121

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	346	0	-	0	643	340
Stage 1	-	-	-	-	340	-
Stage 2	-	-	-	-	303	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1213	-	-	-	438	702
Stage 1	-	-	-	-	721	-
Stage 2	-	-	-	-	749	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1213	-	-	-	414	702
Mov Cap-2 Maneuver	-	-	-	-	414	-
Stage 1	-	-	-	-	682	-
Stage 2	-	-	-	-	749	-

Approach	EB	WB	SB
HCM Control Delay, s	2	0	12.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1213	-	-	-	630
HCM Lane V/C Ratio	0.048	-	-	-	0.229
HCM Control Delay (s)	8.1	0	-	-	12.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.9



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	753	641	64	538	723	334	72	1000	563	414	1160	983
Future Volume (vph)	753	641	64	538	723	334	72	1000	563	414	1160	983
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3491		3433	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.09	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3491		3433	3539	1583	166	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	793	675	67	566	761	352	76	1053	593	436	1221	1035
RTOR Reduction (vph)	0	4	0	0	0	133	0	0	313	0	0	364
Lane Group Flow (vph)	793	738	0	566	761	219	76	1053	280	436	1221	671
Turn Type	Split	NA		Split	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	1		2	2		3	8		7	4	
Permitted Phases						2	8		8			4
Actuated Green, G (s)	41.8	41.8		35.0	35.0	35.0	50.0	45.0	45.0	20.0	60.0	60.0
Effective Green, g (s)	41.8	41.8		35.0	35.0	35.0	50.0	45.0	45.0	20.0	60.0	60.0
Actuated g/C Ratio	0.25	0.25		0.21	0.21	0.21	0.30	0.27	0.27	0.12	0.36	0.36
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0
Lane Grp Cap (vph)	870	885		729	751	336	99	966	432	416	1288	576
v/s Ratio Prot	c0.23	0.21		0.16	c0.22		0.02	0.30		c0.13	0.34	
v/s Ratio Perm						0.14	0.21		0.18			c0.42
v/c Ratio	0.91	0.83		0.78	1.01	0.65	0.77	1.09	0.65	1.05	0.95	1.16
Uniform Delay, d1	59.7	58.2		61.2	64.9	59.3	47.2	59.9	52.9	72.4	50.9	52.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.8	7.1		5.5	36.2	5.0	26.8	56.7	3.7	57.3	14.4	91.8
Delay (s)	73.5	65.3		66.7	101.1	64.3	74.0	116.6	56.7	129.7	65.3	144.2
Level of Service	E	E		E	F	E	E	F	E	F	E	F
Approach Delay (s)		69.5			81.8			94.1			106.1	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	90.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	164.8	Sum of lost time (s)	23.0
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	1099	341	359	1153	4	249	9	288	32	67	32
Future Volume (veh/h)	9	1099	341	359	1153	4	249	9	288	32	67	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	1133	352	370	1189	4	257	10	297	35	73	35
Peak Hour Factor	0.92	0.97	0.97	0.97	0.97	0.92	0.97	0.92	0.97	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	66	725	225	200	1132	960	364	11	315	106	162	137
Arrive On Green	0.01	0.53	0.53	0.09	0.61	0.61	0.14	0.20	0.20	0.02	0.09	0.09
Sat Flow, veh/h	1781	1369	425	1781	1870	1585	1781	52	1541	1781	1870	1585
Grp Volume(v), veh/h	10	0	1485	370	1189	4	257	0	307	35	73	35
Grp Sat Flow(s),veh/h/ln	1781	0	1794	1781	1870	1585	1781	0	1593	1781	1870	1585
Q Serve(g_s), s	0.4	0.0	83.1	13.6	94.9	0.2	20.0	0.0	29.8	2.8	5.8	3.2
Cycle Q Clear(g_c), s	0.4	0.0	83.1	13.6	94.9	0.2	20.0	0.0	29.8	2.8	5.8	3.2
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.97	1.00		1.00
Lane Grp Cap(c), veh/h	66	0	951	200	1132	960	364	0	326	106	162	137
V/C Ratio(X)	0.15	0.00	1.56	1.85	1.05	0.00	0.71	0.00	0.94	0.33	0.45	0.26
Avail Cap(c_a), veh/h	200	0	951	200	1132	960	448	0	349	344	351	297
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.6	0.0	36.9	56.7	30.9	12.2	52.8	0.0	61.4	63.6	68.1	66.9
Incr Delay (d2), s/veh	0.4	0.0	258.1	399.5	40.9	0.0	3.3	0.0	32.3	0.7	2.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	0.0	156.8	46.2	66.6	0.1	14.0	0.0	20.9	2.3	5.2	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.0	0.0	295.0	456.2	71.8	12.2	56.1	0.0	93.7	64.2	70.0	67.9
LnGrp LOS	D	A	F	F	F	B	E	A	F	E	E	E
Approach Vol, veh/h		1495			1563			564			143	
Approach Delay, s/veh		293.3			162.7			76.6			68.1	
Approach LOS		F			F			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	90.0	27.6	19.2	8.2	101.8	9.1	37.7
Change Period (Y+Rc), s	6.4	6.9	5.2	5.6	6.4	6.9	5.2	5.6
Max Green Setting (Gmax), s	13.6	83.1	29.8	29.4	13.6	83.1	24.8	34.4
Max Q Clear Time (g_c+I1), s	15.6	85.1	22.0	7.8	2.4	96.9	4.8	31.8
Green Ext Time (p_c), s	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	198.0
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	62	1199	180	113	1202	20	125	16	80	7	23	53
Future Vol, veh/h	62	1199	180	113	1202	20	125	16	80	7	23	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	205	-	-	205	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	92	92	98	98	92	92	92	98	92	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	63	1223	196	123	1227	20	136	17	87	7	25	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1247	0	0	1419	0	0	2970	2940	1321	2982	3028	1237
Stage 1	-	-	-	-	-	-	1447	1447	-	1483	1483	-
Stage 2	-	-	-	-	-	-	1523	1493	-	1499	1545	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	558	-	-	480	-	-	~ 9	~ 15	191	9	~ 13	215
Stage 1	-	-	-	-	-	-	163	196	-	156	189	-
Stage 2	-	-	-	-	-	-	148	187	-	152	176	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	558	-	-	480	-	-	-	~ 10	191	-	~ 9	215
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	~ 10	-	-	~ 9	-
Stage 1	-	-	-	-	-	-	145	174	-	138	141	-
Stage 2	-	-	-	-	-	-	~ 68	139	-	66	156	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	1.4		
HCM LOS			-	-

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	48	558	-	-	480	-	-	-
HCM Lane V/C Ratio	-	2.174	0.113	-	-	0.256	-	-	-
HCM Control Delay (s)	-	$ 722.5	12.3	-	-	15.1	-	-	-
HCM Lane LOS	-	F	B	-	-	C	-	-	-
HCM 95th %tile Q(veh)	-	10.7	0.4	-	-	1	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	1209	9	54	1109	113	71	7	56	15	12	64
Future Volume (veh/h)	53	1209	9	54	1109	113	71	7	56	15	12	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	1234	9	55	1132	115	72	7	57	15	12	65
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	165	1110	8	166	1001	102	196	22	180	208	32	172
Arrive On Green	0.04	0.60	0.60	0.04	0.60	0.60	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1781	1854	14	1781	1670	170	1322	176	1436	1338	253	1371
Grp Volume(v), veh/h	54	0	1243	55	0	1247	72	0	64	15	0	77
Grp Sat Flow(s),veh/h/ln	1781	0	1868	1781	0	1840	1322	0	1612	1338	0	1624
Q Serve(g_s), s	0.9	0.0	49.0	0.9	0.0	49.0	4.3	0.0	3.0	0.8	0.0	3.6
Cycle Q Clear(g_c), s	0.9	0.0	49.0	0.9	0.0	49.0	7.9	0.0	3.0	3.8	0.0	3.6
Prop In Lane	1.00		0.01	1.00		0.09	1.00		0.89	1.00		0.84
Lane Grp Cap(c), veh/h	165	0	1118	166	0	1102	196	0	202	208	0	204
V/C Ratio(X)	0.33	0.00	1.11	0.33	0.00	1.13	0.37	0.00	0.32	0.07	0.00	0.38
Avail Cap(c_a), veh/h	382	0	1118	382	0	1102	491	0	561	505	0	565
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.1	0.0	16.4	20.1	0.0	16.4	36.5	0.0	32.6	34.3	0.0	32.8
Incr Delay (d2), s/veh	0.4	0.0	63.0	0.4	0.0	70.9	1.1	0.0	0.9	0.1	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.0	0.0	47.2	1.0	0.0	50.3	2.6	0.0	2.1	0.5	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.5	0.0	79.4	20.5	0.0	87.3	37.6	0.0	33.5	34.5	0.0	34.0
LnGrp LOS	C	A	F	C	A	F	D	A	C	C	A	C
Approach Vol, veh/h		1297			1302			136			92	
Approach Delay, s/veh		77.0			84.5			35.7			34.1	
Approach LOS		E			F			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.1	55.0		16.8	10.0	55.0		16.8				
Change Period (Y+Rc), s	6.5	6.0		6.5	6.5	6.0		6.5				
Max Green Setting (Gmax), s	13.5	49.0		28.5	13.5	49.0		28.5				
Max Q Clear Time (g_c+I1), s	2.9	51.0		5.8	2.9	51.0		9.9				
Green Ext Time (p_c), s	0.0	0.0		0.3	0.0	0.0		0.4				

Intersection Summary			
HCM 6th Ctrl Delay		77.0	
HCM 6th LOS		E	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	74	8	127	52	51	12	372	160	70	575	73
Future Volume (veh/h)	17	74	8	127	52	51	12	372	160	70	575	73
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	18	77	8	132	54	53	12	388	0	73	599	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	306	311	32	329	162	159	331	773		504	860	
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.02	0.41	0.00	0.06	0.46	0.00
Sat Flow, veh/h	1287	1666	173	1313	867	851	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	18	0	85	132	0	107	12	388	0	73	599	0
Grp Sat Flow(s),veh/h/ln	1287	0	1839	1313	0	1717	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.7	0.0	2.1	5.1	0.0	2.9	0.2	8.2	0.0	1.2	13.5	0.0
Cycle Q Clear(g_c), s	3.5	0.0	2.1	7.2	0.0	2.9	0.2	8.2	0.0	1.2	13.5	0.0
Prop In Lane	1.00		0.09	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	306	0	343	329	0	321	331	773		504	860	
V/C Ratio(X)	0.06	0.00	0.25	0.40	0.00	0.33	0.04	0.50		0.14	0.70	
Avail Cap(c_a), veh/h	307	0	345	330	0	323	471	773		561	860	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.3	0.0	18.5	21.5	0.0	18.8	9.9	11.6	0.0	8.3	11.4	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.8	0.0	0.6	0.0	2.3	0.0	0.1	4.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.0	1.4	2.5	0.0	1.8	0.1	5.2	0.0	0.6	8.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	0.0	18.8	22.3	0.0	19.4	10.0	13.9	0.0	8.5	16.1	0.0
LnGrp LOS	C	A	B	C	A	B	A	B		A	B	
Approach Vol, veh/h		103			239			400			672	
Approach Delay, s/veh		19.1			21.0			13.8			15.2	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	28.0		15.9	6.8	30.5		15.9
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.3	22.0		10.0	5.0	22.0		10.0
Max Q Clear Time (g_c+I1), s	3.2	10.2		5.5	2.2	15.5		9.2
Green Ext Time (p_c), s	0.0	1.1		0.1	0.0	1.4		0.1

Intersection Summary	
HCM 6th Ctrl Delay	16.1
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	80	105	70	9	23	83
Future Vol, veh/h	80	105	70	9	23	83
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	83	109	73	9	24	86

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	82	0	-	0	353	78
Stage 1	-	-	-	-	78	-
Stage 2	-	-	-	-	275	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1515	-	-	-	645	983
Stage 1	-	-	-	-	945	-
Stage 2	-	-	-	-	771	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1515	-	-	-	608	983
Mov Cap-2 Maneuver	-	-	-	-	608	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	771	-

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1515	-	-	-	867
HCM Lane V/C Ratio	0.055	-	-	-	0.127
HCM Control Delay (s)	7.5	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4

Intersection	
Int Delay, s/veh	47.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	499	714	464	61	51	572
Future Vol, veh/h	499	714	464	61	51	572
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	120	0	125
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	531	760	494	65	54	609

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	559	0	-	0	2316	494
Stage 1	-	-	-	-	494	-
Stage 2	-	-	-	-	1822	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1012	-	-	-	~ 42	~ 575
Stage 1	-	-	-	-	613	-
Stage 2	-	-	-	-	141	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1012	-	-	-	~ 20	~ 575
Mov Cap-2 Maneuver	-	-	-	-	~ 20	-
Stage 1	-	-	-	-	291	-
Stage 2	-	-	-	-	141	-

Approach	EB	WB	SB
HCM Control Delay, s	5.1	0	170.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1012	-	-	-	20	575
HCM Lane V/C Ratio	0.525	-	-	-	2.713	1.058
HCM Control Delay (s)	12.4	-	-	-	$ 1177.2	80.5
HCM Lane LOS	B	-	-	-	F	F
HCM 95th %tile Q(veh)	3.1	-	-	-	7.1	17.3

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	3.3

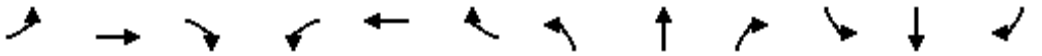
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	113	190	150	23	16	79
Future Vol, veh/h	113	190	150	23	16	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	123	207	163	25	17	86

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	188	0	-	0	629	176
Stage 1	-	-	-	-	176	-
Stage 2	-	-	-	-	453	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1386	-	-	-	446	867
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	640	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1386	-	-	-	401	867
Mov Cap-2 Maneuver	-	-	-	-	401	-
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	640	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1386	-	-	-	725
HCM Lane V/C Ratio	0.089	-	-	-	0.142
HCM Control Delay (s)	7.8	0	-	-	10.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.5

2034 FUTURE PROJECTED CONDITIONS WITH INTERSECTION IMPROVEMENTS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1007	739	51	468	536	530	37	1024	402	367	1024	983
Future Volume (vph)	1007	739	51	468	536	530	37	1024	402	367	1024	983
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3505		3433	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.10	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3505		3433	3539	1583	177	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	1144	840	58	532	609	602	42	1164	457	417	1164	1117
RTOR Reduction (vph)	0	4	0	0	0	109	0	0	288	0	0	415
Lane Group Flow (vph)	1144	894	0	532	609	493	42	1164	169	417	1164	702
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2	8		8			4
Actuated Green, G (s)	39.0	42.6		28.4	32.0	32.0	46.0	42.0	42.0	15.0	53.0	53.0
Effective Green, g (s)	39.0	42.6		28.4	32.0	32.0	46.0	42.0	42.0	15.0	53.0	53.0
Actuated g/C Ratio	0.26	0.28		0.19	0.21	0.21	0.30	0.28	0.28	0.10	0.35	0.35
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0
Lane Grp Cap (vph)	886	988		645	749	335	96	984	440	341	1242	555
v/s Ratio Prot	c0.33	0.26		0.15	0.17		0.01	0.33		c0.12	0.33	
v/s Ratio Perm						c0.31	0.12		0.11			c0.44
v/c Ratio	1.29	0.91		0.82	0.81	1.47	0.44	1.18	0.38	1.22	0.94	1.27
Uniform Delay, d1	56.0	52.3		58.9	56.7	59.5	41.3	54.5	44.0	68.0	47.4	49.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	139.5	11.7		8.8	7.1	228.2	1.2	92.8	0.8	123.8	13.3	133.3
Delay (s)	195.5	64.0		67.7	63.7	287.7	42.5	147.3	44.8	191.8	60.7	182.3
Level of Service	F	E		E	E	F	D	F	D	F	E	F
Approach Delay (s)		137.7			142.3			116.5			131.3	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	132.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	151.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	863	230	264	1175	34	472	67	265	1	2	2
Future Volume (veh/h)	105	863	230	264	1175	34	472	67	265	1	2	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	970	258	297	1320	37	530	73	298	1	2	2
Peak Hour Factor	0.92	0.89	0.89	0.89	0.89	0.92	0.89	0.92	0.89	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	126	745	198	221	1079	914	419	406	499	98	87	74
Arrive On Green	0.04	0.52	0.52	0.10	0.58	0.58	0.17	0.22	0.22	0.00	0.05	0.05
Sat Flow, veh/h	1781	1424	379	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	114	0	1228	297	1320	37	530	73	298	1	2	2
Grp Sat Flow(s),veh/h/ln	1781	0	1802	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.5	0.0	78.5	14.6	86.5	1.5	25.8	4.8	23.8	0.1	0.2	0.2
Cycle Q Clear(g_c), s	5.5	0.0	78.5	14.6	86.5	1.5	25.8	4.8	23.8	0.1	0.2	0.2
Prop In Lane	1.00		0.21	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	126	0	943	221	1079	914	419	406	499	98	87	74
V/C Ratio(X)	0.90	0.00	1.30	1.34	1.22	0.04	1.27	0.18	0.60	0.01	0.02	0.03
Avail Cap(c_a), veh/h	126	0	943	221	1079	914	419	406	499	155	87	74
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.7	0.0	35.8	54.2	31.8	13.8	58.5	47.8	43.4	68.0	68.2	68.2
Incr Delay (d2), s/veh	50.3	0.0	143.7	180.9	109.1	0.0	137.2	0.2	2.0	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.9	0.0	100.9	29.3	96.1	1.0	29.2	4.0	14.4	0.1	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	92.9	0.0	179.4	235.1	140.9	13.8	195.7	48.0	45.3	68.0	68.3	68.4
LnGrp LOS	F	A	F	F	F	B	F	D	D	E	E	E
Approach Vol, veh/h		1342			1654			901			5	
Approach Delay, s/veh		172.1			155.0			134.0			68.3	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	85.4	31.0	12.6	13.0	93.4	5.4	38.2
Change Period (Y+Rc), s	6.4	6.9	5.2	5.6	6.4	6.9	5.2	5.6
Max Green Setting (Gmax), s	14.6	78.5	25.8	7.0	6.6	86.5	5.0	27.8
Max Q Clear Time (g_c+I1), s	16.6	80.5	27.8	2.2	7.5	88.5	2.1	25.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	155.9
HCM 6th LOS	F



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	1004	85	54	1197	11	178	22	111	23	10	63
Future Volume (veh/h)	18	1004	85	54	1197	11	178	22	111	23	10	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	20	1116	92	59	1330	12	193	24	121	26	11	70
Peak Hour Factor	0.90	0.90	0.92	0.92	0.90	0.90	0.92	0.92	0.92	0.90	0.92	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	60	1118	948	125	1279	1084	261	34	169	182	15	93
Arrive On Green	0.60	0.60	0.60	0.04	0.68	0.68	0.10	0.12	0.12	0.04	0.07	0.07
Sat Flow, veh/h	407	1870	1585	1781	1870	1585	1781	269	1357	1781	220	1399
Grp Volume(v), veh/h	20	1116	92	59	1330	12	193	0	145	26	0	81
Grp Sat Flow(s),veh/h/ln	407	1870	1585	1781	1870	1585	1781	0	1626	1781	0	1619
Q Serve(g_s), s	0.0	71.4	3.0	1.4	82.1	0.3	11.9	0.0	10.3	1.6	0.0	5.9
Cycle Q Clear(g_c), s	71.8	71.4	3.0	1.4	82.1	0.3	11.9	0.0	10.3	1.6	0.0	5.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.83	1.00		0.86
Lane Grp Cap(c), veh/h	60	1118	948	125	1279	1084	261	0	202	182	0	107
V/C Ratio(X)	0.33	1.00	0.10	0.47	1.04	0.01	0.74	0.00	0.72	0.14	0.00	0.76
Avail Cap(c_a), veh/h	60	1118	948	136	1279	1084	261	0	230	182	0	135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.22	0.22	0.22	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	60.0	24.0	10.3	30.2	19.0	6.0	45.2	0.0	50.5	48.5	0.0	55.1
Incr Delay (d2), s/veh	14.3	26.4	0.2	0.6	24.0	0.0	10.7	0.0	8.8	0.4	0.0	16.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.5	43.8	1.7	1.8	41.1	0.1	10.1	0.0	8.2	1.3	0.0	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.3	50.4	10.5	30.8	43.0	6.0	56.0	0.0	59.3	48.9	0.0	71.9
LnGrp LOS	E	D	B	C	F	A	E	A	E	D	A	E
Approach Vol, veh/h		1228			1401			338			107	
Approach Delay, s/veh		47.8			42.1			57.4			66.3	
Approach LOS		D			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	11.0	20.9	10.3	77.8	18.0	13.9		88.1
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	17.0	5.0	69.0	12.0	10.0		80.0
Max Q Clear Time (g_c+I1), s	13.8	12.3	3.4	73.8	13.9	7.9		84.1
Green Ext Time (p_c), s	0.0	0.2	0.0	0.0	0.0	0.0		0.0

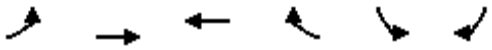
Intersection Summary	
HCM 6th Ctrl Delay	46.9
HCM 6th LOS	D



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	315	844	40	36	923	47	122	65	62	67	33	256
Future Volume (veh/h)	315	844	40	36	923	47	122	65	62	67	33	256
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	354	948	45	40	1037	53	137	73	70	75	37	288
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	339	1221	58	285	976	50	121	137	132	115	37	395
Arrive On Green	0.16	0.69	0.69	0.03	0.55	0.55	0.04	0.16	0.16	0.09	0.09	0.09
Sat Flow, veh/h	1781	1771	84	1781	1764	90	1781	877	841	874	431	1585
Grp Volume(v), veh/h	354	0	993	40	0	1090	137	0	143	112	0	288
Grp Sat Flow(s),veh/h/ln	1781	0	1855	1781	0	1854	1781	0	1719	1305	0	1585
Q Serve(g_s), s	24.5	0.0	53.6	1.4	0.0	83.0	6.1	0.0	11.5	12.0	0.0	12.9
Cycle Q Clear(g_c), s	24.5	0.0	53.6	1.4	0.0	83.0	6.1	0.0	11.5	12.9	0.0	12.9
Prop In Lane	1.00		0.05	1.00		0.05	1.00		0.49	0.67		1.00
Lane Grp Cap(c), veh/h	339	0	1279	285	0	1026	121	0	269	152	0	395
V/C Ratio(X)	1.04	0.00	0.78	0.14	0.00	1.06	1.14	0.00	0.53	0.74	0.00	0.73
Avail Cap(c_a), veh/h	339	0	1279	299	0	1026	121	0	269	152	0	395
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	55.3	0.0	15.5	17.5	0.0	33.5	64.2	0.0	58.2	69.0	0.0	51.6
Incr Delay (d2), s/veh	60.9	0.0	3.6	0.1	0.0	46.2	123.2	0.0	2.0	16.9	0.0	6.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	25.2	0.0	27.8	1.0	0.0	61.0	10.1	0.0	8.9	8.7	0.0	16.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	116.2	0.0	19.1	17.5	0.0	79.7	187.4	0.0	60.2	85.8	0.0	58.3
LnGrp LOS	F	A	B	B	A	F	F	A	E	F	A	E
Approach Vol, veh/h		1347			1130			280			400	
Approach Delay, s/veh		44.6			77.5			122.4			66.0	
Approach LOS		D			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	10.6	109.4	10.6	19.4	31.0	89.0		30.0
Change Period (Y+Rc), s	6.5	6.0	4.5	6.5	6.5	6.0		6.5
Max Green Setting (Gmax), s	5.3	102.2	6.1	12.9	24.5	83.0		23.5
Max Q Clear Time (g_c+I1), s	13.4	55.6	8.1	14.9	26.5	85.0		13.5
Green Ext Time (p_c), s	0.0	15.4	0.0	0.0	0.0	0.0		0.3

Intersection Summary	
HCM 6th Ctrl Delay	66.0
HCM 6th LOS	E



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	450	364	782	145	29	348
Future Volume (veh/h)	450	364	782	145	29	348
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	489	396	850	158	32	378
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	519	1476	943	799	139	469
Arrive On Green	0.22	0.79	0.50	0.50	0.08	0.08
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	489	396	850	158	32	378
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	17.5	5.1	37.2	4.9	1.5	7.0
Cycle Q Clear(g_c), s	17.5	5.1	37.2	4.9	1.5	7.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	519	1476	943	799	139	469
V/C Ratio(X)	0.94	0.27	0.90	0.20	0.23	0.81
Avail Cap(c_a), veh/h	527	1476	943	799	139	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.4	2.5	20.3	12.3	39.0	29.3
Incr Delay (d2), s/veh	25.2	0.4	13.4	0.6	0.8	10.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	19.1	1.9	24.1	3.0	1.2	24.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	50.7	3.0	33.7	12.8	39.8	39.2
LnGrp LOS	D	A	C	B	D	D
Approach Vol, veh/h		885	1008		410	
Approach Delay, s/veh		29.3	30.4		39.3	
Approach LOS		C	C		D	

Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			77.0		13.0	25.6	51.4
Change Period (Y+Rc), s			6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s			71.0		7.0	20.0	45.0
Max Q Clear Time (g_c+I1), s			7.1		9.0	19.5	39.2
Green Ext Time (p_c), s			1.5		0.0	0.1	2.4

Intersection Summary		
HCM 6th Ctrl Delay		31.6
HCM 6th LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	753	641	64	538	723	334	72	1000	563	414	1160	983
Future Volume (vph)	753	641	64	538	723	334	72	1000	563	414	1160	983
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3491		3433	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.09	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3491		3433	3539	1583	162	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	793	675	67	566	761	352	76	1053	593	436	1221	1035
RTOR Reduction (vph)	0	5	0	0	0	138	0	0	281	0	0	344
Lane Group Flow (vph)	793	737	0	566	761	214	76	1053	312	436	1221	691
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2	8		8			4
Actuated Green, G (s)	32.0	35.2		26.8	30.0	30.0	51.0	46.0	46.0	19.0	60.0	60.0
Effective Green, g (s)	32.0	35.2		26.8	30.0	30.0	51.0	46.0	46.0	19.0	60.0	60.0
Actuated g/C Ratio	0.21	0.23		0.18	0.20	0.20	0.34	0.31	0.31	0.13	0.40	0.40
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	1.5	4.0	4.0	1.5	4.0	4.0
Lane Grp Cap (vph)	732	819		613	707	316	108	1085	485	434	1415	633
v/s Ratio Prot	c0.23	0.21		0.16	c0.22		0.02	0.30		c0.13	0.34	
v/s Ratio Perm						0.13	0.21		0.20			c0.44
v/c Ratio	1.08	0.90		0.92	1.08	0.68	0.70	0.97	0.64	1.00	0.86	1.09
Uniform Delay, d1	59.0	55.7		60.6	60.0	55.5	37.7	51.3	44.9	65.5	41.2	45.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	58.1	12.9		19.9	56.3	6.1	15.6	20.5	3.2	44.4	5.9	63.1
Delay (s)	117.1	68.6		80.5	116.3	61.6	53.3	71.9	48.1	109.9	47.1	108.1
Level of Service	F	E		F	F	E	D	E	D	F	D	F
Approach Delay (s)		93.7			92.8			62.9			80.7	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	81.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	1099	341	359	1153	4	249	9	288	32	67	32
Future Volume (veh/h)	9	1099	341	359	1153	4	249	9	288	32	67	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	1133	352	370	1189	4	257	10	297	35	73	35
Peak Hour Factor	0.92	0.97	0.97	0.97	0.97	0.92	0.97	0.92	0.97	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	151	813	253	257	1309	1109	202	192	348	163	92	78
Arrive On Green	0.01	0.59	0.59	0.12	0.70	0.70	0.08	0.10	0.10	0.03	0.05	0.05
Sat Flow, veh/h	1781	1369	425	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	10	0	1485	370	1189	4	257	10	297	35	73	35
Grp Sat Flow(s),veh/h/ln	1781	0	1794	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.3	0.0	89.1	17.6	78.5	0.1	11.8	0.7	15.4	2.8	5.8	3.2
Cycle Q Clear(g_c), s	0.3	0.0	89.1	17.6	78.5	0.1	11.8	0.7	15.4	2.8	5.8	3.2
Prop In Lane	1.00		0.24	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	151	0	1066	257	1309	1109	202	192	348	163	92	78
V/C Ratio(X)	0.07	0.00	1.39	1.44	0.91	0.00	1.27	0.05	0.85	0.21	0.79	0.45
Avail Cap(c_a), veh/h	190	0	1066	257	1309	1109	202	192	348	191	92	78
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.1	0.0	30.5	56.8	18.5	6.8	64.3	60.7	56.2	65.5	70.5	69.3
Incr Delay (d2), s/veh	0.1	0.0	182.9	218.6	9.9	0.0	155.6	0.1	18.1	0.2	35.9	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.0	132.3	37.9	42.2	0.1	17.2	0.6	18.0	2.3	6.7	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.2	0.0	213.4	275.4	28.4	6.8	219.9	60.9	74.3	65.7	106.5	73.3
LnGrp LOS	C	A	F	F	C	A	F	E	E	E	F	E
Approach Vol, veh/h		1495			1563			564			143	
Approach Delay, s/veh		212.1			86.8			140.4			88.4	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.0	96.0	17.0	13.0	8.1	111.9	9.0	21.0
Change Period (Y+Rc), s	6.4	6.9	5.2	5.6	6.4	6.9	5.2	5.6
Max Green Setting (Gmax), s	17.6	89.1	11.8	7.4	5.0	101.7	6.2	13.0
Max Q Clear Time (g_c+I1), s	19.6	91.1	13.8	7.8	2.3	80.5	4.8	17.4
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	14.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	144.7
HCM 6th LOS	F



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	1199	180	113	1202	20	125	16	80	7	23	53
Future Volume (veh/h)	62	1199	180	113	1202	20	125	16	80	7	23	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	63	1223	196	123	1227	20	136	17	87	7	25	54
Peak Hour Factor	0.98	0.98	0.92	0.92	0.98	0.98	0.92	0.92	0.92	0.98	0.92	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	182	1252	1061	144	1410	1195	160	18	94	131	28	61
Arrive On Green	0.67	0.67	0.67	0.04	0.75	0.75	0.05	0.07	0.07	0.04	0.05	0.05
Sat Flow, veh/h	446	1870	1585	1781	1870	1585	1781	266	1360	1781	527	1138
Grp Volume(v), veh/h	63	1223	196	123	1227	20	136	0	104	7	0	79
Grp Sat Flow(s),veh/h/ln	446	1870	1585	1781	1870	1585	1781	0	1626	1781	0	1665
Q Serve(g_s), s	15.3	81.2	6.1	3.3	61.0	0.4	7.0	0.0	8.3	0.5	0.0	6.1
Cycle Q Clear(g_c), s	65.3	81.2	6.1	3.3	61.0	0.4	7.0	0.0	8.3	0.5	0.0	6.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.84	1.00		0.68
Lane Grp Cap(c), veh/h	182	1252	1061	144	1410	1195	160	0	113	131	0	90
V/C Ratio(X)	0.35	0.98	0.18	0.85	0.87	0.02	0.85	0.00	0.92	0.05	0.00	0.88
Avail Cap(c_a), veh/h	182	1252	1061	144	1410	1195	160	0	113	131	0	90
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.39	0.39	0.39	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	38.8	20.5	8.1	38.1	11.4	4.0	57.6	0.0	60.2	53.9	0.0	61.1
Incr Delay (d2), s/veh	5.1	20.5	0.4	17.3	3.2	0.0	32.6	0.0	66.2	0.8	0.0	66.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.3	44.9	3.4	5.1	23.0	0.2	4.5	0.0	9.3	0.4	0.0	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.9	41.1	8.5	55.4	14.6	4.0	90.2	0.0	126.4	54.7	0.0	127.4
LnGrp LOS	D	D	A	E	B	A	F	A	F	D	A	F
Approach Vol, veh/h		1482			1370			240			86	
Approach Delay, s/veh		36.9			18.1			105.9			121.5	
Approach LOS		D			B			F			F	

Timer - Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	11.0	15.0	11.0	93.0	13.0	13.0		104.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	9.0	5.0	87.0	7.0	7.0		98.0
Max Q Clear Time (g_c+I1), s	2.5	10.3	5.3	83.2	9.0	8.1		63.0
Green Ext Time (p_c), s	0.0	0.0	0.0	2.7	0.0	0.0		8.6

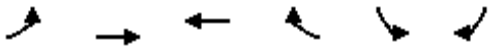
Intersection Summary	
HCM 6th Ctrl Delay	36.3
HCM 6th LOS	D



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	1209	9	54	1109	113	71	7	56	15	12	64
Future Volume (veh/h)	53	1209	9	54	1109	113	71	7	56	15	12	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	1234	9	55	1132	115	72	7	57	15	12	65
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	128	1274	9	144	1148	117	184	23	189	81	52	88
Arrive On Green	0.03	0.69	0.69	0.03	0.69	0.69	0.04	0.13	0.13	0.06	0.06	0.06
Sat Flow, veh/h	1781	1854	14	1781	1670	170	1781	176	1436	671	932	1585
Grp Volume(v), veh/h	54	0	1243	55	0	1247	72	0	64	27	0	65
Grp Sat Flow(s),veh/h/ln	1781	0	1868	1781	0	1840	1781	0	1612	1603	0	1585
Q Serve(g_s), s	1.1	0.0	80.1	1.1	0.0	84.6	4.8	0.0	4.6	0.3	0.0	5.2
Cycle Q Clear(g_c), s	1.1	0.0	80.1	1.1	0.0	84.6	4.8	0.0	4.6	1.8	0.0	5.2
Prop In Lane	1.00		0.01	1.00		0.09	1.00		0.89	0.56		1.00
Lane Grp Cap(c), veh/h	128	0	1283	144	0	1264	184	0	213	133	0	88
V/C Ratio(X)	0.42	0.00	0.97	0.38	0.00	0.99	0.39	0.00	0.30	0.20	0.00	0.74
Avail Cap(c_a), veh/h	142	0	1287	158	0	1267	184	0	214	134	0	90
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.1	0.0	18.8	33.4	0.0	19.5	52.8	0.0	50.5	58.2	0.0	59.8
Incr Delay (d2), s/veh	0.8	0.0	18.2	0.6	0.0	22.1	1.3	0.0	0.8	0.7	0.0	26.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.0	0.0	42.6	2.1	0.0	45.3	4.0	0.0	3.5	1.6	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.9	0.0	37.1	34.0	0.0	41.6	54.2	0.0	51.2	58.9	0.0	86.0
LnGrp LOS	D	A	D	C	A	D	D	A	D	E	A	F
Approach Vol, veh/h		1297			1302			136			92	
Approach Delay, s/veh		37.0			41.3			52.8			78.1	
Approach LOS		D			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	10.8	94.3	9.8	13.7	10.8	94.4		23.5
Change Period (Y+Rc), s	6.5	6.0	4.5	6.5	6.5	6.0		6.5
Max Green Setting (Gmax), s	5.3	88.6	5.3	7.3	5.3	88.6		17.1
Max Q Clear Time (g_c+I1), s	3.1	82.1	6.8	7.2	3.1	86.6		6.6
Green Ext Time (p_c), s	0.0	5.4	0.0	0.0	0.0	1.7		0.1

Intersection Summary	
HCM 6th Ctrl Delay	41.1
HCM 6th LOS	D

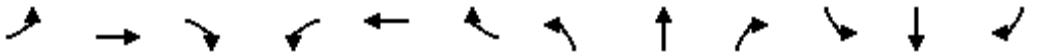


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	499	714	464	61	51	572
Future Volume (veh/h)	499	714	464	61	51	572
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	531	760	494	65	54	609
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	628	1278	675	572	208	537
Arrive On Green	0.22	0.68	0.36	0.36	0.12	0.12
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	531	760	494	65	54	609
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	9.8	13.0	13.8	1.6	1.7	7.0
Cycle Q Clear(g_c), s	9.8	13.0	13.8	1.6	1.7	7.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	628	1278	675	572	208	537
V/C Ratio(X)	0.85	0.59	0.73	0.11	0.26	1.13
Avail Cap(c_a), veh/h	855	1278	675	572	208	537
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.1	5.1	16.6	12.8	24.1	19.8
Incr Delay (d2), s/veh	5.9	2.0	6.9	0.4	0.7	81.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.6	5.3	10.1	1.0	1.2	37.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.0	7.1	23.5	13.2	24.8	101.0
LnGrp LOS	B	A	C	B	C	F
Approach Vol, veh/h		1291	559		663	
Approach Delay, s/veh		10.8	22.3		94.8	
Approach LOS		B	C		F	

Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			47.0		13.0	19.3	27.7
Change Period (Y+Rc), s			6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s			41.0		7.0	21.0	14.0
Max Q Clear Time (g_c+I1), s			15.0		9.0	11.8	15.8
Green Ext Time (p_c), s			3.5		0.0	1.6	0.0

Intersection Summary	
HCM 6th Ctrl Delay	35.5
HCM 6th LOS	D

2034 FUTURE PROJECTED CONDITIONS WITH INTERSECTION IMPROVEMENTS AND WIDENING



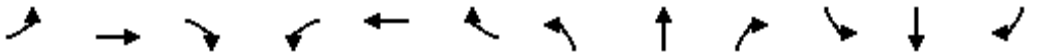
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	863	230	264	1175	34	472	67	265	1	2	2
Future Volume (veh/h)	105	863	230	264	1175	34	472	67	265	1	2	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	970	258	297	1320	37	582	0	298	1	2	2
Peak Hour Factor	0.92	0.89	0.89	0.89	0.89	0.92	0.89	0.92	0.89	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	119	988	1094	292	1160	983	578	0	465	16	16	14
Arrive On Green	0.04	0.53	0.53	0.13	0.62	0.62	0.16	0.00	0.16	0.01	0.01	0.01
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	3563	0	1585	1781	1870	1585
Grp Volume(v), veh/h	114	970	258	297	1320	37	582	0	298	1	2	2
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	0	1585	1781	1870	1585
Q Serve(g_s), s	5.2	73.3	8.7	18.9	89.5	1.3	23.4	0.0	23.4	0.1	0.2	0.2
Cycle Q Clear(g_c), s	5.2	73.3	8.7	18.9	89.5	1.3	23.4	0.0	23.4	0.1	0.2	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	119	988	1094	292	1160	983	578	0	465	16	16	14
V/C Ratio(X)	0.96	0.98	0.24	1.02	1.14	0.04	1.01	0.00	0.64	0.06	0.12	0.14
Avail Cap(c_a), veh/h	119	988	1094	292	1160	983	578	0	465	86	91	77
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	33.4	8.3	51.2	27.4	10.6	60.4	0.0	44.4	70.9	70.9	71.0
Incr Delay (d2), s/veh	68.5	24.3	0.2	56.8	72.8	0.0	39.2	0.0	3.0	1.7	3.2	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.5	47.7	8.4	21.6	79.9	0.8	19.5	0.0	14.4	0.1	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	109.2	57.7	8.5	108.1	100.2	10.7	99.7	0.0	47.4	72.6	74.2	75.6
LnGrp LOS	F	E	A	F	F	B	F	A	D	E	E	E
Approach Vol, veh/h		1342			1654			880			5	
Approach Delay, s/veh		52.6			99.6			82.0			74.4	
Approach LOS		D			F			F			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.3	83.1		6.9	12.0	96.4		29.0				
Change Period (Y+Rc), s	6.4	6.9		5.6	6.4	6.9		5.6				
Max Green Setting (Gmax), s	18.9	76.2		7.0	5.6	89.5		23.4				
Max Q Clear Time (g_c+I1), s	20.9	75.3		2.2	7.2	91.5		25.4				
Green Ext Time (p_c), s	0.0	0.7		0.0	0.0	0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		79.3
HCM 6th LOS		E

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	1099	341	359	1153	4	249	9	288	32	67	32
Future Volume (veh/h)	9	1099	341	359	1153	4	249	9	288	32	67	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	1133	352	370	1189	4	264	0	297	35	73	35
Peak Hour Factor	0.92	0.97	0.97	0.97	0.97	0.92	0.97	0.92	0.97	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	151	1049	1009	316	1309	1109	271	0	359	88	92	78
Arrive On Green	0.01	0.56	0.56	0.15	0.70	0.70	0.08	0.00	0.08	0.05	0.05	0.05
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	3563	0	1585	1781	1870	1585
Grp Volume(v), veh/h	10	1133	352	370	1189	4	264	0	297	35	73	35
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	0	1585	1781	1870	1585
Q Serve(g_s), s	0.4	84.1	15.6	22.6	78.5	0.1	11.1	0.0	11.4	2.9	5.8	3.2
Cycle Q Clear(g_c), s	0.4	84.1	15.6	22.6	78.5	0.1	11.1	0.0	11.4	2.9	5.8	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	151	1049	1009	316	1309	1109	271	0	359	88	92	78
V/C Ratio(X)	0.07	1.08	0.35	1.17	0.91	0.00	0.98	0.00	0.83	0.40	0.79	0.45
Avail Cap(c_a), veh/h	190	1049	1009	316	1309	1109	271	0	359	88	92	78
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.1	32.9	12.7	55.7	18.5	6.8	69.2	0.0	55.2	69.1	70.5	69.3
Incr Delay (d2), s/veh	0.1	52.2	0.4	104.8	9.9	0.0	47.6	0.0	14.6	2.9	35.9	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	66.2	11.1	30.2	42.2	0.1	11.0	0.0	17.5	2.5	6.7	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.2	85.1	13.2	160.5	28.4	6.8	116.8	0.0	69.8	72.0	106.5	73.3
LnGrp LOS	C	F	B	F	C	A	F	A	E	E	F	E
Approach Vol, veh/h		1495			1563			561			143	
Approach Delay, s/veh		67.8			59.6			91.9			89.9	
Approach LOS		E			E			F			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.0	91.0		13.0	8.1	111.9		17.0				
Change Period (Y+Rc), s	6.4	6.9		5.6	6.4	6.9		5.6				
Max Green Setting (Gmax), s	22.6	84.1		7.4	5.0	101.7		11.4				
Max Q Clear Time (g_c+I1), s	24.6	86.1		7.8	2.4	80.5		13.4				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	14.2		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			68.8									
HCM 6th LOS			E									

Notes

User approved volume balancing among the lanes for turning movement.

APPENDIX I
SIGNAL WARRANT ANALYSIS

Warrants Summary Report

1: Bear Creek & Patterson

Intersection Informatior

	Major Street	Minor Street
Street Name	Bear Creek Pk	Patterson Dr
Direction	EB/WB	NB/SB
Number of Lane:	2	2
Approch Speed	45	25

Warrant	Met?	Notes
Warrant 1, Eight-Hour Vehicular Volume		
	Yes	
Condition A or B Met	Yes	13 Hours met (8 required)
Condition A and B M	No	4 Hours met (8 required)
Warrant 2, Four-Hour Vehicular Volume		
	Yes	13 Hours met (4 required)
Warrant 3, Peak Hour		
	Yes	
Condition A Met?	No	0 Hours met (1 required)
Condition B Met?	Yes	7 Hours met (1 required)
Warrant 8, Roadway Network		
	Yes	

Warrant 1: Eight-hour Vehicular Volume

1: Bear Creek & Patterson

Intersection Informatior

Major Street Name:	Bear Creek Pk
Major Street Direction:	EB/WB
Minor Street Direction:	NB/SB

WARRANT 1 MET? Yes

Details:

Condition A Met?	Yes	13 Hours met (8 required)
Condition B Met?	No	4 Hours met (8 required)

Hour	Major Street Vehicles (Total of Both Approaches)		High Volume Minor Approach Vehicles		70% Standard Met? Cond. A OR Cond. B		56% Standard Met? Cond. A AND Cond. B	
					Condition A 70% Column	Condition B 70% Column	Condition A 56% Column	Condition B 56% Column
06:00 to 07:00	**1,238**		**98**		No	Yes*	No	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	No				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	No				
Condition B	**Volume >= 70% column (630)?**	Yes	**Volume >= 70% column (70)?**	Yes				
	Volume >= 56% column (504)?	Yes	**Volume >= 56% column (56)?**	Yes				
07:00 to 08:00	**2,158**		**209**		Yes*	Yes*	Yes*	Yes*
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes				
Condition B	**Volume >= 70% column (630)?**	Yes	**Volume >= 70% column (70)?**	Yes				
	Volume >= 56% column (504)?	Yes	**Volume >= 56% column (56)?**	Yes				
08:00 to 09:00	**1,552**		**170**		Yes*	Yes*	Yes*	Yes*
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes				
Condition B	**Volume >= 70% column (630)?**	Yes	**Volume >= 70% column (70)?**	Yes				
	Volume >= 56% column (504)?	Yes	**Volume >= 56% column (56)?**	Yes				
09:00 to 10:00	**1,230**		**103**		No	Yes*	No	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	No				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	No				
Condition B	**Volume >= 70% column (630)?**	Yes	**Volume >= 70% column (70)?**	Yes				
	Volume >= 56% column (504)?	Yes	**Volume >= 56% column (56)?**	Yes				

10:00 to 11:00	**1,263**		**87**		No	Yes*	No	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	No				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	No				
Condition B	**Volume >= 70% column (630)?**	Yes	**Volume >= 70% column (70)?**	Yes				
	Volume >= 56% column (504)?	Yes	**Volume >= 56% column (56)?**	Yes				

11:00 to 12:00	**1,251**		**85**		No	Yes*	No	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	No				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	No				
Condition B	**Volume >= 70% column (630)?**	Yes	**Volume >= 70% column (70)?**	Yes				
	Volume >= 56% column (504)?	Yes	**Volume >= 56% column (56)?**	Yes				

12:00 to 13:00	**1,328**		**89**		No	Yes*	No	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	No				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	No				
Condition B	**Volume >= 70% column (630)?**	Yes	**Volume >= 70% column (70)?**	Yes				
	Volume >= 56% column (504)?	Yes	**Volume >= 56% column (56)?**	Yes				

13:00 to 14:00	**1,258**		**94**		No	Yes*	No	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	No				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	No				
Condition B	**Volume >= 70% column (630)?**	Yes	**Volume >= 70% column (70)?**	Yes				
	Volume >= 56% column (504)?	Yes	**Volume >= 56% column (56)?**	Yes				

14:00 to 15:00	**1,598**		**103**		No	Yes*	No	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	No				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	No				
Condition B	**Volume >= 70% column (630)?**	Yes	**Volume >= 70% column (70)?**	Yes				
	Volume >= 56% column (504)?	Yes	**Volume >= 56% column (56)?**	Yes				

15:00 to 16:00	**1,969**		**108**		No	Yes*	No	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	No				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	No				
Condition B	**Volume >= 70% column (630)?**	Yes	**Volume >= 70% column (70)?**	Yes				
	Volume >= 56% column (504)?	Yes	**Volume >= 56% column (56)?**	Yes				

16:00 to 17:00	2,071		146		Yes*	Yes*	Yes*	Yes*
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes				
Condition B	**Volume >= 70% column (630)?**	Yes	**Volume >= 70% column (70)?**	Yes				
	Volume >= 56% column (504)?	Yes	**Volume >= 56% column (56)?**	Yes				

17:00 to 18:00	1,774		166		Yes*	Yes*	Yes*	Yes*
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes				
Condition B	**Volume >= 70% column (630)?**	Yes	**Volume >= 70% column (70)?**	Yes				
	Volume >= 56% column (504)?	Yes	**Volume >= 56% column (56)?**	Yes				

18:00 to 19:00	1,044		108		No	Yes*	No	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	No				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	No				
Condition B	**Volume >= 70% column (630)?**	Yes	**Volume >= 70% column (70)?**	Yes				
	Volume >= 56% column (504)?	Yes	**Volume >= 56% column (56)?**	Yes				

Warrant 2: Four-hour Vehicular Volume

1: Bear Creek & Patterson

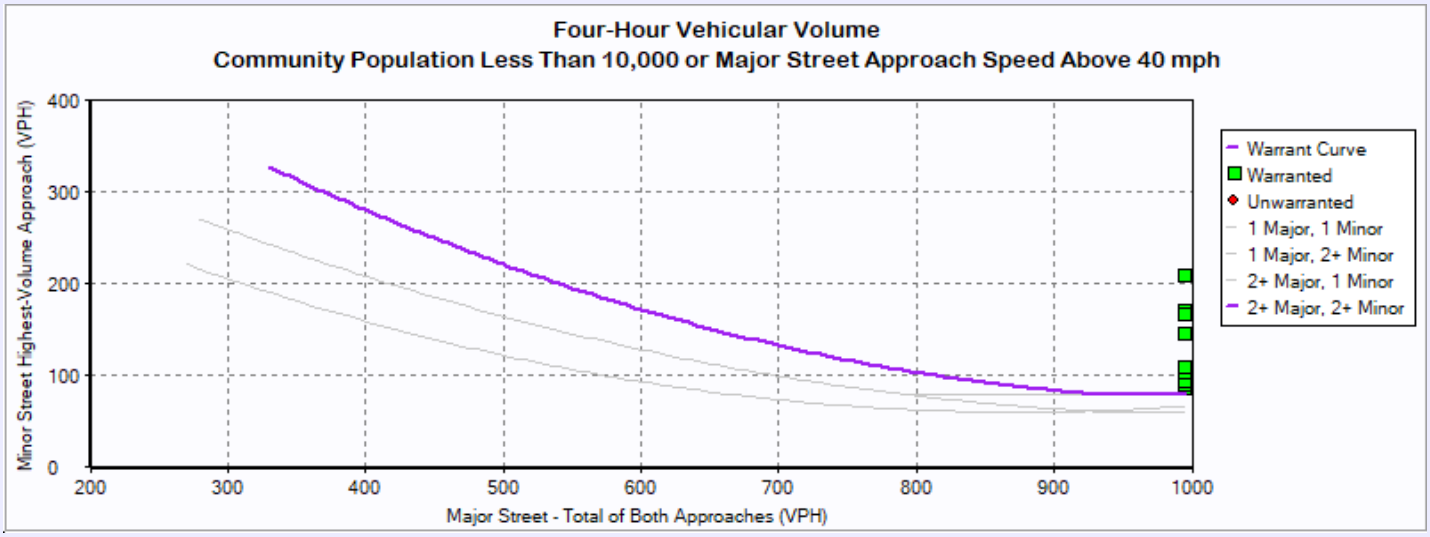
Intersection Informatior

	Major Street	Minor Street
Street Name	Bear Creek Pk	Patterson Dr
Direction	EB/WB	NB/SB
Number of Lane:	2	2
Approch Speed	45	25

Warrant 2 Met? **Yes**

Details:

Notes	13 Hours met (4 required)
Low populatior	No



Hourly Volumes

Hour	Major Street Total All Approaches (vph)	Minor Street Highest Volume Approach (vph)
00:00:00 - 01:00:00	0.00	0.00
01:00:00 - 02:00:00	0.00	0.00
02:00:00 - 03:00:00	0.00	0.00
03:00:00 - 04:00:00	0.00	0.00
04:00:00 - 05:00:00	0.00	0.00
05:00:00 - 06:00:00	0.00	0.00
06:00:00 - 07:00:00	1,238.00	98.00
07:00:00 - 08:00:00	2,158.00	209.00
08:00:00 - 09:00:00	1,552.00	170.00
09:00:00 - 10:00:00	1,230.00	103.00
10:00:00 - 11:00:00	1,263.00	87.00
11:00:00 - 12:00:00	1,251.00	85.00
12:00:00 - 13:00:00	1,328.00	89.00
13:00:00 - 14:00:00	1,258.00	94.00
14:00:00 - 15:00:00	1,598.00	103.00
15:00:00 - 16:00:00	1,969.00	108.00
16:00:00 - 17:00:00	2,071.00	146.00
17:00:00 - 18:00:00	1,774.00	166.00
18:00:00 - 19:00:00	1,044.00	108.00
19:00:00 - 20:00:00	0.00	0.00
20:00:00 - 21:00:00	0.00	0.00
21:00:00 - 22:00:00	0.00	0.00
22:00:00 - 23:00:00	0.00	0.00
23:00:00 - 00:00:00	0.00	0.00

Warranted Volumes

Hour	Major Street Total All Approaches (vph)	Minor Street Highest Volume Approach (vph)
06:00:00 - 07:00:00	1,238.00	98.00
07:00:00 - 08:00:00	2,158.00	209.00
08:00:00 - 09:00:00	1,552.00	170.00
09:00:00 - 10:00:00	1,230.00	103.00
10:00:00 - 11:00:00	1,263.00	87.00
11:00:00 - 12:00:00	1,251.00	85.00
12:00:00 - 13:00:00	1,328.00	89.00
13:00:00 - 14:00:00	1,258.00	94.00
14:00:00 - 15:00:00	1,598.00	103.00
15:00:00 - 16:00:00	1,969.00	108.00
16:00:00 - 17:00:00	2,071.00	146.00
17:00:00 - 18:00:00	1,774.00	166.00
18:00:00 - 19:00:00	1,044.00	108.00

Warrant 3: Peak Hour

1: Bear Creek & Patterson

Intersection Informatior

	Major Street	Minor Street
Street Name	Bear Creek Pk	Patterson Dr
Direction	EB/WB	NB/SB
Number of Lane:	2	2
Approch Speed	45	25

Warrant 3 Met? **Yes**

Details

Low Population? No

Condition A Met' No

Notes 0 Hours met (1 required)

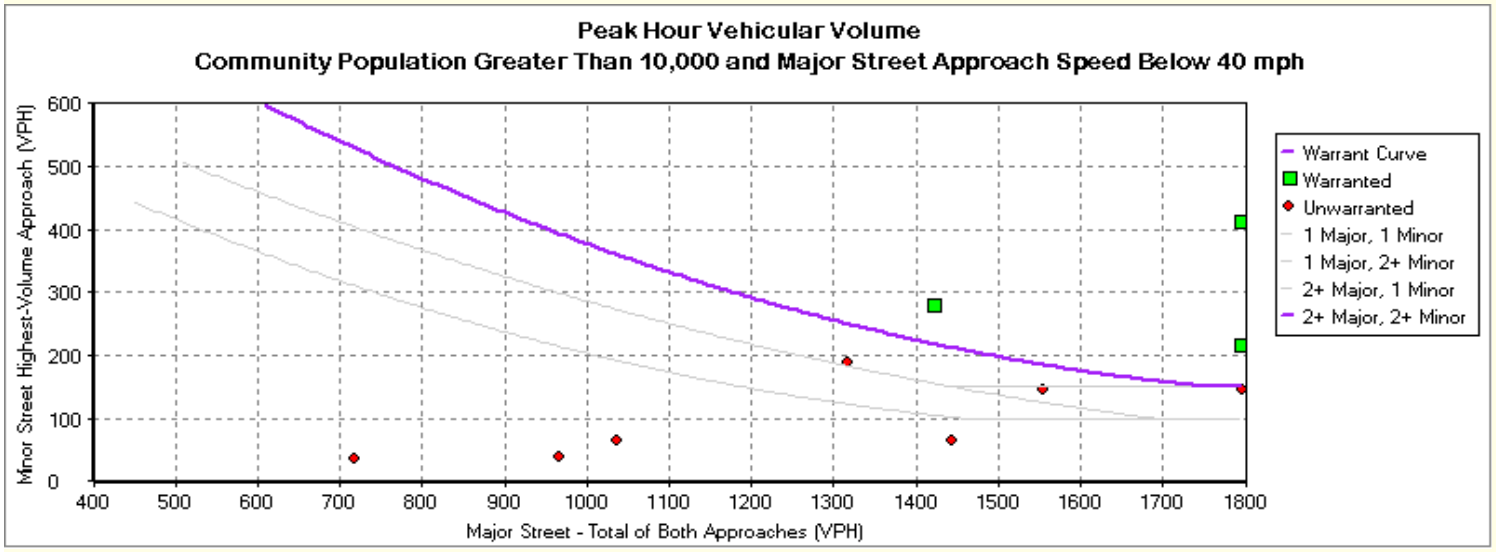
Condition B Met' Yes

Notes 7 Hours met (1 required)

Minor Approach Time Delay Condition Met? Not Met

Minor Approach Volume Condition Met? Met

Total Entering Intersection Volume Condition Met? Not Met



Hour	Major Street Total All Approaches (vph)	Minor Street Highest Volume Approach (vph)
6:00	1,238	98
7:00	2,158	209
8:00	1,552	170
9:00	1,230	103
10:00	1,263	87
11:00	1,251	85
12:00	1,328	89
13:00	1,258	94
14:00	1,598	103
15:00	1,969	108
16:00	2,071	146
17:00	1,774	166
18:00	1,044	108

Intersection: **Bear Creek Pk & Patterson Dr**
Control: One-way Stop
Day: Tuesday
Date: 2/22/2022
Count by: Marr Traffic

Street			Bear Creek Pike				Bear Creek Pike								Patterson Drive				Intersection	
Direction			Eastbound				Westbound				Northbound				Southbound				15-Min	Rolling
TOD	15-Min Increment		L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	Total	Hour Total
AM	6:00	6:15	0	118	0	118	0	62	0	62				0	1	0	2	3	183	970
	6:15	6:30	1	120	2	123	0	93	0	93				0	2	0	5	7	223	1156
	6:30	6:45	0	147	0	147	0	108	0	108				0	1	0	4	5	260	1364
	6:45	7:00	1	167	0	168	0	124	0	124				0	4	0	8	12	304	1546
	7:00	7:15	1	186	0	187	0	168	0	168				0	1	0	13	14	369	1680
	7:15	7:30	4	221	1	226	0	189	1	190				0	7	0	8	15	431	1659
	7:30	7:45	1	185	0	186	0	241	0	241				0	1	0	14	15	442	1539
	7:45	8:00	3	177	0	180	0	239	1	240				0	3	0	15	18	438	1385
	8:00	8:15	6	150	0	156	0	186	1	187				0	2	0	3	5	348	1173
	8:15	8:30	3	135	0	138	0	163	1	164				0	1	0	8	9	311	1057
	8:30	8:45	4	125	0	129	0	150	2	152				0	1	0	6	7	288	967
	8:45	9:00	5	88	0	93	0	129	0	129				0	1	0	3	4	226	923
	9:00	9:15	4	95	0	99	0	117	0	117				0	4	0	12	16	232	955
	9:15	9:30	5	111	0	116	0	95	3	98				0	0	0	7	7	221	970
	9:30	9:45	3	109	0	112	0	127	0	127				0	0	0	5	5	244	994
	9:45	10:00	6	113	1	120	0	127	2	129				0	0	0	9	9	258	1020
	10:00	10:15	3	127	0	130	0	105	0	105				0	1	0	11	12	247	974
	10:15	10:30	8	116	0	124	0	114	0	114				0	0	0	7	7	245	970
	10:30	10:45	6	109	0	115	0	147	0	147				0	3	0	5	8	270	982
	10:45	11:00	3	117	0	120	0	87	1	88				0	1	0	3	4	212	937
Midday	11:00	11:15	8	117	0	125	0	110	1	111				0	3	0	4	7	243	946
	11:15	11:30	10	128	0	138	0	114	1	115				0	0	0	4	4	257	943
	11:30	11:45	2	113	0	115	0	108	0	108				0	0	0	2	2	225	954
	11:45	12:00	7	106	0	113	0	96	0	96				0	2	0	10	12	221	998
	12:00	12:15	7	121	0	128	0	109	0	109				0	0	0	3	3	240	1004
	12:15	12:30	10	119	0	129	0	130	0	130				0	1	0	8	9	268	1000
	12:30	12:45	4	126	0	130	0	128	0	128				0	1	0	10	11	269	972
	12:45	13:00	7	104	0	111	0	113	0	113				0	0	0	3	3	227	941
	13:00	13:15	7	123	0	130	0	101	0	101				0	2	0	3	5	236	943
	13:15	13:30	4	104	1	109	0	125	2	127				0	0	0	4	4	240	963
	13:30	13:45	5	112	0	117	0	115	1	116				0	1	0	4	5	238	1012
	13:45	14:00	1	101	1	103	0	115	2	117				0	1	0	8	9	229	1121
	14:00	14:15	4	134	0	138	0	114	0	114				0	0	0	4	4	256	1207
	14:15	14:30	7	156	0	163	0	122	0	122				0	0	0	4	4	289	1290
	14:30	14:45	3	150	0	153	0	174	4	178				0	1	0	15	16	347	1363
	14:45	15:00	3	149	1	153	0	154	1	155				0	0	0	7	7	315	1423
PM	15:00	15:15	6	152	0	158	0	168	1	169				0	4	0	8	12	339	1471
	15:15	15:30	11	154	1	166	0	189	0	189				0	1	0	6	7	362	1480
	15:30	15:45	12	190	1	203	0	194	4	198				0	0	0	6	6	407	1517
	15:45	16:00	9	174	0	183	0	171	1	172				0	0	0	8	8	363	1482
	16:00	16:15	7	152	0	159	0	171	3	174				0	1	0	14	15	348	1518
	16:15	16:30	10	173	0	183	0	206	3	209				0	1	0	6	7	399	1547
	16:30	16:45	9	153	0	162	0	202	2	204				0	0	0	6	6	372	1469
	16:45	17:00	8	174	0	182	0	207	5	212				0	1	0	4	5	399	1422
	17:00	17:15	15	158	0	173	0	197	2	199				0	1	0	4	5	377	1262
	17:15	17:30	14	161	0	175	0	138	2	140				0	0	0	6	6	321	1137
	17:30	17:45	11	132	0	143	0	176	1	177				0	0	0	5	5	325	1012
	17:45	18:00	5	105	0	110	0	124	2	126				0	2	0	1	3	239	853
	18:00	18:15	10	87	0	97	0	152	0	152				0	0	0	3	3	252	741
	18:15	18:30	9	76	0	85	0	103	2	105				0	1	0	5	6	196	489
	18:30	18:45	7	67	0	74	0	83	3	86				0	1	0	5	6	166	293
	18:45	19:00	5	56	0	61	0	61	0	61				0	0	0	5	5	127	127
AM	7:00	8:00	9	769	1	779	0	837	2	839	0	0	0	0	12	0	50	62		1680
PM	16:15	17:15	42	658	0	700	0	812	12	824	0	0	0	0	3	0	20	23		1547

Intersection: **Bear Creek Pk & Patterson Dr**
Control: One-way Stop
Day: Tuesday
Date: 2/22/2022
Count by: Marr Traffic

2022 Existing (Unadjusted)

Street				Bear Creek Pike				Bear Creek Pike								Patterson Drive				Intersection	
Direction				Eastbound				Westbound				Northbound				Southbound				Hourly Total	Rolling Hour Total
TOD	Hourly Increment			L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
AM	6:00	-	7:00	2	552	2	556	0	387	0	387	0	0	0	0	8	0	19	27	970	970
	7:00	-	8:00	9	769	1	779	0	837	2	839	0	0	0	0	12	0	50	62	1680	1680
	8:00	-	9:00	18	498	0	516	0	628	4	632	0	0	0	0	5	0	20	25	1173	1173
	9:00	-	10:00	18	428	1	447	0	466	5	471	0	0	0	0	4	0	33	37	955	955
	10:00	-	11:00	20	469	0	489	0	453	1	454	0	0	0	0	5	0	26	31	974	974
Midday	11:00	-	12:00	27	464	0	491	0	428	2	430	0	0	0	0	5	0	20	25	946	946
	12:00	-	13:00	28	470	0	498	0	480	0	480	0	0	0	0	2	0	24	26	1004	1004
	13:00	-	14:00	17	440	2	459	0	456	5	461	0	0	0	0	4	0	19	23	943	943
	14:00	-	15:00	17	589	1	607	0	564	5	569	0	0	0	0	1	0	30	31	1207	1207
PM	15:00	-	16:00	38	670	2	710	0	722	6	728	0	0	0	0	5	0	28	33	1471	1471
	16:00	-	17:00	34	652	0	686	0	786	13	799	0	0	0	0	3	0	30	33	1518	1518
	17:00	-	18:00	45	556	0	601	0	635	7	642	0	0	0	0	3	0	16	19	1262	1262
	18:00	-	19:00	31	286	0	317	0	399	5	404	0	0	0	0	2	0	18	20	741	741

Intersection: **Bear Creek Pike & Patterson Drive**
Control: One-way Stop
Day:
Date:
Count by:

2031 Background Growth 27% (9 years at 3%)

Street				Bear Creek Pike				Bear Creek Pike								Patterson Drive				Intersection	
Direction				Eastbound				Westbound				Northbound				Southbound				Hourly Total	Rolling Hour Total
TOD	Hourly Increment			L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
AM	6:00	-	7:00	3	701	3	707	0	491	0	491	0	0	0	0	10	0	24	34	1232	1232
	7:00	-	8:00	11	977	1	989	0	1063	3	1066	0	0	0	0	15	0	64	79	2134	2134
	8:00	-	9:00	23	632	0	655	0	798	5	803	0	0	0	0	6	0	25	31	1489	1489
	9:00	-	10:00	23	544	1	568	0	592	6	598	0	0	0	0	5	0	42	47	1213	1213
	10:00	-	11:00	25	596	0	621	0	575	1	576	0	0	0	0	6	0	33	39	1236	1236
Midday	11:00	-	12:00	34	589	0	623	0	544	3	547	0	0	0	0	6	0	25	31	1201	1201
	12:00	-	13:00	36	597	0	633	0	610	0	610	0	0	0	0	3	0	30	33	1276	1276
	13:00	-	14:00	22	559	3	584	0	579	6	585	0	0	0	0	5	0	24	29	1198	1198
	14:00	-	15:00	22	748	1	771	0	716	6	722	0	0	0	0	1	0	38	39	1532	1532
PM	15:00	-	16:00	48	851	3	902	0	917	8	925	0	0	0	0	6	0	36	42	1869	1869
	16:00	-	17:00	43	828	0	871	0	998	17	1015	0	0	0	0	4	0	38	42	1928	1928
	17:00	-	18:00	57	706	0	763	0	806	9	815	0	0	0	0	4	0	20	24	1602	1602
	18:00	-	19:00	39	363	0	402	0	507	6	513	0	0	0	0	3	0	23	26	941	941

LUC 210 **Columbia Bluffs - Phases 1-3**

Residential Single-family Detached **236 Dwelling Units**

Daily Traffic **2223**

Time			Hourly Distributi	Enter %	Exit %	Hourly Traffic	Enter	Exit
6:00	-	7:00		1.6%	5.8%	82	17	65
7:00	-	8:00		3.1%	10.0%	145	34	111
8:00	-	9:00		3.8%	8.5%	137	42	95
9:00	-	10:00		3.3%	5.8%	101	37	64
10:00	-	11:00		4.2%	5.6%	109	47	62
11:00	-	12:00		5.4%	5.1%	117	60	57
12:00	-	13:00		5.7%	5.7%	127	64	63
13:00	-	14:00		6.1%	6.0%	135	68	67
14:00	-	15:00		7.1%	6.1%	147	79	68
15:00	-	16:00		8.7%	6.2%	166	97	69
16:00	-	17:00		10.5%	7.4%	199	117	82
17:00	-	18:00		10.0%	7.3%	192	111	81
18:00	-	19:00		8.5%	5.9%	160	95	65

Total Trip Gen

Street				Bear Creek Pike				Bear Creek Pike				Site Access 1				Patterson Drive				Intersection	
Direction				Eastbound				Westbound				Northbound				Southbound				Hourly Total	Hour Total
TOD	Hourly Increment			L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
	Enter %					65%		30%									5%				
	Exit %											65%	5%	30%							
AM	6:00	-	7:00	0	0	11	11	5	0	0	5	42	3	20	65	0	1	0	1	82	82
	7:00	-	8:00	0	0	22	22	10	0	0	10	72	6	33	111	0	2	0	2	**145**	145
	8:00	-	9:00	0	0	27	27	13	0	0	13	62	5	29	96	0	2	0	2	138	138
	9:00	-	10:00	0	0	24	24	11	0	0	11	42	3	19	64	0	2	0	2	101	101
	10:00	-	11:00	0	0	31	31	14	0	0	14	40	3	19	62	0	2	0	2	109	109
Midday	11:00	-	12:00	0	0	39	39	18	0	0	18	37	3	17	57	0	3	0	3	117	117
	12:00	-	13:00	0	0	42	42	19	0	0	19	41	3	19	63	0	3	0	3	127	127
	13:00	-	14:00	0	0	44	44	20	0	0	20	44	3	20	67	0	3	0	3	134	134
	14:00	-	15:00	0	0	51	51	24	0	0	24	44	3	20	67	0	4	0	4	146	146
PM	15:00	-	16:00	0	0	63	63	29	0	0	29	45	3	21	69	0	5	0	5	166	166
	16:00	-	17:00	0	0	76	76	35	0	0	35	53	4	25	82	0	6	0	6	199	199
	17:00	-	18:00	0	0	72	72	33	0	0	33	53	4	24	81	0	6	0	6	**192**	192
	18:00	-	19:00	0	0	62	62	29	0	0	29	42	3	20	65	0	5	0	5	161	161

LUC 215 **Columbia Bluffs - Phases 1-3**

Residential Single-family Attached (Townhomes) **94 Dwelling Units**

Daily Traffic **666**

Time			Hourly Distributi	Enter %	Exit %	Hourly Traffic	Enter	Exit
6:00	-	7:00		1.1%	5.8%	23	4	19
7:00	-	8:00		2.7%	13.2%	53	9	44
8:00	-	9:00		3.8%	9.3%	44	13	31
9:00	-	10:00		3.7%	6.9%	35	12	23
10:00	-	11:00		4.0%	4.3%	27	13	14
11:00	-	12:00		4.8%	5.7%	35	16	19
12:00	-	13:00		5.4%	5.1%	35	18	17
13:00	-	14:00		4.5%	4.8%	31	15	16
14:00	-	15:00		5.5%	6.0%	38	18	20
15:00	-	16:00		8.2%	4.8%	43	27	16
16:00	-	17:00		9.8%	5.1%	50	33	17
17:00	-	18:00		12.1%	6.8%	63	40	23
18:00	-	19:00		9.8%	6.6%	55	33	22

Total Trip Gen

Street				Bear Creek Pike				Bear Creek Pike				Site Access 1				Patterson Drive				Intersection	
Direction				Eastbound				Westbound				Northbound				Southbound				Hourly Total	Hour Total
TOD	Hourly Increment			L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
	Enter %					65%		30%									5%				
	Exit %											65%	5%	30%							
AM	6:00	-	7:00	0	0	3	3	1	0	0	1	12	1	6	19	0	0	0	0	23	23
	7:00	-	8:00	0	0	6	6	3	0	0	3	29	2	13	44	0	0	0	0	**53**	53
	8:00	-	9:00	0	0	8	8	4	0	0	4	20	2	9	31	0	1	0	1	44	44
	9:00	-	10:00	0	0	8	8	4	0	0	4	15	1	7	23	0	1	0	1	36	36
	10:00	-	11:00	0	0	8	8	4	0	0	4	9	1	4	14	0	1	0	1	27	27
Midday	11:00	-	12:00	0	0	10	10	5	0	0	5	12	1	6	19	0	1	0	1	35	35
	12:00	-	13:00	0	0	12	12	5	0	0	5	11	1	5	17	0	1	0	1	35	35
	13:00	-	14:00	0	0	10	10	5	0	0	5	10	1	5	16	0	1	0	1	32	32
	14:00	-	15:00	0	0	12	12	5	0	0	5	13	1	6	20	0	1	0	1	38	38
PM	15:00	-	16:00	0	0	18	18	8	0	0	8	10	1	5	16	0	1	0	1	43	43
	16:00	-	17:00	0	0	21	21	10	0	0	10	11	1	5	17	0	2	0	2	50	50
	17:00	-	18:00	0	0	26	26	12	0	0	12	15	1	7	23	0	2	0	2	**63**	63
	18:00	-	19:00	0	0	21	21	10	0	0	10	14	1	7	22	0	2	0	2	55	55

LUC 251 **Columbia Bluffs - Phases 1-3**

Senior Adult Housing - Single Family **200 Dwelling Units**

Daily Traffic **593**

Time			Hourly Distributi	Enter %	Exit %	Hourly Traffic	Enter	Exit
6:00	-	7:00		1.0%	3.7%	14	3	11
7:00	-	8:00		2.8%	8.0%	32	8	24
8:00	-	9:00		3.9%	8.8%	38	12	26
9:00	-	10:00		5.2%	8.4%	41	16	25
10:00	-	11:00		6.1%	8.1%	42	18	24
11:00	-	12:00		7.1%	7.9%	45	21	24
12:00	-	13:00		7.8%	7.9%	46	23	23
13:00	-	14:00		7.3%	7.3%	44	22	22
14:00	-	15:00		7.8%	7.0%	44	23	21
15:00	-	16:00		9.0%	6.8%	47	27	20
16:00	-	17:00		9.4%	6.2%	47	28	19
17:00	-	18:00		9.4%	6.1%	46	28	18
18:00	-	19:00		7.2%	5.3%	37	21	16

Total Trip Gen

Street				Bear Creek Pike				Bear Creek Pike				Site Access 1				Patterson Drive				Intersection	
Direction				Eastbound				Westbound				Northbound				Southbound				Hourly Total	Hour Total
TOD	Hourly Increment			L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
	Enter %					65%		30%									5%				
	Exit %											65%	5%	30%							
AM	6:00	-	7:00	0	0	2	2	1	0	0	1	7	1	3	11	0	0	0	0	14	14
	7:00	-	8:00	0	0	5	5	2	0	0	2	16	1	7	24	0	0	0	0	**31**	31
	8:00	-	9:00	0	0	8	8	4	0	0	4	17	1	8	26	0	1	0	1	39	39
	9:00	-	10:00	0	0	10	10	5	0	0	5	16	1	8	25	0	1	0	1	41	41
	10:00	-	11:00	0	0	12	12	5	0	0	5	16	1	7	24	0	1	0	1	42	42
Midday	11:00	-	12:00	0	0	14	14	6	0	0	6	16	1	7	24	0	1	0	1	45	45
	12:00	-	13:00	0	0	15	15	7	0	0	7	15	1	7	23	0	1	0	1	46	46
	13:00	-	14:00	0	0	14	14	7	0	0	7	14	1	7	22	0	1	0	1	44	44
	14:00	-	15:00	0	0	15	15	7	0	0	7	14	1	6	21	0	1	0	1	44	44
PM	15:00	-	16:00	0	0	18	18	8	0	0	8	13	1	6	20	0	1	0	1	47	47
	16:00	-	17:00	0	0	18	18	8	0	0	8	12	1	6	19	0	1	0	1	46	46
	17:00	-	18:00	0	0	18	18	8	0	0	8	12	1	5	18	0	1	0	1	**45**	45
	18:00	-	19:00	0	0	14	14	6	0	0	6	10	1	5	16	0	1	0	1	37	37

LUC 565 **Columbia Bluffs - Phases 1-3**

Day Care Center **14,000 s.f.**

Daily Traffic **667**

Time			Hourly Distributi	Enter %	Exit %	Hourly Traffic	Enter	Exit
6:00	-	7:00		6.2%	4.3%	35	21	14
7:00	-	8:00		19.5%	16.3%	119	65	54
8:00	-	9:00		13.2%	12.8%	87	44	43
9:00	-	10:00		5.4%	4.6%	33	18	15
10:00	-	11:00		2.6%	2.9%	19	9	10
11:00	-	12:00		2.6%	2.6%	18	9	9
12:00	-	13:00		2.1%	2.6%	16	7	9
13:00	-	14:00		3.0%	3.2%	21	10	11
14:00	-	15:00		4.1%	4.5%	29	14	15
15:00	-	16:00		7.5%	6.9%	48	25	23
16:00	-	17:00		13.6%	14.0%	92	45	47
17:00	-	18:00		16.7%	18.7%	118	56	62
18:00	-	19:00		2.4%	6.3%	29	8	21

Total Trip Gen

Street				Bear Creek Pike				Bear Creek Pike				Site Access 1				Patterson Drive				Intersection	
Direction				Eastbound				Westbound				Northbound				Southbound				Hourly Total	Hour Total
TOD	Hourly Increment			L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
	Enter %					65%		30%									5%				
	Exit %											65%	5%	30%							
AM	6:00	-	7:00	0	0	14	14	6	0	0	6	9	1	4	14	0	1	0	1	35	35
	7:00	-	8:00	0	0	42	42	20	0	0	20	35	3	16	54	0	3	0	3	**119**	119
	8:00	-	9:00	0	0	29	29	13	0	0	13	28	2	13	43	0	2	0	2	87	87
	9:00	-	10:00	0	0	12	12	5	0	0	5	10	1	5	16	0	1	0	1	34	34
	10:00	-	11:00	0	0	6	6	3	0	0	3	7	1	3	11	0	0	0	0	20	20
Midday	11:00	-	12:00	0	0	6	6	3	0	0	3	6	0	3	9	0	0	0	0	18	18
	12:00	-	13:00	0	0	5	5	2	0	0	2	6	0	3	9	0	0	0	0	16	16
	13:00	-	14:00	0	0	7	7	3	0	0	3	7	1	3	11	0	1	0	1	22	22
	14:00	-	15:00	0	0	9	9	4	0	0	4	10	1	5	16	0	1	0	1	30	30
PM	15:00	-	16:00	0	0	16	16	8	0	0	8	15	1	7	23	0	1	0	1	48	48
	16:00	-	17:00	0	0	29	29	14	0	0	14	31	2	14	47	0	2	0	2	92	92
	17:00	-	18:00	0	0	36	36	17	0	0	17	40	3	19	62	0	3	0	3	**118**	118
	18:00	-	19:00	0	0	5	5	2	0	0	2	14	1	6	21	0	0	0	0	28	28

Intersection: **Bear Creek Pike & Patterson Drive/Site Access 1**
Control: Two-way Stop
Day:
Date:
Count by:

2031 Future Projected Conditions (Phases 1-3)

Street				Bear Creek Pike				Bear Creek Pike				Site Access 1				Patterson Drive				Intersection	
Direction				Eastbound				Westbound				Northbound				Southbound				Hourly	Rolling
TOD	Hourly Increment			L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	Total	Hour Total
AM	6:00	-	7:00	3	701	33	737	13	491	0	504	70	6	33	109	10	2	24	36	1386	1386
	7:00	-	8:00	11	977	76	1064	35	1063	3	1101	152	12	69	233	15	5	64	84	**2482**	2482
	8:00	-	9:00	23	632	72	727	34	798	5	837	127	10	59	196	6	6	25	37	1797	1797
	9:00	-	10:00	23	544	55	622	25	592	6	623	83	6	39	128	5	5	42	52	1425	1425
	10:00	-	11:00	25	596	57	678	26	575	1	602	72	6	33	111	6	4	33	43	1434	1434
Midday	11:00	-	12:00	34	589	69	692	32	544	3	579	71	5	33	109	6	5	25	36	1416	1416
	12:00	-	13:00	36	597	74	707	33	610	0	643	73	5	34	112	3	5	30	38	1500	1500
	13:00	-	14:00	22	559	78	659	35	579	6	620	75	6	35	116	5	6	24	35	1430	1430
	14:00	-	15:00	22	748	88	858	40	716	6	762	81	6	37	124	1	7	38	46	1790	1790
PM	15:00	-	16:00	48	851	118	1017	53	917	8	978	83	6	39	128	6	8	36	50	2173	2173
	16:00	-	17:00	43	828	144	1015	67	998	17	1082	107	8	50	165	4	11	38	53	2315	2315
	17:00	-	18:00	57	706	152	915	70	806	9	885	120	9	55	184	4	12	20	36	**2020**	2020
	18:00	-	19:00	39	363	102	504	47	507	6	560	80	6	38	124	3	8	23	34	1222	1222

APPENDIX J
TURN LANE ANALYSIS

Left Turn Deceleration Lane Analysis

Source: NCHRP Report 457: Evaluating Intersection Improvements: An Engineering Study Guide

Bear Creek Pike & Patterson Drive/Site Access 1
2031 Future Projected Peak Hour Traffic Volumes (Phases 1-3)
Westbound Bear Creek Pike

AM Peak Hour

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

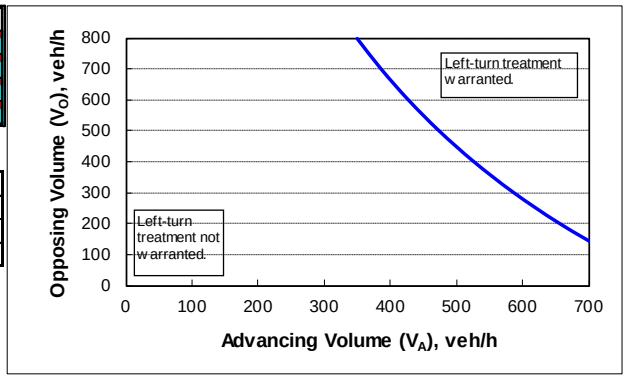
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	4%
Advancing volume (V_A), veh/h:	1170
Opposing volume (V_O), veh/h:	1049

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	276
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

PM Peak Hour

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

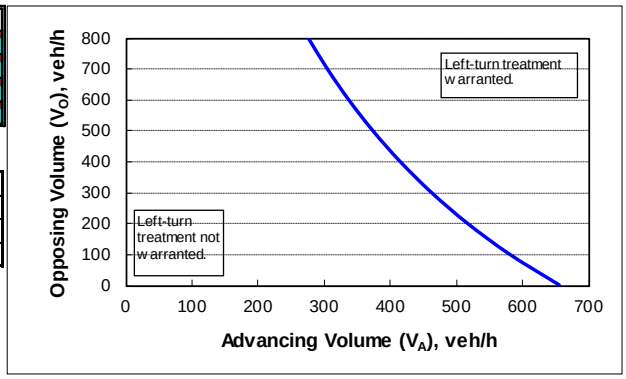
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	7%
Advancing volume (V_A), veh/h:	1222
Opposing volume (V_O), veh/h:	1352

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	163
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left Turn Deceleration Lane Analysis

Source: NCHRP Report 457: Evaluating Intersection Improvements: An Engineering Study Guide

Iron Bridge Road & Site Access 2
2034 Future Projected Peak Hour Traffic Volumes (Full Buildout)
Eastbound Iron Bridge Road

AM Peak Hour

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

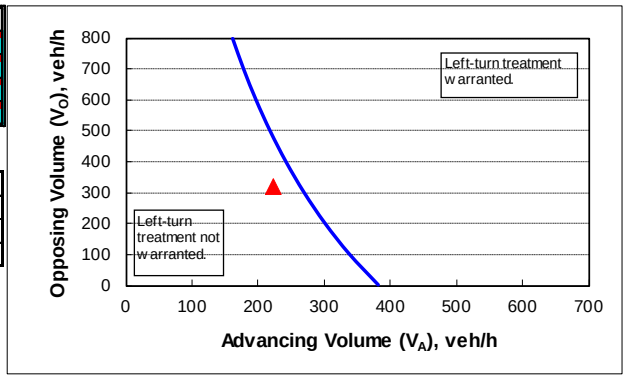
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	24%
Advancing volume (V_A), veh/h:	224
Opposing volume (V_O), veh/h:	318

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	264
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

PM Peak Hour

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

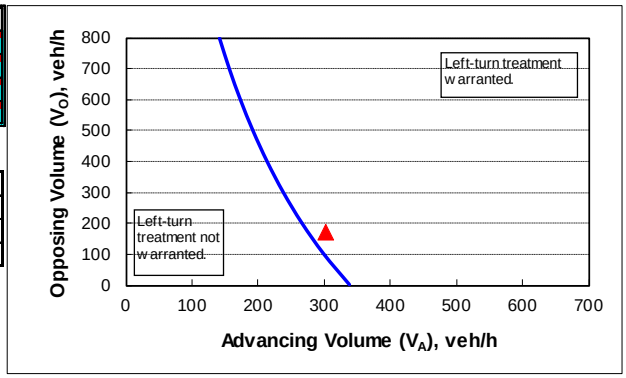
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	37%
Advancing volume (V_A), veh/h:	303
Opposing volume (V_O), veh/h:	173

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	274
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Right Turn Deceleration Lane Analysis

Source: NCHRP Report 457: Evaluating Intersection Improvements: An Engineering Study Guide

Bear Creek Pike & Patterson Drive/Site Access 1
2031 Future Projected Peak Hour Traffic Volumes (Phases 1-3)
Eastbound Bear Creek Pike

AM Peak Hour

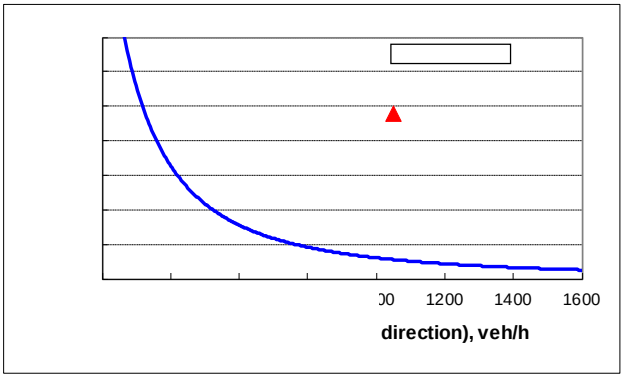
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	1049
Right-turn volume, veh/h:	96

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	11
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	



PM Peak Hour

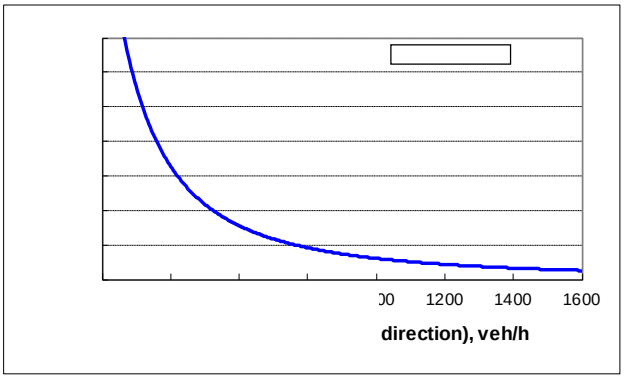
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	1352
Right-turn volume, veh/h:	176

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	7
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	



Right Turn Deceleration Lane Analysis

Source: NCHRP Report 457: Evaluating Intersection Improvements: An Engineering Study Guide

Bear Creek Pike & Patterson Drive/Site Access 1
2031 Future Projected Peak Hour Traffic Volumes (Phases 1-3)
Westbound Bear Creek Pike

AM Peak Hour

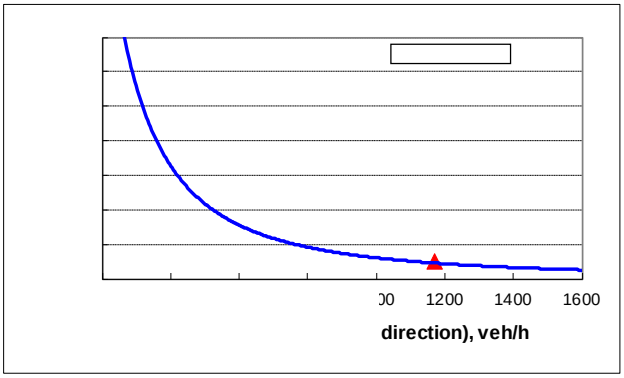
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	1170
Right-turn volume, veh/h:	10

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	9
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	



PM Peak Hour

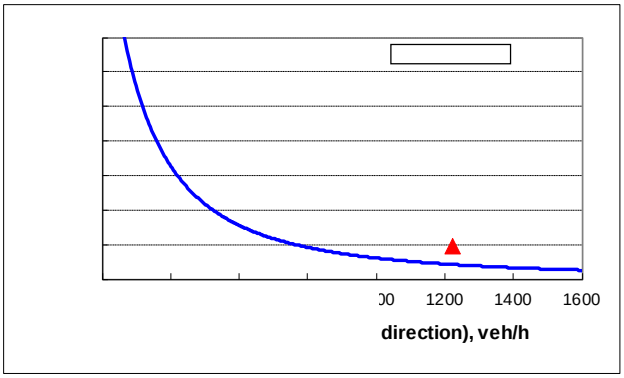
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	1222
Right-turn volume, veh/h:	19

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	8
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	



Right Turn Deceleration Lane Analysis

Source: NCHRP Report 457: Evaluating Intersection Improvements: An Engineering Study Guide

Iron Bridge Road & Site Access 2
2034 Future Projected Peak Hour Traffic Volumes (Full Buildout)
Westbound Iron Bridge Road

AM Peak Hour

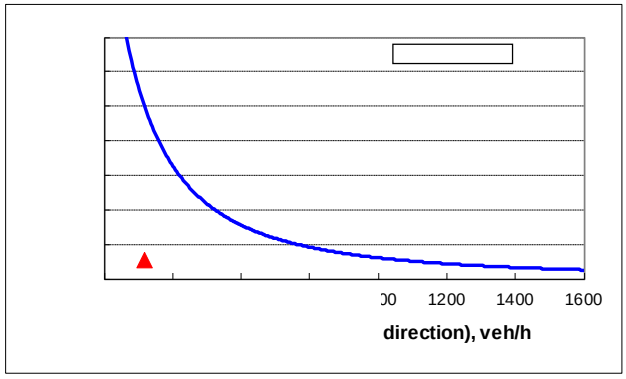
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	318
Right-turn volume, veh/h:	11

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	99
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



PM Peak Hour

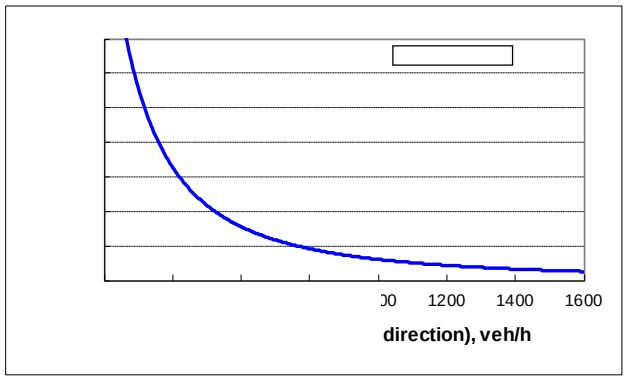
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	173
Right-turn volume, veh/h:	23

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	302
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



APPENDIX K
RECOMMENDED IMPROVEMENT PHASING BY DWELLING UNIT COUNT

COLUMBIA BLUFFS MASTER PLAN
RECOMMENDED IMPROVEMENT PHASING BY DWELLING UNIT COUNT

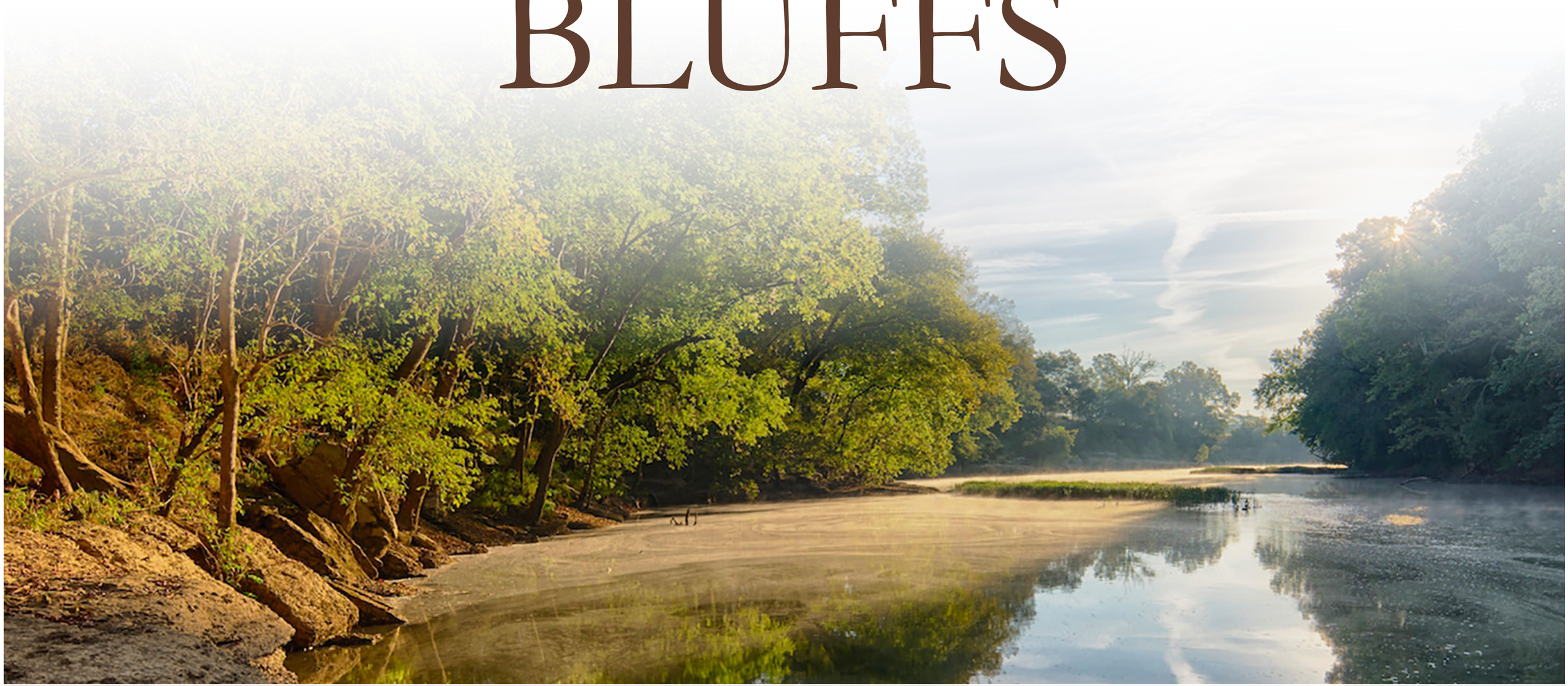
PHASE	LOCATION	LAND USE	DENSITY	CUMULATIVE DENSITY
1	North	Single-family Housing (Attached or Detatched)	143 DU	143 DU
2	North	Single-family Housing (Attached or Detatched)	143 DU	286 DU
3	North	Single-family Housing (Attached or Detatched)	143 DU	429 DU
3B	North	Day Care Center	14,000 SF	429 DU + 14,000 SF
4	South	Single-family Housing (Attached or Detatched)	143 DU	572 DU + 14,000 SF
5	South	Single-family Housing (Attached or Detatched)	143 DU	715 DU + 14,000 SF
6	South	Single-family Housing (Attached or Detatched)	145 DU	860 DU + 14,000 SF

	INTERSECTION & IMPROVEMENTS	DWELLING UNIT OCCUPANCY COUNT	NOTES
#1	**Nashville Highway (US 31) and Bear Creek Pike/US 43**		
-	Laneage improvements by the City and/or TDOT are planned for the intersection.	NA	By Others
-	Modify the signal design and timing to provide lead/lag left turn phasing for the eastbound and westbound approaches.	NA	By Others
#2	**Bear Creek Pike and Tom J Hitch Parkway**		
-	Construct the northbound right turn lane with approximately 100 feet of storage and 60 feet of taper. Restripe northbound approach to 1 left, 1 through, 1 right turn lane.	429 DU	
-	Modify signal design and phasing to provide northbound right turn overlap.	429 DU	
-	Reassign the northbound through to a shared left turn/through lane.	850 DU	Can be completed with Bear Creek Pk widening by Others.
-	Modify the signal design and phasing to provide split phaseing for the northbound and southbound approaches.	850 DU	Can be completed with Bear Creek Pk widening by Others.
#3	**Bear Creek Pike and Patterson Drive/Site Access 1**		
-	Construct Site Access 1 with 1 entering lane and 2 exiting lanes.	1 DU	
-	Construct eastbound right turn deceleration lane.	143 DU	
-	Construct westbound left turn deceleration lane.	143 DU	
-	Construct westbound right turn deceleration lane.	429 DU	
-	Install at traffic signal.	286 DU	
-	Widen Patterson Drive to provide a separate left turn lane.	429 DU + 14,000 SF Day Care	
#4	**Bear Creek Pike and Mt Olivet Road/School Access**		
-	Restripe southbound approach to provide a shared left turn/through lane and a right turn only lane.	429 DU	
-	Modify traffic signal design to provide protected/permissive left turn signal phasing and southbound right turn overlap phasing.	429 DU	
#5	**Tom J Hitch Parkway and Iron Bridge Road**		
-	No Improvements Recommended.	NA	
#6	**Iron Bridge Road and Mt Olivet Road**		
-	No Improvements Recommended.	NA	
#7	**James Campbell Boulevard and Tom J Hitch Parkway**		
-	Install at traffic signal with protected/permissive left turn signal phasing for the eastbound approach and a southbound right turn overlap.	429 DU	
#8	**Iron Bridge Road and Site Access 2**		
-	Construct Site Access 2 aligned with Yanahli Park Access.	430 DU	
-	Construct eastbound left turn deceleration lane on Iron Bridge Road.	715 DU	

COLUMBIA

City of Columbia, Tennessee

BLUFFS



Architectural Review Team Submittal



COLUMBIA BLUFFS ARCHITECTURE

DEVELOPER
JIM HARVEY
KOLTER LAND
14025 RIVEREDGE DRIVE, SUITE 175
TAMPA, FL 33637

ENGINEER
JIM HARRISON
CIVIL SITE DESIGN GROUP
2305 KLINE AVENUE, SUITE 300
NASHVILLE, TN 37211

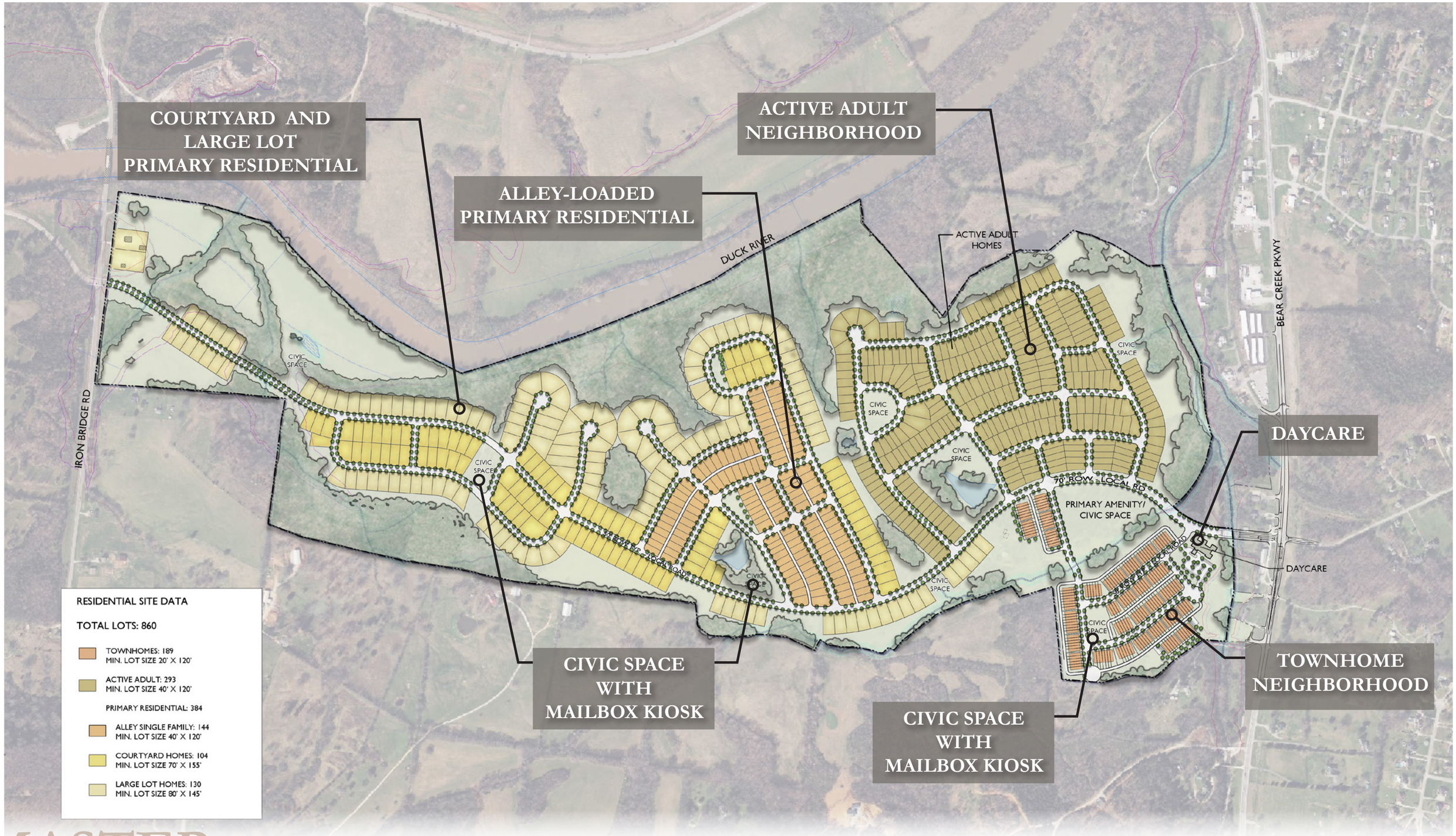
LANDSCAPE ARCHITECT
GREG GAMBLE
GAMBLE DESIGN COLLABORATIVE
3020 STANSBERRY LANE, SUITE 201
FRANKLIN, TN 37069

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2. DEVELOPMENT TEAM
3. DEVELOPMENT PLAN
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5. FACADE VARIETY
6. ACTIVE ADULT NEIGHBORHOOD
8. COURTYARD AND LARGE LOT HOMES
11. ALLEY-LOADED PRIMARY RESIDENTIAL
13. TOWNHOMES
15. DAYCARE
11. MAIN AMENITY ARCHITECTURE
12. CIVIC SPACE ARCHITECTURE

SUBMITTED: 10/16/2023

DEVELOPMENT TEAM



MASTER DEVELOPEMNT PLAN

	Single Family & Townhomes	Active Adult Single Family
Building Height and Massing	• Primarily a mix of 1-story and 2-story, with a maximum of 3-story • Attached garages encouraged	
Building Separation	• Single Family: 10' minimum • Townhomes: 15' minimum	• Single Family: 10' minimum
Street Facades	• Maximize frontage and orientation onto residential streets • Porches should orient to residential streets • Entries visible from residential streets	• Maximize frontage and orientation onto residential streets • Porches should orient to residential streets • Entries visible from residential streets
Building Entries	• Porches minimum 6' deep and 6' wide	
Roof Forms	• Roofs may vary in style, but should be designed to create unity to the full community • All roof forms to be reviewed and approved by the master developer	• Roofs may vary in style, but should be designed to create unity to the full community • All roof forms to be reviewed and approved by the master developer
Roof Detail	• All roofs should create eaves for shadow and rain protection • Where used, gutters should be expressed as positive elements adding desirable detail	• All roofs should create eaves for shadow and rain protection • Where used, gutters should be expressed as positive elements adding desirable detail
Parking	• Garage-parked • Garages minimum depth of 22' • Garage doors with windows required	• Garage-parked • Garages minimum depth of 22' • Garage doors should have windows

ARCHITECTURAL GUIDELINE NOTE:

The architectural guidelines and conceptual elevations are intended to convey the architectural quality and design intent. Final elevations and color schemes will be brought back to be approved by the ADRT at final PUD-R Development Plan.

COMPLIANCE NOTE:

The architectural guidelines as shown in this pattern book represent compliance with the standards set by the Zoning Ordinance except in areas requesting a modification of standards which are requeted to be approved through the PUD-R Preliminary Development Plan process.

Architectural Building Materials

In keeping with the upscale project image, the materials used for structures at Columbia Bluffs should be appropriate for the individual building design concepts and shall be consistent with the project theme. Materials shall be selected and used with consideration to building scale, color scheme, mass, and the surrounding environment.

Roofing Materials

Permitted:
- Dimensional Asphalt Shingles
- Laminated Shingles
- Copper Finishes
- Standing Seam Metal Roofs

Not Permitted:
- Rolled Asphalt
- Asbestos Cement Shingles
- Brightly Colored Metal Roofing

Exterior Siding Materials

Permitted:
- Brick
- Stone
- Natural Wood Accents
- Stucco
- Hardie Plank/Panels
- Cementitious Fiber Siding/Cladding

Not Permitted:
- All Plastics (including vinyl)
- Plywood
- Exposed Concrete Block

Awnings

Permitted:
High Quality Heavy Canvas
Illuminated Awnings
Metal Awnings

Colors

Permitted:
- Muted
- Natural
- Earth Tones

Conditional Permitted:
- Bright
- Primary Colors (per review and approval of the Master Developer)

Building Requirements:
- Maximum Height (Stories) 3 stories

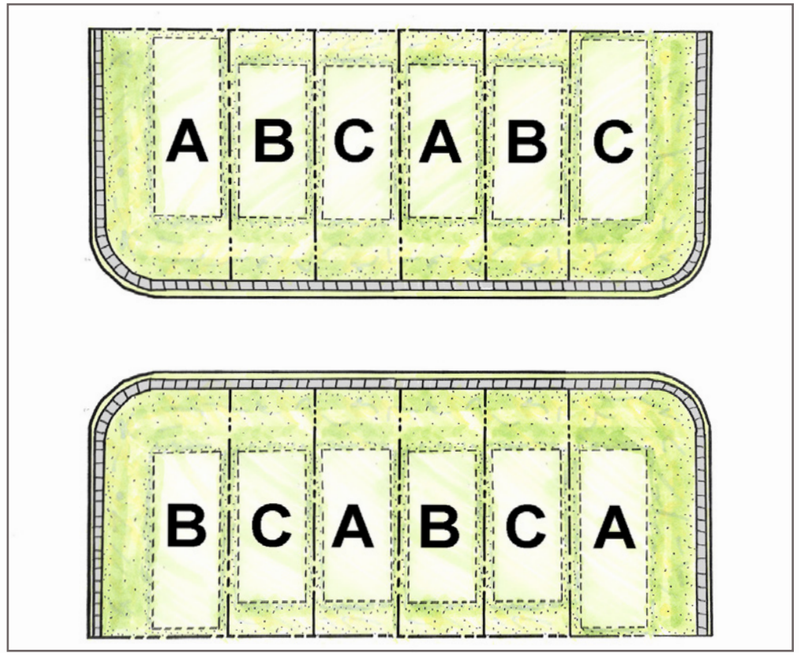








IMAGE OF HOMES REPRESENT AN EXAMPLE OF FACADE VARIETY ALONG SAME STREET. FINAL SELECTION OF MATERIALS AND STYLES TO BE APPROVED AT FMDP.



In order to avoid monotony of architectural design, no approval shall be issued for the construction of a dwelling if it is substantially like any proposed neighboring building for which on approval has already been issued or is being concurrently considered.

- A building shall be considered neighboring if it fronts on the same street as the building under construction or an intersecting street; no building elevation may be repeated across from, adjacent to, or diagonal to a similar building elevation. There shall be a minimum of a 2-lot gap between each similar building elevation (see diagram to above in which A, B, and C represent different elevation styles).
- Vary garage door locations to the front facade of the house when possible. Avoid continuous runs of garages in the same unbroken plain.
- Vary roof orientation, ridge lines, and eave heights between each lot when possible.
- Building facade colors and design elements should vary between each lot with a variation of massing and architectural details on each block.
- Landscaping should vary in composition from building to building when possible.

Final determination of the appropriate elevation pattern and variety is subject to review by the Architectural Design Review Team.

FACADE VARIETY













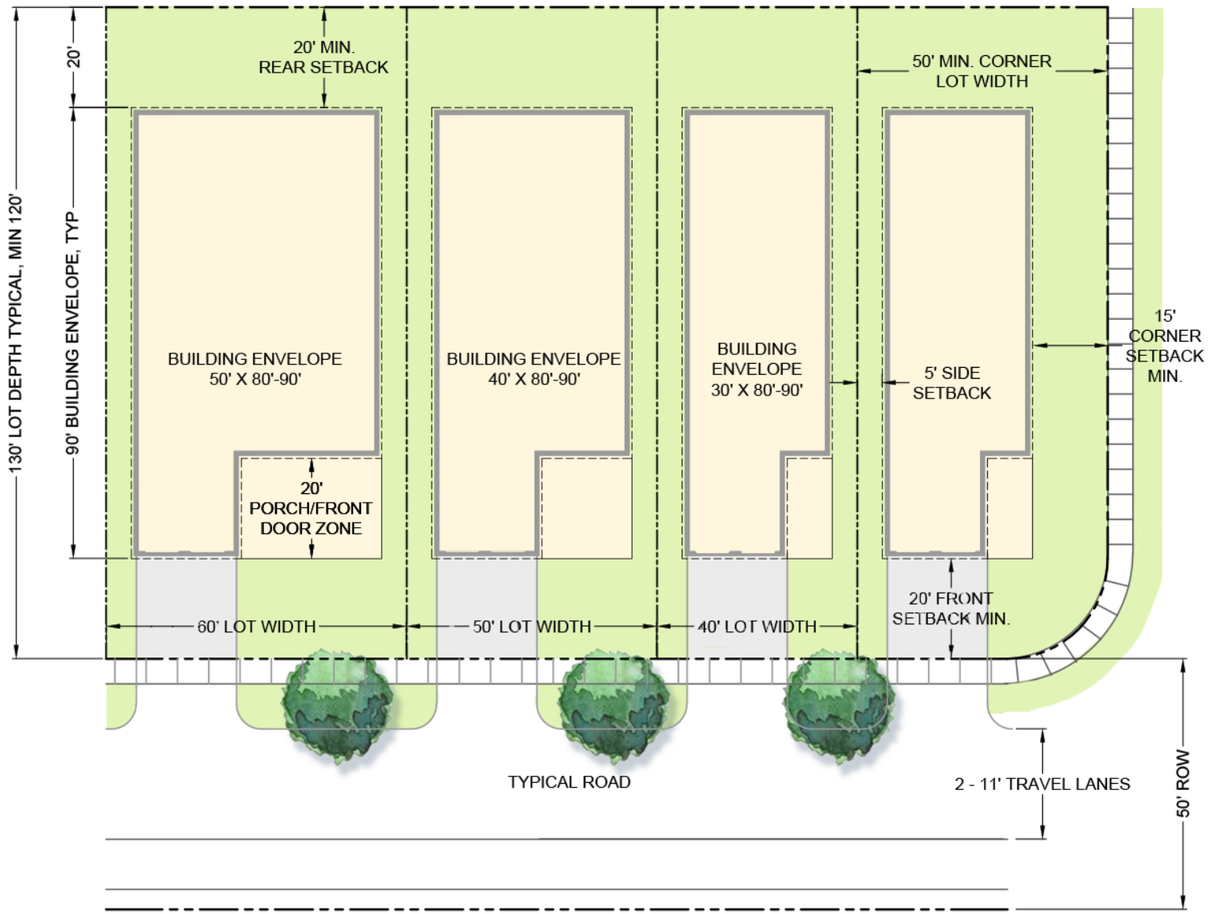






ACTIVE ADULT SINGLE FAMILY

COLOR RENDERING PRESENTS AN
ILLUSTRATIVE DEPICTION OF ARCHITECTURE
AND LANDSCAPE MATERIAL





LOT RANGE: 40'-60'
208 HOMES

BUILDING SETBACKS:

FRONT:	20'
REAR:	20'
SIDE:	5'
CORNER:	15'

ALL LOTS TO HAVE FRONT LOADED GARAGES
- MINIMUM 20' OF DRIVEWAY ON LOT
- MINIMUM 22' DEPTH FOR ALL GARAGES

SITE SETBACKS ARE DUE TO ALL INCLUSIVE MAINTENANCE APPLICATION GOVERNED BY THE PROPOSED HOA, TO BE DEED RESTRICTED.

ACTIVE ADULT SINGLE FAMILY





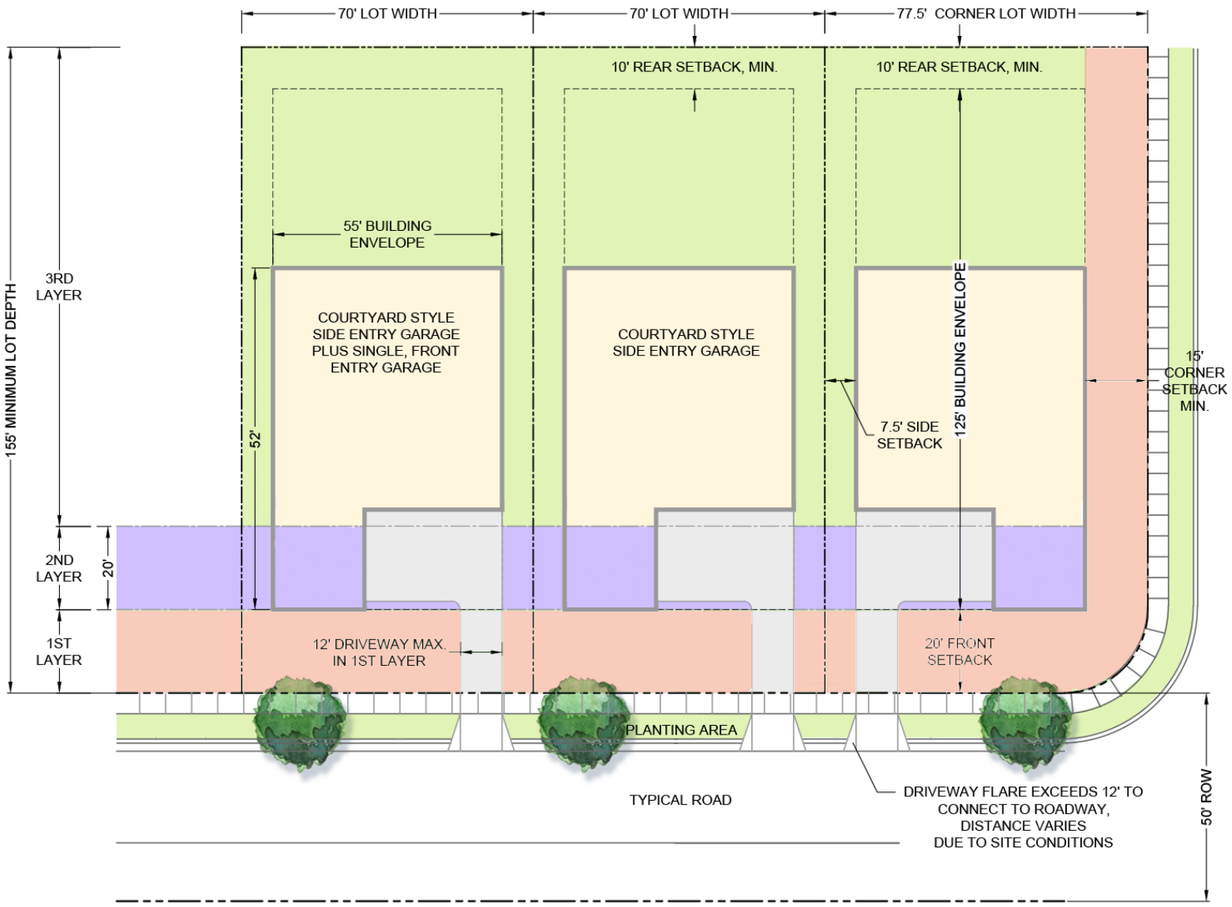







COLOR RENDERING PRESENTS AN ILLUSTRATIVE DEPICTION OF ARCHITECTURE AND LANDSCAPE MATERIAL

COURTYARD HOMES







LOT: 70' MINIMUM

104

BUILDING SETBACKS:

FRONT:	20'
REAR:	20'
SIDE:	7.5'
CORNER:	15'

ALL LOTS TO HAVE SIDE LOADED GARAGES WITH THE OPTION OF A SINGLE, FRONT-LOADED GARAGE IN THE 3RD LAYER.

- MINIMUM 20' LENGTH OF DRIVEWAY ON LOT
- MINIMUM 22' DEPTH FOR ALL GARAGES

COURTYARD HOMES











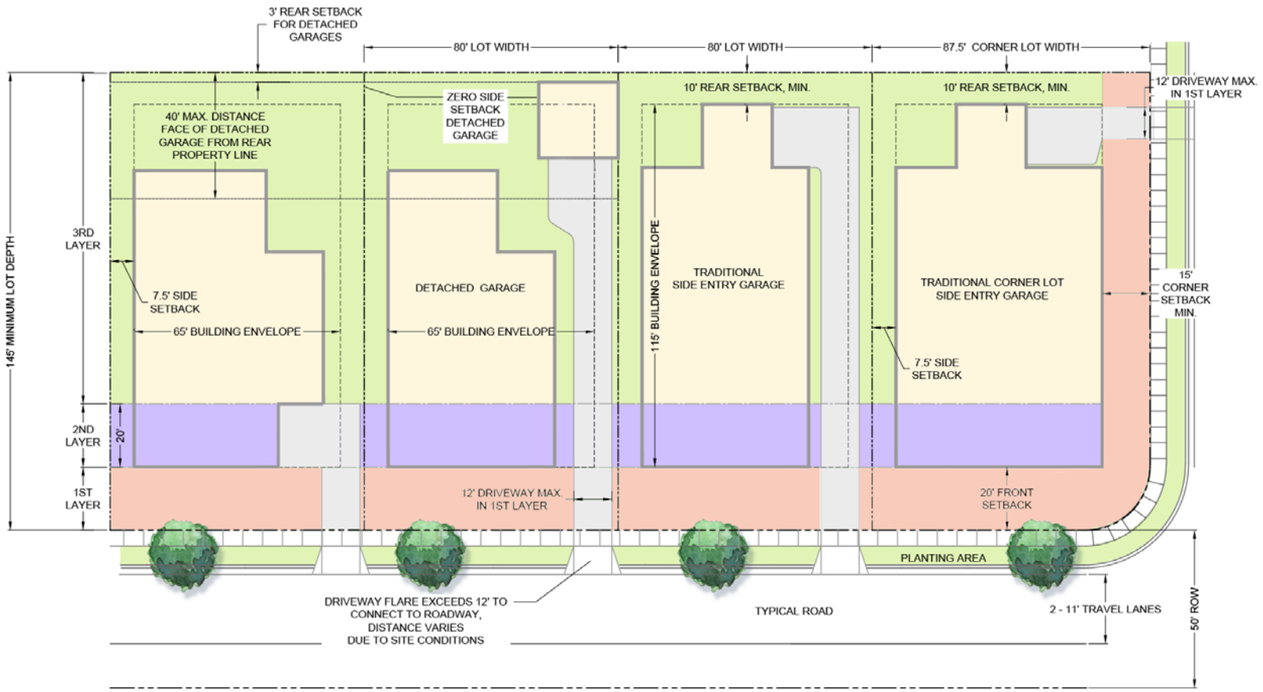







LARGE LOT HOMES

COLOR RENDERING PRESENTS AN ILLUSTRATIVE DEPICTION OF ARCHITECTURE AND LANDSCAPE MATERIAL





LOTS: 80' MINIMUM
130 HOMES

BUILDING SETBACKS:

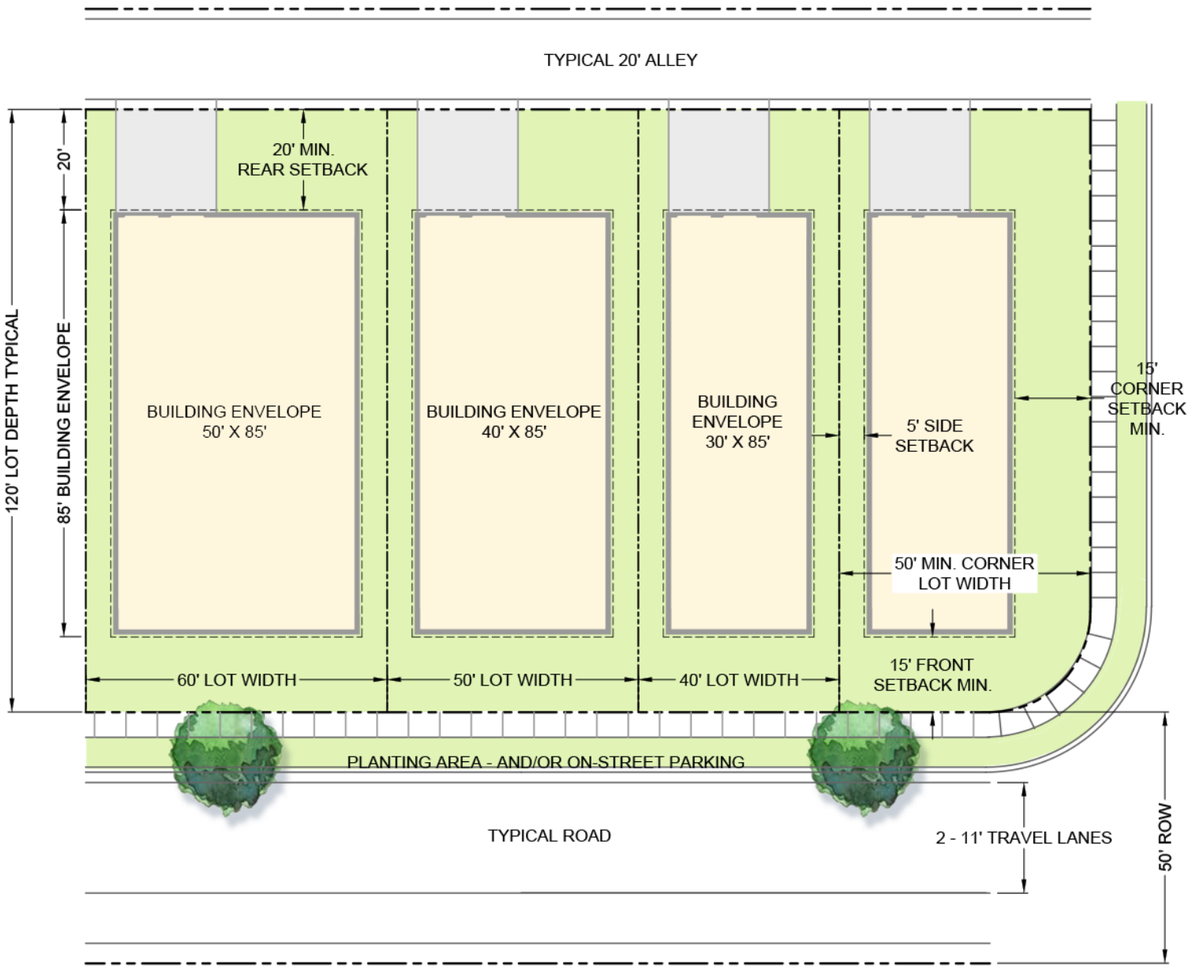
FRONT:	20'
REAR:	20'
SIDE:	7.5'
CORNER:	15'

LOTS WILL HAVE A MIX OF GARAGE LOCATIONS, ATTACHED AND DETACHED
- MINIMUM 20' OF DRIVEWAY ON LOT
- MINIMUM 22' DEPTH FOR ALL GARAGES

LARGE LOT HOMES

SINGLE-FAMILY ALLEY LOADED

COLOR RENDERING PRESENTS AN ILLUSTRATIVE DEPICTION OF ARCHITECTURE AND LANDSCAPE MATERIAL





LOT RANGE: 40’-60’
144 HOMES

BUILDING SETBACKS:
- FRONT: 15’
- REAR: 20’
- SIDE: 5’
- CORNER: 15’

ALL LOTS TO HAVE REAR LOADED GARAGES
- MINIMUM 20’ LENGTH OF DRIVEWAY ON LOT
- MINIMUM 22’ DEPTH FOR ALL GARAGES

SINGLE-FAMILY ALLEY LOADED









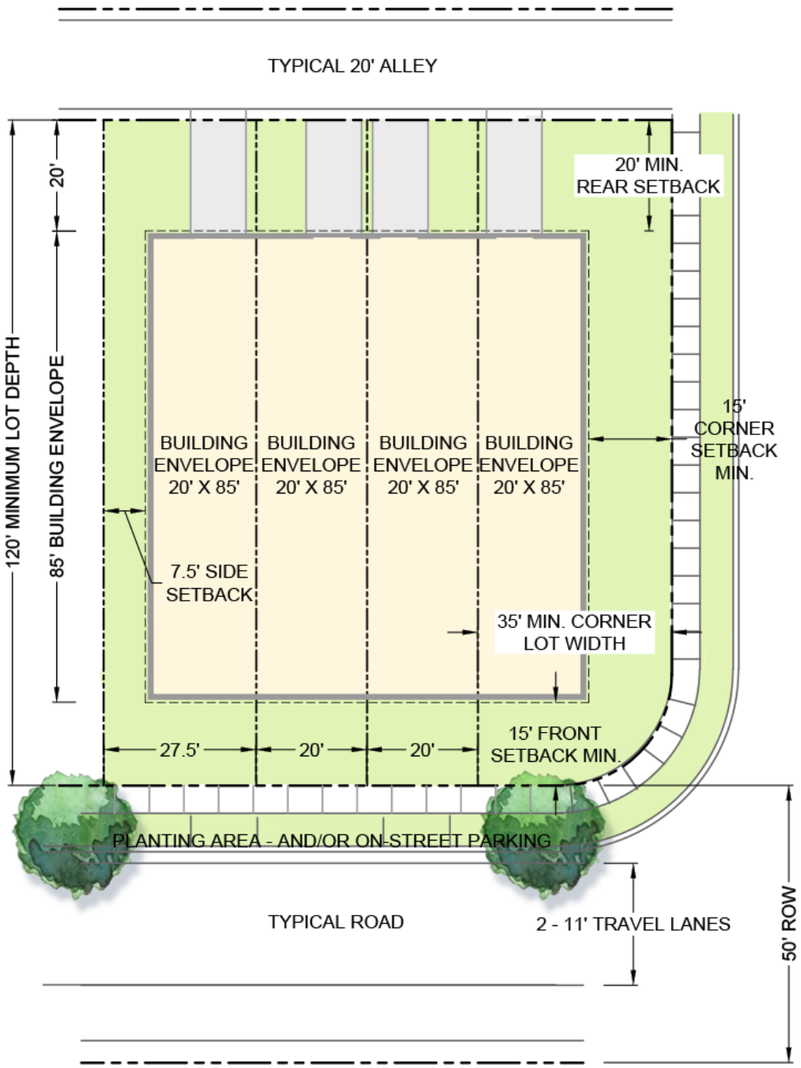


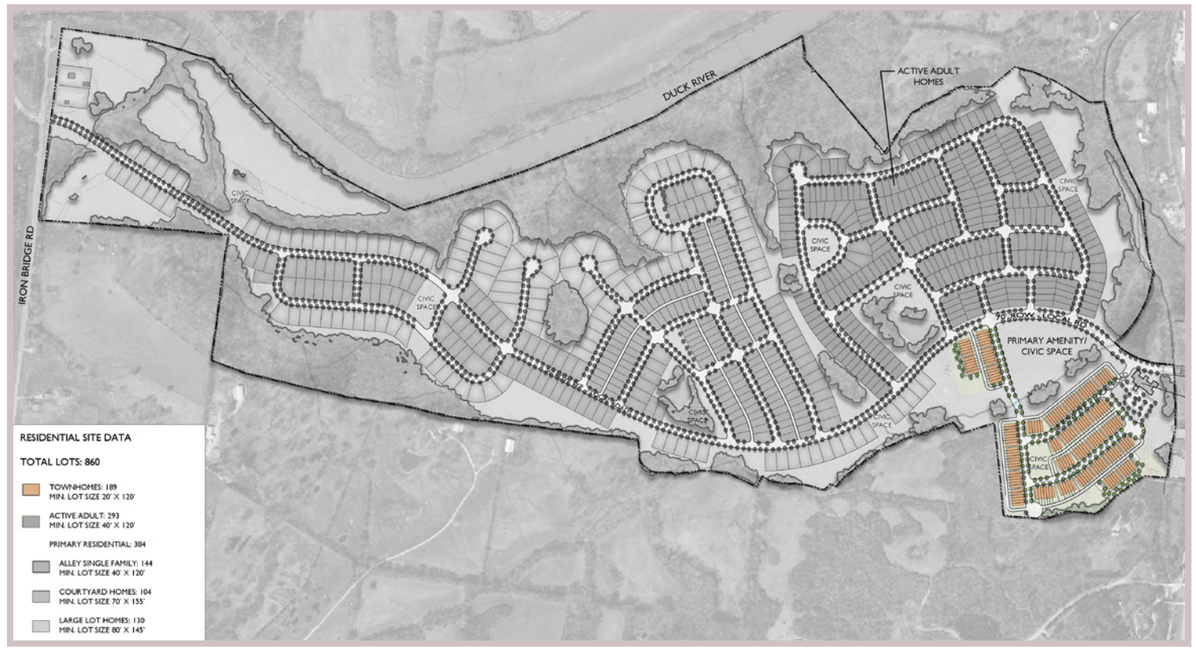






COLOR RENDERING PRESENTS AN ILLUSTRATIVE DEPICTION OF ARCHITECTURE AND LANDSCAPE MATERIAL





LOTS: 20' MINIMUM
189 HOMES

BUILDING SETBACKS:

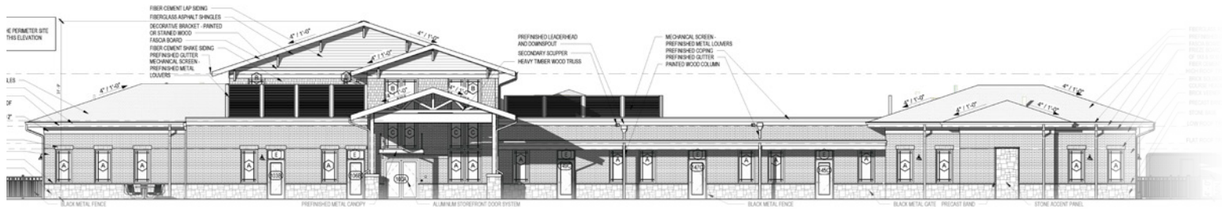
FRONT:	15'
REAR:	20'
SIDE:	7.5'
CORNER:	15'

ALL LOTS TO HAVE REAR LOADED GARAGES
- MINIMUM 20' LENGTH OF DRIVEWAY ON LOT
- MINIMUM 22' DEPTH FOR ALL GARAGES

TOWNHOME BUILDINGS WILL CONSIST OF 4, 6, 7, AND 8 UNIT BUILDINGS.

TOWNHOMES

DAYCARE ELEVATIONS



WEST ELEVATION



EAST ELEVATION

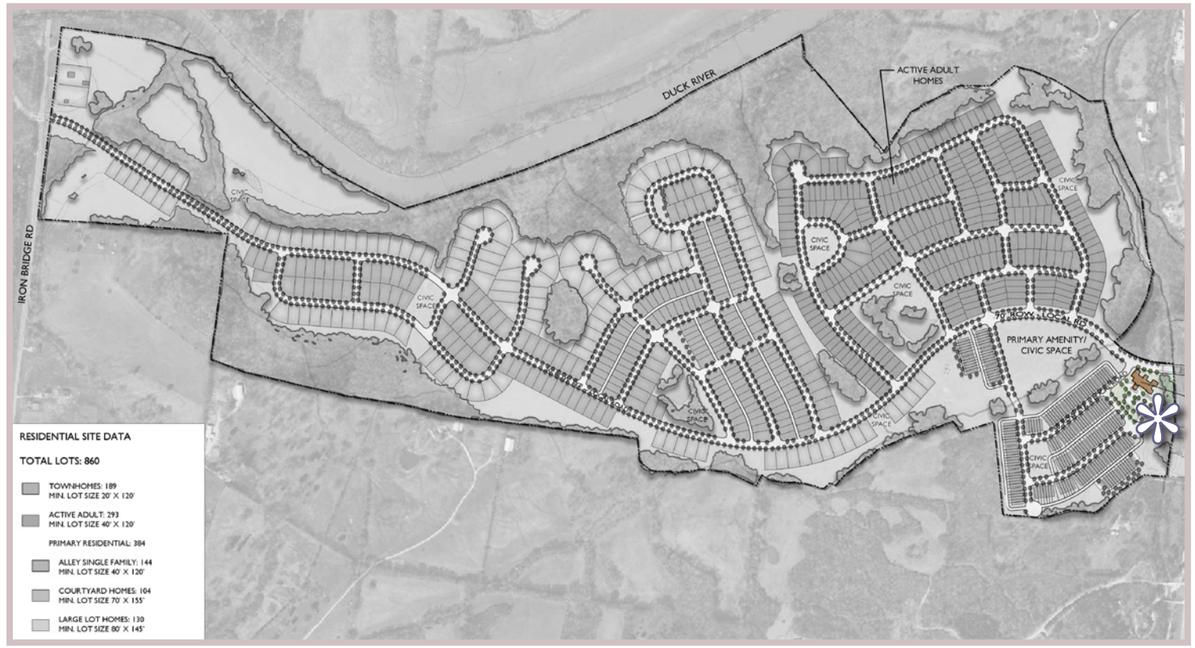


SOUTH ELEVATION



NORTH ELEVATION

ELEVATIONS ARE CONCEPTUAL.
FINAL APPROVALS TO BE DETERMINED WITH FMDP.



DAYCARE

CHILD DAYCARE TO BE APPROXIMATELY 12,000-14,000 SQFT., AND WILL SERVE AS A BENEFIT NOT ONLY TO THE LOCAL NEIGHBORHOOD BUT TO THE COMMUNITY AS WELL.

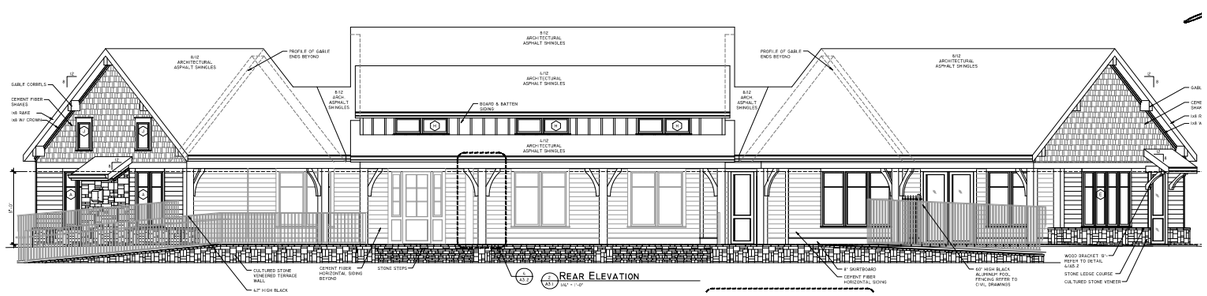
AMENITY PHOTOGRAPHS

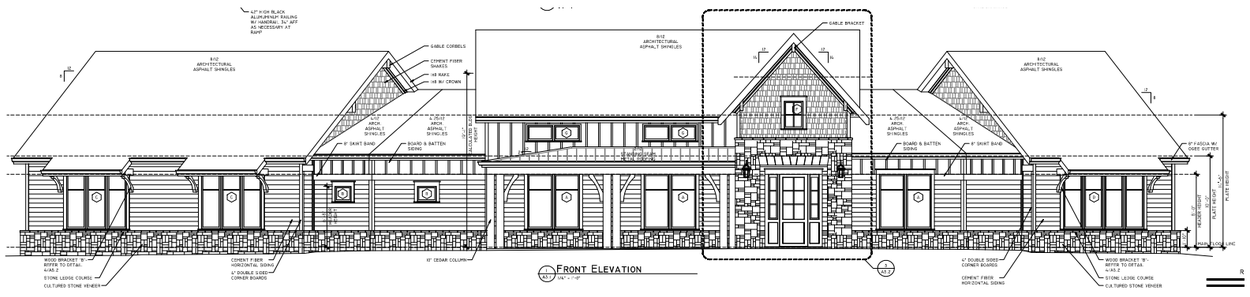




POOL AND CLUBHOUSE FROM SIMILAR KOLTER PROJECT

AMENITY ELEVATIONS





IMAGES AND ELEVATIONS ARE CONCEPTUAL.
FINAL APPROVALS TO BE DETERMINED WITH FMDP.

MAIN AMENITY ARCHITECTURE









5 CIVIC SPACES ARE PLANNED FOR THIS SITE.

THREE OF THESE SITES WILL HAVE COVERED MAILBOX KIOSKS. COVERED SEATING WILL BE PROVIDED IN MOST PARKS.

IMAGES ARE TO PROVIDE EXAMPLES OF TYPES OF COVERED SEATING AND MAILBOX KIOSKS, BUT COULD BE SUBJECT TO REVISIONS AT FMDP APPROVALS.

CIVIC SPACE ARCHITECTURE



1 / LI.1 KEY MAP N.T.S

NEIGHBORHOOD CLUBHOUSE





PICKLE BALL COURTS



DOG PARK

WALKING PATHS





SWING BENCH



POOL



PICKLE BALL COURTS



2 / LI.1 CIVIC SPACE - A
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 50' 100'

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE TENNESSEE REGISTERED LANDSCAPE ARCHITECT 10-16-23

Date: October 16, 2023

Revision Date
△
△
△

OVERALL CIVIC SPACE PLAN

SHEET LI.1



1 LI.2 KEY MAP N.T.S



2 LI.2 CIVIC SPACE - B

CONCEPTUAL PLAN NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'

BENCHES



FORMAL PLANTING





FORMAL LAWN



WALKING PATH



3 LI.2 CIVIC SPACE - C

CONCEPTUAL PLAN NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'

PLAYGROUND





FORMAL PLANTING

PLAYGROUND



GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE REGISTERED LANDSCAPE ARCHITECT TENNESSEE 10/16/23

Date: October 16, 2023

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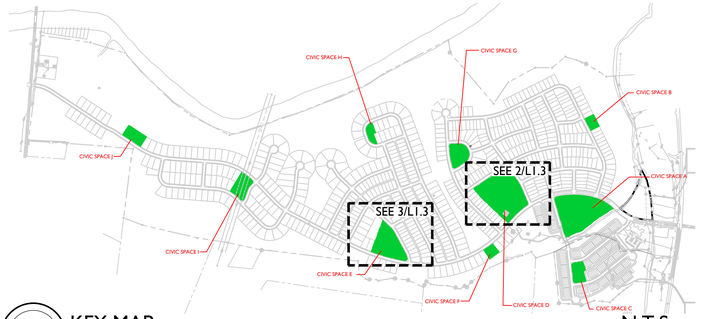
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OVERALL CIVIC SPACE PLAN

SHEET LI.2





1 / L1.3 KEY MAP N.T.S



2 / L1.3 CIVIC SPACE - D
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

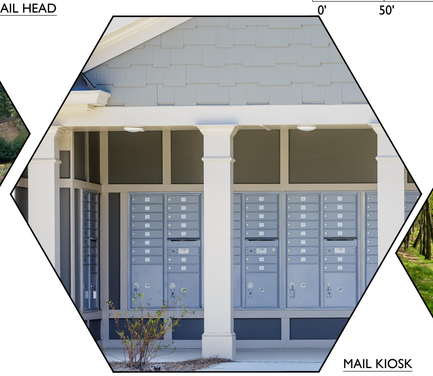
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POND



TRAIL HEAD



MAIL KIOSK

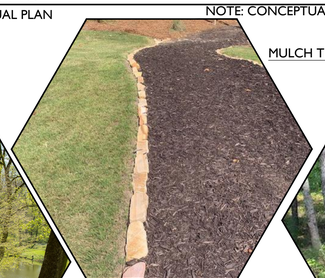
3 / L1.3 CIVIC SPACE - E
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

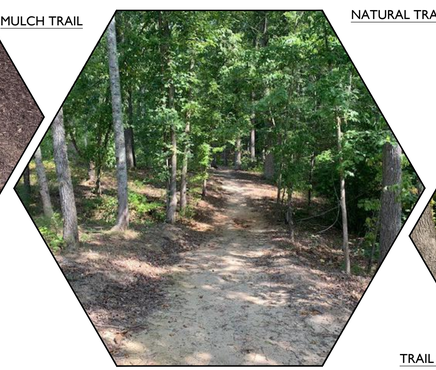
0' 30' 60'



NATURAL POND



MULCH TRAIL



NATURAL TRAIL



TRAIL SIGN

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE REGISTERED LANDSCAPE ARCHITECT TENNESSEE No. 000328

Date: October 16, 2023
Revision Date
△
△
△

OVERALL CIVIC SPACE PLAN
SHEET
L1.3



2 L1.4 CIVIC SPACE - F

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'



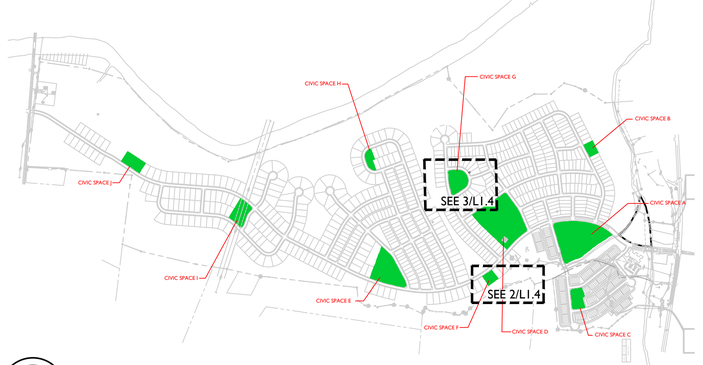
SWINGS



FORMAL PARK



PLAYGROUND



1 L1.4 KEY MAP N.T.S



3 L1.4 CIVIC SPACE - G

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

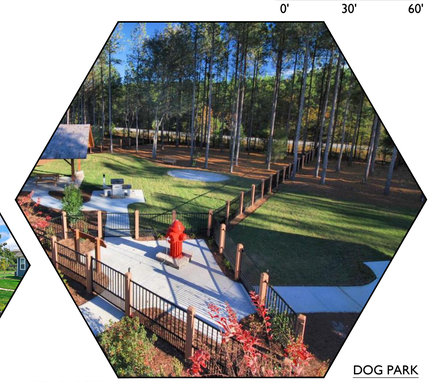
0' 30' 60'



FORMAL PARK



COMMUNITY GARDEN



DOG PARK

GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE REGISTERED LANDSCAPE ARCHITECT TENNESSEE 10/16/23

Date: October 16, 2023

Revision Date

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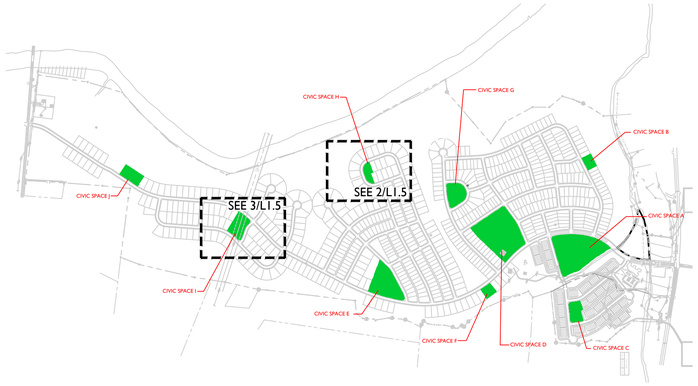
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OVERALL CIVIC SPACE PLAN

SHEET

L1.4



1 LI.5 KEY MAP N.T.S



2 LI.5 CIVIC SPACE - H

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'



SWINGS



PLAYGROUND



PLAYGROUND



3 LI.5 CIVIC SPACE - I

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'



SWINGS



MAIL KIOSK



FORMAL PLANTING

GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE — REGISTERED LANDSCAPE ARCHITECT — TENNESSEE — No. 1002

Date: October 16, 2023

Revision Date
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OVERALL CIVIC SPACE PLAN

SHEET LI.5



2 / L1.6 CIVIC SPACE - J

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 100' 200'



1 / L1.6 KEY MAP N.T.S



KAYAK LAUNCH

NOTE: PRIMITIVE WALKING TRAILS AND KAYAK LAUNCH TO BE FIELD LOCATED.



OPEN FIELD



TRAIL HEAD



MULTI-PURPOSE FIELD

GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
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OVERALL CIVIC SPACE PLAN

SHEET L1.6

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DISTRICT DECLARATION OF COVENANTS, CONDITIONS, AND RESTRICTIONS FOR ***ACTIVE ADULT NEIGHBORHOOD*** AT COLUMBIA BLUFFS

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DISTRICT DECLARATION OF COVENANTS,
CONDITIONS, AND RESTRICTIONS FOR
THE ACTIVE ADULT NEIGHBORHOOD DISTRICT AT NEXUS

This DISTRICT DECLARATION OF COVENANTS, CONDITIONS, AND RESTRICTIONS (this "Declaration") is made effective as of _____, 2023, by _____, _____ ("District Declarant").

W I T N E S S E T H:

WHEREAS, District Declarant is the owner of the real property located in the Columbia , Maury County, Tennessee, described in Exhibit A attached hereto and incorporated herein by reference (the "Property"). The Property, and additional real property now or hereafter subjected to this Declaration, is intended to be developed pursuant to a master plan as a multi-use community including residential properties including multi-family and single-family products encompassing all or portions of the Property (the "District"), to be known as **"CBAA"** _____, and is a part of the Development known as Columbia Bluffs, with various open spaces, common facilities, and Common Area for the benefit of said community; and

WHEREAS, District Declarant desires to provide a flexible and ordered procedure for the overall development of the Property and the District and to establish a method for the administration, maintenance, preservation, use and enjoyment of such portions of the District as are now or may hereafter be submitted to this Declaration; and

WHEREAS, District Declarant intends by this Declaration to impose upon the District mutually beneficial restrictions under a general plan of improvements for the benefit of all owners and/or occupants of property within the Property and all persons or entities having any interest in the Property, by the recording of this Declaration; and

WHEREAS, District Declarant intends that the Property will be developed in phases and that individual phases may be subjected to one or more declarations of restrictive covenants; and

WHEREAS, District Declarant desires that the Property be held, sold and conveyed subject to the provisions of this Declaration.

NOW, THEREFORE, District Declarant hereby declares that all of the Property and any additional property as may by Supplemental Declaration be added to the Property and subjected to this Declaration shall be held, sold, and conveyed subject to the following easements, restrictions, covenants and conditions. Such easements, restrictions, covenants and conditions are for the purpose of protecting the value and desirability of the Property, and shall run with the real property submitted to this Declaration. They shall be binding on all parties having any right, title, or interest in the Property, or any part thereof, their heirs, successors, successors in title, and assigns, and shall inure to the benefit of each owner thereof.

ARTICLE I
DEFINITIONS

Section 1. Age-Qualified Occupant: Any individual (i) 50 years of age or older who owns and occupies the improvements on a Lot and was the original purchaser of the Lot from the

District Declarant; or (ii) 55 years of age or older who occupies the improvements on a Lot. The terms "occupy," occupies,"or "occupancy" shall mean staying overnight in the improvements on a Lot for at least ninety (90) days in any consecutive twelve (12) month period.

Section 2. "Amenity Center" means any clubhouses or centers within the Development, in each case to be a portion of the Common Area, designed to provide, among other things, meeting space, recreational facilities, swimming pools, playgrounds or other amenities to serve the residents within the Development, and may also include offices for the Association manager, Declarant or other persons.

Section 3. "Assessments" shall mean assessments for Common Expenses provided for herein or by any amendment hereto, which shall be used for the purposes of promoting the recreation, health, safety, welfare, common benefit, and enjoyment of the Owners and occupants of all or any portion of the District and of maintaining the District, all as may be specifically authorized from time to time by the Board of Directors and as more specifically authorized below. The term "Assessments" shall include, without limitation, General Assessments, Special Assessments, Common Maintenance Parcel Assessments, and Special Use Assessments, and any other assessments now or hereafter established under this Declaration.

Section 4. Articles of Organization" shall mean the Articles of Organization of the District Association, to be recorded in the Office of the Judge of Probate for Maury County, Tennessee, as may be amended from time to time.

Section 5. "Board of Directors" or "Board" shall be the body responsible for managing the affairs of the District Association. Actions required of or permitted by the Board herein may be taken or fulfilled by a committee or other designee as may be established or appointed by the Board in accordance with the Bylaws of the District Association.

Section 6. "Common Area" shall mean those portions of the Property and any improvements thereto, and components thereof and easements appurtenant thereto, now or hereafter owned by the District Association or designated on any development plan or plat for future use for the common use and enjoyment of the Owners, including, but not limited to, any common open space as set forth on a final development plan, the Common Area shown on any recorded plat of the Property and any and all pedestrian bridges, roadways, alley ways, parking areas, lakes, waterways, landscaping and irrigation systems, fences, structures, sidewalks, community signage, walls, monuments, illumination of Common Area, common utilities, storm water system, wells, fountains, amenity center and other improvements located on such Common Area, but excluding any Master Common Area and such areas that are intended to be or now or hereafter designated as a common area serving only a particular portion of the District or to be conveyed to a Sub-District Association. District Declarant shall hereafter convey the Common Area or portions thereof to the District Association, or Sub-District Association, as applicable, and the District Association or Sub-District Association shall accept such conveyance.

Section 7. "Common Elements" shall include all Common Maintenance Areas and all facilities, utilities and other improvements found or located in Common Maintenance Areas, but excluding any Common Maintenance Areas that are within the authority or responsibility of the Master Association.

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Section 8. "Common Expenses" shall mean and include the actual and estimated expenses of operating the District Association and maintaining the Common Elements, including any reasonable reserves therefor, all as may be found to be necessary and appropriate by the Board pursuant to this Declaration and the Articles of Organization of the District Association, and including without limitation any District Assessment imposed by the Master Association.

Section 9. "Common Maintenance Area" shall mean the Common Area and any portion of the Property for which the District Association has assumed or has been designated as the responsible party for maintenance obligations or otherwise designated by this Declaration or any Supplemental Declaration or a Sub-District Declaration as a Common Maintenance Parcel.

Section 10. "Common Maintenance Parcel Assessments" are Assessments to which Common Maintenance Parcels are subjected, in addition to any General Assessments.

Section 11. "Common Maintenance Parcel" shall mean any Lot designated by this Declaration or any Supplemental Declaration as a Common Maintenance Parcel, but excluding any Common Maintenance Parcels that are within the authority or responsibility of the Master Association or within the authority or responsibility of a Sub-District Association.

Section 12. "Community-Wide Standard" shall mean the standard of conduct, maintenance, or other activity generally prevailing in the Development as established in the reasonable discretion of the Master Declarant, District Declarant or the applicable Board of Directors.

Section 13. "District Association" shall mean _____ District Owners Association, a Tennessee nonprofit corporation, its successors and assigns.

Section 14. "District Declarant" means _____, a _____ limited liability company, its successors and assigns.

Section 15. "Declarant Control Period" means the period ending on the earlier to occur of: (i) the date that the District Declarant voluntarily relinquishes control of the Association; and (ii) when homes have been completed on eighty (80%) of the lots within the District and such lots have been conveyed to third party residential owners.

Section 16. "Development" means the mixed use community to be developed on real property that includes, among other areas, the District, to be known as Town Columbia , and shall be deemed to include the real property described in the Master Declaration, as may be modified, amended, expanded or contracted from time to time.

Section 17. "District" shall have the meaning given in the premises of this Declaration.

Section 18. "District Assessment" means the Assessment to be paid by the District to the Master Association as set forth in the Master Declaration or Supplemental Declaration.

Section 19. "District Representative" means the Person selected by the Board of Directors to be the representative of the District in meetings or otherwise with the Master Association.

Section 20. "District Design Guidelines" shall mean the aesthetic and functional plan for the District, to be implemented through the regulation of land use, landscaping, architecture and such other matters as may be included in the District Design Guidelines. The District Design Guidelines is originally adopted by the District Declarant and may be amended by the District Declarant or District Design Review Committee, with the consent of District Declarant and Master Declarant during the applicable Declarant Control Period, from time to time. The District Design Guidelines does not need to be recorded to be effective but shall be available from the District Design Review Committee.

Section 21. "Final Plat" means, collectively, all plats of a portion of the Property from time to time recorded in the real estate records of the Office of the Judge of Probate for Maury County, Tennessee, as such may be amended from time to time as the Property is developed. The term "Final Plat" may include a plat established by a condominium regime.

Section 22. "Improvements" shall mean buildings, outbuildings, underground installations, grading, slope and drainage alterations, roads, driveways, parking areas, fences, screening walls and barriers, retaining walls, stairs, decks, windbreaks, landscaping, plantings, planted trees and shrubs, poles, signs, lighting, loading areas, and all other man-made changes to the natural configuration and vegetation of the Property, whether above or below the land surface.

Section 23. "Lot" or "Lots" shall mean a separate parcel of the Property now or hereafter set forth as a Lot on any Final Plat, including without limitation open space, conservation areas, or Common Area within a District, or separate parcels conveyed by other property description if no Final Plat has been recorded, and shall be deemed to refer to any and all Improvements located thereon or comprising such Lot.

Section 24. "Master Association" shall mean and refer to the Columbia Bluffs Master Association, Inc., a Tennessee nonprofit corporation, its successors and assigns**, IF REQUIRED**.

Section 25. "Master Declarant" shall mean the Declarant of the Master Declaration, its successors and assigns.

Section 26. "Master Declaration shall mean that certain Master Declaration of Covenants, Conditions, and restrictions for Columbia Bluffs, of record at Book _____, page _ _____, Maury County Register's Office, as may be supplemented, amended, or revised from time to time.

Section 27. "Master Design Guidelines" shall mean the aesthetic and functional plan for the Development, to be implemented through the regulation of land use, landscaping, architecture and such other matters as may be included in the Master Design Guidelines. The Master Design Guidelines is originally adopted by the Master Declarant and may be amended from time to time by the Master Declarant or Master Design Review Committee, with the consent of Master Declarant during the Declarant Control Period applicable to the Master Declaration. The Master Design Guidelines does not need to be recorded to be effective but shall be available from the Master Design Review Committee.

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Section 28. "Mortgage" shall include a deed of trust or mortgage encumbering any Unit.

Section 29. "Mortgagee" shall include a beneficiary under or holder of a note secured by a Mortgage who has provided actual, written notice to the Master Association of such interest.

Section 30. "Mortgagor" shall include the trustor or grantor of a Mortgage.

Section 31. "Operating Budget" shall have the meaning given in Article IX, Section 2 of this Declaration.

Section 32. "Owner" shall mean and refer to one or more Persons or entities, including District Declarant or Master Declarant, who holds or hold the record title to any Lot, but excluding in all cases any party holding an interest merely as security for the performance of an obligation.

Section 33. "Person" shall mean a natural person, a corporation, a partnership, a limited liability company, a trust, a trustee, or any other legal entity.

Section 34. "Property" shall mean and refer to the real property described in Exhibit A attached hereto, and any additional real property submitted to this Declaration from time to time pursuant to a Supplemental Declaration and added to the District.

Section 35. "Resident" or "Qualified Resident" shall mean any of the following persons occupying a Lot: (i) any Age-Qualified Occupant; (ii) any person 19 years of age or older occupying a Lot with an Age-Qualified Occupant; and (iii) any person 19 years of age or older who occupied a Lot with an Age-Qualified Occupant and who continues, without interruption, to occupy the same Lot after termination of the Age-Qualified Occupant's occupancy thereof.

Section 36. "Special Assessment" shall have the meaning given in Article IX, Section 5 of this Declaration.

Section 37. "Special Use Assessment" shall mean the Assessment applied to a Special Use Parcel by Supplemental Declaration, which may be in lieu of all other Assessments; subject to the provisions of Article IX.

Section 38. "Special Use Parcel" shall mean a Lot of unconventional size, shape, location or use that calls for special design and assessment considerations as designated by Master Declarant or District Declarant. Typically, a Special Use Parcel will be used for commercial purposes, civic purposes, an age-restricted neighborhood, multi-family residential, or community or recreational facilities.

Section 39. "Streetscape, Pedestrian, Utility and Street Maintenance Easement" shall include all streetscape, pedestrian, utility and street easements located adjacent to street rights-of-way and medians in public rights of way.

Section 40. "Sub-District Association" shall mean an owners association established to maintain or regulate only a portion of the District pursuant to a Sub-District Declaration, such

as a condominium association, if any, with the prior consent of Master Declarant and District Declarant.

Section 41. "Sub-District" shall mean a portion of the District that has been subjected to particular restrictions, covenants or regulations by Supplemental Declaration or a Sub-District Declaration, , if any, and may be maintained or regulated by a Sub-District Association.

Section 42. "Sub-District Declaration" shall mean a declaration of restrictive covenants and other matters applicable only to a Sub-District.

Section 43. "Supplemental Declaration" shall mean an amendment to this Declaration, including the addition of additional property, Lots or Master Common Area subjected to this Declaration. Such Supplemental Declaration may, but is not required to, impose, expressly or by reference, additional restrictions and obligations to the provisions of this Declaration, or to exempt such property from certain provisions and restrictions of this Declaration. The term "Declaration" as used herein shall include this Declaration, together with any and all Supplemental Declaration, together with any amendments, restatements or other additions or removals thereto.

Section 44. "Telecommunication Services" shall mean residential and commercial services involving the provision of voice, internet, entertainment, television or other related services.

Section 45. Defined Terms. Capitalized terms used herein and not otherwise defined shall have the meaning given in the Master Declaration.

ARTICLE II
DISTRICT AND SUB-DISTRICT ASSOCIATIONS

Section 1. Establishment. This Declaration is a District Declaration as referred to in the Master Declaration, and is established by District Declarant with the consent of Master Declarant.

Section 2. District Sub-District Associations. District Declarant or other Persons may from time to time, with the consent of Master Declarant and District Declarant, establish Sub-Districts within the District to be governed by a Sub-District Association by filing a Sub-District Declaration, Supplemental Declaration, or other means of record. Each area within a Sub-District may consist of one or more Lots within the District, one or more parcels described by property description (each of which will be deemed a Lot), one or more uses, or otherwise as determined by the applicable declarant, District Declarant, or Master Declarant, in their sole discretion, but subject in each case to the consent of Master Declarant and District Declarant. Upon establishment of a Sub-District, and at any time and from time to time, the applicable declarant may but shall not be required to impose additional restrictive covenants that are applicable to such Sub-District or to exempt all or a portion of the Sub-District from one or more provisions of this Declaration, with the consent of the Master Declarant and District Declarant. The applicable declarant may establish, or cause the Sub-District to establish, one or more Sub-District Associations for the management and preservation of such Sub-District, each with the power to establish and collect Assessments for, among other things, the payments of

Assessments to the Master Association or District Association s as may be in the Master Declaration, this Declaration, or in this Declaration.

Section 3. Sub-District Declaration. A Sub-District shall be entitled to establish one or more Sub-District Declarations applicable to a Sub-District and a Sub-District Association for the administration thereof, but such Sub-District Declarations and all Sub-District Associations shall in each case be subject to the prior review and approval of District Declarant and Master Declarant in their respective sole discretion, and shall be deemed subordinate to the Master Declaration and this Declaration.

Section 4. Sub-District Representatives. Unless otherwise established by the declarant in a Sub-District Declaration, it shall be the responsibility of Owners within a Sub-District to establish equitable, fair and representative procedures for the selection of any representative to the District Association as may be established, in each case to be approved by District Declarant. If applicable, no voting or representative rights shall be available to a Sub-District until such time as a Sub-District Representative has been duly selected. Each Sub-District will be governed, controlled and subject to the powers and authority vested in the Master Association and the District Association, whether or not the District has elected a District Representative.

ARTICLE III
PROPERTY RIGHTS AND EASEMENTS

Section 1. Common Area. Every Owner shall have a right and easement of enjoyment in and to the Common Area that is appurtenant to the title to such Owner's Lot, subject to any restrictions or limitations contained in the Master Declaration, this Declaration or in any Deed or amendment thereto conveying the Common Area to the District Association or subjecting the Common Area to this Declaration. Any Owner may delegate his or her right of enjoyment to their family, tenants, customers, and invitees, as applicable, subject to reasonable regulation by the Board and in accordance with procedures the Board may adopt from time to time.

Section 2. Exceptions to Rights. The Owner's right granted in Section 1 above shall be subject to the following:

(a) The right of the Master Association or District Association to dedicate or transfer all or any part of the Common Area to any public body, agency, authority, or utility for such purposes as are consistent with the purposes of the Master Association set forth in the Master Declaration or the District Association set forth in this Declaration.

(b) The limitation of Owner rights only to those areas of the Common Area for which such Owner shall pay a portion of the Common Expenses related thereto.

(c) Each Owner's responsibility to pay for Common Expenses, fees, Fines and other charges hereunder assessed by the Board or the District Association against an Owner's Lot.

(d) The right of Master Declarant, District Declarant or other declarant under a Sub-District Declaration to limit, restrict, or regulate the use of the Common Area in their sole discretion.

Section 3. Owner Easements. Subject to the limitations of Section 2 above, every Owner, its successors and assigns, shall have the following perpetual easements with respect to the Property; provided, that for purposes of this Section 3, Common Area shall be deemed to include Common Area that is now or hereafter created within a District, without regard to whether the District Association has ownership of such areas or responsibilities for maintenance or otherwise with respect such areas:

(a) A non-exclusive easement of ingress and egress to its Lot over, across and through the Common Area and Streetscape, Pedestrian and Utility Maintenance Easements.

(b) A perpetual easement in common with the Owners of all other Lots to use all pipes, wires, cables, public utility lines and other Common Elements serving its Lot.

(c) A nonexclusive, perpetual and reciprocal access easement for ingress and egress in common with the Owners of all other Lots for access over any drive aisles or alleys located, constructed and available on or within any Lot, but expressly excluding private driveways constructed solely for internal use only within a Lot, and any areas excluded from use by a Supplemental Declaration, this Declaration, or a Sub-District Declaration.

(d) A perpetual and non-exclusive easement in, over and through all Common Area and to use the entranceways, pedestrian systems and other common improvements within the Property subject to the right of the Board to:

(i) promulgate rules and regulations for the use and enjoyment thereof; and,

(ii) suspend the enjoyment and voting rights of any Owner for any period during which any Assessment for Common Expenses or Fine or other charge or fee hereunder remains unpaid, or for any period during which any infraction of its published rules and regulations continues, it being understood that any suspension for either non-payment of any assessment or a breach of the rules and regulations of the District Association shall not constitute a waiver or discharge of the Owner's obligation to pay the assessment..

Section 4. District Declarant and District Association Easements. The District Declarant and the District Association, their successors and assigns, and their contractors and agents shall have the following perpetual easements with respect to the Property:

(a) A perpetual and non-exclusive easement for the maintenance of any Common Elements and Streetscape, Pedestrian, and Utility Maintenance Easements, which may presently, or hereinafter encroach upon a Lot.

(b) A perpetual and non-exclusive right of access to each Lot: (1) to inspect same for the purpose of verifying conformance with this Declaration and any rules and

regulations of the District Association, (2) to remedy any violations set forth in this Declaration or in any rules and regulations of the District Association, and (3) to perform any operations required in connection with the maintenance, repairs or replacements of or to the Common Area, or any equipment, facilities or fixtures affecting or serving other lot(s) or the Common Elements; provided that requests for entry are made in advance and that any such entry is at a time reasonably convenient to the Owner. In the case of an emergency, such right of entry shall be immediate, whether Owner is present at the time or not.

(c) A perpetual and non-exclusive easement in, over, upon, across and through the Common Area for surface water runoff and drainage caused by natural forces and elements, grading, and/or the improvements located upon the Property. No individual Owner shall directly or indirectly interfere with or alter the drainage and runoff patterns and systems within the Property without written approval of the Master Association.

(d) A perpetual and non-exclusive easement in, upon, over, across and through the Common Area for the purpose of installation, maintenance, repair, service and replacement of all sewer, water, power and telephone pipes, lines, mains, conduits, waters, poles, transformers, meters, and any and all other equipment or machinery necessary or incidental to the proper functioning of any utility company or other entity that requires same for the purpose of furnishing one or more of the foregoing services as determined and authorized by the Master Association.

(e) A perpetual and non-exclusive easement of unobstructed ingress and egress in, upon, over, across and through the Common Area to the District Association, the Master Association, and their respective officers, agents and employees and all police, fire, and ambulance personnel in the proper performance of their respective duties (including but not limited to emergency or other necessary repairs to a lot upon which the Owner has failed to perform) and for repair and maintenance of the Common Elements. Except in the event of emergencies, the rights accompanying the easements provided for in this subsection shall be exercised only during reasonable daylight hours and then, whenever practical, only after advance notice to the Owner(s) directly affected thereby.

(f) The District Declarant reserves the right and easement, which shall be a covenant running with the land, for and to the benefit of District Declarant and District Association for the installation and use of entrance Improvements to be located on the entrances to the District. The estimated and actual cost of operating and maintaining any improvement thereon will be the responsibility of the District Association. Excluding the Master Declarant or District Declarant, and any of their respective affiliates, the publication or display of any signage or other matter by any Person, whether or not such Person is a Member of the District Association, upon any Improvement on the entry feature easement will be subject to contract with the District Association for the reasonable compensation for services and operating expenses in connection therewith.

Section 5. Easement Related to Infrastructure and Other Improvements. Notwithstanding the foregoing or anything else contained herein to the contrary, District

Declarant and/or the District Association shall have and hereby retain the right, but not the obligation, to create, install, construct, modify, repair, replace and maintain certain forms of infrastructure for the District that may consist of curbs, streets, service drives, sidewalks, and other hardscape, landscaping, street trees, street lights, irrigation systems, brick pads, benches, bridges, street furniture, walking paths, parks, trash receptacles, drainage facilities, signage, utilities, and any apparatuses related thereto, as well as other improvements not necessarily enumerated above. Said improvements may be installed along the roads or within any Lot or in the Common Area of the District if deemed necessary or desirable by the District Declarant and/or the District Association, in their sole and absolute discretion, for the overall functionality or aesthetics of the District. Continued maintenance, repair and replacement of any of the aforementioned infrastructure or improvements, if and once installed, shall be the responsibility of the Lot Owner if located within said Owner's Lot, or the responsibility of the applicable District Association if located within the Common Area of the District or the responsibility of the Master Association if located within the Master Common Area. Any costs and expense associated with this right may be reallocated and assessed by the District Association as a Common Expense. Notwithstanding the foregoing, when exercising said right, neither District Declarant nor the District Association shall do anything which may reduce the number of parking spaces within the Lot. In addition, neither District Declarant nor the District Association shall have the right to modify an existing building located on a Lot without the consent of the Lot Owner. An easement is hereby granted to the District Declarant, the District Association and to any construction or management company selected by the District Declarant or the District Association to enter in or cross over the Common Area or to enter or cross over any Lot to create, install, construct, modify, repair, replace and maintain any of the aforementioned forms of infrastructure or improvements located within any portion of the District.

Section 6. Easements for Utilities and Related Purposes. The District Association is authorized and empowered to grant (and shall from time to time grant) such licenses, easements and/or rights of way for sewer lines, water lines, electrical cables, telephone cables, television and other communication cables, internal and external wiring and antennae, gas lines, drainage, slopes, storm drains, regulatory signage, street lights, underground conduits and/or such other purposes related to the provision of public utilities and other common services to the District as may be considered necessary, appropriate or desirable by the Board for the orderly maintenance, preservation and enjoyment of the Common Area or for the preservation of the health, safety, convenience and/or welfare of the Owners of the lots and District Declarant. A ten (10) foot nonexclusive underground utility easement for the District Association is reserved along all the frontage (but behind right of way), both sides, and rear of all Lots, and on both sides of the sidelines of all comer Lots. Additional easements are reserved on the recorded plat(s), as amended from time to time. Within these easements, no construction of any kind shall be placed or permitted to remain which will in any way damage or interfere with the installation or maintenance of utilities.

Section 7. Streetscape, Pedestrian, Utility, and Street Maintenance Easements. Streetscape, Pedestrian, Utility, and Street Maintenance Easements shall include all streetscape, pedestrian, utility, and street maintenance easements located adjacent to street rights-of-way, and required pavers and medians in public rights-of-way.

Section 8. Easements of Encroachment. There shall be reciprocal appurtenant easements of encroachment as between each Lot and such portion or portions of the

Improvements adjacent thereto or as between adjacent Lots due to unintentional placement or settling or shifting of Improvements constructed, reconstructed or altered thereon.

Section 9. General Easement. The District Declarant, so long as it shall retain record title to any Lot or other tract within the District or the Common Area, and the District Association, reserve the right and easement to the use of the Common Area and any Lot (regardless of ownership) or any portion thereof, as may be needed for repair, maintenance or construction on such Lot or any other Lot or the Common Area.

Section 10. Revision of Common Area. Notwithstanding any other provision of this Declaration, District Declarant shall have the right by recording a Final Plat or otherwise to revise any Common Area, in whole or in part, including without limitation the conversion to other types or uses of property, the increase or decrease in size, or the granting of easements or construction of improvements in such Common Area.

ARTICLE IV
MEMBERSHIP AND VOTING RIGHTS

Section 1. Membership in the District Association. Every Person who is the record owner of a joint or undivided fee interest in any Lot shall be deemed to be a member of the Association (each such person or entity, a "Member"). Membership shall be appurtenant to and may not be separated from such fee interest ownership, and any transfer of a Lot shall operate automatically to transfer to the new record owner thereof the membership in the Association appurtenant thereto. The foregoing is not intended to include persons who hold an interest merely as security for the performance of an obligation, and the giving of a security interest shall not terminate that Member's membership.

Section 2. Assignment by Declarant. Notwithstanding the foregoing, District Declarant may at any time assign, pledge, hypothecate or alienate its membership and/or District Declarant's rights as District Declarant herein, but any transfer by District Declarant of title to a Lot shall automatically transfer the membership in the Association appurtenant thereto, free and clear from any such assignment, pledge, hypothecation or alienation.

Section 3. Voting Rights. Voting and other rights of the Members shall be as set forth in the By-Laws of the Association.

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ARTICLE V
MAINTENANCE

Section 1. District Association's Responsibility. The District Association shall maintain and keep in good repair the Common Maintenance Area. Subject to the provisions of any Supplemental Declaration or Sub-District Declaration, such maintenance may include, without limitation, maintaining, repairing, and replacing, subject to any insurance then in effect, all trees, landscaping and other flora, structures, irrigation system, storm water control and any other Improvements situated upon the Common Area or the Common Maintenance Area, and the maintenance of non-public streets, parking areas, or driveways, street or entrance lighting, signage, including without limitation directional signage.

Section 2. Common Maintenance Parcels. The District Association shall maintain those portions of Common Maintenance Parcels as this Declaration or any Supplemental Declaration establishes as a District Association responsibility, and may charge to the Owners of such Common Maintenance Parcel a Common Maintenance Parcel Assessment, as appropriate.

(a) Unless otherwise established by Supplemental Declaration, the District Association shall provide for the maintenance, care, repair, and replacement of the following portions of the Common Maintenance Parcels, to be funded by Common Maintenance Parcel Assessments: the exterior landscaping (except such landscaping installed by, or on behalf of, the Lot Owner and such landscaping enclosed by a fence, if any), walkways, and porches located upon or about each Common Maintenance Parcel. The District Association also shall maintain the exterior of each Common Maintenance Parcel as follows: painting, maintenance, and repair of exterior building surfaces as the Board shall deem necessary and proper, including roofs, gutters, downspouts, exterior building surfaces, trees, shrubs, grass, walks, replacement of trim, caulking and other repairs to roof covers (to include the repair and replacement of all components of the roof of each Common Maintenance Parcel), and other miscellaneous repairs. Such exterior maintenance shall not include glass surfaces (weather windows or sliding glass doors), HVAC equipment, storm doors, front or rear entry doors, garage doors, fences, screens, or patio covers. The balance of the improvements located on the respective Common Maintenance Parcels shall be maintained by the Owner of the particular Lot involved. For the sole purpose of performing the exterior maintenance upon each Lot required by this Article V, the duly authorized employees or agents of the District Association shall have the right, after reasonable notice to the Owner, to enter upon any Lot and into any Lot at reasonable hours of any day.

(b) Notwithstanding any foregoing provision to the contrary, the duly authorized agents or employees of the District Association shall have the right to enter in or upon any Lot or into any structure or located on a Lot, without notice to the Owner thereof, when, in the judgment of the District Association, acting through its Board of Directors, such entrance is necessary to prevent damage to such Lot or surrounding Lots or Common Area by fire, criminal act, natural disaster, or other similar emergency.

(c) Notwithstanding the obligations of the District Association with respect to maintenance of certain portions of the exterior of certain Lots, the District Association shall have no obligation to repair interior or structural portions of any Lot or personal

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property that is lost or damaged as a result of construction defects, damage or maintenance issues of exterior portions of any Lot, including without limitation damage resulting from water leaks, foundational issues, or settling or structural matters. Each Owner shall bear full responsibility for obtaining and maintaining such insurance as may be desired for protection against such losses.

(d) Notwithstanding the foregoing, if the need for exterior maintenance and repair of Common Maintenance Parcels by the District Association as required by this section is caused by the willful or grossly negligent conduct or act an Owner, his/her family, guest, invitees, or other Persons using or occupying his/her Lot with his/her express or implied permission, the cost of such repair or maintenance may be assessed against such Owner as a Special Assessment of this Declaration upon a finding by the Board, which shall be due and payable thirty (30) days from the date of notice thereof, such Assessment to be collected and enforced as provided in this Declaration. Such Special Assessment shall not require the approval of any of the Members; provided, however, that any Owner against which any such Assessment is levied shall be entitled to notice, a hearing at a time and place set by the Board in its sole discretion, and an opportunity to do the corrective work required (provided that the work is performed by a competent contractor mutually agreeable to both parties and in a manner and quality agreed to by the Board), prior to a Special Assessment being levied against such Owner in accordance with the provisions of this subsection.

Section 3. Owner's Responsibility. Except as provided in the foregoing Section 1. Section 2. or otherwise set forth in a District Declaration, the Owner of each Lot shall have the sole responsibility for maintenance of all exterior and interior portions of the Lot, all Improvements located thereon, the land, flora, irrigation, and landscaping within the boundaries of the Lot; and other improvements not maintained by the District Association. Each Owner shall maintain its Lot in a manner consistent with the Community Wide Standard, the applicable covenants set forth in this Declaration, and such rules and regulations as may be established by the Board from time to time.

ARTICLE VI
INSURANCE AND CASUALTY LOSSES

Section 1. Insurance. The Board of Directors for the District Association, or its duly authorized agent, shall have the authority to and shall obtain insurance for all insurable improvements on the Common Area against loss or damage by fire or other hazards, including extended coverage, vandalism, and malicious mischief. This insurance shall be in an amount sufficient to cover the full replacement costs of any repair or reconstruction in the event of damage or destruction from any such hazard.

(a) The Board shall also obtain a public liability policy covering the Common Area and District Association for all damage or injury caused by the negligence of the District Association or any of its employees or agents. The public liability policy shall have at least a One Million Dollar ($1,000,000.00) single person limit as respects bodily injury and property damage, a One Million Dollar ($1,000,000.00) limit per occurrence, and a Five Hundred Thousand Dollar ($500,000.00) minimum property damage limit. The policy or policies may contain a reasonable deductible, and the

amount thereof shall be added to the face amount of the policy in determining whether the insurance at least equals the full replacement cost.

(b) In addition to the other insurance required by this Section, the Board shall obtain, as a Common Expense, worker's compensation insurance, if and to the extent necessary, and a fidelity bond or bonds on directors, officers, employees, and other persons handling or responsible for the District Association's funds. The amount of fidelity coverage shall be determined in the directors' best business judgment, but may not be less than three months' Assessments, plus reserves on hand. Bonds shall contain a waiver of all defenses based upon the exclusion of persons serving without compensation and may not be canceled or substantially modified without at least thirty (30) days' prior written notice to the District Association. The Board shall also obtain, as a Common Expense, a reasonably available amount of Directors and Officers Errors and Omissions insurance.

(c) Premiums for all insurance required by this Article VI, shall be Common Expenses of the District Association and shall be included in the General Assessment.

Section 2. Insurance; Common Maintenance Parcels.

(a) The District Association shall, as a Common Expense applicable only to Lots that are Common Maintenance Parcels, obtain and continue in effect adequate blanket all-risk casualty insurance, if reasonably available, and if not reasonably available, fire and extended coverage, in such form as the Board deems appropriate for one hundred (100%) percent of the replacement cost of the Lots that are Common Maintenance Parcels, excluding the replacement of any finishes, fixtures, cabinets, appliances, flooring, or other improvements installed or supplied by the Owners, or their tenants, or personal property of the Owners, or their tenants, guests, and invitees located within such Lots.

(b) Neither the District Declarant nor the District Association has constructed the Lots on the Common Maintenance Parcels, and neither District Declarant nor the District Association shall be liable for any claims or causes of action of any kind whatsoever in law or in equity arising from or in any way relating to the construction of improvements upon the Common Maintenance Parcels that was performed by parties other than District Declarant, its agents, employees, subsidiaries or other affiliated entities.

(c) Premiums for all insurance required by this Article VI, Section 2, shall be Common Expenses of the Association applicable only to Common Maintenance Parcels and shall be included in the Common Maintenance Parcel Assessment. The policy or policies may contain a reasonable deductible, and the amount thereof shall be added to the face amount of the policy in determining whether the insurance at least equals the full replacement cost.

Section 3. Disbursement of Proceeds. Proceeds of insurance policies with respect to Common Area shall be disbursed as follows:

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(a) If the damage or destruction for which the proceeds are paid is to be repaired or reconstructed, the proceeds, or such portion thereof as may be required for such purpose, shall be disbursed in payment of such repairs or reconstruction as hereinafter provided. Any proceeds remaining after defraying such costs of repairs or reconstruction to the Common Area or, in the event no repair or construction is made shall be retained by and for the benefit of the District Association and placed in a capital improvements account.

(b) If it is determined that the damage or destruction to the Common Area for which the proceeds are paid shall not be repaired or reconstructed, such proceeds shall be disbursed in the manner as provided for excess proceeds in Section 2(a) above.

Section 4. Repair and Reconstruction. If the damage or destruction to the Common Area for which the insurance proceeds are paid is to be repaired or reconstructed, and such proceeds are not sufficient to defray the cost thereof, the Board of Directors may use reserve or capital improvements account funds, or may levy a Special Assessment against all Lots. Additional Assessments may be made in like manner at any time during or following the completion of any repair or reconstruction.

Section 5. Annual Review of Policies. At least annually, the Board shall review all insurance policies that are required by this Article VI to be maintained by the District Association in order to ascertain whether the coverage contained in the policies is sufficient. If the Board deems such coverage to be insufficient, the Board may expand the coverage to the extent it reasonably deems necessary.

ARTICLE VII
NO PARTITION

Whenever all or any part of the Common Area shall be taken (or conveyed in lieu of and under threat of condemnation by the Board) by any authority having the power of condemnation or eminent domain, the award made for such taking shall be payable to the District Association as Trustee for all Owners to be disbursed as follows: If the taking involves a portion of the Common Area on which Improvements have been constructed, then, unless within sixty (60) days after such taking the District Declarant or the District Association shall otherwise agree, the District Association shall restore or replace such Improvements so taken on the remaining land included in the Common Area to the extent lands are available therefor, in accordance with plans approved by the Board and the District Design Review Committee. If such Improvements are to be repaired or restored, the above provisions in Article V hereof regarding the disbursement of funds in respect to casualty damage or destruction shall apply. If the taking does not involve any Improvements on the Common Area, or if there is a decision made not to repair or restore, or if there are net funds remaining after any such restoration or replacement is completed, then such award or net funds shall be disbursed to the District Association and used for such purposes as the Board shall determine.

ARTICLE VIII
RIGHTS AND OBLIGATIONS OF THE DISTRICT ASSOCIATION

In addition to the powers delegated to the District Association by its Articles of Organization or the laws of the State of Tennessee, the District Association shall be empowered to perform each of the following duties related to the Property and Common Area:

Section 1. Operation and Maintenance of Common Maintenance Area. To operate, maintain and otherwise manage or provide for the operation, maintenance and management of the Common Maintenance Area, together with all easements for operation and maintenance purposes and for the benefit of the District Association or the Owners over and within the Common Area; to keep all Improvements, if any, of whatever purpose from time to time located on the Common Area in good order, condition, and repair.

Section 2. Title. Any other provision of this Declaration or the Bylaws notwithstanding, the District Association always shall maintain lien free title to the Common Area, excepting only a lien for current year taxes, provided, however, that the District Association may mortgage or convey the Common Area with an affirmative vote of at least sixty-seven percent (67%) of the Directors; and provided, further, that the District Association may accept a conveyance of the Common Area subject to a lien or other encumbrance.

Section 3. Seasonal or Other Decorations. To install and maintain seasonal and other decorations, lighting, street banners, and other items designed to enhance the appearance or attractiveness of the District or the enjoyment or experience of those living, shopping or otherwise participating in the District, in the sole discretion of the District Declarant or Board of Directors, the cost of which shall be a Common Expense. Common Maintenance Parcels are not allowed to attach anything or drill holes into the outside walls of the building.

Section 4. Water and Other Utilities. To acquire, provide, and/or pay for, water, sewerage, garbage disposal, electrical, telephone, gas, and other necessary utility services for the Common Area.

Section 5. Taxes and Assessments. To pay all real and personal property taxes and assessments separately levied upon or assessed against the District Association and/or the property owned by the District Association. Such taxes and assessments may be contested or compromised by the District Association; provided, however, that they are paid or a bond in an amount at least equal to such taxes and assessments is posted prior to the sale or other disposition of any property to satisfy the payment of such taxes or assessments.

Section 6. Insurance. To obtain from reputable insurance companies qualified to do business in the State of Tennessee the insurance set forth in this Declaration, and to maintain in force at all times such insurance as is required by this Declaration.

Section 7. Personal Property and Real Property for Common Use. The District Association, through action of its Board of Directors, may acquire, hold, and dispose of tangible and intangible personal property and real property. The Board, acting on behalf of the District Association, shall accept any real or personal property, leasehold, or other property interests within Maury County conveyed to it by the District Declarant as permitted herein.

Section 8. Rules and Regulations. The District Association, through its Board of Directors or otherwise, may make and enforce reasonable rules and regulations governing the use of the Property, which rules and regulations shall be consistent with the rights and duties established by this Declaration. Sanctions for violations of the rules and regulations may include reasonable monetary Fines (as hereinafter defined) and suspension of the right to use the Common Area. The Board shall, in addition, have the power to seek relief in any court for violations or to abate nuisances. In addition, the District Association, through the Board or

otherwise, may, by contract or other agreement, enforce city or county ordinances or permit the City of Columbia or Maury County to enforce ordinances on the Property for the benefit of the District Association and the Owners.

Section 9. Traffic Control. The Board may make rules and regulations concerning driving and parking within the Property, subject to applicable governmental requirements and restrictions. Without limiting the foregoing, to the extent permitted by local governmental authority, the District Association may construct traffic calming devices and post speed limits or other traffic signs and take other measures deemed necessary to discourage excessive speed and to promote a safe environment. The District Association may enforce such rules and regulations with penalties, Fines or towing, and shall have all remedies set forth in this Declaration.

Section 10. Implied Rights. The District Association may exercise any other right or privilege given to it expressly by this Declaration or the Bylaws, any law, statute or ordinance, and every other right or privilege reasonably to be implied from the existence of any right or privilege given to it herein or reasonably necessary to effectuate any such right or privilege.

ARTICLE IX
ASSESSMENTS

Section 1. Creation of Assessments. There shall be created annual Assessments as may be from time to time specifically authorized by the Board of Directors as follows (collectively, the "Annual Assessments"):

(a) The Board may levy general assessments for expenses determined by the Board to benefit the District Association and/or the District as a whole, including without limitation, expenses incurred by the District Association in fulfilling its maintenance obligations set forth in this Declaration or otherwise expressly or implicitly authorized by this Declaration, reserves as deemed appropriate by the Board, and the District Assessment ("General Assessments").

(b) The Board may levy a Common Maintenance Parcel Assessment against Common Maintenance Parcels for expenses determined by the Board to benefit only such Common Maintenance Parcels, including without limitation, expenses incurred by the District Association in fulfilling its maintenance or service obligations with respect to such Common Maintenance Parcels. Common Maintenance Parcels may be established with different levels of services and maintenance obligations for the District Association, and the Common Maintenance Parcel Assessment applicable to Common Maintenance Parcels may reflect such differences.

(c) The Board may levy a Special Use Assessment to the extent established by a Supplemental Declaration for any Special Use Parcel. In the event a Special Use Assessment is established, the General Assessments shall not apply to such Special Use Parcels. If no Special Use Assessment is established in a Supplemental Declaration by oversight or error, then the Declarant or the Board may at any time thereafter establish a Special Use Assessment in the Declarant's or the Board's discretion, to be applied to such Special Use Assessment from after the date of such establishment. The Special Use Assessment may include maintenance or landscaping responsibilities for areas within the District but not located within the Special Use Parcel.

Section 2. Operating Budget. It shall be the duty of the Board to prepare a budget covering the estimated costs of operating the District Association during the coming year, including without limitation Common Expenses and Common Maintenance expenses (the "Operating Budget").

Section 3. Capital Budget and Contribution. The Board of Directors shall annually prepare a capital budget that shall take into account the number and nature of replaceable assets, the expected life of each asset, and the expected repair or replacement cost (the "Capital Budget"). The Board shall set the required capital contribution, if any, in an amount sufficient to permit meeting the projected capital needs of the District Association, as shown on the Capital Budget, with respect both to amount and timing by Assessments over the period of the Budget. The capital contribution required shall be fixed by the Board and included within the Operating Budget and Assessment. The Capital Budget shall also provide for the establishment of separate reserve accounts to hold the proceeds of the Assessments imposed for capital expenditures.

Section 4. Allocation of General Assessments. Unless otherwise set forth in any Supplemental Declaration or District Declaration, General Assessments shall be allocated against all Lots (other than Special Use Parcels) within the District equally. Assessments for Special Use Parcels may include the responsibility for specific areas or maintenance or landscaping within the Development that shall not be considered in setting the General Assessments.

The Board shall set Assessments based on the Operating Budget and the Capital Budget. The Board shall cause a copy of the Operating Budget, the Capital Budget, and the amount of each General Assessment to be communicated to the Members of the District Association at least ten (10) days prior to the year for which Assessments shall be made. The Operating Budget, together with the Capital Budget and the Annual Assessments (collectively, the "Budget"), shall be adopted by the Board at a duly called meeting of the Board. Notwithstanding the foregoing, however, in the event a Budget is not established for any reason for any year, then and until such time as a Budget shall have been determined as provided herein, the Budget in effect for the then current year shall continue for the succeeding year. No failure to provide the Operating Budget or Assessments as required hereunder shall relieve any Lot Owner from payment of such Assessments once established.

Section 5. Special Assessments. In addition to the Annual Assessments authorized above, the Board may levy, during any calendar year, special assessments, applicable only to that year, to be used solely to defray, in whole or in part, the cost of any construction, reconstruction, or unexpected repair or replacement of a capital improvement, including the necessary fixtures and personal property related thereto ("Special Assessments"). The Board may levy a Special Assessment against all Lots for such expenses determined by the Board to benefit the District Association and/or the District as a whole, and may levy a Special Assessment against particular Lots for such expenses as may be determined by the Board to benefit less than the Master Association or District as a whole.

Section 6. Assessment Obligation. Assessments against each Lot shall commence on recording of a Supplemental Declaration, District Declaration or Sub-District Declaration applicable to such Lot, provided, however, that the applicable Supplemental Declaration or District Declaration or Sub-District Declaration may, with the approval of Master Declarant and District Declarant, suspend or delay the payment of Assessments as set forth therein. Each Owner, by acceptance of his or her Deed, is deemed to covenant and agree to pay all

Assessments levied by the District Association, whether or not such obligation is so expressed in such Deed. Each Owner shall be deemed a direct beneficiary of the Common Expenses of the Master Association, which are made for the benefit of the entire Development, and apportionment of the District Assessment shall be payable be each Lot Owner. Notwithstanding any other provision of this Declaration, no Assessments shall be levied against Lots or other Property owned by the District Declarant, its successors or assigns.

(a) All Assessments, together with interest at the highest rate allowable under the laws of Tennessee from time to time relating to usury (or if no such rate is established, sixteen percent (16%) per annum) ("Interest"), costs, and reasonable attorneys' fees, shall be a charge on the land and shall be a continuing lien upon the Lots within the District against which each Assessment is made. Each Assessment, together with Interest, costs, and reasonable attorneys' fees, shall also be the personal obligation of the Person who was the Owner of such Lot at the time the Assessment arose, and his or her grantee shall be jointly and severally liable for such portion thereof as may be due and payable at the time of conveyance, except no first Mortgagee who obtains title to a Lot pursuant to the remedies provided in the Mortgage shall be liable for unpaid Assessments which accrued prior to such acquisition of title in excess of six (6) months accrued Assessments.

(b) Assessments shall be paid in such manner and on such dates as may be fixed by the Board. The manner of payment fixed by the Board may include, without limitation, acceleration of the Assessment levied on a particular Lot on account of delinquent payment of such Assessment or monthly installment thereof. Unless the Board otherwise provides, Annual Assessments shall be paid in quarterly installments. Without limiting the foregoing, the Board may also levy a late charge on Assessments not timely paid, in the discretion of the Board.

Section 7. Lien for Assessments. To secure the payment of any Assessment and/or fine imposed by the District Association pursuant to this Declaration (each such fine, a "Fine"), a lien is expressly retained in favor of the District Association on each and every Lot or Special Use Parcel in the District Association. Such lien shall be prior and superior to all other liens, except all taxes, bonds, assessments, first mortgage liens, liens in favor of the Master Association, and other levies which by law would be superior thereto.

Section 8. Start-up Assessment. Each Lot Owner who takes title to a Lot shall pay to the District Association at closing a start-up assessment fee in an amount established by the Board from time to time (the "Start-up Assessment"). This one time Start-up Assessment shall be in addition to and not a prepayment of the regular Assessments provided for above. The District Declarant may, by Supplemental Declaration, Sub-District Declaration, contract, or otherwise, exempt certain properties from the Start-Up Assessment, limit the payment of the Start-Up Assessment to certain transactions, or otherwise alter the general obligations set forth hereunder.

Section 9. Transfer Assessment. The Board may establish an Assessment to be paid by the purchaser of any Lot within the Property on transfer or conveyance of such Lot from time to time (the "Transfer Assessment"). The amount of such Transfer Assessment shall be established by the Board from time to time. The Transfer Assessment shall not be due on any closing of a Lot in which the Start-Up Assessment is paid. District Declarant may, by

Supplemental Declaration, Sub-District Declaration, contract, or otherwise, exempt certain properties from the Transfer Assessment, limit the payment of the Transfer Assessment to certain transactions, or otherwise alter the general obligations set forth hereunder.

Section 10. Administrative Fee. In addition to the Start-Up Assessment and Transfer Assessment, the Board may establish an administrative fee that the purchaser of any Lot within the Property shall be obligated to pay. The purpose of the Administrative Fee is to pay for the administrative expenses of the District Association or its agent resulting from the change in Lot ownership.

Section 11. Use of Assessments and Fees. The Start-Up Assessment and Transfer Assessment collections may be used as the Board of the District Association shall deem appropriate, which use may include, without limitation, operating costs of the District Association, the payment for capital improvements of the District Association, the establishment of reserves, or the establishment of a fund, account or nonprofit corporation formed for the purpose of enhancing, directly or indirectly, the District and the Owner, including the support of charitable, educational, social or beneficial organizations, causes, events or scholarships.

Section 12. Certificate of Payment. The Board shall, upon request and for a reasonable charge, furnish to any Person a certificate, signed by an officer of the District Association, setting forth whether or not all Assessments, whether General or Special, or other applicable fees or Interest, on a specified Lot or Special Use Parcel have been paid. Such certificate shall be conclusive evidence of payment of any Assessment therein stated to have been paid.

Section 13. Legal Fees for Enforcement. Any legal fees incurred in relation to the resolution of a violation enforcement action will automatically be considered an Assessment therefore will carry the same collection powers of a regular assessment.

ARTICLE X
CONSTRUCTION AND ARCHITECTURAL STANDARDS

Section 1. Construction Standards. Owners shall construct all Improvements on Lots in accordance with plans and specifications approved by the City of Columbia , Tennessee (the "City"). Further, no Person shall construct any Improvements upon a Lot, or after completion of such Improvements, make any modifications, additions or alterations to such Improvements, without the prior written approval of the Master Design Review Committee and District Design Committee (as defined below). In no event shall the District Design Review Committee approve any plans violating the use restrictions set forth in Article XI below, and no purported approval shall constitute a waiver of such restrictions.

Section 2. Design Review Committee. The District Declarant or Board, as applicable, shall designate a site and architectural review board (the "District Design Review Committee") consisting of up to five (5) persons, one of which may be an architect selected by District Declarant (a "Qualified Architect"), to exercise the Board's authority under this Article. The District Design Review Committee shall promulgate detailed standards and procedures in implementing the requirements of this Article, in addition to the Design Guidelines. So long as District Declarant owns any land within the District or subject to this Declaration or remains the District Declarant, the District Declarant may select the membership of the District Design

Review Committee. Thereafter, the Board shall select the membership of the District Design Review Committee. The District Design Review Committee shall also have the authority to hire such contractors or employees in support of its review and administration obligations as it may reasonably determine to be necessary or appropriate, the costs of which shall be paid by the applicants or included in Common Expenses. This Article shall be effective, and may not be amended without the prior written consent of District Declarant, so long as District Declarant owns any land subject to this Declaration or subject to annexation by this Declaration.

Section 3. Construction Subject to Review.

(a) Review of Plans. Prior to construction of any exterior improvement, the District Design Review Committee must review and approve construction plans and specifications for all Improvements on any Lot within the Property. No construction on any Lot shall begin and no Improvements on any Lot shall be modified except in accordance with an approved plan. Once a plan is approved, any modification to that plan, or any modification to the finished Improvement, must also be reviewed and approved.

(b) Common Area. Construction of any Improvement upon the Common Area (other than initial construction by the Declarant), or modification of any existing structure, as well as any material alteration of the landscaping or topography of any Common Area, must be approved in advance by the Design Review Committee.

(c) Scope. The Design Guidelines shall set standards for all aspects or improvement on any Lot visible from the outside, including without limitation the size and shape of any building, its roof, windows, doors, porches and other components, placement on the Lot, fences, drainage, paving and landscaping and all finish materials. The Design Guidelines may also regulate the type, placement and number of Improvements that may be constructed on a Lot and the uses to which those Lots may be put. Review shall include materials and color selection and selection and placement of any ornamentation or functional accessories, including but not limited to the following:

(i) Materials and color selection for the main building and any outbuilding (including roof, doors, windows and trim);

(ii) Driveways, walks, patios and other ground surface materials;

(iii) Parking areas and drive through lanes;

(iv) Outdoor eating areas;

(v) Lighting;

(vi) Signage of any type;

(vii) Antennas, satellite dishes or receivers, solar panels or other devices that are visible from outside the Lot;

(viii) Fountains, swimming pools, or other water features;

(ix) Privacy walls or other fences and gates;

(x) Awnings, flower boxes, shelves, statues, or other outdoor ornamentations, and window coverings visible through the window;

(xi) Construction trailers or other trailers, temporary structures, tents, shacks, and sheds;

(xii) Grills or fire pits; and

(xiii) Permanent or semi-permanent play equipment, whether or not secured, such as tree houses, trampolines, basketball hoops, skateboard ramps and swing sets.

The listing of a category does not imply that such construction is permitted.

(d) Exception. Interior construction and modifications not affecting the external structure or appearance of any building and not visible from the exterior are not subject to review. However, construction drawings are required as part of the review process to assist in interpreting the design.

(e) Trees. Owners may be required to plant street trees on their Lot or within Common Area or public rights-of-way adjacent to their Lot, in accordance with the direction of the District Design Review Committee, to maintain trees and to replace trees that die or that become damaged or diseased, or the District Association may elect to take such actions for the benefit of Owners, the cost of which will be part of the Common Expenses. The cutting, removal or intentional damage of new or existing trees (including neglect, excessive pruning or failure to use due care with equipment or when removing other trees permitted to be removed) shall be prohibited and subject to enforcement under this Declaration. The District Design Review Committee may require the relocation and replanting of trees that must be removed for construction. If particularly significant trees are found within a Lot, the District Design Review Committee shall determine whether the placement of the building should be altered to accommodate the trees, or whether the trees may be removed. If trees or other growth block sidewalks or other areas, the Owner may be required to prune, trim or remove such growth. The Master Association may also take action to keep sidewalks and other areas clear, including pruning, trimming and removal of limbs on trees within a Lot, and may enter any Lot for such purpose.

(f) Drainage. All plans shall comply with and Owners shall be solely responsible for applicable drainage, water conservation, erosion control and stormwater detention requirements. No alteration of existing grade or any planting, fences or other improvements that alter the flow of water shall be permitted without the express consent of the District Design Review Committee, which approval shall be for the exclusive benefit of the Declarant or District Association, as applicable, and shall not remove or alter the responsibility of any Owner or builder for compliance with such requirements. Notwithstanding any other provision of this Declaration, neither District Declarant nor the District Association shall have the responsibility to ensure that drainage or grading of Lots is properly accomplished. Each Owner shall be solely responsible to ensure that grading and drainage are in compliance with all applicable

laws, codes, regulations and other requirements, including without limitation any easements for drainage, whether or not shown on any recorded plat and must provide a as-built drawing of finished grading and drainage to ensure these items are in compliance. The Homeowner will be charged in the event they do not provide the approved as-builts to the Committee, and any costs to the developer to fix any grading or drainage that were not caused by the developer.

(g)

(h) Modifications. Modifications after completion of construction, or additions or changes to the approved plans during construction, must be reviewed and approved. However, review is not required to paint with originally approved materials and colors, or to replace the roof or other components with duplicates of the original material. Significant new landscaping, grading and any removal of trees or plants must be approved in advance.

Section 4. Review Procedure.

(a) Application. The plans to be submitted for approval shall include (i) the construction plans and specifications, including all materials and colors, (ii) elevations of all proposed improvements (iii) proposed clearing, grading and landscaping, and (iv) all other items required by the District Design Review Committee. Plans and specifications for review shall be submitted in the form required by the District Design Review Committee.

(b) Uniform Procedures. The District Design Review Committee may establish forms and procedures for the review of applications, including review costs and fees, if any, to be paid by the applicant, which may include costs for the Qualified Architect. The District Design Review Committee may provide lists of approved materials and may allow for staff review and approval of routine or minor matters.

(c) Basis for Decision. Applications shall be approved or denied based upon overall quality of design, including purely aesthetic considerations at the discretion of the District Design Review Committee. If the District Design Review Committee rejects an application due to overall design quality or aesthetic considerations, despite compliance with the Design Guidelines, the District Design Review Committee may make suggestions for improving the design.

(d) Variances. The District Design Review Committee may grant approvals notwithstanding normal guidelines based on existing topographical or landscape conditions, existing trees, or architectural merit. Any such variance must be in writing. Approval of a variance does not constitute a precedent for other applications, and such requests may be arbitrarily denied. Notwithstanding the foregoing, the District Design Review Committee shall not have the right to waive any guidelines imposed by the Master Design Review Committee, the Master Declaration, or other requirement established by Master Declarant or the Master Association without their prior written consent.

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(e) Notification; Construction; Inspection. The District Design Review Committee shall make best efforts to notify the applicant of its decision within the time allowances set out in its design approval process guidelines. However, a delay in reviewing an application shall not be deemed consent to construction. If approval is given, construction of the Improvements may begin. All construction must comply with the submitted plans. The District Design Review Committee or its agent may inspect the property during construction but has no obligation to make any such inspection. Any inspection made by the District Design Review Committee is made for the benefit of the District Design Review Committee or District Declarant, and is not made for the benefit of or to be relied upon by any third party or Owner.

(f) Completion. When the primary building and landscaping are completed in substantial compliance with the approved plans and specifications, the District Design Review Committee may on request issue a Certificate of Substantial Conformance. The Certificate shall describe any areas of deficiency that need to be corrected. All Fines and other enforcement shall be waived so long as the deficiencies are corrected within sixty (60) days. Upon correction of all deficiencies, the District Design Review Committee shall issue a Certificate of Completion and Release in recordable form. If no Certificate of Substantial Conformance is requested, the District Design Review Committee shall not be estopped from later determining that a deficiency needs correction, and reserves all rights of Fines and enforcement.

(g) Governmental Compliance. Owners are responsible for making sure that construction conforms to governmental regulations and all local building codes. If the District Design Review Committee notes noncompliance, the Owner will be required to make the necessary changes. However, the District Design Review Committee is not responsible for compliance with governmental requirements.

Section 5. Approval of Architects, Builders. District Declarant shall have the right to approve any and all architects or builders in all or any portion of the District, in its sole discretion. District Declarant's approval of an architect, builder or other design professional shall not constitute any representation or endorsement of such professional's character, experience or professional capabilities.

Section 6. Enforcement.

(a) Fines. The District Design Review Committee may require the Builder or Owner to post a deposit from which the District Design Review Committee may deduct Fines for failure to comply with the approved plans and specifications, tree regulations and rules for builder conduct. The collection of a Fine shall not in any way diminish the available remedies at law or equity.

(b) Suit Permitted. If any construction is begun that has not been approved or that deviates from approved plans and specifications, the District Design Review Committee, District Declarant or the District Association may require the Owner to resolve the dispute through binding arbitration or may bring suit seeking damages, specific performance, declaratory decree and/or injunction, or any other remedy at law or in equity. The Board shall be empowered to bring suits on behalf of the District Association. If suit is brought and the court finds that the construction was not

approved or that the construction deviated from the approved plans or specifications, then the party bringing suit shall also be awarded reasonable attorney's fees, even if the relief requested is not granted.

(c) Trees and Hedges. Improper cutting, removal, lack of care or intentional damage to existing trees and hedges may be subject to the imposition of Fines plus a requirement that the tree be replaced with an approved species of comparable caliper, or, if approved by the District Design Review Committee, a combination of trees totaling the caliper of the removed tree, or that hedges be replaced with an approved hedge plant. Fines shall be set by the District Design Review Committee.

(d) Drainage. After reasonable notice (except in an emergency), District Declarant or the District Association shall have the right but not the obligation to enter onto a Lot and correct improper grading or other modification to the Lot which causes drainage problems. Such corrections shall be made at the cost and expense of the Owner of the Lot, who shall promptly reimburse District Declarant or the District Association, as applicable. The Lot shall be subject to a lien for the cost if not paid. District Declarant or the District Association, as applicable, shall not be required to repair or replace landscaping or other improvements after such action.

(e) No Waiver. Failure to enforce any provision of this Declaration shall not be deemed a waiver of the right to do so at any time thereafter.

Section 7. Liability. District Declarant and District Design Review Committee and its inspectors are concerned primarily with aesthetic considerations, and are not responsible for compliance with governmental requirements or design or construction defects or use of materials affecting the safety or structural integrity of the building. Approval by the District Design Review Committee of an application shall not constitute a basis for any liability of the Qualified Architect, District Declarant, members of the District Design Review Committee, the Directors of the Board or the District Association for failure of the plans to conform to any applicable building codes or inadequacy or deficiency in the plans resulting in defects in the improvements, or for the performance or quality of work of any builder or architect approved by it, or for non-compatible or unstable soil conditions or soil erosion, or any other condition of the property.

ARTICLE XI
USE RESTRICTIONS

Section 1. Use Restrictions. In addition to all other covenants contained herein, the use of the Property is subject to the following; provided, however, that if any Supplemental Declaration or Sub-District Declaration expressly permits uses or matters that would otherwise be prohibited, with the express consent of District Declarant, then such Supplemental Declaration or Sub-District Declaration shall control over this Declaration for purposes of this Article XI:

(a) Maintenance of Exterior and Interior. Except as provided in this District Declaration or any Supplemental Declaration, each Owner shall be responsible for the maintenance of, and shall maintain, the exterior and interior of its Lot and any Improvements in a clean, sanitary, and attractive condition, and shall (1) keep its Lot free from rubbish, litter, and noxious weeds; (2) maintain, cultivate, and keep in good

condition and repair shrubs, trees, grass, lawns, plantings, and other landscaping located, or from time to time placed, within the bounds of its Lot; and (3) replace dead plants, shrubs, trees, grass, or landscaping of the same or similar type. If any irrigation system is in place on any Lot, the Master Association may require that the Owner maintain such irrigation system and keep such system in use to the extent required to keep a maintain healthy landscaping.

(b) Association to Landscape Common Area. Except as otherwise provided herein, the District Association shall have the right and the obligation at any time to plant, replace, maintain, and cultivate shrubs, trees, grass, plantings, and other landscaping upon the Common Maintenance Area located on the Property. No Owner shall remove, alter, or injure in any way any shrubs, trees, grass, plants or other landscaping placed upon or about a Lot by District Declarant or the District Association, without first obtaining the written consent of the Board.

(c) Signs and Billboards; Exterior Lights. No sign or billboard of any kind shall be displayed to the public view on any portion of the Common Area, except for (1) directional or informational signs, established by District Declarant or the District Association, (2) signs used by District Declarant, or by its successors or assigns, to advertise the Property, provided such signs are located on the Common Area, and (3) signs permitted under any Supplemental Declaration or Sub-District Declaration, provided that the Board may establish or require a common signage system for such purposes and such system shall prevail over the general provisions of this subsection.

(d) Quiet Enjoyment. No noxious, offensive or illegal activity shall be carried on, in or upon any Lot or any part of the Property, nor shall anything be done thereon that may be or may become an annoyance or nuisance to the neighborhood, that shall interfere in any way with any Owner's quiet enjoyment of its respective Lot, or that shall increase the rate of insurance in any way.

(e) Temporary Structures. No structure of a temporary character or other out-building shall be used on any Lot or the Common Area at any time as a residence or otherwise, either temporarily or permanently. Notwithstanding the foregoing, District Declarant or its agents shall have the right to conduct any business necessary for the sale of Lots, including showing model Lots and maintaining a sales and/or construction office on the Common Area or in any Lot owned by Declarant. In furtherance thereof Declarant shall have an easement over all of the Common Area for ingress, egress and parking for itself, its agents, employees, and prospective buyers of Lots for so long as District Declarant or any subsidiary or affiliated company owns any interest in the Property, and District Declarant may block or restrict access over and across roadways so long as access to a particular Lot owned by a Person other than District Declarant is not prohibited.

(f) Animals. No animals, reptiles, rodents, livestock, birds, or poultry of any kind shall be raised, bred or kept in or on any Lots, other than bona fide service animals or household pets. No household pets shall be kept outside the dwelling or housing unit, and any outside activity shall be under the active control I.E. leashed, of the Owner or one acting on the Owner's behalf. Without limiting the foregoing, animals who repeatedly bark, are aggressive, or other create a negative impact on other Owners

or other persons may be subject to further restrictions and, in the discretion of the Board, removed from the Development. No animal may be kept in a manner that, in the sole determination of the Board, is unhealthy or cruel for such animal, including without limitation keeping animals tied up or tethered for extended periods of time. In making any determination of cruelty or unhealthy conditions, the Board shall have the right but not the obligation to consult governmental or private animal control or shelter organizations. The Board may permit variances to the restrictions set forth in this subsection in the Board's sole discretion. The Board may establish further rules and regulations for control of animals and household pets, and may impose Fines for violations of the foregoing or additional rules and regulations in addition to requiring removal of animals from the Development.

(g) Vehicles. No truck, trailer, camper, boat, van or similar equipment or disabled vehicle shall be permitted to remain upon or within the Common Area or public streets unless on a space designated for such use by the District Association. No such equipment may be stored or permitted to remain upon a Lot or any portion of the Common Area or public streets for more than forty-eight (48) hours unless stored in an enclosed garage.

(h) Exterior Structures. No fences, ornamental screens, awnings, screen doors, sunshades except as approved by or under general rules adopted by the District Design Review Committee.

(i) Garbage Collection. All rubbish, trash, and garbage shall be removed from the Property regularly and shall not be allowed to accumulate thereon. All refuse containers, clothes lines, woodpiles, storage areas, machinery, or equipment shall be kept in such a manner as not to be visible from neighboring property or contiguous streets. No incinerators shall be kept or maintained on any Lot. Refuse containers shall not be placed outside for trash pickup prior to 6:00 p.m. on the day prior to such pickup, and shall be returned to non-visible areas no later than the end of the day on which pickup is made. No debris, trash, ashes, lawn clippings, leaves, leaf bags or other refuse may be thrown or dumped on any of the Lots or Common Area. Debris and trash during the construction of an Owner's Improvements shall be collected by each Owner (or his or her representative) in containers approved by the District Design Review Committee and periodically removed so that no unsightly condition occurs on the Lot or adjoining Lots.

(j) Taxes and Utilities. Each Owner shall pay any real and personal property taxes or charges assessed against their respective Lot and Improvements and the utility charges for said Improvements.

(k) Infections, Plant Diseases or Insects. No Owner shall permit anything or condition to exist upon any portion of such Owner's Lot that shall induce, breed, or harbor infections, plant diseases, vermin or noxious insects.

(l) Reasonable Inspection and Entry. The Board shall have the right of inspection and entry onto Lots in order to perform the duties and obligations of the Board under this Declaration and under the Bylaws. In addition, District Declarant, the District Association, and their designees shall have the right to enter upon a Lot for the

purpose of cutting grass, hedges and shrubbery and providing maintenance agreed upon with the Owner thereof.

(m) Trade or Business. No gainful profession, occupation, trade or other nonresidential use shall be conducted in any Lot designated for residential purposes or upon the District Common Area or any portion thereof without the prior approval of the Board. Special Use Parcels or areas in which a mix of business and residential purposes are appropriate shall be governed by the provisions of any Supplemental Declaration or Sub-District Declaration covering such portions of the Development. The Board may disapprove such a trade or business in the event that it determines that the trade or business would have a negative impact on the Property, including, without limitation, creating problems related to traffic, parking or security. In determining whether to approve a trade or business conducted in a residential Lot, the Board shall be provided with detailed information on (i) the type of trade or business and (ii) the activities related thereto that could potentially affect the Property. In the event that the Board approves a certain trade or business (the "Approved Use"), then so long as the activities related to that Approved Use do not materially change from the activities described to and approved by the Board, the Board (whether or not the composition of the Board changes) shall not have the right to disapprove the Approved Use after the date of the original approval, subject to subparagraph (s) below. Notwithstanding the foregoing, an Owner or occupant residing in a unit within the Development may conduct business activities within the unit so long as: (a) the existence or operation of the business activity is not apparent or detectable by sight, sound, signage or smell from outside the Unit; (b) the business activity conforms to all applicable zoning, law, statute or ordinance requirements; (c) the business activity does not involve persons coming onto the Development who do not reside in the Development or door-to-door solicitation of residents of the Development; and (d) the business activity is consistent with the residential character of the Property and does not constitute a nuisance, or a hazardous or offensive use, or threaten the security or safety of other residents of the Development, as may be determined in the sole discretion of the Board. The terms "business" and "trade", as used in this provision, shall be construed to have their ordinary, generally accepted meanings, and shall include, without limitation, any occupation, work or activity undertaken on an ongoing basis which involves the provision of goods or services to persons other than the provider's family and for which the provider receives a fee, compensation, or other form of consideration, regardless of whether: (i) such activity is engaged in full or part-time; (ii) such activity is intended to or does generate a profit; or (iii) a license is required therefor.

(n) Compliance with Law. The District Association and each Owner shall comply promptly with all laws, statutes, ordinances, rules and regulations of federal, state or municipal governments or authorities applicable to use, occupancy, construction and maintenance of any Improvements upon the Lots, including without limitation any zoning or other approvals or restrictions.

(o) Damage from Plants. No Owner shall permit any plant, tree, shrubbery or other similar item to exist upon any portion of such Owner's Lot that shall damage or create a nuisance on another Lot or that has not been approved by the District Design Review Committee. The Board shall determine conclusively, in its sole and absolute

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discretion, whether, for the purpose of this paragraph, a particular plant, tree, shrubbery, or other similar item is a nuisance and therefore to be removed from the Property.

(p) Wells. No private wells may be drilled or maintained on any Lot without the prior written consent of the District Design Review Committee.

(q) Laundry. Without the express permission of the District Design Review Committee, no Owner, guest, or tenant, shall hang laundry from any area within or outside the Improvements on a Lot if such laundry is within the public view, or hang laundry in full public view to dry, such as on balcony or terrace railings.

(r) Firearms and Other Weapons. Discharge of firearms and other weapons is prohibited; provided, the Board shall have no obligation to take action to prevent or stop such discharge; provided, further, however, that nothing in this provision shall be deemed to prevent the Declarant or Board, or the Declarant or Board of any Sub-Association, with the consent of Declarant or Board, from establishing or permitting facilities, Lots, or other areas where such activities may be permitted, whether on a private or retail basis. For this purpose, firearms and weapons shall be deemed to include any instrument that may or is designed to propel or discharge bullets, arrows, or other objects by use of explosive force, compressed air, elastic contraction or other means, including without limitation handguns, rifles, shotguns, pellet guns, BB guns, cross-bows, and long or compound bows. This definition shall be broadly construed, and the Declarant and Board of Directors shall have discretion to determine whether a particular object or instrument is a firearm or weapon in its sole discretion.

(s) Restriction on Rentals. No Living Unit shall be rented to a non-Owner except with the prior written consent of the Association.

(i) If an Owner shall desire to rent its Living Unit to a third-party, the Owner shall be required to submit to the Association all of the following, in form and content satisfactory to the Association:

(1) An application for rental providing, among other things, the identity of the Living Unit, the name of the proposed tenant and occupants, the proposed term of the rental, and contact information for the Owner while not occupying the Living Unit.

(2) A copy of a qualifying lease. For purposes of this section, a qualifying lease is one that is for a term not less than twelve (12) months and that expressly advises tenant that the Living Unit is subject to the Declaration and that the tenant is responsible for compliance with the Declaration and all other rules and regulations adopted by the Association from time to time.

(3) A copy of a background check on the prospective tenant and all occupants of the Living Unit provided with the written consent of the prospective tenant and that indicates no prior criminal

convictions or any sex offender status or other matter reasonably objected to by the Association.

(4) Any fee charged by the Association for review of the application and other material.

(5) Upon approval, a copy of the executed tenant lease.

(ii) A failure to procure approval prior to leasing a Living Unit shall constitute a violation of the Declaration and, among other things, the Association shall be entitled to injunctive relief against such Owner and the tenant, the Owner acknowledging that legal remedies may not be adequate. The Owner shall be subject to all expenses of the Association resulting from any such violation, including without limitation reasonable attorney fees and other costs of enforcement.

(iii) The Board shall have the power to waive the foregoing restrictions and to reduce the minimum lease term for good cause shown, in the sole discretion of the Board.

(iv) Notwithstanding the foregoing, no Owner shall lease, license for occupancy, or otherwise permit a non-Owner to remain in a Living Unit for a period of less than thirty (30) days if consideration is given for such stay or if such occupancy is advertised by any medium, including without limitation short term rentals.

Section 2. Age Restriction. The District is intended to provide housing primarily for persons 55 years of age or older, subject to the rights reserved to District Declarant as may otherwise be provided herein. The District shall be operated as an age restricted community in compliance with all applicable state and federal laws. No person under 19 years of age shall stay overnight in the improvements on any Lot for more than ninety (90) days in any consecutive twelve (12) month period unless approved by the Board for special consideration. Each Lot, if occupied, shall be occupied by at least one (1) individual 55 years of age or older; provided, however, that once a Lot is occupied by an Age-Qualified Occupant, other Qualified Residents of that Lot may continue to occupy the Lot, regardless of the termination of the Age-Qualified Occupant's occupancy. Notwithstanding the above, at all times, at least eighty percent (80%) of the Lots within the District shall be occupied by at least one (1) individual 55 years of age or older. The Board shall establish policies and procedures from time to time as necessary to monitor and maintain its status as an age restricted community under state or federal law. The Association shall provide, or contract for the provision of those facilities and services designed to meet the physical and social needs of older persons as may be required under such laws. The provisions of this Section may be enforced by the Association by an action in law or in equity, including, without limitation, an injunction requiring specific performance hereunder.

Section 3. Additional Restrictions. The Board of Directors shall be entitled to invoke additional rules and regulations from time to time for the operation, use and maintenance of the Property located within its jurisdiction, including the Lots and the Common Area, provided such rules and regulations are not inconsistent with this Declaration.

ARTICLE XII
GENERAL PROVISIONS

Section 1. Term. The covenants and restrictions of this Declaration shall run with and bind the Property, and shall inure to the benefit of and shall be enforceable by the District Association or the Owner of any of the Property subject to this Declaration, their respective legal representatives, heirs, successors and assigns, for a term of thirty (30) years from the date this Declaration is recorded. After the initial thirty (30) year term has expired, the term of this Declaration shall be automatically extended for successive periods of ten (10) years, unless an instrument in writing, signed by sixty-seven percent (67%) of the then Owners, has been recorded within the year preceding the beginning of each successive ten-year period, agreeing to change said covenants and restrictions, in whole or in part, or to terminate the same.

Section 2. Amendment. This Declaration may be amended by a sixty-seven percent (67%) affirmative vote of the Owners present, in person or by proxy, at any duly called meeting, and the written approval of the Master Declarant and District Declarant during the respective Declarant Control Period. During the Declarant Control Period, District Declarant may unilaterally amend this Declaration for any purpose. Any amendment shall not become effective until recorded in the Office of the Register's Office for Maury County, Tennessee. No amendment may remove, revoke, or modify any right or privilege of District Declarant without the written consent of District Declarant or the assignee of such right or privilege. After the Declarant Control Period, the Declarant may unilaterally amend this Declaration so long as such amendment is designed to comply with any law, regulation or provision of the Federal Home Loan Mortgage Corporation or Federal National Mortgage Association.

Section 3. Indemnification. The District Association shall indemnify its officers and directors against any and all expenses and liabilities, including attorney fees, reasonably incurred by or imposed upon any officer or director in connection with any action, suit, or other controversy or proceeding (including settlement of any suit or proceeding, if approved by the then Board of Directors) to which he or she may be a party, or may become involved, by reason of being or having been an officer or director of the District Association. The officers and directors shall not be liable for any mistake of judgment, negligent or otherwise, except for their own individual willful misfeasance, malfeasance, misconduct or bad faith. The officers and directors shall have no personal liability with respect to any contract or other commitment made by them, in good faith, on behalf of the District Association (except to the extent that such officers or directors may also be Members of the District Association), and the District Association shall indemnify and forever hold each such officer and director free and harmless against any and all liability to others on account of any such contract or commitment. Any right to indemnification provided for herein shall not be exclusive of any other rights to which any officer or director, or former officer or director, may be entitled. The District Association shall, as a common expense, maintain adequate general liability and officers' and directors' liability insurance to fund this obligation, if such insurance is reasonably available.

Section 4. Delegation of Use. Any Owner may delegate, in accordance with the Articles of Organization of the District Association and this Declaration, his or her right of enjoyment to the Common Area and facilities to customers, the members of his or her family, tenants and social invitees, subject to such rules and regulations as the Board of Directors may adopt.

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Section 5. Construction and Sale by District Declarant. Notwithstanding any provisions contained in this Declaration to the contrary, so long as construction and initial sale of Lots or Improvements shall continue, it shall be expressly permissible for District Declarant to construct, maintain and carry on upon portions of the Property, other than Lots owned by persons other than District Declarant, such facilities and activities as, in the sole opinion of District Declarant, may be reasonably required, convenient, or incidental to the construction or sale of such Lots, including, but not limited to, business offices, signs, utilities, model units, and sales offices, and District Declarant and its invitees shall have an easement for access to such facilities. District Declarant may further delegate all or some of the privileges set forth in this Section 8 to any Person in the sole discretion of District Declarant. This Section may not be amended without the express written consent of District Declarant.

Section 6. Severability. Invalidation of any one of these covenants or restrictions by judgment or court order shall in no way affect any other provisions, which shall remain in full force and effect. Each covenant and restrictions shall be enforced to the fullest extent permitted by law.

Section 7. Enforcement. The District Association, or any Owner, shall have the right to enforce, by any proceeding at law or in equity, all restrictions, conditions, covenants, reservations, liens and charges now or hereafter imposed by the provisions of this Declaration. Failure by the District Association or by any Owner to enforce any covenant or restriction herein contained shall in no event be deemed a waiver of the right to do so thereafter. Without limiting the foregoing, the District Association shall have the authority to enforce the restrictions, conditions, covenants and rules and regulations now or hereafter adopted pursuant to this Declaration by the imposition of Fines on Owners, which shall be established by the Board of Directors in its discretion, and enforced and collected as a Special Assessment pursuant to the Declaration. The Board of Directors may establish notice, hearing and other procedures from time to time in conjunction with the use and levying of Fines.

Section 8. Use of the Words "_____". No Person shall use the words "_____ _____" or "_____ at Columbia Bluffs" or any derivative thereof in any printed or promotional material without the prior written consent of District Declarant and Master Declarant.

Section 9. Disclosures. Each Owner acknowledges the following:

(a) The Property is located adjacent to thoroughfares that may be affected by traffic and noise from time to time and may be improved and/or widened in the future.

(b) The views from an Owner's Lot may change over time due to, among other circumstances, additional development and the removal or addition of landscaping.

(c) No representations are made regarding the zoning of adjacent property, or that the category to which adjacent property is zoned may not change in the future.

(d) No representations are made regarding the schools that currently or may in the future serve the Development or any Lot.

(e) Since in every neighborhood, there are conditions that different people may find objectionable, it is acknowledged that there may be conditions outside of the Property that an Owner may find objectionable and that it shall be the sole responsibility of the Owners to become acquainted with neighborhood conditions that could affect a Lot.

(f) All Owners acknowledge and understand that District Declarant and builders or developers will be constructing/renovating portions of the District and engaging in other construction activities related to the construction of Common Area and improvement of Lots. Such construction activities may, from time to time, produce certain conditions within the District, including, without limitation: noise or sound that is objectionable because of its volume, duration, frequency or shrillness; smoke; noxious, toxic, or corrosive fumes or gases; obnoxious odors; dust, dirt or flying ash; unusual fire or explosion hazards; temporary interruption of utilities; and/or other conditions that may threaten the security or safety of persons within the District. Notwithstanding the foregoing, all Owners agree that such conditions within the District resulting from renovation and construction activities shall not be deemed a nuisance and shall not cause District Declarant and its agents to be deemed in violation of any provision of this Declaration.

ARTICLE XIII
DECLARANT'S RIGHTS

Section 1. Withdrawal or Addition of Property. District Declarant reserves the right to amend this Declaration, for the purpose of removing any portion of the Property or to add additional property to be subject to this Declaration by Supplemental Declaration. Such amendment shall not require the consent of any Person other than the Owner(s) of the property to be withdrawn, if not the District Declarant. If the property is Common Area, the District Association shall consent to such withdrawal. The inclusion of real property in the term "District" shall not be deemed to obligate Declarant to acquire such real property or to include such property within the Property or the Development except in the sole discretion of Declarant.

Section 2. Marketing and Sales Activities. District Declarant and Persons authorized by District Declarant may construct and maintain upon portions of the District and the Common Area such facilities and activities as, in District Declarant's sole opinion, may be reasonably required, convenient, or incidental to the construction or sale of Lots, including, but not limited to, business offices, signs, model units, and sales offices. District Declarant and authorized Persons shall have easements for access to and use of such facilities at no charge.

Section 3. Right to Approve Changes in District Design Standards. No amendment to or modification of any restrictions and rules or architectural guidelines shall be effective without prior notice to and the written approval of District Declarant so long as District Declarant owns property subject to this Declaration or which may become subject to this Declaration in accordance with this Article.

Section 4. Provision of Telecommunication Services. District Declarant shall have the right to enter into an agreement with one or more authorized providers of Telecommunication Services pursuant to which such providers may have the exclusive right to provide

Telecommunication Services to all or a particular portion or portions of the District, subject to approval by Master Declarant.

Section 5. Right to Use of Amenity Center. District Declarant shall have the right to use any amenity center within the Development without cost at any time and to permit other parties, including without limitation builders or industry groups, the same privilege of usage at no cost.

Section 6. Right to Transfer or Assign District Declarant Rights. Any or all of District Declarant's special rights and obligations set forth in this Declaration may be transferred in whole or in part to other Persons. No such transfer or assignment shall be effective unless it is in a written instrument executed by District Declarant and recorded in the Office of the Judge of Probate. The foregoing sentence shall not preclude District Declarant from permitting other Persons to exercise any right reserved to District Declarant in this Declaration as an agent, employee or contractor of District Declarant where District Declarant does not intend to transfer such right in its entirety, and in such case it shall not be necessary to record any written assignment unless necessary to evidence District Declarant's consent to such exercise. In the event District Declarant ceases to act as District Declarant and abandons its role as District Declarant after the end of the Declarant Control Period, then the District Association shall have and may exercise all rights of District Declarant without the necessity of a written assignment by District Declarant.

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IN WITNESS WHEREOF, the undersigned Declarant has executed this Declaration effective as of the date first set forth above.

DECLARANT:

_____

By:_____

Print Name:_____

Title:_____

STATE OF TENNESSEE

COUNTY OF _____

Before me, the undersigned, a Notary Public in and for the State and County aforesaid, personally appeared _____ with whom I am personally acquainted, (or proved to me on the basis of satisfactory evidence), and who, upon oath, acknowledged that (s)he executed the within instrument for the purposes therein contained, and who further acknowledged that (s)he is the _____ of _____, a _____, and that (s)he as such _____executed the foregoing instrument for the purpose therein contained, being authorized so to do, to execute this instrument on behalf of _____, by signing the name of _____ , as _____.

Witness my hand, at office, this _____day of _____, 20___.

Notary Public_____

My commission expires:_____

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EXHIBIT A
PROPERTY DESCRIPTION

TO BE INSERTED UPON FORMATION OF ASSOCIATION

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EXHIBIT B
CHARTER OF DISTRICT ASSOCIATION

TO BE INSERTED UPON FORMATION OF ASSOCIATION

EXHIBIT C
BY-LAWS OF DISTRICT ASSOCIATION

TO BE INSERTED UPON FORMATION OF ASSOCIATION

This Instrument Was Prepared by:
J. Bryan Echols
Thompson Burton PLLC
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Franklin, Tennessee 37067

DISTRICT DECLARATION OF COVENANTS, CONDITIONS, AND RESTRICTIONS FOR ***PRIMARY NEIGHBORHOOD*** AT COLUMBIA BLUFFS

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DISTRICT DECLARATION OF COVENANTS,
CONDITIONS, AND RESTRICTIONS FOR
THE PRIMARY NEIGHBORHOOD DISTRICT AT COLUMBIA BLUFFS

This DISTRICT DECLARATION OF COVENANTS, CONDITIONS, AND RESTRICTIONS (this "Declaration") is made effective as of _____, 2023, by _____, _____ ("District Declarant").

W I T N E S E T H:

WHEREAS, District Declarant is the owner of the real property located in the Columbia, Maury County, Tennessee, described in Exhibit A attached hereto and incorporated herein by reference (the "Property"). The Property, and additional real property now or hereafter subjected to this Declaration, is intended to be developed pursuant to a master plan as a multi-use community including residential properties including multi-family and single-family products encompassing all or portions of the Property (the "District"), to be known as "**CBPR HOA" _____**, and is a part of the Development known as Columbia Bluffs, with various open spaces, common facilities, and Common Area for the benefit of said community; and

WHEREAS, District Declarant desires to provide a flexible and ordered procedure for the overall development of the Property and the District and to establish a method for the administration, maintenance, preservation, use and enjoyment of such portions of the District as are now or may hereafter be submitted to this Declaration; and

WHEREAS, District Declarant intends by this Declaration to impose upon the District mutually beneficial restrictions under a general plan of improvements for the benefit of all owners and/or occupants of property within the Property and all persons or entities having any interest in the Property, by the recording of this Declaration; and

WHEREAS, District Declarant intends that the Property will be developed in phases and that individual phases may be subjected to one or more declarations of restrictive covenants; and

WHEREAS, District Declarant desires that the Property be held, sold and conveyed subject to the provisions of this Declaration.

NOW, THEREFORE, District Declarant hereby declares that all of the Property and any additional property as may by Supplemental Declaration be added to the Property and subjected to this Declaration shall be held, sold, and conveyed subject to the following easements, restrictions, covenants and conditions. Such easements, restrictions, covenants and conditions are for the purpose of protecting the value and desirability of the Property, and shall run with the real property submitted to this Declaration. They shall be binding on all parties having any right, title, or interest in the Property, or any part thereof, their heirs, successors, successors in title, and assigns, and shall inure to the benefit of each owner thereof.

ARTICLE I
DEFINITIONS

Section 1. "Amenity Center" means any clubhouses or centers within the Development, in each case to be a portion of the Common Area, designed to provide, among

other things, meeting space, recreational facilities, swimming pools, playgrounds or other amenities to serve the residents within the Development, and may also include offices for the Association manager, Declarant or other persons.

Section 2. "Assessments" shall mean assessments for Common Expenses provided for herein or by any amendment hereto, which shall be used for the purposes of promoting the recreation, health, safety, welfare, common benefit, and enjoyment of the Owners and occupants of all or any portion of the District and of maintaining the District, all as may be specifically authorized from time to time by the Board of Directors and as more specifically authorized below. The term "Assessments" shall include, without limitation, General Assessments, Special Assessments, Common Maintenance Parcel Assessments, and Special Use Assessments, and any other assessments now or hereafter established under this Declaration.

Section 3. Articles of Organization" shall mean the Articles of Organization of the District Association, to be recorded in the Office of the Judge of Probate for Maury County, Tennessee, as may be amended from time to time.

Section 4. "Board of Directors" or "Board" shall be the body responsible for managing the affairs of the District Association. Actions required of or permitted by the Board herein may be taken or fulfilled by a committee or other designee as may be established or appointed by the Board in accordance with the Bylaws of the District Association.

Section 5. "Common Area" shall mean those portions of the Property and any improvements thereto, and components thereof and easements appurtenant thereto, now or hereafter owned by the District Association or designated on any development plan or plat for future use for the common use and enjoyment of the Owners, including, but not limited to, any common open space as set forth on a final development plan, the Common Area shown on any recorded plat of the Property and any and all pedestrian bridges, roadways, alley ways, parking areas, lakes, waterways, landscaping and irrigation systems, fences, structures, sidewalks, community signage, walls, monuments, illumination of Common Area, common utilities, storm water system, wells, fountains, amenity center and other improvements located on such Common Area, but excluding any Master Common Area and such areas that are intended to be or now or hereafter designated as a common area serving only a particular portion of the District or to be conveyed to a Sub-District Association. District Declarant shall hereafter convey the Common Area or portions thereof to the District Association, or Sub-District Association, as applicable, and the District Association or Sub-District Association shall accept such conveyance.

Section 6. "Common Elements" shall include all Common Maintenance Areas and all facilities, utilities and other improvements found or located in Common Maintenance Areas, but excluding any Common Maintenance Areas that are within the authority or responsibility of the Master Association.

Section 7. "Common Expenses" shall mean and include the actual and estimated expenses of operating the District Association and maintaining the Common Elements, including any reasonable reserves therefor, all as may be found to be necessary and appropriate by the Board pursuant to this Declaration and the Articles of Organization of the District Association, and including without limitation any District Assessment imposed by the Master Association.

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Section 8. "Common Maintenance Area" shall mean the Common Area and any portion of the Property for which the District Association has assumed or has been designated as the responsible party for maintenance obligations or otherwise designated by this Declaration or any Supplemental Declaration or a Sub-District Declaration as a Common Maintenance Parcel.

Section 9. "Common Maintenance Parcel Assessments" are Assessments to which Common Maintenance Parcels are subjected, in addition to any General Assessments.

Section 10. "Common Maintenance Parcel" shall mean any Lot designated by this Declaration or any Supplemental Declaration as a Common Maintenance Parcel, but excluding any Common Maintenance Parcels that are within the authority or responsibility of the Master Association or within the authority or responsibility of a Sub-District Association.

Section 11. "Community-Wide Standard" shall mean the standard of conduct, maintenance, or other activity generally prevailing in the Development as established in the reasonable discretion of the Master Declarant, District Declarant or the applicable Board of Directors.

Section 12. "District Association" shall mean **Columbia Bluffs Primary Residential** Owners Association, a Tennessee nonprofit corporation, its successors and assigns.

Section 13. "District Declarant" means _____, a _____ limited liability company, its successors and assigns.

Section 14. "Declarant Control Period" means the period ending on the earlier to occur of: (i) the date that the District Declarant voluntarily relinquishes control of the Association; and (ii) when homes have been completed on eighty (80%) of the lots within the District and such lots have been conveyed to third party residential owners.

Section 15. "Development" means the Residential to be developed on real property that includes, among other areas, the District, to be known as Town Columbia, and shall be deemed to include the real property described in the Master Declaration, as may be modified, amended, expanded or contracted from time to time.

Section 16. "District" shall have the meaning given in the premises of this Declaration.

Section 17. "District Assessment" means the Assessment to be paid by the District to the Master Association as set forth in the Master Declaration or Supplemental Declaration.

Section 18. "District Representative" means the Person selected by the Board of Directors to be the representative of the District in meetings or otherwise with the Master Association.

Section 19. "District Design Code" shall mean the aesthetic and functional plan for the District, to be implemented through the regulation of land use, landscaping, architecture and such other matters as may be included in the District Design Code. The District Design Code is originally adopted by the District Declarant and may be amended by the District Declarant or District Design Review Committee, with the consent of District Declarant and Master Declarant

during the applicable Declarant Control Period, from time to time. The District Design Code does not need to be recorded to be effective but shall be available from the District Design Review Committee.

Section 20. "Final Plat" means, collectively, all plats of a portion of the Property from time to time recorded in the real estate records of the Office of the Judge of Probate for Maury County, Tennessee, as such may be amended from time to time as the Property is developed. The term "Final Plat" may include a plat established by a condominium regime.

Section 21. "Improvements" shall mean buildings, outbuildings, underground installations, grading, slope and drainage alterations, roads, driveways, parking areas, fences, screening walls and barriers, retaining walls, stairs, decks, windbreaks, landscaping, plantings, planted trees and shrubs, poles, signs, lighting, loading areas, and all other man-made changes to the natural configuration and vegetation of the Property, whether above or below the land surface.

Section 22. "Lot" or "Lots" shall mean a separate parcel of the Property now or hereafter set forth as a Lot on any Final Plat, including without limitation open space, conservation areas, or Common Area within a District, or separate parcels conveyed by other property description if no Final Plat has been recorded, and shall be deemed to refer to any and all Improvements located thereon or comprising such Lot.

Section 23. "Master Association" shall mean and refer to the Columbia Bluffs Master Association, Inc., a Tennessee nonprofit corporation, its successors and assigns, **IF REQUIRED**.

Section 24. "Master Declarant" shall mean the Declarant of the Master Declaration, its successors and assigns.

Section 25. "Master Declaration shall mean that certain Master Declaration of Covenants, Conditions, and restrictions for Columbia Bluffs, of record at Book _____, page _____, Maury County Register's Office, as may be supplemented, amended, or revised from time to time.

Section 26. "Master Design Code" shall mean the aesthetic and functional plan for the Development, to be implemented through the regulation of land use, landscaping, architecture and such other matters as may be included in the Master Design Code. The Master Design Code is originally adopted by the Master Declarant and may be amended from time to time by the Master Declarant or Master Design Review Committee, with the consent of Master Declarant during the Declarant Control Period applicable to the Master Declaration. The Master Design Code does not need to be recorded to be effective but shall be available from the Master Design Review Committee.

Section 27. "Mortgage" shall include a deed of trust or mortgage encumbering any Unit.

Section 28. "Mortgagee" shall include a beneficiary under or holder of a note secured by a Mortgage who has provided actual, written notice to the Master Association of such interest.

Section 29. "Mortgagor" shall include the trustor or grantor of a Mortgage.

Section 30. "Operating Budget" shall have the meaning given in Article IX, Section 2 of this Declaration.

Section 31. "Owner" shall mean and refer to one or more Persons or entities, including District Declarant or Master Declarant, who holds or hold the record title to any Lot, but excluding in all cases any party holding an interest merely as security for the performance of an obligation.

Section 32. "Person" shall mean a natural person, a corporation, a partnership, a limited liability company, a trust, a trustee, or any other legal entity.

Section 33. "Property" shall mean and refer to the real property described in Exhibit A attached hereto, and any additional real property submitted to this Declaration from time to time pursuant to a Supplemental Declaration and added to the District.

Section 34. "Special Assessment" shall have the meaning given in Article IX, Section 5 of this Declaration.

Section 35. "Special Use Assessment" shall mean the Assessment applied to a Special Use Parcel by Supplemental Declaration, which may be in lieu of all other Assessments; subject to the provisions of Article IX.

Section 36. "Special Use Parcel" shall mean a Lot of unconventional size, shape, location or use that calls for special design and assessment considerations as designated by Master Declarant or District Declarant. Typically, a Special Use Parcel will be used for commercial purposes, civic purposes, an age-restricted neighborhood, multi-family residential, or community or recreational facilities.

Section 37. "Streetscape, Pedestrian, Utility and Street Maintenance Easement" shall include all streetscape, pedestrian, utility and street easements located adjacent to street rights-of-way and medians in public rights of way.

Section 38. "Sub-District Association" shall mean an owners association established to maintain or regulate only a portion of the District pursuant to a Sub-District Declaration, such as a condominium association, if any, with the prior consent of Master Declarant and District Declarant.

Section 39. "Sub-District" shall mean a portion of the District that has been subjected to particular restrictions, covenants or regulations by Supplemental Declaration or a Sub-District Declaration, , if any, and may be maintained or regulated by a Sub-District Association.

Section 40. "Sub-District Declaration" shall mean a declaration of restrictive covenants and other matters applicable only to a Sub-District.

Section 41. "Supplemental Declaration" shall mean an amendment to this Declaration, including the addition of additional property, Lots or Master Common Area subjected to this Declaration. Such Supplemental Declaration may, but is not required to, impose, expressly or by reference, additional restrictions and obligations to the provisions of this Declaration, or to

exempt such property from certain provisions and restrictions of this Declaration. The term "Declaration" as used herein shall include this Declaration, together with any and all Supplemental Declaration, together with any amendments, restatements or other additions or removals thereto.

Section 42. "Telecommunication Services" shall mean residential and commercial services involving the provision of voice, internet, entertainment, television or other related services.

Section 43. Defined Terms. Capitalized terms used herein and not otherwise defined shall have the meaning given in the Master Declaration.

ARTICLE II
DISTRICT AND SUB-DISTRICT ASSOCIATIONS

Section 1. Establishment. This Declaration is a District Declaration as referred to in the Master Declaration, and is established by District Declarant with the consent of Master Declarant.

Section 2. District Sub-District Associations. District Declarant or other Persons may from time to time, with the consent of Master Declarant and District Declarant, establish Sub-Districts within the District to be governed by a Sub-District Association by filing a Sub-District Declaration, Supplemental Declaration, or other means of record. Each area within a Sub-District may consist of one or more Lots within the District, one or more parcels described by property description (each of which will be deemed a Lot), one or more uses, or otherwise as determined by the applicable declarant, District Declarant, or Master Declarant, in their sole discretion, but subject in each case to the consent of Master Declarant and District Declarant. Upon establishment of a Sub-District, and at any time and from time to time, the applicable declarant may but shall not be required to impose additional restrictive covenants that are applicable to such Sub-District or to exempt all or a portion of the Sub-District from one or more provisions of this Declaration, with the consent of the Master Declarant and District Declarant. The applicable declarant may establish, or cause the Sub-District to establish, one or more Sub-District Associations for the management and preservation of such Sub-District, each with the power to establish and collect Assessments for, among other things, the payments of Assessments to the Master Association or District Association s as may be in the Master Declaration, this Declaration, or in this Declaration.

Section 3. Sub-District Declaration. A Sub-District shall be entitled to establish one or more Sub-District Declarations applicable to a Sub-District and a Sub-District Association for the administration thereof, but such Sub-District Declarations and all Sub-District Associations shall in each case be subject to the prior review and approval of District Declarant and Master Declarant in their respective sole discretion, and shall be deemed subordinate to the Master Declaration and this Declaration.

Section 4. Sub-District Representatives. Unless otherwise established by the declarant in a Sub-District Declaration, it shall be the responsibility of Owners within a Sub-District to establish equitable, fair and representative procedures for the selection of any representative to the District Association as may be established, in each case to be approved by District Declarant. If applicable, no voting or representative rights shall be available to a Sub-

District until such time as a Sub-District Representative has been duly selected. Each Sub-District will be governed, controlled and subject to the powers and authority vested in the Master Association and the District Association, whether or not the District has elected a District Representative.

ARTICLE III
PROPERTY RIGHTS AND EASEMENTS

Section 1. Common Area. Every Owner shall have a right and easement of enjoyment in and to the Common Area that is appurtenant to the title to such Owner's Lot, subject to any restrictions or limitations contained in the Master Declaration, this Declaration or in any Deed or amendment thereto conveying the Common Area to the District Association or subjecting the Common Area to this Declaration. Any Owner may delegate his or her right of enjoyment to their family, tenants, customers, and invitees, as applicable, subject to reasonable regulation by the Board and in accordance with procedures the Board may adopt from time to time.

Section 2. Exceptions to Rights. The Owner's right granted in Section 1 above shall be subject to the following:

(a) The right of the Master Association or District Association to dedicate or transfer all or any part of the Common Area to any public body, agency, authority, or utility for such purposes as are consistent with the purposes of the Master Association set forth in the Master Declaration or the District Association set forth in this Declaration.

(b) The limitation of Owner rights only to those areas of the Common Area for which such Owner shall pay a portion of the Common Expenses related thereto.

(c) Each Owner's responsibility to pay for Common Expenses, fees, Fines and other charges hereunder assessed by the Board or the District Association against an Owner's Lot.

(d) The right of Master Declarant, District Declarant or other declarant under a Sub-District Declaration to limit, restrict, or regulate the use of the Common Area in their sole discretion.

Section 3. Owner Easements. Subject to the limitations of Section 2 above, every Owner, its successors and assigns, shall have the following perpetual easements with respect to the Property; provided, that for purposes of this Section 3, Common Area shall be deemed to include Common Area that is now or hereafter created within a District, without regard to whether the District Association has ownership of such areas or responsibilities for maintenance or otherwise with respect such areas:

(a) A non-exclusive easement of ingress and egress to its Lot over, across and through the Common Area and Streetscape, Pedestrian and Utility Maintenance Easements.

(b) A perpetual easement in common with the Owners of all other Lots to use all pipes, wires, cables, public utility lines and other Common Elements serving its Lot.

(c) A nonexclusive, perpetual and reciprocal access easement for ingress and egress in common with the Owners of all other Lots for access over any drive aisles or alleys located, constructed and available on or within any Lot, but expressly excluding private driveways constructed solely for internal use only within a Lot, and any areas excluded from use by a Supplemental Declaration, this Declaration, or a Sub-District Declaration.

(d) A perpetual and non-exclusive easement in, over and through all Common Area and to use the entranceways, pedestrian systems and other common improvements within the Property subject to the right of the Board to:

(i) promulgate rules and regulations for the use and enjoyment thereof; and,

(ii) suspend the enjoyment and voting rights of any Owner for any period during which any Assessment for Common Expenses or Fine or other charge or fee hereunder remains unpaid, or for any period during which any infraction of its published rules and regulations continues, it being understood that any suspension for either non-payment of any assessment or a breach of the rules and regulations of the District Association shall not constitute a waiver or discharge of the Owner's obligation to pay the assessment..

Section 4. District Declarant and District Association Easements. The District Declarant and the District_Association, their successors and assigns, and their contractors and agents shall have the following perpetual easements with respect to the Property:

(a) A perpetual and non-exclusive easement for the maintenance of any Common Elements and Streetscape, Pedestrian, and Utility Maintenance Easements, which may presently, or hereinafter encroach upon a Lot.

(b) A perpetual and non-exclusive right of access to each Lot: (1) to inspect same for the purpose of verifying conformance with this Declaration and any rules and regulations of the District Association, (2) to remedy any violations set forth in this Declaration or in any rules and regulations of the District Association, and (3) to perform any operations required in connection with the maintenance, repairs or replacements of or to the Common Area, or any equipment, facilities or fixtures affecting or serving other lot(s) or the Common Elements; provided that requests for entry are made in advance and that any such entry is at a time reasonably convenient to the Owner. In the case of an emergency, such right of entry shall be immediate, whether Owner is present at the time or not.

(c) A perpetual and non-exclusive easement in, over, upon, across and through the Common Area for surface water runoff and drainage caused by natural forces and elements, grading, and/or the improvements located upon the Property. No individual Owner shall directly or indirectly interfere with or alter the drainage and runoff patterns and systems within the Property without written approval of the Master Association.

(d) A perpetual and non-exclusive easement in, upon, over, across and through the Common Area for the purpose of installation, maintenance, repair, service and replacement of all sewer, water, power and telephone pipes, lines, mains, conduits, waters, poles, transformers, meters, and any and all other equipment or machinery necessary or incidental to the proper functioning of any utility company or other entity that requires same for the purpose of

furnishing one or more of the foregoing services as determined and authorized by the Master Association.

(e) A perpetual and non-exclusive easement of unobstructed ingress and egress in, upon, over, across and through the Common Area to the District Association, the Master Association, and their respective officers, agents and employees and all police, fire, and ambulance personnel in the proper performance of their respective duties (including but not limited to emergency or other necessary repairs to a lot upon which the Owner has failed to perform) and for repair and maintenance of the Common Elements. Except in the event of emergencies, the rights accompanying the easements provided for in this subsection shall be exercised only during reasonable daylight hours and then, whenever practical, only after advance notice to the Owner(s) directly affected thereby.

(f) The District Declarant reserves the right and easement, which shall be a covenant running with the land, for and to the benefit of District Declarant and District Association for the installation and use of entrance Improvements to be located on the entrances to the District. The estimated and actual cost of operating and maintaining any improvement thereon will be the responsibility of the District Association. Excluding the Master Declarant or District Declarant, and any of their respective affiliates, the publication or display of any signage or other matter by any Person, whether or not such Person is a Member of the District Association, upon any Improvement on the entry feature easement will be subject to contract with the District Association for the reasonable compensation for services and operating expenses in connection therewith.

Section 5. Easement Related to Infrastructure and Other Improvements. Notwithstanding the foregoing or anything else contained herein to the contrary, District Declarant and/or the District Association shall have and hereby retain the right, but not the obligation, to create, install, construct, modify, repair, replace and maintain certain forms of infrastructure for the District that may consist of curbs, streets, service drives, sidewalks, and other hardscape, landscaping, street trees, street lights, irrigation systems, brick pads, benches, bridges, street furniture, walking paths, parks, trash receptacles, drainage facilities, signage, utilities, and any apparatuses related thereto, as well as other improvements not necessarily enumerated above. Said improvements may be installed along the roads or within any Lot or in the Common Area of the District if deemed necessary or desirable by the District Declarant and/or the District Association, in their sole and absolute discretion, for the overall functionality or aesthetics of the District. Continued maintenance, repair and replacement of any of the aforementioned infrastructure or improvements, if and once installed, shall be the responsibility of the Lot Owner if located within said Owner's Lot, or the responsibility of the applicable District Association if located within the Common Area of the District or the responsibility of the Master Association if located within the Master Common Area. Any costs and expense associated with this right may be reallocated and assessed by the District Association as a Common Expense. Notwithstanding the foregoing, when exercising said right, neither District Declarant nor the District Association shall do anything which may reduce the number of parking spaces within the Lot. In addition, neither District Declarant nor the District Association shall have the right to modify an existing building located on a Lot without the consent of the Lot Owner. An easement is hereby granted to the District Declarant, the District Association and to any construction or management company selected by the District Declarant or the District Association to enter in or cross over the Common Area or to enter or cross over any Lot to

create, install, construct, modify, repair, replace and maintain any of the aforementioned forms of infrastructure or improvements located within any portion of the District.

Section 6. Easements for Utilities and Related Purposes. The District Association is authorized and empowered to grant (and shall from time to time grant) such licenses, easements and/or rights of way for sewer lines, water lines, electrical cables, telephone cables, television and other communication cables, internal and external wiring and antennae, gas lines, drainage, slopes, storm drains, regulatory signage, street lights, underground conduits and/or such other purposes related to the provision of public utilities and other common services to the District as may be considered necessary, appropriate or desirable by the Board for the orderly maintenance, preservation and enjoyment of the Common Area or for the preservation of the health, safety, convenience and/or welfare of the Owners of the lots and District Declarant. A ten (10) foot nonexclusive underground utility easement for the District Association is reserved along all the frontage (but behind right of way), both sides, and rear of all Lots, and on both sides of the sidelines of all comer Lots. Additional easements are reserved on the recorded plat(s), as amended from time to time. Within these easements, no construction of any kind shall be placed or permitted to remain which will in any way damage or interfere with the installation or maintenance of utilities.

Section 7. Streetscape, Pedestrian, Utility, and Street Maintenance Easements. Streetscape, Pedestrian, Utility, and Street Maintenance Easements shall include all streetscape, pedestrian, utility, and street maintenance easements located adjacent to street rights-of-way, and required pavers and medians in public rights-of-way.

Section 8. Easements of Encroachment. There shall be reciprocal appurtenant easements of encroachment as between each Lot and such portion or portions of the Improvements adjacent thereto or as between adjacent Lots due to unintentional placement or settling or shifting of Improvements constructed, reconstructed or altered thereon.

Section 9. General Easement. The District Declarant, so long as it shall retain record title to any Lot or other tract within the District or the Common Area, and the District Association, reserve the right and easement to the use of the Common Area and any Lot (regardless of ownership) or any portion thereof, as may be needed for repair, maintenance or construction on such Lot or any other Lot or the Common Area.

Section 10. Revision of Common Area. Notwithstanding any other provision of this Declaration, District Declarant shall have the right by recording a Final Plat or otherwise to revise any Common Area, in whole or in part, including without limitation the conversion to other types or uses of property, the increase or decrease in size, or the granting of easements or construction of improvements in such Common Area.

ARTICLE IV
MEMBERSHIP AND VOTING RIGHTS

Section 1. Membership in the District Association. Every Person who is the record owner of a joint or undivided fee interest in any Lot shall be deemed to be a member of the Association (each such person or entity, a "Member"). Membership shall be appurtenant to and may not be separated from such fee interest ownership, and any transfer of a Lot shall operate automatically to transfer to the new record owner thereof the membership in the Association

appurtenant thereto. The foregoing is not intended to include persons who hold an interest merely as security for the performance of an obligation, and the giving of a security interest shall not terminate that Member's membership.

Section 2. Assignment by Declarant. Notwithstanding the foregoing, District Declarant may at any time assign, pledge, hypothecate or alienate its membership and/or District Declarant's rights as District Declarant herein, but any transfer by District Declarant of title to a Lot shall automatically transfer the membership in the Association appurtenant thereto, free and clear from any such assignment, pledge, hypothecation or alienation.

Section 3. Voting Rights. Voting and other rights of the Members shall be as set forth in the By-Laws of the Association.

ARTICLE V
MAINTENANCE

Section 1. District Association's Responsibility. The District Association shall maintain and keep in good repair the Common Maintenance Area. Subject to the provisions of any Supplemental Declaration or Sub-District Declaration, such maintenance may include, without limitation, maintaining, repairing, and replacing, subject to any insurance then in effect, all trees, landscaping and other flora, structures, irrigation system, storm water control and any other Improvements situated upon the Common Area or the Common Maintenance Area, and the maintenance of non-public streets, parking areas, or driveways, street or entrance lighting, signage, including without limitation directional signage.

Section 2. Common Maintenance Parcels. The District Association shall maintain those portions of Common Maintenance Parcels as this Declaration or any Supplemental Declaration establishes as a District Association responsibility, and may charge to the Owners of such Common Maintenance Parcel a Common Maintenance Parcel Assessment, as appropriate.

(a) Unless otherwise established by Supplemental Declaration, the District Association shall provide for the maintenance, care, repair, and replacement of the following portions of the Common Maintenance Parcels, to be funded by Common Maintenance Parcel Assessments: the exterior landscaping (except such landscaping installed by, or on behalf of, the Lot Owner and such landscaping enclosed by a fence, if any), walkways, and porches located upon or about each Common Maintenance Parcel. The District Association also shall maintain the exterior of each Common Maintenance Parcel as follows: painting, maintenance, and repair of exterior building surfaces as the Board shall deem necessary and proper, including roofs, gutters, downspouts, exterior building surfaces, trees, shrubs, grass, walks, replacement of trim, caulking and other repairs to roof covers (to include the repair and replacement of all components of the roof of each Common Maintenance Parcel), and other miscellaneous repairs. Such exterior maintenance shall not include glass surfaces (weather windows or sliding glass doors), HVAC equipment, storm doors, front or rear entry doors, garage doors, fences, screens, or patio covers. The balance of the improvements located on the respective Common Maintenance Parcels shall be maintained by the Owner of the particular Lot involved. For the sole purpose of performing the exterior maintenance upon each Lot required by this Article V, the duly authorized employees or agents of the District Association shall have the right, after reasonable notice to the Owner, to enter upon any Lot and into any Lot at reasonable hours of any day.

(b) Notwithstanding any foregoing provision to the contrary, the duly authorized agents or employees of the District Association shall have the right to enter in or upon any Lot or into any structure or located on a Lot, without notice to the Owner thereof, when, in the judgment of the District Association, acting through its Board of Directors, such entrance is necessary to prevent damage to such Lot or surrounding Lots or Common Area by fire, criminal act, natural disaster, or other similar emergency.

(c) Notwithstanding the obligations of the District Association with respect to maintenance of certain portions of the exterior of certain Lots, the District Association shall have no obligation to repair interior or structural portions of any Lot or personal property that is lost or damaged as a result of construction defects, damage or maintenance issues of exterior portions of any Lot, including without limitation damage resulting from water leaks, foundational issues, or settling or structural matters. Each Owner shall bear full responsibility for obtaining and maintaining such insurance as may be desired for protection against such losses.

(d) Notwithstanding the foregoing, if the need for exterior maintenance and repair of Common Maintenance Parcels by the District Association as required by this section is caused by the willful or grossly negligent conduct or act an Owner, his/her family, guest, invitees, or other Persons using or occupying his/her Lot with his/her express or implied permission, the cost of such repair or maintenance may be assessed against such Owner as a Special Assessment of this Declaration upon a finding by the Board, which shall be due and payable thirty (30) days from the date of notice thereof, such Assessment to be collected and enforced as provided in this Declaration. Such Special Assessment shall not require the approval of any of the Members; provided, however, that any Owner against which any such Assessment is levied shall be entitled to notice, a hearing at a time and place set by the Board in its sole discretion, and an opportunity to do the corrective work required (provided that the work is performed by a competent contractor mutually agreeable to both parties and in a manner and quality agreed to by the Board), prior to a Special Assessment being levied against such Owner in accordance with the provisions of this subsection.

Section 3. Owner's Responsibility. Except as provided in the foregoing Section 1. Section 2. or otherwise set forth in a District Declaration, the Owner of each Lot shall have the sole responsibility for maintenance of all exterior and interior portions of the Lot, all Improvements located thereon, the land, flora and landscaping within the boundaries of the Lot; and other improvements not maintained by the District Association. Each Owner shall maintain its Lot in a manner consistent with the Community Wide Standard, the applicable covenants set forth in this Declaration, and such rules and regulations as may be established by the Board from time to time.

ARTICLE VI
INSURANCE AND CASUALTY LOSSES

Section 1. Insurance. The Board of Directors for the District Association, or its duly authorized agent, shall have the authority to and shall obtain insurance for all insurable improvements on the Common Area against loss or damage by fire or other hazards, including extended coverage, vandalism, and malicious mischief. This insurance shall be in an amount sufficient to cover the full replacement costs of any repair or reconstruction in the event of damage or destruction from any such hazard.

(a) The Board shall also obtain a public liability policy covering the Common Area and District Association for all damage or injury caused by the negligence of the District Association or any of its employees or agents. The public liability policy shall have at least a One Million Dollar ($1,000,000.00) single person limit as respects bodily injury and property damage, a One Million Dollar ($1,000,000.00) limit per occurrence, and a Five Hundred Thousand Dollar ($500,000.00) minimum property damage limit. The policy or policies may contain a reasonable deductible, and the amount thereof shall be added to the face amount of the policy in determining whether the insurance at least equals the full replacement cost.

(b) In addition to the other insurance required by this Section, the Board shall obtain, as a Common Expense, worker's compensation insurance, if and to the extent necessary, and a fidelity bond or bonds on directors, officers, employees, and other persons handling or responsible for the District Association's funds. The amount of fidelity coverage shall be determined in the directors' best business judgment, but may not be less than three months' Assessments, plus reserves on hand. Bonds shall contain a waiver of all defenses based upon the exclusion of persons serving without compensation and may not be canceled or substantially modified without at least thirty (30) days' prior written notice to the District Association. The Board shall also obtain, as a Common Expense, a reasonably available amount of Directors and Officers Errors and Omissions insurance.

(c) Premiums for all insurance required by this Article VI, shall be Common Expenses of the District Association and shall be included in the General Assessment.

Section 2. Insurance; Common Maintenance Parcels.

(a) The District Association shall, as a Common Expense applicable only to Lots that are Common Maintenance Parcels, obtain and continue in effect adequate blanket all-risk casualty insurance, if reasonably available, and if not reasonably available, fire and extended coverage, in such form as the Board deems appropriate for one hundred (100%) percent of the replacement cost of the Lots that are Common Maintenance Parcels, excluding the replacement of any finishes, fixtures, cabinets, appliances, flooring, or other improvements installed or supplied by the Owners, or their tenants, or personal property of the Owners, or their tenants, guests, and invitees located within such Lots.

(b) Neither the District Declarant nor the District Association has constructed the Lots on the Common Maintenance Parcels, and neither District Declarant nor the District Association shall be liable for any claims or causes of action of any kind whatsoever in law or in equity arising from or in any way relating to the construction of improvements upon the Common Maintenance Parcels that was performed by parties other than District Declarant, its agents, employees, subsidiaries or other affiliated entities.

(c) Premiums for all insurance required by this Article VI, Section 2, shall be Common Expenses of the Association applicable only to Common Maintenance Parcels and shall be included in the Common Maintenance Parcel Assessment. The policy or policies may contain a reasonable deductible, and the amount thereof shall be added to the face amount of the policy in determining whether the insurance at least equals the full replacement cost.

Section 3. Disbursement of Proceeds. Proceeds of insurance policies with respect to Common Area shall be disbursed as follows:

(a) If the damage or destruction for which the proceeds are paid is to be repaired or reconstructed, the proceeds, or such portion thereof as may be required for such purpose, shall be disbursed in payment of such repairs or reconstruction as hereinafter provided. Any proceeds remaining after defraying such costs of repairs or reconstruction to the Common Area or, in the event no repair or construction is made shall be retained by and for the benefit of the District Association and placed in a capital improvements account.

(b) If it is determined that the damage or destruction to the Common Area for which the proceeds are paid shall not be repaired or reconstructed, such proceeds shall be disbursed in the manner as provided for excess proceeds in Section 2(a) above.

Section 4. Repair and Reconstruction. If the damage or destruction to the Common Area for which the insurance proceeds are paid is to be repaired or reconstructed, and such proceeds are not sufficient to defray the cost thereof, the Board of Directors may use reserve or capital improvements account funds, or may levy a Special Assessment against all Lots. Additional Assessments may be made in like manner at any time during or following the completion of any repair or reconstruction.

Section 5. Annual Review of Policies. At least annually, the Board shall review all insurance policies that are required by this Article VI to be maintained by the District Association in order to ascertain whether the coverage contained in the policies is sufficient. If the Board deems such coverage to be insufficient, the Board may expand the coverage to the extent it reasonably deems necessary.

ARTICLE VII
NO PARTITION

Whenever all or any part of the Common Area shall be taken (or conveyed in lieu of and under threat of condemnation by the Board) by any authority having the power of condemnation or eminent domain, the award made for such taking shall be payable to the District Association as Trustee for all Owners to be disbursed as follows: If the taking involves a portion of the Common Area on which Improvements have been constructed, then, unless within sixty (60) days after such taking the District Declarant or the District Association shall otherwise agree, the District Association shall restore or replace such Improvements so taken on the remaining land included in the Common Area to the extent lands are available therefor, in accordance with plans approved by the Board and the District Design Review Committee. If such Improvements are to be repaired or restored, the above provisions in Article V hereof regarding the disbursement of funds in respect to casualty damage or destruction shall apply. If the taking does not involve any Improvements on the Common Area, or if there is a decision made not to repair or restore, or if there are net funds remaining after any such restoration or replacement is completed, then such award or net funds shall be disbursed to the District Association and used for such purposes as the Board shall determine.

ARTICLE VIII
RIGHTS AND OBLIGATIONS OF THE DISTRICT ASSOCIATION

In addition to the powers delegated to the District Association by its Articles of Organization or the laws of the State of Tennessee, the District Association shall be empowered to perform each of the following duties related to the Property and Common Area:

Section 1. Operation and Maintenance of Common Maintenance Area. To operate, maintain and otherwise manage or provide for the operation, maintenance and management of the Common Maintenance Area, together with all easements for operation and maintenance purposes and for the benefit of the District Association or the Owners over and within the Common Area; to keep all Improvements, if any, of whatever purpose from time to time located on the Common Area in good order, condition, and repair.

Section 2. Title. Any other provision of this Declaration or the Bylaws notwithstanding, the District Association always shall maintain lien free title to the Common Area, excepting only a lien for current year taxes, provided, however, that the District Association may mortgage or convey the Common Area with an affirmative vote of at least sixty-seven percent (67%) of the Directors; and provided, further, that the District Association may accept a conveyance of the Common Area subject to a lien or other encumbrance.

Section 3. Seasonal or Other Decorations. To install and maintain seasonal and other decorations, lighting, street banners, and other items designed to enhance the appearance or attractiveness of the District or the enjoyment or experience of those living, shopping or otherwise participating in the District, in the sole discretion of the District Declarant or Board of Directors, the cost of which shall be a Common Expense.

Section 4. Water and Other Utilities. To acquire, provide, and/or pay for, water, sewerage, garbage disposal, electrical, telephone, gas, and other necessary utility services for the Common Area.

Section 5. Taxes and Assessments. To pay all real and personal property taxes and assessments separately levied upon or assessed against the District Association and/or the property owned by the District Association. Such taxes and assessments may be contested or compromised by the District Association; provided, however, that they are paid or a bond in an amount at least equal to such taxes and assessments is posted prior to the sale or other disposition of any property to satisfy the payment of such taxes or assessments.

Section 6. Insurance. To obtain from reputable insurance companies qualified to do business in the State of Tennessee the insurance set forth in this Declaration, and to maintain in force at all times such insurance as is required by this Declaration.

Section 7. Personal Property and Real Property for Common Use. The District Association, through action of its Board of Directors, may acquire, hold, and dispose of tangible and intangible personal property and real property. The Board, acting on behalf of the District Association, shall accept any real or personal property, leasehold, or other property interests within Maury County conveyed to it by the District Declarant as permitted herein.

Section 8. Rules and Regulations. The District Association, through its Board of Directors or otherwise, may make and enforce reasonable rules and regulations governing the use of the Property, which rules and regulations shall be consistent with the rights and duties established by this Declaration. Sanctions for violations of the rules and regulations may include reasonable monetary Fines (as hereinafter defined) and suspension of the right to use the Common Area. The Board shall, in addition, have the power to seek relief in any court for violations or to abate nuisances. In addition, the District Association, through the Board or otherwise, may, by contract or other agreement, enforce city or county ordinances or permit the

City of Columbia or Maury County to enforce ordinances on the Property for the benefit of the District Association and the Owners.

Section 9. Traffic Control. The Board may make rules and regulations concerning driving and parking within the Property, subject to applicable governmental requirements and restrictions. Without limiting the foregoing, to the extent permitted by local governmental authority, the District Association may construct traffic calming devices and post speed limits or other traffic signs and take other measures deemed necessary to discourage excessive speed and to promote a safe environment. The District Association may enforce such rules and regulations with penalties, Fines, or towing, and shall have all remedies set forth in this Declaration.

Section 10. Implied Rights. The District Association may exercise any other right or privilege given to it expressly by this Declaration or the Bylaws, any law, statute, or ordinance, and every other right or privilege reasonably to be implied from the existence of any right or privilege given to it herein or reasonably necessary to effectuate any such right or privilege.

ARTICLE IX
ASSESSMENTS

Section 1. Creation of Assessments. There shall be created annual Assessments as may be from time to time specifically authorized by the Board of Directors as follows (collectively, the "Annual Assessments"):

(a) The Board may levy general assessments for expenses determined by the Board to benefit the District Association and/or the district as a whole, including without limitation, expenses incurred by the District Association in fulfilling its maintenance obligations set forth in this Declaration or otherwise expressly or implicitly authorized by this Declaration, reserves as deemed appropriate by the Board, and the District Assessment ("General Assessments").

(b) The Board may levy a Common Maintenance Parcel Assessment against Common Maintenance Parcels for expenses determined by the Board to benefit only such Common Maintenance Parcels, including without limitation, expenses incurred by the District Association in fulfilling its maintenance or service obligations with respect to such Common Maintenance Parcels. Common Maintenance Parcels may be established with different levels of services and maintenance obligations for the District Association, and the Common Maintenance Parcel Assessment applicable to Common Maintenance Parcels may reflect such differences.

(c) The Board may levy a Special Use Assessment to the extent established by a Supplemental Declaration for any Special Use Parcel. In the event a Special Use Assessment is established, the General Assessments shall not apply to such Special Use Parcels. If no Special Use Assessment is established in a Supplemental Declaration by oversight or error, then the Declarant or the Board may at any time thereafter establish a Special Use Assessment in the Declarant's or the Board's discretion, to be applied to such Special Use Assessment from after the date of such establishment. The Special Use Assessment may include maintenance or landscaping responsibilities for areas within the District but not located within the Special Use Parcel.

Section 2. Operating Budget. It shall be the duty of the Board to prepare a budget covering the estimated costs of operating the District Association during the coming year,

including without limitation Common Expenses and Common Maintenance expenses (the "Operating Budget").

Section 3. Capital Budget and Contribution. The Board of Directors shall annually prepare a capital budget that shall take into account the number and nature of replaceable assets, the expected life of each asset, and the expected repair or replacement cost (the "Capital Budget"). The Board shall set the required capital contribution, if any, in an amount sufficient to permit meeting the projected capital needs of the District Association, as shown on the Capital Budget, with respect both to amount and timing by Assessments over the period of the Budget. The capital contribution required shall be fixed by the Board and included within the Operating Budget and Assessment. The Capital Budget shall also provide for the establishment of separate reserve accounts to hold the proceeds of the Assessments imposed for capital expenditures.

Section 4. Allocation of General Assessments. Unless otherwise set forth in any Supplemental Declaration or District Declaration, General Assessments shall be allocated against all Lots (other than Special Use Parcels) within the District equally. Assessments for Special Use Parcels may include the responsibility for specific areas or maintenance or landscaping within the Development that shall not be considered in setting the General Assessments.

The Board shall set Assessments based on the Operating Budget and the Capital Budget. The Board shall cause a copy of the Operating Budget, the Capital Budget, and the amount of each General Assessment to be communicated to the Members of the District Association at least ten (10) days prior to the year for which Assessments shall be made. The Operating Budget, together with the Capital Budget and the Annual Assessments (collectively, the "Budget"), shall be adopted by the Board at a duly called meeting of the Board. Notwithstanding the foregoing, however, in the event a Budget is not established for any reason for any year, then and until such time as a Budget shall have been determined as provided herein, the Budget in effect for the then current year shall continue for the succeeding year. No failure to provide the Operating Budget or Assessments as required hereunder shall relieve any Lot Owner from payment of such Assessments once established.

Section 5. Special Assessments. In addition to the Annual Assessments authorized above, the Board may levy, during any calendar year, special assessments, applicable only to that year, to be used solely to defray, in whole or in part, the cost of any construction, reconstruction, or unexpected repair or replacement of a capital improvement, including the necessary fixtures and personal property related thereto ("Special Assessments"). The Board may levy a Special Assessment against all Lots for such expenses determined by the Board to benefit the District Association and/or the District as a whole, and may levy a Special Assessment against particular Lots for such expenses as may be determined by the Board to benefit less than the Master Association or District as a whole.

Section 6. Assessment Obligation. Assessments against each Lot shall commence on recording of a Supplemental Declaration, District Declaration or Sub-District Declaration applicable to such Lot, provided, however, that the applicable Supplemental Declaration or District Declaration or Sub-District Declaration may, with the approval of Master Declarant and District Declarant, suspend or delay the payment of Assessments as set forth therein. Each Owner, by acceptance of his or her Deed, is deemed to covenant and agree to pay all Assessments levied by the District Association, whether or not such obligation is so expressed in such Deed. Each Owner shall be deemed a direct beneficiary of the Common Expenses of the

Master Association, which are made for the benefit of the entire Development, and apportionment of the District Assessment shall be payable be each Lot Owner. Notwithstanding any other provision of this Declaration, no Assessments shall be levied against Lots or other Property owned by the District Declarant, its successors or assigns.

(a) All Assessments, together with interest at the highest rate allowable under the laws of Tennessee from time to time relating to usury (or if no such rate is established, sixteen percent (16%) per annum) ("Interest"), costs, and reasonable attorneys' fees, shall be a charge on the land and shall be a continuing lien upon the Lots within the District against which each Assessment is made. Each Assessment, together with Interest, costs, and reasonable attorneys' fees, shall also be the personal obligation of the Person who was the Owner of such Lot at the time the Assessment arose, and his or her grantee shall be jointly and severally liable for such portion thereof as may be due and payable at the time of conveyance, except no first Mortgagee who obtains title to a Lot pursuant to the remedies provided in the Mortgage shall be liable for unpaid Assessments which accrued prior to such acquisition of title in excess of six (6) months accrued Assessments.

(b) Assessments shall be paid in such manner and on such dates as may be fixed by the Board. The manner of payment fixed by the Board may include, without limitation, acceleration of the Assessment levied on a particular Lot on account of delinquent payment of such Assessment or monthly installment thereof. Unless the Board otherwise provides, Annual Assessments shall be paid in quarterly installments. Without limiting the foregoing, the Board may also levy a late charge on Assessments not timely paid, in the discretion of the Board.

Section 7. Lien for Assessments. To secure the payment of any Assessment and/or fine imposed by the District Association pursuant to this Declaration (each such fine, a "Fine"), a lien is expressly retained in favor of the District Association on each and every Lot or Special Use Parcel in the District Association. Such lien shall be prior and superior to all other liens, except all taxes, bonds, assessments, first mortgage liens, liens in favor of the Master Association, and other levies which by law would be superior thereto.

Section 8. Start-up Assessment. Each Lot Owner who takes title to a Lot shall pay to the District Association at closing a start-up assessment fee in an amount established by the Board from time to time (the "Start-up Assessment"). This one time Start-up Assessment shall be in addition to and not a prepayment of the regular Assessments provided for above. The District Declarant may, by Supplemental Declaration, Sub-District Declaration, contract, or otherwise, exempt certain properties from the Start-Up Assessment, limit the payment of the Start-Up Assessment to certain transactions, or otherwise alter the general obligations set forth hereunder.

Section 9. Transfer Assessment. The Board may establish an Assessment to be paid by the purchaser of any Lot within the Property on transfer or conveyance of such Lot from time to time (the "Transfer Assessment"). The amount of such Transfer Assessment shall be established by the Board from time to time. The Transfer Assessment shall not be due on any closing of a Lot in which the Start-Up Assessment is paid. District Declarant may, by Supplemental Declaration, Sub-District Declaration, contract, or otherwise, exempt certain properties from the Transfer Assessment, limit the payment of the Transfer Assessment to certain transactions, or otherwise alter the general obligations set forth hereunder.

Section 10. Administrative Fee. In addition to the Start-Up Assessment and Transfer Assessment, the Board may establish an administrative fee that the purchaser of any Lot within the Property shall be obligated to pay. The purpose of the Administrative Fee is to pay for the administrative expenses of the District Association or its agent resulting from the change in Lot ownership.

Section 11. Use of Assessments and Fees. The Start-Up Assessment and Transfer Assessment collections may be used as the Board of the District Association shall deem appropriate, which use may include, without limitation, operating costs of the District Association, the payment for capital improvements of the District Association, the establishment of reserves, or the establishment of a fund, account or nonprofit corporation formed for the purpose of enhancing, directly or indirectly, the District and the Owner, including the support of charitable, educational, social or beneficial organizations, causes, events or scholarships.

Section 12. Certificate of Payment. The Board shall, upon request and for a reasonable charge, furnish to any Person a certificate, signed by an officer of the District Association, setting forth whether or not all Assessments, whether General or Special, or other applicable fees or Interest, on a specified Lot or Special Use Parcel have been paid. Such certificate shall be conclusive evidence of payment of any Assessment therein stated to have been paid.

ARTICLE X
CONSTRUCTION AND ARCHITECTURAL STANDARDS

Section 1. Construction Standards. Owners shall construct all Improvements on Lots in accordance with plans and specifications approved by the City of Columbia, Tennessee (the "City"). Further, no Person shall construct any Improvements upon a Lot, or after completion of such Improvements, make any modifications, additions or alterations to such Improvements, without the prior written approval of the Master Design Review Committee and District Design Committee (as defined below). In no event shall the District Design Review Committee approve any plans violating the use restrictions set forth in Article XI below, and no purported approval shall constitute a waiver of such restrictions.

Section 2. Design Review Committee. The District Declarant or Board, as applicable, shall designate a site and architectural review board (the "District Design Review Committee") consisting of up to five (5) persons, one of which may be an architect selected by District Declarant (a "Qualified Architect"), to exercise the Board's authority under this Article. The District Design Review Committee shall promulgate detailed standards and procedures in implementing the requirements of this Article, in addition to the Design Code. So long as District Declarant owns any land within the District or subject to this Declaration or remains the District Declarant, the District Declarant may select the membership of the District Design Review Committee. Thereafter, the Board shall select the membership of the District Design Review Committee. The District Design Review Committee shall also have the authority to hire such contractors or employees in support of its review and administration obligations as it may reasonably determine to be necessary or appropriate, the costs of which shall be paid by the applicants or included in Common Expenses. This Article shall be effective, and may not be amended without the prior written consent of District Declarant, so long as District Declarant owns any land subject to this Declaration or subject to annexation by this Declaration.

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Section 3. Construction Subject to Review.

(a) Review of Plans. Prior to construction, the District Design Review Committee must review and approve construction plans and specifications for all Improvements on any Lot within the Property. No construction on any Lot shall begin and no Improvements on any Lot shall be modified except in accordance with an approved plan. Once a plan is approved, any modification to that plan, or any modification to the finished Improvement, must also be reviewed and approved.

(b) Common Area. Construction of any Improvement upon the Common Area (other than initial construction by the Declarant), or modification of any existing structure, as well as any material alteration of the landscaping or topography of any Common Area, must be approved in advance by the Design Review Committee.

(c) Scope. The Design Code shall set standards for all aspects or improvement on any Lot visible from the outside, including without limitation the size and shape of any building, its roof, windows, doors, porches and other components, placement on the Lot, fences, drainage, paving and landscaping and all finish materials. The Design Code may also regulate the type, placement and number of Improvements that may be constructed on a Lot and the uses to which those Lots may be put. Review shall include materials and color selection and selection and placement of any ornamentation or functional accessories, including but not limited to the following:

(i) Materials and color selection for the main building and any outbuilding (including roof, doors, windows and trim);

(ii) Driveways, walks, patios and other ground surface materials;

(iii) Parking areas and drive through lanes;

(iv) Outdoor eating areas;

(v) Lighting;

(vi) Signage of any type;

(vii) Antennas, satellite dishes or receivers, solar panels or other devices that are visible from outside the Lot;

(viii) Fountains, swimming pools, or other water features;

(ix) Privacy walls or other fences and gates;

(x) Awnings, flower boxes, shelves, statues, or other outdoor ornamentations, and window coverings visible through the window;

(xi) Construction trailers or other trailers, temporary structures, tents, shacks, and sheds;

(xii) Grills or fire pits; and

(xiii) Permanent or semi-permanent play equipment, whether or not secured, such as tree houses, trampolines, basketball hoops, skateboard ramps and swing sets.

The listing of a category does not imply that such construction is permitted.

(d) Exception. Interior construction and modifications not affecting the external structure or appearance of any building and not visible from the exterior are not subject to review. However, construction drawings are required as part of the review process to assist in interpreting the design.

(e) Trees. Owners may be required to plant street trees on their Lot or within Common Area or public rights-of-way adjacent to their Lot, in accordance with the direction of the District Design Review Committee, to maintain trees and to replace trees that die or that become damaged or diseased, or the District Association may elect to take such actions for the benefit of Owners, the cost of which will be part of the Common Expenses. The cutting, removal or intentional damage of new or existing trees (including neglect, excessive pruning or failure to use due care with equipment or when removing other trees permitted to be removed) shall be prohibited and subject to enforcement under this Declaration. The District Design Review Committee may require the relocation and replanting of trees that must be removed for construction. If particularly significant trees are found within a Lot, the District Design Review Committee shall determine whether the placement of the building should be altered to accommodate the trees, or whether the trees may be removed. If trees or other growth block sidewalks or other areas, the Owner may be required to prune, trim or remove such growth. The Master Association may also take action to keep sidewalks and other areas clear, including pruning, trimming and removal of limbs on trees within a Lot, and may enter any Lot for such purpose.

(f) Drainage. All plans shall comply with and Owners shall be solely responsible for applicable drainage, water conservation, erosion control and stormwater detention requirements. No alteration of existing grade or any planting, fences or other improvements that alter the flow of water shall be permitted without the express consent of the District Design Review Committee, which approval shall be for the exclusive benefit of the Declarant or District Association, as applicable, and shall not remove or alter the responsibility of any Owner or builder for compliance with such requirements. Notwithstanding any other provision of this Declaration, neither District Declarant nor the District Association shall have the responsibility to ensure that drainage or grading of Lots is properly accomplished. Each Owner shall be solely responsible to ensure that grading and drainage are in compliance with all applicable laws, codes, regulations and other requirements, including without limitation any easements for drainage, whether or not shown on any recorded plat and must provide a as-built drawing of finished grading and drainage to ensure these items are in compliance. The Homeowner will be charged in the event they do not provide the approved as-builts to the Committee, and there are costs to the developer to fix any grading or drainage that were not caused by the developer.

(g) Modifications. Modifications after completion of construction, or additions or changes to the approved plans during construction, must be reviewed and approved. However, review is not required to paint with originally approved materials and colors, or to replace the roof or other components with duplicates of the original material. Significant new landscaping, grading and any removal of trees or plants must be approved in advance.

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Section 4. Review Procedure.

(a) Application. The plans to be submitted for approval shall include (i) the construction plans and specifications, including all materials and colors, (ii) elevations of all proposed improvements (iii) proposed clearing, grading and landscaping, and (iv) all other items required by the District Design Review Committee. Plans and specifications for review shall be submitted in the form required by the District Design Review Committee.

(b) Uniform Procedures. The District Design Review Committee may establish forms and procedures for the review of applications, including review costs and fees, if any, to be paid by the applicant, which may include costs for the Qualified Architect. The District Design Review Committee may provide lists of approved materials and may allow for staff review and approval of routine or minor matters.

(c) Basis for Decision. Applications shall be approved or denied based upon overall quality of design, including purely aesthetic considerations at the discretion of the District Design Review Committee. If the District Design Review Committee rejects an application due to overall design quality or aesthetic considerations, despite compliance with the Design Code, the District Design Review Committee may make suggestions for improving the design.

(d) Variances. The District Design Review Committee may grant approvals notwithstanding normal guidelines based on existing topographical or landscape conditions, existing trees, or architectural merit. Any such variance must be in writing. Approval of a variance does not constitute a precedent for other applications, and such requests may be arbitrarily denied. Notwithstanding the foregoing, the District Design Review Committee shall not have the right to waive any guidelines imposed by the Master Design Review Committee, the Master Declaration, or other requirement established by Master Declarant or the Master Association without their prior written consent.

(e) Notification; Construction; Inspection. The District Design Review Committee shall make best efforts to notify the applicant of its decision within the time allowances set out in its design approval process guidelines. However, a delay in reviewing an application shall not be deemed consent to construction. If approval is given, construction of the Improvements may begin. All construction must comply with the submitted plans. The District Design Review Committee or its agent may inspect the property during construction but has no obligation to make any such inspection. Any inspection made by the District Design Review Committee is made for the benefit of the District Design Review Committee or District Declarant, and is not made for the benefit of or to be relied upon by any third party or Owner.

(f) Completion. When the primary building and landscaping are completed in substantial compliance with the approved plans and specifications, the District Design Review Committee may on request issue a Certificate of Substantial Conformance. The Certificate shall describe any areas of deficiency that need to be corrected. All Fines and other enforcement shall be waived so long as the deficiencies are corrected within sixty (60) days. Upon correction of all deficiencies, the District Design Review Committee shall issue a Certificate of Completion and Release in recordable form. If no Certificate of Substantial Conformance is requested, the District Design Review Committee shall not be estopped from later determining that a deficiency needs correction, and reserves all rights of Fines and enforcement.

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(g) Governmental Compliance. Owners are responsible for making sure that construction conforms to governmental regulations and all local building codes. If the District Design Review Committee notes noncompliance, the Owner will be required to make the necessary changes. However, the District Design Review Committee is not responsible for compliance with governmental requirements.

Section 5. Approval of Architects, Builders. District Declarant shall have the right to approve any and all architects or builders in all or any portion of the District, in its sole discretion. District Declarant's approval of an architect, builder or other design professional shall not constitute any representation or endorsement of such professional's character, experience or professional capabilities.

Section 6. Enforcement.

(a) Fines. The District Design Review Committee may require the Builder or Owner to post a deposit from which the District Design Review Committee may deduct Fines for failure to comply with the approved plans and specifications, tree regulations and rules for builder conduct. The collection of a Fine shall not in any way diminish the available remedies at law or equity.

(b) Suit Permitted. If any construction is begun that has not been approved or that deviates from approved plans and specifications, the District Design Review Committee, District Declarant or the District Association may require the Owner to resolve the dispute through binding arbitration or may bring suit seeking damages, specific performance, declaratory decree and/or injunction, or any other remedy at law or in equity. The Board shall be empowered to bring suits on behalf of the District Association. If suit is brought and the court finds that the construction was not approved or that the construction deviated from the approved plans or specifications, then the party bringing suit shall also be awarded reasonable attorney's fees, even if the relief requested is not granted.

(c) Trees and Hedges. Improper cutting, removal, lack of care or intentional damage to existing trees and hedges may be subject to the imposition of Fines plus a requirement that the tree be replaced with an approved species of comparable caliper, or, if approved by the District Design Review Committee, a combination of trees totaling the caliper of the removed tree, or that hedges be replaced with an approved hedge plant. Fines shall be set by the District Design Review Committee.

(d) Drainage. After reasonable notice (except in an emergency), District Declarant or the District Association shall have the right but not the obligation to enter onto a Lot and correct improper grading or other modification to the Lot which causes drainage problems. Such corrections shall be made at the cost and expense of the Owner of the Lot, who shall promptly reimburse District Declarant or the District Association, as applicable. The Lot shall be subject to a lien for the cost if not paid. District Declarant or the District Association, as applicable, shall not be required to repair or replace landscaping or other improvements after such action.

(e) No Waiver. Failure to enforce any provision of this Declaration shall not be deemed a waiver of the right to do so at any time thereafter.

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Section 7. Liability. District Declarant and District Design Review Committee and its inspectors are concerned primarily with aesthetic considerations, and are not responsible for compliance with governmental requirements or design or construction defects or use of materials affecting the safety or structural integrity of the building. Approval by the District Design Review Committee of an application shall not constitute a basis for any liability of the Qualified Architect, District Declarant, members of the District Design Review Committee, the Directors of the Board or the District Association for failure of the plans to conform to any applicable building codes or inadequacy or deficiency in the plans resulting in defects in the improvements, or for the performance or quality of work of any builder or architect approved by it, or for non-compatible or unstable soil conditions or soil erosion, or any other condition of the property.

ARTICLE XI
USE RESTRICTIONS

Section 1. Use Restrictions. In addition to all other covenants contained herein, the use of the Property is subject to the following; provided, however, that if any Supplemental Declaration or Sub-District Declaration expressly permits uses or matters that would otherwise be prohibited, with the express consent of District Declarant, then such Supplemental Declaration or Sub-District Declaration shall control over this Declaration for purposes of this Article XI:

(a) Maintenance of Exterior and Interior. Except as provided in this District Declaration or any Supplemental Declaration, each Owner shall be responsible for the maintenance of, and shall maintain, the exterior and interior of its Lot and any Improvements in a clean, sanitary, and attractive condition, and shall (1) keep its Lot free from rubbish, litter, and noxious weeds; (2) maintain, cultivate, and keep in good condition and repair shrubs, trees, grass, lawns, plantings, and other landscaping located, or from time to time placed, within the bounds of its Lot; and (3) replace dead plants, shrubs, trees, grass, or landscaping of the same or similar type. If any irrigation system is in place on any Lot, the Master Association may require that the Owner maintain such irrigation system and keep such system in use to the extent required to keep a maintain healthy landscaping.

(b) Association to Landscape Common Area. Except as otherwise provided herein, the District Association shall have the right and the obligation at any time to plant, replace, maintain, and cultivate shrubs, trees, grass, plantings, and other landscaping upon the Common Maintenance Area located on the Property. No Owner shall remove, alter, or injure in any way any shrubs, trees, grass, plants or other landscaping placed upon or about a Lot by District Declarant or the District Association, without first obtaining the written consent of the Board.

(c) Signs and Billboards; Exterior Lights. No sign or billboard of any kind shall be displayed to the public view on any portion of the Common Area, except for (1) directional or informational signs, established by District Declarant or the District Association, (2) signs used by District Declarant, or by its successors or assigns, to advertise the Property, provided such signs are located on the Common Area, and (3) signs permitted under any Supplemental Declaration or Sub-District Declaration, provided that the Board may establish or require a common signage system for such purposes and such system shall prevail over the general provisions of this subsection.

(d) Quiet Enjoyment. No noxious, offensive or illegal activity shall be carried on, in or upon any Lot or any part of the Property, nor shall anything be done thereon that may be or may become an annoyance or nuisance to the neighborhood, that shall interfere in any way with any Owner's quiet enjoyment of its respective Lot, or that shall increase the rate of insurance in any way.

(e) Temporary Structures. No structure of a temporary character or other out-building shall be used on any Lot or the Common Area at any time as a residence or otherwise, either temporarily or permanently. Notwithstanding the foregoing, District Declarant or its agents shall have the right to conduct any business necessary for the sale of Lots, including showing model Lots and maintaining a sales and/or construction office on the Common Area or in any Lot owned by Declarant. In furtherance thereof Declarant shall have an easement over all of the Common Area for ingress, egress and parking for itself, its agents, employees, and prospective buyers of Lots for so long as District Declarant or any subsidiary or affiliated company owns any interest in the Property, and District Declarant may block or restrict access over and across roadways so long as access to a particular Lot owned by a Person other than District Declarant is not prohibited.

(f) Animals. No animals, reptiles, rodents, livestock, birds, or poultry of any kind shall be raised, bred or kept in or on any Lots, other than bona fide service animals or household pets. No household pets shall be kept outside the dwelling or housing unit, and any outside activity shall be under the active control of the Owner or one acting on the Owner's behalf. Without limiting the foregoing, animals who repeatedly bark, are aggressive, or other create a negative impact on other Owners or other persons may be subject to further restrictions and, in the discretion of the Board, removed from the Development. No animal may be kept in a manner that, in the sole determination of the Board, is unhealthy or cruel for such animal, including without limitation keeping animals tied up or tethered for extended periods of time. In making any determination of cruelty or unhealthy conditions, the Board shall have the right but not the obligation to consult governmental or private animal control or shelter organizations. The Board may permit variances to the restrictions set forth in this subsection in the Board's sole discretion. The Board may establish further rules and regulations for control of animals and household pets, and may impose Fines for violations of the foregoing or additional rules and regulations in addition to requiring removal of animals from the Development.

(g) Vehicles. No truck, trailer, camper, boat, van or similar equipment or disabled vehicle shall be permitted to remain upon or within the Common Area or public streets unless on a space designated for such use by the District Association. No such equipment may be stored or permitted to remain upon a Lot or any portion of the Common Area or public streets for more than forty-eight (48) hours unless stored in an enclosed garage.

(h) Exterior Structures. No fences, ornamental screens, awnings, screen doors, sunshades except as approved by or under general rules adopted by the District Design Review Committee.

(i) Garbage Collection. All rubbish, trash, and garbage shall be removed from the Property regularly and shall not be allowed to accumulate thereon. All refuse containers, clothes lines, woodpiles, storage areas, machinery, or equipment shall be kept in such a manner as not to be visible from neighboring property or contiguous streets. No incinerators shall be kept or maintained on any Lot. Refuse containers shall not be placed outside for trash pickup prior to

6:00 p.m. on the day prior to such pickup, and shall be returned to non-visible areas no later than the end of the day on which pickup is made. No debris, trash, ashes, lawn clippings, leaves, leaf bags or other refuse may be thrown or dumped on any of the Lots or Common Area. Debris and trash during the construction of an Owner's Improvements shall be collected by each Owner (or his or her representative) in containers approved by the District Design Review Committee and periodically removed so that no unsightly condition occurs on the Lot or adjoining Lots.

(j) Taxes and Utilities. Each Owner shall pay any real and personal property taxes or charges assessed against their respective Lot and Improvements and the utility charges for said Improvements.

(k) Infections, Plant Diseases or Insects. No Owner shall permit anything or condition to exist upon any portion of such Owner's Lot that shall induce, breed, or harbor infections, plant diseases, vermin or noxious insects.

(l) Reasonable Inspection and Entry. The Board shall have the right of inspection and entry onto Lots in order to perform the duties and obligations of the Board under this Declaration and under the Bylaws. In addition, District Declarant, the District Association, and their designees shall have the right to enter upon a Lot for the purpose of cutting grass, hedges and shrubbery and providing maintenance agreed upon with the Owner thereof.

(m) Trade or Business. No gainful profession, occupation, trade or other nonresidential use shall be conducted in any Lot designated for residential purposes or upon the District Common Area or any portion thereof without the prior approval of the Board. Special Use Parcels or areas in which a mix of business and residential purposes are appropriate shall be governed by the provisions of any Supplemental Declaration or Sub-District Declaration covering such portions of the Development. The Board may disapprove such a trade or business in the event that it determines that the trade or business would have a negative impact on the Property, including, without limitation, creating problems related to traffic, parking or security. In determining whether to approve a trade or business conducted in a residential Lot, the Board shall be provided with detailed information on (i) the type of trade or business and (ii) the activities related thereto that could potentially affect the Property. In the event that the Board approves a certain trade or business (the "Approved Use"), then so long as the activities related to that Approved Use do not materially change from the activities described to and approved by the Board, the Board (whether or not the composition of the Board changes) shall not have the right to disapprove the Approved Use after the date of the original approval, subject to subparagraph (s) below. Notwithstanding the foregoing, an Owner or occupant residing in a unit within the Development may conduct business activities within the unit so long as: (a) the existence or operation of the business activity is not apparent or detectable by sight, sound, signage or smell from outside the Unit; (b) the business activity conforms to all applicable zoning, law, statute or ordinance requirements; (c) the business activity does not involve persons coming onto the Development who do not reside in the Development or door-to-door solicitation of residents of the Development; and (d) the business activity is consistent with the residential character of the Property and does not constitute a nuisance, or a hazardous or offensive use, or threaten the security or safety of other residents of the Development, as may be determined in the sole discretion of the Board. The terms "business" and "trade", as used in this provision, shall be construed to have their ordinary, generally accepted meanings, and shall include, without limitation, any occupation, work or activity undertaken on an ongoing basis which involves the provision of goods or services to persons other than the provider's family and for which the

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provider receives a fee, compensation, or other form of consideration, regardless of whether: (i) such activity is engaged in full or part-time; (ii) such activity is intended to or does generate a profit; or (iii) a license is required therefor.

(n) Compliance with Law. The District Association and each Owner shall comply promptly with all laws, statutes, ordinances, rules and regulations of federal, state or municipal governments or authorities applicable to use, occupancy, construction and maintenance of any Improvements upon the Lots, including without limitation any zoning or other approvals or restrictions.

(o) Damage from Plants. No Owner shall permit any plant, tree, shrubbery or other similar item to exist upon any portion of such Owner's Lot that shall damage or create a nuisance on another Lot or that has not been approved by the District Design Review Committee. The Board shall determine conclusively, in its sole and absolute discretion, whether, for the purpose of this paragraph, a particular plant, tree, shrubbery, or other similar item is a nuisance and therefore to be removed from the Property.

(p) Wells. No private wells may be drilled or maintained on any Lot without the prior written consent of the District Design Review Committee.

(q) Laundry. Without the express permission of the District Design Review Committee, no Owner, guest, or tenant, shall hang laundry from any area within or outside the Improvements on a Lot if such laundry is within the public view, or hang laundry in full public view to dry, such as on balcony or terrace railings.

(r) Firearms and Other Weapons. Discharge of firearms and other weapons is prohibited; provided, the Board shall have no obligation to take action to prevent or stop such discharge; provided, further, however, that nothing in this provision shall be deemed to prevent the Declarant or Board, or the Declarant or Board of any Sub-Association, with the consent of Declarant or Board, from establishing or permitting facilities, Lots, or other areas where such activities may be permitted, whether on a private or retail basis. For this purpose, firearms and weapons shall be deemed to include any instrument that may or is designed to propel or discharge bullets, arrows, or other objects by use of explosive force, compressed air, elastic contraction or other means, including without limitation handguns, rifles, shotguns, pellet guns, BB guns, cross-bows, and long or compound bows. This definition shall be broadly construed, and the Declarant and Board of Directors shall have discretion to determine whether a particular object or instrument is a firearm or weapon in its sole discretion.

(s) Restriction on Rentals. No Living Unit shall be rented to a non-Owner except with the prior written consent of the Association.

(i) If an Owner shall desire to rent its Living Unit to a third-party, the Owner shall be required to submit to the Association all of the following, in form and content satisfactory to the Association:

(1) An application for rental providing, among other things, the identity of the Living Unit, the name of the proposed tenant and occupants, the proposed term of the rental, and contact information for the Owner while not occupying the Living Unit.

(2) A copy of a qualifying lease. For purposes of this section, a qualifying lease is one that is for a term not less than twelve (12) months and that expressly advises tenant that the Living Unit is subject to the Declaration and that the tenant is responsible for compliance with the Declaration and all other rules and regulations adopted by the Association from time to time.

(3) A copy of a background check on the prospective tenant and all occupants of the Living Unit provided with the written consent of the prospective tenant and that indicates no prior criminal convictions or any sex offender status or other matter reasonably objected to by the Association.

(4) Any fee charged by the Association for review of the application and other material.

(5) Upon approval, a copy of the executed tenant lease.

(ii) A failure to procure approval prior to leasing a Living Unit shall constitute a violation of the Declaration and, among other things, the Association shall be entitled to injunctive relief against such Owner and the tenant, the Owner acknowledging that legal remedies may not be adequate. The Owner shall be subject to all expenses of the Association resulting from any such violation, including without limitation reasonable attorney fees and other costs of enforcement.

(iii) The Board shall have the power to waive the foregoing restrictions and to reduce the minimum lease term for good cause shown, in the sole discretion of the Board.

(iv) Notwithstanding the foregoing, no Owner shall lease, license for occupancy, or otherwise permit a non-Owner to remain in a Living Unit for a period of less than thirty (30) days if consideration is given for such stay or if such occupancy is advertised by any medium, including without limitation short term rentals.

Section 2. Additional Restrictions. The Board of Directors shall be entitled to invoke additional rules and regulations from time to time for the operation, use and maintenance of the Property located within its jurisdiction, including the Lots and the Common Area, provided such rules and regulations are not inconsistent with this Declaration.

ARTICLE XII
GENERAL PROVISIONS

Section 1. Term. The covenants and restrictions of this Declaration shall run with and bind the Property, and shall inure to the benefit of and shall be enforceable by the District Association or the Owner of any of the Property subject to this Declaration, their respective legal representatives, heirs, successors and assigns, for a term of thirty (30) years from the date this Declaration is recorded. After the initial thirty (30) year term has expired, the term of this Declaration shall be automatically extended for successive periods of ten (10) years, unless an instrument in writing, signed by sixty-seven percent (67%) of the then Owners, has been

recorded within the year preceding the beginning of each successive ten-year period, agreeing to change said covenants and restrictions, in whole or in part, or to terminate the same.

Section 2. Amendment. This Declaration may be amended by a sixty-seven percent (67%) affirmative vote of the Owners present, in person or by proxy, at any duly called meeting, and the written approval of the Master Declarant and District Declarant during the respective Declarant Control Period. During the Declarant Control Period, District Declarant may unilaterally amend this Declaration for any purpose. Any amendment shall not become effective until recorded in the Office of the Register's Office for Maury County, Tennessee. No amendment may remove, revoke, or modify any right or privilege of District Declarant without the written consent of District Declarant or the assignee of such right or privilege. After the Declarant Control Period, the Declarant may unilaterally amend this Declaration so long as such amendment is designed to comply with any law, regulation or provision of the Federal Home Loan Mortgage Corporation or Federal National Mortgage Association.

Section 3. Indemnification. The District Association shall indemnify its officers and directors against any and all expenses and liabilities, including attorney fees, reasonably incurred by or imposed upon any officer or director in connection with any action, suit, or other controversy or proceeding (including settlement of any suit or proceeding, if approved by the then Board of Directors) to which he or she may be a party, or may become involved, by reason of being or having been an officer or director of the District Association. The officers and directors shall not be liable for any mistake of judgment, negligent or otherwise, except for their own individual willful misfeasance, malfeasance, misconduct or bad faith. The officers and directors shall have no personal liability with respect to any contract or other commitment made by them, in good faith, on behalf of the District Association (except to the extent that such officers or directors may also be Members of the District Association), and the District Association shall indemnify and forever hold each such officer and director free and harmless against any and all liability to others on account of any such contract or commitment. Any right to indemnification provided for herein shall not be exclusive of any other rights to which any officer or director, or former officer or director, may be entitled. The District Association shall, as a common expense, maintain adequate general liability and officers' and directors' liability insurance to fund this obligation, if such insurance is reasonably available.

Section 4. Delegation of Use. Any Owner may delegate, in accordance with the Articles of Organization of the District Association and this Declaration, his or her right of enjoyment to the Common Area and facilities to customers, the members of his or her family, tenants and social invitees, subject to such rules and regulations as the Board of Directors may adopt.

Section 5. Construction and Sale by District Declarant. Notwithstanding any provisions contained in this Declaration to the contrary, so long as construction and initial sale of Lots or Improvements shall continue, it shall be expressly permissible for District Declarant to construct, maintain and carry on upon portions of the Property, other than Lots owned by persons other than District Declarant, such facilities and activities as, in the sole opinion of District Declarant, may be reasonably required, convenient, or incidental to the construction or sale of such Lots, including, but not limited to, business offices, signs, utilities, model units, and sales offices, and District Declarant and its invitees shall have an easement for access to such facilities. District Declarant may further delegate all or some of the privileges set forth in this

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Section 8 to any Person in the sole discretion of District Declarant. This Section may not be amended without the express written consent of District Declarant.

Section 6. Severability. Invalidation of any one of these covenants or restrictions by judgment or court order shall in no way affect any other provisions, which shall remain in full force and effect. Each covenant and restrictions shall be enforced to the fullest extent permitted by law.

Section 7. Enforcement. The District Association, or any Owner, shall have the right to enforce, by any proceeding at law or in equity, all restrictions, conditions, covenants, reservations, liens and charges now or hereafter imposed by the provisions of this Declaration. Failure by the District Association or by any Owner to enforce any covenant or restriction herein contained shall in no event be deemed a waiver of the right to do so thereafter. Without limiting the foregoing, the District Association shall have the authority to enforce the restrictions, conditions, covenants and rules and regulations now or hereafter adopted pursuant to this Declaration by the imposition of Fines on Owners, which shall be established by the Board of Directors in its discretion, and enforced and collected as a Special Assessment pursuant to the Declaration. The Board of Directors may establish notice, hearing and other procedures from time to time in conjunction with the use and levying of Fines.

Section 8. Use of the Words "_____". No Person shall use the words "_____" or "_____ at Columbia Bluffs" or any derivative thereof in any printed or promotional material without the prior written consent of District Declarant and Master Declarant.

Section 9. Disclosures. Each Owner acknowledges the following:

(a) The Property is located adjacent to thoroughfares that may be affected by traffic and noise from time to time and may be improved and/or widened in the future.

(b) The views from an Owner's Lot may change over time due to, among other circumstances, additional development and the removal or addition of landscaping.

(c) No representations are made regarding the zoning of adjacent property, or that the category to which adjacent property is zoned may not change in the future.

(d) No representations are made regarding the schools that currently or may in the future serve the Development or any Lot.

(e) Since in every neighborhood, there are conditions that different people may find objectionable, it is acknowledged that there may be conditions outside of the Property that an Owner may find objectionable and that it shall be the sole responsibility of the Owners to become acquainted with neighborhood conditions that could affect a Lot.

(f) All Owners acknowledge and understand that District Declarant and builders or developers will be constructing/renovating portions of the District and engaging in other construction activities related to the construction of Common Area and improvement of Lots. Such construction activities may, from time to time, produce certain conditions within the District, including, without limitation: noise or sound that is objectionable because of its volume,

duration, frequency or shrillness; smoke; noxious, toxic, or corrosive fumes or gases; obnoxious odors; dust, dirt or flying ash; unusual fire or explosion hazards; temporary interruption of utilities; and/or other conditions that may threaten the security or safety of persons within the District. Notwithstanding the foregoing, all Owners agree that such conditions within the District resulting from renovation and construction activities shall not be deemed a nuisance and shall not cause District Declarant and its agents to be deemed in violation of any provision of this Declaration.

ARTICLE XIII
DECLARANT'S RIGHTS

Section 1. Withdrawal or Addition of Property. District Declarant reserves the right to amend this Declaration, for the purpose of removing any portion of the Property or to add additional property to be subject to this Declaration by Supplemental Declaration. Such amendment shall not require the consent of any Person other than the Owner(s) of the property to be withdrawn, if not the District Declarant. If the property is Common Area, the District Association shall consent to such withdrawal. The inclusion of real property in the term "District" shall not be deemed to obligate Declarant to acquire such real property or to include such property within the Property or the Development except in the sole discretion of Declarant.

Section 2. Marketing and Sales Activities. District Declarant and Persons authorized by District Declarant may construct and maintain upon portions of the District and the Common Area such facilities and activities as, in District Declarant's sole opinion, may be reasonably required, convenient, or incidental to the construction or sale of Lots, including, but not limited to, business offices, signs, model units, and sales offices. District Declarant and authorized Persons shall have easements for access to and use of such facilities at no charge.

Section 3. Right to Approve Changes in District Design Standards. No amendment to or modification of any restrictions and rules or architectural guidelines shall be effective without prior notice to and the written approval of District Declarant so long as District Declarant owns property subject to this Declaration or which may become subject to this Declaration in accordance with this Article.

Section 4. Provision of Telecommunication Services. District Declarant shall have the right to enter into an agreement with one or more authorized providers of Telecommunication Services pursuant to which such providers may have the exclusive right to provide Telecommunication Services to all or a particular portion or portions of the District, subject to approval by Master Declarant.

Section 5. Right to Use of Amenity Center. District Declarant shall have the right to use any amenity center within the Development without cost at any time and to permit other parties, including without limitation builders or industry groups, the same privilege of usage at no cost.

Section 6. Right to Transfer or Assign District Declarant Rights. Any or all of District Declarant's special rights and obligations set forth in this Declaration may be transferred in whole or in part to other Persons. No such transfer or assignment shall be effective unless it is in a written instrument executed by District Declarant and recorded in the Office of the Judge of Probate. The foregoing sentence shall not preclude District Declarant from permitting other

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Persons to exercise any right reserved to District Declarant in this Declaration as an agent, employee or contractor of District Declarant where District Declarant does not intend to transfer such right in its entirety, and in such case it shall not be necessary to record any written assignment unless necessary to evidence District Declarant's consent to such exercise. In the event District Declarant ceases to act as District Declarant and abandons its role as District Declarant after the end of the Declarant Control Period, then the District Association shall have and may exercise all rights of District Declarant without the necessity of a written assignment by District Declarant.

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IN WITNESS WHEREOF, the undersigned Declarant has executed this Declaration effective as of the date first set forth above.

DECLARANT:

_____

By:_____

Print Name:_____

Title:_____

STATE OF TENNESSEE

COUNTY OF _____

Before me, the undersigned, a Notary Public in and for the State and County aforesaid, personally appeared _____ with whom I am personally acquainted, (or proved to me on the basis of satisfactory evidence), and who, upon oath, acknowledged that (s)he executed the within instrument for the purposes therein contained, and who further acknowledged that (s)he is the _____ of _____, a _____, and that (s)he as such _____executed the foregoing instrument for the purpose therein contained, being authorized so to do, to execute this instrument on behalf of _____, by signing the name of _____ , as _____.

Witness my hand, at office, this _____day of _____, 20___.

Notary Public_____

My commission expires:_____

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EXHIBIT A
PROPERTY DESCRIPTION

TO BE INSERTED UPON FORMATION OF ASSOCIATION

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EXHIBIT B
CHARTER OF DISTRICT ASSOCIATION

TO BE INSERTED UPON FORMATION OF ASSOCIATION

EXHIBIT C
BY-LAWS OF DISTRICT ASSOCIATION

TO BE INSERTED UPON FORMATION OF ASSOCIATION

CPWS
Columbia Power & Water Systems

201 Pickens Lane
P.O. Box 379
Columbia, TN 38402

P 931.388.4833
F 931.388.5287
www.cpws.com

October 13, 2023

Kolter Land
Joshua Gibbs
1704 Tellico Dr,
Thompsons Station, TN 37179

Re: 420 Bear Creek Pike , Columbia Bluffs

Dear Sir:

Columbia Power System has an existing power line near your proposed development.

We are willing to serve this new development subject to all Columbia Power System policies and procedures in effect at actual time service is rendered provided an approved final plat and complete electrical load information is furnished as soon as possible prior to start of actual construction.

Yours truly,

COLUMBIA POWER & WATER SYSTEMS

Ryan Massey, P. E.
Manager of Power Operations

kw

CITY OF COLUMBIA
TENNESSEE

WASTEWATER DEPARTMENT

16 October 2023

Kolter Land
14025 Riveredge Drive, Suite 175
Tampa, Florida 33637
Attn: James P. Harvey

RE: "Columbia Bluffs" Tax Parcels: 090 012.01,090 012.01 001 and 090 016.00 001

Mr. Harvey,

This letter serves as confirmation that the City of Columbia Wastewater Department has the available capacity to service the above-referenced development. Major or minor improvements to existing infrastructure may or may not be necessary to satisfactorily convey the additional sanitary sewer flow from the above-referenced proposed development. Any extension to the existing sewer infrastructure will be initiated by the owner/developer, reviewed by our department and approved by the State of Tennessee. Grinder Pump systems are not allowed by the City of Columbia. The project must be advanced in accordance with local, state and federal rules, regulations and policies. Funding and construction of those improvements will remain the responsibility of the owner/developer. New customers will be required to pay all fees applicable at the time of connection. No detailed design plan for an extension of the sewer has been proposed at this time.

Donnie Boshers, Director
City of Columbia, TN
Wastewater Department

CPWS

October 13, 2023
Mr. Joshua Gibbs
Kolter Land
14025 Riveredge Drive, Suite 175
Tampa, FL 33637
Sent via email: jgibbs@kolter.com
RE: Water Availability Letter
Big Bear Bluffs Single Family – 129 Units
400 Bear Creek Pike
Tax Map 90, Parcel 12.01
Columbia, Maury County, TN

Dear Mr. Gibbs:

Columbia Power and Water Systems ("the Utility"/CPWS) is a municipal corporation authorized to provide water services in accordance with State law. CPWS has adopted rules, regulations, and standard operation procedures, prescribing the conditions under which CPWS will furnish water service. In addition, certain State laws delegate authority to the Tennessee Department of Environment and Conservation, various Planning Commissions and other authorities in Cities and Counties. These Cities and Counties have also adopted rules and regulations. Subject to the payment of all charges and fees imposed by CPWS and the approval of any and all required governmental agencies, water service will be made available on a first-come, first-served basis, subject to availability of all CPWS furnished equipment and materials appropriate for the development and provided the applicant complies with all rules and regulations of CPWS and conditions set out herein.

As submitted by the applicant, the proposed development includes up to 860 single-family residential units in townhome and detached configurations, an approximately 4,600 square-foot amenity building with pool, a daycare, and irrigation for common areas. CPWS has evaluated the projected water demands for the proposed development and is able to meet a fire-flow capacity of 1,000 gpm at 20 psi for all proposed lots (as submitted by the applicant in concept plan dated 9/29/2023) while maintaining the existing level of service and pressures in this portion of the distribution system. CPWS can provide water for the proposed development according to the following requirements:

- Water availability for the proposed 860 units is contingent upon the schedule of development as provided by the applicant. Any acceleration of the schedule (start, finish, or increased unit count per phase) will require re-evaluation of water availability. Acceptance of an accelerated schedule is not guaranteed. The schedule as provided by the applicant is as follows:

Project Phase	Approximate Units	Sitework Started	Vertical Construction Completion	Notes
Phase 1	129	Q1 2026	Q2 2028	
Phase 2	142	Q2 2028	Q4 2029	Includes amenity building
Phase 3	109	Q3 2029	Q1 2031	Includes daycare
Phase 4	135	Q4 2030	Q2 2032	
Phase 5	112	Q1 2032	Q2 2033	
Phase 6	122	Q2 2033	Q1 2034	
Phase 7	94	Q1 2030	Q2 2033	

- This Water Availability Letter represents water availability for the entire development, but a new water service application and fee is required for subsequent phases. Water service is not guaranteed until the relevant impact fees are paid for each meter to be installed.
- A new 12-inch water main will be required to be installed by the Applicant from Bear Creek Pike, south through the spine road of the proposed development to Iron Bridge Road. From there a 16-inch main will be installed west to Tom J Hitch Parkway. From the intersection of Tom J Hitch Parkway and Iron Bridge Road, a new 16-inch water main will be installed north to the existing 12-inch CPWS water main located just south of the Duck River bridge on Tom J Hitch, as well as south to the existing 12-main near 1451 Tom J Hitch Parkway. The attached figure provides a visual representation of these requirements.
- A permanent, exclusive 20-foot water main easement will be provided by the developer for the new 16-inch and 12-inch water mains. Within the development, the easement may overlap the right-of-way of the spine road.
- Lane additions or other required improvements at Bear Creek Pike or other roadways may necessitate additional construction to relocate any impacted existing water mains.
- All off-site improvements must be constructed, tested per CPWS standards and deeded over to CPWS prior to connection of any domestic water meter used for full-time residence.
- The remainder of the water mains in the development shall be a minimum of 8-inch diameter with looped connections throughout the development. Final design to accommodate fire protection loads may necessitate an increase in some water main sizes in the development.

All of the above requirements are to be constructed and paid for by the Applicant and deeded over to CPWS once complete up to and including the meter. No construction of water infrastructure shall be initiated until final construction plans have been approved by TDEC and a water service agreement with CPWS is fully executed.

Once you have received this Water Availability Letter, next steps in the process to obtain water service from CPWS are as follows:

- Present the attached fireflow analysis figure for coordination and approval of development from the Columbia Fire Marshall.
- Prior to expiration of this water letter, remit to CPWS the new water service fees for Phase 1 of the development as follows:

New Water Service Fee: $1,500 + $370 per SFU (129 SFUs)	$49,230.00

- Provide site base CAD files in DWG format, including roads, lot lines, existing and proposed contours, and other existing and proposed utilities, for use in development of water construction drawings. *This should include survey for the corridor of any required offsite improvements.*
- CPWS will then develop water construction drawings and submit them to TDEC for approval. Upon approval by TDEC and payment of Phase 1 meter and impact fees by the applicant, applicant may then schedule a pre-construction meeting with CPWS. Pre-construction meeting will not be scheduled until fees are paid in full or surety is provided in lieu of full payment. Final meter and impact fees are subject to change based on final design and meter size determination. Meter fees are subject to change based on market costs at time of purchase. Meters will not be set until meter and impact fees are paid. Meter and impact fees for Phase 1 are as follows:

Meter Fee: $540 per 3/4" meter (129 meters)	$69,660.00
Impact Fee: $4,500 per 3/4" meter (129 meters)	$580,500.00
Total Meter and Impact Fees Due =	**$650,160.00**

- After the pre-construction meeting, CPWS will then issue a formal notice to proceed. No construction of CPWS infrastructure may take place prior to the pre-construction meeting.
- Applicant is then required to construct all public water infrastructure per CPWS standard specifications and provide CPWS personnel unregulated access to the site to inspect the construction of the water infrastructure.

If you have any questions, please feel free to contact me at 423-774-0349 or eric.king@inflodesign.com. This letter is valid for one-hundred twenty (120) calendar days from the date of this letter.

Sincerely,



Eric King, P.E.
Inflo Design Group, LLC
on behalf of Columbia Power and Water Systems

cc: Jonathan Hardin, CPWS
File 22-092

PUD-R Justification
Date: October 16, 2023
Project: Columbia Bluffs Preliminary PUD-R Master Development Plan

Property and Master Plan Description

Identifying paths for new development, suburban neighborhood development, through *Connect Columbia*

- **Fostered as part of a practice of managed growth that relies on balancing growth, economic development and community development**
  Columbia Bluffs seeks to be a master planned community with diversity of housing options and civic opportunities.

- **Preservation of historic, cultural and environmental assets**
  Columbia Bluffs seeks to build civic areas around the historic/cultural history of the property and utilize proactive measures to protect the natural environmental systems supporting the Duck River.

- **Connectivity**
  Columbia Bluffs seeks to provide a north-south roadway connection between Iron Bridge and Bear Creek Parkway as well as provide stub road opportunities for future development to the east.

- ***Connect Columbia* Top Priorities: allowing a PUD model that will allow flexibility with more assurance of the final outcome**
  Columbia Bluffs seeks to create a master planned neighborhood with commitments on density, architectural character, quality amenities, and protected open space.

- **Suburban Neighborhood goals: future development emphasizing connectivity and housing diversity, pedestrian friendly**
  Columbia Bluffs seeks to development a master plan with all of these goals.

- ***Connect Columbia* Near-Term Priorities: promote master planned housing opportunities for a "full-life cycle" to accommodate retirees and young professionals and to review zoning standards to permit smaller lot and home sizes to encourage such developments.**
  Columbia Bluffs seeks to create a master planned neighborhood with housing opportunities that range from Active Adult age-restricted living, larger lots/homes to support growing families and generational living opportunities, to smaller lots and town homes for young families.

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PUD Justification

PUD Zoning is only to be used under certain very specific conditions.

- 2.4.4 – *PUD district may be assigned to an area within a parcel of land over 10 gross acres, only if due to unique site conditions or the necessary and intrinsic uses, size, or form a proposed development* ***cannot under any plan, design, or circumstances conform to one or more of the character districts*** *and standards therefor.*

Environmental Uniqueness. The uniqueness of the land and its proximity to the Duck River provides a unique opportunity to master plan the community with greater environmental protection.

The Duck River may be the most significant natural feature in Columbia. It's the protection and preservation of this resource for aquatic species diversity, wildlife, and a clean Columbia is paramount. Open spaces should be identified and preserved with these specific goals in mind. Based on the Zoning Ordinance Primary Use Table 4.3.9.A-1, open spaces are defined based on the use type. While some uses on this chart are similar, they do not seem to capture the breadth of environmental resource protections and would therefore fall under "other open space use not listed under any use category" which is limited to use within a PUD only. The use of the PUD-R for this property ensures the City's oversight and the design team's plans for development are thought about on the front end and not left to speculation. The property should be developed using Conservation Design Concepts where low impact development is proposed and where conservation is the top priority within sensitive land and around environmental features in order to protect them. These conservation areas include floodplains, steep slopes, natural drainage areas, and areas of established tree canopy along the Duck River.

The Zoning Ordinance does not require a Conservation Plan, nor a development strategy to protect a resource as significant as the Duck River. Section 6.2 Preservation of Natural Features states: Development shall preserve the natural features of the site, such as wetlands, unique wildlife habitats, Historic Structures, major trees and scenic views both from and into the site. This regulation is too vague and not specific enough for the subject property.

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Environmental Protection Strategy

1. **Strategy for Resource Protection utilizing a PUD Planning and Design Approach**

    a. Establish a Limits of Disturbance along the Duck River and its tributaries based upon slopes, natural drainage ways, floodplain areas, and mature tree canopy.
    b. Design new development around open space areas to highlight them as community amenities with pedestrian systems that will connect the entire conservation design open space throughout the community.
    c. Pedestrian circulation and trails are highly encouraged along the river, along stream corridors, and through scenic areas.
    d. The quantity of Open Space preservation should greatly exceed any established base zone district.
    e. New home lots should generally be smaller, clustered areas away from the protected banks of the Duck River.
    f. Document on-site natural resources through a State approved Hydrologist and concurrence reports with local, state, and federal agencies.
    g. Remove debris removal along creek banks to prevent impact to Bear Creek (shoes, clothing, random bottles, containers, fencing, wood)
    h. Use Best Management Practices for Stormwater Pollution Prevention Plans during construction.
    i. Use only one crossing point (< less than approx. 50’ - 60’ feet that spans the creek with no structures within Bear Creek (similar to several crossings visible from US (Highway 412).

2. **Strategy for Protection through Construction**

    Implementation of the Plan requires protective measures. PUD phasing and areas of disturbance should be documented and considered through the PUD process. Protection practices shall include:

    A. Storm water erosion control applications I.E.
        i. Stormwater Detention Areas,
        ii. natural riparian buffers
        iii. silt fencing
        iv. sediment ponds
        v. Check dams

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vi. Ongoing stormwater monitoring of Environmental Controls of water runoff areas and tributaries

B. Compliance with CGP, ARAP and NPDES permitting to address the protections that provide additional oversight to the project.

Throughout the duration of the project, these types of practices within the action areas will ensure environmental compliance with local, state and federal requirements.

3. Strategy for Protection when construction is completed.

Once development is completed permanent storm water detention areas and water out fall locations will be cleaned and stabilized in accordance with the local, state, and federal guidelines.

PUD Standards and the Columbia Bluffs Plans

The Columbia Bluffs Master Plan will address and satisfy the standards for PUD Development as defined in 3.7.1 PUD-R District Standards: **PUD-Residential**: *Specifically, this District is intended for predominantly Residential areas on sites where there are sufficient existing infrastructure, services, and utilities available for a proposed Development. Development in this District:*

a. Is walkable and provides a diverse mixture of housing choices and Building Types,
b. Is necessary to implement and is consistent with the Comprehensive Plan,
c. Cannot under any circumstances, plan, or design conform to one or more of the other Districts and standards therefor due to its necessary and intrinsic Uses or size or form,
d. Provides an innovative plan and design,
e. Is harmonious with and respects the land use, character, and natural or man-made features of both the subject property and Adjacent property,
f. Promotes quality and environmentally sensitive planning and design by taking advantage of special site characteristics, locations and land uses,
g. Provides Civic Space,
h. Is the best use of the site consistent with the goals of protecting and enhancing the natural environment. There are specific Development standards provided for this District, which may be supplemented by additional standards approved as part of the applicable Final Master PUD Development Plan.

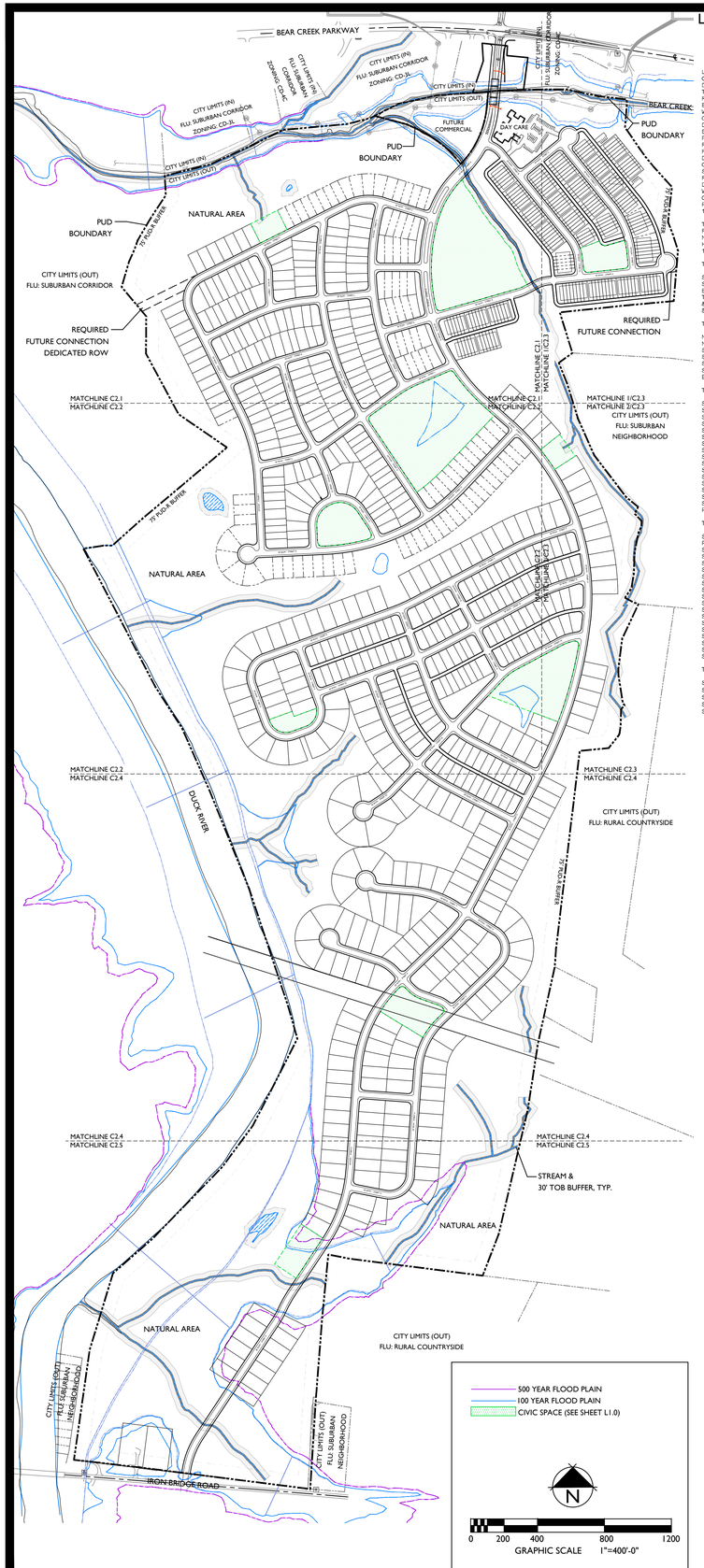
PUD-R Justification
Date: October 16, 2023
Project: Columbia Bluffs Preliminary PUD-R Master Development Plan

Modifications of Standards

The following modifications of standards will be requested by the developer to reduce the development footprint and increase the open space held in preservation. The reduction in ROW width, setbacks, and variations in garage locations will provide for a unique, clustered neighborhood experience.

1. Reduction in ROW width from 70' to 50' provides approximately 19 acres of additional land placed into open space. (+/-41,730 LF of roadway).
2. Reduction in side setbacks from 10' to 7.5' on front loaded homes and townhomes provides approximately 6.6 acres of additional land placed into open space. (113,400 sf townhomes + 175,500 sf front load x 2 side yards x 2.5' reduction).
3. Reduction in side setbacks from 10' to 5' on detached alley loaded homes and active adult homes provides approximately 9.7 acres of additional land placed into open space. (397 homes x 120' depth x 2 side yards x 5' reduction = 422,400 SF)
4. Allow garage in 2nd layer on courtyard style homes (garage doors not facing frontage in second layer)
5. Allow double garage doors with a maximum width of 16' wide, single door with windows
6. Allow primary residential driveways to be 12' instead of 10' across the 1st layer and active adult driveways to be 18' across the 1st layer

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LEGAL DESCRIPTION OF PROPERTY:

LEGAL DESCRIPTION FOR ANNEXATION OF 409.92 ACRES TO PUD
FOR PART OF MAP 90, PARCEL 12.01
DEED BOOK R2051, PAGE 792
BIG BEAR BLUFFS, LLC

LAND LYING IN THE 4TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE, BOUNDED ON THE NORTH BY BEAR CREEK PIKE, ROCK 'N' ROLL JESUS, LLC, AS OF RECORD IN DEED BOOK R2727, PAGE 1242 OF THE REGISTERS OFFICE OF MAURY COUNTY, TENNESSEE (ROMCTN); AMIT J. PATEL AND WIFE, MINAXBEN G. PATEL AS OF RECORD IN DEED BOOK R2411, PAGE 1348, ROMCTN; HK BIG BEAR BLUFFS, LLC (R BOOK R2678, PAGE 961, ROMCTN; ON THE EAST BY JEFFERY L. HEAD AND ROSE HEAD, WIFE & HUSBAND AS OF RECORD IN DEED BOOK R2230, PAGE 388, ROMCTN, STEVEN CHARLES FOSTER AND REBECCA JANE FOSTER, HUSBAND & WIFE AS OF RECORD IN DEED BOOK R2497, PAGE 1334, ROMCTN, BARRY C. BLACKBURN, TRUSTEE FOR BARRY C. BLACKBURN REVOCABLE TRUST AS OF RECORD IN DEED BOOK R2301, PAGE 1492, ROMCTN, BRENT W. THORNTON AND WIFE TERRI L. THORNTON AS OF RECORD IN DEED BOOK R0396, PAGE 766, ROMCTN, CALVIN DEAN JOHNSON FORMERLY CARL JOHNSON AND WIFE, BARBARA D. JOHNSON AS OF RECORD IN DEED BOOK 375, PAGE 543, ROMCTN, AND CALVIN DEAN JOHNSON AND WIFE SHERYL GAY JOHNSON AS OF RECORD IN DEED BOOK R747, PAGE 602, ROMCTN; ON THE SOUTH BY IRON BRIDGE ROAD; AND ON THE WEST BY JIMMY MATHEWS AS OF RECORD IN DEED BOOK R2411, PAGE 80, DAVID LUNN HARRIS ETUX AS OF RECORD IN DEED BOOK R2115, PAGE 1148, ROMCTN, DUCK RIVER, AND MARK A. SEAGO AND WIFE TINA SEAGO AS OF RECORD DEED BOOK R2369, PAGE 973 ROMCTN; AND CONTINUED TO THE NORTH BY MIKE BIKES AS OF RECORD IN DEED BOOK R1884, PAGE 1082, DWAYNE SAM GOODMAN AS OF RECORD IN DEED BOOK R2732, PAGE 1288, AND IS MORE PARTICULARLY DESCRIBED AS FOLLOWS

TO FIND THE TRUE POINT OF BEGINNING, COMMENCE AT AN 1 INCH IRON PIPE FOUND IN THE SOUTHERN ROW OF BEAR CREEK PIKE, SAID POINT ALSO BEING THE NORTHWEST BOUNDARY OF ROCK 'N' ROLL JESUS, LLC (BK R2727, PG 1242) AND HAVING A TENNESSEE STATE PLANE COORDINATE OF NORTH 475,793.95 EAST 1,872,344.21;

THENCE, WITH THE WEST BOUNDARY OF JESUS, THE FOLLOWING CALLS:

S 05°01'16" W, FOR A DISTANCE OF 269.51 FEET, TO AN IRON PIN FOUND;
S 21°32'47" E, FOR A DISTANCE OF 51.20 FEET TO A THE CENTER OF BEAR CREEK BEING THE SOUTHWEST CORNER OF ROCK N ROLL JESUS;
THENCE, WITH THE SOUTH BOUNDARY OF ROCK 'N' ROLL JESUS, LLC, AMIT J. PATEL & HK BIG BEAR BLUFFS, LLC, AND ALSO BEING THE CENTER OF BEAR CREEK, N 85°53'31" E, 307.86 FEET TO THE TRUE POINT OF BEGINNING;

THENCE, CONTINUING WITH BEAR CREEK, THE FOLLOWING CALLS:

N 85°53'31" E, FOR A DISTANCE OF 85.49 FEET TO A POINT;
N 89°39'27" E, FOR A DISTANCE OF 118.80 FEET TO A POINT;
S 89°57'56" E, FOR A DISTANCE OF 168.93 FEET TO A POINT;
S 81°59'35" E, FOR A DISTANCE OF 77.46 FEET TO A POINT;
S 78°01'43" E, FOR A DISTANCE OF 120.71 FEET TO A POINT;
S 83°35'45" E, FOR A DISTANCE OF 172.70 FEET TO A POINT ALONG THE WEST BOUNDARY OF JEFFERY L. HEAD;

THENCE, WITH THE WEST BOUNDARY OF HEAD, THE FOLLOWING CALLS:

S 0°56'50" W, FOR A DISTANCE OF 40.52 FEET TO AN IRON PIN;
S 04°40'44" W, FOR A DISTANCE OF 127.32 FEET TO A 1-1/2" PIPE FOUND;
S 34°29'27" E, FOR A DISTANCE OF 153.87 FEET TO A T-POST;
S 35°04'16" E, FOR A DISTANCE OF 55.17 FEET TO A T-POST;
S 39°22'56" E, FOR A DISTANCE OF 64.02 FEET TO A T-POST;
S 42°05'33" E, FOR A DISTANCE OF 106.39 FEET TO A T-POST;
S 42°31'20" E, FOR A DISTANCE OF 55.23 FEET TO AN 1-1/2" PIPE FOUND;
S 7°06'58" W, FOR A DISTANCE OF 101.11 FEET TO A 3" METAL POST;
S 5°45'07" W, FOR A DISTANCE OF 110.19 FEET TO AN 1-1/2" PIPE FOUND;
S 21°14'47" E, FOR A DISTANCE OF 78.14 FEET TO A T-POST;
S 17°34'01" E, FOR A DISTANCE OF 102.59 FEET TO A 24" CEDAR;
S 4°57'22" W, FOR A DISTANCE OF 172.54 FEET TO A T-POST;
S 4°32'31" W, FOR A DISTANCE OF 130.65 FEET TO 36" OAK;
S 84°46'29" W, FOR A DISTANCE OF 270.35 FEET TO 20" MAPLE;
S 84°01'38" W, FOR A DISTANCE OF 414.11 FEET TO A FENCE POST;
S 17°15'39" E, FOR A DISTANCE OF 254.68 FEET TO A 6" ROTTED HACKBERRY FENCE POST TO THE SOUTHWEST CORNER OF HEAD;

THENCE, WITH THE WEST BOUNDARY OF FOSTER, THE FOLLOWING CALLS:

S 54°11'5" W, FOR A DISTANCE OF 100.29 FEET TO 6" ROTTED HACKBERRY FENCE POST;
S 21°03'18" E, FOR A DISTANCE OF 130.86 FEET TO A CEDAR FENCE POST;
S 17°11'57" E, FOR A DISTANCE OF 221.38 FEET TO A 12" ELM;
S 23°46'07" E, FOR A DISTANCE OF 240.66 FEET TO A T-POST;
S 37°24'05" E, FOR A DISTANCE OF 315.73 FEET TO 14" ELM;
S 50°37'42" E, FOR A DISTANCE OF 91.73 FEET TO 60" TWIN OAK;
S 28°59'39" W, FOR A DISTANCE OF 35.62 FEET TO 60" OAK;
S 40°35'26" W, FOR A DISTANCE OF 9.08 FEET TO A T-POST;
S 42°52'20" E, FOR A DISTANCE OF 62.79 FEET TO A POINT;
S 1°50'17" W, FOR A DISTANCE OF 30.25 FEET TO A POINT;
S 23°53'47" W, FOR A DISTANCE OF 42.59 FEET TO 14" HACKBERRY;
S 11°25'58" W, FOR A DISTANCE OF 117.75 FEET TO A T-POST;
S 2°03'52" W, FOR A DISTANCE OF 130.94 FEET TO ROTTED HACKBERRY;
S 9°12'29" W, FOR A DISTANCE OF 87.18 FEET A POINT;
S 33°58'56" W, FOR A DISTANCE OF 69.04 FEET TO A 30" HACKBERRY;
S 61°19'48" E, FOR A DISTANCE OF 54.74 FEET TO A 24" HACKBERRY;
S 70°11'17" E, FOR A DISTANCE OF 34.53 FEET TO 12" CEDAR POST AT THE SOUTHWEST CORNER OF FOSTER;

THENCE, WITH THE WEST BOUNDARY OF BLACKBURN, THE FOLLOWING CALLS:

S 25°13'18" W, FOR A DISTANCE OF 225.44 FEET TO A 36" HACKBERRY;
S 7°09'46" W, FOR A DISTANCE OF 177.84 FEET TO A 8" DOGWOOD;
S 0°16'28" W, FOR A DISTANCE OF 41.40 FEET TO A 24" HACKBERRY FLAGGED;
S 8°53'22" E, FOR A DISTANCE OF 173.37 FEET TO A T-POST;
S 50°40'30" E, FOR A DISTANCE OF 13.02 FEET TO 6" FENCE POST;
S 39°18'12" W, FOR A DISTANCE OF 34.16 FEET TO A POINT;
S 1°12'16" W, FOR A DISTANCE OF 95.58 FEET TO A 12" OSAGE;
S 7°58'27" W, FOR A DISTANCE OF 43.94 FEET TO A 6" ROTTED TREE;
S 15°41'30" W, FOR A DISTANCE OF 13.75 FEET TO A A 6" TREE USED AS FENCE POST;
S 38°17'00" W, FOR A DISTANCE OF 100.34 FEET TO A 14" ROTTEN CEDAR;
S 84°35'04" W, FOR A DISTANCE OF 173.30 FEET TO FENCE CORNER PK FOUND;
S 6°40'35" W, FOR A DISTANCE OF 1187.64 FEET TO A POINT;
S 4°03'46" W, FOR A DISTANCE OF 112.89 FEET TO A 26" CEDAR;
S 12°22'22" W, FOR A DISTANCE OF 465.96 FEET TO A 1" PIPE FOUND;

THENCE, WITH THE WEST BOUNDARY OF BLACKBURN AND CONTINUING TO THORNTON, THE FOLLOWING CALLS:

S 8°47'46" W, FOR A DISTANCE OF 411.13 FEET TO 1" PIPE FOUND;

THENCE, WITH THE WEST BOUNDARY THORNTON, THE FOLLOWING CALLS:

S 13°08'41" W, FOR A DISTANCE OF 759.59 FEET TO 1" PIPE FOUND;
S 21°10'50" W, FOR A DISTANCE OF 265.00 FEET TO 1" PIPE FOUND AT THE SOUTHWEST CORNER OF THORNTON;

THENCE, WITH THE NORTH BOUNDARY OF JOHNSON, THE FOLLOWING CALLS:

N 82°44'49" W, FOR A DISTANCE OF 600.97 FEET TO 1" PIPE FOUND;
N 78°43'22" W, FOR A DISTANCE OF 130.34 FEET TO 1" PIPE FOUND;

THENCE, WITH THE WEST BOUNDARY OF JOHNSON, THE FOLLOWING CALLS:

S 5°33'34" W, FOR A DISTANCE OF 375.75 FEET TO 1" PIPE FOUND;
S 4°27'28" W, FOR A DISTANCE OF 508.55 FEET TO A POINT;
S 5°35'19" W, FOR A DISTANCE OF 523.31 FEET TO 5/8" IRON PIN FOUND AT THE SOUTHWEST CORNER OF THORNTON;

THENCE, WITH THE NORTH BOUNDARY OF IRON BRIDGE ROAD RIGHT-OF-WAY, THE FOLLOWING CALLS:

N 82°45'55" W, FOR A DISTANCE OF 501.29 FEET TO AN 5/8" IRON PIN FOUND;
N 82°46'22" W, FOR A DISTANCE OF 525.64 FEET TO RAILROAD SPIKE PK FOUND;
N 83°23'15" W, FOR A DISTANCE OF 396.04 FEET TO 5/8" IRON PIN FOUND AT SOUTHEAST CORNER OF MATTHEWS;

THENCE, WITH THE EAST BOUNDARY OF MATHEWS, HARRIS AND DUCK RIVER, THE FOLLOWING CALLS:

N 8°06'23" E, FOR A DISTANCE OF 864.54 FEET TO 1/2" IRON PIN FOUND;
N 1°16'09" E, FOR A DISTANCE OF 478.23 FEET TO A POINT;
N 48°48'57" E, FOR A DISTANCE OF 312.04 FEET TO A POINT;
N 44°09'58" E, FOR A DISTANCE OF 600.70 FEET TO A POINT;
N 36°27'00" E, FOR A DISTANCE OF 305.02 FEET TO A POINT;
N 27°21'22" E, FOR A DISTANCE OF 284.82 FEET TO A POINT;
N 26°51'08" E, FOR A DISTANCE OF 301.40 FEET TO 1" PIPE FOUND;

N 15°43'20" W, FOR A DISTANCE OF 197.42 FEET TO A POINT;
N 18°27'24" W, FOR A DISTANCE OF 744.16 FEET TO A POINT;
N 21°56'04" W, FOR A DISTANCE OF 031.16 FEET TO A POINT;
N 23°44'52" W, FOR A DISTANCE OF 409.10 FEET TO A POINT;
N 32°46'41" W, FOR A DISTANCE OF 286.98 FEET TO A POINT;
N 27°28'08" W, FOR A DISTANCE OF 932.36 FEET TO A POINT;

THENCE, DIRECTING RIGHT AWAY FROM DUCK RIVER TO THE SOUTH AND EAST BOUNDARY OF SEAGO, THE FOLLOWING CALLS:

N 85°09'29" E, FOR A DISTANCE OF 22.00 FEET TO A POINT;
N 81°22'35" E, FOR A DISTANCE OF 109.60 FEET TO A POINT;
S 87°29'25" E, FOR A DISTANCE OF 42.46 FEET TO 26" OAK;
N 46°08'47" E, FOR A DISTANCE OF 244.67 FEET TO A POINT;
N 46°56'39" E, FOR A DISTANCE OF 291.18 FEET TO 10" HACKBERRY AND 8" CEDAR;
N 49°46'28" E, FOR A DISTANCE OF 367.28 FEET TO 1" PIPE FOUND;
N 55°27'24" W, FOR A DISTANCE OF 350.42 FEET TO A POINT;
N 28°16'29" W, FOR A DISTANCE OF 411.36 FEET TO A 1" PIPE FOUND;
N 71°17'50" E, FOR A DISTANCE OF 220.64 FEET TO AN IRON PIN FOUND;
N 39°36'42" W, FOR A DISTANCE OF 228.86 FEET TO AN IRON PIN FOUND;
N 16°17'40" E, FOR A DISTANCE OF 158.31 FEET TO A POINT;
N 24°10'55" E, FOR A DISTANCE OF 52.03 FEET TO A POINT;
N 27°26'46" E, FOR A DISTANCE OF 28.14 FEET TO 1" PIPE IRON PIPE;
N 19°40'08" E, FOR A DISTANCE OF 57.72 FEET TO A 12" CEDAR;
N 30°13'56" E, FOR A DISTANCE OF 123.71 FEET TO A POINT;
N 32°10'27" E, FOR A DISTANCE OF 87.89 FEET TO A POINT;
N 33°44'57" E, FOR A DISTANCE OF 105.82 FEET TO 1" PIPE FOUND;
N 3°11'17" W, FOR A DISTANCE OF 116.30 FEET TO A POINT AT THE NORTHEAST CORNER OF SEAGO AND THE CENTER OF BEAR CREEK;

THENCE, ALONG BEAR CREEK AND SOUTHERN BOUNDARY OF MIKES BIKES, THE FOLLOWING CALLS:

N 75°48'45" E, FOR A DISTANCE OF 280.14 FEET TO A POINT;
N 85°23'51" E, FOR A DISTANCE OF 281.90 FEET TO A POINT AT THE SOUTHEAST CORNER OF BIKES;

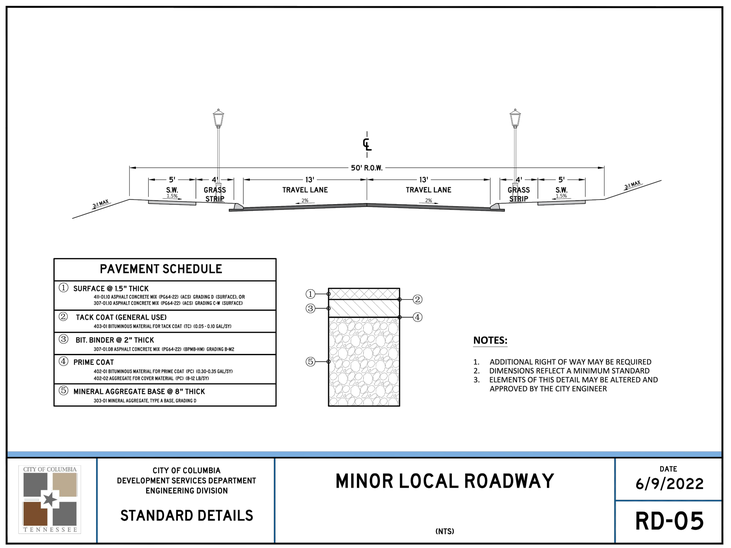
THENCE, ALONG SOUTH BOUNDARY OF GOODMAN, N 63°42'14" E, 199.86 FEET TO A POINT;

THENCE, CREATING A NEW LINE FOR THE ANNEXATION OF 409.92 ACRES. THE FOLLOWING CALLS:

N 84°40'48" E, FOR A DISTANCE OF 385.89 FEET TO A POINT;
N 75°36'41" E, FOR A DISTANCE OF 141.99 FEET TO A POINT;
N 83°11'05" E, FOR A DISTANCE OF 28.87 FEET TO A POINT AT AN INTERSECTION OF MCKAY BRANCH
CONTINUING ALONG MCKAY BRANCH AND CREATING A NEW LINE FOR THE ANNEXATION OF 409.92 ACRES. THE FOLLOWING CALLS:
S 7°51'27" E, FOR A DISTANCE OF 201.29 FEET TO A POINT;
S 85°15'03" E, FOR A DISTANCE OF 74.45 FEET TO A POINT;
S 61°08'47" E, FOR A DISTANCE OF 61.78 FEET TO A POINT;
S 58°09'42" E, FOR A DISTANCE OF 42.46 FEET TO A POINT;
S 51°12'54" E, FOR A DISTANCE OF 88.37 FEET TO A POINT;
S 45°49'08" E, FOR A DISTANCE OF 65.41 FEET TO A POINT;
S 39°48'13" E, FOR A DISTANCE OF 73.31 FEET TO A POINT;

THENCE, LEAVING MCKAY BRANCH AND CREATING A NEW LINE FOR THE ANNEXATION OF 409.92 ACRES, THE FOLLOWING CALLS:

NORTHEASTERLY ALONG A CURVE THROUGH A CENTRAL ANGLE OF 38°33'55", AN ARC DISTANCE OF 380.30 FEET TO A POINT OF TANGENCY, SAID CURVE IS CONCAVE NORTHWESTERLY AND HAS A RADIUS OF 565.50 FEET, CHORD BEARING N 24°33'52" E WITH A CHORD DISTANCE OF 373.16 FEET TO A POINT OF TANGENCY;
N 05°15'54" E, 84.04 FEET TO THE POINT OF BEGINNING CONTAINING 409.92 ACRES (17,855,971 SQ.FT.) AND BEING A PORTION OF THE PROPERTY SHOWN ON TAX MAP 90 PARCEL 12.01 CONVEYED TO BIG BEAR BLUFFS, LLC BY DEED OF RECORD IN BOOK R2837, PAGE 287 IN THE REGISTER'S OFFICE OF MAURY COUNTY, TENNESSEE.



REQUESTED STREET SECTION

PROJECT DESCRIPTION AND SITE DATA:

REQUEST TO ANNEX AND REZONE THE COLUMBIA BLUFFS PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN.

THE PUD-R PLAN PROPOSES AN ENVIRONMENTALLY SENSITIVE MASTER PLAN FOR A DIVERSE RESIDENTIAL DEVELOPMENT. APPROXIMATELY ONE-THIRD OF THE PROPOSED DEVELOPMENT IS RESERVED FOR ACTIVE ADULT/AGE RESTRICTED SINGLE-FAMILY HOMES. ADDITIONALLY, TOWN HOMES AND A VARIETY OF DETACHED SINGLE-FAMILY HOMES ARE PROPOSED.

IN ADDITION TO THE RESIDENTIAL COMPONENT, THE PUD-R PLANS PROPOSES A DAY CARE FACILITY AND A VARIETY OF NEIGHBORHOOD AMENITIES.

TOTAL SITE AREA: 409.92 ACRES
FUTURE LAND USE: SUBURBAN NEIGHBORHOOD

TOTAL DWELLING UNITS: 860 HOMES
OVERALL SITE DENSITY: 2.1 DUA

RESIDENTIAL BREAKDOWN		NON RESIDENTIAL
ACTIVE ADULT HOMES:	293	DAYCARE 12,000 - 14,000 SF
TOWNHOMES:	189	
ALLEY SINGLE-FAMILY:	144	
COURTYARD HOMES:	104	
LARGE LOT HOMES:	130	

EXISTING TREE CANOPY COVERAGE: 262.2 ACS; 64% OF TOTAL SITE
REQUIRED TREE CANOPY RETENTION: 36%; REQUIRED WITH FMDP

TOTAL OPEN SPACE PROVIDED: 199.8 AC; 48.7% OF GROSS SITE AREA
OPEN SPACE BREAKDOWN
CIVIC SPACE: 22.2 AC
ENVIRONMENTAL PROTECTION (FLOODWAY, STREAM/BUFFERS, 100 YR FLOOD PLAIN): 75.0 AC
ALL OTHER OPEN SPACE: 102.6 AC

CIVIC SPACE REQUIRED: 5% MINIMUM; 20.5 AC
CIVIC SPACE PROVIDED: 5.4%; 22.2 AC (SEE SHEET L1.0)

PARKING: SEE LOT DIAGRAMS (C2.6) FOR PROPOSED RESIDENTIAL PARKING;
AND SHEETS L1.0-L1.6 FOR CIVIC SPACE PARKING
RESIDENTIAL: 2 PARKING SPACES PER UNIT
DAYCARE: 1 PER STAFF + 0.5 PER CHILD
CIVIC SPACE: 1 PER 5,000 SF

ANNEXATION AND REZONING REQUEST:

REQUEST TO ANNEX +/-409.92 ACRES AND REZONE TO PUD-R
FUTURE LAND USE: SUBURBAN NEIGHBORHOOD

CONNECT COLUMBIA FINDINGS:
Annexation should provide for a continuation of orderly, planned development of the City. Lot sizes and development scale should be compatible with surrounding development. If proposed development abuts land that is undeveloped or has low density/intensity, the density and intensity of the proposed development should taper towards the periphery to provide compatibility of the development pattern. Land annexed into the City should follow the transect and Character Area Matrix to provide the most appropriate land uses and zoning for the newly annexed land.
Response: The proposed Columbia Bluffs subdivision is 2 miles from the downtown core. Density and lot size transitions from higher density/intensity at the north, along the Bear Creek Parkway corridor to the south, where a more rural character is appropriate adjacent to Iron Bridge Rd and the Yanahli Park. The properties along Bear Creek Parkway have been identified as "area of change." With the development along this corridor, residential development in close proximity to downtown and new commercial development along Tom Hitch Parkway is a logical progression of development pattern.

Connectivity, directly through street, sidewalks, bikeways, greenways, and trails, and indirectly, through a mixture of housing and business types, should be encouraged throughout Columbia..
Response: In addition to roadway and sidewalk connections, Columbia Bluffs proposes nature trails through out the property. The development will also provide a roadway connection between Bear Creek Parkway and Iron Bridge Road. A variety of housing types are proposed, including an age restricted Active Adult neighborhood.

Suburban Neighborhood: Future development should emphasize connectivity and housing diversity.
Response: Columbia Bluffs proposes a variety of housing styles
Near-term Priorities: HOUSING MIX/TYPES: Promote mastered planned housing opportunities for a "full-life cycle" community to accommodate retirees and young professionals. Review Zoning standards to permit smaller lot and home sizes to encourage such developments.

MODIFICATIONS FROM STANDARD PUD-R ZONING REQUEST:

RESIDENTIAL LOT DIAGRAMS: SEE SHEET C2.6
1. ACTIVE ADULT AND PRIMARY ALLEY LOADED HOMES SIDE-SETBACK REDUCED TO 5'.
2. OTHER PRIMARY RESIDENTIAL SIDE-SETBACK REDUCED TO 7.5'.
3. ACTIVE ADULT, COURTYARD, AND LARGE LOT GARAGE LOCATED IN 2ND LAYER
4. ACTIVE ADULT, COURTYARD, AND LARGE LOT ALLOWED DOUBLE CAR GARAGE DOORS, WITH A MAXIMUM WIDTH OF 16'
5. ACTIVE ADULT DRIVEWAYS TO BE 18' IN FIRST LAYER.
6. COURTYARD AND LARGE LOT DRIVEWAY TO BE 12' IN FIRST LAYER.

THOROUGHFARE STANDARDS:
1. UTILIZATION OF 50' ROW INSTEAD OF 70' ROW.

CIVIC SPACE:
1. ACTIVE ADULT NEIGHBORHOOD TO BE EXCLUDED FROM REQUIRED PLAYGROUND CRITERIA.

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE
REGISTERED
TENNESSEE
LANDSCAPE ARCHITECT
1621

Date: October 16, 2023
Revision Date
△
△
△

OVERALL PUD-R PMDP
SHEET
C2.0

LEGAL DESCRIPTION FOR ANNEXATION OF 409.92 ACRES TO PUD
FOR PART OF MAP 90, PARCEL 12.01
DEED BOOK R2051, PAGE 792
BIG BEAR BLUFFS, LLC

LAND LYING IN THE 4TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE, BOUNDED ON THE NORTH BY BEAR CREEK PIKE, ROCK 'N' ROLL JESUS, LLC, AS OF RECORD IN DEED BOOK R2727, PAGE 1242 OF THE REGISTERS OFFICE OF MAURY COUNTY, TENNESSEE (ROMCTN), AMIT J. PATEL AND WIFE, MINAXIBEN G. PATEL AS OF RECORD IN DEED BOOK R2411, PAGE 1348, ROMCTN, HK BIG BEAR BLUFFS, LLC (R BOOK 2878, PAGE 961, ROMCTN, ON THE EAST BY JEFFERY L. HEAD AND ROSE HEAD, WIFE & HUSBAND AS OF RECORD IN DEED BOOK R2230, PAGE 388, ROMCTN, STEVEN CHARLES FOSTER AND REBECCA JANE FOSTER, HUSBAND & WIFE AS OF RECORD IN DEED BOOK R2497, PAGE 1304, ROMCTN, BARRY C. BLACKBURN, TRUSTEE FOR BARRY C. BLACKBURN REVOCABLE TRUST AS OF RECORD IN DEED BOOK R2301, PAGE 1492, ROMCTN, BRENT W. THORNTON AND WIFE TERRI L. THORNTON AS OF RECORD IN DEED BOOK R2096, PAGE 766, ROMCTN, CALVIN DEAN JOHNSON FORMERLY CARL JOHNSON AND WIFE, BARBARA D. JOHNSON AS OF RECORD IN DEED BOOK 375, PAGE 542, ROMCTN, AND CALVIN DEAN JOHNSON AND WIFE SHERYL GAY JOHNSON AS OF RECORD IN DEED BOOK R747, PAGE 602, ROMCTN; ON THE SOUTH BY IRON BRIDGE ROAD; AND ON THE WEST BY JIMMY MATHEWS AS OF RECORD IN DEED BOOK 1311, PAGE 80, DAVID LUNN HARRIS ETUX AS OF RECORD IN DEED BOOK R2173, PAGE 1148, ROMCTN, DUCK RIVER, AND MARK A. SEAGO AND WIFE TINA SEAGO AS OF RECORD DEED BOOK R2369, PAGE 973 ROMCTN; AND CONTINUED TO THE NORTH BY MIKE BIKES AS OF RECORD IN DEED BOOK R1884, PAGE 1082, DWAYNE SAM GOODMAN AS OF RECORD IN DEED BOOK R2732, PAGE 1288, AND IS MORE PARTICULARLY DESCRIBED AS FOLLOWS;

TO FIND THE TRUE POINT OF BEGINNING, COMMENCE AT AN 1 INCH IRON PIPE FOUND IN THE SOUTHERN ROW OF BEAR CREEK PIKE, SAID POINT ALSO BEING THE NORTHWEST BOUNDARY OF ROCK 'N' ROLL JESUS, LLC (BK R2727, PG 1242) AND HAVING A TENNESSEE STATE PLANE COORDINATE OF NORTH 475,793.95 EAST 1,672,944.21;

THENCE, WITH THE WEST BOUNDARY OF JESUS, THE FOLLOWING CALLS:

S 08°01'16" W, FOR A DISTANCE OF 269.51 FEET, TO AN IRON PIN FOUND;
S 21°32'47" E, FOR A DISTANCE OF 51.20 FEET TO A THE CENTER OF BEAR CREEK BEING THE SOUTHWEST CORNER OF ROCK N ROLL JESUS;
THENCE, WITH THE SOUTH BOUNDARY OF ROCK 'N' ROLL JESUS, LLC, AMIT J. PATEL & HK BIG BEAR BLUFFS, LLC, AND ALSO BEING THE CENTER OF BEAR CREEK, N 85°53'31" E, 307.86 FEET TO THE TRUE POINT OF BEGINNING;

THENCE, CONTINUING WITH BEAR CREEK, THE FOLLOWING CALLS:

N 85°53'31" E, FOR A DISTANCE OF 85.49 FEET TO A POINT;
N 88°09'20" E, FOR A DISTANCE OF 218.80 FEET TO A POINT;
S 89°57'55" E, FOR A DISTANCE OF 158.93 FEET TO A POINT;
S 78°59'35" E, FOR A DISTANCE OF 77.46 FEET TO A POINT;
S 78°01'13" E, FOR A DISTANCE OF 120.71 FEET TO A POINT;

S 83°35’45” E, FOR A DISTANCE OF 172.70 FEET TO A POINT ALONG THE WEST BOUNDARY OF JEFFERY L. HEAD;

THENCE, WITH THE WEST BOUNDARY OF HEAD, THE FOLLOWING CALLS:

S 0°55'50" W, FOR A DISTANCE OF 40.52 FEET TO AN IRON PIN;
S 04°40'44" W, FOR A DISTANCE OF 127.32 FEET TO A 1-1/2” PIPE FOUND;
S 34°29'27" E, FOR A DISTANCE OF 153.97 FEET TO A T-POST;
S 35°04'16" E, FOR A DISTANCE OF 55.17 FEET TO A T-POST;
S 39°22'56" E, FOR A DISTANCE OF 84.02 FEET TO A T-POST;
S 42°05'33" E, FOR A DISTANCE OF 106.39 FEET TO A T-POST;
S 42°31'20" E, FOR A DISTANCE OF 55.23 FEET TO AN 1-1/2” PIPE FOUND;
S 7°06'55" W, FOR A DISTANCE OF 101.11 FEET TO A 3” METAL POST;
S 5°45'07" W, FOR A DISTANCE OF 110.19 FEET TO AN 1-1/2” PIPE FOUND;
S 21°14'47" E, FOR A DISTANCE OF 78.14 FEET TO A T-POST;
S 17°34'01" E, FOR A DISTANCE OF 102.59 FEET TO A 24” CEDAR;
S 4°57'22" W, FOR A DISTANCE OF 172.54 FEET TO A T-POST;
S 4°32'31" W, FOR A DISTANCE OF 130.65 FEET TO 36” OAK;
S 84°48'25" W, FOR A DISTANCE OF 270.35 FEET TO 30” MAPLE;
S 84°01'38" W, FOR A DISTANCE OF 414.11 FEET TO A FENCE POST;
S 17°15'39" E, FOR A DISTANCE OF 254.68 FEET TO A 6” ROTTED HACKBERRY FENCE POST TO THE SOUTHWEST CORNER OF HEAD;

THENCE, WITH THE WEST BOUNDARY OF FOSTER, THE FOLLOWING CALLS:

S 54°11'15" W, FOR A DISTANCE OF 100.29 FEET TO 6” ROTTED HACKBERRY FENCE POST;
S 21°53'18" E, FOR A DISTANCE OF 130.86 FEET TO A CEDAR FENCE POST;
S 17°11'57" E, FOR A DISTANCE OF 221.38 FEET TO A 12” ELM;
S 23°46'07" E, FOR A DISTANCE OF 240.66 FEET TO A T-POST;
S 37°24'05" E, FOR A DISTANCE OF 315.73 FEET TO 14” ELM;
S 50°37'42" E, FOR A DISTANCE OF 91.73 FEET TO 60” TWIN OAK;
S 26°59'39" W, FOR A DISTANCE OF 35.62 FEET TO 60” OAK;
S 40°35'26" W, FOR A DISTANCE OF 9.08 FEET TO A T-POST;
S 42°52'20" E, FOR A DISTANCE OF 62.79 FEET TO A POINT;
S 1°50'17" W, FOR A DISTANCE OF 30.25 FEET TO A POINT;
S 23°53'47" W, FOR A DISTANCE OF 42.59 FEET TO 14” HACKBERRY;
S 11°25'58" W, FOR A DISTANCE OF 117.73 FEET TO A T-POST;
S 2°03'52" W, FOR A DISTANCE OF 130.34 FEET TO ROTTED HACKBERRY;
S 9°12'29" W, FOR A DISTANCE OF 87.18 FEET A POINT;
S 33°56'56" W, FOR A DISTANCE OF 69.94 FEET TO A 30” HACKBERRY;
S 61°19'48" E, FOR A DISTANCE OF 54.74 FEET TO A 24” HACKBERRY;
S 70°11'17" E, FOR A DISTANCE OF 34.53 FEET TO 12” CEDAR POST AT THE SOUTHWEST CORNER OF FOSTER;

THENCE, WITH THE WEST BOUNDARY OF BLACKBURN, THE FOLLOWING CALLS:

S 25°13'18" W, FOR A DISTANCE OF 228.44 FEET TO A 36” HACKBERRY;
S 7°06'46" W, FOR A DISTANCE OF 177.84 FEET TO A 8” DOGWOOD;
S 0°16'28" W, FOR A DISTANCE OF 41.40 FEET TO A 24” HACKBERRY FLAGGED;
S 8°53'22" E, FOR A DISTANCE OF 173.37 FEET TO A T-POST;
S 50°40'30" E, FOR A DISTANCE OF 13.02 FEET TO 6” FENCE POST;

S 39°18'12" W, FOR A DISTANCE OF 34.16 FEET TO A POINT;
S 1°12'18" W, FOR A DISTANCE OF 95.58 FEET TO A 12” OSAGE;
S 7°58'27" W, FOR A DISTANCE OF 43.94 FEET TO A 6” ROTTED TREE;
S 15°41'30" W, FOR A DISTANCE OF 13.75 FEET TO A A 6” TREE USED AS FENCE POST;
S 38°17'00" W, FOR A DISTANCE OF 100.34 FEET TO A 14” ROTTEN CEDAR;
S 84°35'04" W, FOR A DISTANCE OF 173.30 FEET TO FENCE CORNER PK FOUND;
S 6°49'35" W, FOR A DISTANCE OF 1187.64 FEET TO A POINT;
S 4°03'46" W, FOR A DISTANCE OF 112.86 FEET TO A 24” CEDAR;
S 12°22'22" W, FOR A DISTANCE OF 465.96 FEET TO A 1” PIPE FOUND;

THENCE, WITH THE WEST BOUNDARY OF BLACKBURN AND CONTINUING TO THORNTON, THE FOLLOWING CALLS:

S 8°47'49" W, FOR A DISTANCE OF 411.13 FEET TO 1” PIPE FOUND;

THENCE, WITH THE WEST BOUNDARY THORNTON, THE FOLLOWING CALLS:

S 13°08'41" W, FOR A DISTANCE OF 759.59 FEET TO 1” PIPE FOUND;
S 21°10'50" W, FOR A DISTANCE OF 265.00 FEET TO 1” PIPE FOUND AT THE SOUTHWEST CORNER OF THORNTON;

THENCE, WITH THE NORTH BOUNDARY OF JOHNSON, THE FOLLOWING CALLS:

N 82°44'49" W, FOR A DISTANCE OF 800.97 FEET TO 1” PIPE FOUND;
N 78°43'22" W, FOR A DISTANCE OF 130.34 FEET TO 1” PIPE FOUND;

THENCE, WITH THE WEST BOUNDARY OF JOHNSON, THE FOLLOWING CALLS:

S 5°32'34" W, FOR A DISTANCE OF 375.75 FEET TO 1” PIPE FOUND;
S 4°27'28" W, FOR A DISTANCE OF 508.55 FEET TO A POINT;
S 3°32'19" W, FOR A DISTANCE OF 523.31 FEET TO 5/8” IRON PIN FOUND AT THE SOUTHWEST CORNER OF THORNTON;

THENCE, WITH THE NORTH BOUNDARY OF IRON BRIDGE ROAD RIGHT-OF-WAY, THE FOLLOWING CALLS:

N 82°45'55" W, FOR A DISTANCE OF 501.29 FEET TO AN 5/8” IRON PIN FOUND;
N 82°46'20" W, FOR A DISTANCE OF 525.64 FEET TO RAILROAD SPIKE PK FOUND;
N 83°23'15" W, FOR A DISTANCE OF 396.04 FEET TO 5/8” IRON PIN FOUND AT SOUTHEAST CORNER OF MATTHEWS;

THENCE, WITH THE EAST BOUNDARY OF MATHEWS, HARRIS AND DUCK RIVER, THE FOLLOWING CALLS:

N 8°06'23" E, FOR A DISTANCE OF 664.54 FEET TO 1/2” IRON PIN FOUND;
N 16°56'08" E, FOR A DISTANCE OF 479.23 FEET TO A POINT;
N 48°48'57" E, FOR A DISTANCE OF 312.04 FEET TO A POINT;
N 44°09'58" E, FOR A DISTANCE OF 600.70 FEET TO A POINT;
N 36°27'00" E, FOR A DISTANCE OF 305.02 FEET TO A POINT;
N 27°21'22" E, FOR A DISTANCE OF 284.62 FEET TO A POINT;
N 26°51'38" E, FOR A DISTANCE OF 301.40 FEET TO 1” PIPE FOUND;

N 15°43'20" W, FOR A DISTANCE OF 197.42 FEET TO A POINT;
N 18°21'24" W, FOR A DISTANCE OF 744.16 FEET TO A POINT;
N 21°56'04" W, FOR A DISTANCE OF 631.16 FEET TO A POINT;
N 23°44'52" W, FOR A DISTANCE OF 409.10 FEET TO A POINT;
N 32°46'41" W, FOR A DISTANCE OF 296.98 FEET TO A POINT;
N 27°28'08" W, FOR A DISTANCE OF 932.36 FEET TO A POINT;

THENCE, DIRECTING RIGHT AWAY FROM DUCK RIVER TO THE SOUTH AND EAST BOUNDARY OF SEAGO, THE FOLLOWING CALLS:

N 85°09'29" E, FOR A DISTANCE OF 22.00 FEET TO A POINT;
N 81°22'35" E, FOR A DISTANCE OF 109.60 FEET TO A POINT;
S 87°28'25" E, FOR A DISTANCE OF 42.46 FEET TO 36” OAK;
N 48°08'47" E, FOR A DISTANCE OF 244.67 FEET TO A POINT;
N 49°58'39" E, FOR A DISTANCE OF 291.18 FEET TO 10” HACKBERRY AND 8” CEDAR;
N 49°46'26" E, FOR A DISTANCE OF 367.28 FEET TO 1” PIPE FOUND;
N 55°27'24" W, FOR A DISTANCE OF 350.42 FEET TO A POINT;
N 28°16'29" W, FOR A DISTANCE OF 411.36 FEET TO A 1” PIPE FOUND;
N 0°17'30" E, FOR A DISTANCE OF 223.84 FEET TO AN IRON PIN FOUND;
N 39°56'42" W, FOR A DISTANCE OF 228.86 FEET TO AN IRON PIN FOUND;
N 16°17'40" E, FOR A DISTANCE OF 158.31 FEET TO A POINT;
N 24°10'55" E, FOR A DISTANCE OF 52.03 FEET TO A POINT;
N 23°26'46" E, FOR A DISTANCE OF 28.14 FEET TO 1” PIPE IRON PIPE;
N 19°40'08" E, FOR A DISTANCE OF 57.72 FEET TO A 12” CEDAR;
N 30°13'58" E, FOR A DISTANCE OF 123.71 FEET TO A POINT;
N 32°10'27" E, FOR A DISTANCE OF 87.69 FEET TO A POINT;
N 33°44'57" E, FOR A DISTANCE OF 105.82 FEET TO 1” PIPE FOUND;
N 3°11'17" W, FOR A DISTANCE OF 116.30 FEET TO A POINT AT THE NORTHEAST CORNER OF SEAGO AND THE CENTER OF BEAR CREEK;

THENCE, ALONG BEAR CREEK AND SOUTHERN BOUNDARY OF MIKES BIKES, THE FOLLOWING CALLS:

N 75°48'45" E, FOR A DISTANCE OF 280.14 FEET TO A POINT;
N 65°23'51" E, FOR A DISTANCE OF 281.90 FEET TO A POINT AT THE SOUTHEAST CORNER OF BIKES;

THENCE, ALONG SOUTH BOUNDARY OF GOODMAN, N 63°42'14" E, 199.86 FEET TO A POINT;

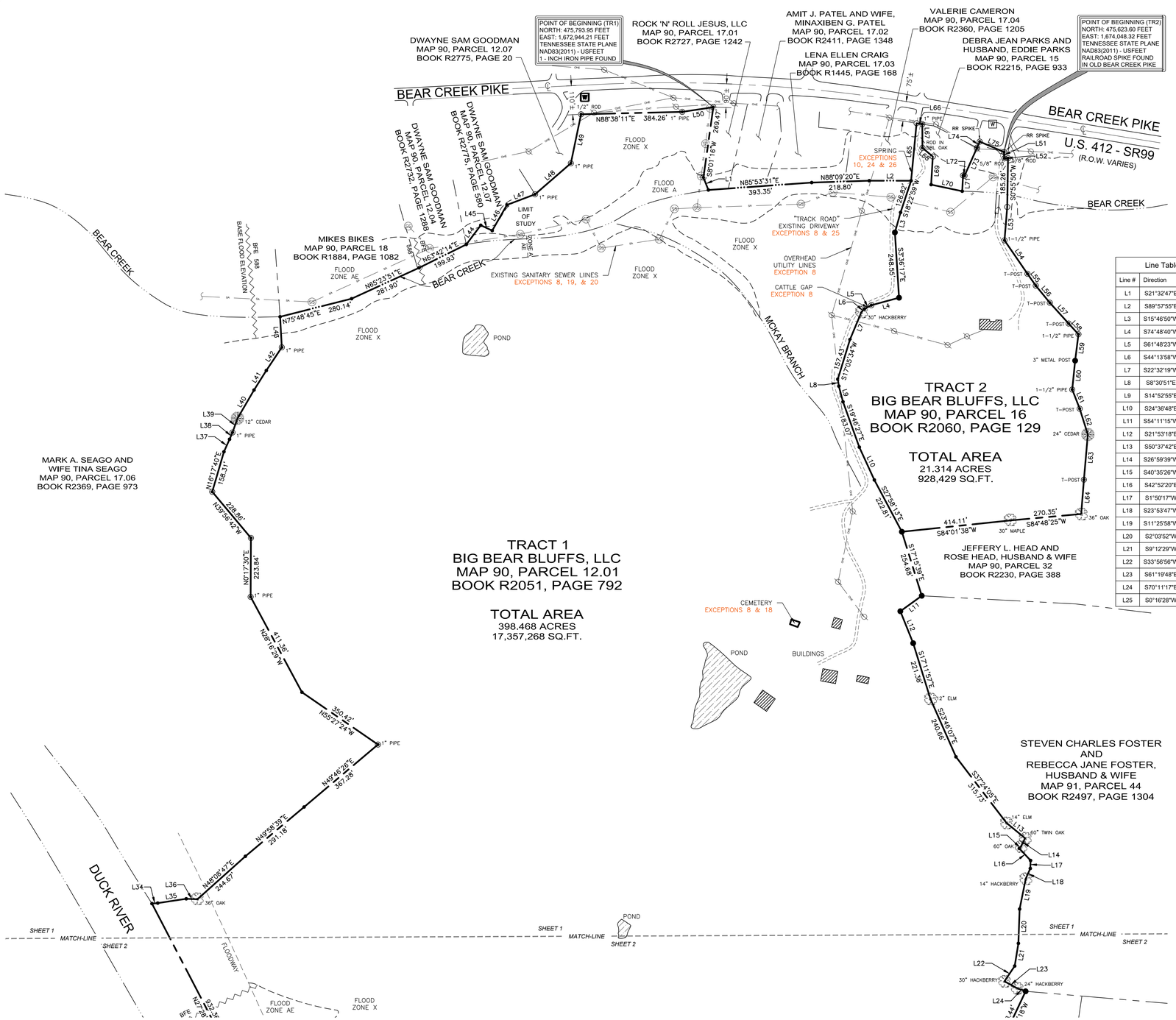
THENCE, CREATING A NEW LINE FOR THE ANNEXATION OF 409.92 ACRES, THE FOLLOWING CALLS:

N 84°40'46" E, FOR A DISTANCE OF 385.89 FEET TO A POINT;
N 75°36'41" E, FOR A DISTANCE OF 141.99 FEET TO A POINT;
N 63°11'05" E, FOR A DISTANCE OF 28.87 FEET TO A POINT AT AN INTERSECTION OF MCKAY BRANCH;
CONTINUING ALONG MCKAY BRANCH AND CREATING A NEW LINE FOR THE ANNEXATION OF 409.92 ACRES, THE FOLLOWING CALLS:
S 75°17'27" E, FOR A DISTANCE OF 201.23 FEET TO A POINT;
S 65°15'03" E, FOR A DISTANCE OF 74.45 FEET TO A POINT;
S 61°08'47" E, FOR A DISTANCE OF 61.78 FEET TO A POINT;

S 58°09'42" E, FOR A DISTANCE OF 42.46 FEET TO A POINT;
S 53°12'54" E, FOR A DISTANCE OF 86.37 FEET TO A POINT;
S 45°49'08" E, FOR A DISTANCE OF 65.41 FEET TO A POINT;
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THENCE, LEAVING MCKAY BRANCH AND CREATING A NEW LINE FOR THE ANNEXATION OF 409.92 ACRES, THE FOLLOWING CALLS:

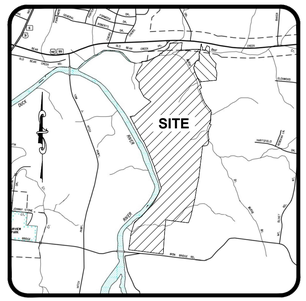
NORTHEASTERLY ALONG A CURVE THROUGH A CENTRAL ANGLE OF 38°33'55", AN ARC DISTANCE OF 380.30 FEET TO A POINT OF TANGENCY, SAID CURVE IS CONCAVE NORTHWESTERLY AND HAS A RADIUS OF 565.00 FEET, CHORD BEARING N 24°32’52” E WITH A CHORD DISTANCE OF 373.16 FEET TO A POINT OF TANGENCY;
N 05°15'54" E, 94.04 FEET TO THE POINT OF BEGINNING CONTAINING 409.92 ACRES (17,855,971 SQ.FT.) AND BEING A PORTION OF THE PROPERTY SHOWN ON TAX MAP 90 PARCEL 12.01 CONVEYED TO BIG BEAR BLUFFS, LLC BY DEED OF RECORD IN BOOK R2827, PAGE 287 IN THE REGISTER’S OFFICE OF MAURY COUNTY, TENNESSEE.



Line Table		
Line #	Direction	Length
L1	S21°32'47"E	51.20'
L2	S89°57'55"E	158.94'
L3	S15°46'50"W	78.97'
L4	S74°48'40"W	109.09'
L5	S61°48'23"W	30.10'
L6	S44°13'58"W	15.73'
L7	S22°32'19"W	113.52'
L8	S8°30'51"E	26.77'
L9	S14°52'55"E	61.47'
L10	S24°36'48"E	137.17'
L11	S54°11'15"W	100.29'
L12	S21°53'18"E	130.86'
L13	S50°37'42"E	91.73'
L14	S26°59'39"W	35.62'
L15	S40°35'26"W	9.08'
L16	S42°52'20"E	62.79'
L17	S1°50'17"W	30.25'
L18	S23°53'47"W	42.59'
L19	S11°25'58"W	117.73'
L20	S2°03'52"W	130.34'
L21	S9°12'29"W	87.18'
L22	S33°56'56"W	69.94'
L23	S61°19'48"E	54.74'
L24	S70°11'17"E	34.53'
L25	S0°16'28"W	41.40'

Line Table		
Line #	Direction	Length
L26	S50°40'30"E	13.02'
L27	S39°18'12"W	34.16'
L28	S1°12'18"W	95.58'
L29	S7°58'27"W	43.94'
L30	S15°41'30"W	13.75'
L31	S38°17'00"W	100.34'
L32	S4°03'46"W	112.86'
L33	N78°43'22"W	130.34'
L34	N85°09'29"E	22.00'
L35	N81°22'35"E	109.60'
L36	S87°28'25"E	42.46'
L37	N24°10'55"E	52.03'
L38	N23°26'46"E	28.14'
L39	N19°40'08"E	57.72'
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L56	S39°22'56"E	84.02'
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L58	S42°31'20"E	55.23'
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L74	N24°07'16"E	25.12'
L75	S66°43'29"E	100.36'



VICINITY MAP
NOT TO SCALE

NO.	DATE	COMMENT

108 Beasley Drive
Franklin, TN
37064
615.794.2275

WILSON&ASSOCIATES, P.C.
Engineering/Surveying/Environmental

JOHN C. WILSON II
REGISTERED
LAND SURVEYOR
No. 2089
STATE OF
TENNESSEE
7/7/22

ALTA/NSPS LAND TITLE SURVEY

MAP 90, PARCELS 12.01 & 16
BEAR CREEK PIKE / IRON BRIDGE ROAD
MAURY COUNTY, TENNESSEE
FOR: KOLTER GROUP ACQUISITIONS, LLC

LEGEND

IRON PIN FOUND	BENCH MARK	ELECTRIC METER-BOX	EVERGREEN TREE	UNDERGROUND ELEC UGE
IRON PIN SET	WATER METER	ELECTRIC MH	DECIDUOUS TREE	OVERHEAD ELEC OHE
FENCE POST FOUND	WATER VALVE	LIGHT POLE	HANDICAP PARKING	GAS 4" G
FENCE POST SET	FIRE HYDRANT	UTILITY POLE	SIGN	COMMUNICATIONS COM
CONC. MON. FOUND	SANITARY SEWER MH	GUY ANCHOR	TURN LANE MARKING	BOUNDARY
CONC. MON. SET	SANITARY SEWER CO	COMMUNICATION BOX	MAIL BOX	CENTERLINE
PK FOUND	AREA DRAIN	COMMUNICATION MH	CEMETERY	FENCE X
PK SET	CURB INLET	GAS METER	SANITARY SEWER 8" SA	WATER FEATURE
UNMARKED POINT (BEND/SNAG)	STORM MH	GAS VALVE	WATER 4" W	TREE LINE

CONTROL TABLE

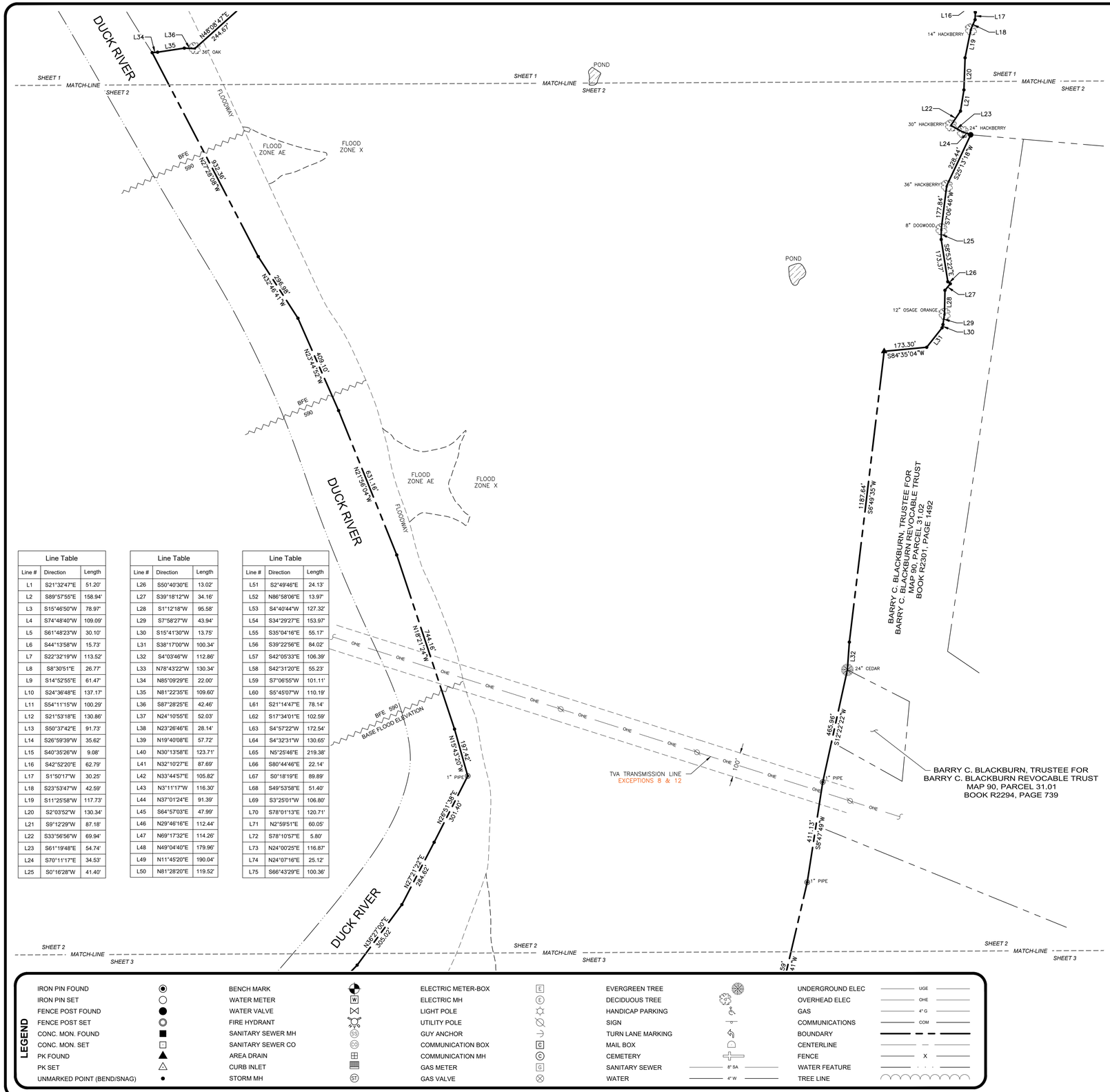
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101	N 472,572.21'	E 1,672,903.25'	EL 726.28'	CAPPED ROD
102	N 470,899.48'	E 1,673,280.18'	EL 728.47'	CAPPED ROD
103	N 468,089.58'	E 1,671,459.06'	EL 573.74'	CAPPED ROD

PROJECT CONTROL: TENNESSEE STATE PLANE COORDINATES. NAD83(2011), GEOID03 GRID 7 REVISED. NO DATUM ADJUSTMENT.

200 0 100 200 400
GRAPHIC SCALE: 1" = 100'

DRAWN BY:	JEC
APPVD. BY:	JCW II
DATE	1/7/2022
PROJ. No.	21-1801
SCALE:	1" = 200'

SHEET No.
1 OF 4



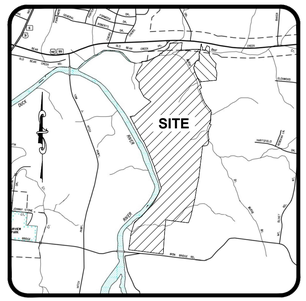
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L4	S74°48'40"W	109.09'
L5	S61°48'23"W	30.10'
L6	S44°13'58"W	15.73'
L7	S22°32'19"W	113.52'
L8	S8°30'51"E	26.77'
L9	S14°52'55"E	61.47'
L10	S24°36'48"E	137.17'
L11	S54°11'15"W	100.29'
L12	S21°53'18"E	130.86'
L13	S50°37'42"E	91.73'
L14	S26°59'39"W	35.62'
L15	S40°35'26"W	9.08'
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L17	S1°50'17"W	30.25'
L18	S23°53'47"W	42.59'
L19	S11°25'58"W	117.73'
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L21	S9°12'29"W	87.18'
L22	S33°56'56"W	69.94'
L23	S61°19'48"E	54.74'
L24	S70°11'17"E	34.53'
L25	S0°16'28"W	41.40'

Line Table		
Line #	Direction	Length
L26	S50°40'30"E	13.02'
L27	S39°18'12"W	34.16'
L28	S1°12'18"W	95.58'
L29	S7°58'27"W	43.94'
L30	S15°41'30"W	13.75'
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FENCE POST FOUND	WATER VALVE	LIGHT POLE	HANDICAP PARKING	GAS	4"G
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CONC. MON. FOUND	SANITARY SEWER MH	GUY ANCHOR	TURN LANE MARKING	BOUNDARY	
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PK SET	CURB INLET	GAS METER	SANITARY SEWER	WATER FEATURE	
UNMARKED POINT (BEND/SNAG)	STORM MH	GAS VALVE	WATER	TREE LINE	



VICINITY MAP
NOT TO SCALE

GENERAL NOTES:

1. THE PURPOSE OF THIS SURVEY IS: ALTA/NSPS LAND TITLE (BOUNDARY)
2. THE ADDRESS OF THIS PROPERTY IS: 400 & 420 BEAR CREEK PIKE - COLUMBIA, TN 37401
3. SUBJECT PROPERTY IS PRESENTLY IDENTIFIED AS PARCELS 12.01 & 16, ON MAURY COUNTY TAX MAP 90. SAID PARCEL IS FURTHER IDENTIFIED AS ALL OF THE PROPERTY DESCRIBED IN DEED BOOK R2051, PAGE 792, AND BOOK R2060, PAGE 129, REGISTERS OFFICE OF MAURY COUNTY, TENNESSEE.
4. SUBSURFACE AND ENVIRONMENTAL CONDITIONS WERE NOT EXAMINED OR CONSIDERED AS A PART OF THIS SURVEY.
5. EVERY DOCUMENT OF RECORD REVIEWED AND CONSIDERED AS A PART OF THIS SURVEY IS NOTED HEREON. ONLY THE DOCUMENTS NOTED HEREON WERE SUPPLIED TO THE SURVEYOR. OTHER DOCUMENTS OF RECORD MAY EXIST THAT WOULD AFFECT THIS PARCEL.
6. THE WORD "CERTIFY" IS AN EXPRESSION OF PROFESSIONAL OPINION REGARDING THE FACTS OF THE SURVEY AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EXPRESSED OR IMPLIED. DECLARATION IS MADE TO THE SPECIFICALLY NAMED PARTIES AND IS NOT TRANSFERABLE TO ADDITIONAL PERSONS, INSTITUTIONS OR SUBSEQUENT OWNERS OF THE SUBJECT PROPERTY.
7. THIS SURVEY WAS CONDUCTED WITH THE BENEFIT OF A TITLE REPORT ISSUED BY FIDELITY NATIONAL TITLE INSURANCE COMPANY, COMMITMENT NO. 14203-21, DATED NOVEMBER 12, 2021 AT 8:00AM AND IS SUBJECT TO ITS FINDINGS. THERE MAY BE OTHER IMPROVEMENTS OR ENCUMBRANCES THAT AFFECT THE PROPERTY SINCE THE ISSUANCE OF THE REPORT.
8. BEARINGS SHOWN HEREON ARE BASED ON THE TENNESSEE STATE PLANE COORDINATE SYSTEM (NAD83). ELEVATIONS SHOWN HEREON ARE BASED ON NAVD88.
9. ALL CORNERS SHOWN ON THE FACE OF THE SURVEY ARE MARKED EITHER FOUND OR SET. ANY MISSING CORNERS ARE MARKED WITH AN IRON ROD AND CAP BEARING THIS SURVEYORS COMPANY NAME.
10. UTILITIES SHOWN HEREON WERE COMPILED FROM VISIBLE STRUCTURES AT THE SITE, INFORMATION FROM PLANS, AND PHYSICAL MARKINGS AND COMBINED TO DEVELOP A VIEW OF THE UNDERGROUND UTILITIES. HOWEVER, LACKING EXCAVATION, THE EXACT LOCATION OF UNDERGROUND FEATURES CANNOT BE ACCURATELY, COMPLETELY, AND RELIABLY DEPICTED. IN ADDITION, IN SOME JURISDICTIONS, 811 OR OTHER SIMILAR UTILITY LOCATE REQUESTS FROM SURVEYORS MAY BE IGNORED OR RESULT IN AN INCOMPLETE RESPONSE. THIS SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THIS SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. VERIFICATION OF EXISTENCE, LOCATIONS, AND DEPTH SHOULD BE MADE BEFORE CONDUCTING ANY EXCAVATION IN THE VICINITY OF THE UTILITY.
11. BY SCALED MAP LOCATION AND GRAPHIC PLOTTING ONLY, PORTIONS OF THIS PROPERTY ARE LYING WITHIN ZONE "AE" AS DESIGNATED ON CURRENT FEDERAL EMERGENCY MANAGEMENT AGENCY MAP NOS. 47119C0170E, 47119C0190E, 47119C0285E, 47119C0305E, WITH EFFECTIVE DATES OF APRIL 16, 2007, WHICH MAKES UP A PART OF THE NATIONAL FLOOD INSURANCE PROGRAM. BASE FLOOD ELEVATIONS FOR THIS PROPERTY ARE 590 ALONG THE DUCK RIVER AND 588 ALONG BEAR CREEK. ZONE "AE" IS AN AREA WHERE BASE FLOOD ELEVATIONS HAVE BEEN DETERMINED. ZONE "X" IS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.
12. I HEREBY CERTIFY THAT THIS IS A CATEGORY IV SURVEY AND WAS CONDUCTED IN ACCORDANCE WITH RULE 0820-03.11 (GLOBAL POSITION SYSTEMS SURVEYS) ACCORDING TO THE CURRENT TENNESSEE MINIMUM STANDARDS OF PRACTICE AS PROMULGATED BY THE TENNESSEE STATE BOARD OF EXAMINERS FOR LAND SURVEYORS. THIS SURVEY WAS CONDUCTED WITH DUAL-FREQUENCY RTK GPS EQUIPMENT BASED ON THE TDOT C.O.R.S NETWORK.
    a. POSITIONAL ACCURACY: 0.08'
    b. DATE OF SURVEY: 01/04/2022
    c. HORIZONTAL ZONE/DATUM: TN-4100/NAD83(2011) - TENNESSEE STATE PLANE COORDINATES.
    d. OCCUPATIONS FOR CONTROL POINTS ARE 3 MINUTES EACH, SIDE SHOTS ARE 3 SECONDS.
    e. VERTICAL DATUM: NAVD88 (GEOID03, GRID 7 REVISED)
    f. NO COMBINED GRID FACTORS WERE USED.
13. THERE WAS NO EVIDENCE OF RECENT EARTH MOVING AT THE TIME OF SURVEY.
14. THERE ARE NO KNOWN CHANGES TO THE STREET ROW AT THE TIME OF SURVEY.
15. THERE WAS NO EVIDENCE OF DELINEATED WETLANDS AT THE TIME OF SURVEY, HOWEVER, SHOWN ON THE SURVEY ARE CLASSIFIED FRESHWATER PONDS AND STREAMS. FURTHER DETAILS CAN BE FOUND ON WETLAND MAPPER WEBSITE. https://www.fws.gov/wetlands/data/mapper.html
16. EXCEPT AS NOTED, THERE WAS NO EVIDENCE OF ENCROACHMENTS AT THE TIME OF SURVEY.
17. THE LOCATIONS OF STRUCTURES ARE APPROXIMATE FROM SATELLITE IMAGERY.

CONTROL TABLE

100	N 474,238.52'	E 1,672,762.90'	EL 675.03'	CAPPED ROD
101	N 472,572.21'	E 1,672,903.25'	EL 726.28'	CAPPED ROD
102	N 470,899.48'	E 1,673,280.18'	EL 728.47'	CAPPED ROD
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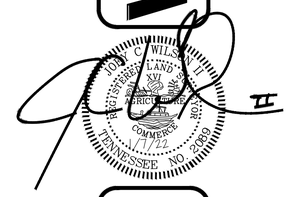
PROJECT CONTROL: TENNESSEE STATE PLANE COORDINATES. NAD83(2011), GEOID03 GRID 7 REVISED. NO DATUM ADJUSTMENT.

200 0 100 200 400
GRAPHIC SCALE: 1" = 200'

NO.	DATE	COMMENT

108 Beasley Drive
Franklin, TN
37064
615.794.2275

WILSON & ASSOCIATES, P.C.
Engineering/Surveying/Environmental

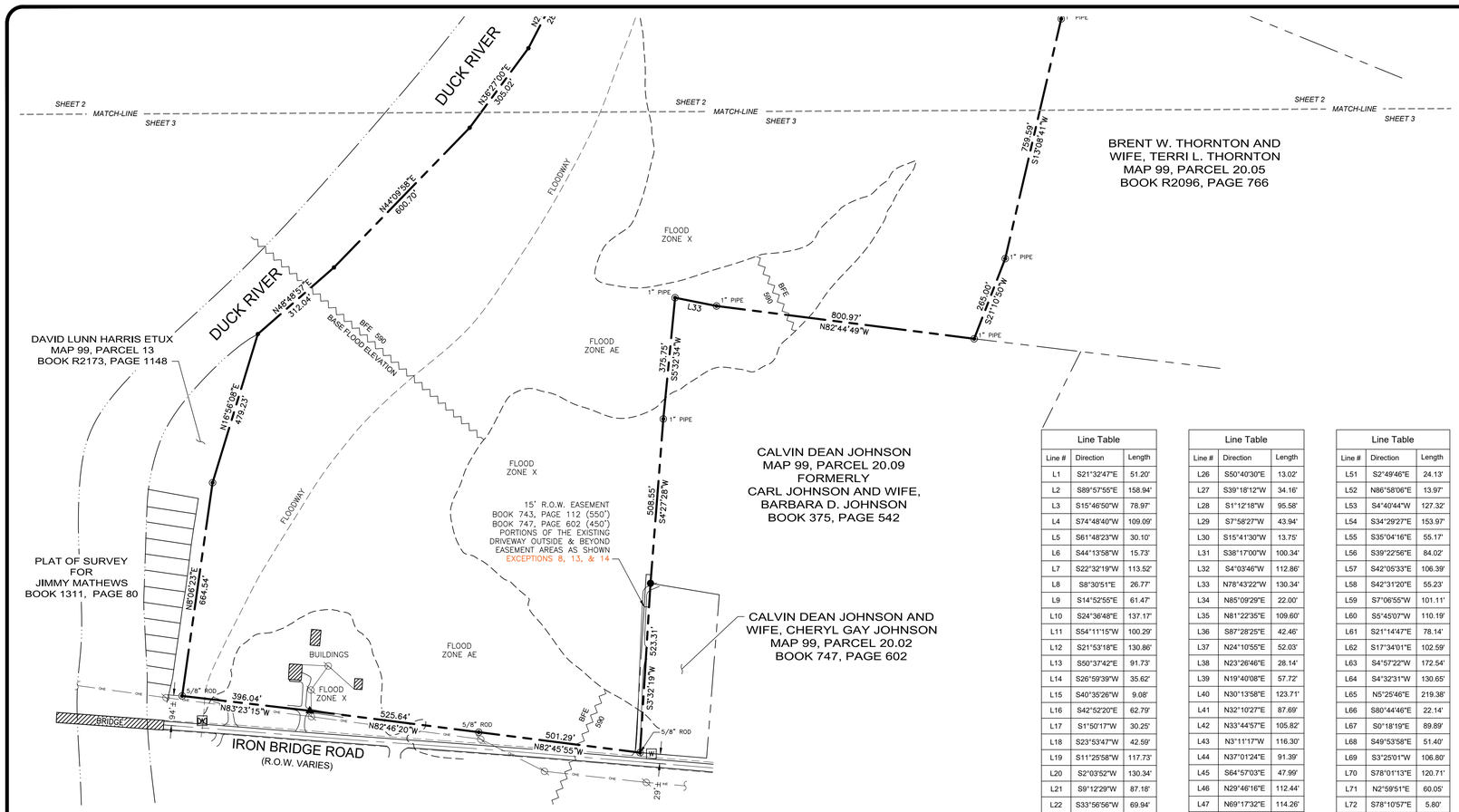


ALTA/NSPS LAND TITLE SURVEY

MAP 90, PARCELS 12.01 & 16
BEAR CREEK PIKE / IRON BRIDGE ROAD
MAURY COUNTY, TENNESSEE
FOR: KOLTER GROUP ACQUISITIONS, LLC

DRAWN BY:	JEC
APPVD. BY:	JCW II
DATE	1/7/2022
PROJ. No.	21-1801
SCALE:	1" = 200'

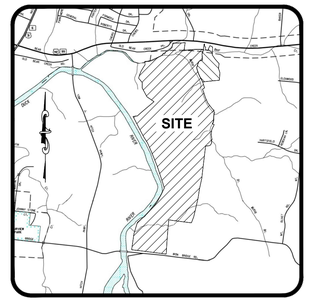
SHEET No.
2 OF 4



Line Table		
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VICINITY MAP
NOT TO SCALE

SCHEDULE B-II EXCEPTIONS:

1. RIGHTS OR CLAIMS OF PARTIES IN POSSESSION NOT SHOWN BY THE PUBLIC RECORDS. NONE OBSERVED DURING SURVEY
2. ANY LIEN, OR RIGHT TO A LIEN, FOR SERVICES, LABOR, OR MATERIAL HERETOFORE OR HEREAFTER FURNISHED, IMPOSED BY LAW AND NOT SHOWN BY THE PUBLIC RECORDS. NOT A SURVEY MATTER
3. TAXES OR SPECIAL ASSESSMENTS WHICH ARE NOT SHOWN AS EXISTING LIENS BY THE PUBLIC RECORDS. NOT A SURVEY MATTER
4. ANY ENCROACHMENT, ENCUMBRANCE, VIOLATION, VARIATION, OR ADVERSE CIRCUMSTANCES AFFECTING THE TITLE THAT WOULD BE DISCLOSED BY AN ACCURATE AND COMPLETE LAND SURVEY OF THE LAND. NO ENCROACHMENTS OBSERVED DURING SURVEY EXCEPT AS NOTED
5. EASEMENTS OR CLAIMS OF EASEMENTS NOT SHOWN BY THE PUBLIC RECORDS. DRIVEWAY USE EXTENDS OUTSIDE AND BEYOND EASEMENT AREA AS SHOWN - SEE ALSO ITEMS 13 &14
6. ANY DEFECT, LIEN, ENCUMBRANCE, ADVERSE CLAIM, OR OTHER MATTER THAT APPEARS FOR THE FIRST TIME IN THE PUBLICRECORDS OR IS CREATED, ATTACHES, OR IS DISCLOSED BETWEEN THE COMMITMENT DATE AND THE DATE ON WHICH ALL OF THE SCHEDULE B, PART I--REQUIREMENTS ARE MET. NOT A SURVEY MATTER
7. 2022 AND SUBSEQUENT YEARS MAURY COUNTY, TENNESSEE AND CITY OF COLUMBIA REAL PROPERTY TAXES AND/OR ASSESSMENTS WHICH CONSTITUTE A LIEN UPON SAID REAL PROPERTY UNTIL PAID. IF IMPROVEMENTS ARE COMPLETED AFTER JANUARY 1 OF ANY YEAR, THE LAW REQUIRES SUPPLEMENTAL ASSESSMENT FOR THE YEAR IN WHICH IMPROVEMENTS ARE COMPLETED AS DEFINED BY STATUTE. WE ASSUME NO LIABILITY FOR TAXES ASSESSED BY CORRECTION PURSUANT TO THE PROVISIONS OF SECTION 67-5-603, ET SEQ., TENN. CODE ANN. NOT A SURVEY MATTER
8. SUBJECT TO ANY AND ALL MATTERS APPEARING IN MAP OF RECORD IN PLAT BOOK P16, PAGES 53-54 IN THE MAURY COUNTY, TENNESSEE REGISTER OF DEEDS OFFICE, INCLUDING BUT NOT LIMITED TO RIGHTS OF OTHERS, IF ANY, IN AND TO THE "TRACK ROAD" ALONG THE NORTHERN PORTION OF THE EASTERN BOUNDARY; CEMETERY; TVA TRANSMISSION LINE; "JOHNSON RIGHT OF WAY"; LOCAL SERVICE POWER AND TELEPHONE LINES; DUCK RIVER; BEAR CREEK; OLD BEAR CREEK PIKE AND, SEWER LINE WITH MANHOLES ALONG THE NORTHERN BOUNDARY. (TRACT 1) SHOWN ON SURVEY
9. TITLE TO ANY PORTION OF SAID LAND LYING WITHIN THE BOUNDS OF ANY ROAD OR RIGHT OF WAY. (TRACT 1) RIGHT OF WAY MARGINS SHOWN ON SURVEY BASED ON FOUND MONUMENTS
10. TERMS AND CONDITIONS OF THAT CERTAIN BENEFICIAL EASEMENT IN FAVOR OF N.W. DANNELLEY AND WIFE, RUTH A. DANNELLEY FOR THE PURPOSE OF RIGHT IN AND TO A SPRING OF RECORD IN BOOK 319 AT PAGE 295 IN THE MAURY COUNTY REGISTER OF DEEDS OFFICE. (TRACT 1). SPRING SHOWN ON SURVEY
11. EASEMENT IN FAVOR OF MAURY COUNTY, TENNESSEE FOR RIGHT OF WAY FOR ROAD PURPOSES (IRON BRIDGE ROAD) OF RECORD IN BOOK 387 AT PAGE 497 IN THE MAURY COUNTY REGISTER OF DEEDS OFFICE. (TRACT 1). EXISTING IRON BRIDGE ROAD IS SHOWN ON SURVEY
12. EASEMENT IN FAVOR OF TVA FOR THE PURPOSE OF ELECTRIC TRANSMISSION LINES AS REFERENCED IN CURRENT VESTING DEED OF RECORD IN BOOK R2051 AT PAGE 792 IN THE MAURY COUNTY, TENNESSEE REGISTER OF DEEDS OFFICE. (TRACT 1) SHOWN ON SURVEY
13. EASEMENT IN FAVOR OF CALVIN DEAN JOHNSON FOR THE PURPOSE OF RIGHT OF WAY OF RECORD IN BOOK 747 AT PAGE 602 IN THE MAURY COUNTY REGISTER OF DEEDS OFFICE. (TRACT 1). SHOWN ON SURVEY
14. EASEMENT IN FAVOR OF CARL JOHNSON ETUX BARBARA D. JOHNSON FOR THE PURPOSE OF RIGHT OF WAY OF RECORD IN BOOK 743 AT PAGE 112 IN THE MAURY COUNTY REGISTER OF DEEDS OFFICE. (TRACT 1). SHOWN ON SURVEY
15. TITLE TO ANY PORTION OF SAID LAND LYING IN THE BED OR BANKS OF THE MCKAY BRANCH CREEK, THE RIGHTS OF UPPER AND LOWER RIPARIAN OWNERS TO THE FREE AND UNOBSTRUCTED FLOW OF THE WATER OF SAID MCKAY BRANCH CREEK, WITHOUT DIMINUTION OR POLLUTION, AND THE CONSEQUENCE OF ANY PAST OR FUTURE CHANGE IN THE LOCATION OF SAID MCKAY BRANCH CREEK. (TRACT 1) NOT A SURVEY MATTER
16. TITLE TO ANY PORTION OF SAID LAND LYING IN THE BED OR BANKS OF THE DUCK RIVER, THE RIGHTS OF UPPER AND LOWER RIPARIAN OWNERS TO THE FREE AND UNOBSTRUCTED FLOW OF THE WATER OF SAID DUCK RIVER, WITHOUT DIMINUTION OR POLLUTION, AND THE CONSEQUENCE OF ANY PAST OR FUTURE CHANGE IN THE LOCATION OF SAID DUCK RIVER. (TRACT 1) NOT A SURVEY MATTER
17. TITLE TO ANY PORTION OF SAID LAND LYING IN THE BED OR BANKS OF THE BEAR CREEK, THE RIGHTS OF UPPER AND LOWER RIPARIAN OWNERS TO THE FREE AND UNOBSTRUCTED FLOW OF THE WATER OF SAID BEAR CREEK, WITHOUT DIMINUTION OR POLLUTION, AND THE CONSEQUENCE OF ANY PAST OR FUTURE CHANGE IN THE LOCATION OF SAID BEAR CREEK. (TRACT 1) NOT A SURVEY MATTER
18. RIGHTS OF OTHERS IN AND TO THE CEMETERY LOCATED ON SUBJECT PROPERTY AND THE RIGHTS OF INGRESS AND EGRESS THERETO. (TRACT 1). CEMETERY SHOWN ON SURVEY
19. EASEMENT IN FAVOR OF CITY OF COLUMBIA, TN FOR THE PURPOSE OF RIGHT OF WAY FOR SEWER/UTILITY EASEMENT OF RECORD IN BOOK R1801 AT PAGE 828 IN THE MAURY COUNTY REGISTER OF DEEDS OFFICE. (TRACT 1). EXISTING SEWER LINES SHOWN ON SURVEY
20. EASEMENT IN FAVOR OF CITY OF COLUMBIA, TN FOR THE PURPOSE OF RIGHT OF WAY FOR SEWER/UTILITY EASEMENT OF RECORD IN BOOK R1801 AT PAGE 831 IN THE MAURY COUNTY REGISTER OF DEEDS OFFICE. (TRACT 1). EXISTING SEWER LINES SHOWN ON SURVEY
21. SUBJECT TO ALL MATTERS SHOWN ON UNRECORDED SURVEY OF S. K. ADKINS DATED JULY 14, 2008. (TRACT 1) DOCUMENT WAS NOT PROVIDED
22. SPECIAL PROPERTY TAX ASSESSMENT (I.E. ROLL-BACK TAX), IF APPLICABLE, PURSUANT TO T.C.A. SECTION 67-5-1008 (D) ("THE AGRICULTURAL, FOREST, AND OPEN SPACE LAND ACT OF 1976"), AS MOST RECENTLY AMENDED. GREENBELT APPLICATION OF RECORD IN BOOK G5 AT PAGE 218 IN THE MAURY COUNTY, TENNESSEE REGISTER OF DEEDS OFFICE. (TRACT 1). NOT A SURVEY MATTER
23. ANY INACCURACY IN THE AREA, SQUARE FOOTAGE, OR ACREAGE OF LAND DESCRIBED IN PROPERTY DESCRIPTION OR ATTACHED PLAT, IF ANY. THE COMPANY DOES NOT INSURE THE AREA, SQUARE FOOTAGE, OR ACREAGE OF THE LAND. (TRACT 1) AREAS NOTED ARE CORRECT
24. EASEMENT FOR THE PURPOSE OF INGRESS/EGRESS RIGHT OF WAY OVER THE LANDS OF THOMPSON AND RIGHTS TO OBTAIN WATER FROM SPRING NOTED IN DEED OF RECORD IN BOOK 537 AT PAGE 671 IN THE MAURY COUNTY REGISTER OF DEEDS OFFICE. (TRACT 2) SPRING SHOWN ON SURVEY
25. EASEMENTS IN FAVOR OF JAMES A. HARDISON AND WIFE, MARJORIE J. HARDISON FOR THE PURPOSE OF INGRESS/EGRESS OF RECORD IN BOOK 513 AT PAGE 220 AND BOOK 483 AT PAGE 527 IN THE MAURY COUNTY, TENNESSEE REGISTER OF DEEDS OFFICE. (TRACT 2)
26. EASEMENT IN FAVOR OF J. W. THOMPSON OR "ANYONE ELSE" FOR THE PURPOSE OF OBTAINING SPRING WATER OF RECORD IN BOOK 441 AT PAGE 504 IN THE MAURY COUNTY, TENNESSEE REGISTER OF DEEDS OFFICE. (TRACT 2) SPRING SHOWN ON SURVEY
27. TITLE TO THAT PORTION OF THE PROPERTY WITHIN THE BOUNDS OF OLD BEAR CREEK PIKE. (TRACT 2) RIGHT OF WAY MARGINS SHOWN ON SURVEY BASED ON FOUND MONUMENTS - RAILROAD SPIKES FOUND IN THE REMNANTS OF PAVEMENT - MAY BE SUBJECT TO RIGHT OF WAY - LEGAL QUESTION REGARDING ABANDONMENT - MINIMAL AREA IN QUESTION
28. TITLE TO ANY PORTION OF SAID LAND LYING IN THE BED OR BANKS OF THE BEAR CREEK, THE RIGHTS OF UPPER AND LOWER RIPARIAN OWNERS TO THE FREE AND UNOBSTRUCTED FLOW OF THE WATER OF SAID BEAR CREEK, WITHOUT DIMINUTION OR POLLUTION, AND THE CONSEQUENCE OF ANY PAST OR FUTURE CHANGE IN THE LOCATION OF SAID BEAR CREEK. (TRACT2) NOT A SURVEY MATTER
29. ANY INACCURACY IN THE AREA, SQUARE FOOTAGE, OR ACREAGE OF LAND DESCRIBED IN PROPERTY DESCRIPTION OR ATTACHED PLAT, IF ANY. THE COMPANY DOES NOT INSURE THE AREA, SQUARE FOOTAGE, OR ACREAGE OF THE LAND. (TRACT 2) AREAS NOTED ARE CORRECT
30. SPECIAL PROPERTY TAX ASSESSMENT (I.E. ROLL-BACK TAX), IF APPLICABLE, PURSUANT TO T.C.A. SECTION 67-5-1008 (D) ("THE AGRICULTURAL, FOREST, AND OPEN SPACE LAND ACT OF 1976"), AS MOST RECENTLY AMENDED. GREENBELT APPLICATION OF RECORD IN BOOK G5 AT PAGE 275 IN THE MAURY COUNTY, TENNESSEE REGISTER OF DEEDS OFFICE. (TRACT 2) NOT A SURVEY MATTER
31. TITLE TO ANY PORTION OF SAID LAND LYING WITHIN THE BOUNDS OF ANY ROAD OR RIGHT OF WAY. (TRACT 2) RIGHT OF WAY MARGINS SHOWN ON SURVEY BASED ON FOUND MONUMENTS

CERTIFICATION OF SURVEY FOR ALTA/NSPS LAND TITLE SURVEYS

TO: (I) KOLTER GROUP ACQUISITIONS, LLC, AND (II) FIDELITY NATIONAL TITLE INSURANCE COMPANYOLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY.

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 2, 3, 4, 8, 11(OBSERVED), 13, 14, 16, 17, 18, AND 19, OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON 01/04/22.

JOEY C. WILSON II, PE, RLS
TN PE NO. 106976 1/7/22
TN RLS NO. 2089

LEGAL DESCRIPTIONS BASED ON THIS SURVEY WILL BE PROVIDED ON SHEET NUMBER 4 AFTER TITLE COMMENTS AND QUESTIONS HAVE BEEN ADDRESSED.

LEGEND

IRON PIN FOUND		BENCH MARK		ELECTRIC METER-BOX	E	EVERGREEN TREE	UNDERGROUND ELEC UGE
IRON PIN SET		WATER METER	W	ELECTRIC MH	E	DECIDUOUS TREE	OVERHEAD ELEC OHE
FENCE POST FOUND		WATER VALVE		LIGHT POLE		HANDICAP PARKING	GAS 4" G
FENCE POST SET		FIRE HYDRANT		UTILITY POLE		SIGN	COMMUNICATIONS COM
CONC. MON. FOUND		SANITARY SEWER MH		GUY ANCHOR		TURN LANE MARKING	BOUNDARY
CONC. MON. SET		SANITARY SEWER CO	CO	COMMUNICATION BOX	C	MAIL BOX	CENTERLINE
PK FOUND		AREA DRAIN		COMMUNICATION MH	C	CEMETERY	FENCE X
PK SET		CURB INLET		GAS METER	G	SANITARY SEWER	8" SA — WATER FEATURE
UNMARKED POINT (BEND/SNAG)		STORM MH	ST	GAS VALVE		WATER	4" W — TREE LINE

CONTROL TABLE

100	N 474,238.52'	E 1,672,762.90'	EL 675.03'	CAPPED ROD
101	N 472,572.21'	E 1,672,903.25'	EL 726.28'	CAPPED ROD
102	N 470,899.48'	E 1,673,280.18'	EL 728.47'	CAPPED ROD
103	N 468,089.58'	E 1,671,459.06'	EL 573.74'	CAPPED ROD

PROJECT CONTROL: TENNESSEE STATE PLANE COORDINATES. NAD83(2011), GEOID03 GRID 7 REVISED. NO DATUM ADJUSTMENT.

200 0 100 200 400
GRAPHIC SCALE: 1" = 200'

NO.	DATE	COMMENT

108 Beasley Drive
Franklin, TN
37064
615.794.2275

WILSON&ASSOCIATES, P.C.
Engineering/Surveying/Environmental

JOEY C. WILSON II
REGISTERED LAND SURVEYOR
TENNESSEE
NO. 2089
1/7/22
COMMERCE

ALTA/NSPS LAND TITLE SURVEY

MAP 90, PARCELS 12.01 & 16
BEAR CREEK PIKE / IRON BRIDGE ROAD
MAURY COUNTY, TENNESSEE
FOR: KOLTER GROUP ACQUISITIONS, LLC

DRAWN BY:	JEC
APPVD. BY:	JCW II
DATE	1/7/2022
PROJ. No.	21-1801
SCALE:	1" = 200'

SHEET No.
3 OF 4

CITY OF COLUMBIA TENNESSEE

DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

Preliminary Plat, Site Development Plan, and PUD Checklist

Development: Columbia Bluffs PUD-R Preliminary Master Development Plan

This checklist shall be completed, and included with the submittal documents. If the submittal does not contain a completed checklist, it shall be deemed incomplete. All below listed items shall be included in the submittal documents and plans, as well as any further information required by the City of Columbia to evaluate compliance and to perform a full and complete review. See Zoning Ordinance Article 8 and Subdivision Regulations.

General

- ☑ Name of development
- ☑ Contact info for the owner and licensed design professional(s) preparing plan: name, address, email, phone
- ☑ Plan sealed by a Design Professional licensed in the State of Tennessee.
- ☑ North Arrow, legend, and site vicinity map
- ☑ Graphic Scale: between 1 in. = 10 ft. and 1 in. =100 ft.
- ☑ Survey stamped by a State of Tennessee Licensed Professional Land Surveyor, with all project boundaries including bearings and angles to the nearest hundredth, utilities, and existing streets and rights-of-way.
- ☑ Note referencing Tennessee State Plane Coordinate System, NAD 83 Datum
- ☑ All property boundaries, existing easements, and encumbrances
- ☑ Parcel identification, owner, and deed and plat references of adjoining properties
- ☑ Proposed phasing and timetable for all phases of development
- ☑ Traffic Impact Study, as required.
- ☑ The substance of all existing and proposed covenants, easements, or other restrictions.

Lots and Land-Use

- ☑ The size of total property to be developed in square feet and acres
- ☑ Lot numbers of all proposed lots, with dimensions, locations, and square footage
- ☑ A tabulation of the land area to be devoted to various uses and activities and overall densities.
- ☑ Typical lot layout depicting proposed setbacks, yards, and easements, where applicable

Structures

- ☑ Location and approximate dimensions of all existing and proposed structures.
- ☑ Location of all earth retaining structures, with approximate top and bottom of wall elevations.
- ☑ Existing and intended use of all buildings and structures on site, including the number of dwelling units and density, where applicable
- ☐ Location, type, and size of proposed signs FMDP
- ☑ Approximate height, bulk, and the utilization of structures including activities and the number of living units.

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COLUMBIA, TN 38401
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Grading, Drainage, and Storm

- ☑ Existing conditions and contours at vertical intervals of not more than two (2) feet
- ☑ General proposed contours at vertical intervals of not more than two (2) feet
- ☑ FEMA Special Flood Hazard Area (SFHA), 100-year Floodplain (F-P), and Floodway (F-W) boundaries with elevations and the exact location of the nearest benchmark. Indicate the Flood Insurance Rate Map (FIRM) panel number, its effective date, and flood insurance zones
- ☑ Location and dimension of aquatic buffer zones
- ☑ General layout of the proposed storm drainage system including surface and subsurface drainage systems, areas for detention, and water quality devices.
- ☑ Identification of all critical lots

Streets, Parking, and Pedestrian Elements

- ☑ Proposed street and alley rights-of-way, typical sections, widths, classification, names, and proposed ownership and maintenance responsibility
- ☑ Proposed connections to existing and proposed streets (including classification) located outside the development
- ☑ Proposed improvements as identified in the Traffic Impact Study, as required
- ☑ Existing and proposed sidewalks, trails, and other pedestrian elements
- ☑ Existing and proposed on-street and off-street parking and loading areas
- ☑ Summary of all provided and required parking

Landscaping, Open Space, and Amenities

- ☑ Natural features on site including, but not limited to, wetlands, streams, ponds, springs, sinkholes, wells, rock outcroppings, excessive slopes, and forested areas
- ☑ Landscaped areas and buffers with details on proposed plantings, existing vegetation, and other features. FMDP
- ☑ The location and size of all common open space, parkland dedications, and dedications and reservations of land for public uses.
- ☑ Any amenity features and structures for private or public benefit.
- ☑ Location, dimension, and materials of fences and walls
- ☑ Tree Canopy retention FMDP

Utilities

- ☑ General layout and location of existing and proposed utilities and utility features including, but not limited to potable water, fire hydrants, sanitary sewer, storm sewer, and power and communication facilities.
- ☑ Acknowledgement from water, sewer, and power utility providers that the proposed development may be adequately served with existing infrastructure, or if improvements are required to adequately serve the development, a general statement of the improvements.

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PUD Specific Items

- ☑ Legal Description of Property
- ☑ Owner's Affidavit
- ☑ List of all variances requested
- ☑ The nature of the landholder's interest in the land proposed to be developed and a written statement of concurrence from all parties having a beneficial interest in the affected property.
- ☑ Location and approximate dimensions of all existing and proposed structures including approximate height, bulk, and the utilization of structures including activities and the number of living units. Include architectural renderings of all proposed structures with materials listed.
- ☑ The substance of covenants, grants of easements or other restrictions to be imposed upon the use of the land, buildings and structures including proposed easements for public utilities on the property or documentation of off-site easements.
- ☐ Exterior lighting FMDP

If the application is deemed incomplete by the Zoning Administrator, a written request shall be made within ten days after the original submittal, for further information. In such case the application shall be held in abeyance until deemed complete for final review. No plan shall be formally presented for Planning Commission action until such plan is found complete, compliant with City standards, and ready for review.

Checklist Completed By:

KELI FRYMIRE	[signature]	10/16/2023
Print Name	Signature	Date

Rev. 6/7/2022

CITY OF COLUMBIA TENNESSEE

DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
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PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)*
Fold hard copy submittals larger than 8½"x11"

ADDRESS/LOCATION	400 Bear Creek Pike		
	TAX MAP: 90	GROUP:	PARCEL: 12.01
SUMMARY OF NATURE OF REQUEST AND WORK	Annexation request and PUD-R rezoning request for a little over 400 acres between Bear Creek and Iron Bridge Road. PUD-R neighborhood to provide a variety of homes, including Active Adult/age restricted area, town homes, and large single family home lots.		

DATE OF PRE-APPLICATION CONFERENCE	8/30/2023	*Pre-application meetings are scheduled for Wednesdays.*

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☒ Annexation ☐ Rezoning ☐ Preliminary Plat ☐ Final Plat ☒ PUD Preliminary Master Plan ☐ PUD Final Site Plan ☐ Multi-Family Site Plan ☐ Other: **File naming nomenclature examples:* *Freedom Point Site Plan* *Freedom Point Master Plan* *Freedom Point Final Plat*	**Annexations/Rezoning/PUD's:** ☐ Written Legal Description copy ☐ Requested Zone Listed ☐ Compliance with Comprehensive Plan ☐ Annexation Permission Form ☐ Plans and/or Plats conforming to City standards with check list completed ☐ Columbia Water System Availability Letter **Plats/PUDs:** ☐ Project Name (include Sections & Phases) Columbia Bluffs PUD-R Preliminary Master Plan ☐ Total Number of Lots 866 residential lots ☐ Total acreage +/-409.52 acres

Rev. 4/14/2022

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	Greg Gamble - Gamble Design	PHONE	615-975-5765
ADDRESS	3020 Stansberry Lane, Suite 201, Franklin	EMAIL	info@gdc-tn.com

PROPERTY OWNER NAME	HK Big Bear Bluffs, LLC	PHONE	813-615-1244
ADDRESS	14025 Riveredge Dr. Ste 175 Tampa FL 33637	EMAIL	jgibbs@kolter.com

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

Greg Gamble
APPLICANT NAME

APPLICANT SIGNATURE

10/16/2023
DATE

HK Big Bear Bluffs LLC
James P. Harvey
PROPERTY OWNER NAME

PROPERTY OWNER SIGNATURE

10/10/2023
DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	

DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS	
DATE OF PUBLIC NOTICES IN DAILY HERALD	

BOARD ACTION	

From: Keli Frymire
To: Paul Keltner; Austin Brass; Kevin McCarthy
Cc: Joshua Gibbs; Ty; Greg Gamble; Brad Snyder; Tyler Gray
Subject: [Caution External Email] - Columbia Bluffs - Planning Commission Deferral Request
Date: Monday, February 12, 2024 4:43:14 PM
Attachments: image001.png

Good afternoon all,
I spoke with Kevin today on the phone and am sending this email as a follow up to that conversation.

We request to defer the Columbia Bluffs PUD-R and Columbia Bluffs CD-4 annexation and rezoning projects from the February 14, 2024 Planning Commission agenda to the March 13, 2024 agenda. We would like to ensure that we have the appropriate time to work through the late sewer comments and remove any uncertainty surrounding this issue. Additionally, Kevin and I discussed the Land Use policy amendment for the CD-4 parcel and will need to also use this time to update this request to include the land use policy change.

Thank you again for working with us on these projects.

Keli Frymire | PLA
Mailing: 3020 Stansberry Lane, Suite 201; Franklin, TN 37069
Physical: Freeport, FL
keli@gdc-tn.com
Mobile: (706) 566-6480
www.gdc-tn.com

Bear Creek Commercial Site

Project #:	23-0421	Location:	Tax Map 90 Parcel 12.01
Applicant:	Greg Gamble	Case Type(s):	Rezoning
Staff Planner:	Kevin C. McCarthy, AICP	Proposed Use:	Professional Office

PROJECT SUMMARY

The applicant requests annexation with a plan of services and rezoning of 3.27-acres situated between Bear Creek and McKay's Branch. The property is part of a larger existing parcel, a small portion of which is located within Columbia's corporate limits. This request pertains to a relatively small portion of the property which is located outside the city but within its Urban Growth Boundary. Along with annexation into the city, the applicant requests rezoning to CD-4 (General Urban Character District).

- The request is inconsistent with Connect Columbia, the city's comprehensive plan. Consequently, the request does not satisfy the criteria for rezoning at 8.5.19.H.4.a. and the Planning Commission must recommend denial of the rezoning request.
- If the future land use map for the subject property were amended from Suburban Neighborhoods (fka Suburban Neighborhood) to City Center Urban Village (fka Urban Neighborhood), the requested zoning would be consistent with the comprehensive plan.
- The concept plan demonstrates that it is possible to develop the site in conformity with the standards of the requested character district.
- Subsequent development and division of the property will require review and approval by the Planning Commission or the Zoning Administrator.
- The Planning Commission is a **recommending body** for rezoning requests.
- Templates are provided at the end of the report to assist the Planning Commission in crafting properly formatted motions.

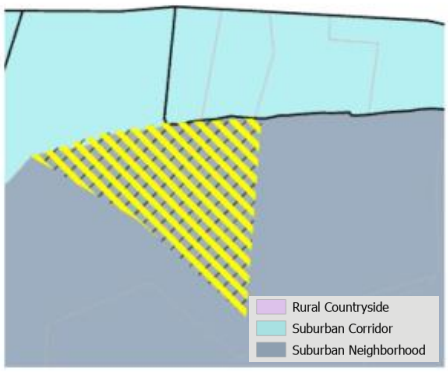
DRAFT

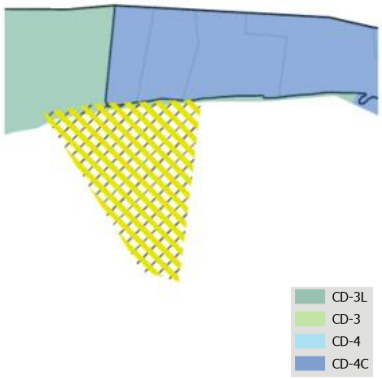
SITE INFORMATION

CURRENT ZONING	EXISTING USE	EXISTING IMP.	LAND AREA
Unincorporated	Vacant	Various Structures	+/- 409.92



FUTURE LAND USE MAP	ZONING MAP





SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	Suburban Neighborhood	Unincorporated	Vacant
North	Suburban Corridor	CD-3L/CD-4C	Commercial
South	Suburban Neighborhood	Unincorporated	Vacant
East	Suburban Neighborhood	Unincorporated	Vacant
West	Suburban Neighborhood	Unincorporated	Vacant

CONSISTENCY WITH CONNECT COLUMBIA

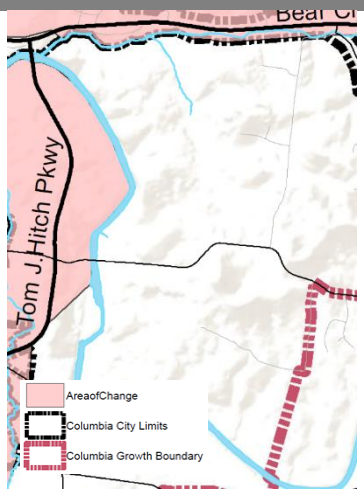
Suburban Neighborhood: The requested rezoning is not consistent with the future land use map. The future land use of the subject site is Suburban Neighborhood. The Character Area is characterized by a residential development and neighborhoods, with limited, intermixed and compatible civic uses (Connect Columbia, p. 22). The Future Land Use Plan indicates that "the general development pattern is defined by a single use activity on individual lots" (Connect Columbia, p. 22). Green space is largely incorporated on individual lots; neighborhood and community parks should be located within neighborhoods to enhance the quality of life. Development should emphasize connectivity and housing diversity (Connect Columbia, p. 23). The Character Area Matrix from page twenty-two of the Future Land Use Plan (excerpted below) is a guide to approving requests for zoning map amendments and Planned Unit Developments. The future land use classification is implemented by the CD-3L and CD-3 character districts, as well as PUDs.

DRAFT

CHARACTER AREA MATRIX				
	Development Pattern	**Zoning Category and Uses**	**Infrastructure**	**Design Standard**
SUBURBAN NEIGHBORHOOD	**Is the property in an Area of Change?** **No:** The development pattern is established. Changes to overall character of the area should rarely occur. **Yes:** The development pattern is evolving. Changes to the area are likely as development occurs. New development should respect both the natural environment and blend with existing, surrounding neighborhood assets.	**Residential Uses Zoning Category:** Low Density Residential District and Medium Residential. **Public and Civic Uses Zoning Category:** Religious Facilities, Government Facilities (low impact), and Educational Facilities.	**Not in an Area of Change:** Limited new services, with mostly in-fill enhancements to existing infrastructure. **Within an Area of Change:** Extensions to transportation, water, sewer, and other services should be expected. New service or extensive redevelopment of existing services should be vetted and reviewed by Planning Commission and City Council as a primary element of approval.	Scale: New dwellings and structures should be compatible with the established character of the area. Architecture: New developments should include a mix of architectural styles. Residential garages, if front-facing, should be recessed from the front façade of the structure. Civic use should respect the residential character, while providing architectural interest.

AREA OF CHANGE

The subject site **is not located** in an Area of Change (Connect Columbia Map 3). In 2017 the Planning Commission determined that the development pattern was established. Changes to overall character of the area should rarely occur. The designation does not necessarily mean that any particular development proposal is inconsistent with Connect Columbia. It does mean that the Planning Commission may pause to ensure the context of the area surrounding the subject property is considered fully in the review process. (Connect Columbia p. 14).



CONFORMITY WITH ZONING ORDINANCE

As required by **§ 8.5.19.F.3** of the Zoning Ordinance, the applicant provided a concept plan (i.e. "Sketch Development Plan"). The purpose of the concept plan is to demonstrate that it is possible to develop the site in conformity with the standards of the requested character district. This request for rezoning simply establishes entitlements under the zoning ordinance, not a vested right to develop the site as depicted in the concept plan.

Lots, Building Sites & Bulk Standards

- **The concept demonstrates that it is possible to develop the site in conformity with the bulk and design standard of the Ordinance at Table 4.3.1-D.**
    - The plan depicts a small retail building site with associated parking.
    - As drawn, the plan would not conform to the standards for frontage buildout and parking placement. However, with a minor modification of the building placement, it could conform to the CD-4 bulk and site standards listed in **Table 4.3.1-D** of the Zoning Ordinance.
    - If the rezoning is successful and the site develops, Planning staff will perform zoning compliance review to determine conformity with the standards of the Ordinance.
    - Any proposed redevelopment of the site must conform to the standards of the Zoning Ordinance and applicable overlays.
- **The current request establishes the applicable standards for future reviews. The concept plan is not a plan of development and approval of the rezoning request does not establish a vested right.**

Plan Consistency

- **The Zoning Ordinance requires plan consistence for all rezonings.**
    - **§ 8.5.19.H.4.a** requires the Planning Commission to determine that all proposed rezonings are consistent and not in conflict with the Comprehensive Plan or other applicable approved local plans for the area when making a recommendation to City Council.
    - Furthermore, **§ 8.5.19.K.6.a** requires the City Council to determine the Rezoning is in agreement with the Comprehensive Plan and any applicable local area plans prior to approval.

- The future land use of the subject site under the 2018 version of Connect Columbia is suburban neighborhood. The 2018 version of the plan indicates that appropriate uses for Suburban Neighborhood include medium density residential and civic uses. The requested CD-4 zoning is a mixed use district which permits commercial uses, as depicted in the applicant's site plan.
- The 2024 version of Connect Columbia, adopted on February 8, 2024, places the subject property in the Suburban Neighborhoods future land use classification. The future land use classification is implemented by CD-3 and CD-3L.
- Articles 3 and 4 of the Zoning Ordinance describes the CD-4 character districts as appropriate for the Urban Neighborhood character area and makes clear that it is a mixed-use district. Pending Zoning text amendments update this language to indicate that the CD-4 character district implements the City Center Urban Village future land use classification.
- The requested zoning is not consistent with the comprehensive plan.

DRAFT

REVIEW PROCESS

The Development Review Committee evaluated the proposed rezoning at its December 2023 meeting, as directed by section **8.3.7** of the Zoning Ordinance. Technical comments are provided in the agenda package.

Section **8.5.19** of the Zoning Ordinance directs the Planning Commission to review and make a recommendation on all proposed changes to the Official Zoning Map. The Planning Commission is the recommending body for rezonings under **§ 8.3.3.B.3** of the Zoning Ordinance.

Section **8.5.19.H.4** of the Zoning Ordinance establishes the review criteria for approval of all changes to the Official Zoning Map:

a. *The Rezoning is consistent and not in conflict with the Comprehensive Plan or other applicable approved local plans for the area;*
b. *It has been determined that the legal purposes for which zoning exists, as set forth in Section 1.5 [, are not contravened];* [1]
c. *It has been determined that there will be no adverse effect upon Adjoining property owners unless such effect can be justified by the overwhelming public good or welfare;*
d. *It has been determined that no one property owner or small group of property owners will benefit materially from the change to the detriment of the general public;*
e. *It has been determined that conditions affecting the area have changed to a sufficient to warrant the Zoning Map Amendment or that the existing zoning of the property was the result of a mistake;*
f. *It has been determined that adequate school, road, parks, wastewater treatment, water supply, and stormwater drainage facilities are available*

[1] Ordinance 4400 contains this incomplete sentence. The previous ordinance contained a nearly identical list of criteria at § 3.18.7.B. The corresponding criterion in Ordinance 3638 read "the legal purposes for which zoning exists are not contravened."

SUMMARY OF DEVELOPMENT REVIEW COMMITTEE COMMENTS

The DRC reviewed this proposal at its December 2023 and January 2024 meetings. A full list of comments, and the applicant's responses, is provided in the agenda packet. Some key comments are noted below.

- **Planning** informed the applicant that the request is inconsistent with the comprehensive plan and requested that the applicant amend the application to request a future land use map amendment.
- Planning also requested that the applicant provide a narrative response explaining why the applicant believes the five criteria for Planning Commission recommendations listed at 8.5.20.F of the Zoning Ordinance (p. 450) support the proposed change to the Future Land Use Map.
- **Planning** directed the applicant to provide a narrative response to criterion at **§ 8.5.19.H.4(e)** explaining why the applicant believes conditions affecting the area have changed sufficiently to warrant the Zoning Map Amendment.
- Planning also advised that staff prefers to see this request combined with a related and concurrent request for Planned Unit Development approval of the larger portion of the same parcel. The subject site will be inaccessible if the other development is not completed.
- Planning also advised the applicant to consider the feasibility of providing the required parking for the intended use of the property.
- Utility providers indicated willingness and capacity to serve. Some included standard caveats about the impact of supply chain disruption on the ability to establish services. Water availability letters must be renewed every 120 days.

DRAFT

COMMENTARY FROM PROFESSIONAL PLANNING STAFF

The requested CD-4 zoning is not consistent with Connect Columbia; the Planning Commission must recommend denial. As discussed above, the subject site's future land use classification is Urban Neighborhood. Section **8.5.19.H.4.a** of the Zoning Ordinance requires the Planning Commission to determine that all proposed rezonings are consistent and not in conflict with the Comprehensive Plan. Section **8.5.19.K.6.a** requires the City Council to determine the Rezoning is in agreement with the Comprehensive Plan prior to approval. The requested CD-4 zoning is a medium density mixed use district which is not consistent with the Suburban Nieghborhoods future land use classification.

SAMPLE MOTIONS

Approve:

Move to find, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in sections **8.5.19.H** of the City of Columbia Zoning Ordinance have been satisfied and recommend approval of the proposed annexation with a plan of services and rezoning *[, subject to technical comments and other conditions presented by planning staff*].

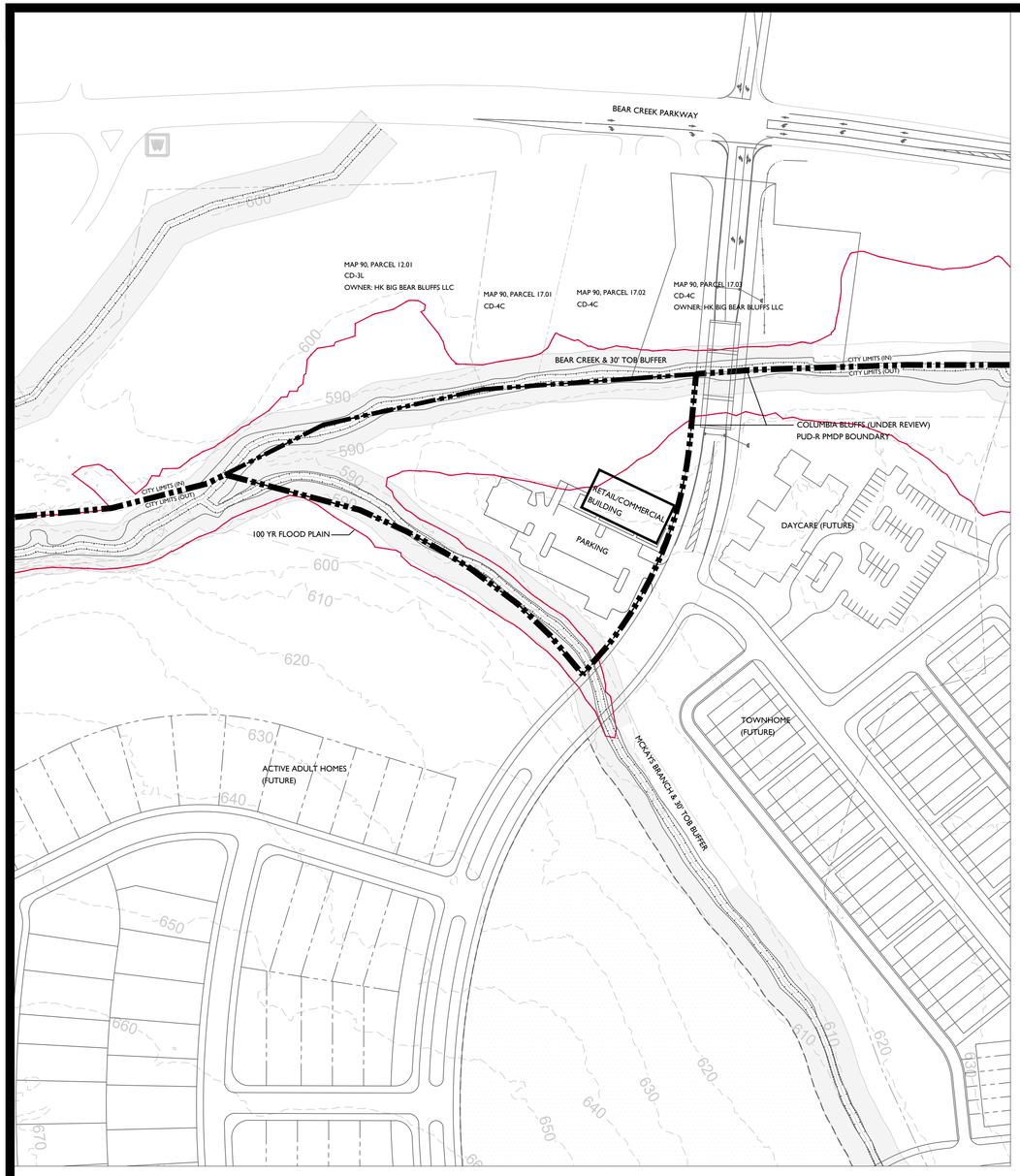
Deny:

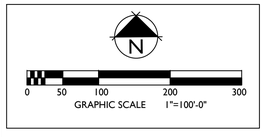
Move to recommend denial of the requested annexation with a plan of services and rezoning having found, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in section **8.5.19.H** of the City of Columbia Zoning Ordinance are not satisfied [*list specific reasons for denial*].

Defer:

Move to find that there is insufficient information to decide, defer the matter to the next regularly scheduled meeting of the Planning Commission, and request that the [*applicant/staff*] provide: [*list additional information*] for review at a future meeting.

DRAFT





CONCEPTUAL DEVELOPMENT PLAN CD-4 DESIGN CRITERIA:

GROSS SITE AREA: +/-3.36 AC

7,200 SF NON-RESIDENTIAL BUILDING (60'X120')

TOTAL IMPERVIOUS SURFACE RATIO: 80% MAX
MAXIMUM BUILDING LENGTH: 120'

SETBACKS:
FRONT: 6' - 20'
SIDE: 6' MIN.
REAR: 3' MIN.

PARKING PER ZONING ORDINANCE STANDARD
PARKING PROVIDED: SURFACE IN 3RD LAYER
+/- 54 PARKING SPACES SHOWN ON PLAN (1 PER 133 SF)

LEGAL DESCRIPTION OF PROPERTY:

LEGAL DESCRIPTION
FOR ANNEXATION REQUEST – 3.36 ACRES
A PORTION OF MAP 90, PARCEL 12.01
DEED BOOK R2827, PAGE 587
HK BIG BEAR BLUFFS, LLC

LAND LYING IN THE 4TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE, BOUNDED ON THE NORTH BY ROCK 'N' ROLL JESUS, LLC (BK R2727, PG 1242), AMIT J. PATEL AND WIFE, MINAXIBEN G. PATEL (BK R2411, PAGE 1348), HK BIG BEAR BLUFFS, LLC (R2870, PG 961), AND WEST, SOUTH, AND EAST BY REMAINING PORTIONS OF BIG BEAR BLUFFS, LLC (2827, PG 587) REGISTERS OFFICE OF MAURY COUNTY, TENNESSEE (ROMCTN), AND IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

TO FIND THE TRUE POINT OF BEGINNING, COMMENCE AT AN 1 INCH IRON PIPE FOUND IN THE SOUTHERN ROW OF BEAR CREEK PIKE, SAID POINT ALSO BEING THE NORTHWEST BOUNDARY OF ROCK 'N' ROLL JESUS, LLC (BK R2727, PG 1242) AND HAVING A TENNESSEE STATE PLANE COORDINATE OF NORTH 475,793.95 EAST 1,672,944.21;

THENCE, WITH THE WEST BOUNDARY OF JESUS, THE FOLLOWING CALLS:

S 08°01'15" W, FOR A DISTANCE OF 269.51 FEET, TO AN IRON PIN FOUND;
S 21°32'47" E, FOR A DISTANCE OF 51.20 FEET TO A THE CENTER OF BEAR CREEK BEING THE SOUTHWEST CORNER OF ROCK N ROLL JESUS AND THE TRUE POINT OF BEGINNING;

THENCE, WITH THE SOUTH BOUNDARY OF ROCK 'N' ROLL JESUS, LLC, AMIT J. PATEL & HK BIG BEAR BLUFFS, LLC, AND ALSO BEING THE CENTER OF BEAR CREEK, N 85°53'31" E, 307.86 FEET TO A POINT;

THENCE, CREATING A NEW LINE WITH THIS ANNEXATION OF PROPERTY, THE FOLLOWING 2 CALLS:

S 05°15'54" W, 94.01 FEET TO THE BEGINNING OF A CURVE CONCAVE WESTERLY, SAID CURVE HAS A RADIUS OF 565.00 FEET;

SOUTHERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 38°33'55", AN ARC DISTANCE OF 380.30 FEET, CHORD BEARING S 24°32'52" W WITH A CHORD DISTANCE OF 373.16 FEET TO A POINT ALONG THE CENTER OF MCKAY BRANCH;

THENCE, ALONG MCKAY BRANCH, THE FOLLOWING 7 CALLS:

N 39°46'13" W, 73.31 FEET TO A POINT;

N 45°49'08" W, 65.41 FEET TO A POINT;

N 53°12'54" W, 86.37 FEET TO A POINT;

N 58°09'42" W, 42.46 FEET TO A POINT;

N 61°08'47" W, 61.78 FEET TO A POINT;

N 65°15'03" W, 74.45 FEET TO A POINT;

N 75°17'27" W, 201.23 FEET TO A POINT WHERE MCKAY BRANCH CREEK INTERSECTS WITH BEAR CREEK;

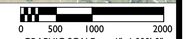
THENCE, ALONG BEAR CREEK, THE FOLLOWING 2 CALLS:

N 63°11'05" E, 159.96 FEET TO A POINT;

N 77°31'07" E, 234.79 FEET TO THE POINT OF BEGINNING CONTAINING 3.36 ACRES (146,345.13 SQ FT.) AND BEING A PORTION OF THE PROPERTY SHOWN ON TAX MAP 90 PARCEL 12.01 CONVEYED TO BIG BEAR BLUFFS, LLC BY DEED OF RECORD IN BOOK R2827, PAGE 287 IN THE REGISTER'S OFFICE OF MAURY COUNTY, TENNESSEE.



LOCATION MAP



PROJECT INFORMATION:

PARCEL: PORTION OF MAP 90 PARCEL 12.01
ADDRESS: PORTION OF 400 BEAR CREEK PARKWAY

PROPOSED USE: NEIGHBORHOOD SERVING COMMERCIAL CONFORMING TO THE APPROVED CD-4 USES.

CONTACT:

APPLICANT/LANDSCAPE ARCHITECT:
GREG GAMBLE OR KELI FRYMIRE
GAMBLE DESIGN COLLABORATIVE
3020 STANSBERRY LANE, SUITE 201
FRANKLIN, TN 37069
615-975-5765
greg.gamble@gdc-tn.com
keli@gdc-tn.com

DEVELOPER:
KOLTER LAND
JIM HARVEY OR
JOSHUA GIBBS
615-582-3253
jgibbs@kolter.com

OWNER:
HK BIG BEAR BLUFFS LLC
JIM HARVEY

ANNEXATION AND REZONING REQUEST:

REQUEST TO ANNEX +/-3.36 ACRES AND REZONE TO CD-4
FUTURE LAND USE: SUBURBAN NEIGHBORHOOD

CONNECT COLUMBIA FINDINGS:
Annexation should provide for a continuation of orderly, planned development of the City. Lot sizes and development scale should be compatible with surrounding development. If proposed development abuts land that is undeveloped or has low density/intensity, the density and intensity of the proposed development should taper towards the periphery to provide compatibility of the development pattern. Land annexed into the City should follow the transect and Character Area Matrix to provide the most appropriate land uses and zoning for the newly annexed land.
Response: The proposed commercial parcel would be adjacent to CD-4C zoned properties on Bear Creek Parkway and would serve to provide neighborhood commercial and personal service options for the residents of the proposed Columbia Bluffs development. The parcels along Bear Creek Parkway are within an area of change. With the development along this corridor, residential development in close proximity to downtown and new commercial development along Tom Hitch Parkway is a logical progression of development pattern.

Suburban Neighborhood: Future development should emphasize connectivity and housing diversity. Additionally, new development should create a pedestrian-friendly environment by adding sidewalks and/or creating other pedestrian-friendly multiuse trail/bike routes linking current and future neighborhoods and major destinations such as libraries, neighborhood centers, health facilities, commercial clusters, parks, schools, or other such uses.
Response: The small commercial parcel will be a destination for nearby residents and is proposed along a new/proposed road into the Columbia Bluffs development. Sidewalk connections will link this commercial area to this residential development.

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

PORTION OF 400 BEAR CREEK PARKWAY ANNEXATION, REZONING REQUEST & CONCEPTUAL DEVELOPMENT PLAN

Columbia, Tennessee



Date: OCTOBER 16, 2023

Revision Date
△
△
△

CONCEPTUAL DEVELOPMENT PLAN

SHEET
L1.0

January 23, 2024

Paul Keltner, Director
Development Services
City of Columbia, TN

RE: Project# 23-0421; Re-Submittal 400 Bear Creek Parkway – Annexation Request and CD4 Rezoning

Dear Mr. Keltner,
The accompanying documents and comment responses below are for the resubmittal of the above referenced project. It is our understanding that this project will be on the February CMPC agenda.

Below, please find written responses to the Technical Review comments provided on December 12, 2023.

Included in the submittal are the following:

1. Comment responses to Development Review Committee (below)

Staff Comments:

Planning

1. The requested character district (CD-4) is inconsistent with the comprehensive plan future land use map. Please add a request for a comprehensive plan amendment to Urban Neighborhood.
   Response: The applicant is not seeking a comprehensive plan amendment and is not seeking to change the land use policy in this area to Urban Neighborhood. The existing future land use policy is Suburban Neighborhood, with adjacency to Suburban Corridor. The applicant has heard feedback that would support small, neighborhood serving commercial uses in this location and feels like this land use policy and zoning district would be more appropriate.
2. The lead staff person for this case is City Planner Kevin McCarthy, AICP; he will prepare the staff report for this item. Please contact kmccarthy@columbiatn.com with question about the development review process or technical comments.
   Response: Noted.

DEVELOPMENT PLANNING | DESIGN | MANAGEMENT
greg.gamble@gdc-tn.com | 615.975.5765 cell | 3020 Stansberry Lane, Suite 201, Franklin, TN 37069

greg.gamble@gdc-tn.com
615.975.5765 cell
3020 Stansberry Lane, Suite 201
Franklin, TN 370

3. At resubmittal, please provide a response letter addressing each comment along with any revised plans. If the nature of the comment does not warrant a response, please simply not that the information has been acknowledged.
   Response: noted.
4. Please provide a narrative response to criterion 8.5.19.H.4(e) explaining why the applicant believes conditions affecting the area have changed sufficiently to warrant the Zoning Map Amendment.
   Response: With approval of the Columbia Bluffs development, this small commercial parcel would add a pedestrian friendly commercial opportunity to the local residents. This commercial parcel would also be on the multi-use trail route that serves as a link between Bear Creek Parkway and Iron Bridge Road.
5. Please provide a narrative response explaining why the applicant believes the five criteria for Planning Commission Recommendations listed at 8.5.20.F of the Zoning Ordinance (p. 450) support the proposed change to the Future Land Use Map.
   Response: The applicant is not seeking a change to the Future Land Use Map.
6. Please provide a more detailed concept plan indicating that the site can be developed in conformity with the standards of the CD-4 character district.
   Response: The previous/current concept plan depicts a small commercial building with associated parking and stormwater. Access to the parcel would currently only be available from the proposed Columbia Bluffs Boulevard.
7. Please explain how the site will be accessed if the adjacent Planned Unit Development Preliminary Master Plan is not approved. Does the utilization of this site under the standards of the CD-4 character district depend on a change of entitlements and approved plan of development for another property?
   Response: The applicant does not anticipate pursuing this application if the larger Columbia Bluffs PUD-R Preliminary Master Development Plan is not approved.
8. Advisory: A current water availability letter is required throughout the entitlement process. The current letter will expire on February 17, 2023. Presuming a timely resubmittal to technical comments and a favorable recommendation from the planning Commission in February, the item will proceed to City Council agenda for first consideration in March. Consequently, following consideration by the Planning Commission, a new water availability letter will be required to proceed to the City Council agenda. The lead times for new letters can be long. Please communicate with IDG and CPWS accordingly.
   Response: Noted.
9. Advisory: Planning staff will place signs on the property and send certified letters to adjacent property owners at least 10 days prior to the Planning Commission meeting. Please be prepared to address any concerns regarding compatibility with the established pattern of the surrounding area.
   Response: noted.
10. Advisory: Planning staff recommends timing resubmittals so that this item proceeds to Planning Commission on the same agenda as the Planned Unit Development Preliminary Master Plan proposed for the adjacent site.
    Response: Noted. The items are intended to track on the same agenda.

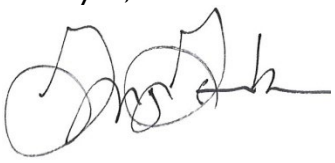
DEVELOPMENT PLANNING
DESIGN
MANAGEMENT

greg.gamble@gdc-tn.com
615.975.5765 cell
3020 Stansberry Lane, Suite 201
Franklin, TN 370

11. Columbia Power System has an existing power line near your proposed development. We are willing to serve this new development subject to all Columbia Power System policies and procedures in effect at actual time service is rendered provided an approved final plat and complete electrical load information is furnished as soon as possible prior to start of actual construction.
    Response: Noted
12. Unfortunately, due to current supply chain challenges, no timeframe can be guaranteed regarding the availability of meters or transformers appropriate. for your development.
    Response: noted.
13. Please see attached Plan of Services for 3-acre portion for commercial use and City of Columbia Dumpster Guidelines & Accessibility Requirements.
    Response: Noted.
14. All sewer improvements including but not limited to off-site improvements, on-site improvements, and pump station and equipment installation shall be completed and functioning to the satisfaction of the Director of the Wastewater Department prior to the filing of any Final Plat with the City of Columbia Municipal Planning Commission, unless specific approval is granted by the Director and a surety of sufficient amount is provided. Note: Pump stations will require a building permit and all other required permits from additional entities. All inspections must be completed and certificates of completion granted before Council Agenda Deadline. Please contact the Wastewater Department for standard design details and equipment.
    Response: noted
15. "A water availability letter was issued on November 19, 2023, it remains valid for 120 days. The availability of capacity to serve is based on a determination by the Fire Marshal of fire flow requirements and the information submitted on the Water Service Availability Request application. Any off-site improvements detailed in the availability letter are the responsibility of the developer/owner. All public water system improvements are subject to the preparation and approval of detailed construction plans prepared in accordance with CPWS and Tennessee Department of Environment and Conservation requirements."
    Response: noted
16. ATT intends to serve.
    Response: Noted.
17. [CPWS BB] Plan to serve.
    Response: Noted.

If there are any questions or additional information needed, please feel free to reach out to me, or Keli Frymire (keli@gdc-tn.com) in my office.

Thank you,



Gamble Design Collaborative
Greg Gamble

PLAN OF SERVICES

FOR ANNEXATION

400 BEAR CREEK PIKE PROPERTY

+/-3.36 ACRES,

BEING

TAX MAP 90 PARCEL 12.01

23-0421

A. Water

The project is within Columbia Power and Water's service area. "A water availability letter was issued on October 13, 2023, it remains valid for 120 days. The letter will need to be updated prior to the applicable meeting of the Planning Commission. The availability of capacity to serve will be based on a determination by the Fire Marshal of fire flow requirements and the information submitted on the Water Service Availability Request application. Any off-site improvements detailed in the availability letter are the responsibility of the developer/owner. All public water system improvements are subject to the preparation and approval of detailed construction plans prepared in accordance with CPWS and Tennessee Department of Environment and Conservation requirements."

B. Sewer

All sewer improvements including but not limited to off-site improvements, on-site improvements, and pump station and equipment installation shall be completed and functioning to the satisfaction of the Director of the Wastewater Department prior to the filing of any Final Plat with the City of Columbia Municipal Planning Commission, unless specific approval is granted by the Director and a surety of sufficient amount is provided. Note: Pump stations will require a building permit and all other required permits from additional entities. All inspections must be completed and certificates of completion granted before Council Agenda Deadline. Please contact the Wastewater Department for standard design details and equipment.

C. Police

The jurisdiction of the Columbia Police Department will be extended to the areas annexed immediately upon the effective date of annexation.

D. Fire and Rescue

1. The City of Columbia Fire & Rescue provides an array of services to the citizens and visitors of the City of Columbia. These services include but may not be limited to non-emergency services such as fire prevention and codes enforcement, pre-incident planning, public education programs, smoke alarm check/replacement, emergency management preparedness, and emergency services such as fire suppression, heavy rescue, emergency medical first response, and hazardous materials response. The City of Columbia Fire Department currently holds an Insurance Service Organization (ISO) class 1 rating.

   Columbia Fire & Rescue strives to provide all services in a timely, courteous, and professional manner. Due to the nature of emergency services, we strive to arrive at the incident scene as quickly as possible but without posing additional dangers to the residents/visitors we meet while responding to your location.

Infrastructure:

The infrastructure put in place is like the foundation of your development. If the infrastructure is designed and constructed with the present needs and future plans in mind, your development will be prepared for the future.

Water:

Columbia Fire & Rescue requires that there be sufficient water provided through the municipal water system to meet the needed fire flow requirements for your facility. These flows are calculated by the Fire Marshal. These flows are based on many factors dealing with your buildings' construction type, fire load in the building, square footages, and etc. If you install fire sprinkler systems in your facilities, Columbia Fire & Rescue can drastically reduce fire flow requirements.

Roadway and Bridges: Columbia Fire & Rescue serves the residents and visitors of our jurisdiction by utilizing highly trained firefighters and modern fire apparatus. A minimum response to a structure fire in your development will be four fire apparatus. One of the fire apparatus that will respond to your development will be a ladder truck with a gross vehicle weight rating of approximately 80,000 pounds. Roadways and bridges must be designed and constructed not only with light vehicle traffic in mind but with the emergency service vehicles that will be servicing your development.

Damage Free Property Access: Columbia Fire & Rescue requires all gates automatic or manual that will be or may be locked to be equipped with Knox Rapid Entry system. You can research this product at www.knoxbox.com or

your gate vendor will be familiar with the product. Our department would also be happy to work with you to find what Knox Rapid Entry product is best suited for your application.

Damage Free Home/Facility Access: Currently, Columbia Fire & Rescue does not require residential occupancies to be equipped with the Knox Rapid Entry system. However, this product is a very wise investment for your future development. The Knox Rapid Entry System products allow homes to be secured but also allow the Columbia Fire & Rescue Department access to your property and/or homes without any delay or property damage. The system has an armored key lock safe recess mounted to the exterior of the homes with the key to the residence inside. Firefighters access the residence key during an emergency to gain entry into the home without causing any property damage. Again, our department would be happy to provide you with information and education on this program and its many positive attributes.

Emergency Response to Your Location: The proposed annex will be located on the property at 400 Bear Creek Pike in Columbia, Tennessee. This location is approximately 1.4 miles from Columbia Fire Station #3 located at 705 Tom Sharp Road, 3.3 miles from Fire Station #1 located at 1000 South Garden in downtown Columbia, and 7.4 miles from Fire Station #5 located at 2633 Nashville Hwy. These distances are used to calculate an estimated response time to your development for the different levels of emergency response that may be needed at your facilities.

Medical Emergency Response: Columbia Fire & Rescue normally responds a minimum of one fire apparatus from Station #3 to service your location for a medical emergency. From the time you dial 911 until the fire department will arrive at your location will be within 3.5 minutes. Should your property experience a mass casualty incident where additional fire apparatus/firefighters would need to respond, then Fire Station #1 could send an additional unit and arrive on-scene 4.5 minutes of your 911 call.

Fire Incident Response: Columbia Fire & Rescue recommends a multi-faceted fire suppression approach. First, future homes should be constructed to meet or exceed all applicable fire and life safety codes. Secondly, even if not required by building, fire, or life safety codes, we encourage the installation and use of fire sprinkles in future homes. Columbia Fire & Rescue's normal fire incident response to a single family residential development is three fire apparatus with a minimum 15 firefighters and 1 Chief Officer. Response times will be similar to the times estimated in the emergency medical response section. Your first fire apparatus should be on-scene within approximately 3.5 minutes, the second fire apparatus should be on-scene within 4.5 minutes, and the third/fourth apparatus should be on-scene within 4.5 minutes. Due to OSHA standards that require at least four firefighters to arrive on-scene prior to initiating an interior fire attack

and Columbia Fire & Rescue's minimum staffing policy, it could take the 4.5 minutes to get the minimum number of firefighters to the scene to begin an interior fire attack.

In summary, the members of the Columbia Fire & Rescue consider it an honor to serve the residents and visitors in our community each and every day. When an emergency occurs, time is our worst enemy. Columbia firefighters train to reduce every second while not posing any additional undue risk to firefighters and/or the public when responding to or working at an emergency incident. The times estimated in the referenced examples are a combination of averages and estimations. Our department has very little data to support incident responses to your location. The time estimations are based on the fire companies being at their regular station, time it takes for Maury 911 to process a 911 call, the time it takes for Columbia firefighters to board the apparatus and leave the station, and the travel time from the station to your location is an estimate based on road miles, probable traffic conditions, and road conditions. You can see by the examples referenced above that it will take time for Columbia Fire & Rescue to receive your call for help and then respond to your location. The roadways have considerable driveway/cross street connections, hills, curves, and reduced speed zones that contribute to a long response time for fire apparatus to arrive.

E. Development Services

1. The planning and zoning jurisdiction of the City will extend to the annexed areas immediately upon the effective date of the annexation.

2. The property shall be zoned CD-4 (General Urban Character District)) upon the effective date of the annexation.

3. The code administration jurisdiction of the City will extend to the annexed areas immediately upon the effective date of the annexation.

4. Upon the effective date of annexation, all development will be required to abide by the Columbia Zoning Ordinance.

F. Streets

1. Upon acceptance by City Council and all warranties have expired; all streets and drainage systems will be maintained by Public Works. Service will include street sweeping, catch basin cleaning, street repair and snow removal drainage maintenance, and sidewalk repair.

2. Upon acceptance by City Council, all approved street signs will be maintained by Public Works.

G. Parks and Recreation

Residents of the annexed areas may use all existing recreational facilities, parks, etc., on the effective date of annexation. The same standards and policies now used in the present City will be followed in expanding the recreational program and facilities in the enlarged City.

H. Refuse Collection

Single family homes will receive City of Columbia trashcan service. For 189 townhomes, we recommend five or six 8-yard dumpsters with 3x/week collection if utilizing City of Columbia sanitation services. Private sanitation services, including dumpsters, compactors, individual receptacles or valet service, may be utilized. Individual trash receptacles will not be provided by the City of Columbia to townhome residents.

Single Family homes will receive the following City of Columbia sanitation services: Residential customers will be issued one 96-gallon garbage receptacle with the option to purchase up to two additional garbage receptacles. The Sanitation Department will provide weekly curbside garbage collection. Bi-weekly curbside recycling will be offered on a subscription basis. Brush collection will be provided on a bi-weekly basis. Residents are allotted three free bulk item pickups per year.

Townhomes will receive the following services: The Sanitation Department will provide dumpster collection. For the 189 units, we recommend five (5) or six (6) 8-yard dumpsters serviced 3 times a week. Brush collection will be provided on a bi-weekly basis. Residents are allotted three free bulk item pickups per year. Private sanitation services, including dumpsters, compactors, individual receptacles or valet service, a are an option for townhomes. Individual receptacles will not be provided by the City of Columbia to multi-family apartment or townhomes.

I. Power

Columbia Power System has an existing power line near the proposed development. We are willing to serve this new development subject to all Columbia Power System policies and procedures in effect at actual time service is rendered provided an approved final plat and complete electrical load information is furnished as soon as possible prior to start of actual construction.

J. Schools

This property falls under the jurisdiction of Maury County Public School System.

The development combined with current neighborhoods and additional approved developments in these zones may require either new construction or realignment of school zones to accommodate new students.

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, January 9, 2024

ITEM NO.
23-0421

DESCRIPTION: Annexation request and CD4 Rezoning Request for a parcel of about 3.36 acres between Bear Creek and McKays Branch, adjacent to the proposed Columbia Bluffs PUD-R property.

RECOMMENDATION: For final recommendation please see staff report.

COMMENTS:

Planning

1. The requested character district (CD-4) is inconsistent with the comprehensive plan future land use map. Please add a request for a comprehensive plan amendment to Urban Neighborhood.
2. The lead staff person for this case is City Planner Kevin McCarthy, AICP; he will prepare the staff report for this item. Please contact kmccarthy@columbiatn.com with question about the development review process or technical comments.
3. At resubmittal, please provide a response letter addressing each comment along with any revised plans. If the nature of the comment does not warrant a response, please simply not that the information has been acknowledged.
4. Advisory: Planning staff will place signs on the property and send certified letters to adjacent property owners on or before December 28th. Please be prepared to address any concerns regarding compatibility with the established pattern of the surrounding area.
5. Advisory: Planning staff recommends timing resubmittals so that this item proceeds to Planning Commission on the same agenda as the Planned Unit Development Preliminary Master Plan proposed for the adjacent site.
6. Please provide a narrative response to criterion 8.5.19.H.4(e) explaining why the applicant believes conditions affecting the area have changed sufficiently to warrant the Zoning Map Amendment.
7. Please provide a narrative response explaining why the applicant believes the five criteria for Planning Commission Recommendations listed at 8.5.20.F of the Zoning Ordinance (p. 450) support the proposed change to the Future Land Use Map.
8. Advisory: A current water availability letter is required throughout the entitlement process. The current letter will expire on February 17, 2023. Presuming a timely resubmittal to technical comments and a favorable recommendation from the planning

Commission in January, the item will proceed to City Council agenda for first consideration in February. If the City Council reviews the request favorably upon initial consideration, the public hearing for this item will occur on March 14th. Consequently, following consideration by the Planning Commission, a new water availability letter will be required to proceed to the City Council agenda. The lead times for new letters can be long. Please communicate with IDG and CPWS accordingly.

9. Please provide a more detailed concept plan indicating that the site can be developed in conformity with the standards of the CD-4 character district.
10. Please explain how the site will be accessed if the adjacent Planned Unit Development Preliminary Master Plan is not approved. Does the utilization of this site under the standards of the CD-4 character district depend on a change of entitlements and approved plan of development for another property?

Building

1. No comments.

Police

2. No comments provided.

Columbia Power

3. Columbia Power System has an existing power line near your proposed development.
   We are willing to serve this new development subject to all Columbia Power System policies and procedures in effect at actual time service is rendered provided an approved final plat and complete electrical load information is furnished as soon as possible prior to start of actual construction.
   • Unfortunately, due to current supply chain challenges, no timeframe can be guaranteed regarding the availability of meters or transformers appropriate. for your development.

Public Works

4. Please see attached Plan of Services for 3 acre portion for commercial use and City of Columbia Dumpster Guidelines & Accessibility Requirements.

ATT

5. ATT TO SERVE

Maury County E911

6. No comment on Annexation.

Wastewater

7. All sewer improvements including but not limited to off-site improvements, on-site improvements, and pump station and equipment installation shall be completed and functioning to the satisfaction of the Director of the Wastewater Department prior to the filing of any Final Plat with the City of Columbia Municipal Planning Commission, unless specific approval is granted by the Director and a surety of sufficient amount is provided. Note: Pump stations will require a building permit and all other required permits from additional entities. All inspections must be completed and certificates of completion granted before Council Agenda Deadline. Please contact the Wastewater Department for standard design details and equipment.

Maury County Schools

8. Howell Elementary, Cox Middle School, Central High School
   See Attached Capacity Numbers
   The development combined with current neighborhoods and additional approved developments in these zones may require either new construction or realignment of school zones to accommodate new students.
   of school zones to accommodate new students.

Duck River Electric Membership Corp

9. No comment.

Fire

10. No comments

Columbia Water

11. "A water availability letter was issued on October 13, 2023, it remains valid for 120 days. The letter will need to be updated prior to the applicable meeting of the Planning Commission. The availability of capacity to serve is based on a determination by the Fire Marshal of fire flow requirements and the information submitted on the Water Service Availability Request application. Any off-site improvements detailed in the availability letter are the responsibility of the developer/owner. All public water system improvements are subject to the preparation and approval of detailed construction plans prepared in accordance with CPWS and Tennessee Department of Environment and Conservation requirements."

Atmos Energy

12. Natural Gas available along Bear Creek Pike

Engineering

13. No Comment on rezoning. Bridge over Bear Creek must be constructed before any development can occur on this property.

Maury County Highway Dept.

14. No comments.

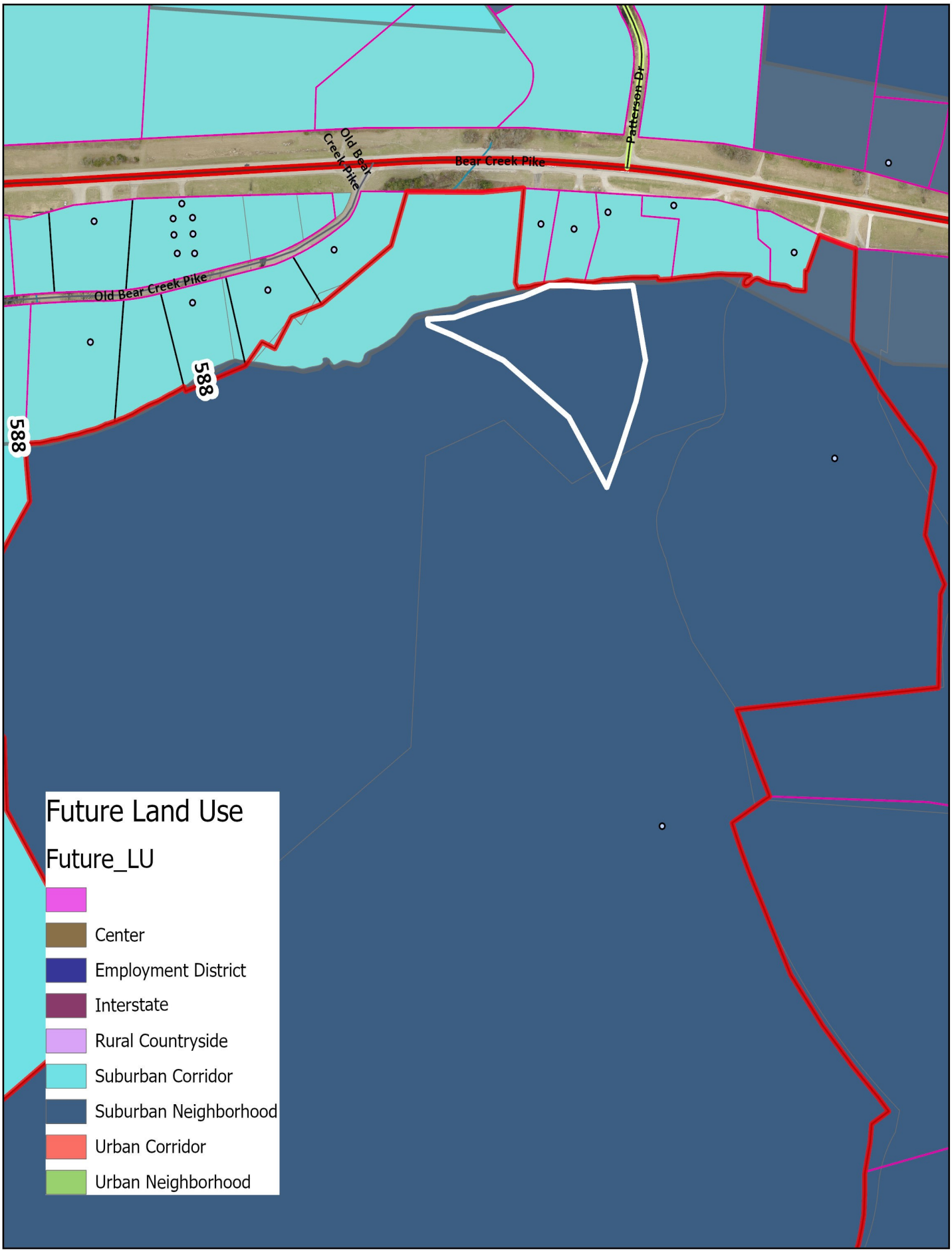
ATTACHMENTS: Concept Plan

NOTE: All submittals shall be compliant with City standards prior to Planning Commission review. Items that are not adhering to the regulations and/or comments for that request will not be forwarded to the next agenda until such items are amended.

Current Enrollment / Capacity

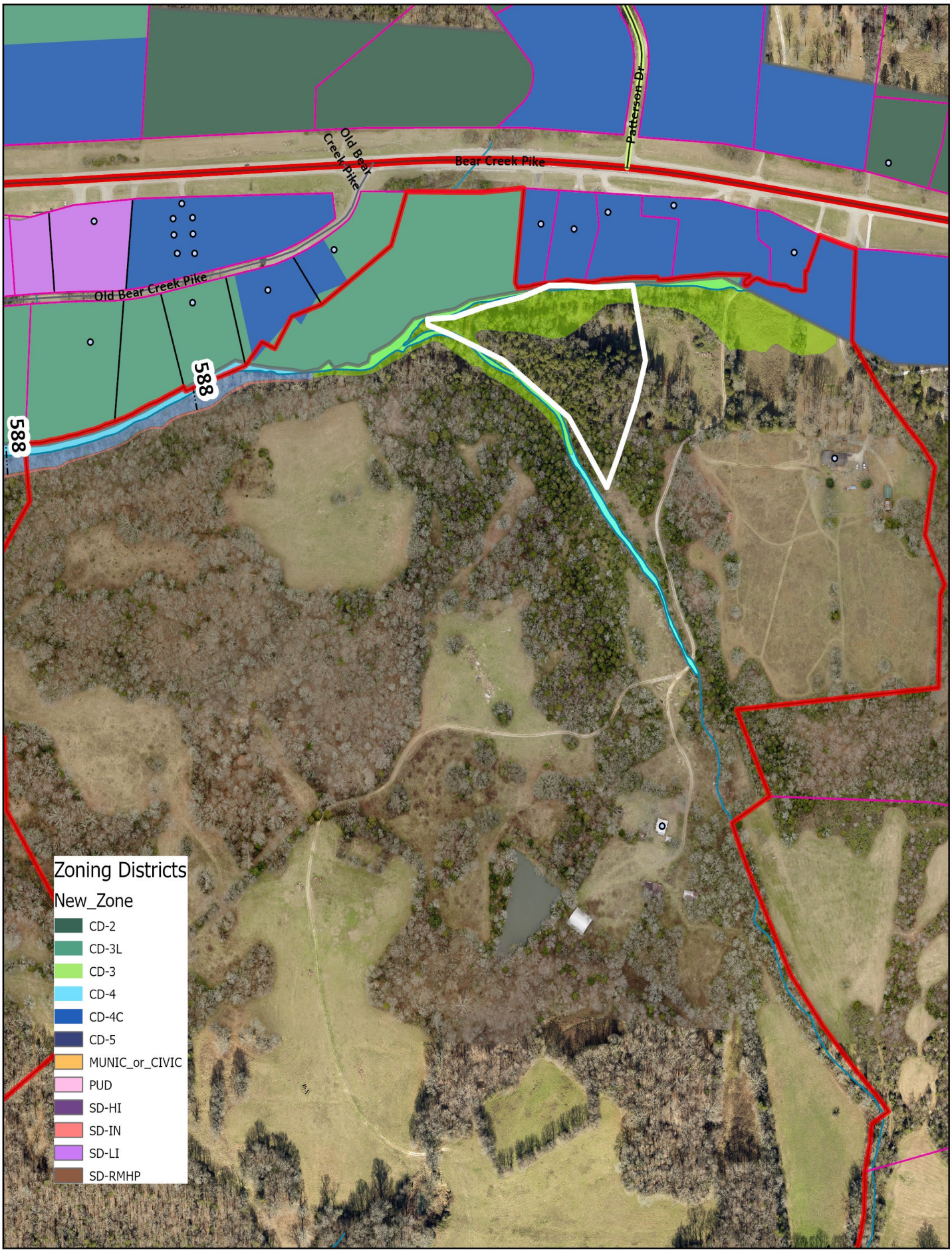
	Facility Name	Date Constructed	Sq. Ft.	Acreage	Capacity
Elementary	Baker	1960	43,920	12	340
	Battle Creek	2019	90,000	30	700
	Brown	1968	56,720	20	405
	Highland	1986	47,800	4.5	380
	Howell	1999	81,600	17.5	700
	Mt. Pleasant	1978	80,021	22	630
	Riverside	1984	71,150	14	500
	Spring Hill	1984	69,000	10	540
	Woodard	1990	76,200	17	600
	Wright	2005	97,765	18	740
					5535
Middle	Battle Creek	2019	125,000	45	900
	Cox	1997	137,200	25	900
	Mt. Pleasant	2001	113,938	29.2	550
	Spring Hill	2010	158,106	39.49	950
	Whitthorne	1979	175,600	17	1050
					4350
High	Central	2016	296,740	55	1700
	Mt. Pleasant	1969	110,759	31	600
	Spring Hill	1993	181,800	57	1200
					3500
Unit	Culleoka	1969	205,800	34	1020
	Hampshire	1978	83,410	13.12	500
	Santa Fe	1964	94,225	24	650
					2170
Other	Central Office	1960	15,400	1.5	
	College Hill	1958	42,211	2.26	
	Maintenance	1987	9,400	4.7	
	McDowell		46,165	7	
			2,509,930	**550.27**	**15555**

Current Enrollment	Capacity Used
328	96.5%
632	90.3%
358	88.4%
304	80.0%
592	84.6%
580	92.1%
406	81.2%
445	82.4%
559	93.2%
601	81.2%
4805	***86.8%***
731	81.2%
656	72.9%
424	77.1%
527	55.5%
971	92.5%
3309	***76.1%***
1396	82.1%
379	63.2%
1223	101.9%
2998	***85.7%***
875	85.8%
408	81.6%
509	78.3%
1792	***82.6%***
166	
13070	



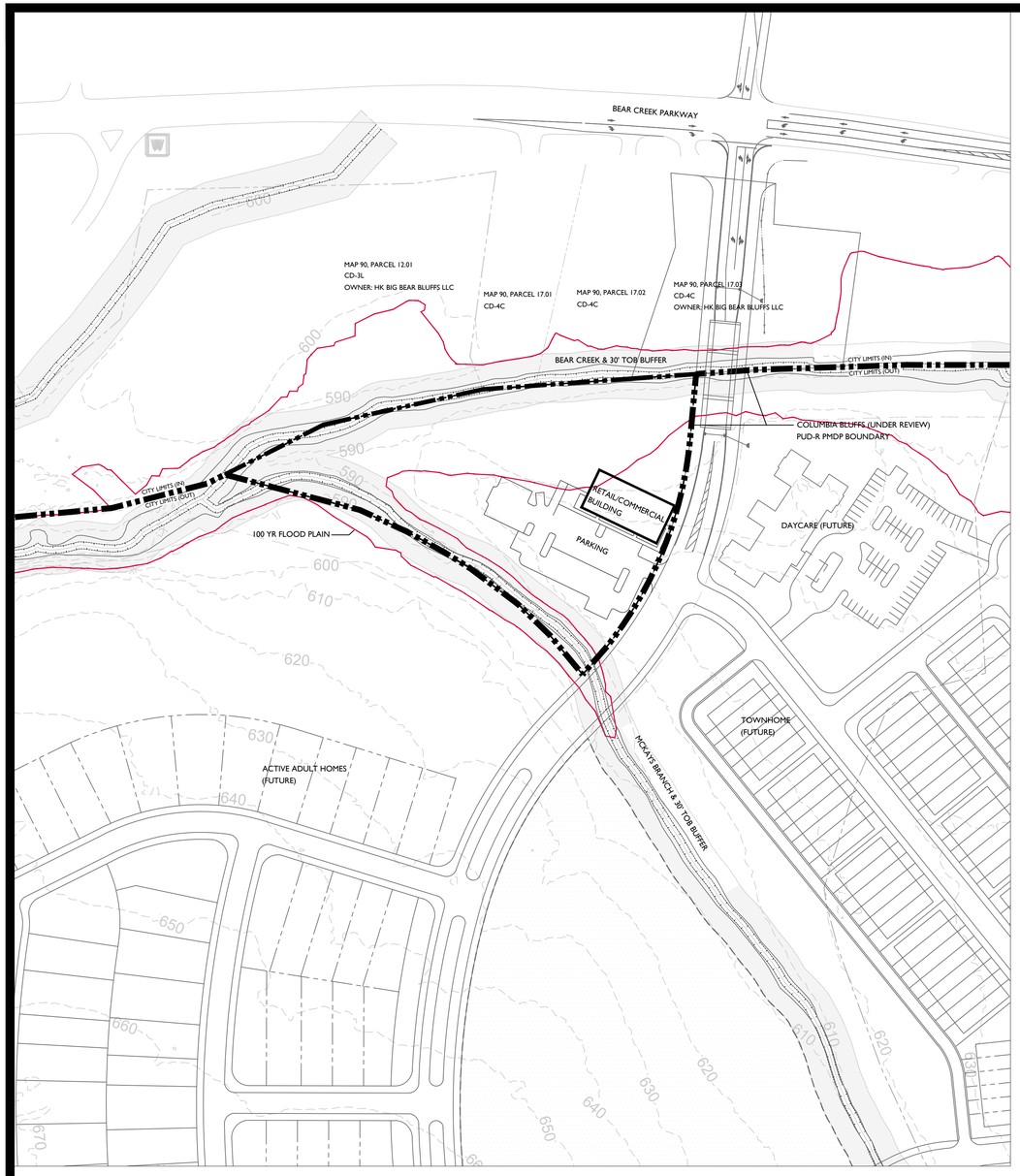
23-0421
Tax Map 90 Parcel 12.01,
3.36 acre portion
Bear Creek Pike

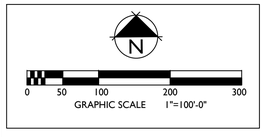
CITY OF COLUMBIA TENNESSEE
DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541



23-0421
Tax Map 90 Parcel 12.01,
3.36 acre portion
Bear Creek Pike

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PHONE: (931) 560-1560
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CONCEPTUAL DEVELOPMENT PLAN CD-4 DESIGN CRITERIA:

GROSS SITE AREA: +/-3.36 AC

7,200 SF NON-RESIDENTIAL BUILDING (60'X120')

TOTAL IMPERVIOUS SURFACE RATIO: 80% MAX
MAXIMUM BUILDING LENGTH: 120'

SETBACKS:
FRONT: 6' - 20'
SIDE: 6' MIN.
REAR: 3' MIN.

PARKING PER ZONING ORDINANCE STANDARD
PARKING PROVIDED: SURFACE IN 3RD LAYER
+/- 54 PARKING SPACES SHOWN ON PLAN (1 PER 133 SF)

LEGAL DESCRIPTION OF PROPERTY:

LEGAL DESCRIPTION
FOR ANNEXATION REQUEST – 3.36 ACRES
A PORTION OF MAP 90, PARCEL 12.01
DEED BOOK R2827, PAGE 587
HK BIG BEAR BLUFFS, LLC

LAND LYING IN THE 4TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE, BOUNDED ON THE NORTH BY ROCK 'N' ROLL JESUS, LLC (BK R2727, PG 1242), AMIT J. PATEL AND WIFE, MINAXIBEN G. PATEL (BK R2411, PAGE 1348), HK BIG BEAR BLUFFS, LLC (R2870, PG 961), AND WEST, SOUTH, AND EAST BY REMAINING PORTIONS OF BIG BEAR BLUFFS, LLC (2827, PG 587) REGISTERS OFFICE OF MAURY COUNTY, TENNESSEE (ROMCTN), AND IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

TO FIND THE TRUE POINT OF BEGINNING, COMMENCE AT AN 1 INCH IRON PIPE FOUND IN THE SOUTHERN ROW OF BEAR CREEK PIKE, SAID POINT ALSO BEING THE NORTHWEST BOUNDARY OF ROCK 'N' ROLL JESUS, LLC (BK R2727, PG 1242) AND HAVING A TENNESSEE STATE PLANE COORDINATE OF NORTH 475,793.95 EAST 1,672,944.21;

THENCE, WITH THE WEST BOUNDARY OF JESUS, THE FOLLOWING CALLS:

S 08°01'15" W, FOR A DISTANCE OF 269.51 FEET, TO AN IRON PIN FOUND;
S 21°32'47" E, FOR A DISTANCE OF 51.20 FEET TO A THE CENTER OF BEAR CREEK BEING THE SOUTHWEST CORNER OF ROCK N ROLL JESUS AND THE TRUE POINT OF BEGINNING;

THENCE, WITH THE SOUTH BOUNDARY OF ROCK 'N' ROLL JESUS, LLC, AMIT J. PATEL & HK BIG BEAR BLUFFS, LLC, AND ALSO BEING THE CENTER OF BEAR CREEK, N 85°53'31" E, 307.86 FEET TO A POINT;

THENCE, CREATING A NEW LINE WITH THIS ANNEXATION OF PROPERTY, THE FOLLOWING 2 CALLS:

S 05°15'54" W, 94.01 FEET TO THE BEGINNING OF A CURVE CONCAVE WESTERLY, SAID CURVE HAS A RADIUS OF 565.00 FEET;

SOUTHERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 38°33'55", AN ARC DISTANCE OF 380.30 FEET, CHORD BEARING S 24°32'52" W WITH A CHORD DISTANCE OF 373.16 FEET TO A POINT ALONG THE CENTER OF MCKAY BRANCH;

THENCE, ALONG MCKAY BRANCH, THE FOLLOWING 7 CALLS:

N 39°46'13" W, 73.31 FEET TO A POINT;

N 45°49'08" W, 65.41 FEET TO A POINT;

N 53°12'54" W, 86.37 FEET TO A POINT;

N 58°09'42" W, 42.46 FEET TO A POINT;

N 61°08'47" W, 61.78 FEET TO A POINT;

N 65°15'03" W, 74.45 FEET TO A POINT;

N 75°17'27" W, 201.23 FEET TO A POINT WHERE MCKAY BRANCH CREEK INTERSECTS WITH BEAR CREEK;

THENCE, ALONG BEAR CREEK, THE FOLLOWING 2 CALLS:

N 63°11'05" E, 159.96 FEET TO A POINT;

N 77°31'07" E, 234.79 FEET TO THE POINT OF BEGINNING CONTAINING 3.36 ACRES (146,345.13 SQ FT.) AND BEING A PORTION OF THE PROPERTY SHOWN ON TAX MAP 90 PARCEL 12.01 CONVEYED TO BIG BEAR BLUFFS, LLC BY DEED OF RECORD IN BOOK R2827, PAGE 287 IN THE REGISTER'S OFFICE OF MAURY COUNTY, TENNESSEE.



LOCATION MAP

0 500 1000 2000
GRAPHIC SCALE 1"=1,000'-0"

PROJECT INFORMATION:

PARCEL: PORTION OF MAP 90 PARCEL 12.01
ADDRESS: PORTION OF 400 BEAR CREEK PARKWAY

PROPOSED USE: NEIGHBORHOOD SERVING COMMERCIAL CONFORMING TO THE APPROVED CD-4 USES.

CONTACT:

APPLICANT/LANDSCAPE ARCHITECT:
GREG GAMBLE OR KELI FRYMIRE
GAMBLE DESIGN COLLABORATIVE
3020 STANSBERRY LANE, SUITE 201
FRANKLIN, TN 37069
615-975-5765
greg.gamble@gdc-tn.com
keli@gdc-tn.com

DEVELOPER:
KOLTER LAND
JIM HARVEY OR
JOSHUA GIBBS
615-582-3253
jgibbs@kolter.com

OWNER:
HK BIG BEAR BLUFFS LLC
JIM HARVEY

ANNEXATION AND REZONING REQUEST:

REQUEST TO ANNEX +/-3.36 ACRES AND REZONE TO CD-4
FUTURE LAND USE: SUBURBAN NEIGHBORHOOD

CONNECT COLUMBIA FINDINGS:
Annexation should provide for a continuation of orderly, planned development of the City. Lot sizes and development scale should be compatible with surrounding development. If proposed development abuts land that is undeveloped or has low density/intensity, the density and intensity of the proposed development should taper towards the periphery to provide compatibility of the development pattern. Land annexed into the City should follow the transect and Character Area Matrix to provide the most appropriate land uses and zoning for the newly annexed land.
Response: The proposed commercial parcel would be adjacent to CD-4C zoned properties on Bear Creek Parkway and would serve to provide neighborhood commercial and personal service options for the residents of the proposed Columbia Bluffs development. The parcels along Bear Creek Parkway are within an area of change. With the development along this corridor, residential development in close proximity to downtown and new commercial development along Tom Hitch Parkway is a logical progression of development pattern.

Suburban Neighborhood: Future development should emphasize connectivity and housing diversity. Additionally, new development should create a pedestrian-friendly environment by adding sidewalks and/or creating other pedestrian-friendly multiuse trail/bike routes linking current and future neighborhoods and major destinations such as libraries, neighborhood centers, health facilities, commercial clusters, parks, schools, or other such uses.
Response: The small commercial parcel will be a destination for nearby residents and is proposed along a new/proposed road into the Columbia Bluffs development. Sidewalk connections will link this commercial area to this residential development.

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

PORTION OF 400 BEAR CREEK PARKWAY ANNEXATION, REZONING REQUEST & CONCEPTUAL DEVELOPMENT PLAN

Columbia, Tennessee

GREGORY C. GAMBLE — TENNESSEE REGISTERED LANDSCAPE ARCHITECT — 340 — 10.12.23

Date: OCTOBER 16, 2023

Revision Date
△
△
△

CONCEPTUAL DEVELOPMENT PLAN

SHEET
L1.0

LEGAL DESCRIPTION
FOR ANNEXATION REQUEST – 3.36 ACRES
A PORTION OF MAP 90, PARCEL 12.01
DEED BOOK R2827, PAGE 587
HK BIG BEAR BLUFFS, LLC

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CITY OF COLUMBIA
TENNESSEE

DEVELOPMENT SERVICES

I, HK Big Bear Bluffs, LLC_being the sole ownership of the property__ more particularly described as 090 012.01; 090-16.00____ on Plat of Record in Plat Book **R2827** Page **576-586** in the Maury County Register of Deeds office, do hereby, formally, request that the City of Columbia, Tennessee annex such property into such City.

James P. Harvey
Print Name

11/10/2022
Date

Signature

STAFF USE ONLY	
Docket Number:	Requested Agenda:

CITY OF COLUMBIA TENNESSEE

DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)*
*Fold hard copy **submittals larger than 8½"x11"***

ADDRESS/LOCATION	400 Bear Creek Pike		
	TAX MAP: 90	GROUP:	PARCEL: 12.01
SUMMARY OF NATURE OF REQUEST AND WORK	Annexation request and CD4 Rezoning Request for a parcel of about 3 and a quarter acres between Bear Creek and McKay's Branch adjacent to and accessed from the main entry road of the Columbia Bluffs PUD-R property.		

DATE OF PRE-APPLICATION CONFERENCE	8/30/2023	*Pre-application meetings are scheduled for Wednesdays.*

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☒ Annexation ☒ Rezoning ☐ Preliminary Plat ☐ Final Plat ☐ PUD Preliminary Master Plan ☐ PUD Final Site Plan ☐ Multi-Family Site Plan ☐ Other: **File naming nomenclature examples:* *Freedom Point Site Plan* *Freedom Point Master Plan* *Freedom Point Final Plat*	**Annexations/Rezoning/PUD's:** ☐ Written Legal Description copy ☐ Requested Zone Listed ☐ Compliance with Comprehensive Plan ☐ Annexation Permission Form ☐ Plans and/or Plats conforming to City standards with check list completed ☐ Columbia Water System Availability Letter **Plats/PUDs:** ☐ Project Name (include Sections & Phases) Columbia Bluffs Annexation/Commercial CD4 Rezoning ☐ Total Number of Lots 1 non-residential lot ☐ Total acreage +/-3.27 acres

Rev. 4/14/2022

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	Greg Gamble - Gamble Design	PHONE	615-975-5765
ADDRESS	3020 Stansberry Lane, Suite 201, Franklin	EMAIL	info@gdc-tn.com

PROPERTY OWNER NAME	HK Big Bear Bluffs, LLC	PHONE	813-615-1244
ADDRESS	14025 Riveredge Dr. Ste 175 Tampa FL 33637	EMAIL	jgibbs@kolter.com

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

Greg Gamble		10/16/2023
APPLICANT NAME	APPLICANT SIGNATURE	DATE
HK Big Bear Bluffs LLC James P. Harvey		10/10/2023
PROPERTY OWNER NAME	PROPERTY OWNER SIGNATURE	DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	

DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS	
DATE OF PUBLIC NOTICES IN DAILY HERALD	

BOARD ACTION	

Proposed Zoning Text Amendment

Additions are Underlined
~~Deletions are Strikethrough~~

§ 8.5.19 (446 – 449) Rezoning

A. Applicability

This Section 8.15.9 is applicable to requests for a change in the District boundaries of property, including without limitation the District assignment of a particular piece of property, as depicted on the Official Zoning Map. Such a change is sometimes referred to as a Rezoning or a Zoning Map Amendment. Requests for amendment of the text or other content of this Ordinance (i.e., a Zoning Ordinance Amendment or a "zoning text amendment") are governed by Section 8.5.18.

B. General.

1. The City Council may, from time to time, amend the Official Zoning Map by changing the boundaries of districts whenever it is alleged that there was an error in the Official Zoning Map or whenever the public necessity, convenience, and general welfare require such amendment.
2. For additional requirements applicable to Rezonings to a Planned Unit Development, see Section 8.5.21.

C. Consistency & Coordination with Plans.

1. All petitions for Rezoning shall be consistent with the Comprehensive Plan and ~~any~~ applicable local plans. A petition for Rezoning shall not be approved by the City Council unless the Rezoning is consistent with and not in conflict with the Comprehensive Plan or applicable local plans, as determined by the Planning Commission (see Section 8.5.20). The Planning Commission is not obligated to recommend approval of requests which would bring existing zoning into

This language makes clear that the Planning Commission establishes the pace of implementation of the Future Land Use Map based on an analysis of "public necessity, convenience, and general welfare" as well as concurrency.

conformity with the Comprehensive Plan prior to the time such change is warranted by the findings of 8.5.19.H.4.e and f.

2. When required, an application for a Comprehensive Plan Amendment or other Land Use Plan Amendment may be submitted concurrently with an application for Rezoning. The decisions, however, shall be rendered with separate motions.

D. Initiation of Rezoning.

Rezonings may be initiated by the City Council, the Planning Commission, the Zoning Administrator, or by application by the owner of the property or an authorized agent of the owner.

E. Application for Rezoning.

1. An application for Rezoning shall be filed with the Zoning Administrator.
2. The Zoning Administrator, on receiving such application, shall transmit a copy thereof to the Planning Commission prior to any consideration of the proposed amendment by the City Council.

F. Application Requirements.

1. Rezonings ~~should~~ must correspond with the boundary lines of existing platted Lots, Building Sites, or tracts, or~~.~~ ~~I~~if the boundaries of a Rezoning request stop short of an exterior property line, that portion of the property outside the proposed Rezoning boundary shall be capable of being subdivided in accordance with the ~~City~~ Subdivision Regulations and Developed in accordance with the requirements of this Ordinance.

Prevents the creation of split—zoned properties and avoids ambiguities of entitlements.

2. All requirements of this Ordinance shall be met within the boundaries of the area being Rezoned. If all of the requirements cannot be met on the property proposed to be Rezoned, the Rezoning shall be expanded to include necessary property being used to meet such requirements.

3. As applicable, a ~~Sketch Development~~concept p~~P~~lan meeting the minimum requirements ~~of Section 8.5.6.G~~established by the Zoning Administrator or a Master PUD Development Plan meeting the requirements of Section 8.5.21 shall be provided as part of a Rezoning application that proposes assignment of land to any of the available types of PUD District. Without limitation to the foregoing, no proposal for Rezoning shall be approved unless and until ~~an application for~~ a ~~Sketch Development~~concept ~~P~~plan or a Master PUD Development Plan, as applicable, shall have been ~~approved~~ reviewed~~and or certified, as applicable,~~ pursuant to Section ~~8.5.6.G~~ 8.3.7 and Section 8.5.4 or as applicable, Section 8.5.21.

Makes clear that the concept plan is not a Site Development Plan and does not create any vested rights for a plan of development. Directs the Zoning Administrator to establish minimum requirements for rezoning and to present rezoning requests to the Development Review Committee.

G. Hearing Schedule.

1. The petition for Rezoning shall be placed on the agenda of the next available Planning Commission meeting.

H. Planning Commission Action.

1. Notice requirements shall be met as described in Section 8.5.4.D.
2. The Planning Commission shall make its recommendation within 30 days of its initial public hearing. The time period for a recommendation may be

altered, as in the case of significant modifications, in which case one additional 30-day period shall be granted before the case shall go to the City Council.

3. When a recommendation is not rendered within the time periods established in this section, the City Council may process the request without a Planning Commission recommendation.
4. The Planning Commission in its review and recommendation, shall make specific findings with regard to the following grounds for an amendment and shall note the same in the official record as follows:

    a. The Rezoning is consistent ~~and not in conflict~~ with the Comprehensive Plan ~~or~~ and other applicable approved local plans for the area, provided the Planning Commission is not obligated to recommend approval of requests which would bring existing zoning into conformity with the Comprehensive Plan prior to the time such change is warranted by the findings of 8.5.19.H.4.e and f;

    b. It has been determined that the legal purposes for which zoning exists, as set forth in Section 1.5;

    c. It has been determined that there will be no adverse effect upon Adjoining property owners unless such effect can be justified by the overwhelming public good or welfare;

    d. It has been determined that no one property owner or small group of property owners will

Reiterates that the Planning Commission establishes the pace of implementation of the Future Land Use Map based on an analysis of "public necessity, convenience, and general welfare" as well as concurrency.

benefit materially from the change to the detriment of the general public;

e. It has been determined that conditions affecting the area have changed to a sufficient degree to warrant the Zoning Map Amendment or that the existing zoning of the property was the result of a mistake.

f. It has been determined that adequate school, road, parks, wastewater treatment, water supply, and stormwater drainage facilities are available.

~~**I. Initial Reading before City Council**.~~

~~The City Council shall hold an initial reading of the petition for Rezoning prior to scheduling a public hearing.~~

J. Notice of Public Hearing.

Prior to approval, ~~A~~any request for Rezoning shall require a public hearing before the City Council, ~~. After the initial reading before the City Council, the petition~~ which shall be placed on the agenda of the next available City Council meeting. ~~and n~~Notification of a public hearing shall be performed as follows:

1. Notice of the Rezoning shall be published in accordance with Section 8.5.4.D.2.
2. This notice shall specify the property by the best means possible and proposed zoning classification of the property under consideration.
3. Except in cases of a newly annexed property receiving initial zoning, the City shall post signs on

It is the practice of the Zoning Administrator to post signs even when not required to do so by 8.5.4.D.3.

the property indicating the action requested in accordance with Section 8.5.4.D.3.

4. Initial zoning of properties newly annexed into the City shall not require the posting of a sign.
5. Notice of the Rezoning shall be mailed in accordance with Section 8.5.4.D.3.
6. This notice shall specify the street address, current and proposed zoning classification, and it shall contain a graphic illustration of the area.

K. **Initial Consideration by City Council**.

The City Council shall hold an initial consideration of the petition for Rezoning after conducting a public hearing. The request must receive an affirmative vote upon first consideration in order to proceed to second consideration.

~~K.~~**L. City Council Action.**

1. Notice requirements shall be met.
2. The City Council shall consider any recommendations by the Planning Commission in rendering its decision.
3. The City Council may approve the request, deny the request, or send the request back to the Planning Commission for additional consideration.
4. The City Council may approve the request at a less intensive classification than requested with consent of the applicant.
5. Including the initial consideration before City Council mentioned above, affirmative votes on two considerations before the City Council shall be required ~~prior to any decision on~~ for the petition to be approved. If the Planning Commission

These changes remove ambiguities about the rezoning review process and mirror the provisions of Article 4 of the City Charter and Section 13-7-204 of the Tennessee Code.

recommended denial of the request, the petition must receive a favorable vote of a majority of the entire membership of the City Council to be approved.

6. The City Council in its deliberation and decision shall make specific findings with regard to the following grounds for a Rezoning and shall note the same in the official record as follows:
    a. The Rezoning is ~~in agreement~~consistent with the Comprehensive Plan and any applicable local area plans;
    b. It has been determined that the legal purposes for which zoning exists are not contravened; and
    c. It has been determined that there will be no adverse effect upon Adjoining property owners unless such effect can be justified by the overwhelming public good or welfare.

Proposed Zoning Text Amendment

Additions are Underlined
~~Deletions are Strikethrough~~

§ 9.3 (p. 484) Defined Terms

Comprehensive Plan: The general plan of the City of Columbia as adopted according to T.C.A. § 13-4-201 through 203, also referred to as Connect Columbia. The Comprehensive Plan includes all text and maps of Connect Columbia as well as any ancillary special area plans .

§ 9.3 (p. 496) Defined Terms

Future Land Use Character Area: The general classification of land identified in the future land use element of Connect Columbia, the comprehensive plan. The comprehensive plan indicates the community's preference for general land use categories and desirable intensity of development corresponding to each future land use character area. Connect Columbia also describes the typical aesthetic and material qualities which provide distinctive character to each area. Each future land use character area corresponds to one or more Character Areas or Special Districts as provided in Article 3. The use, bulk, and design standards of this ordinance, when applied to specific properties, implement the general future land use character area designations. The Planning Commission shall determine the pace of implementation through the process of zoning map amendments (rezoning) described in Article 8.

Proposed Zoning Text Amendment

Additions are Underlined
~~Deletions are Strikethrough~~

TABLE 3.7.1 District Descriptions (p. 36 – 39)

Districts
CD-2 (Rural)
The CD-2 Rural Character District consists of large-lot semi-rural estates, open spaces, and legacy agricultural operations~~sparsely settled, primarily agricultural or~~ in low density single-family detached Residential areas. ~~Typical buildings include farmhouses and agricultural buildings.~~ CD-2 is an appropriate District for the Rural ~~Countryside~~ Transition and Hillsides & Natural Spaces future land use Character Areas described in the Comprehensive Plan.
CD-3L (Neighborhood-Large Lot)
The CD-3L Neighborhood Large Lot Character District consists of primarily a low density single-family detached Residential area in which ~~Estate Houses and~~ House~~s~~ ~~are~~ is the predominant Building Types. It has large lots, medium to deep front Setbacks and medium to wide side Setbacks. Its Thoroughfares and Internal Drives have curbs and may include Sidewalks and/or street trees, and form medium to large blocks. CD-3L is an appropriate District for the ~~Suburban Neighborhood~~ Suburban Neighborhoods future land use Character Area described in the Comprehensive Plan.

These changes to the district descriptions correspond to the 2023 update of Connect Columbia, the Comprehensive Plan.

Proposed Zoning Text Amendment

Additions are Underlined
~~Deletions are Strikethrough~~

CD-3 (Neighborhood)

The CD-3 Neighborhood District consists of primarily a low density single-family detached Residential area in which ~~Cottages and~~ Houses are the predominant Building Types. It has medium to deep front Setbacks and medium to wide side Setbacks. Its Thoroughfares and Internal Drives have curbs and may include Sidewalks and/or street streets, and form medium to large blocks. CD-3 is an appropriate District for the Suburban Neighborhoods and Future Land Use Character Area, ~~the Tom Hitch Special Area, and the Bear Creek Pike "Node" Special Area~~ described in the Comprehensive Plan; it is also be appropriate for the City Center Urban Village Future Land Use Character Area where the Planning Commission determines that it is compatible with the established land use pattern in the surrounding area .

CD-3 is most appropriate for the Suburban Neighborhoods FLU Character Area; however, the Planning Commission may determine that it is appropriate within the City Center Urban Village FLU Character Area where compatible with established land use pattern.

CD-4 (General Urban)

The CD-4 General Urban Character District consists of a medium density area that has a mix of Building Types and primarily Residential, Retail / Personal Service / Artisan, Office, Lodging and Civic Uses; there are medium, narrow or no front Setbacks and narrow to medium side Setbacks; it has variable private landscaping; and it has Thoroughfares and Internal Drives with curbs, Sidewalks and trees that define medium-sized blocks. CD-4 is an appropriate District for the City Center Urban Village Future Land Use~~Urban Neighborhood Character Area, the Employment~~ Character Area~~, the Tom Hitch Special Area, the Industrial Road Special Area, the Bear Creek Pike "Node" Special Area, and the Interstate Gateway Special Area as~~ described in the Comprehensive Plan.

CD-4C (General Urban-Corridor)

The CD-4C General Urban - Corridor Character District consists of a medium density area along a corridor. It provides for a balanced automobile- and pedestrian- oriented built environment and a mix of Building Types and primarily Residential, Retail / Personal Service / Artisan, Office, Lodging and Civic Uses; there are ~~medium, narrow or no front Setbacks and narrow to medium side~~variable Setbacks; it has variable private landscaping; and it has Thoroughfares and Internal Drives with curbs, Sidewalks and trees that define medium-sized blocks. CD-4C is an appropriate District for parcels identified as Facilitate or Activate on the Areas of Change map of the Comprehensive Plan, which have access onto a public right-of-way classified as principal arterial or minor arterial in the Transportation element of the Plan and are located in the Suburban Neighborhoods and City Center Urban Village Future Land Use ~~Corridor~~ Character Area~~s~~, ~~the Employment Character Area, the Urban Corridor Character Area, the Tom Hitch Special Area, the Bear Creek Pike "Node" Special Area the Neapolis Special Area~~ described in the ~~Comprehensive~~ Plan.

The appropriateness of CD-4C will be determined by the Areas of Change policy and the functional classification of roadways.

CD-5 (Urban Center)

The CD-5 Urban Center Character District consists of medium to high~~er~~ density Mixed Use areas. It has a tight network of Thoroughfares and Internal Drives with side Sidewalks, street lights and regular tree spacing, defining medium-sized blocks. Buildings are set close to the Sidewalks. CD-5 is an appropriate District for the ~~Urban Neighborhood~~ City Center Urban Village Future Land Use Character Area, ~~the Center Character Area, the Inner Core~~

~~(Downtown) Special Area, and the Neapolis Special Area~~ described in the Comprehensive Plan.

CD-5C (Urban Center - Corridor)

The CD-5C is currently a "floating zone." No properties are currently zoned CD-5C.

The CD-5C Urban Center-Corridor Character District consists of higher density Mixed Use areas along a corridor. It provides for a balanced automobile- and pedestrian- oriented built environment, a mix of Building Types and primarily has a tight network of Thoroughfares and ~~Ilternal~~ Internal Drives with side Sidewalks, street lights and regular tree spacing, defining medium-sized blocks. Buildings are set close to the Sidewalks. CD-5C is limited to parcels identified as Activate on the Areas of Change map of the Comprehensive Plan which have access to a Principal Arterial identified in the Transportation Plan~~an appropriate District for the Urban Corridor Character Area, the South Central (James Campbell) Special Area, and the Neapolis Special Area~~ located in the City Center Urban Village Character Area described in the Comprehensive Plan.

Corrects a scrivener's error in the text.

SD-MHP (Manufactured Home Park)

This District is designed to provide suitable areas for Manufactured Home Parks where sufficient urban facilities are available prior to Development. Manufactured Homes and Buildings necessary to support the Residential occupancy of Manufactured Homes are permitted. This District is intended also to permit community facilities and public utility installations that are necessary to service specifically the residents of this District, or which are benefited by and compatible with a Residential environment. SD-MHP is appropriate for the Suburban Neighborhoods future land use character area described in the Comprehensive Plan.

SD-INT (Interstate)

This District is designed to provide space along I-65 to serve the needs of the motoring public. Automobile and other vehicular service establishments, transient sleeping accommodations, and eating and drinking establishments primarily characterize this District. Appropriate locations for this District are along I-65 in an environment of general Commercial and Mixed Use activity. Due to the high traffic volumes and general incompatibility between some of the Uses permitted within this District and those in CD-3L and CD-3 areas, this District shall not be located in or Adjacent to a CD-3L or CD-3 District. The SD- INT Special District is an appropriate District for the Technology Employment Center future land use Character Area ~~Interstate Gateway Special Area~~ described in the Comprehensive Plan. SD-INT is limited to parcels within 3,960 feet of an Interstate, Freeway, or other limited access highway identified in the Transportation element of the Plan.

SD-LI (Light Industrial)

This District is intended to provide space for a wide range of wholesale trade, warehousing of a wide variety of products or materials, manufacturing processes, and industrial and related uses that conform to a high level of performance criteria and have few objectionable characteristics. All operations must be carried on within completely enclosed Buildings, thus providing a standard of Development that removes most adverse characteristics that affect neighboring properties. This District may provide a buffer between other Districts and other industrial activities that have more objectionable influences. This District may require types of Structures and have Uses and other characteristics that cannot be

facilitated in other Districts. New Residential Development, Commercial establishments, Retail establishments, personal service Uses, and community facilities and utilities, are permitted, as well as additional Uses that provide needed complementary services or are necessary for the general community welfare. SD-LI is an appropriate District for Technology Employment Center future land use Character Area ~~portions of the Industrial Road Special Area~~ described in the Comprehensive Plan.

SD-HI (Heavy Industrial)

This District is intended to provide suitable areas for intense or potentially noxious Industrial operations, including open land operations. It is specifically intended that all newly created Districts be so located and Buffered as to prevent possible negative impact upon Adjacent land and Uses. SD-HI is an appropriate District for Technology Employment Center future land use Character Area ~~portions of the Industrial Road Special Area~~ described in the Comprehensive Plan.

PUD-R (Residential)

This District ~~is to allow for~~permits utilization of the Planned Unit Development process under ~~TSA~~ TCA Section 13-4-310, implementation of the Comprehensive Plan, and review and approval of a Master PUD Development Plan that complies with these standards and establishes them and other standards as entitlements for a property, including a customized combination of permitted Uses, Building Types, Private Frontage Types, Setbacks and Yards, and Thoroughfares and Internal Drives.

Scriveners errors misidentify TCA (Tennessee Code Annotated) at ten locations in the Ordinance. Two of them are corrected here. The others will be addressed in later updates to the Zoning Ordinance.

Specifically, this District is intended for predominantly Residential areas on sites ~~where there are~~with sufficient existing infrastructure, services, and utilities available for a proposed Development. Development in this District (a) is walkable and provides a diverse mixture of housing choices and Building Types, (b) is necessary to implement and is consistent with the Comprehensive Plan, (c) cannot under any circumstances, plan, or design conform to one or more of the other Districts and standards therefor due to its necessary and intrinsic Uses or size or form, (d) provides an innovative plan and design, (e) is harmonious with and respects the land use, character, and natural or man-made features of both the subject property and Adjacent property, (f) promotes quality and environmentally sensitive planning and design by taking advantage of special site characteristics, locations and land uses, (g) provides Civic Space, (h) is the best use of the site consistent with the goals of protecting and enhancing the natural environment. There are specific Development standards provided for this District, which may be supplemented by additional standards approved as part of the applicable Final Master PUD Development Plan. The Planning Commission may determine that a specific PUD-R Master Plan is consistent with the future land use map of the Comprehensive Plan.

PUD-MU (Mixed Use)

This District ~~is to allow for~~ permits utilization of the Planned Unit Development process under ~~TSA~~ TCA Section 13-4-310, implementation of the Comprehensive Plan, and review and approval of a Master PUD Development Plan that complies with these standards and establishes them and other standards as entitlements for a property, including a customized combination of

permitted Uses, Building Types, Private Frontage Types, Setbacks and Yards, and Thoroughfares and Internal Drives.

Specifically, this District is intended for Commercial, Office, Mixed Use, and Multifamily Uses on sites ~~where there are~~with sufficient existing infrastructure, services, and utilities available for a proposed Development. Development in this District (a) is walkable and provides a diverse mixture of housing choices and Building Types, (b) is necessary to implement and is consistent with the Comprehensive Plan, (c) cannot under any circumstances, plan, or design conform to one or more of the other Districts and standards therefor due to its necessary and intrinsic Uses or size or form, (d) provides an innovative plan and design, (e) is harmonious with and respects the land use, character, and natural or man-made features of both the subject property and Adjacent property, (f) promotes quality and environmentally sensitive planning and design by taking advantage of special site characteristics, locations and land uses, (g) provides Civic Space, (h) is the best use of the site consistent with the goals of protecting and enhancing the natural environment. There are specific Development standards provided for this District, which may be supplemented by additional standards approved as part of the applicable Final Master PUD Development Plan. The Planning Commission may determine that a specific PUD-MU Master Plan is consistent with the future land use map of the Comprehensive Plan.

PUD-RES

PUD-C

PUD-OP

PUD-VC

Proposed Zoning Text Amendment

Additions are Underlined
~~Deletions are Strikethrough~~

PUD-I		
PUD-B1	Per applicable approved Master PUD Development Plan	
PUD-B3		
PUD-CEG		
PUD-CRS		
PUD-GRS		
PUD-R1		
PUD-R2		
PUD-R6		
PUD-RM1		
PUD-RM2		
PUD-RS6		
PUD-RS10		

CV (Civic District)

Civic District (CV) is assigned to areas designated for Civic purposes. These may be Open Space of one or more Civic Space Types allowed within or Adjacent to any specific Character District or Special District, as well as sites dedicated to significant Buildings to be used for Civic purposes, such as City Halls, Post Offices, Libraries, Places of Assembly, Places of Worship, and community centers. This district is appropriate to all future land use Character Areas described in the Comprehensive Plan as determined by the Planning Commission.

Proposed Zoning Text Amendment

Additions are Underlined
~~Deletions are Strikethrough~~

TABLE 4.3.1-A District Standards (p. 46)

Rural Character District

The CD-2 Rural Character District consists of large-lot semi-rural estates, open spaces, and legacy agricultural operations~~sparsely settled, primarily agricultural or~~ in low density single-family detached Residential areas. ~~Typical buildings include farmhouses and agricultural buildings.~~ CD-2 is an appropriate District for the Rural ~~Countryside~~ Transition and Hillsides & Natural Spaces future land use Character Areas described in the Comprehensive Plan.

These changes to the district descriptions correspond to the 2023 update of Connect Columbia, the Comprehensive Plan.

TABLE 4.3.1-B District Standards (p. 56)

Neighborhood Large Lot Character District

The CD-3L Neighborhood Large Lot Character District consists of primarily a low density single-family detached Residential area in which House is the predominant Building Type. It has large Lot or Building Sites, medium to deep front Setbacks and medium to wide side Setbacks. Its Thoroughfares and Internal Drives have curbs and may include Sidewalks and/or street trees, and form medium to large blocks. CD-3L is an appropriate District for the Suburban Neighborhoods future land use~~Suburban Neighborhood~~ Character Area described in the Comprehensive Plan.

Proposed Zoning Text Amendment

Additions are Underlined
~~Deletions are Strikethrough~~

TABLE 4.3.1-C District Standards (p. 66)

Neighborhood Character District

The CD-3 Neighborhood District consists of primarily a medium density single-family detached Residential area in which House is the predominant Building Types. It has medium to deep front Setbacks and medium to wide side Setbacks. Its Thoroughfares have curbs and may include Sidewalks and/or street trees, and form medium to large blocks. CD-3 is an appropriate District for the Suburban Neighborhoods Future Land Use Character ~~Area, the Tom Hitch Special Area, and the Bear Creek Pike "Node" Special Area described~~Area described in the Comprehensive Plan; it is also be appropriate for the City Center Urban Village Future Land Use Character Area where the Planning Commission determines that it is compatible with the established land use pattern in the surrounding area .

TABLE 4.3.1-D District Standards (p. 76)

General Urban Character District

The CD-4 General Urban Character District consists of a medium density area that has a mix of Building Types and primarily Residential, Retail / Personal Service / Artisan, Office, Lodging and Civic Uses; there are medium, shallow or no front Setbacks and narrow to medium side Setbacks; it has variable private landscaping; and it has Thoroughfares and Internal Drives with curbs, Sidewalks and trees that define medium-sized blocks. CD-4 is an appropriate District for the City Center Urban Village Future Land Use ~~Urban Neighborhood~~ Character Area~~, the Employment Character Area, the Tom Hitch Special Area, the Industrial Road~~

~~Special Area, the Bear Creek Pike "Node" Special Area, and the Interstate Gateway Special Area as~~ described in the Comprehensive Plan.

TABLE 4.3.1-E District Standards (p. 86)

General Urban Corridor Character District

The CD-4C General Urban - Corridor Character District consists of a medium density area along a corridor. It provides for a balanced automobile- and pedestrian- oriented built environment and a mix of Building Types and primarily Residential, Retail / Personal Service / Artisan, Office, Lodging and Civic Uses; there are medium, narrow or no front Setbacks and narrow to medium side Setbacks; it has variable private landscaping; and it has Thoroughfares and Internal Drives with curbs, Sidewalks and trees that define medium-sized blocks. CD-4C is an appropriate District for parcels identified as Facilitate or Activate on the Areas of Change map of the Comprehensive Plan, which have access onto a public right-of-way classified as principal arterial or minor arterial in the Transportation element of the Plan and are located in ~~the~~ Suburban Neighborhoods and City Center Urban Village Future Land Use ~~Corridor~~ Character Areas~~, the Employment Character Area, the Urban Corridor Character Area, the Tom Hitch Special Area, the Bear Creek Pike "Node" Special Area the Neapolis Special Area~~ described in the Comprehensive Plan.

Proposed Zoning Text Amendment

Additions are Underlined
~~Deletions are Strikethrough~~

TABLE 4.3.1-F District Standards (p. 66)

Urban Center Character District

The CD-5 Urban Center Character District consists of medium to high~~er~~ density Mixed Use areas. It has a tight network of Thoroughfares and Internal Drives with Sidewalks, street lights and regular tree spacing, defining medium-sized blocks. Buildings are set close to the Sidewalks. CD-5 is an appropriate District for the City Center Urban Village Future Land Use ~~Urban Neighborhood~~ Character Area~~, the Center Character Area, the Inner Core (Downtown) Special Area, and the Neapolis Special Area~~ described in the Comprehensive Plan.

TABLE 4.3.1-G District Standards (p. 106)

Urban Center Corridor Character District

The CD-5C Urban Center-Corridor Character District consists of higher density Mixed Use areas. It provides for a balanced automobile- and pedestrian- oriented built environment, a mix of Building Types and primarily has a tight network of Thoroughfares and Internal Drives with Sidewalks, street lights and regular tree spacing, defining medium-sized blocks. Buildings are set close to the Sidewalks. CD-5C is limited to parcels identified as Activate on the Areas of Change map of the Comprehensive Plan which have access to a Principal Arterial identified in the Transportation Plan ~~an appropriate District for the Urban Corridor Character Area, the South Central (James Campbell) Special Area, and the Neapolis Special Area~~ located in the City Center Urban Village Character Area described in the Comprehensive Plan.

Proposed Zoning Text Amendment

Additions are Underlined
~~Deletions are Strikethrough~~

TABLE 4.3.1-H District Standards (p. 116)

Manufactured Home Park Residential

Special District

This District is designed to provide suitable areas for Manufactured Home Parks where sufficient urban facilities are available prior to Development. Manufactured Homes and Buildings necessary to support the Residential occupancy of Manufactured Homes are permitted. This District is intended also to permit community facilities and public utility installations that are necessary to service specifically the residents of this District, or which are benefited by and compatible with a Residential environment. SD-MHP is appropriate for the Suburban Neighborhoods future land use character area described in the Comprehensive Plan.

Provides for SD-MHP to implement a future land use classification in the Plan.

TABLE 4.3.1-~~H~~ I District Standards (p. 124)

Interstate Service Special District

This District is designed to provide space along I-65 to serve the needs of the motoring public. Automobile and other vehicular service establishments, transient sleeping accommodations, and eating and drinking establishments primarily characterize this District. Appropriate locations for this District are along I-65 in an environment of general Commercial and Mixed Use activity. Due to the high traffic volumes and general incompatibility between some of the Uses permitted within this District and those in CD-3L and CD-3 areas, this District shall not be located in or Adjacent to a CD-3L or CD-3 District. The SDINT Special District is an appropriate District for the Technology Employment Center future land use

The table number was misidentified in the original for this and subsequent districts. Future text amendments will correct the cross-references.

Character Area ~~Interstate Gateway Special Area~~ described in the Comprehensive Plan. SD-INT is limited to parcels within 3,960 feet of an Interstate, Freeway, or other limited access highway identified in the Transportation element of the Plan.

TABLE 4.3.1-~~I~~J District Standards (p. 134)

Light Industrial Special District

This District is intended to provide space for a wide range of wholesale trade, warehousing of a wide variety of products or materials, manufacturing processes, and industrial and related uses that conform to a high level of performance criteria and have few objectionable characteristics. All operations must be carried on within completely enclosed Buildings, thus providing a standard of Development that removes most adverse characteristics that affect neighboring properties. This District may provide a buffer between other Districts and other industrial activities that have more objectionable influences. This District may require types of Structures and have Uses and other characteristics that cannot be facilitated in other Districts. New Residential Development, Commercial establishments, Retail establishments, personal service Uses, and community facilities and utilities, are permitted, as well as additional Uses that provide needed complementary services or are necessary for the general community welfare. SD-LI is an appropriate District for Technology Employment Center future land use Character Area described in the Comprehensive Plan.

Proposed Zoning Text Amendment

Additions are Underlined
~~Deletions are Strikethrough~~

TABLE 4.3.1-~~J~~ K District Standards (p. 146)

Heavy Industrial Special District

This District is intended to provide suitable areas for intense or potentially noxious Industrial operations, including open land operations. It is specifically intended that all newly created Districts be so located and Buffered as to prevent possible negative impact upon Adjacent land and Uses. SD-HI is an appropriate District for Technology Employment Center future land use Character Area described in the Comprehensive Plan.

TABLE 4.3.1-~~K~~ L District Standards (p. 156)

Planned Unit Development Residential District

This District ~~is to allow for~~permits utilization of the Planned Unit Development process under TCA Section 13-4-310, implementation of the Comprehensive Plan, and review and approval of a Master PUD Development Plan that complies with these standards and establishes them and other standards as entitlements for a property, including a customized combination of permitted Uses, Building Types, Private Frontage Types, Setbacks and Yards, and Thoroughfares and Internal Drives. Specifically, this District is intended for predominantly Residential areas on sites ~~where there are~~with sufficient existing infrastructure, services, and utilities available for a proposed Development. Development in this District (a) is walkable and provides a diverse mixture of housing choices and Building Types, (b) is necessary to implement and is consistent with the Comprehensive Plan, (c) cannot under any circumstances, plan, or design conform to one or more of the other Districts and standards therefor due to its necessary and intrinsic

Uses or size or form, (d) provides an innovative plan and design, (e) is harmonious with and respects the land use, character, and natural or man-made features of both the subject property and Adjacent property, (f) promotes quality and environmentally sensitive planning and design by taking advantage of special site characteristics, locations and land uses, (g) provides Civic Space, (h) is the best use of the site consistent with the goals of protecting and enhancing the natural environment. There are specific Development standards provided for this District, which may be supplemented by additional standards approved in the applicable Final Master PUD Development Plan. The Planning Commission may determine that a specific PUD-R Master Plan is consistent with the future land use map of the Comprehensive Plan.

TABLE 4.3.1-~~L~~ M District Standards (p. 168)

Planned Unit Development - Mixed Use

This District ~~is to~~ allows ~~for~~ utilization of the Planned Unit Development process under TCA Section 13-4-310, implementation of the Comprehensive Plan, and review and approval of a Master PUD Development Plan that complies with these standards and establishes them and other standards as entitlements for a property, including a customized combination of permitted Uses, Building Types, Private Frontage Types, Setbacks and Yards, and Thoroughfares and Internal Drives. Specifically, this District is intended for Commercial, Office, Mixed Use, and Multifamily Uses on sites ~~where there are~~with sufficient existing infrastructure, services, and utilities available for a proposed Development. Development in this District (a) is walkable and provides a diverse mixture of housing choices and Building Types, (b) is necessary to implement and is

consistent with the Comprehensive Plan, (c) cannot under any circumstances, plan, or design conform to one or more of the other Districts and standards therefor due to its necessary and intrinsic Uses or size or form, (d) provides an innovative plan and design, (e) is harmonious with and respects the land use, character, and natural or man-made features of both the subject property and Adjacent property, (f) promotes quality and environmentally sensitive planning and design by taking advantage of special site characteristics, locations and land uses, (g) provides Civic Space, (h) is the best use of the site consistent with the goals of protecting and enhancing the natural environment. There are specific Development standards provided for this District, which may be supplemented by additional standards approved in the applicable Final Master PUD Development Plan. The Planning Commission may determine that a specific PUD-MU Master Plan is consistent with the future land use map of the Comprehensive Plan.

The Ordinance reserves eight sub-tables for previous PUDs. Section 3.7.1 lists elven PUD types approved under previous ordinances. Table 3.7.1 lists seventeen. Regardless of the number, it is unnecessary to reserve more than one sub-table for the note indicating that approved PUD Master Plans regulate existing PUDs.

TABLE 4.3.1-~~M~~ N ~~- TABLE 4.3.1-T~~ (p. 179)

OTHER PUD DISTRICTS FROM PREVIOUS ORDINANCES TO BE REGULATED BY THEIR PUD APPROVALS.

TABLE 4.3.1-~~U~~ O District Standards (p. 180)

Civic District

Civic District (CV) is assigned to areas designated for Civic purposes. These may be one or more Civic Space Types allowed within or Adjacent to any specific Character District or Special District, as well as sites dedicated to significant Buildings to be used for Civic purposes, such as City Halls, Post Offices, Libraries, Places of Assembly, Places of Worship, and community

centers. This district is appropriate to all future land use Character Areas described in the Comprehensive Plan as determined by the Planning Commission.

CITY OF COLUMBIA TENNESSEE

DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
FAX: (931) 560-1541

PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)*
Fold hard copy submittals larger than 8½"x11"

ADDRESS/LOCATION	Citywide		
	TAX MAP: N/A	GROUP: N/A	PARCEL: N/A
SUMMARY OF NATURE OF REQUEST AND WORK	Amendments to the text of the Zoning Ordinance at § 8.3.6 and § 8.5.15 Tables 3.7.1 (District Descriptions) and 4.3.1 (District Standards), §9.3 (definitions)., and §8.5.19.		

DATE OF PRE-APPLICATION CONFERENCE	N/A	*Pre-application meetings are scheduled for Wednesdays.*

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
❑ Annexation ❑ Rezoning ❑ Preliminary Plat ❑ Final Plat ❑ PUD Preliminary Master Plan ❑ PUD Final Site Plan ❑ Multi-Family Site Plan ❑ Other: Zoning Text Amendment **File naming nomenclature examples:* *Freedom Point Site Plan* *Freedom Point Master Plan* *Freedom Point Final Plat*	**Annexations/Rezoning/PUD's:** ❑ Written Legal Description copy ❑ Requested Zone Listed ❑ Compliance with Comprehensive Plan ❑ Annexation Permission Form ❑ Plans and/or Plats conforming to City standards with check list completed ❑ Columbia Water System Availability Letter **Plats/PUDs:** ❑ Project Name (include Sections & Phases) N/A ❑ Total Number of Lots N/A ❑ Total acreage N/A

Rev. 4/14/2022

Applications and all required submittals must be filed with the Department of Development Services prior to the established deadline. Both the applicant and property owner (if different from applicant) must sign the application.

Any requests to defer or move the item to future meetings dates must be requested by the resubmittal date listed on the Planning Commission schedule.

APPLICANT

All communications go to the Applicant's email that is provided.

NAME	Kevin McCarthy, AICP	PHONE	931-560-1560
ADDRESS	700 N Garden, St, Columbia TN 38401	EMAIL	kmccarthy@columbiatn.com

PROPERTY OWNER NAME	N/A	PHONE	N/A
ADDRESS	N/A	EMAIL	N/A

In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

Kevin c. McCarthy, AICP		11/20/2023
APPLICANT NAME	APPLICANT SIGNATURE	DATE
N/A	N/A	N/A
PROPERTY OWNER NAME	PROPERTY OWNER SIGNATURE	DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	

DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS	
DATE OF PUBLIC NOTICES IN DAILY HERALD	

BOARD ACTION	