CITY OF COLUMBIA
TENNESSEE

AGENDA

The Columbia Municipal Planning Commission will meet on Wednesday, April 10, 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

1. Request from WES Engineers & Surveyors for Final Plat approval with surety in the amount of $400,000 for Rutherford Subdivision Phase 1 consisting of 31 lots and dedication of right-of-way off Rutherford Lane.

Documents:

1. 24-0114_Final Plat_03-18-2024
2. 24-0114_Response to DRC Comments_03-18-2024
3. 24-0114_DRC Comments_03-12-2024
4. 24-0114_Development Agreement_02-19-2024
5. 24-0114_Application_02-19-2024

2. Request from Allison Corolla for Final Plat approval with surety in the amount of $120,000 for Summit at Carter's West Phase 1A consisting of nine lots off Cleburne and Fellowship Roads.

Documents:

1. 24-0009_Final Plat_02-19-2024
2. 24-0009_Development Agreement_02-19-2024
3. 24-0089_Stormwater Management Agreement_02-19-2024
4. 24-0009_Application_02-19-2024

III. Discussion Items

1. 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.
THIS ITEM WAS DEFERRED FROM A PREVIOUS AGENDA

Documents:

1. 23-0414_Public Comment_Richard Klein_04-04-2024
2. 23-0414_Applicant New Materials Provided at Meeting_03-13-2024
3. 23-0414_ Plan of Services_03-13-2024
4. 23-0414_Staff Mark Up Overlaying Revisions_03-13-2024
5. 23-0414_Staff Mark Up Grading Overlay Existing_03-13-2024
6. 23-0414_Park and Greenways Map_03-13-2024
7. 23-0414_ Applicant Adjusted Sanitary Illustration_03-08-2024
8. 23-0414_Updated_Architecture Review Pattern Book_03-08-2024
9. 23-0414_Water Availability Letter _03-08-2024
10. 23-0414_Deferral Request_02-12-2024
11. 23-0414 _Amenity Construction Phase_02-09-2024
12. 23-0414_Updated GeoTech Letter_02-09-2024
13. 23-0414_Geotech Final Report_02-09-2024
14. 23-0414_Geotech Appendices_02-09-2024
15. 23-0414_Wastewater Pump Station Comment_02-03-2024
16. 23-0414_Response to Comments_01-23-2024
17. 23-0414_January Revised PUD Master Plan_01-23-2024
18. 23-0414_Requested PUD Deviations_01-23-2024
19. 23-0414_PUD Justification Document_01-23-2024
20. 23-0414_DRC Comments_2024-01-10
21. 23-0414_Aerial of Traffic improvements_PDF_12-18-2023
22. 23-0414_December Revised PUD Master Plan_12-18-2023
23. 23-0414_PUD Justification Document_12-18-2023

24. 23-0414_Traffic Concurrence Letter_12-18-2024
25. 23-0414_Response to DRC Comments_12-18-2023
26. 23-0414_Supplemental DRC Review Lots and Throughfares_ 11-14-2023
27. 23-0414_DRC Comments_11-07-2023
28. 23-0414_Partial_DRC Comments_ 11-07-2023
29. 23-0414_Traffic Impact Study_10-16-2023
30. 23-0414_Civic Space Illustrations_10-16-2023
31. 23-0414_Active Adult HOA Draft_10-16-2023
32. 23-0414_Residential HOA Declaration Draft_10-16-2023
33. 23-0414_Electric Availability_10-16-2023
34. 23-0414_Sewer Availability_10-16-2023
35. 23-0414_Description of Proposed Project_10-16-2023
36. 23-0414_Legal Description_10-16-2023
37. 23-0414_PUD-R Checklist_10-16-2023
38. 23-0414_Preliminary PUD Master Plan_10-16-2023
39. 23-0414_Application_10-16-2023

2. Request from Greg Gamble for Annexation approval with a Plan of Services and zoning to CD-4C (General Urban Corridor Character District) for an approximate 3.27 acre portion of Tax Map 90 Parcel 12.01 located at 400 Bear Creek Pike.
THIS ITEM WAS DEFERRED FROM A PREVIOUS AGENDA

Documents:

1. 23-0421_400 Bear Creek Pike_Rezone_Staff Report_3-13-2024
2. 23-0421_ Plan of Services_03-13-2024
3. 23-0421_Revised Concept Plan_02-19-2024
4. 23-0421_Revised Application_02-19-2024
5. 23-0421_Response to DRC Comments_02-19-2024
6. 23-0421_Deferral Request_02-12-2024
7. 23-0421_Response to DRC Comments_01-23-2024
8. 23-0421_DRC Comments_01-09-2024
9. 23-0421_Concept Plan_10-16-2023
10. 23-0421_Legal Description_10-16-2023
11. 23-0421_Owner Permission Form_10-16-2024
12. 23-0421_Application_10-16-2023
13. 23-0421_FLU Map
14. 23-0421_Zone Map

3. Request from Josh Rowland for Annexation with Plan of Services, a Comprehensive Plan amendment from Rural Countryside to Suburban Neighborhoods and Zoning to CD-3 (Neighborhood Character District) for 57.26 acres at 1748, 1768, 1770 and 1774 Bear Creek Pike, being Tax Map 72 Parcels 54, 54.01 and 54.02.
THIS ITEM WAS DEFERRED FROM A PREVIOUS AGENDA

Documents:

1. Deferral Request 3-12-24
2. 24-0031_Staff Report_DRAFT_03-13-2024
3. 24-0031_Plan of Services_03-13-2024
4. 24-0031_Revised Concept_02-19-2024
5. 24-0031_Applicant Fire Access Illustration_02-19-2024
6. 24-0031_Applicant Sewer Illustration_02-19-2024
7. 24-0031_Response to DRC Comments_02-19-2024
8. 24-0031_DRC Comments_02-13-2024
9. 24-0031_Concept Plan_01-15-2024
10. 24-0031_Concept Plan Aerial_01-15-2024
11. 24-0031_Applicant FLU Map Illustration_01-15-2024
12. 24-0031_Applicant Zoning Map Illustration_01-15-2024
13. 24-0031_Water Availability__01-15-2024
14. 24-0031_Wastewater Availability_01-15-2024
15. 24-0031_Legal Description_01-15-2024
16. 24-0031_Permission Forms_01-15-2024
17. 24-0031_Application_01-15-2024
18. 24-0031_FLU Map
19. 24-0031_Zone Map

4. Request from Richard Woodson to Rezone property at 1209 Galloway Street from CD-3 (Neighborhood Character District) to CD-4 (General Urban Character District).

Documents:

1. 24-0096_Staff Report_DRAFT
2. 24-0096_Fire Marshal Letter_03-18-2024
3. 24-0096_Wastewater Availability__03-18-2024
4. 24-0096_Response to DRC Comments_03-18-2024
5. 24-0096_DRC Comments_03-12-2024
6. 24-0096_Concept Plan_02-19-2024
7. 24-0096_Legal Description_02-19-2024
8. 24-0096_Application_02-19-2024

5. Request from Richard Woodson to Rezone property at 815 Woodside Street from CD-3 (Neighborhood Character District) to CD-4 (General Urban Character District).

Documents:

1. 24-0095_Staff Report_Draft
2. 24-0095_Fire Marshal Letter_03-18-2024
3. 24-0095_Wastewater Availability_03-18-2024
4. 24-0095_Response to DRC Comments_03-18-2024
5. 24-0095_DRC Comments_03-12-2024
6. 24-0095_ Concept Plan_02-19-2024
7. 24-0095 Wilkes Street Warranty Deed_02-19-2024
8. 24-0095_Application_02-19-2024

6. Request from Ben Beasley to amend a previously approved Preliminary Plat of Hampshire Hills subdivision consisting of 43 lots at Tax Map 89P Group A Parcel 15. The prior approval included 42 lots and is vested under Ordinance 3638, the previous zoning ordinance.

Documents:

1. 24-0094_Staff Report_DRAFT
2. 24-0094_Revised Preliminary Plat_3-20-2024_03-18-2024
3. 24-0094_Checklist_03-18-2024
4. 24-0094_Response to DRC Comments_03-18-2024
5. 24-0094_DRC Comments_03-12-2024
6. 24-0094_Application_02-19-2024
7. 24-0094_Preliminary Plat_02-19-2024

7. Request from TKC Architecture & Engineering LLC for Rezoning of property from PUD-R (Residential Planned Unit Development) to CD-3L (Neighborhood Large Lot Character District) of approximately 57.5 acres at Tax Map 75 Parcel 11.17 off Baker Road.

Documents:

1. 24-0033_Response to Comments_03-18-2024
2. 24-0033_Revised_Concept Plan_03-18-2024
3. 24-0033_DRC Comments_03-12-2024
4. 24-0033_Application_02-19-2024
5. 24-0033_Submittal Letter_02-19-2024
6. 24-0033_Concept Plan_02-19-2024
7. 24-0033_Property Owner Permission Form
8. 24-0033_Survey_02-19-2024
9. 24-0033_Legal Description_02-19-2024
10. 24-0033__Water Availability Letter__02-19-2024

11. 24-0033__Wastewater Availability Letter_02-19-2024
12. 24-0033__Electric Availability_02-19-2024
13. 24-0033_Zonemap
14. 24-0033_FLU Map

IV. Other Business

1. Updates from Planning Staff

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.

Organization

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

Chairman Charlie Goatz called the March Planning Commission Meeting for the City of Columbia to order at 4:00 p.m.
The meeting was held in Council Chambers at City Hall.

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

Chairman Charlie Goatz called for a verbal roll call. The quorum was established and included the following: Planning Commission Chairman Charlie Goatz; Planning Commission Member Councilman Danny Coleman; Planning Commission Member Dr. Christa Martin; Planning Commission Member Mayor Chaz Molder; Planning Commission Member James Shannon; Planning Commission member James Sloan.
Absent Was: Planning Commission Member Ray Pace.
Other Attendes: Mr. Robert Archibald, Planner II; Mr. Austin Brass, Assistant City Planner; Mr. Glenn Harper, City Engineer; Mr. Paul Keltner, Director of Development Services; Mr. Kevin McCarthy, City Planner; Mrs. Sandra Richardson, Secretary; Mrs. Melissa Sanders, Planner I; Mr. Tim Tisher, City Attorney, 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 order 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 shared the updated status of the Planning items that were forwarded to City Council.

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

Councilman Coleman moved to approve the February minutes, and Dr. Martin seconded the motion. The minutes were approved six to zero.

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

City Engineer Glenn Harper stated all letters of credit are in order.

Consent

Mr. Goatz moved to approve both consent items subject to technical comments, with Councilman Coleman seconding. The motion to approve passed six to zero.

Item II.1. - **Request from TKC Architecture and Engineering LLC for Final Plat approval with surety in the amount of $203,000 for a revision to Open Space in Bear Creek Overlook Phase 1 off Merkel Road.**

Item II.2. - **Request from Allen O'Leary for Final Plat approval with surety in the amount of $1,190,000 (Phases 1 and 2) for The Preserve at Drumwright Phase 1 consisting of 68 lots off Williams Ridge Drive.**

Discussion Items

Item III.1. - **Request from Abigail Overstreet for Final Plat approval with surety in the amount of $645,000 for Hillcrest Village Subdivision Phase 1A consisting of 27 lots and three open spaces off Rolling Brook Drive at Tax Map 113 Parcel 80.50.**

Mr. Brass gave the details of the staff report. This final plat does correspond with the construction plans that are on file. The condition on this request is from Wastewater. They noted that there is a pump station that is required. Mr. Dave Cummins of MI Homes was present to answer questions. The discussion included issuance at CO, or issuance at permit, and staff recommendation will be issuance at permit. Mr. Cummins stated that they have been having discussions with Columbia Wastewater and staff since last summer in reference to the pump station. He requested that it be conditioned as written per the staff report. He asked if it would stay as is. Mr. Goatz stated you would rather it stay with CO rather than a building permit. Mr. Cummins stated yes. Further discussion included this is the first part of the project, there have been no sales conducted already, risks, the pump station is on order, and looking at the requirements. Mr. Goatz stated if he was to make a motion it would be to approve subject to staff comments, and no building permits issued until the pump station is up and functioning, and wastewater consulted, and subject to any other technical comments. Councilman Coleman asked if he made a motion. Mr. Goatz stated yes, subject to that, and Councilman Coleman seconded the motion. Additional discussion included experiencing delays in getting equipment with all the fallout from the pandemic, this is a strain, model home, permit, pulling a few specs, model permit, the delays, pump and generator, materials, proof of orders, discussions, timeline of July anticipating getting parts. Mr. Goatz stated that he will stick to his motion to approve subject to staff's request, approve subject to no permits issued until the sewer pump station is up, functioning, and accepted by Wastewater, along with any other technical comment. Councilman Coleman withdrew his second, and Mr. Shannon seconded. The motion to approve subject to technical comments passed with a vote of four to two, with Councilman Coleman, and Mayor Molder voting nay.

Item III.2. - **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.
THIS ITEM WAS DEFERRED FROM A PREVIOUS AGENDA

Mr. McCarthy, and Mr. Austin Brass gave the details of the staff report. Mr. Greg Gamble with Gamble Design Collaborative, and Mr. Ty Hasty, Consultant were present to answer questions. Mr. Ted Headlee expressed concerns about this project being annexed to the City, and the different effects. Mr. Scott Prins, 749 Mt. Olivet Road, had six copies to be handed out to the Commission from Bonita Oliver. He had concerns about traffic, and infrastructure. Mr. Jerry Strahan, District 1 County Commissioner, 234 Patterson Drive, thanked everyone for their hard work and expressed a desire for controlled growth, and looking at the big picture. William Kramb 960 Mt. Olivet Road, expressed concerns about more traffic, and having the infrastructure. Mr. Wayne Jones, 719 Mt. Olivet Road, had concerns about traffic and growth. Mrs. Tina Seago, 236 Bear Creek Pike, read section 6.2 of the Zoning Ordinance and shared concerns. Mr. Samuel Whatley, 319 West 8th Street, expressed concerns about transportation, traffic, water, getting an expert analysis, and focusing on things that are more priority. Libby Seago 236 Bear Creek Pike, read an email from her sister with concerns about growth, congestion, and overcrowding of schools. Dr. Mark Seago, 236 Bear Creek Pike expressed a desire for clarity of the previous language, the comp plan, and designations. He quoted from the previous comprehensive plan. Mr. Gabe Howard, District 8 County Commissioner Crawford Hollow Road, stated that he is representing the people, and this change is something that the people don't want. He discussed not having enough water, the infrastructure, and schools. Mr. Philip Davis, 2148 Double Branch, shared concerns with run off, increasing the water level, electricity assessment, and infrastructure. Kevon Sabor, Williams Ridge Drive, expressed concerns about water supply issues, public infrastructure taking longer to repair, density, and honoring the comprehensive plan. Mr. Greg Gamble presented handouts to the Commission, and gave his detailed presentation. Mr. Ty Hasty discussed the improvements made to the project, the precedence setting, the significant voluntary reductions, and the impact. Additional discussion included that there was no new information handed out, just bullet points, illuminating the ten-foot sidewalk, improved nature walk, new information, being able to absorb the information presented, and concerns. Mr. Goatz moved to defer, and Dr. Martin seconded the motion. Mayor Molder thanked everyone for their attendance and stated that the applicant has reduced density by five hundred, removed the multi-family, added senior living which is something the Commission requested, added parks portfolio and voluntarily agreeing to impact fee. Those are factors if you take outside biases away on how you may feel about the development and where it's located in relations to other growth. He feels any reasonable person would agree that those are positive factors for purposes of a development of this nature. He agrees with the chairman's recommendation based on the circumstances and ongoing conversations. He also discussed the oppositions and the McDowell Elementary School that was torn down, (400 student capacity) and there was always a commitment to a new school being built. The motion to defer passed six to zero. Mr. Gamble inquired about a special work session. Mr. Goatz encouraged sending feed back to staff.

Item III.3. - **Request from Greg Gamble for Annexation approval with a Plan of Services and zoning to CD-4C (General Urban Corridor Character District) for an approximate 3.27 acre portion of Tax Map 90 Parcel 12.01 located at 400 Bear Creek Pike.**

THIS ITEM WAS DEFERRED FROM A PREVIOUS AGENDA

The applicant requested a deferral. Mr. Goatz moved to defer, and Councilman Coleman seconded the motion. The motion to defer passed six to zero.

Item III.4. - **Request from TKC Architecture & Engineering, LLC for Preliminary Plat and Site Development Plan approval of a mixed use development consisting of commercial, mixed use, and 98 townhome lots off Harley Davidson Blvd. at Tax Map 93 Parcels 2 and 2.01**.

Mr. Brass gave the details of the request. The request does meet the parking requirements. The site for townhomes is over parked slightly. Within the zoning code a development cannot go over thirty percent of required parking. This site plan does fully comply with Zoning Ordinance 4400. Mr. Cole Newton, TKC Architecture & Engineering, was present to answer questions. Discussion included previous zoning, new code requirements, conforming, street parking, street width, and the street parking conforms to code standards. Dr. Martin expressed concern about the staff report on Wastewater comments. Mr. Cole Newton discussed the comment. Additional discussion included the line upgrade, flow, gravity flow, pump station, and is it a major issue. Mr. Goatz stated for clarification if this is just a preliminary plat any further issues will be addressed at final plat. Mr. Keltner stated that the next step would be at final plat, and staff will see construction plans before you see the final plat. Mayor Molder moved to approve, and Mr. Goatz seconded the motion and amended to add subject to any technical comments and submittal of As Approved plans as required by staff. The motion to approve with conditions passed six to zero.

Item III.5. - **Request from Corey Nelsen to Rezone properties at West 12th and Haley Streets, being Tax Map 100E Group F Parcels 25, 25.01, 25.02, and 25.03, from CD-3 (Neighborhood Character District) to CD-4 (General Urban Character District).**

Mr. McCarthy gave the details of the staff report. He also addressed a question concerning the comprehensive plan from an earlier discussion. Mr. Corey Nelson was present to answer questions. Discussion included CD-4, affordable single family homes detached, light industrial, development pattern, definitive affordable housing, attainable houses, the need, mobile homes, zoning, proactive area, the outcome of the surrounding lots, Mr. McCarthy discussed the City taking proactive steps. Councilman Coleman moved to approve subject to Technical comments with Dr. Martin seconding. The motion to approve subject to technical comments passed five to one with Mr. Goatz voting nay.

Item III.6. - **Request from Josh Rowland for Annexation with Plan of Services, a Comprehensive Plan amendment from Rural Countryside to Suburban**

Neighborhoods and Zoning to CD-3 (Neighborhood Character District) for 57.26 acres at 1748, 1768, 1770 and 1774 Bear Creek Pike, being Tax Map 72 Parcels 54, 54.01 and 54.02.

THE APPLICANT HAS REQUESTED A DEFERRAL.

Chairperson Goatz asked to move this item first, because the applicant requested a deferral. Mr. Goatz stated that based upon the applicant's request to defer, he moved to defer, and Councilman Coleman seconded the motion. The motion to defer passed six to zero.

Other Business

Mr. McCarthy discussed the first meeting with the new Comprehensive plan in effect. Mr. Goatz discussed Townhome pariking. Mr. Goatz thanked staff for the depth of the staff reports.

Adjournment

Mr. Goatz moved to adjourn and Mr. Shannon seconded. The motion to adjourn passed six to zero. The meeting adjourned at 6:09 p.m.

_____ _____

Planning Commission Chairman, Charlie Goatz

Date

Project #:	24-0114	Location:	Map 112 Parcel 003.06
Applicant:	Allen O'Leary/ Regent Homes	Case Type(s):	Final Plat
Staff Planner:	Austin Brass, AICP	Proposed Use:	Single Family Homes

PROJECT SUMMARY

The applicant requests approval of a Final Plat to create 31 single-family residential lots and associated infrastructure for Phase 1 of the Rutherford Subdivision. The Planning Commission approved the Preliminary Plat (22-0202) on September 14th, 2022. This preliminary plat was approved for the development of 124 single-family residential lots on a 65-acre site with a 10,000 square foot area & 75' lot width minimum. The previous preliminary plat approval created a vested right under RS-10 standards of the previous Zoning Ordinance.

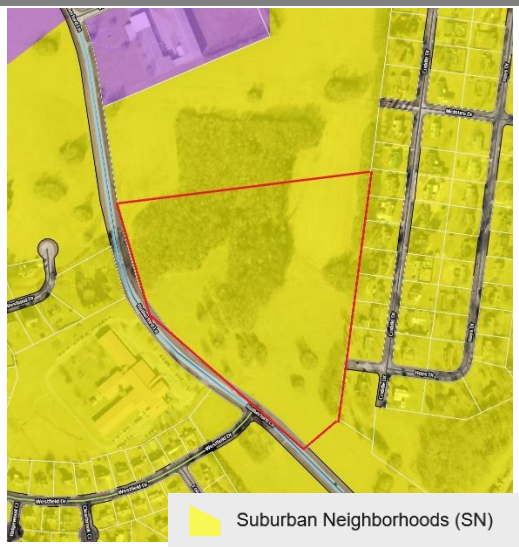
- The development is subject to Ordinance 3638, the pre-July 2022 zoning ordinance.
- The Final Plat conforms to the approved Preliminary Plat.
- The DRC reviewed this proposal at its March 2024 meeting. Staff review included standard comments and requests for technical corrections. Full technical comments are provided in the agenda packet.
- A letter of credit of $400,000 has been provided for this phase.
- It has been noted by engineering that school crossings and right turn lane be installed prior to preliminary acceptance of Phase 1 final plat or recording of Phase 2 final plat, whichever occurs first.
- The Planning Commission is the **Decision-Making Authority** for the Final Plat.
- Templates are provided at the end of the report to assist the Planning Commission in crafting properly formatted motions.

SITE INFORMATION

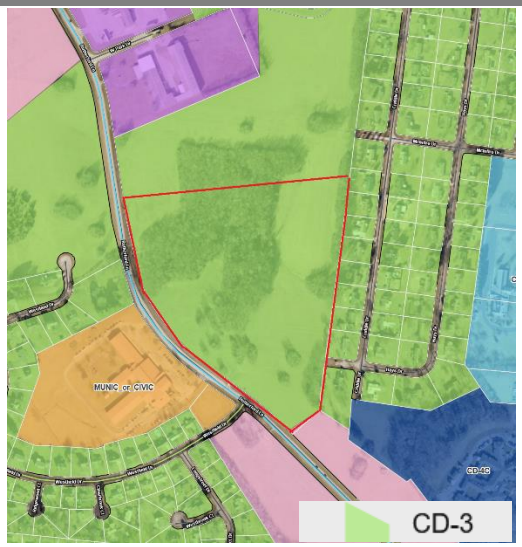
CURRENT ZONING	EXISTING USE	EXISTING IMP.	LAND AREA
CD-3	In Development	Infrastructure for Development	+/- 17 Acres



FUTURE LAND USE MAP



ZONING MAP



SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	Suburban Neighborhoods	CD-3	Vacant/Developing
North	Technology and Employment	SD-LI	Light Industrial/ Vacant Land
South	Suburban Neighborhoods	PUD	Vacant Land
East	Suburban Neighborhoods	CD-3	Single-Family Homes
West	Suburban Neighborhoods	CD-3/Civic	Vacant/ School

City Council approve a Rezoning of the subject property from a Mixed-Use Planned Unit Development on December 9th, 2021 (21-0167) to RS-10 (*CD-3*). The Planning Commission approved a Preliminary Plat (21-0138) for development of 124 lots on the site in on September of 2022.

CONFORMITY WITH ZONING ORDINANCE

The Final Plat conforms to the approved preliminary plat of the applicable zoning ordinance (3638), and the Subdivision Regulations.

REVIEW PROCESS

The Development Review Committee evaluated the proposed Final Plat at its March 2024 meeting, as directed by section **8.3.7** of the Zoning Ordinance. Technical comments are provided in the agenda package and summarized above.

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 Final Plats under **§ 8.3.3.B.1** of the Zoning Ordinance and **§ 2.3** 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 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.

B. Final Plat approval shall be subject to the completion of required improvements, or in lieu, the CMPC may approve a Performance Agreement.

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].

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 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, the PUD Master Plan, or the approved Preliminary Plat, and deny the request due to [list specific deficiencies].

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 R2839, Page 368, 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 — Regent Homes LLC

CERTIFICATE OF APPROVAL OF STREETS, DRAINAGE, STREET SIGNS, AND UTILITIES

I hereby certify that the streets, drainage, and utilities designated in Rutherford Subdivision, Phase 1 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 Rutherford Subdivision, Phase 1 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.

3/18/24 — Allen B. O'Leary — TN RLS #1987
Date — Allen B. O'Leary — Number

PURPOSE NOTE:
The purpose of this plat is to create 31 single family 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.

STORMWATER MANAGEMENT AGREEMENT:
RECORDED:_____
DEED BOOK:_____ PAGE:_____

PARCEL NUMBER:
TAX MAP 112, PARCEL 003.06

DEED BOOK:
R2839, PAGE 368

PARCEL ADDRESS:
RUTHERFORD LANE
COLUMBIA, TN 38401

APPROVED ZONING UNDER ZONING ORDINANCE 3638:
PS-10(CD-3) ZONING DISTRICT

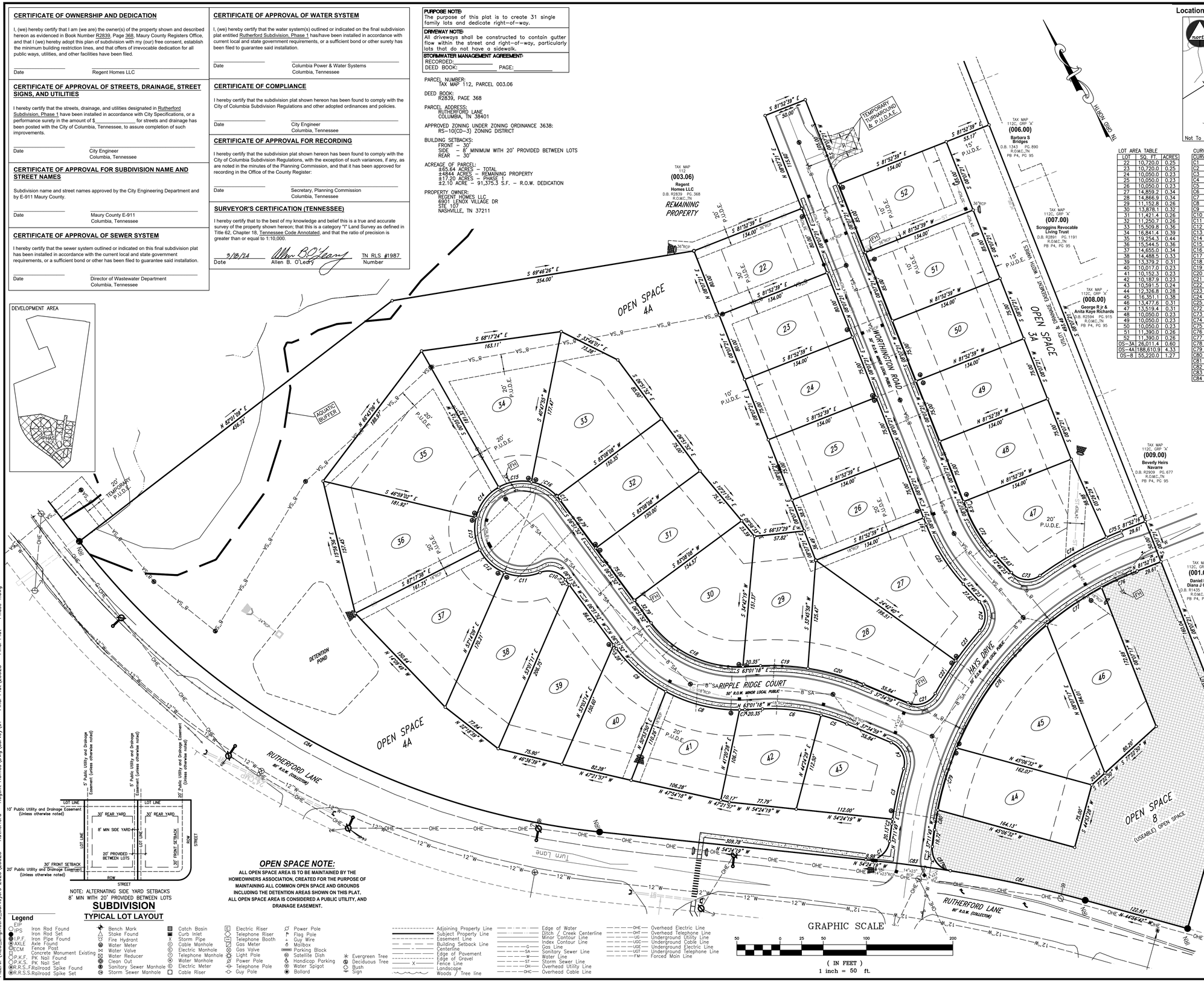
BUILDING SETBACKS:
FRONT – 30'
SIDE – 8' MINIMUM WITH 20' PROVIDED BETWEEN LOTS
REAR – 30'

ACREAGE OF PARCEL:
±65.64 ACRES – TOTAL
±4844 ACRES – REMAINING PROPERTY
±17.20 ACRES – PHASE 1
±2.10 ACRE – 91,375.3 S.F. – R.O.W. DEDICATION

PROPERTY OWNER:
REGENT HOMES LLC
6901 LENOX VILLAGE DR
STE 107
NASHVILLE, TN 37211

DEVELOPMENT AREA

PHASE 1



LOT	SQ. FT.	ACRES
22	10,720.0	0.25
23	10,720.0	0.25
24	10,050.0	0.23
25	10,050.0	0.23
26	10,050.0	0.23
27	14,859.2	0.34
28	14,866.9	0.34
29	11,152.8	0.26
30	13,678.1	0.32
31	11,421.4	0.26
32	11,250.7	0.26
33	15,309.8	0.36
34	16,841.4	0.39
35	19,254.3	0.44
36	15,544.5	0.36
37	14,855.0	0.34
38	14,488.5	0.33
39	13,379.2	0.31
40	10,017.0	0.23
41	10,152.3	0.23
42	10,187.9	0.23
43	10,591.5	0.24
44	12,326.8	0.28
45	16,351.1	0.38
46	13,477.6	0.31
47	13,519.4	0.31
48	10,050.0	0.23
49	10,050.0	0.23
50	10,050.0	0.23
51	11,390.0	0.26
52	11,390.0	0.26
OS–3A	26,011.4	0.60
OS–4A	188,610.9	4.33
OS–8	55,220.0	1.27

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	25.00'	38.57'	34.86'	N 81°23'45" E	88°23'52"
C2	425.00'	5.58'	5.58'	N 37°34'23" E	0°45'07"
C3	425.00'	60.00'	59.95'	N 41°59'35" E	8°05'19"
C4	25.00'	36.49'	33.33'	N 04°13'38" E	83°37'14"
C5	225.00'	31.45'	31.42'	N 41°35'15" W	8°00'32"
C6	225.00'	68.45'	68.18'	N 54°18'24" W	17°25'47"
C7	175.00'	6.19'	6.19'	N 62°00'32" W	2°01'32"
C8	175.00'	88.99'	88.03'	N 46°25'44" W	29°08'03"
C9	175.00'	76.35'	75.75'	N 19°21'47" W	24°59'50"
C10	25.00'	32.95'	30.62'	N 44°37'33" W	75°31'21"
C11	55.00'	42.49'	41.44'	N 60°15'16" W	44°15'54"
C12	55.00'	39.19'	38.37'	N 17°42'28" W	40°49'41"
C13	55.00'	38.69'	37.90'	N 22°51'40" E	40°18'35"
C14	55.00'	45.19'	43.93'	N 66°33'06" E	47°04'17"
C15	55.00'	39.08'	38.26'	S 69°33'25" E	40°42'41"
C16	55.00'	34.41'	33.85'	S 31°16'36" E	35°50'57"
C17	55.00'	6.23'	6.22'	S 10°06'30" E	6°29'15"
C18	125.00'	122.52'	117.67'	S 34°56'35" E	56°09'26"
C19	275.00'	55.04'	54.95'	S 57°17'17" E	11°28'01"
C20	275.00'	67.06'	66.89'	S 44°34'08" E	13°58'17"
C21	25.00'	36.49'	33.33'	S 79°23'36" E	83°37'14"
C22	425.00'	44.70'	44.68'	N 61°48'38" E	6°01'32"
C23	425.00'	44.70'	44.68'	N 67°50'05" E	6°01'32"
C24	25.00'	36.49'	33.33'	N 29°02'14" E	83°37'14"
C25	225.00'	82.06'	81.60'	N 02°19'31" W	20°53'44"
C72	175.00'	63.80'	63.47'	S 02°19'31" E	20°53'44"
C73	25.00'	36.49'	33.33'	S 54°35'00" E	83°37'14"
C74	425.00'	88.79'	88.62'	N 89°35'28" E	11°58'11"
C75	425.00'	18.94'	18.94'	S 83°08'51" E	2°33'11"
C76	375.00'	45.50'	45.47'	N 85°20'50" W	6°57'08"
C77	375.00'	77.06'	76.92'	S 85°17'24" W	11°46'24"
C78	375.00'	177.99'	176.32'	S 65°48'22" W	27°11'40"
C79	375.00'	75.15'	75.03'	S 46°28'03" W	11°28'58"
C80	375.00'	23.10'	23.09'	S 38°57'42" W	3°31'45"
C81	25.00'	38.56'	34.85'	S 06°59'03" E	88°21'44"
C82	1472.39'	159.85'	159.77'	N 48°03'19" W	6°13'13"
C83	1472.39'	88.62'	88.61'	N 52°53'23" W	3°26'55"
C84	874.94'	708.93'	689.69'	N 31°11'35" W	46°25'28"

NOTE: ALTERNATING SIDE YARD SETBACKS
8' MIN WITH 20' PROVIDED BETWEEN LOTS

SUBDIVISION
TYPICAL LOT LAYOUT

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. ALL OPEN SPACE AREA IS CONSIDERED A PUBLIC UTILITY, AND DRAINAGE EASEMENT.

Legend

- EIP — Iron Rod Found
- IPS — Iron Rod Set
- I.P.F. — Iron Pipe Found
- AXLE — Axle Found
- ECM — 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

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

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. 112, Parcel No. 003.06, Maury County. For designation shown thus ( ) indicates Parcel Numbers for said map.
8. Plat reference: N/A
9. Deed reference: Book R2839, Page 368
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 as shown on F.E.M.A. Flood Insurance Rate Map, Community Panel No. 47119C0285E, 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 5" rebar with cap reading "WES 1987" unless otherwise noted.

Register of Deed Recording Stamp

ALLEN B. O'LEARY — REGISTERED LAND SURVEYOR — XVI — AGRICULTURE — SCIENCE — COMMERCE — 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
REGENT HOMES LLC
6901 LENOX VILLAGE DR
SUITE 107
NASHVILLE, TN 37211

FINAL PLAT
RUTHERFORD SUBDIVISION, PHASE 1
COLUMBIA, TN

REVISIONS	DATE

Drawn: EB
Checked: AO
Approved: AO
Date: 03-18-2024

Job. no. 23528
Scale: Vertical: 1"=50'
Horizontal:

1 of 1

FILE: K:\WES_Engineers_Surveyors 2023\23528 – Rutherford – Regent Homes\Dwg\Survey\01 – Final Plat\23528 – Final Plat – Phase 1.dwg

March 18, 2024

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

RE: Project Name: Rutherford Subdivision, Phase 1, Final Plat
City of Columbia Staff Review Resubmittal

On behalf of Regent Homes LLC, the owner of these 31 proposed single family lots, **WES Engineers & Surveyors** would like to resubmit this Final Plat to the City of Columbia for Planning Commission approval. Comments are addressed below in red.

Please see the list of revisions made to the Final Plat that was not part of the comments:

1. On the "Typical Lot Layout" the side yard setback requirements has been revised to match the Preliminary Plat having 8' minimum with 20' provided between lots.
2. On the "Typical Lot Layout" the P.U.D.E. along the fronts of the lots has been expanded to 20' instead of 10'.

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 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, or the comment was previously addressed, please simply note that the information has been acknowledged. Noted.
3. Please provide notation on Final Plat that this review was approved under the previous Zoning Ordinance 3638 and is subject to the vesting of that approval in a RS-10 (CD-3) Zoning District. This has been noted on the Final Plat.

Engineering

1. LOC in the amount of $400,000 provided. This will be handled by the developer.
2. Record and reference Stormwater Maintenance Agreement. This will be recorded and referenced prior to obtaining final signatures for recording.
3. School Crossing and right turn lane to be installed prior to preliminary acceptance of Phase 1 Final Plat or recording of Phase 2 Final Plat (whichever occurs first). Noted.
4. Work with Public Works (Timothy McMeans tmcmeans@columbiatn.com) to satisfy signal optimization requirements outlined in the TIS. Noted.
5. Label roadways as Minor, Local, and Public. The roadways have been labeled.

Wastewater

6. Columbia Wastewater approves. Noted.

Maury County E911

7. Ripple Ridge CT - approved and reserved. Hays Drive - approved and reserved. Worthington Drive - approved and reserved. Noted.

Maury County Schools

8. Woodard Elementary, Whitthorne Middle, 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. Noted.

Columbia Power

9. 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

10. Natural gas installed in development. Noted.

Columbia Water

11. "Complete any remaining infrastructure, conduct bacteria and pressure testing, and be prepared to deed over infrastructure to CPWS at time of plat signing. Water system must be active in order for plat signing". Noted.

CPWS BBp

12. Plan to Serve. 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

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, March 12, 2024

ITEM NO.
24-0114

DESCRIPTION: The purpose of Rutherford Subdivision, Phase 1 Final Plat is to create 31 single family lots and dedicate right-of-way.

RECOMMENDATION: For final recommendation please see staff report.

COMMENTS:

Engineering

1. LOC in the amount of $400,000 provided
2. Record and reference Stormwater Maintenance Agreement.
3. School Crossing and right turn lane to be installed prior to preliminary acceptance of Phase 1 Final Plat or recording of Phase 2 Final Plat (whichever occurs first).
4. Work with Public Works (Timothy McMeans tmcmeans@columbiatn.com) to satisfy signal optimization requirements outlined in the TIS
5. Label roadways as Minor, Local, and Public

Wastewater

6. Columbia Wastewater approves.

Fire

7. No comments

Maury County Highway Dept.

8. No comment.

ATT

9. NO COMMENT

Building

10. No comments.

Maury County E911

11. Ripple Ridge CT - approved and reserved. Hays Drive - approved and reserved. Worthington Drive - approved and reserved.

Maury County Schools

12. Woodard Elementary, Whitthorne Middle, 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

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.

Atmos Energy

14. Natural gas installed in development

Police

15. No comments provided.

Public Works

16. No comments

Columbia Water

17. "Complete any remaining infrastructure, conduct bacteria and pressure testing, and be prepared to deed over infrastructure to CPWS at time of plat signing. Water system must be active in order for plat signing"

Duck River Electric Membership Corp

18. No comments.

CPWS BB

19. Plan to Serve

ATTACHMENTS: Final 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	Open Seats
322	94.7%	18
636	90.9%	64
369	91.1%	36
314	82.6%	66
594	84.9%	106
575	91.3%	55
401	80.2%	99
449	83.1%	91
563	93.8%	37
599	80.9%	141
4822	***87.1%***	**713**
727	80.8%	173
64	7.1%	836
416	75.6%	134
527	55.5%	423
973	92.7%	77
2707	***62.2%***	**1643**
1382	81.3%	318
370	61.7%	230
1198	99.8%	2
2950	***84.3%***	**550**
874	85.7%	146
412	82.4%	88
512	78.8%	138
1798	***82.9%***	**372**
173		
12450		3105

Appendix B: Subdivision Development Agreement

This DEVELOPMENT AGREEMENT is made and entered into on this

29th day of November, 2023,
between THE CITY OF COLUMBIA, TENNESSEE, (hereinafter the "CITY"), and

Regent Homes 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

_____ day of _____, 20_____,
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.

Rutherford Phase 1
PROJECT

Completed by the Developer	*Completed by the City*
Regent Homes LLC DEVELOPER NAME	
David A McCord AUTHORIZED AGENT NAME	 CITY ENGINEER
 SIGNATURE	 SIGNATURE
11-29-2023 DATE	 DATE
6901 Lenox Village Dr #107 STREET	
Nashville, TN 37211 CITY, STATE, ZIP	
615-981-0900 PHONE	
Andy.Davidson@regenthomes-TN.com EMAIL	
Attest	*Attest*
Andy Davidson ATTEST NAME	 ATTEST NAME
 ATTEST SIGNATURE	 ATTEST SIGNATURE
11/29/23 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 on a USB thumb drive or CD (no multiple applications on one storage device)*
Fold hard copy submittals larger than 8½"x11"

ADDRESS/LOCATION	Rutherford Lane, Columbia, TN		
	TAX MAP: 112	GROUP:	PARCEL: 003.06
SUMMARY OF NATURE OF REQUEST AND WORK	Request Final Plat approval for 31 single family residential lots for Rutherford Subdivision, Phase 1.		

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) Rutherford Subdivision, Phase 1 ☑ Total Number of Lots 31 ☑ Total acreage ±17.20

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	Regent Homes LLC	PHONE	
ADDRESS	6901 Lenox Village Dr, Ste 107 Nashville, TN 37211	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.

Regent Homes LLC		12-14-2023
APPLICANT NAME	APPLICANT SIGNATURE	DATE
McBrown FLP		12-14-2023
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	

Summit at Carters West Phase 1A Final Plat

Project #:	24-0089	Location:	Map 41 Parcel 15.00
Applicant:	T-Square Engineering	Case Type(s):	Final Plat
Staff Planner:	Austin Brass, AICP	Proposed Use:	Single Family Homes

PROJECT SUMMARY

The applicant requests approval of a Final Plat to create 9 single-family residential lots. The Planning Commission approved the Preliminary Plat (21-0102) on September 8th, 2021. The preliminary plat was for 399 single-family residential lots that included an R-10 cluster alternative within a 113-acre site. The previous preliminary plat approval created a vested right under R-6 and R-10 with a cluster alternative of the previous Zoning Ordinance.

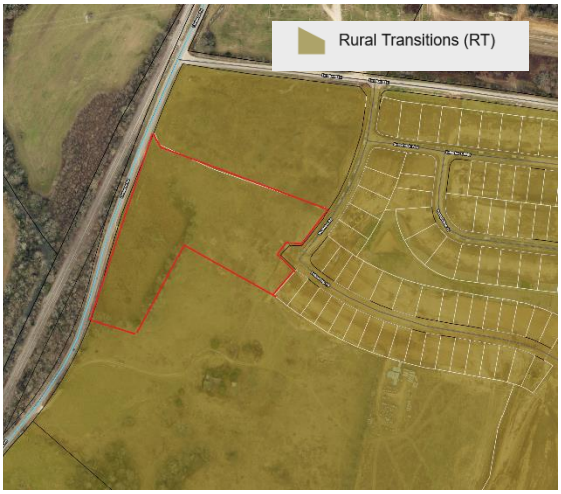
- The development is subject to Ordinance 3638, the pre-July 2022 zoning ordinance.
- This phase is a subphase of the overall Summit at Carters West and is within a previously zoned R-6 section of the overall Preliminary Plat.
- The Final Plat conforms to the approved Preliminary Plat.
- The DRC reviewed this proposal at its December 2023 meeting. Staff review included standard comments and requests for technical corrections. Full technical comments are provided in the agenda packet.
- A letter of credit for the amount of $120,000 has been provided for this Final Plat.
- The Planning Commission is the **Decision-Making Authority** for the Final 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-3	In Development	Infrastructure for Development	+/- 5.52 Acres



FUTURE LAND USE MAP	ZONING MAP





SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	Rural Transitions	CD-3	Vacant/Developing
North	Rural Transitions	CD-4	Vacant/Developing
South	Rural Transitions	CD-3	Vacant/Developing
East	Rural Transitions	CD-3	Vacant/Developing
West	None/ Spring Hill UGB	County	Cleburne Road/ Vacant Land

The Planning Commission approved a Preliminary Plat (21-0102) for development of 399 overall lots within a larger phase preliminary plat in September of 2021.

CONFORMITY WITH ZONING ORDINANCE

The Final Plat conforms to the approved Preliminary Plat of the applicable Zoning Ordinance (3638), and the Subdivision Regulations.

REVIEW PROCESS

The Development Review Committee evaluated the proposed Final Plat at its September 2023 meeting, as directed by section **8.3.7** of the Zoning Ordinance. Technical comments are provided in the agenda package and summarized above.

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 Final Plats under **§ 8.3.3.B.1** of the Zoning Ordinance and **§ 2.3** 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 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.

B. Final Plat approval shall be subject to the completion of required improvements, or in lieu, the CMPC may approve a Performance Agreement.

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].

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 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:

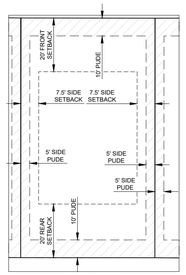
Move to find that the Final Plat as presented does not conform to the applicable zoning ordinance, the Subdivision Regulations, or the approved Preliminary Plat, and deny the request due to [list specific deficiencies



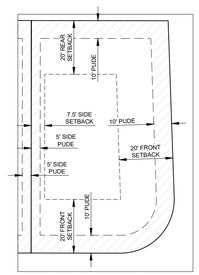
VICINITY MAP - NOT TO SCALE

GENERAL NOTES

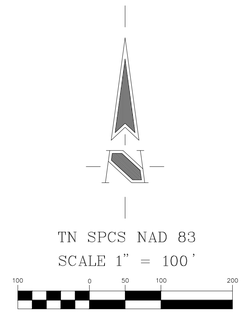
1. THE PURPOSE OF THIS PLAT IS TO CREATE 9 LOTS AND DEDICATE RIGHT-OF-WAY AND OPEN SPACE.
2. THE PROPERTY SHOWN HEREON IS LOCATED WITHIN THE CITY OF COLUMBIA, MAURY COUNTY, TN. ALL MATTERS PERTAINING TO CONSTRUCTION, USE, LOCATION OF IMPROVEMENTS, SIGNAGE, PARKING, NOISE, VIBRATION, EMISSIONS, FIRE HAZARDS, RADIATION, ILLUMINATION, SETBACK PROVISIONS, ETC. ARE SUBJECT TO THE CITY OF COLUMBIA'S ZONING REGULATIONS AS INTERPRETED AND REGULATED BY THE DEPARTMENT OF DEVELOPMENT SERVICES.
3. SUBJECT PROPERTY IS PARCEL 15.05 AS SHOWN ON MAURY COUNTY TAX MAP 41.
4. THE HORIZONTAL LOCATION DATA SHOWN ON THIS SURVEY WAS GATHERED USING STANDARD RADIAL SURVEYING TECHNIQUES WITH AN ELECTRONIC TOTAL STATION AND DATA COLLECTOR AND IS BASED UPON A POSITIONAL SOLUTION DERIVED FROM GLOBAL POSITIONING SYSTEM (GPS) OBSERVATIONS) USING THE TDOT NETWORK. TENNESSEE STATE PLANE COORDINATE SYSTEM ZONE 4100, NAD83. DRONE AERIAL PHOTOMETRY WAS ALSO USED TO SURVEY SOME ELEMENTS.
5. NO TITLE REPORT HAS BEEN FURNISHED, THEREFORE THIS SURVEY IS SUBJECT TO THE FINDINGS OF AN ACCURATE TITLE SEARCH.
6. THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE REQUIREMENTS OF A GENERAL PROPERTY SURVEY AND CONFORMS TO THE ACCURACY OF A CATEGORY 1 SURVEY AS CURRENTLY DEFINED AND ADOPTED BY THE TENNESSEE STATE BOARD OF EXAMINERS FOR LAND SURVEYORS, AND THE RATIO OF PRECISION IS LESS THAN 1:10,000.
7. ALL PLOT AND DEED RECORDATION REFERENCES SHOWN HEREON ARE AS RECORDED IN THE REGISTER'S OFFICE FOR MAURY COUNTY, TENNESSEE.
8. COLUMBIA POWER AND WATER SYSTEMS IS THE POWER PROVIDER.
9. STORMWATER MANAGEMENT OPERATION & MAINTENANCE WILL BE GOVERNED BY THE INSPECTION & MAINTENANCE AGREEMENT OF PRIVATE STORMWATER MANAGEMENT FACILITIES, DATED _____, RECORDED IN DEED BOOK ____, PAGE ____, REGISTER'S OFFICE OF MAURY COUNTY, TN.
10. BY SCALED MAP LOCATION AND GRAPHIC PLOTTING ONLY, THIS PROPERTY LIES WITHIN FLOOD ZONE "X", AS DESIGNATED ON CURRENT FEDERAL EMERGENCY MANAGEMENT AGENCY MAP NO. 47119C0180E WITH AN EFFECTIVE DATE OF 4/16/2007, WHICH MAKES UP A PART OF THE NATIONAL FLOOD INSURANCE ADMINISTRATION REPORT; COMMUNITY NO. 119C, PANEL NO. 0180 SUFFIX E, WHICH IS THE CURRENT FLOOD INSURANCE RATE MAP FOR THE COMMUNITY IN WHICH SAID PREMISES IS SITUATED. SAID MAP DEFINES ZONE "X" UNDER "OTHER AREAS" AS AREAS DETERMINED TO BE OUTSIDE THE 500-YEAR FLOOD PLAIN.
11. ACCORDING TO THE TYPICAL LOT DETAIL, ALL LOTS ARE TO HAVE A 10' PUDE IN THE FRONT AND REAR OF THE LOTS, AS WELL AS A 5' PUDE IN THE SIDE OF THE LOTS.



TYPICAL R-6 LOT
N.T.S.



TYPICAL R-6 CORNER LOT
N.T.S.



CERTIFICATE OF APPROVAL OF WATER SYSTEM

I HEREBY CERTIFY THAT THE WATER 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.

_____, 20____
DATE — DIRECTOR OF COLUMBIA WATER DEPARTMENT

CERTIFICATE OF APPROVAL OF STREETS, DRAINAGE AND UTILITIES

I HEREBY CERTIFY THAT THE STREETS, DRAINAGE AND UTILITIES DESIGNATED IN SUMMIT AT CARTER'S WEST, PHASE 1A 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 TO ASSURE COMPLETION OF SUCH IMPROVEMENTS.

_____, 20____
DATE — CITY ENGINEER

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 ARE NOTED IN THE MINUTES OF THE PLANNING COMMISSION AND THAT IT HAS BEEN APPROVED FOR RECORDING IN THE OFFICE OF THE COUNTY REGISTER.

_____, 20____
DATE — NAME, TITLE, AGENCY OF AUTHORIZED AGENT

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 CATEGORY I LAND SURVEY AS DEFINED IN TITLE 62, CHAPTER 18, TENNESSEE CODE ANNOTATED, AND THAT THE RATIO OF PRECISION IS LESS THAN OR EQUAL TO 1:10,000.

_____, 20____
DATE — MARK CANTRELL, R.L.S

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.

_____, 20____
DATE — CITY ENGINEER

CERTIFICATE OF APPROVAL OF SUBDIVISION AND STREET NAMES

SUBDIVISION NAME AND STREET NAMES ARE APPROVED BY THE CITY ENGINEERING DEPARTMENT AND MAURY COUNTY E911.

_____, 20____
DATE — MAURY E911

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 SURETY HAS BEEN FILED TO GUARANTEE SAID INSTALLATION.

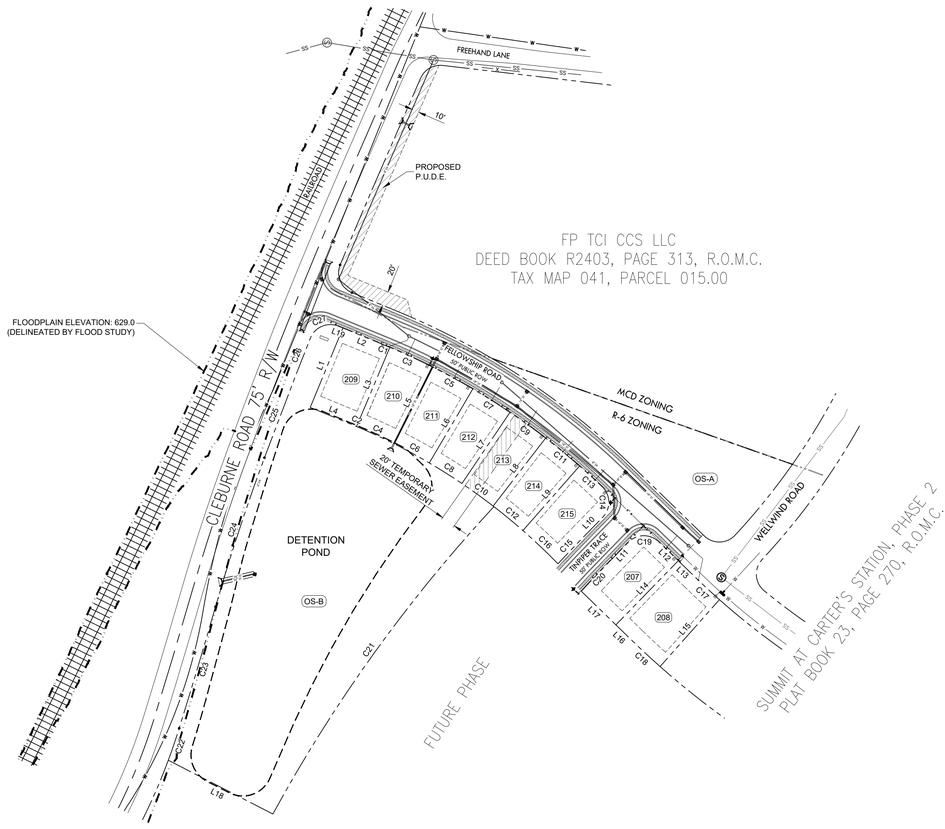
_____, 20____
DATE — DIRECTOR OF COLUMBIA WASTEWATER DEPARTMENT

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 RECORD BOOK NUMBERS R2806, PAGE 535 & R2403, PAGE 313, MAURY COUNTY REGISTER'S OFFICE, AND THAT I (WE) HEREBY ADOPT THIS PLAN OF SUBDIVISION WITH MY (OUR) FREE CONSENT, ESTABLISH THE MINIMUM BUILDING RESTRICTION LINE, AND THAT OFFERS OF IRREVOCABLE DEDICATION FOR ALL PUBLIC WAYS, UTILITIES AND OTHER FACILITIES HAVE BEEN FILED.

_____, 20____
DATE — OWNER

_____, 20____
DATE — OWNER



LEGEND

- W — WATER SERVICE
- SEWER SERVICE
- HEADWALL
- STORMWATER MANHOLE
- FIRE HYDRANT
- CURB INLET
- AREA DRAIN
- PROP. SEWER MANHOLE
- EX. SEWER MANHOLE
- 8" SA — PROP. SEWER LINE
- 18" ST — PROP. STORMWATER LINE
- 8" W — PROP. WATER LINE
- W — EX. WATER LINE
- SS — EX. SANITARY SEWER

SITE DATA	
CURRENT ZONING:	R6
MINIMUM BUILDING SETBACKS:	
FRONT:	20'
REAR:	20'
SIDE:	7.5'
TOTAL PHASE AREA:	6.20 ACRES
OPEN SPACE:	3.70 ACRES
NEW ROW:	0.88 ACRES

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING
C1	975.00'	7.58'	7.58'	S 67°25'02" E
C2	855.00'	6.65'	6.65'	N 67°25'02" W
C3	975.00'	65.64'	65.63'	S 65°15'56" E
C4	855.00'	57.56'	57.55'	N 65°15'56" W
C5	975.00'	64.13'	64.12'	S 61°27'10" E
C6	855.00'	56.24'	56.23'	N 61°27'10" W
C7	975.00'	61.43'	61.42'	S 57°45'48" E
C8	855.00'	53.87'	53.86'	N 57°45'48" W
C9	975.00'	61.43'	61.42'	S 54°09'13" E
C10	855.00'	53.87'	53.86'	N 54°09'13" W
C11	975.00'	61.43'	61.42'	S 50°32'38" E
C12	855.00'	53.87'	53.86'	N 50°32'38" W
C13	975.00'	43.00'	42.99'	S 47°28'33" E
C14	30.00'	47.41'	42.63'	S 00°56'16" E
C15	2025.00'	52.35'	52.35'	S 43°35'46" W
C16	855.00'	67.52'	67.50'	N 46°28'36" W
C17	1025.00'	47.35'	47.34'	N 47°06'56" W
C18	1150.00'	53.12'	53.11'	N 47°06'56" W
C19	30.00'	47.06'	42.38'	S 89°16'20" W
C20	1975.00'	56.91'	56.91'	N 43°30'40" E
C21	2145.00'	530.52'	529.17'	S 35°42'32" W
C22	852.94'	47.31'	47.30'	N 18°48'39" E
C23	8549.46'	177.27'	177.26'	N 16°37'41" E
C24	2930.74'	219.21'	219.16'	N 18°10'36" E
C25	7502.71'	120.80'	120.80'	N 20°46'51" E
C26	7502.71'	58.29'	58.29'	N 21°27'53" E
C27	30.00'	47.48'	42.67'	N 67°01'25" E

LINE	BEARING	DISTANCE
L1	N 22°21'36" E	120.00'
L2	S 67°38'24" E	63.36'
L3	N 22°48'20" E	120.00'
L4	N 67°38'24" W	63.36'
L5	N 26°39'47" E	120.00'
L6	N 30°25'54" E	120.00'
L7	N 34°02'29" E	120.00'
L8	N 37°39'04" E	120.00'
L9	N 41°15'39" E	120.00'
L10	S 44°20'12" W	37.89'
L11	N 44°20'12" E	38.16'
L12	S 45°47'33" E	38.01'
L13	S 45°47'33" E	31.79'
L14	N 44°12'27" E	125.00'
L15	S 41°33'40" W	125.00'
L16	N 45°47'33" W	31.79'
L17	N 45°47'33" W	67.06'
L18	N 62°46'33" W	164.31'
L19	S 67°38'24" E	6.69'

LOT	SQ. FT.
207	8302.9
208	10252.4
209	8456.7
210	7392.0
211	7222.4
212	6917.5
213	6917.5
214	6917.5
215	8227.0
OS-A	29408.9
OS-B	131458.1

FLOOD STUDY INFORMATION

THE FLOOD PLAIN INFORMATION AND ELEVATIONS ARE BASED ON A FLOOD STUDY (CASE NO. 1378R) PREPARED BY CRUNK ENGINEERING AS SEALED BY ADAM W. CRUNK, PE. THE FEMA PRELIMINARY FLOOD INSURANCE RATE MAP COMMUNITY PANEL MAP NUMBER IS 47119C0180E, DATED APRIL 16TH, 2007.

OWNERS OF RECORD

PULTE HOMES TENNESSEE LIMITED PARTNERSHIP
DEED BK. R2806 PG. 535, MAP 041 PARCEL 015.05

FP TCI CCS LLC
DEED BK. R2403 PAGE 313, MAP 041 PARCEL 015.05

APPLICANT

T-SQUARE ENGINEERING
1329 WEST MAIN ST
FRANKLIN, TN 37064
615.678.8212

REVISIONS

NO.	DATE

DATE: 2-13-2024
SCALE: 1" = 100'
DRAWN BY: DSW
REVIEWER:

FINAL PLAT - PHASE 1A
MAP 041, P/O PARCEL 015.05
MAURY COUNTY, TENNESSEE

SUMMIT AT CARTER'S WEST

J. MARK CANTRELL
PROFESSIONAL LAND SURVEYOR
XVI
AGRICULTURE
COMMERCE
TENNESSEE NO. 1859

PROJECT
21-0515

SHEET
1 OF 1

T-SQUARE ENGINEERING
1329 WEST MAIN STREET • FRANKLIN, TN • 615-678-8212 • WWW.T2-ENG.COM

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

Pulte Homes Tennessee Limited Partnership, 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

_____ day of _____, 20_____ ,
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.

Summit at Carter's West, Phase 1

PROJECT

Completed by the Developer	*Completed by the City*
Pulte Homes Tennessee Limited Partnership DEVELOPER NAME	
JEREMY BROOKS AUTHORIZED AGENT NAME	_____ CITY ENGINEER
_____ SIGNATURE	_____ SIGNATURE
09-12-23 DATE	_____ DATE
100 WESTWOOD PL, SUITE #100 STREET	
BRENTWOOD, TN 37027 CITY, STATE, ZIP	
629-867-8449 PHONE	
JEREMY.BROOKS@PULTEGROUP.COM EMAIL	
Attest	*Attest*
Kimberly Maynard ATTEST NAME	_____ ATTEST NAME
Kimberly Maynard ATTEST SIGNATURE	_____ ATTEST SIGNATURE
9-12-23 DATE	_____ DATE

DOCUMENT PREPARED BY:
Name: Alexander Mollica
Company Crunk Engineering
Address: 7112 Crossroads Blvd.
Brentwood, TN 37027
After recording return copy to City of Columbia, Development Services

INSPECTION AND MAINTENANCE AGREEMENT OF PRIVATE STORMWATER MANAGEMENT FACILITIES

Map & Parcel Number: Map 041, Parcel 15.50
Project Name: Summit at Carter's Station - Phase 1

Recorded by deed in the Register of Deeds Office of Maury County in Deed Book _____, Page(s) _____.

THIS AGREEMENT, made this 5 day of August, 2023, by and between
Pulte Homes Tennessee Limited Partnership hereinafter referred to as the "OWNER(S)" of the following property and City of Columbia, Tennessee, hereinafter referred to as the "CITY",

WE, the OWNER(S), with full authority to execute deeds, mortgages, other covenants, all rights, titles, and interests in the property described above, do hereby covenant with the CITY and agree as follows:

1. The OWNER(S) covenant and agree with the CITY that the OWNER(S) shall provide for adequate long term maintenance and continuation of stormwater control measures described in the Long Term Maintenance Plan and shown on the location map, deed of easement drawing or plat attached hereto to ensure that the facilities, are and remain in proper working condition in accordance with approved design standards, rules and regulations, and applicable laws. The OWNER(S) shall perform preventative maintenance activities at intervals described in the schedule attached hereto along with necessary landscaping (grass cutting, etc.) and trash removal as part of regular maintenance.

2. The OWNER(S) shall perform routine inspections to ensure that all long term stormwater management facilities are properly functioning. These inspections shall be conducted on an annual basis, at a minimum. These inspections shall be conducted by a person familiar with control measures implemented at the site. The OWNER(S) or operators shall maintain documents of these inspections.

3. The OWNER(S) shall perform comprehensive inspections of all stormwater management facilities and practices. These inspections shall be conducted once every five years, at a minimum. Such inspections must be conducted by either a professional engineer or landscape architect.

4. The OWNER(S) shall grant to the CITY or its agent or contractor the right of entry at reasonable times and in a reasonable manner for the purpose of inspecting, operating, installing, constructing, reconstructing, maintaining or repairing the facility within the CITY.

5. The OWNER(S) shall record and grant to the CITY the necessary easements and rights-of-way and maintain perpetual access from public rights-of-way to the facility for the CITY or its agent and contractor.

6. If, upon inspection, the CITY finds that the OWNER(S) has failed to properly maintain the facilities, the CITY may order the work performed within ten (10) days. In the event the work is not performed within the specified time, the ONWER(S) agrees to allow the CITY to enter the property and take whatever steps it deems necessary to maintain the stormwater control facilities. This provision shall not be construed to allow the CITY to erect any structure of a permanent nature on the PROPERTY without first obtaining written approval of the OWNER(S)

7. The CITY is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any obligation on the CITY. The OWNER(S) shall reimburse the CITY upon demand the costs incurred in the maintenance of the facilities.

8. If the OWNER(S) fails to pay the CITY for the above expensive after forty-five (45) days written notice, the OWNER(S) authorizes the CITY to collect said expenses from the OWNER(S) through appropriate legal action and the OWNER(S) shall be liable for the reasonable expenses of collection, court costs, and attorney fees.

9. The OWNER(S) and the OWNER(S) heirs, administrators, executors, assigns, and any other successor in interest shall indemnify and hold harmless the CITY and its officers, agents and employees for any and all damages, accidents, casualties, occurrences, claims or attorney's fees which might arise or be asserted, in whole or in part,

against the CITY from the construction, presence, existence, or maintenance of the stormwater control facilities subject to this AGREEMENT. In the event a claim is asserted against the CITY, its officers, agents or employees, the CITY shall notify OWNER(S) and the OWNER(S) shall defend at OWNER(S) expense any suit based on such claim. If any judgment or claims against the CITY, its officers, agents or employees, shall be allowed, the OWNER(S) shall pay all costs and expenses in connection therewith. The CITY will not indemnify, defend or hold harmless in any fashion the OWNER(S) from any claims arising from any failure, regardless of any language in any attachment or other document that the OWNER(S) may provide

10. The OWNER(S) shall not be able to transfer, assign or modify its responsibilities with respect to this agreement without the CITY's written prior consent. Nothing herein shall be construed to prohibit a transfer by OWNER(S) to subsequent owners and assigns.

11. No waiver of any provision of this AGREEMENT shall affect the right of any party thereafter to enforce such provision or to exercise any right or remedy available to it in the event of any default.

12. The OWNER(S) shall record a plat showing and accurately defining the easements for stormwater control facilities. The plat must reference the Instrument Number where this AGREEMENT and its attachments are recorded and contain a note that the OWNER(S) is responsible for maintaining the stormwater management facilities.

13. The OWNER(S) shall record this AGREEMENT in the office of the Register of Deeds for the county of Maury, Tennessee, and the AGREEMENT shall constitute a covenant running with the land, and shall be binding upon the OWNER(S) and the OWNER(S) heirs, administrators, executors, assigns, and any other successors in interest

ATTEST BY OWNER(S):

Print Name JEREMY BROOKS

Title DIR. LAND

Signature

Owner PULTE HOMES TENNESSEE LIMITED PARTNERSHIP.

Address 100 WESTWOOD PL

SUITE #100

City, State ZIP BRENTWOOD, TN 37027.

STATE OF Tennessee
COUNTY OF Davidson

Before me, Kimberly Maynard of the state and county mentioned, personally appeared Jeremy Brooks, with whom I am personally acquainted and who acknowledged that he/she executed the foregoing instrument of the purposes therein contained.

KIMBERLY MAYNARD
STATE OF TENNESSEE NOTARY PUBLIC
DAVIDSON COUNTY
MY COMMISSION EXPIRES 9-8-2025

Witness my hand this the 11th day of September, 20 23.

Kimberly Maynard
Notary Public

My Commission Expires: 9-8-2025

CITY OF COLUMBIA, TENNESSEE
ENGINEERING DEPARTMENT

APPROVED BY :_____

STATE OF TENNESSEE
COUNTY OF MAURY

Before me, _____ of the state and county mentioned, personally appeared _____, with whom I am personally acquainted, and who acknowledged themselves to be the City Engineer of the City of Columbia or his designee and as such, being authorized so to do, executed the foregoing instrument of the purposes therein contained.

Witness my hand this the _____ day of _____, 20_____.

_____
Notary Public
My Commission Expires:_____

Post Construction Long Term Maintenance Plan

Project Name: Summit at Carter's Station North – Phase 1

Columbia, TN

September 5,2023

Table of Contents

Section Name

System Description
Maintenance Procedures

System Description

The site consists of a series of stormwater conveyances both open channel and piped, detention / retention and water quality ponds.

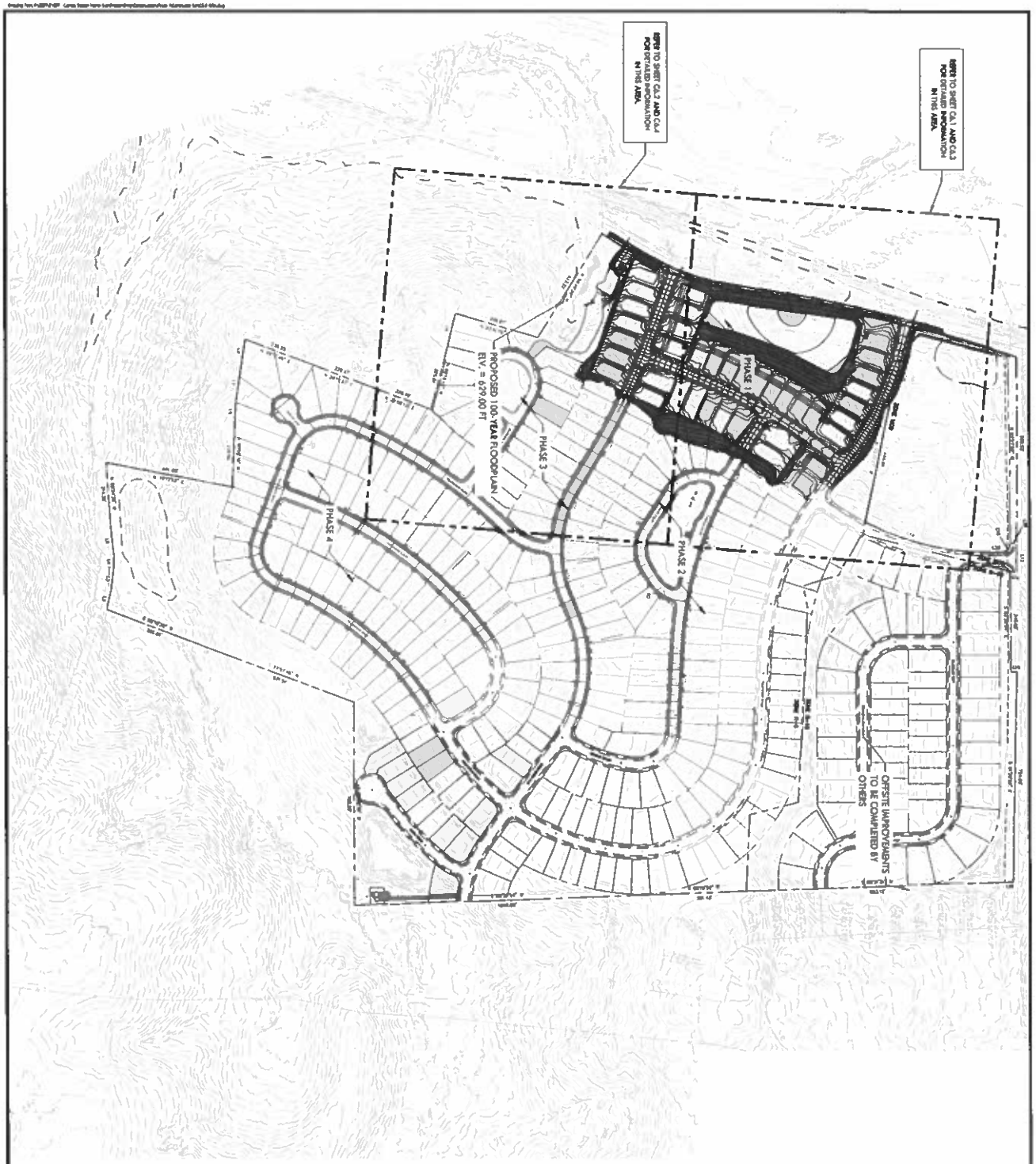
- There is one stormwater detention ponds sized to detain through the 100 year peak event. The orifice is designed to contain the first flush, 1 inch, for 24 hour.
- 419 feet of grass lined open channel.
- 172 feet of 36 in ADS pipe, 569 feet 30 in ADS pipe, 266 feet of 24 in ADS pipe, 1,098 feet of 18 in ADS pipe, 278 feet of 15 in ADS pipe, 563 feet of 12 in ADS pipe and 39 storm inlets.

Upon completion of the site construction, 'Record Drawings' in a version not less than AutoCAD 2006 LT (NAD83, NAVD88) of the stormwater controls will be provided to the City of Columbia for verification.

A copy of the INSPECTION AND MAINTENANCE AGREEMENT OF PRIVATE STORMWATER MANAGEMENT FACILITIES that has been completed, notarized, and recorded in the Land Records of the County of Maury, Tennessee will be kept on site with this document.

Maintenance Procedures

1. **STORMWATER DETENTION PONDS**
    a. The outlet structures shall be checked regularly for clogging and shall be cleaned and repaired as necessary---monthly after it is first built then a regular sequence should be established or at least quarterly or after a large rain event.
    b. Check banks and bottom surface of basins for erosion and correct as necessary.
    c. Check at least quarterly and after each extreme storm event, the facility should be cleaned of accumulated debris. The banks of surface ponds should be checked and areas of erosion repaired. Remove nuisance wetland species and take appropriate measures to control mosquitos.
    d. This maintenance typically includes sediment, floatable, and debris removal from inlets, outlets and skimmers.
    e. Pond vegetation to be trimmed or harvested as appropriate, grassy areas, frequently mowed. Grass should be mowed so that it does not get over 12.
    f. Remove sediment when accumulation reached 6 inches, or if re-suspension is observed or probable.
    g. Some sediment may contain contaminants which the Tennessee Department of Environment and Conservation (TDEC) requires special disposal procedure. If there is any uncertainty about what the sediment contains or it is known to contain contaminants, then TDEC should be consulted and their disposal recommendations followed. The TDEC Division of Water Pollution Control should be contacted at (931) 380-3371. Generally, special attention or sampling should be given to sediment accumulated in facilities serving industrial, manufacturing or heavy commercial sites, Page 2 of 4 Rev. 9/26/2016 fueling centers or automotive maintenance areas, large parking areas, or other areas where pollutants (other than clean soil) are suspected to accumulate and be conveyed by storm runoff.
    h. Some sediment collected may be innocuous (free of pollutants) and can be used as fill material, cover or land spreading. It is important that this material not be placed in any way that will promote or allow re-suspension in storm runoff.
2. **172 feet of 36 in ADS pipe, 569 feet 30 in ADS pipe, 266 feet of 24 in ADS pipe, 1,098 feet of 18 in ADS pipe, 278 feet of 15 in ADS pipe, 563 feet of 12 in ADS pipe and 39 storm inlets.**
    a. These structures will be inspected and cleaned quarterly to ensure pipes and drain inlets do not fill with sediment or trash.



NOTES

1. GRADING TO MATCH ADJOINING TYP. AND ANY LOTS OVER 30% GRADE SHALL BE LABELED AS CRITICAL.
2. A GEOTECHNICAL INVESTIGATION SHALL BE PERFORMED TO DETERMINE IF SUBSURFACE CONDITIONS ARE SUITABLE FOR BUILDING. RECOMMENDATIONS SHALL BE INCORPORATED AS NECESSARY.

0 50 100 150 200
GRAPHIC SCALE

N

C6.0
OVERALL GRADING & DRAINAGE PLAN

02/27/23
21027

REVISIONS	
No.	DATE
1	11/29/22
2	1/4/23
3	2/21/23
4	4/28/23
5	6/8/23
6	6/19/23

SUMMIT AT CARTERS STATION NORTH
PHASE 1 - CONTRACTOR SET

CARTERS CREEK STATION ROAD
MAURY COUNTY, TENNESSEE

CRUNK ENGINEERING LLC
7112 CROSSROADS BOULEVARD
SUITE 201
BRENTWOOD, TN 37027
(615) 873-1795
WWW.CRUNKENG.COM

C6.1
GRADING PLAN

02/27/23
21027

REVISIONS	
No.	DATE
1	11/29/22
2	1/4/23
3	2/21/23
4	4/28/23
5	6/8/23
6	6/19/23

SUMMIT AT CARTERS STATION NORTH
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NOTES:
1. REFER TO SHEET C2.0 FOR HATCH.

GRADING & DRAINAGE PLAN KEYNOTES

CODE	DESCRIPTION	DETAIL LOCATION
(D)	SINGLE CURB INLET	C8.1 - 3
(SD)	SINGLE CATCH BASIN	C8.1 - 4
(JB)	JUNCTION BOX	C8.1 - 2
(HW)	CONCRETE HEADWALL	C8.1 - 6
(SO)	NORTH POND OUTLET STRUCTURE	C8.2 - 1
(SH)	SLOPED CONCRETE HEADWALL	C8.4 - 4

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SUMMIT AT CARTERS STATION NORTH
PHASE 1 - CONTRACTOR SET

CARTERS CREEK STATION ROAD
MAURY COUNTY, TENNESSEE

REVISIONS	
No.	DATE
1	11/29/22
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3	2/21/23
4	4/28/23
5	6/8/23
6	6/19/23

02/27/23
21027

C6.2
GRADING PLAN

NOTES

1. GRADING TO MATCH MATCHING TYPE AND ANY LOTS OVER 30% GRADE SHALL BE LABELED AS CRITICAL.
2. A GEOTECHNICAL INVESTIGATION WILL BE REQUIRED TO DETERMINE SUITABILITY OF ON-SITE SOILS FOR ANY PROPOSED EMBANKMENTS. ANY UNSUITABLE SOILS DISCOVERED WILL BE REMEDIATED AS NECESSARY.

C6.3
FLOODPLAIN EARTHWORKS EXHIBIT

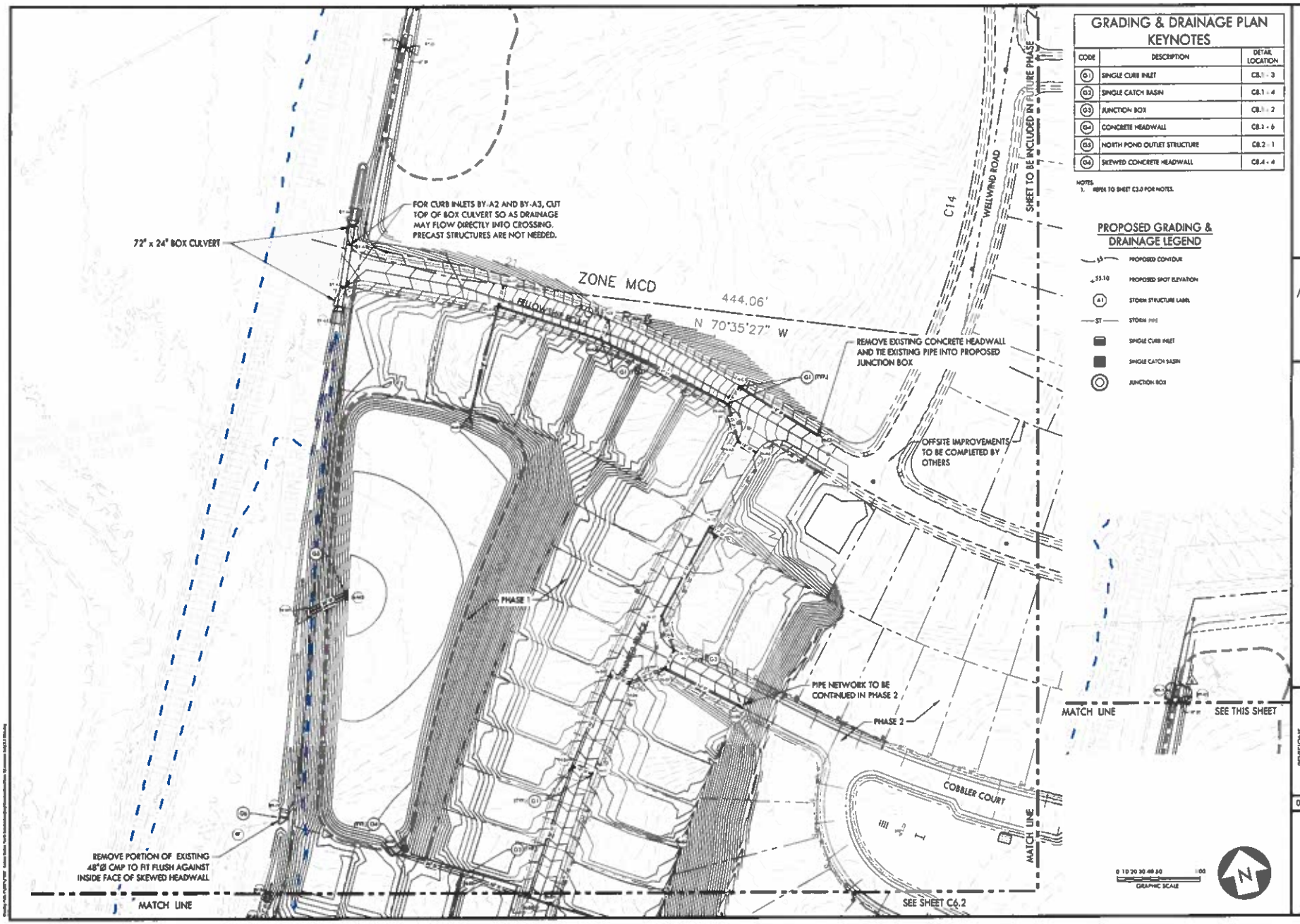
02/27/23
21027

REVISIONS	
No.	DATE
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4	4/20/23
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6	6/19/23

SUMMIT AT CARTERS STATION NORTH
PHASE 1 - CONTRACTOR SET

CARTERS CREEK STATION ROAD
MAURY COUNTY, TENNESSEE

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GRADING & DRAINAGE PLAN KEYNOTES

CODE	DESCRIPTION	DETAIL LOCATION
G1	SINGLE CURB INLET	C8.1 - 3
G2	SINGLE CATCH BASIN	C8.1 - 4
G3	JUNCTION BOX	C8.1 - 2
G4	CONCRETE HEADWALL	C8.3 - 6
G5	NORTH POND OUTLET STRUCTURE	C8.2 - 1
G6	SKEWED CONCRETE HEADWALL	C8.4 - 4

NOTES:
1. REFER TO SHEET C3.0 FOR NOTES.

PROPOSED GRADING & DRAINAGE LEGEND

- PROPOSED CONTOUR
- PROPOSED SPOT ELEVATION
- STORM STRUCTURE LABEL
- STORM PIPE
- SINGLE CURB INLET
- SINGLE CATCH BASIN
- JUNCTION BOX

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ENGINEERING CRUNK

STATE OF TENNESSEE

SUMMIT AT CARTERS STATION NORTH
PHASE 1 - CONTRACTOR SET

CARTERS CREEK STATION ROAD
MAURY COUNTY, TENNESSEE

REVISIONS		
No.	DATE	
1	11/29/22	
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3	2/21/23	
4	4/28/23	
5	6/8/23	
6	6/19/23	

02/27/23 21027

C6.4
DRAINAGE PLAN

C6.5
DRAINAGE PLAN

02/27/23
21027

REVISIONS	
No.	DATE
1	11/29/22
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3	2/21/23
4	4/28/23
5	6/8/23
6	6/19/23

SUMMIT AT CARTERS STATION NORTH
PHASE 1 - CONTRACTOR SET

CARTERS CREEK STATION ROAD
MAURY COUNTY, TENNESSEE

CRUNK ENGINEERING LLC
7112 CROSSROADS BOULEVARD
SUITE 201
BRENTWOOD, TN 37027
(615) 873-5795
WWW.CRUNKENG.COM

| STORM STRUCTURE TABLE | | |

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	Carter's Creek Station Road, Columbia, TN		
	TAX MAP: 41	GROUP:	PARCEL: 15.50
SUMMARY OF NATURE OF REQUEST AND WORK	This application is to approve the final plat for phases of Summit at Carter's West, Phase 1 A.		

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) Summit at Carter's West, Phase 1 A. ☒ Total Number of Lots 9 ☒ Total acreage 6.2 AC

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	T-Square Engineering	PHONE	615.678.8212
ADDRESS	1329 West Main St., Franklin, TN 37064	EMAIL	Allison.Corolla@T2-Eng.com

PROPERTY OWNER NAME	Pulte Homes Tennessee Limited Partnership	PHONE	629.867.8449
ADDRESS	100 Westwood Place, Suite 100 Brentwood, TN 37027	EMAIL	Jeremy.Brooks@PulteGroup.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.

Allison Corolla	*Allison Corolla*	9/18/2023
APPLICANT NAME	APPLICANT SIGNATURE	DATE
PULTE HOMES TENNESSEE LIMITED (JEREMY BROOKS) PARTNERSHIP		09/18/23
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	

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.

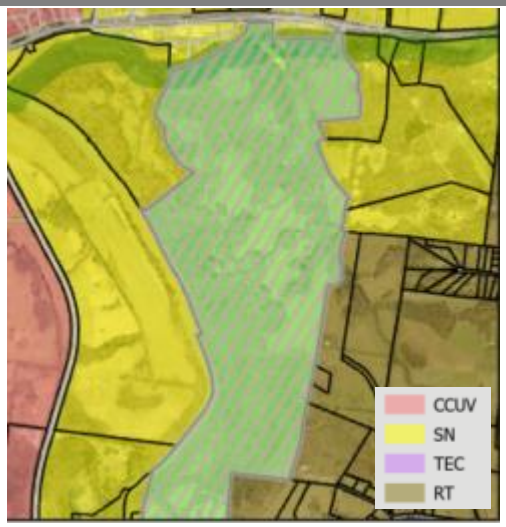
- The applicant proposes a customized set of standards which deviate from the PUD-R standards and offers justification for each deviation.
- The Architectural Design Review Team evaluated proposed elevations and made a recommendation to the Planning Commission. The recommendation includes deviations 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

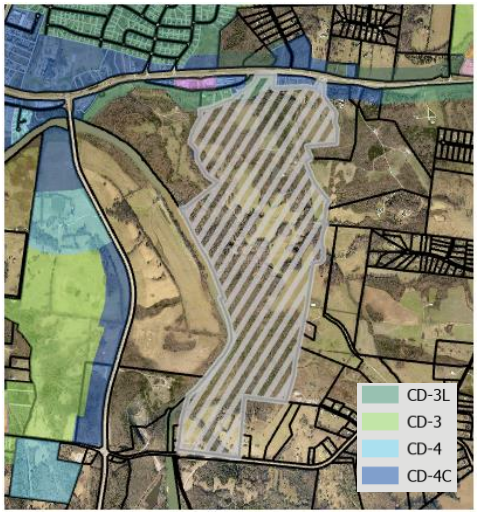
CURRENT ZONING	EXISTING USE	EXISTING IMP.	LAND AREA
Unincorporated	Vacant	Various Structures	+/- 409.92



FUTURE LAND USE MAP



ZONING MAP



SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	Suburban Neighborhoods	Unincorporated	Vacant
North	Suburban Neighborhoods	CD-3L/CD-4C	Single Family
South	Suburban Neighborhoods	Unincorporated	County Park
East	Suburban Neighborhoods	CD-3L/Unincorporated	Single Family
West	Rural Transition	Unincorporated	Single Family/Duck River

CONSISTENCY WITH CONNECT COLUMBIA

Suburban Neighborhoods: The requested CD-3L zoning is consistent with Connect Columbia. The intent of the Suburban Neighborhoods (SN) future land use is to enhance existing suburban areas and create new neighborhoods that will improve the quality of life in Columbia. Where appropriate, the SN future land use area also establishes mixed-use and commercial centers which serve residents' retail needs and provide a wider range of housing options. Each development parcel should add to Columbia's existing sense of place and extend the established form and pattern to create a more interconnected community. Future development should emphasize connectivity and continuity of the city as whole. The density and intensity of residential development increases in proximity to areas under the City Center Urban Village (CCUV) future land use classification. In the same way, density and intensity decrease in proximity to areas under the Rural Transition (RT) future land use classification. New development enhances pedestrian infrastructure with sidewalks and other multimodal routes. Public frontages may include sidewalks and street trees. Over time, new and infill development connects neighborhoods and community anchors such as libraries, neighborhood centers, health facilities, retail uses, parks, and schools. The future land use classification is usually implemented by the CD-3L and CD-3 character districts, as well as PUDs. CD-4C is also an appropriate zone where the subject property is accessed by an arterial roadway.

Character & Intent

The intent of the Suburban Neighborhoods (SN) future land use is to enhance existing suburban areas and create new neighborhoods that will improve the quality of life in Columbia. Where appropriate, the SN future land use area also establishes mixed-use and commercial centers which serve residents' retail needs and provide a wider range of housing options. Each development parcel should add to Columbia's existing sense of place and extend the established form and pattern to create a more interconnected community. Future development should emphasize connectivity and continuity of the city as whole. The density and intensity of residential development increases in proximity to areas under the CCUV future land use classification. In the same way, density and intensity decrease in proximity to areas under the Rural Transition (RT) future land use classification. New development enhances pedestrian infrastructure with sidewalks and other multimodal routes. Public frontages may include sidewalks and street trees. Over time, new and infill development connects neighborhoods and community anchors such as libraries, neighborhood centers, health facilities, retail uses, parks, and schools.

Land Use Considerations

The primary land use is low-density detached housing. Along arterial roadways, primary uses may include offices, retail, and all forms of medium-density housing. Secondary land uses include accessory dwellings, two-family homes, civic uses, institutional uses, schools, religious facilities, utility facilities, parks and open space. New industrial and warehouse uses are inappropriate.



Form & Pattern

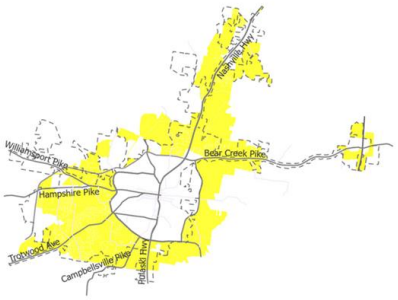
The SN future land use area is characterized by the organization of the built environment to extend a succession of large-lot neighborhoods and compact walkable neighborhoods. Development parcels extend established neighborhood patterns. Leap-frogging development is inappropriate. The SN future land use is distinguished from RT in the organization of lots and thoroughfares to form blocks. Physically separated developments which do not extend established block formation and roadway networks are inappropriate. The density of streets and blocks increases with proximity to CCUV and community anchors. Implementing bulk and design standards loosely delimit the public and domestic realms though the application of layers and front-to-back discipline of lots. Along arterial roadways, commercial corridors of varying intensities emerge over time with a high-quality built environment typified by a mix of building types and a balance between automobile-oriented and pedestrian-oriented design. The physical intensity of development along arterial corridors varies based on the surrounding residential density and the roadway's place in the transportation network. New development should accompany concurrent extension of complete urban services. Parking is provided on-site by private land users, supplemented by on-street spaces.

Implementing Districts

Neighborhood-Large Lot CD-3L
Neighborhood CD-3
General Urban-Corridor CD-4C (only along Arterial roadways)
Manufactured Home Park SD-MHP
Residential PUD PUD-R
Mixed Use PUD PUD-MU
Civic CV

Implementing Standards

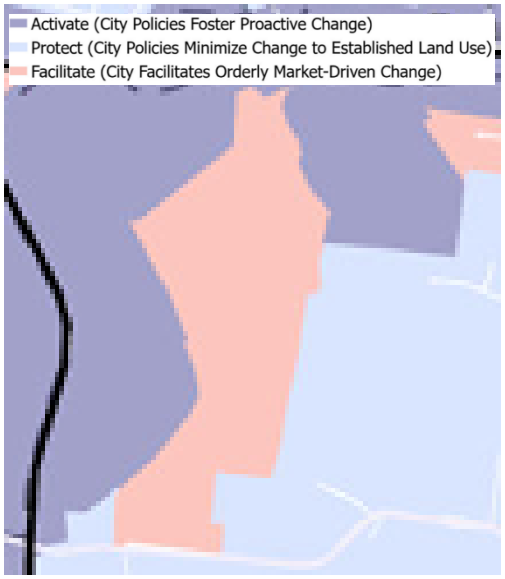
General Development Pattern: Mixed Uses & Isolated Uses
Density (density unites per ace): 4 - 24 du/ac
Building Height: 1 - 4 stories
Open Space Elements: Civic Spaces, Parks & Greenways





AREAS OF CHANGE POLICY

Connect Columbia established the Areas of Change Policy designation for the subject site as *Facilitate*. The classification indicates a basically neutral position to market-driven requests to amend the official zoning map. New and infill development should maintain or improve the level of service for municipal services. City policies facilitate change through a process of public deliberation and high standards for the built environment. (Connect Columbia p. 32).



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.

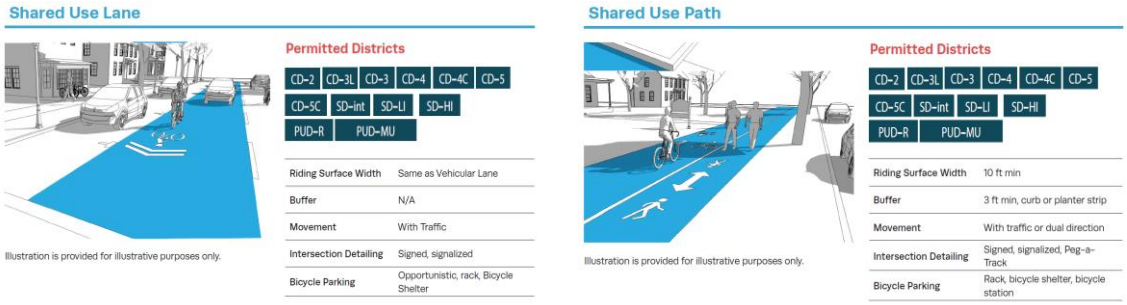
- Under **8.5.21.B.2.d**, the Planning Commission must determine that there are sufficient existing infrastructure, services, and utilities available to the site prior to Development.
  - The applicant obtained will-serve and availability letters from utility providers. Additional comments were identified 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.



- **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

- 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.

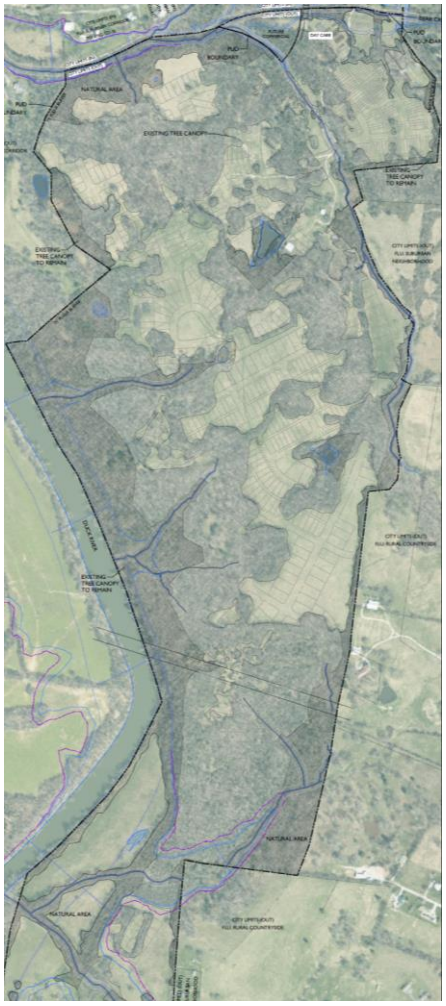
Tree Preservation

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).

- **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.

(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 or within view of same façade	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 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 or within view of same façade	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 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.

- 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

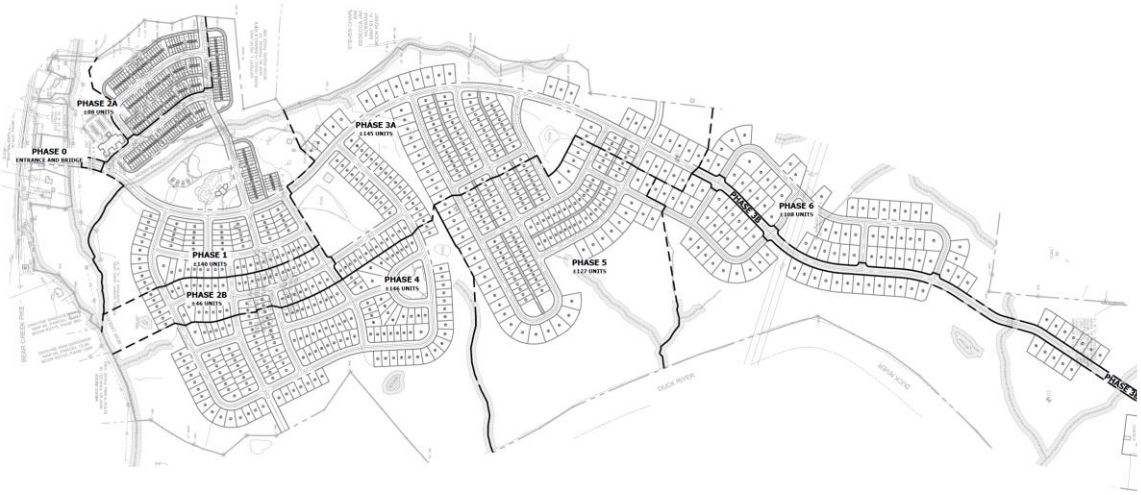
- **The Revised Final PUD Master Plan proposes a customized set of bulk and site standards which deviate from the prescriptive PUD-R standards in Table 4.3.1-K.**
- The prescribed and proposed standards are summarized in the table below. The applicant's proposed deviation are noted in **red**.

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.

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.

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.

COMMUNITY & ENVIRONMENTAL DEFENSE SERVICES

Richard D. Klein
24 Greenshire Lane
Owings Mills, Maryland 21117

410-654-3021
Help@ceds.org
ceds.org

April 5, 2024

Tina & Mark Seago
236 Bear Creek Pike
Columbia, Tennessee 38401

RE: Columbia Bluffs & Duck River Impacts

Dear Dr. & Mrs. Seago:

As you requested, I have reviewed the Columbia Bluffs project of concern to you and your neighbors. This review was based upon a number of documents as well as other sources cited below, including those listed on the Columbia Municipal Planning Commission agendas for March 13 and April 10, 2024 for Project 23-0414, *400 Bear Creek Pike being Tax Map 90 Parcel 12.01*, aka Columbia Bluffs.

From conversations with you and your neighbors, it is clear that a large number of Maury County and Columbia residents are troubled by the direction that annexations and rezonings have taken within the City of Columbia growth boundary. Among the aspects of this growth of concern to you and others is the apparent lack of responsible planning regarding aquatic resources, principally the Duck River. Therefore, the focus of this letter is the potential impact to the Duck River should the requested Columbia Bluffs annexation and rezoning be approved.

IMPACT SUMMARY

The 410-acre Columbia Bluffs site adjoins the Duck River at a point which is among the most ecologically diverse, sensitive and important sections of the entire river system. The site is also a mere 1.8-miles upstream of the city of Columbia water supply intake. Columbia Bluffs, as proposed, will degrade the quality of Duck River by:

- Reducing forest cover on the 410-acre site from the current 64% to 25% which will greatly diminish high-quality groundwater inflow to the Duck River,
- Exposing 200 acres of soil to the erosive effects of rainfall and runoff which will likely result in massive quantities of sediment laden stormwater discharging into the Duck River, and
- After construction an equally massive quantity of stormwater entrained nutrients and other pollutants would flow into the Duck River from the hundred acres of rooftops, streets, parking lots and other impervious surfaces.

The Environmental Protection Strategy in the applicant's December 18, 2023 PUD-R Justification and other submittals will not resolve the three categories of impact listed above. Further detail is provided in these comments regarding the science supporting the impacts and the reasons why proposed environmental protection measures will be inadequate. As a result, the project fails to

meet the findings required for the Planning Commission to recommend approval of the annexation and rezoning requested by the applicant.

COLUMBIA BLUFFS PROJECT

On the next page are maps from the Columbia Bluffs Architectural Review Team Submittal. On the left is the site as it currently exists and the right shows the site with the proposed development. The Columbia Bluffs project is proposed for a 409.92-acre site adjoining the Duck River.

In 2022, the Columbia/Big Bear Bluffs project (22-0078) was proposed for essentially the same site, though the area was given as 413 acres, and was proposed as 800 single-family detached homes, 300 townhomes, 300 multifamily units, and 4.1 acres of commercial development leaving 175-acres of open space of which only 58 acres will be forest.

The current Columbia Bluffs project would consist of 800 homes and a daycare facility. The Project Description and Site Data table on Sheet C2.0, of the Columbia Bluffs PUD-R Preliminary Master Development Plan & Annexation Request, noted that 262.4 acres of the is currently forest and only 101.5 acres of forest will remain after development.

While Columbia Bluffs will leave more forest compared to the 2022 proposal, the loss of forest will still have a severe impact to Duck River and the many beneficial uses the river supports as will be shown in these comments.

EXCEPTIONAL DUCK RIVER QUALITY MAKES COLUMBIA UNIQUE

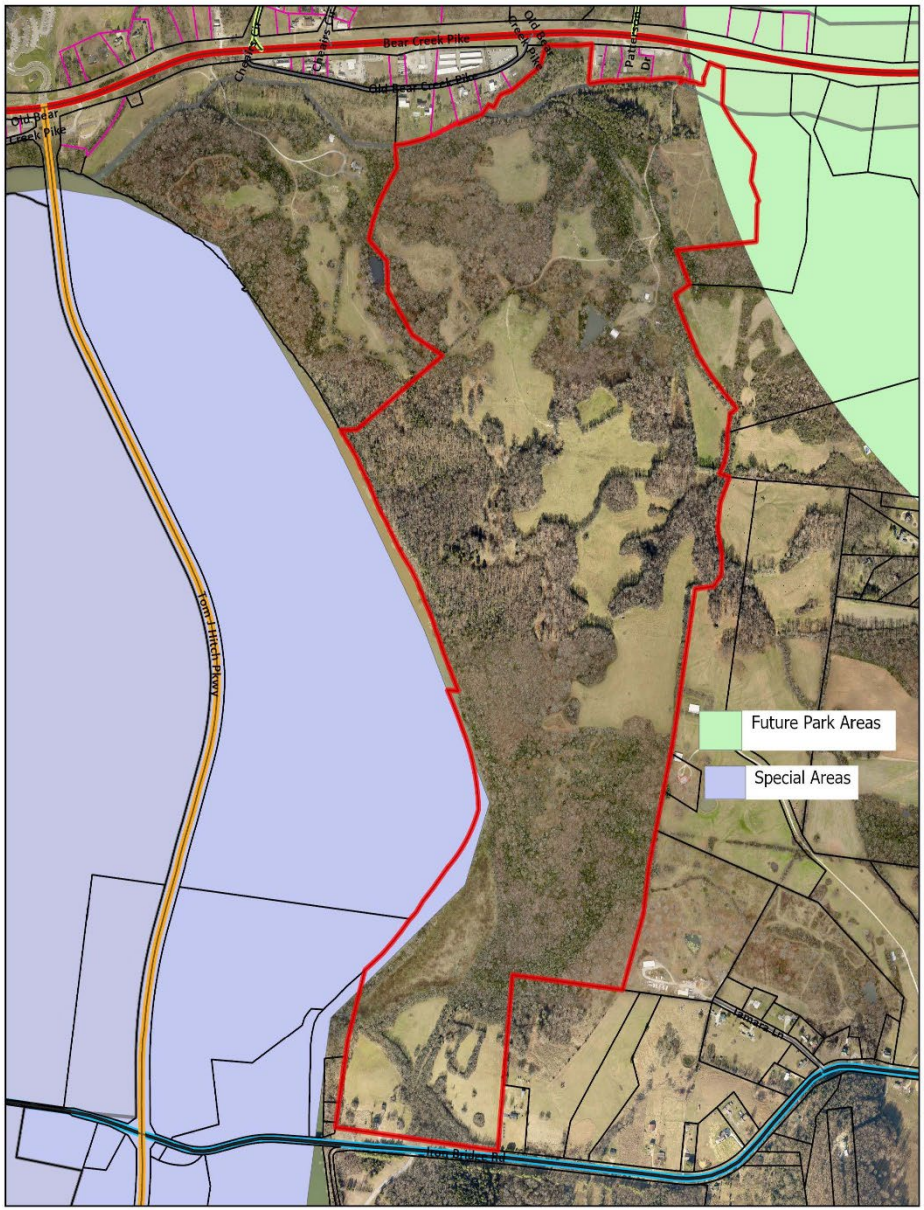
The 410-acre Columbia/Big Bear Bluffs site includes 1.25-miles of the Duck River shoreline. The site is located 1.8-miles upriver of the Old Columbia Dam where water is withdrawn by the Columbia Power & Water Systems for consumption by Columbia area residents and others.

The Duck River has been designated *Exceptional Waters* by the Tennessee Department of Environment and Conservation (TDEC).[1] Perhaps the most succinct definition of "Exceptional Waters" is that which appears in the Tennessee General Water Quality Criteria:

"waters with outstanding ecological, or recreational value".[2]

The U.S. Fish & Wildlife Service (USFWS) Information for Planning & Consultation (IPaC)[3] website lists a number of threatened or endangered species for the Duck River system. Of these species, nine are clams (mussels). At first, one might question the importance of species as humble as a mussel. But keeping the Duck River mussel populations healthy also keeps the River clean as a drinking water source for Columbia area residents and suitable for the many aesthetic and recreational benefits the Duck River provides. Mussels feed by filtering particles from the River and

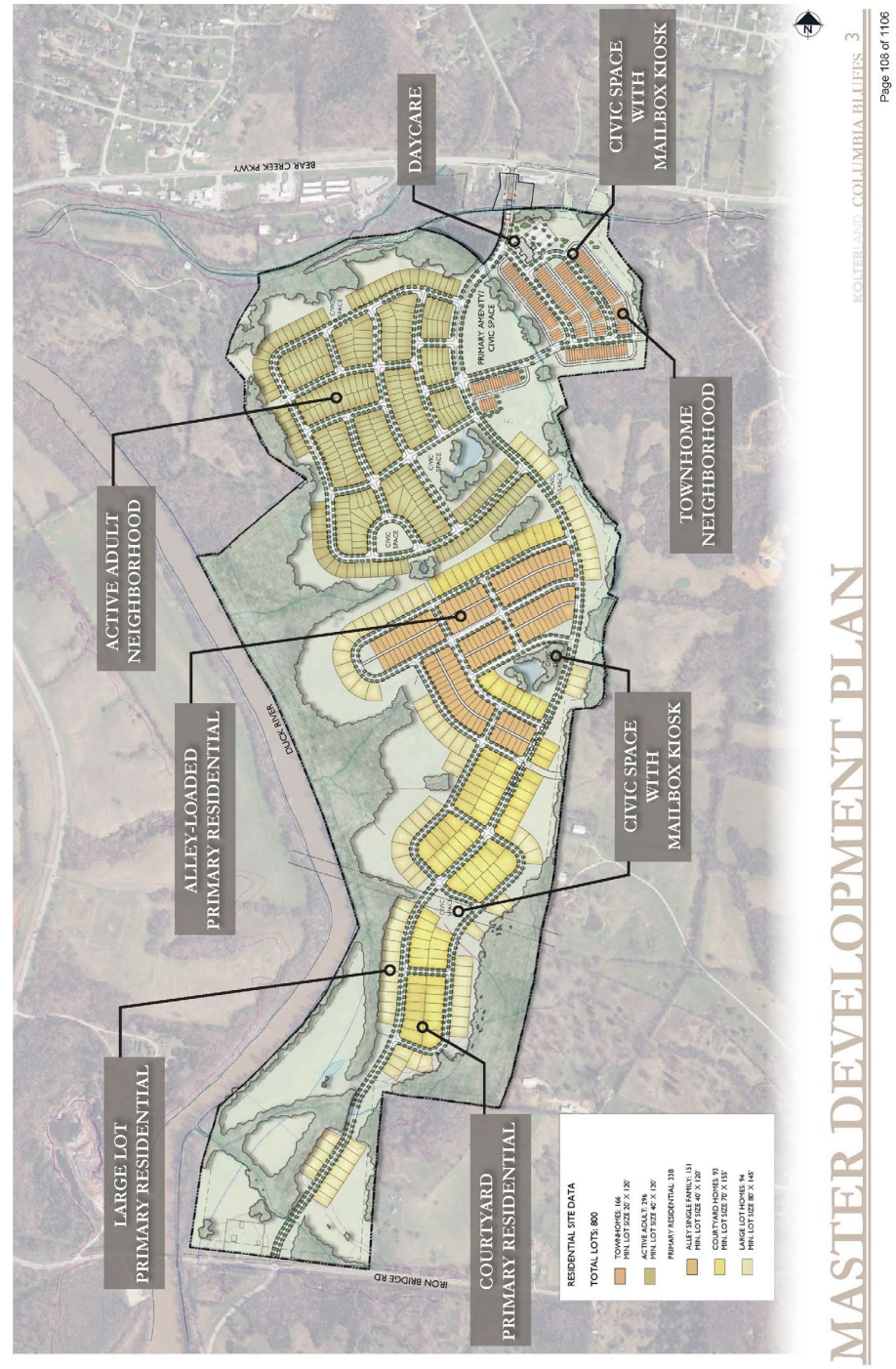
[1] The portions of the Duck River system designated Exceptional Tennessee Waters are defined in the spreadsheet available online at: https://dataviewers.tdec.tn.gov/pls/enf_reports/f?p=9034:34304:4364479562473527
[2] See Rule 0400-40-03-.06(4) Antidegradation Statement available online at: https://publications.tnsosfiles.com/rules/0400/0400-40/0400-40-03.20190911.pdf
[3] The IPaC website is at: https://ipac.ecosphere.fws.gov/



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



thereby greatly improve water clarity while reducing pollutant concentrations. One could argue that the Duck River would not be Exceptional Tennessee Waters were it not for the tremendous mussel populations.

A landmark study was published in 2017, *Historical and Current Examination of Freshwater Mussels (Bivalvia: Margaritiferidae: Unionidae) in the Duck River Basin Tennessee, U.S.A.*[4] The eight researchers who coauthored this164-page study based their conclusions on mussel populations at 112 locations along the Duck River and tributary streams. The researchers also compared current mussel populations with those dating back to 1922.

A basic ecological concept is that the greater the number of species (species richness) the healthier and more stable a population and ecosystem. Table 6, on page 23, of the 2017 study shows 15 mussel species at Columbia Dam in 1922, then 29 by 1965, and 33 in 2002.

The authors attributed this dramatic recovery in Duck River water quality, as indicated by mussel species richness increases, to:

- Wastewater treatment improvements made by Columbia and other Duck River basin cities,
- Improvements in chemical and manufacturing wastewater treatment,
- Increases in minimum river flows thanks to TVA's Reservoir Release Improvement program,
- Improved farming practices that reduced erosion and sediment pollution as well as diminishing pesticide releases, and
- Designation of the Duck River as a State scenic river in 2002.

Table 4, on page 21, of the 2017 study, compared mussel species richness at four low-head dams on the Duck River: Hardison Mill Dam, Lillard Mill Dam, Old Columbia Dam, and Shelbyville Dam. Species richness was highest at the Old Columbia Dam site which is where water for Columbia area residents is withdrawn. This point is 1.8-miles below the Columbia/Big Bear Bluffs site. One might say that the portion of the Duck River along the Columbia/Big Bear Bluffs site and down to the Columbia water intake is the healthiest based on mussel species richness.

So, what does all this means for City and other area residents in the context of the Columbia Bluffs project? Well, with regard to the success of the City, Maury County and Tennessee in restoring the river, the authors wrote on page 100:

> *"Recovery of mussel resources in the Duck River as reported here is* ***unprecedented.****"* [emphasis added]

And on page 97, of the 2017 study, the authors also wrote:

[4] This study is available online at: https://lsa.umich.edu/content/dam/ummz-assets/ummz-docs/MR4546/2 Ahlstedt et al Duck River.pdf

"By all accounts the Duck River has the greatest mussel species richness of any tributary system throughout the United States."

The uniquely high quality of the Duck River is not just a fact recognized by a few scientists. In February, 2022, Nashville Channel 2 station WKRN ran a segment entitled: *The Duck River is the 'most bio-diverse river in North America'*. This televised segment and the accompanying article can be viewed at: https://www.wkrn.com/special-reports/hidden-tn/the-duck-river-is-the-most-bio-diverse-river-in-north-america/

Visit Columbia Tennessee has devoted a webpage to the Duck River as a way to attract more tourism dollars to the area: https://www.visitcolumbiatn.com/about/duck-river/.

I believe that Columbia may be one of very few cities in the U.S. that has such a high-quality river flowing through its center. Because of its uniquely high quality, the Duck River and its mussel populations enhance Columbia quality of life in many ways, including the provision of a high-quality public water supply and a multitude of tourism and recreational opportunities.

It is for these reasons that it is imperative that growth, such as that proposed for the Columbia Bluffs site, be managed to preserve and enhance Columbia area quality of life for current (and future) residents in ways that also preserve - perhaps further enhancing – Duck River quality.

POTENTIAL COLUMBIA BLUFFS DUCK RIVER IMPACTS

While it is theoretically possible to intensely develop the 410-acre Columbia Bluffs site without damaging the Duck River, this is highly unlikely given site soil constraints and the current state of aquatic resource protection.

In 1979, I published what has been called one of the first studies of the relationship between watershed development and aquatic resource health: *Urbanization & Stream Quality Impairment*.[5] Perhaps one of the best compilations of all the research that followed my 1979 study is *Impacts of Impervious Cover on Aquatic Systems*, by the Center for Watershed Protection.[6]

Transforming the land area draining to a river – the watershed – from farm and forest to homes, buildings, streets, parking lots and other *impervious surfaces* begins degrading highly-sensitive aquatic ecosystems when as little as 2% of a watershed is rendered impervious. Other waters will not exhibit significant, adverse effects until 8% to 10% of a watershed is impervious. Most aquatic life will be eliminated when a fourth (25%) of a watershed is covered with buildings, streets and other impervious surfaces.

The Columbia Bluffs site is presently less than 1% impervious. With the proposed 800 housing units and day care center, the site could become 25% impervious. However, the Duck River watershed has an area of 1,195-square miles by the time it reaches the Tom J. Hitch Parkway bridge just downriver of the site. The 410-acre Columbia Bluffs site occupies a mere 0.05% of that massive watershed. While normally development of the site would have little effect on a waterway with such

[5] This paper is available online at: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1752-1688.1979.tb01074.x
[6] This publication is available online at: https://owl.cwp.org/mdocs-posts/impacts-of-impervious-cover-on-aquatic-systems-2003/

a massive upriver drainage area, other factors magnify the potential impact of this one annexation-rezoning proposal. These factors are associated with the following four categories of aquatic resource impact resulting from development:

- Loss of riparian (riverside) forest,
- Loss of upland forest,
- Construction phase soil erosion and sediment pollution, and
- Post-construction stormwater runoff and loss of groundwater recharge.

Riparian Forest

There is a large body of research documenting the need to maintain forest and other undisturbed native vegetation along stream or river banks. One of the more comprehensive studies documented that to maintain good to excellent aquatic resource quality, forest must be preserved for 100 feet back from each bank and this buffer must exist along a minimum of 70% of the length of a stream or river.[7]

The City of Columbia *Aquatic Buffer Regulations* call for a minimum 60-foot buffer along streams or rivers designated Exceptional Tennessee Waters, such as the portion of the Duck River adjoining the Columbia Bluffs site.[8] The regulations also call for expanding the buffer to include the 100-year floodplain.

On the next page are two aerial photos from the Tennessee Property Viewer Site: https://tnmap.tn.gov/assessment/. The aerial on the left (on the next page) shows the 410-acre Columbia Bluffs site. The middle aerial then shows the portion of the site within a 100-year floodplain. The right-hand image is from the applicant's Architectural Review Team Submittal and shows that a large portion of the 100-year floodplain will be kept in undisturbed forest. Except for a small portion, the Architectural Review excerpt shows that most of the forest buffer will extend at least 100 feet back from the Duck River bank top.

While the applicant is to be commended for proposing to preserve this extensive riparian forest, a buffer alone is not sufficient to counteract the negative impacts from construction phase sediment pollution or post-construction impervious surface runoff. Buffers are only effective in controlling polluted runoff when it travels as a very shallow and slow-moving sheet flow across a forest floor. This sheet flow allows much of the runoff to soak into the soil and for pollution particles to be filtered by leaves, twigs and vegetation.

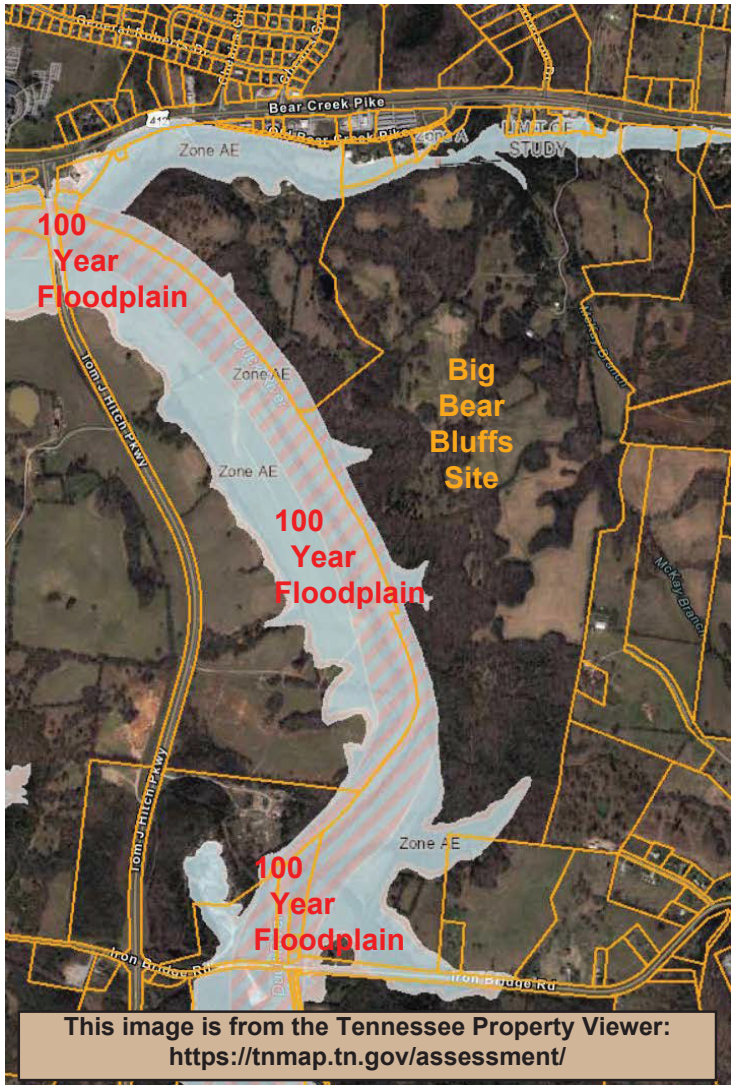
Both construction and post-construction runoff quickly forms into a deep, rapid channel flow that carries the full pollution load through a buffer to adjoining waters. Because of this, local, state and federal laws require the use of construction phase erosion and sediment control measures and post-construction stormwater management to minimize runoff pollution before it reaches a buffer or waterway.

[7] This study, *IKONOS imagery for resource management: Tree cover, impervious surfaces, and riparian buffer analyses in the mid-Atlantic region* is available online at: https://www.sciencedirect.com/science/article/pii/S0034425703002414

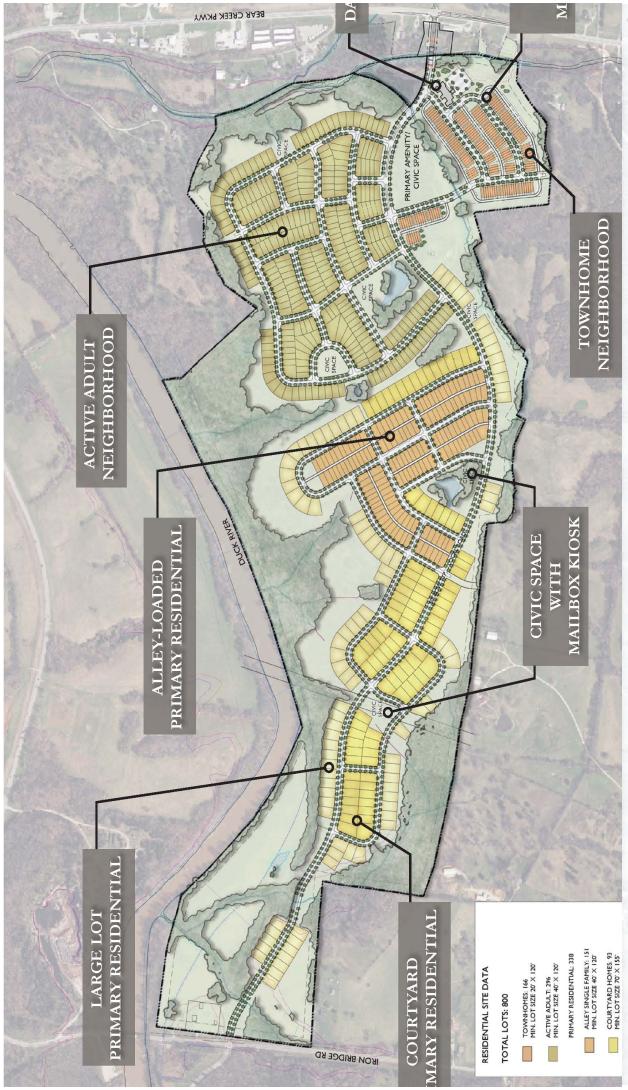
[8] The regulations are available online at: https://www.columbiatn.com/documentcenter/view/2129



This image is from the Tennessee Property Viewer:
https://tnmap.tn.gov/assessment/



This image is from the Tennessee Property Viewer:
https://tnmap.tn.gov/assessment/



Loss of Upland Forest

As noted on the first page of these comments, the applicant's documents shows that 64% (262.4 acres) of the 410-acre Columbia Bluffs site is currently forest. Forest above the floodplain and throughout watershed uplands is of equal and perhaps greater importance to the Duck River ecosystem health when compared to riparian (riverside) forest.

When rain falls upon a forest it is intercepted by leaves, branches, and other tree structures then settles upon a leaf-covered forest floor. This interception greatly increases the amount of rain (or snowmelt) that soaks into the forest soils. As this infiltrating water passes through the soil much of the air pollution it contains is removed. Over a period of weeks or months the infiltrated water cools as it travels through the soil and underlying geology to enter wetlands or waterways via springs or seeps. This high-quality groundwater inflow is what allows the Duck River to achieve the distinction of having…

"… the greatest mussel species richness of any tributary system throughout the United States."

So how much forest must remain on the Columbia Bluffs site to keep high-quality groundwater flowing into Duck River? One study indicated that about 50% a watershed should remain in forest to maintain good to excellent aquatic resource health.[9]

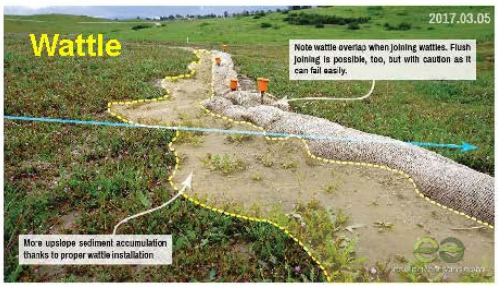
Sheet C2.0, of the Columbia Bluffs PUD-R Preliminary Master Development Plan & Annexation Request, showed that of the 262.4 acres of the site which is currently forest, only 101.5 acres of forest will remain after development. To put this loss in context, forest cover on the site will decline by 161 acres and go from 64% of the site to just 25%, which is far below the 50% threshold for a good to excellent quality river.

Construction Phase Soil Erosion & Sediment Pollution

Studies conducted in the 1960s, before the advent of modern erosion and sediment control, determined that the eroded soil and resulting sediment pollution released from a single construction site could damage up to three miles of downstream waters with recovery taking up to a century.[10]

Since the early 1970s, contractors have been required to use erosion and sediment control measures to minimize soil erosion and the release of sediment laden runoff into nearby waters.







[9] This study, I*KONOS imagery for resource management: Tree cover, impervious surfaces, and riparian buffer analyses in the mid-Atlantic region* is available online at: https://www.sciencedirect.com/science/article/pii/S0034425703002414

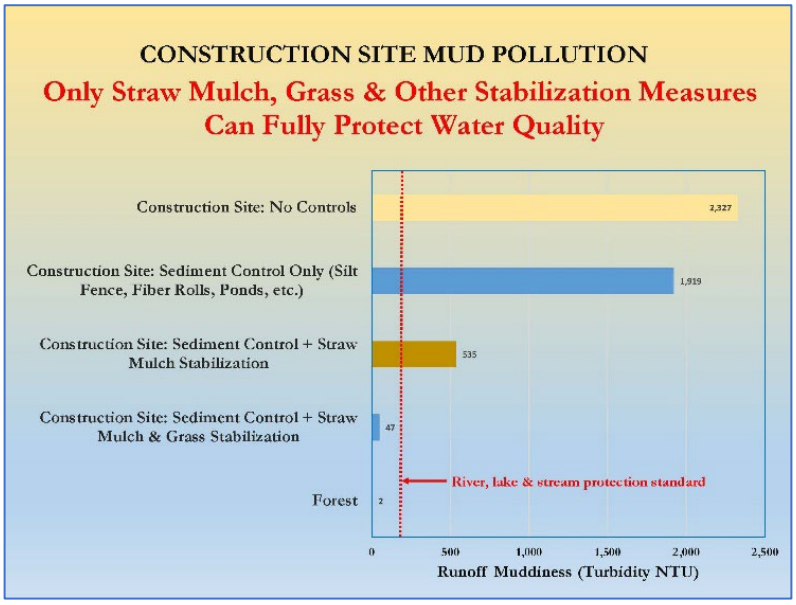
[10] For an example of these 1960s studies see *Effects of construction on fluvial sediment, urban and suburban areas of Maryland*: https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/WR003i002p00451

Measures that must be employed during construction in Tennessee are presented in the *Erosion and Sediment Control Handbook*.[11] The most common measures seen on construction site are the silt fence, wattle and sediment pond (basin) pictured above.

Soil is composed of gravel, sand, silt and clay size particles. While the measures shown above can be effective at keeping gravel, sand and larger silt particles from polluting nearby waters, they are far less effective in trapping smaller silt and clay sized particles. And it is these smaller particles which can be the most damaging to aquatic life, particularly filter-feeders like mussels.

Unfortunately, one cannot protect highly-sensitive aquatic species, such as mussels, unless these smaller particles are kept out of waterways. The sediment basin pictured above is quite muddy. The muddiness is likely caused by clay particles which take a long time to settle from suspension. During the most recent rain a large volume of clay sized particles likely flowed out of the basin and into a nearby waterway. Come the next rain and runoff event, the clay discoloring the basin in the photo above will have been displaced and also discharged out into the nearest waterway.

The most effective way to prevent clays and other fine particles from leaving a site is to protect all exposed soils with a thick layer of straw mulch and then grass. Of course, it would make little sense to apply mulch or grass seed while a site is being cleared and graded, but once earth-moving has ceased and bulldozers have moved on, then all exposed soils could be protected with mulch and grass. Road or parking lots bed would be protected with a base course of stone.



Turbidity is a measure of the clarity of water. The turbidity of construction site runoff is mostly caused by suspended clay particles. The graph to the left compares the turbidity of construction site runoff under four control measure scenarios. The vertical red line is a generally accepted turbidity threshold for protecting aquatic ecosystems. Note that only by protecting exposed soil with mulch and grass can one protect sensitive waters from the pollutional effects of construction site runoff.

Using recent (2022) Google Earth aerial photos, I examined several construction sites within the City of Columbia. Earth-moving equipment was not present on these sites. Clearly these sites had been brought up to rough grade weeks or months ago. Yet there was no evidence that these idle soils had been protected with straw mulch, grass or any other temporary stabilization measure. If

[11] The handbook is available online at: https://tnepsc.org/handbook.asp

existing sites are not being treated with measures needed to protect the highly-sensitive Duck River ecosystem, then it is unlikely that the Columbia Bluffs site will be. In fact, the Environmental Protection Strategy in the applicant's December 18, 2023 PUD-R Justification makes no mention of temporary stabilization.

A comprehensive, independent assessment should be made to determine if soils are being exposed to erosive forces long after the time when they should be protected with mulch and grass. An example of such an assessment is the CEDS *Greater Baltimore Construction Site Erosion Control Audit* I oversaw in 2015: https://ceds.org/wp-content/uploads/2019/06/2015GBSESPReport.pdf

The City should postpone annexation and upzoning of uniquely sensitive sites, like Columbia Bluffs, until all construction sites consistently benefit from effective use of mulch, grass and other stabilization measures once earth-moving has ceased.

Stormwater Runoff & Groundwater Recharge Loss

The following excerpt is from the Tennessee DEC stormwater permitting webpage:[12]

> *"Stormwater runoff is generated from rain and snowmelt events that flow over land or impervious surfaces, such as paved streets, parking lots, and building rooftops, and does not soak into the ground. The runoff picks up pollutants like trash, chemicals, oils, and dirt/sediment that can harm our rivers, streams, lakes, and wetlands."*

Converting a rural watershed to homes on small lots, as proposed for Columbia Bluffs, can increase the frequency and severity of flooding by a hundred-fold.[13] Those floodwaters can scour stream channels to a width two- to eight-times greater than that prior to development. Along with all that increased runoff comes a long list of pollutants including nutrients and a number of others that are toxic to aquatic life.

Additionally, much of that runoff is rainwater that had soaked into the soil prior to development. Covering soils with buildings, roads and other impervious surfaces prevents this *groundwater recharge*. It is recharge that accounts for the high-quality water that enters streams and rivers from springs and seeps long after a storm has passed. In fact, during droughts all of the high-quality water carried by a river derives from groundwater recharge.

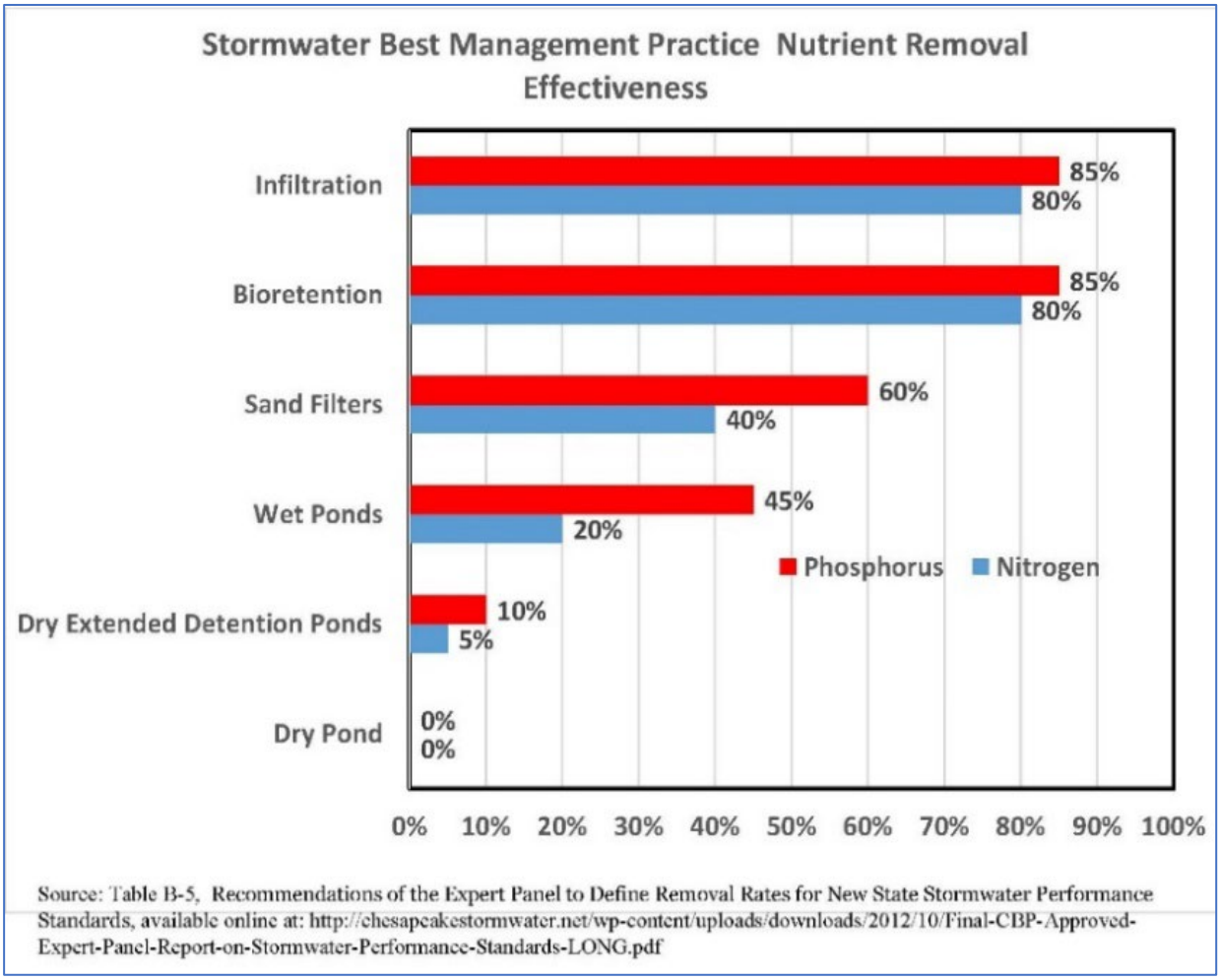
As with erosion and sediment control, efforts to manage stormwater from developed lands began in the 1970s. Today, the *Tennessee Permanent Stormwater Management And Design Guidance Manual* sets forth requirements to minimize adverse effects from proposed development projects like Columbia Bluffs.[14] The graph on the next page presents six categories of stormwater management

[12] See: https://www.tn.gov/environment/permit-permits/water-permits1/npdes-permits1/npdes-stormwater-permitting-program.html

[13] See *Urban Hydrology for Small Watersheds* at: https://nationalstormwater.com/urban-hydrology-for-small-watersheds-tr-55/

[14] The Tennessee Permanent Stormwater Management And Design Guidance Manual is available online at: https://tnpermanentstormwater.org/manual.asp

measures or *Best Management Practices* (BMPs) and the generalized effectiveness of each in preventing nutrients washed from rooftops, streets and lawns from reaching nearby waters.



Source: Table B-5, Recommendations of the Expert Panel to Define Removal Rates for New State Stormwater Performance Standards, available online at: http://chesapeakestormwater.net/wp-content/uploads/downloads/2012/10/Final-CBP-Approved-Expert-Panel-Report-on-Stormwater-Performance-Standards-LONG.pdf

A practice which is good at trapping nutrients is generally good at safeguarding waters from metals and other stormwater contaminants. But only infiltration and bioretention measures can maintain groundwater recharge at near predevelopment levels and achieve the highest pollutant removal. However, not all sites and soils are suitable for these highly-effective measures.

On the next page is Sheet C4.02 from the applicant's Columbia Bluffs PUD-R Preliminary Master Development Plan & Annexation Request. This sheet and three others show a number of areas labeled "DET." These DET areas appear to be proposed stormwater *detention* facilities.

The graph above shows that detention ponds only remove 5% to 10% of nutrients entrained in stormwater runoff. It is possible though that these DET areas could be converted to the more effective wet ponds and achieve 20% to 45% nutrient removal. Even if this is so, ponds only remain wet if runoff does not infiltrate into underlying soils. Therefore, the wet ponds would not maintain groundwater recharge at predevelopment levels. To resolve this very serious shortcoming, infiltration or bioretention facilities could be located throughout the site to achieve the much higher



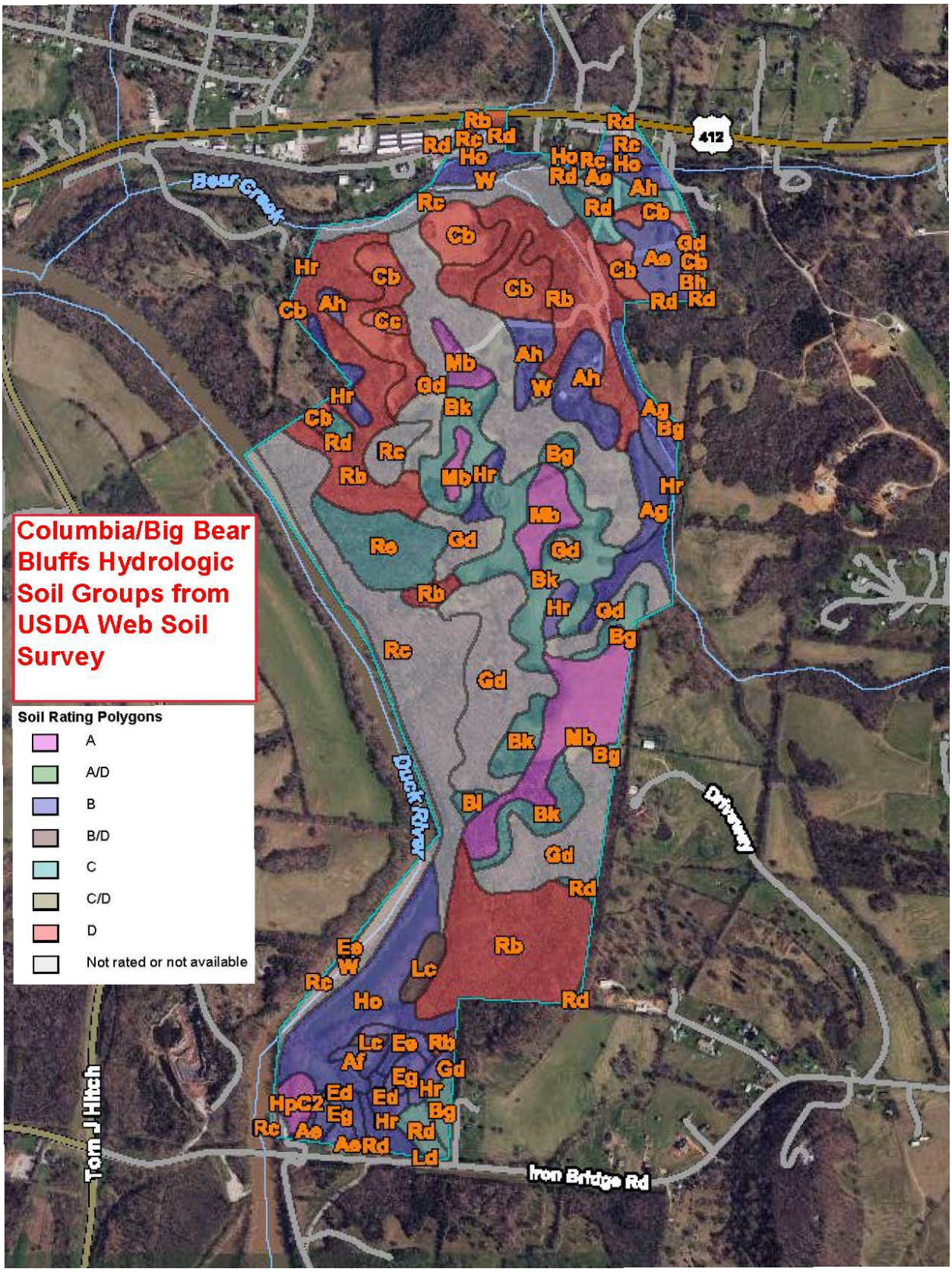
degree of pollutant removal as well as groundwater recharge. Unfortunately, soils on the 410-acre site appear mostly unsuited to these highly-effective measures.

Hydrologic Soil Groups (HSG) is a system for rating soils according to infiltration and runoff characteristics. The ratings range from "A" to "D". The sandy-gravelly HSG "A" soils produce the least runoff and allow the greatest amount of infiltration and groundwater recharge. The clayey or wet HSG "D" soils produce the greatest runoff with minimal infiltration and recharge.

HSG "A" and "B" soils are best for attaining the maximum pollutant removal and recharge benefits of infiltration or bioretention facilities. HSG "C" are marginal and "D" soils are unsuitable for infiltration-bioretention BMPs.

The map on the next page is from the USDA Web Soil Survey site.[15] The soils colored pink and dark blue belong to HSG "A" and "B". Of the 410-acre site, only 114 acres are on these HSG "A" and "B" soils. Because of the paucity of permeable soils, the Columbia/Big Bear Bluffs site is mostly unsuited for the highly-effective stormwater BMPs essential to preserving highly-sensitive aquatic ecosystems such as the Duck River.

[15] The USDA Web Soil Survey is at: https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm


Columbia/Big Bear Bluffs Hydrologic Soil Groups from USDA Web Soil Survey
Soil Rating Polygons
A
A/D
B
B/D
C
C/D
D
Not rated or not available
Bear Creek
Duck River
Driveway
Tom J Hitch
Iron Bridge Rd
412

COLUMBIA BLUFFS RECHARGE & COLUMBIA WATER SUPPLY

It appears that the 2015 *Maury County Regional Water Supply Strategic Plan*, drafted by the Tennessee Duck River Development Agency, may be the most recent, comprehensive examination of Columbia area water supply conditions.[16] Table 2, below, appeared on page 6 of the report, and shows progressively worsening drought-year water shortages in the coming decades.

Table 2. Current and projected water supply deficits at Columbia for the Duck River

Deficit	2010	2020	2030	2040	2050	2060
Potential water supply deficit at Columbia based on critical drought year of record and maintenance of 100 cfs at Duck River Mile 132.8 (MG)	300	500	700	900	1150	1400
Potential water supply deficit at Columbia based on critical drought year of record and maintenance of 100 cfs at Duck River Mile 132.8 (mgd)	4	10	15	21	27	32

The competition for limited water resources in the Duck River basin is becoming increasingly intense. Perhaps nothing exemplifies the growing tension more than the lawsuit filed by the Marshal County Board of Public Works last August. The suit sought to overturn a permit decision by the Tennessee Department of Environment and Conservation (TDEC) that included protective Duck River flow restrictions.

The Southern Environmental Law Center supported the TDEC decision on behalf of the Nature Conservancy and the Tennessee Wildlife Federation. Both organizations viewed the flow restrictions as essential to balancing water supply needs with those of the highly-sensitive aquatic communities inhabiting the Duck River. Of course, Marshal is the next county upriver of Maury County and Columbia.

I understand the suit was settled a couple of years ago. It is also my understanding that the settlement included launching the Duck River Pilot Project, the goal of which is to take a comprehensive look at options for providing the water needed by existing and future residents and other users while keeping enough flow in the Duck River to preserve its very diverse and important ecosystem along with the many recreational uses it supports.

COLUMBIA BLUFFS RECHARGE & WATER INFLOW UNIQUELY IMPORTANT

As previously mentioned, Columbia Bluffs occupies a mere 0.05% of the Duck River watershed at the Columbia water intake 1.8 miles downriver of the site. Though the 410-acre site may seem insignificant when compared with the massive watershed, the groundwater recharge then inflow from the site could become of far greater significance come future droughts.

According to Table 2, in the U.S. Geologic Survey report *Recharge Rates & Aquifer Hydraulic Characteristics For Selected Drainage Basins In Middle & East Tennessee*, an average of 4.8 inches of

[16] The Maury County Regional Water Supply Strategic Plan is available online at: https://webgen1files1.revize.com/theduckriveragencytn/Document%20Center/Projects%20and%20Programs%20Programs/Maury%20County%20Strategic%20Plan%20Report.pdf

recharge occurs annually in the Columbia portion of the Duck River watershed.[17] For the 410-acre Columbia Bluffs site, 4.8 inches of annual recharge works out to nearly 54 million gallons of groundwater recharge per year.[18] This also means nearly 54 million gallons/year of high-quality inflow to the Duck River. This recharge and inflow enter at a point less than two miles upriver of the Columbia water supply intake.

The next major Duck River water withdrawal point is 32 miles upstream of Columbia at the Spring Hill Water Department intake. During a drought, the groundwater recharge and inflow stemming from forest and other open lands along the 32 miles of river between the Columbia and Spring Hill intakes would be of far greater importance. The Columbia Bluffs site occupies 1.25 miles or 2% of the 64 miles (32 miles for each of two banks) of shoreline between the Columbia and Spring Hill intakes.

Given this 2%, the potential importance of the high-quality inflow from the site becomes far greater when contrasted with the 0.05% of the watershed it occupies, particularly in light of how near the site is to the Columbia intake. For this and many other reasons, the City of Columbia should safeguard these immediately upriver lands within the growth boundary from large-scale forest removal and intense development.

COLUMBIA BLUFFS MOST SENSITIVE PORTION OF COLUMBIA GROWTH AREA

The map on the next page is from the 2023 *Connect Columbia* comprehensive growth plan.[19] I added Columbia Bluffs site and the Columbia Duck River water supply intake labels to the map.

Note that Columbia Bluffs is one of very few parcels within the Growth Boundary located upriver of the water supply intake and along the portion of the River with the highest mussel species richness based on the 2017 study referenced on page 3, of these comments. Given the close proximity of the site to these highly-sensitive features and the poor suitability of the site for highly-effective stormwater protection measures, this 410-acre site is arguably the last area within the Growth Boundary that should be considered for annexation and upzoning.

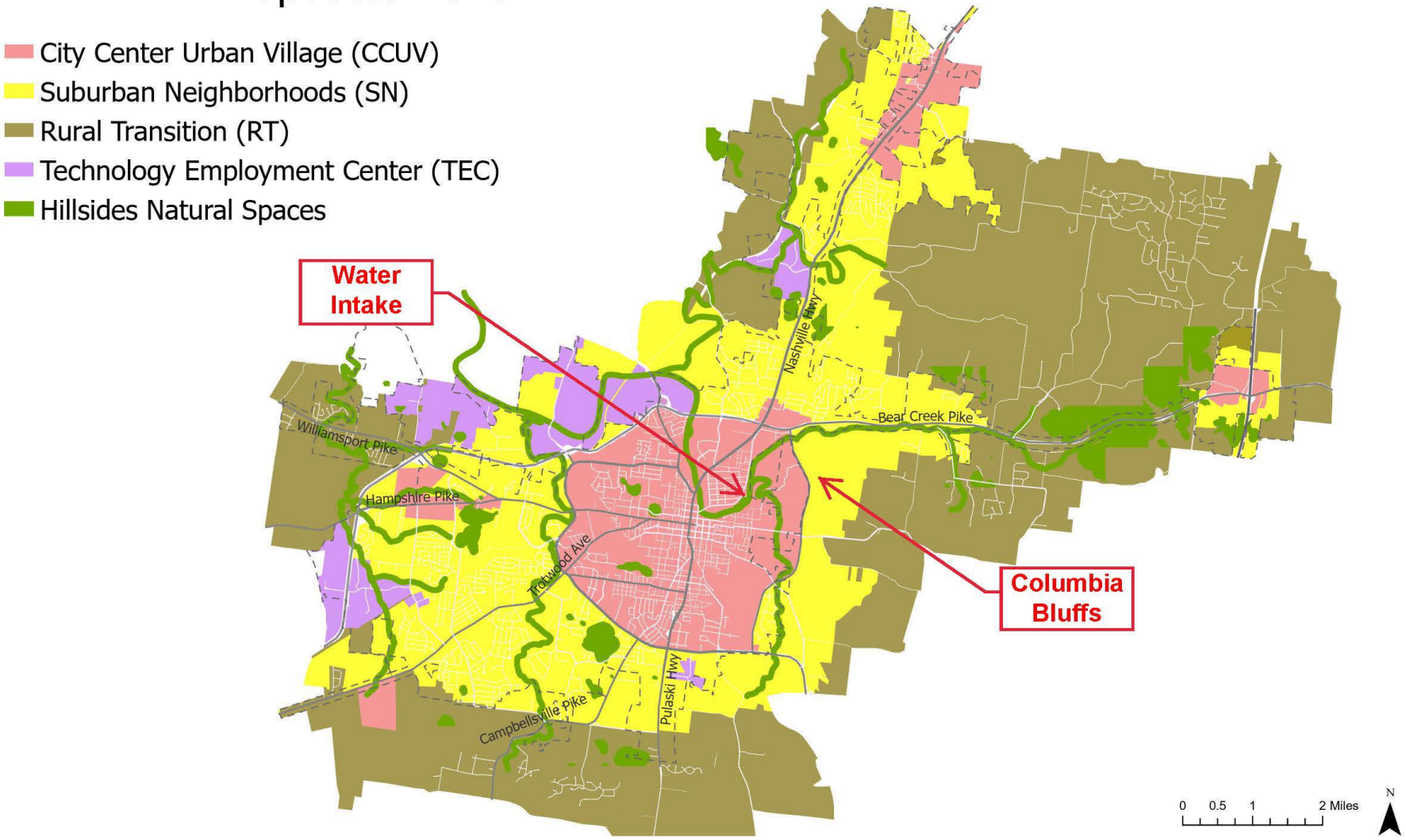
Instead, the City of Columbia should consider the value of amending Future Land Use Map and the comprehensive plan to switch the 410-acre site from the current Suburban Neighborhood future land use designation to Rural Countryside. Consideration should also be given to establishing a new Conservation category, which is used by many local jurisdictions throughout the U.S.

[17] The report Recharge Rates & Aquifer Hydraulic Characteristics For Selected Drainage Basins In Middle & East Tennessee is available online at: https://www2.tntech.edu/wrc/DuckRiverManual/wrir_90-4015.pdf

[18] 4.8 inches of recharge/year ÷ 12 = 0.4 feet of recharge/year x 43,560 square feet/acre = 17,424 cubic feet of recharge/acre/year x 413 acres = 7,196,112 cubic feet of recharge/year x 7.48 gallons/cubic foot = 53.8 million gallons of recharge/year for the 413-acre Big Bear Bluffs site.

[19] Connect Columbia is available online at: https://www.columbiatn.com/DocumentCenter/View/3054/Connect-Columbia-Adopted-February-2024

Connect Columbia Future Land Use Map
Updated 2023



Some of the provision essential to allowing a reasonable amount of development on lands designated Conservation while preserving ecological benefits, could include:

- Preserving at least half the site as forest,
- Minimum 100-foot forest buffers along all waters,
- Uses would be restricted to residential or other low-intensity uses,
- Buildings would be clustered so runoff would flow to soils suited to highly-effective stormwater BMPs, like infiltration and bioretention, and
- Buildings would be served with wells and advanced treatment septic systems; not public water-sewer.

COMPREHENSIVE PLAN AMENDMENT-REZONING CRITERIA NOT MET

Sections 3.18.7 and 3.19.6, of the City of Columbia Zoning Ordinance[20], lists criteria the Planning Commission is to use in reviewing then making recommendations regarding a comprehensive plan amendment and a rezoning request. The following analysis pertains to criteria relevant to the adverse impacts to the Duck River documented in these comments. The staff report and the other documents posted on the Planning Commission's March 13th and April 10th agendas were mostly silent with regard to these impacts.

Comprehensive Plan Amendment

Section 3.19.6, lists four criteria for reviewing the Columbia Bluffs comprehensive plan amendment request. The probable adverse effects of the project to the Duck River fails to meet two of these four criteria.

A. Whether the proposed change would be consistent with the intent, goals, objectives, policies, guiding principles and programs of any adopted plans;

The Columbia's Land Use Plan[21] section of the Connect Columbia comprehensive plan[22] includes the following text relevant to the potential Duck River impacts of the Columbia Bluffs project:

Page 6: The natural environment, that is, the environment existing prior to urban development or related disturbance, often has a significant impact to the pattern of land-use and development in a community. Simply put: all development occurs within a natural environment, and that environment imposes constraints and limitations on all development. Ignoring these factors can prove to be extremely costly to specific property owners and to the community as a whole.

With regard to the natural environment, the 2017 study referenced in these comments indicated that the portion of the Duck River at and upstream of the Columbia water intake was the most ecologically diverse and sensitive portion of the river system. It is also the river section which would have the greatest effect on the quality of water withdrawn for consumption by Columbia area

[20] The Columbia zoning ordinance is available online at: https://www.columbiatn.com/documentcenter/view/167
[21] The Land Use Plan is available online at: https://www.columbiatn.com/DocumentCenter/View/186/Connect-Columbia---Land-Use-Plan-PDF
[22] The Connect Columbia plan is at: https://www.columbiatn.com/577/Connect-Columbia-Comprehensive-Plan

residents. The large area of forest on the 410-acre site provides high-quality inflow to this portion of the Duck River. These factors make the 410-acre parcel the most sensitive within the portion of Columbia Growth Boundary area adjoining the Duck River.

Much of the forest on the site will be removed if the Columbia Bluffs project is approved. While the use of highly-effective stormwater measures could resolve the loss of forest, most of the soils on the site are unsuited for these measures. Therefore, a dramatic increase in stormwater pollution and loss of groundwater recharge will result. Given the lack of use of highly-effective measures on existing construction sites, it is likely substantial clay-sediment pollution would also result from developing the Columbia Bluffs site.

It is for these reasons that amending the comprehensive plan to allow the Columbia Bluffs project will result in a very significant impact to the natural environment of that portion of the Duck River that is of greatest importance to the City and its residents.

Pages 9-10: The existing pattern of land-use within an area has a direct impact on the hydrology of an area. The more impervious surface an area has, the more severe the stormwater run-off problems become. In an area with troublesome drainage problems all community decision-makers should be sensitive, aware, and active about land use decisions and the direct hydrologic impacts of those decisions. Each new development should be thoroughly examined for its impact on the hydrologic system of the study area.

The Columbia Bluffs site lacks soils suitable to the highly-effective stormwater management measures essential to safeguarding the portion of the Duck River hydrologic system adjoining the site. The site contains the portion of the Growth Boundary area of greatest importance to the health, safety and welfare of City residents. The loss of so much forest adjacent to this portion of the Duck River and construction-phase clay-sediment pollution will compound the impact.

C. Whether the proposed change would create substantial adverse impacts in the adjacent area or the City in general;

For the reasons described above, the proposed change would cause substantial adverse impact to the adjacent area which is the portion of the Duck River of greatest importance to the City and surrounding residents.

Rezoning
Section 3.18.7B, of the City of Columbia Zoning Ordinance, sets forth the criteria the Planning Commission is to use in the review and formulating of recommendations regarding a rezoning request. The Columbia Bluffs rezoning request fails to meet the following criteria:

1. The rezoning is in agreement with the general plan for the area;

As explained above, the Duck River impacts resulting from the proposed rezoning are not in agreement with the Connect Columbia comprehensive plan.

3. 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;

The proposed rezoning will have a very substantial adverse effect on adjoining property owners and those in the larger area with minimal justifying benefits to the public good or welfare.

6. The availability of adequate school, road, parks, wastewater treatment, water supply, and stormwater drainage facilities.

Most of the soils on the site are unsuitable for the highly-effective stormwater drainage facilities needed to accommodate the intense development allowed by the rezoning. Therefore, rezoning would jeopardize the Columbia water supply.

Because of the numerous criteria Columbia Bluffs fails to meet, the Planning Commission should recommend denial of the Comprehensive Plan amendment and rezoning request. At the very least though, the Planning Commission should postpone a recommendation until the additional information in the last section of this letter becomes available.

NEED TO POSTPONE BIG BEAR BLUFFS ANNEXATION-UPZONING
A decision to annex then rezone the Columbia Bluffs site should be postponed until the:

- City studies the value of amending the Connect Columbia comprehensive plan with a Conservation category and including the Columbia Bluffs site in this category,

- The Duck River Pilot Project comprehensive analysis is completed and shows how continued growth in the watershed can be managed while balancing the needs of mussels and other uniquely important and sensitive ecosystem communities, and

- An independent study is carried out by independent, nonprofit watershed or other environmental organizations of construction sites in the Columbia area to determine if the use of highly-effective erosion and sediment control measures is as low as recent aerial photos indicate and, if so, changes are implemented that achieve a high degree of success in getting disturbed soils under a protective blanket of straw mulch and grass. An independent study example is at: https://ceds.org/wp-content/uploads/2019/06/2015GBSESPReport.pdf.

My resume accompanies this letter. I can be reached at 410-654-3021 or Rklein@ceds.org should you have any questions.

Sincerely,



Richard D. Klein

COMMUNITY & ENVIRONMENTAL DEFENSE SERVICES

Richard D. Klein
24 Greenshire Lane
Owings Mills, Maryland 21117

410-654-3021
Help@ceds.org
ceds.org

QUALIFICATIONS
LAND USE IMPACTS UPON
AQUATIC SYSTEMS

RICHARD D. KLEIN

EMPLOYMENT HISTORY

COMMUNITY & ENVIRONMENTAL DEFENSE SERVICES

1987-Present		President

MARYLAND DEPARTMENT OF NATURAL RESOURCES

1977-1987	Save Our Streams Program	Conservation Associate Natural Resources Manager
1973-1977	Water Quality Services Division	Conservation Associate
1969-1973	Anadromous Fish & Stream Survey Project	Conservation Aide Conservation Associate

EXPERT TESTIMONY ON THE EFFECTS OF LAND DEVELOPMENT UPON AQUATIC SYSTEMS

Though I am not certified as a biologist, chemist, engineer, or any other specific professional classification, my five decades of experience in evaluating the effects of land development upon aquatic systems have allowed me to qualify as an expert in circuit court, the Maryland Court of Special Appeals, and the following administrative bodies:

Jurisdiction/Decision-Making Body	Case
Anne Arundel Co., MD	
Board of Appeals	Back Bay Beach Project Chesapeake Terrace Rubble Landfill Woods Landing II
Baltimore Co., MD	
Board of Appeals	Eck Property Georges Transfer Greystone Golf Course Villa Julie College
Zoning Commissioner/Hearing Officer	Bridle Ridge Burns Property Glyndon Meadows Glyn Garth Greystone Golf Course Honeygo Rubble Landfill

Baltimore Co., MD *continued*	
	Locksley Conserve
	Magers Landing
Cecil Co., MD	
Board of Appeals	Old Line Village
Charles Co., MD	
Board of Appeals	St. Peters Church mining site
Board of County Commissioners	Chapmans Landing
District of Columbia	
Zoning Commission	Arkenderry Mews
Dorchester Co., MD	
Board of Appeals	Hunting Creek rubble landfill
Easton, CT	
Planning & Zoning Commission	Running Brook Farm
Conservation Commission	Running Brook Farm
Howard Co., MD	
Board of Appeals	Greenwood Place
	Prince Property
	Donaldson Funeral Home
Planning Board	Covenant Baptist Church
Kent Co., MD	
Board of Appeals	Eastern Shore Bible Church
Planning Board	Eastern Shore Bible Church
	Bramble Contractor Yard
King George Co., VA	
Board of Supervisors	Hopyard Farm
Circuit Court	Guest et al v. Board of Supervisors
Department of Environmental Quality	King George landfill
King County, WA	
Hearing Examiner	Beaver Lake Estates II
	Bordeaux at Beaver Crest
	Greens at Beaver Crest
	Norris Estates
Louisa Co., VA	
Board of Supervisors	Edgemar Rezoning Request
Martha's Vineyard, MA	
Martha's Vineyard Commission	Meeting House Golf Club
Maryland	
Office of Administrative Hearings	Villa Julie College
Maryland Wetlands Administration	Baldwins Choice
	Riddle Farm
Montgomery Co., MD	
Planning Board	Marriott/Milestone Project
	Residences at Great Falls
Zoning Hearing Examiner	VanGrack/McNeil Project
	Miller Property

Pilesgrove Township, NJ	
Planning Board	Point Airy Place
Prince George's Co., MD	
Planning Board	The Woodlands Project
	Schelford North Farm
Zoning Hearing Examiner	Cross Road Trail rubble landfill
	Villages of Belmont
Prince William Co., VA	
Planning Board	Waverley
Queen Anne' County, MD	
Board of Appeals	Days Cove Rubble Landfill
Board of County Commissioners	Rubble landfill zoning text amendments
Planning Board	Rubble landfill zoning text amendments
Saint Mary's Co., MD	
Board of Appeals	Cedar Cove Marina Boatel
	Persimmon Rubble Landfill
	Renie Quade Property
	Woods at Myrtle Point
Board of County Commissioners	County solid waste plan
	First Colony
	Planning Commission First Colony
	Willowbrook
	Woods at Myrtle Point
Tinicum Township, PA	
Board of Supervisors	Quarry Valley Country Club
Worcester Co., MD	
Board of Appeals	Captains Pointe
Board of County Commissioners	Captains Pointe
	Lighthouse Sound

EDUCATION

In 1973, I began pursuing a degree in environmental science so I could engage in professional level work within the Department of Natural Resources (DNR). After completing my first year of college it became apparent that DNR would permit me to perform professional level work regardless of academic credentials. At that point I elected to expand my knowledge of environmental science through independent study and the training provided through the Department. I did not complete a degree program.

EXPERTISE GAINED THROUGH EXPERIENCE & OBSERVATION

TRAINING

While working under the supervision of DNR chemists, biologists, engineers, and other professionals, I acquired expertise in a wide range of methods for assessing the physical, chemical, and biological characteristics of aquatic systems. These systems included freshwater streams and rivers, ponds, lakes, reservoirs, wetlands, tidal waters, and groundwater. Following is a summary of the specific assessment methods I learned how to employ:

- Collection of water samples for chemical and bacteriological analysis; operation of various water quality meters including those designed to measure dissolved oxygen, stream flow, tidal currents, specific conductance, turbidity, pH, chlorine, chloride, fluorescence, and water/air temperature. I also learned how to operate weather monitoring equipment, well sampling equipment, data loggers and recorders, and robot water quality monitors. I spent several months analyzing water samples for chemical and bacteriological parameters in the DNR laboratory.

- I was instructed in procedures for surveying streams, rivers, tidal waters, and lakes for factors which may affect fishery resources. These factors included pollution, discharges, stormwater runoff, erosion and sedimentation problems, fish migration barriers, sources of thermal pollution, stream shade and buffer deficiencies, livestock grazing effects and other agricultural impacts, construction site impacts, physical destruction of aquatic habitat, and a number of other factors. I employed these procedures in surveying nearly a thousand miles of Maryland streams, rivers, tidal waters and impoundments.

- I was also instructed in procedures for collecting and identifying fish, aquatic insects, crustaceans, aquatic plants (including algae), shellfish, and other aquatic organisms. I was taught how to assess the condition of individual organisms and to use aquatic communities to assess the health and condition of streams, lakes, tidal waters, and other aquatic systems.

- I learned how to study groundwater systems through monitoring wells and other methods. My responsibilities included sampling monitoring wells at landfills, sewage sludge disposal sites, wastewater treatment facilities, and other locations.

- I was also instructed on proper procedures for designing and conducting various studies of aquatic systems. This included sampling station selection, quality control/quality assurance, data analysis, and interpretation of data results based upon Maryland water quality standards and various other criteria. I was also instructed on the preparation of reports on the findings of studies of aquatic systems.

PROFESSIONAL RESEARCH & ACTIVITIES-DNR

While I was with the Water Quality Services Division, I studied the quality of stormwater runoff from developed lands. This experience included sample collection, laboratory analysis, study design, and interpretation of the results. In 1978, I conducted my first independent professional study, which focused on the relationships between land development and the health of aquatic systems. The paper addressed the effect of land development upon groundwater recharge and base flow, water temperature, pollutant loadings, channel erosion, and the overall relationship between percent impervious area and the health of fish and macroinvertebrate communities. The results of my study were published in the scientific journal *Water Resources Bulletin* (15(4):936-952) under the title of *Urbanization and Stream Quality Impairment*. This paper serves as the primary basis for percent impervious area limits found in the Maryland Chesapeake Bay Critical Areas law and many local land use laws. My paper also served as one of the primary justifications for the two-acre lot exemption contained in the Maryland Stormwater Management regulations.

- I developed a method for quickly assessing the health of freshwater streams and rivers using aquatic insects, crustaceans, and other macroinvertebrates.

- I managed 15 major DNR investigations of the effects of developed lands upon the quality of aquatic systems. These investigations utilized the macroinvertebrate assessment technique I developed.

- I designed and managed a study of the effects of Savage River Reservoir upon the Savage River, in Garrett County, Maryland. The study was designed to assess the effects of the reservoir upon channel morphology (stream bed particle size distribution, channel width and depth), base flow, water depth and velocity distributions, and various facets of stream ecology, including effects upon aquatic insects, crustaceans, and fishery resources. I interpreted the data generated through the study and prepared the report of findings.

- I conducted a study of the effects of Prettyboy and Loch Raven Reservoirs upon the temperature, chemistry, aquatic insects, and fishery resources of Big Gunpowder Falls.

- I conducted studies of the temperature regime of streams and the effects of the following factors upon stream temperature: stormwater runoff from developed lands, absence of shading vegetation, effects of varying amounts of shade upon stream temperature, discharges of heated water from industrial activities, and impoundment effects.

- I conducted a study of fish migration barriers formed by highway crossings in Maryland.

- I managed a study of the effects of existing stormwater management ponds and lakes upon stream channel erosion. The study was carried out by DNR staff under my supervision.

- I developed a program for training citizens to evaluate the quality of erosion and sediment control measures on construction sites. I supervised a number of large citizen inventories of erosion and sediment control quality at the county and watershed level.

- I developed and managed the Gwynns Falls Restoration Campaign. This was the first attempt to restore a degraded suburban-urban stream in Maryland. It was a joint project of Baltimore County, the City of Baltimore, and the Maryland Department of Natural Resources. My duties included developing a watershed restoration plan, overseeing a $100,000 study to establish “before” conditions in the stream system, and managing the staff assigned to the project. I chaired the joint city, county, and DNR committee overseeing the campaign.

- I was the author of the DNR handbooks entitled *The Preservation & Enhancement of Stream Quality* and *The Restoration of Urban Streams*. I also wrote DNR publications on the use of the Universal Soil Loss Equation and Manning’s equation for calculating land development effects upon flood water volumes.

- I designed and supervised the installation of eight stormwater infiltration structures. These were the first stormwater infiltration structures installed in an existing developed area in Maryland.

- I compiled a review for DNR of the scientific literature of the effects of sediment pollution from agriculture, logging, mining, and construction activity upon aquatic systems.

- I compiled another review of scientific literature for DNR entitled Effects of Urbanization Upon Aquatic Resources.

- I was assigned the responsibility by DNR's Tidewater Administration to develop habitat protection criteria for all of Maryland's fish and shellfish resources. This responsibility included review of the scientific literature as well as coordinating research conducted by most of the agency's other professional staff. The criteria covered physical habitat requirements along with temperature preferences and the lethal-sublethal effects of temperature, toxic substances, and all other environmental contaminants.

PROFESSIONAL RESEARCH & ACTIVITIES: CEDS

Since starting Community & Environmental Defense Services (CEDS) in 1987, I have evaluated the environmental effects of thousands of land development projects. Though most of these evaluations were performed at the request of citizen organizations, my clients have included development companies as well as local and state government.

- I prepared watershed management plans for the following Maryland waterways: Cuckold Creek, Middle River, Town Creek, and the Saint Mary's River. Much of each plan is devoted to the effects of current and future watershed development.

- In 1990, I conducted a survey of 90 construction sites in the Chesapeake Bay watershed on behalf of the Chesapeake Bay Foundation. The purpose of the survey was to assess erosion and sediment control quality along with stormwater management measures. The results of the survey were presented in a book entitled *Turning the Tide* (Island Press).

- Methods for assessing and minimizing the effects of land development upon aquatic systems were included in my book, *Everybody Wins: A Citizen's Guide to Development*, which is published by the American Planning Association.

- I prepared a guidance publication entitled *Protecting the Aquatic Environment from The Effects of Golf Courses*. The publication begins with a review of a study I conducted of 11 golf courses in Maryland and Pennsylvania. Next, the scientific literature regarding the environmental effects of golf courses in reviewed. I then presented a number of recommendations for siting, designing, and managing golf courses to enhance the aquatic environment. The findings presented in my publication were cited in a literature review commissioned by the U.S. Golf Association, *Environmental Issues Related to Golf Course Construction and Management*. I wrote a chapter in the second edition of

Handbook of Integrated Pest Management for Turf and Ornamentals, which is published by the U.S. Environmental Protection Agency. The chapter is entitled Siting and Design Considerations to Enhance the Environmental Benefits of Golf Courses. The chapter is based upon my publication *Protecting the Aquatic Environment from The Effects of Golf Courses*. I presented by findings at a 1991 conference sponsored by the U.S. Golf Association and the Golf Course Superintendents Association of America. I also presented a paper at the 1991 New York State Turfgrass Conference and the 1991 conference on golf courses held in Honolulu, Hawaii. A paper I wrote appeared in the March/April 1991 issue of the Green Section Record, which is published by the U.S. Golf Association. In 1991, I was retained by the Office of State Planning, State of Hawaii, to evaluate the potential environmental effects of three golf courses proposed for construction on the island of Oahu. I have conducted assessments of more than one hundred golf courses located throughout the United States.

- I conducted a review of the scientific literature regarding the effects of boating activity and boating facilities upon the aquatic environment. The results of this review were presented in my publication *The Effects of Boating Activity & Related Facilities Upon Tidal Creeks*. Recommendations contained in this publication were incorporated into a U.S. EPA guidance document entitled *Guidance specifying management measures for sources of nonpoint pollution in coastal waters*. The State of Maryland also adopted my recommendations as part of the marina regulations administered by the Tidal Wetlands Division of the Department of the Environment.

- I wrote a 300-page book entitled *How To Win Land Development Issues*. This book guides citizens through a process for finding Equitable Solutions to development related concerns.

- In 2010, I conducted a series of workshops throughout Maryland on the new Environmental Site Design requirements. More than 200 engineers, government officials, nonprofit staff and volunteers attended the workshops.

- I designed, managed and wrote the reports for the:
  2015-2016 Greater Baltimore Construction Site Erosion Control Audit; and
  2016 Greater Baltimore Stormwater Best Management Practice Audit.

PROFESSIONAL COMMITTEES

I served as the County Executive's representative on the Baltimore County Soil Conservation District.

I served as a representative of the Department of Natural Resources on:

- the 208 Technical Advisory Committee which oversaw the Nationwide Urban Runoff Project administered by the former Baltimore Regional Planning Council.

- the subcommittee of the General Assembly that drafted the Maryland Stormwater Management Act.

- the Instream Flow Committee of the Interstate Commission on the Potomac River Basin.
- I served on the Acid-Rain Task Force convened by Trout Unlimited.
- I served on the Golf and Environment Roundtable convened by the National Golf Foundation, the U.S. Golf Association other national golfing organizations, and a number of national environmental organizations.
- I served on two committees formed by the Maryland Department of the Environment-the Solid Waste Accord and the Rubble Landfill Workgroup.
- In 2016, I served on the USEPA Chesapeake Bay Program Best Management Practice Verification Committee.

HONORS & AWARDS

Environmental Excellence Award - Maryland Department of the Environment.
Maryland Governor Schaefer's Salute to Excellence.
Outstanding Conservationist; Maryland State Game & Fish Protective Association.
Conservation Award; Izaak Walton League of America.
Certificate of Commendation; Tawes Award for a Clean Environment.
The Joe Brooks Conservation Award; Maryland Chapter - Trout Unlimited.
Outstanding Water Conservationist; Maryland Wildlife Federation.
Gurney Godfrey Award; Maryland Fly Anglers.
Certificate of Appreciation; Maryland Classified Employees Association.
Outstanding Individual; American Planning Association - Maryland Chapter.

PUBLICATIONS

Urbanization and stream quality impairment. *Water Resources Bulletin* (now the JAWRA Journal of the American Water Resources Association) 15(4):948-963

Everyone Wins: A Citizen Guide to Development. Planners Press, American Planning Association, Chicago, Illinois.

How to Win Land Development Issues

Critical Watershed Analysis: Tailoring Watershed Management Practices to Benefit Sensitive Aquatic Communities, presented at the Conference on Putting the LID (Low-Impact Development) On Stormwater Management, September 21 - 23, 2004, The Inn and Conference Center—Marriott, College Park, Maryland.

Siting and design considerations to enhance the environmental benefits of golf courses. In: *Handbook of Integrated Pest for Turf and Ornamentals*, edited by Anne R. Leslie, U.S.

Environmental Protection Agency, Washington, D.C.

Protecting the aquatic environment from the effects of golf courses. Community & Environmental Defense Services, Post Office Box 206, Maryland Line, MD 21105. Enhancing the environmental benefits of golf courses. *U.S. Golf Association Green Section Record* March/April 1991 and presented at the 1991 Golf Course Superintendents Conference in Las Vegas, Nevada.

Effects of sediment pollution upon the aquatic environment. Maryland Tidewater Administration, Tawes State Office Building, Annapolis, MD 21401.

Effects of urbanization upon aquatic resources. Maryland Tidewater Administration, Tawes State Office Building, Annapolis, MD 21401.

The effects of boating activity and related facilities upon tidal creeks in Maryland. Community & Environmental Defense Services, Post Office Box 206, Maryland Line, MD 21105.

Restoration of Urban Streams, Maryland Tidewater Administration, Tawes State Office Building,
Annapolis, MD 21401

Preservation & Enhancement of Stream Quality, Maryland Tidewater Administration, Tawes State Office Building, Annapolis, MD 21401.

2015-2016 Greater Baltimore Construction Site Erosion Control Audit;

2016 Greater Baltimore Stormwater Best Management Practice Audit.

A number of my other publications and training materials are available at:
https://ceds.org/publications/

Kolter Columbia Bluffs

Total Master Planned Area: 421.45 acres

Commercial Site Area: 11.53 acres

- 4.23 acres environmental protection

Residential (PUD) Area: 409.92 acres

- **800 residential units** (**reduction of 596 units, 40%**) (1.95 DUA)
  - Multi-family removed from the project
  - 296 Active Adult Single-Family Homes
  - 338 Single-Family Homes
  - 166 Townhomes
- **214.93 acres open space (52.4% of PUD area)**
  - 75 acres of environmental protection
  - 139.93 acres outside of environmental protection

Strategy for Resource Protection utilizing a PUD Planning and Design Approach

- Establish a Limits of Disturbance along the Duck River and its tributaries based upon slopes, natural drainage ways, floodplain areas, and mature tree canopy.
- 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.
- Pedestrian circulation and trails are highly encouraged along the river, along stream corridors, and through scenic areas.
- The quantity of Open Space preservation should greatly exceed any established base zone district.
- New home lots should generally be smaller, clustered areas away from the protected banks of the Duck River.
- Document on-site natural resources through a State approved Hydrologist and concurrence reports with local, state, and federal agencies.
- Remove debris removal along creek banks to prevent impact to Bear Creek (shoes, clothing, random bottles, containers, fencing, wood)
- Use Best Management Practices for Stormwater Pollution Prevention Plans during construction.

- 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).

Vehicle Trip Reduction of 4,000 trips per day

- **5 developer funded traffic improvements** offsite as dictated by the traffic study and city planners.
  - **Bear Creek Pike and Mt. Olive Road School Access**
  - **Tom J Hitch and Bear Creek**
  - **Bear Creek and Patterson Drive**
  - **Iron Bridge Road and Site Access**
  - **James Campbell Boulevard and Tome J Hitch Parkway**

Utility Impact

- **Reduction** in overall Sewer impact- by +/- 238,400 Gallons per day
- **Reduction** in overall Water usage by +/- 238,400 Gallons per day

School Impact

- **Reduction in overall school impacts-** by reducing the residential units over 40% plus adding age restricted senior living the increase to the entire county school system is reduced to +/- 312 students of various ages, over the full build out.
- **Voluntary Payment:** Maury County Schools to receive $2000 per home not including the active adult. $1,008,0000

Community Amenities

- **A 10 foot wide paved public pedestrian/bike path** stretching the entire north/south length of the project from Bear Creek to Iron Bridge Road – 1.7 miles
- **Nature Trails along the Duck River**
- **10 parks totaling 84.89 acres of HOA maintained park space**
- **Includes:**
  - **Club House with 2 Pools**
  - **Pickleball Courts**
  - **5 Playgrounds**
  - **2 Dog Parks**
  - **Community Gardens**
  - **Multi-purpose Field**

Architecture Patternbook

Deviations – 16, 9 are architectural, 2 are right of way

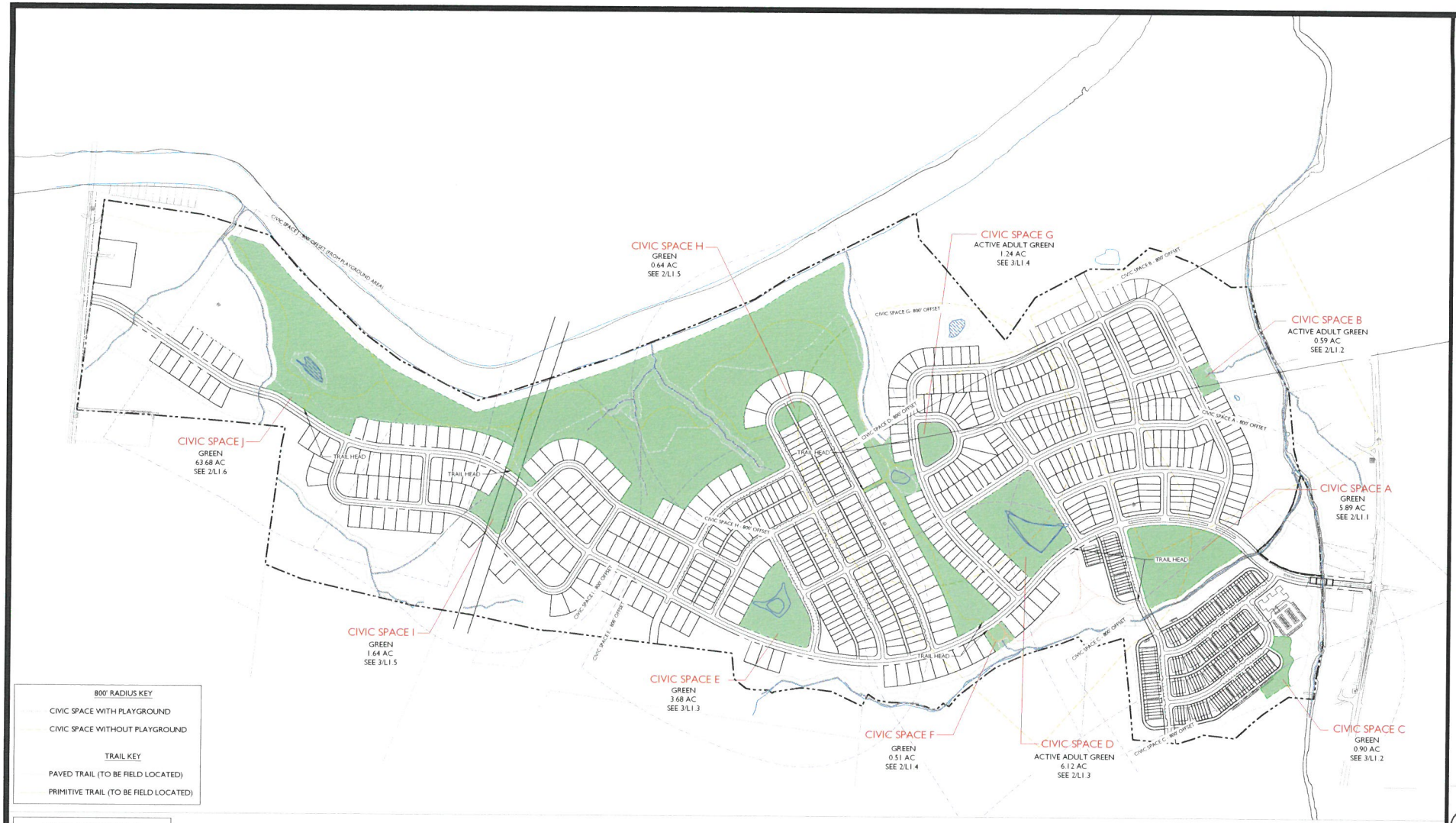
Wins for Columbia:

214.93 Acres of preserved open space - 52.4% of the property

Spine Road with 1.7 mile long Greenway Trail

Parks Department Coordination: Multi Use Trail along Spine Road, nature trails, dedication of 5 acres to the County

Over a million dollars donated to Maury County Schools



TOTAL OPEN SPACE PROVIDED: 214.93 AC; 52.4% OF GROSS SITE AREA

OPEN SPACE BREAKDOWN

CIVIC SPACE: 84.89 AC

ENVIRONMENTAL PROTECTION (FLOODWAY, STREAMBUFFERS, 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 LI.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

ERIC C. GAMBLE REGISTERED LANDSCAPE ARCHITECT 1.25.24

Date: October 16, 2023

Revision Date

1. December 18, 2023
2. January 23, 2024
3.

OVERALL CIVIC SPACE PLAN

SHEET LI.0



1 / L1.1 KEY MAP N.T.S





2 / L1.1 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

JOHN C. GAMBLE REGISTERED LANDSCAPE ARCHITECT 1.25.24

Date: October 16, 2023
Revision Date
1. December 18, 2023
2. January 23, 2024
3.

OVERALL CIVIC SPACE PLAN
SHEET
L1.1



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 LAWN


FORMAL PLANTING


WALKING PATH

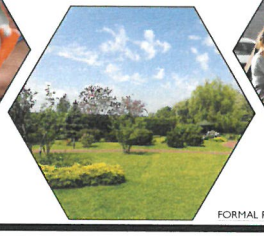


3 LI.2 CIVIC SPACE - C

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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COLUMBIA BLUFFS
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3

OVERALL CIVIC SPACE PLAN
SHEET
LI.2



2 LI.3 CIVIC SPACE - D

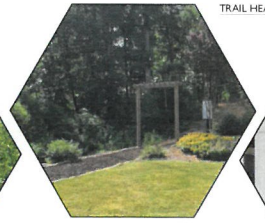
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

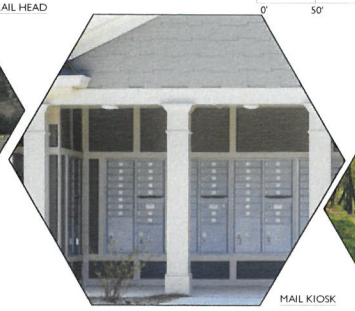
0' 50' 100'



POND



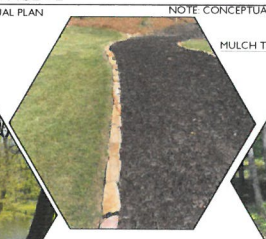
TRAIL HEAD



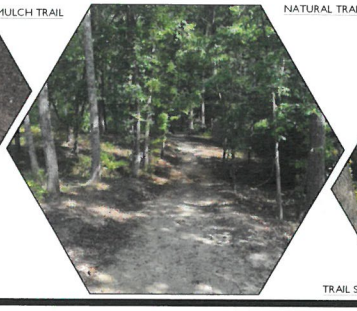
MAIL KIOSK



NATURAL POND



MULCH TRAIL



NATURAL TRAIL



TRAIL SIGN



1 LI.3 KEY MAP N.T.S

3 LI.3 CIVIC SPACE - E

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'

GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS

PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

ROBERT C. GAMBLE JR. LANDSCAPE ARCHITECT 1.25.24

Date: October 16, 2023

Revision Date

December 18, 2023

January 23, 2024

OVERALL CIVIC SPACE PLAN

SHEET LI.3



2 LI.4 CIVIC SPACE - F
CONCEPTUAL PLAN

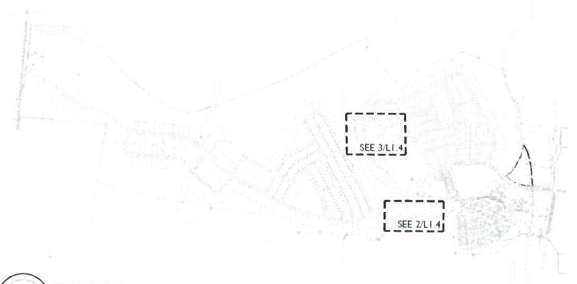
NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'


SWINGS


FORMAL PARK


PLAYGROUND



1 LI.4 KEY MAP N.T.S

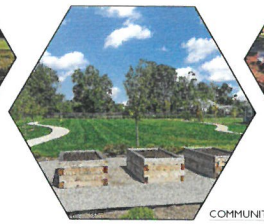


3 LI.4 CIVIC SPACE - G
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'


FORMAL PARK


COMMUNITY GARDEN


DOG PARK

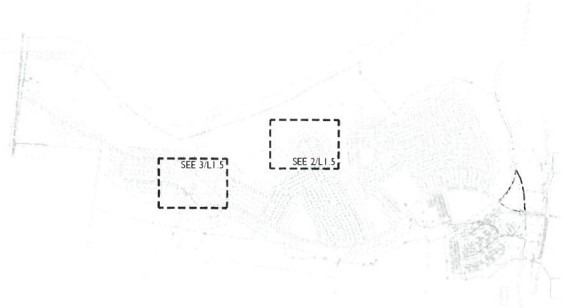
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DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
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OVERALL CIVIC SPACE PLAN
SHEET
LI.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

ROBERT G. GAMBLE JR. TENNESSEE REGISTERED LANDSCAPE ARCHITECT 1.25.24

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OVERALL CIVIC SPACE PLAN
SHEET LI.5



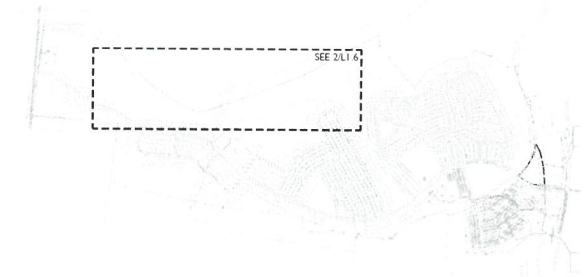
2 / LI.6 CIVIC SPACE - J

CONCEPTUAL PLAN NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 100' 200'

NOTE: PRIMITIVE WALKING TRAILS TO BE FIELD LOCATED.





1 / LI.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

ROBERT G. GAMBLE REGISTERED LANDSCAPE ARCHITECT 1.25.24

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△

OVERALL CIVIC SPACE PLAN

SHEET LI.6

Deviations: 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
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
Building Standards		
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.
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.
Building Materials		
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.
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
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.

KOLTERLAND

14025 Riveredge Drive
Suite 175
Tampa, FL 33637

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F 813-615-1461
www.kolter.com

March 8th, 2024

Mr. Al Ray
Director – Parks and Recreation
Maury County
1018 Maury County
Columbia, TN 38401

RE: Columbia Bluffs & Maury County Parks and Recreation Memorandum of Understanding (MOU)

Dear Director Ray,

Kolter Land (Developer) would like to submit this MOU to the Maury County Parks and Recreation (MCPR) for your review and approval in the County Parks Department's involvement within the proposed development called "Columbia Bluffs." Per our discussions, please see the bullet points based on the items the developer is willing to agree to only upon final approval from the City of Columbia City Council for the proposed Columbia Bluffs development.

The following points shall be finalized between the Developer & MCPR, upon final non-appealable approval by the City of Columbia:

1. Developer shall donate a predetermined acreage agreed to by the parties that consist of the southern house, land and out structures known as the "Donated Area" that is located off Iron Bridge Road. The Donated Area is to create a HUB location for the County Parks department for the benefit of Yaneli Park. It is the understanding from the MCPR, this location would be utilized for MCPR recreational needs and future purposes.

2. The Donated Area shall be accepted as is, and shall be solely the responsibility of the MCPR to make all improvements to the aforementioned. MCPR shall present to the Developer with a Site Plan of the intended uses for these donated areas for the benefit of the County and City residents. Developer shall work with MCPR throughout this process for the MCPR to accomplish their intent and be allowed to make recommendations to adhere to the overall intent of the Columbia Bluffs Development in nature. Developer assist in making recommendations for the consultant the MCPR could use for this service.

3. In exchange for said Donated Area, the MCPR shall be construct all the primitive trails throughout the development at their costs solely. The developer shall provide a 20' temporary construction easement relating to the estimated location of the primitive trails to establish the construction's limits of disturbance to perform the construction of all the primitive trails. The MCPR shall install all the primitive trails on or before June 1 2026. Once completed the

DRAFT

developer shall provide a "public access easement" of 10' for the completed primitive trails in the form of a survey, which this easement document will be recorded. The MCPR shall have right access up to 7' outside of the established public access easement to maintain the easement. The MCPR shall be required to provide to the Ownership Entity and/or Developer a Certificate of Insurance (COI) for General Liability and Workman's Comp, at a minimum and name the Ownership Entity and/or Developer as Additional Insured prior to construction of the primitive trails.

4. In addition, in exchange for said Donated Area, the MCPR shall perform all annual maintenance for the southern portion agreed to areas of all open or green spaces on the southern portion of the development and all primitive trail network through out the Columbia Bluffs development once portions of improvements are completed. This shall be accomplished through a 100 year long term lease agreement, the "Agreement" with the MCPR for a minimal cost of $1 dollar for said Agreement.

5. Prior to the commencement of either rehabilitation or construction of the Donated Area improvements, MCPR shall work with Developer for approval of any exterior rehabilitation of the southern house, and any future structures to be placed within the Donated Area. This is to ensure it meets the overall intent of the use and matches the character of the development. Approval by the Developer shall not be unreasonably withheld.

6. MCPR shall provide to the ownership entity a tax credit equal to the value of the donated property. The value will represent Fair Market Value of the Donated Area and its improvements. MCPR will provide appraisal or other form of valuation for determining the tax credit value.

7. Maintenance Areas shall be designated within the Agreement by way of an exhibit showing the locations and what the annual maintenance responsibilities shall be for the MCPR.

8. The Agreement shall be able to be renewed at the expiration date and shall not be unreasonably withheld.

In Closing, we are excited for the opportunity this presents to the MCPR in working with this development. It is the overall intent of this MOU to demonstrate both public and private entities can work hand in hand for the benefit of generations to come.

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

Terms Agreed to by the Parties Below

Developer: Columbia Bluffs

Date: _____

Accepted by:

_____
Authorized Signature

Maury County Parks Department

Accepted by: Mr. Al Ray- Director of Parks

_____
Authorized Signature

Exhibit "A"

Donated Area- Subject to Boundary Survey- +/-5.26 AC—Highlighted in Red

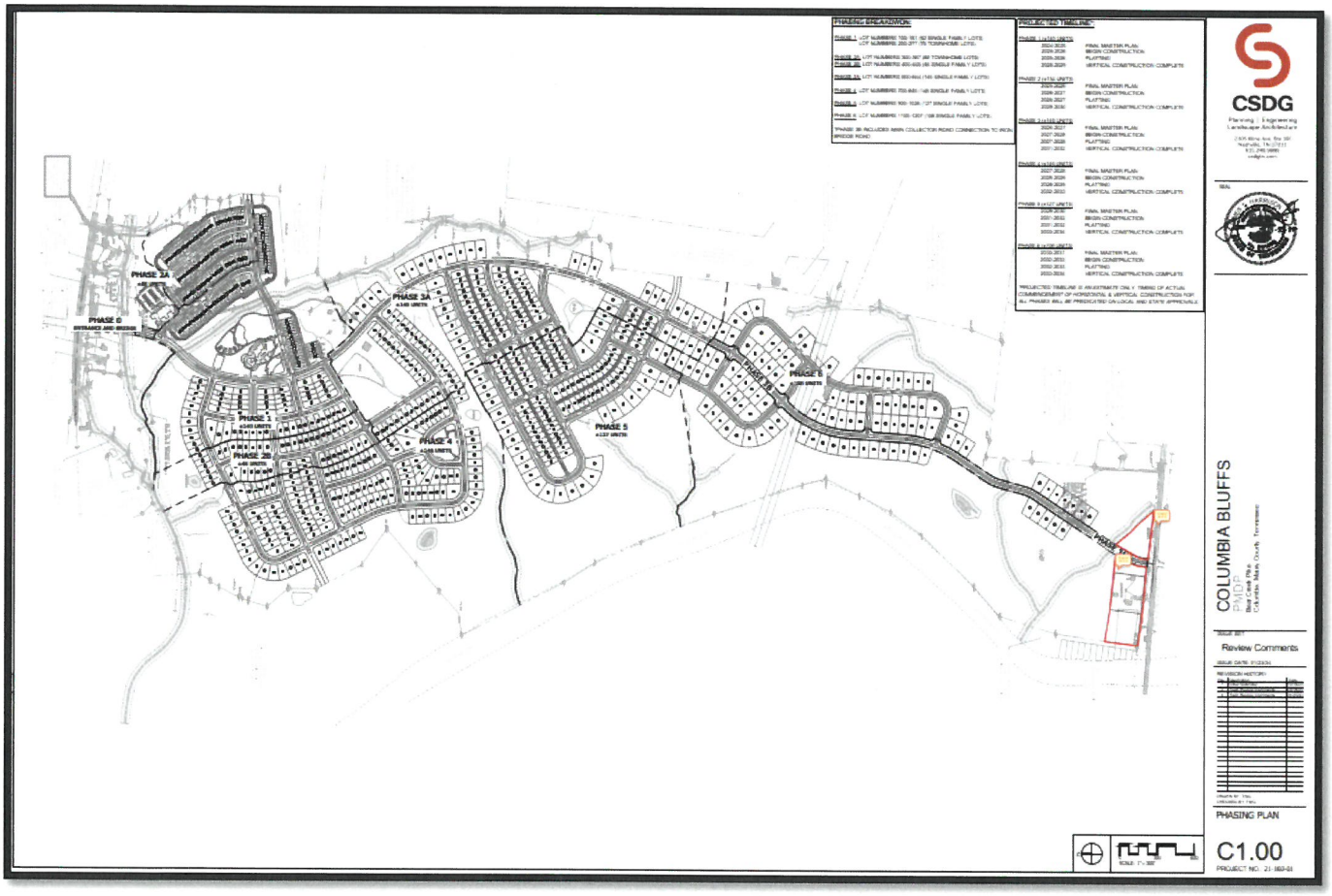
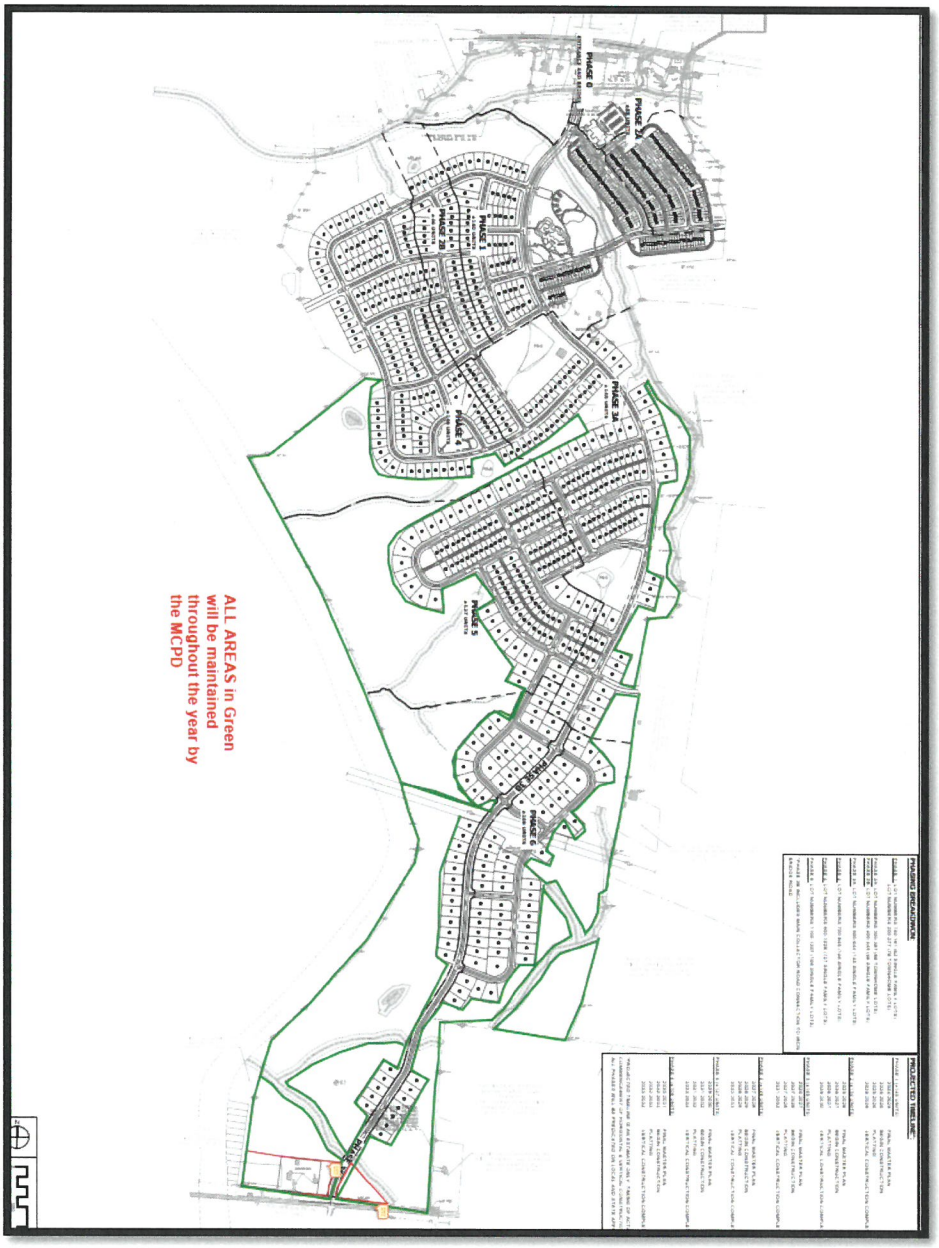


Exhibit "B"
Estimated Primitive Trails- Min. 6' wide for MPCD- In RED



Exhibit "C"

MPCD Annual Maintenace Areas- either Mowing or Trail Maintenance



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Authorized Signature

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Accepted by: Mr. Al Ray- Director of Parks

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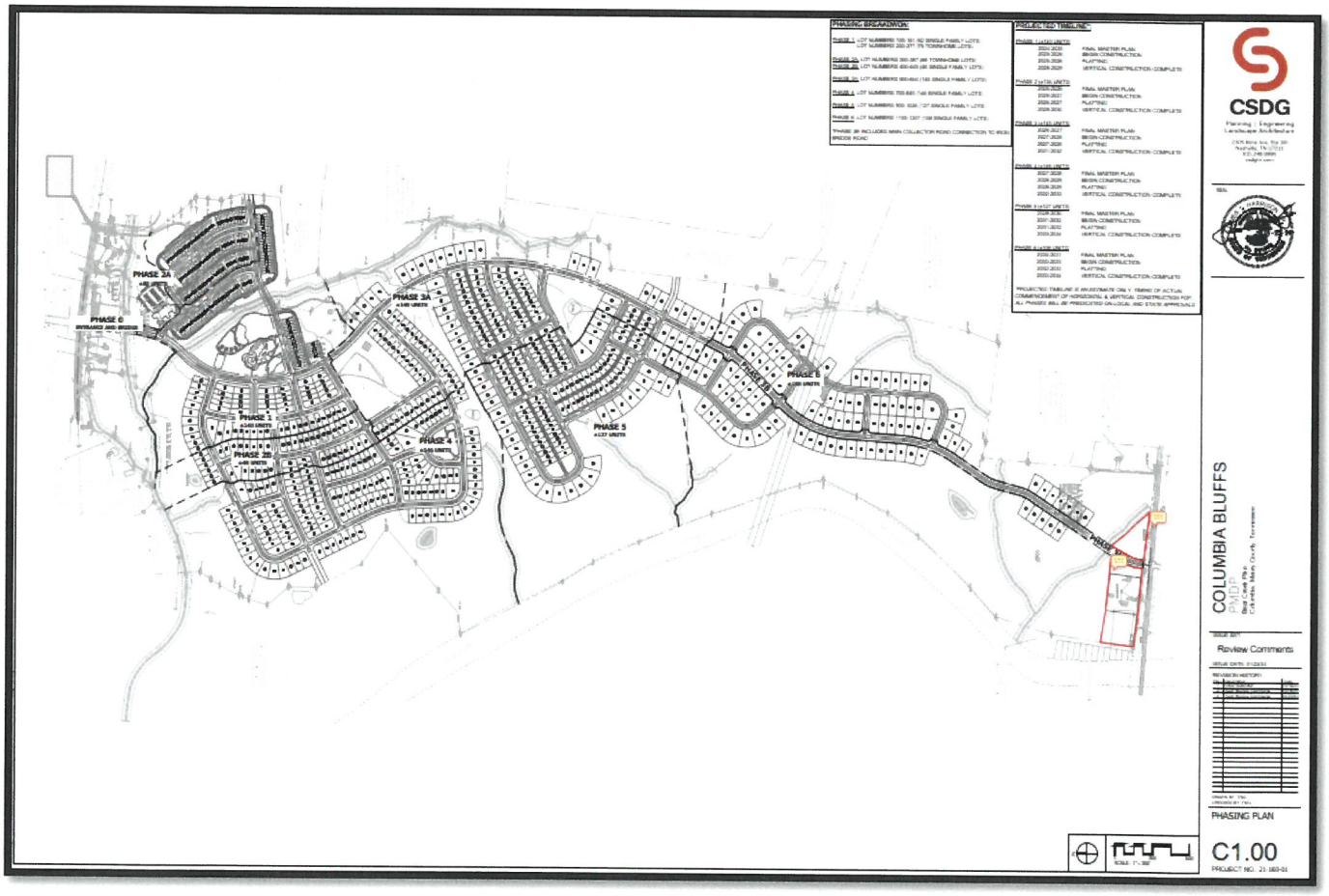
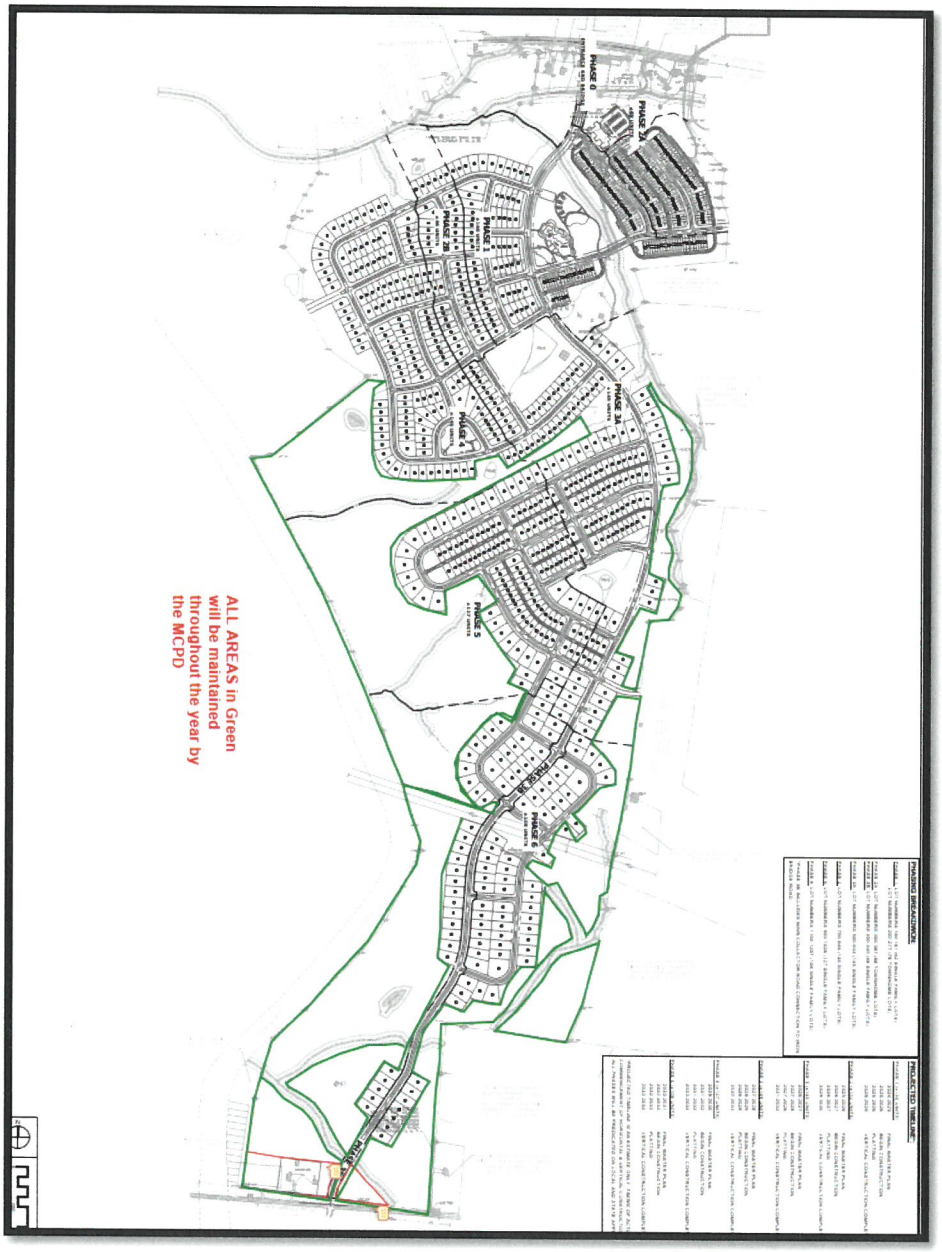


Exhibit "B"
Estimated Primitive Trails- Min. 6' wide for MPCD- In RED



Exhibit "C"

MPCD Annual Maintenace Areas- either Mowing or Trail Maintenance



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.

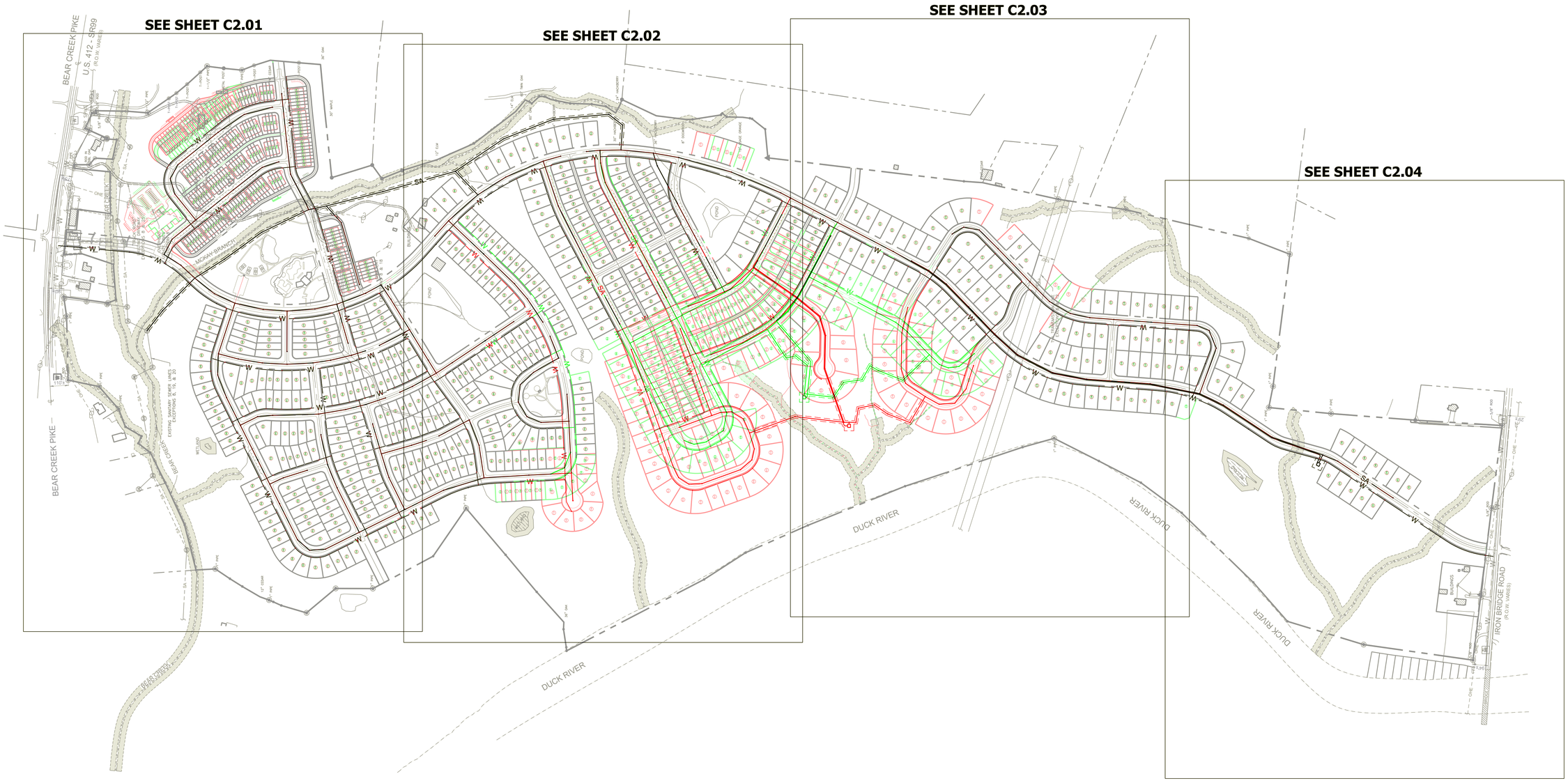
I. Power

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.



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SEAL



COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

INITIAL SUBMITTAL
Review Submittal

ISSUE DATE: 02/28/2023

REVISION HISTORY:

Rev.	Description	Date
1	Initial Submittal	10/18/2023
2	Tech Review Comments	12/18/2023
3	Tech Review Comments	01/23/24

DRAWN BY: TWG
CHECKED BY: TWG

OVERALL UTILITY PLAN

C3.00

PROJECT NO.: 21-160-01

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

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

ROD IN DBL OAK

5/8" ROD

5/8" ROD

1-1/2" PIPE

BEAR CREEK

BEAR CREEK

EXISTING SANITARY SEWER LIINES EXCEPTIONS 8, 19, & 20

TIE TO EXISTING SEWER MAIN

PUBLIC SEWER EASEMENT (TYP)

SANITARY SEWER (TYP)

FIRE HYDRANT LOCATION (TYP)

TRACK ROAD

EXISTING DRIVEWAY EXCEPTIONS 8 & 25

OVERHEAD UTILITY LINES EXCEPTION 8

PUBLIC WATER MAIN (TYP)

MCKAY BRANCH

T-POST

T-POST

T-POST

1-1/2" PIPE

1-1/2" PIPE

METAL POST

WETLAND

1" PIPE

12" CEDAR

1" PIPE

PUBLIC WATER MAIN (TYP)

FIRE HYDRANT LOCATION (TYP)

SANITARY SEWER (TYP)

PUBLIC WATER MAIN (TYP)

FIRE HYDRANT LOCATION (TYP)

SANITARY SEWER (TYP)

1" PIPE

CEMETERY EXCEPTIONS 8 & 18

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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12-18-23

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

INITIAL SUBMITTAL
Review Submittal

ISSUE DATE: 12/18/2023

REVISION HISTORY:

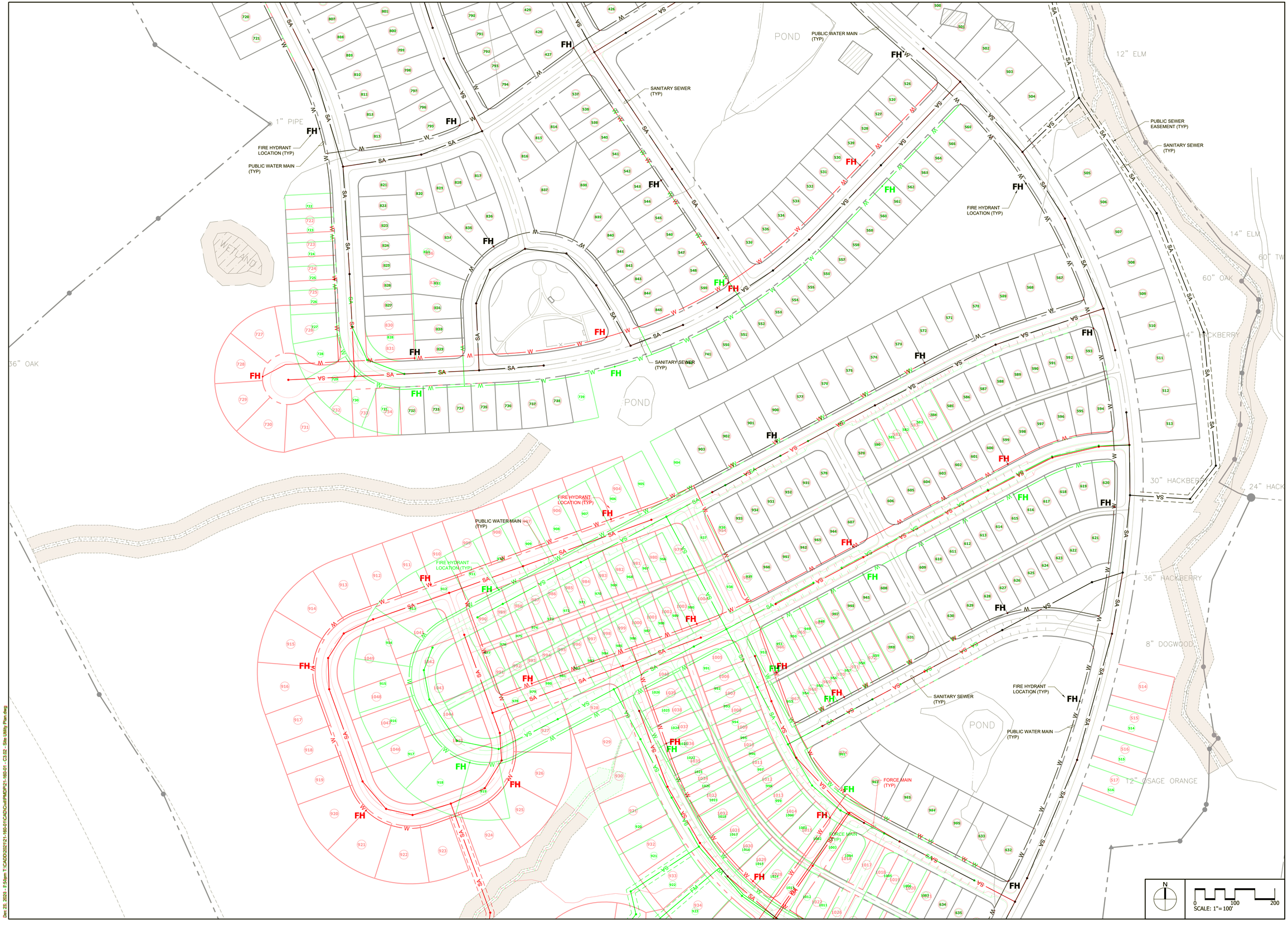
Rev.	Description	Date
1	Initial Submittal	12/18/2023
2	Tech Review Comments	12/18/2023
3	Tech Review Comments	01/23/24

DRAWN BY: TWG
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SITE UTILITY PLAN

C3.01

PROJECT NO.: 21-160-01



N

0 100 200
SCALE: 1"= 100'

Date: Dec 20, 2023 - 7:54am T:\CADD\2021\21-160-01\CADD\Civil\PMDP\21-160-01 - C3.02 - Site Utility Plan.dwg

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COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
INITIAL SUBMITTAL
Review Submittal

ISSUE DATE: 12/20/2023

REVISION HISTORY:

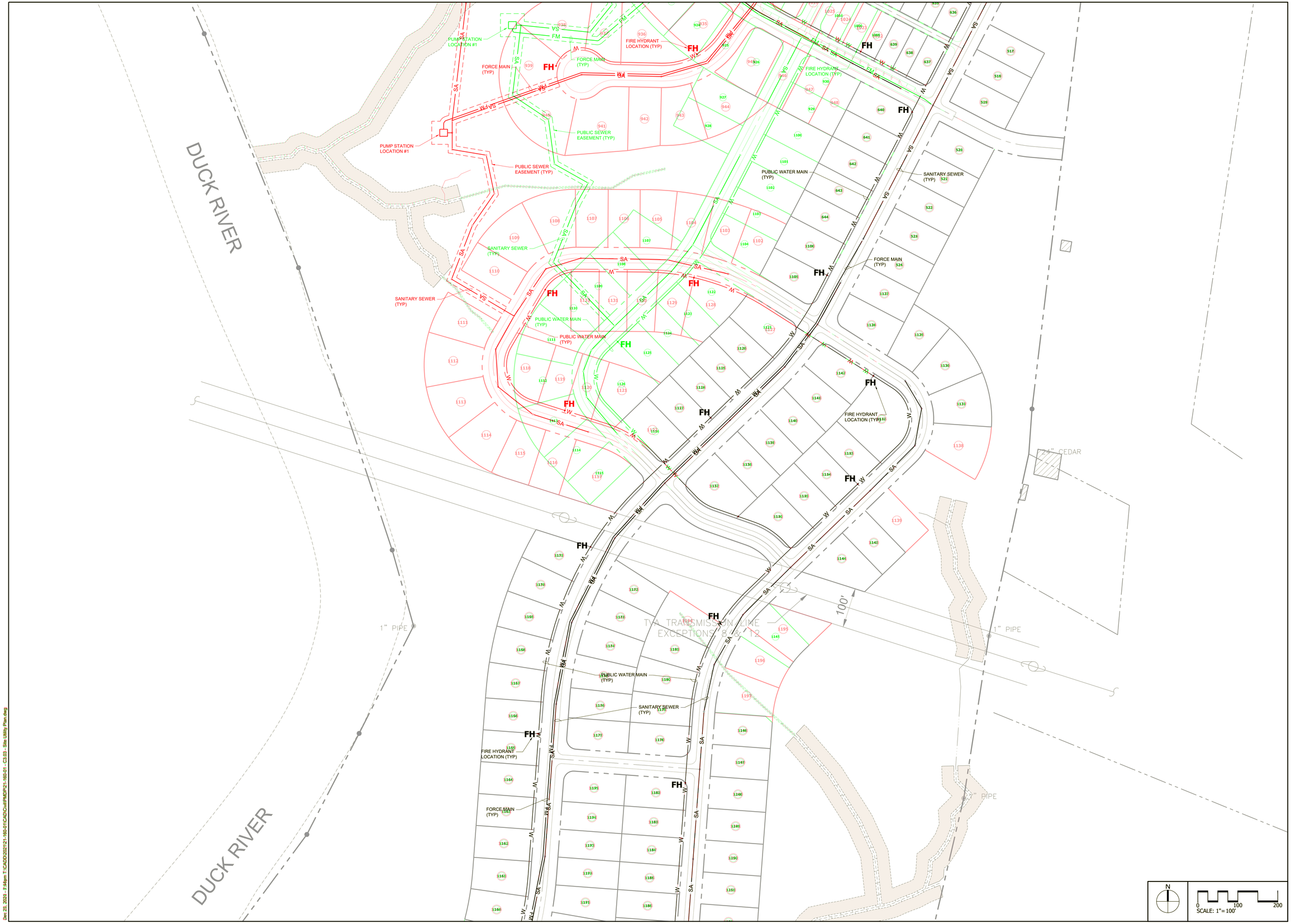
Rev.	Description	Date
1	Initial Submittal	10/16/2023
2	Tech Review Comments	12/18/2023
3	Tech Review Comments	01/23/2024

DRAWN BY: TWG
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SITE UTILITY PLAN

C3.02

PROJECT NO.: 21-160-01



Dec 20, 2023 - 7:44pm T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.03 - Site Utility Plan.dwg

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12-18-23

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Columbia, Maury County, Tennessee

ISSUE SET:
INITIAL SUBMITTAL
Revised Submittal

ISSUE DATE: 12/18/2023

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

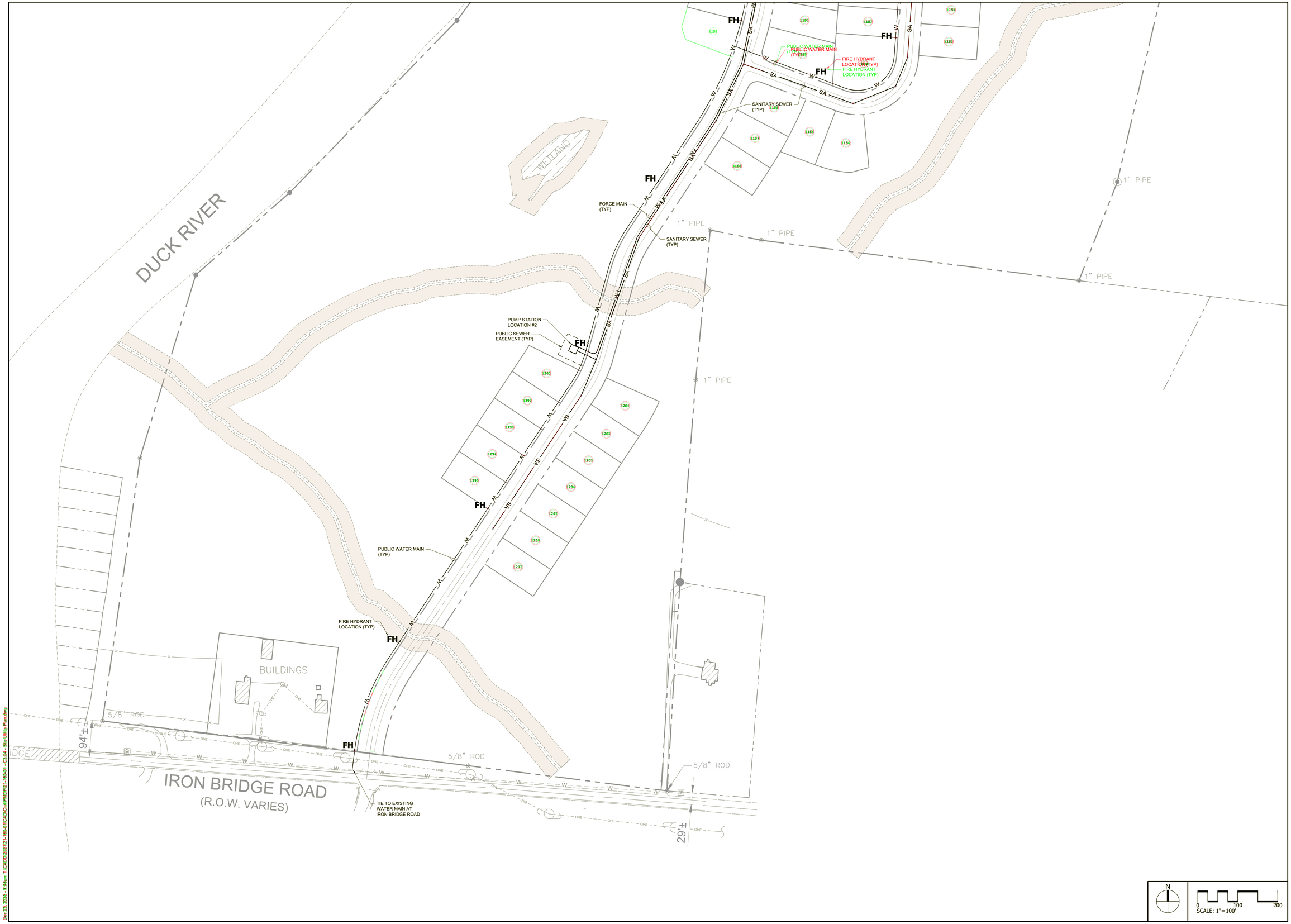
SITE UTILITY PLAN

C3.03

PROJECT NO.: 21-160-01

N

0 100 200
SCALE: 1"= 100'



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ISSUE SET:
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Tech Review Comments

ISSUE DATE: 12/18/2023

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DRAWN BY: TWG
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SITE UTILITY PLAN

N

0 100 200
SCALE: 1"= 100'

C3.04

PROJECT NO.: 21-160-01

Dec 20, 2023 - 3:46pm T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.04 - Site Utility Plan.dwg



N

0 300 600
SCALE: 1"= 300'

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ISSUE DATE: 12/18/2023

REVISION HISTORY:

Rev.	Description	Date
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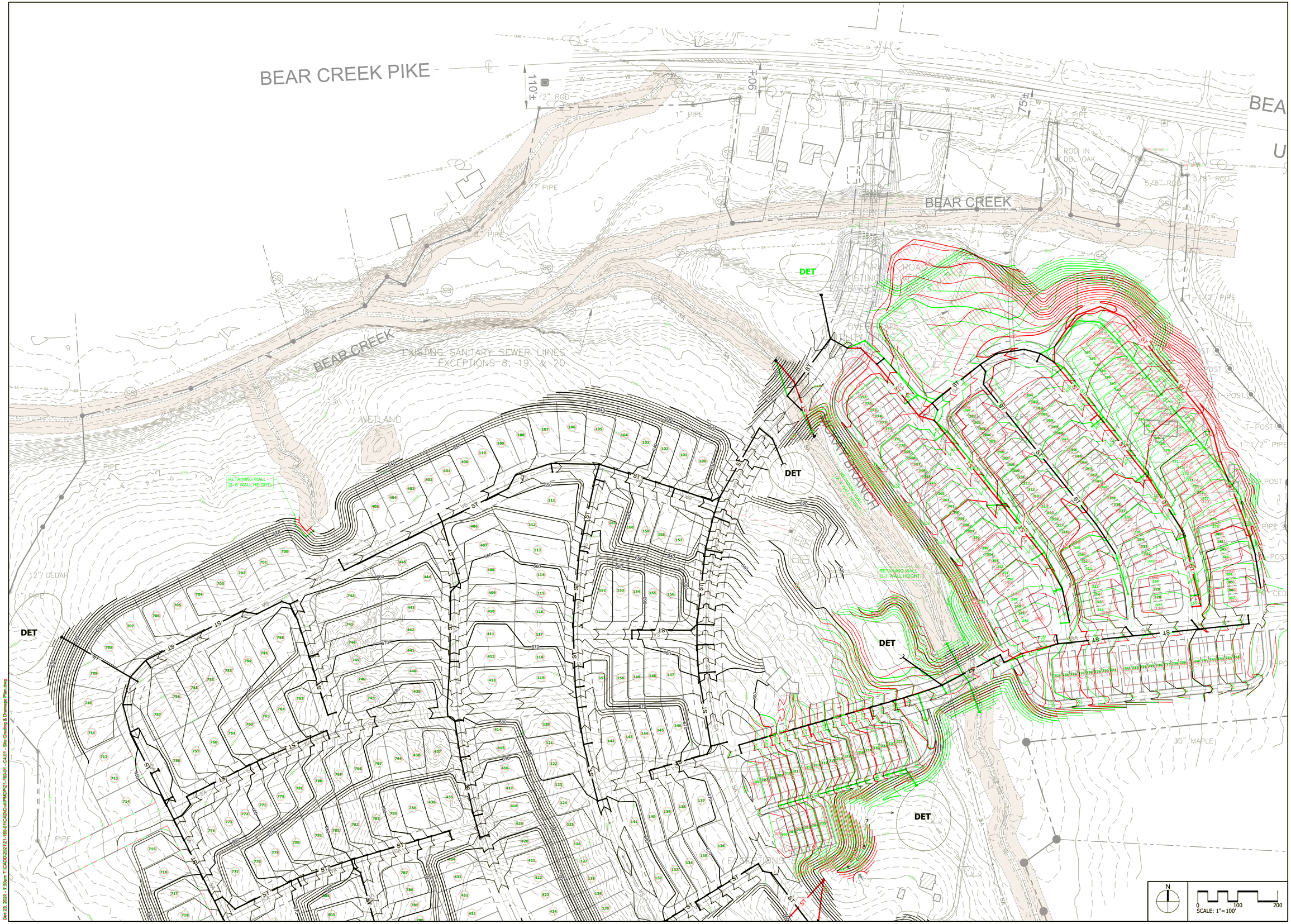
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OVERALL GRADING & DRAINAGE PLAN

C4.00

PROJECT NO.: 21-160-01

Dec 23, 2023 - 7:49pm T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.00 - Overall Grading & Drainage Plan.dwg



Dec 20, 2023 - 7:36pm T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.01 - Site Grading & Drainage Plan.dwg

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ISSUE DATE: 12/18/2023

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Rev.	Description	Date
1	Initial Submittal	12/18/2023
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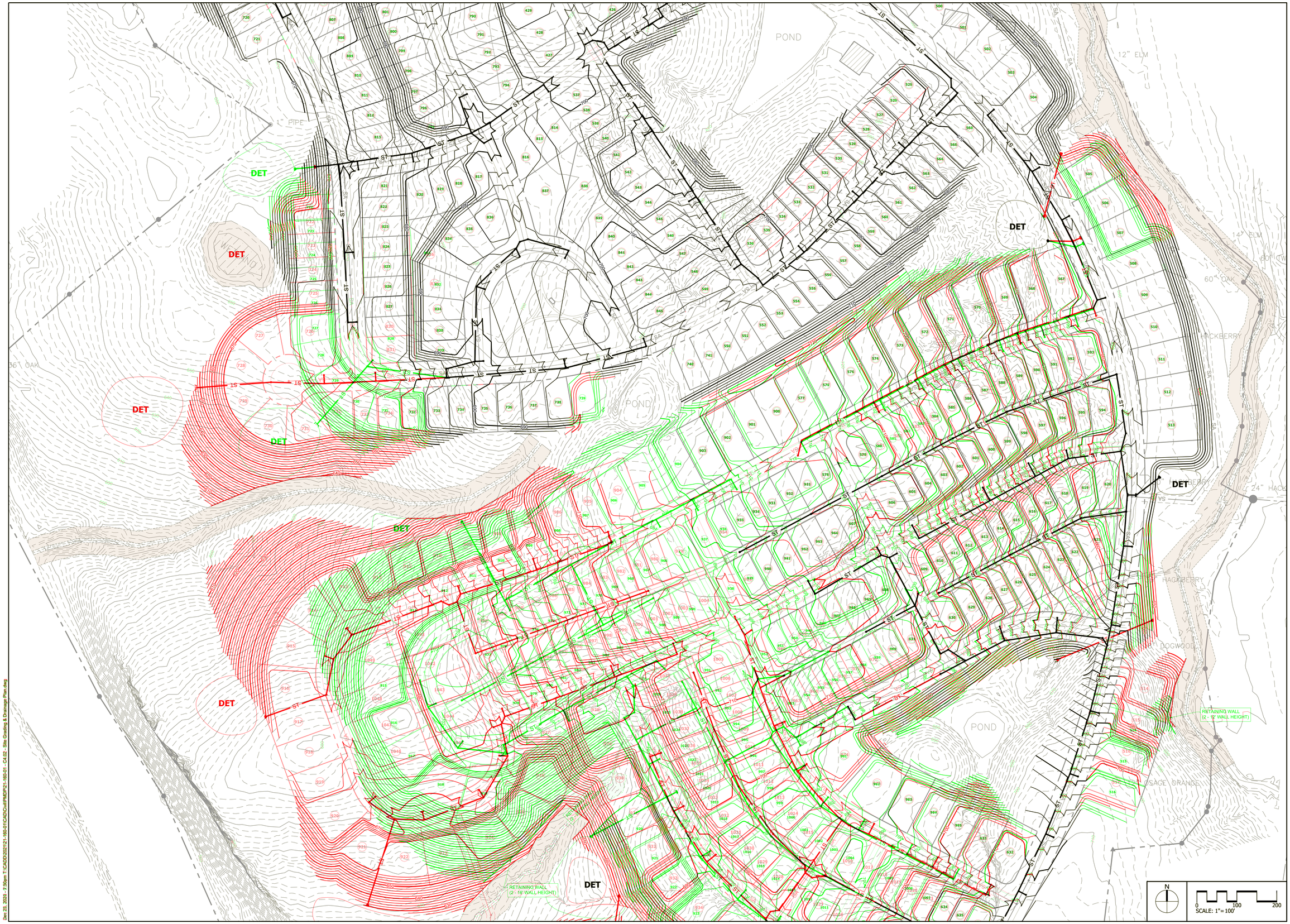
SITE GRADING & DRAINAGE PLAN

C4.01

PROJECT NO.: 21-160-01

N

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SCALE: 1"= 100'



Dec 20, 2023 - 7:36pm T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.02 - Site Grading & Drainage Plan.dwg

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ISSUE DATE: 12/18/2023

REVISION HISTORY:

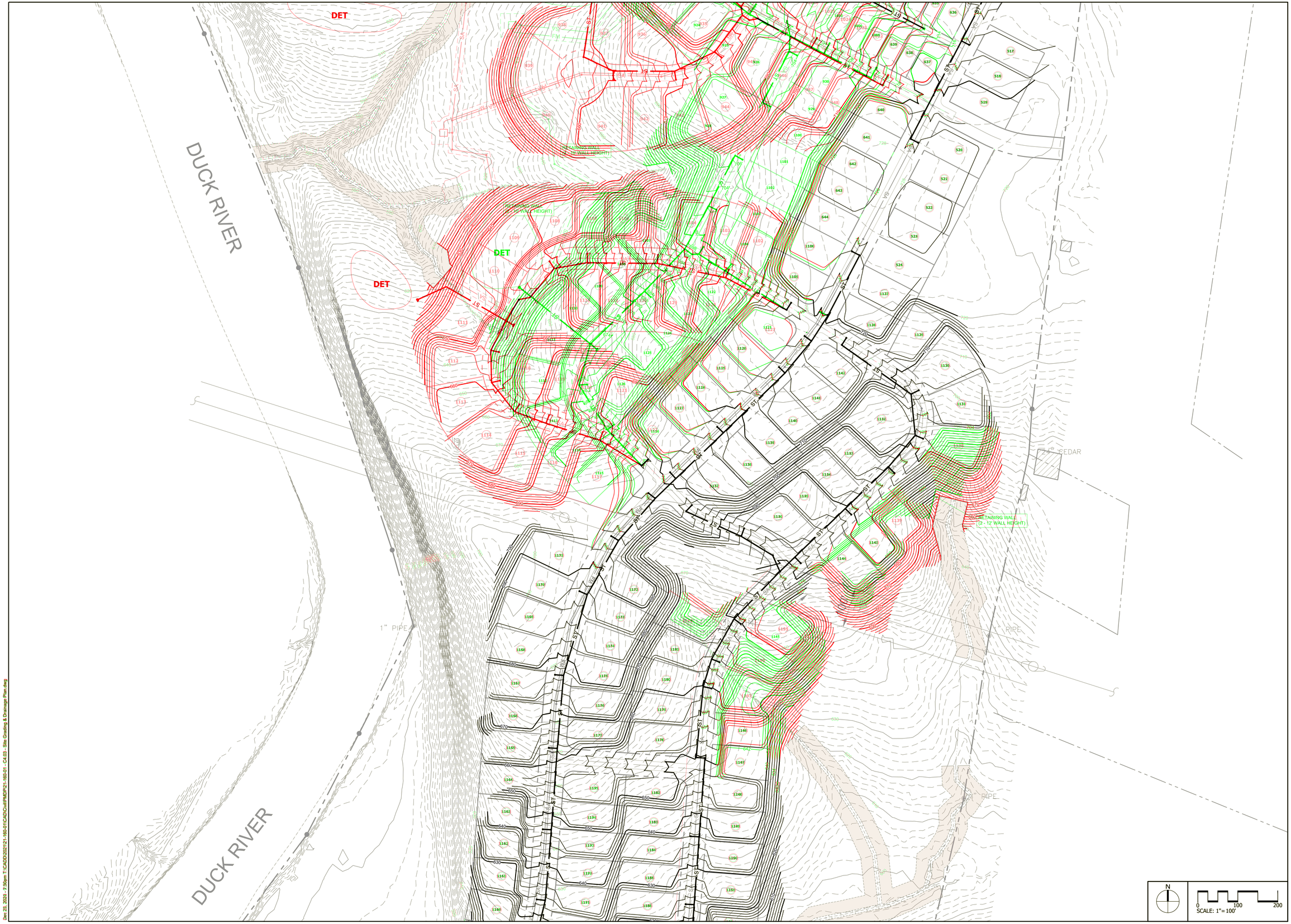
Rev.	Description	Date
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3	Tech Review Comments	01/23/24

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SITE GRADING & DRAINAGE PLAN

C4.02

PROJECT NO.: 21-160-01



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12-18-23

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Review Submittal

ISSUE DATE: ~~12/18/2023~~

REVISION HISTORY:

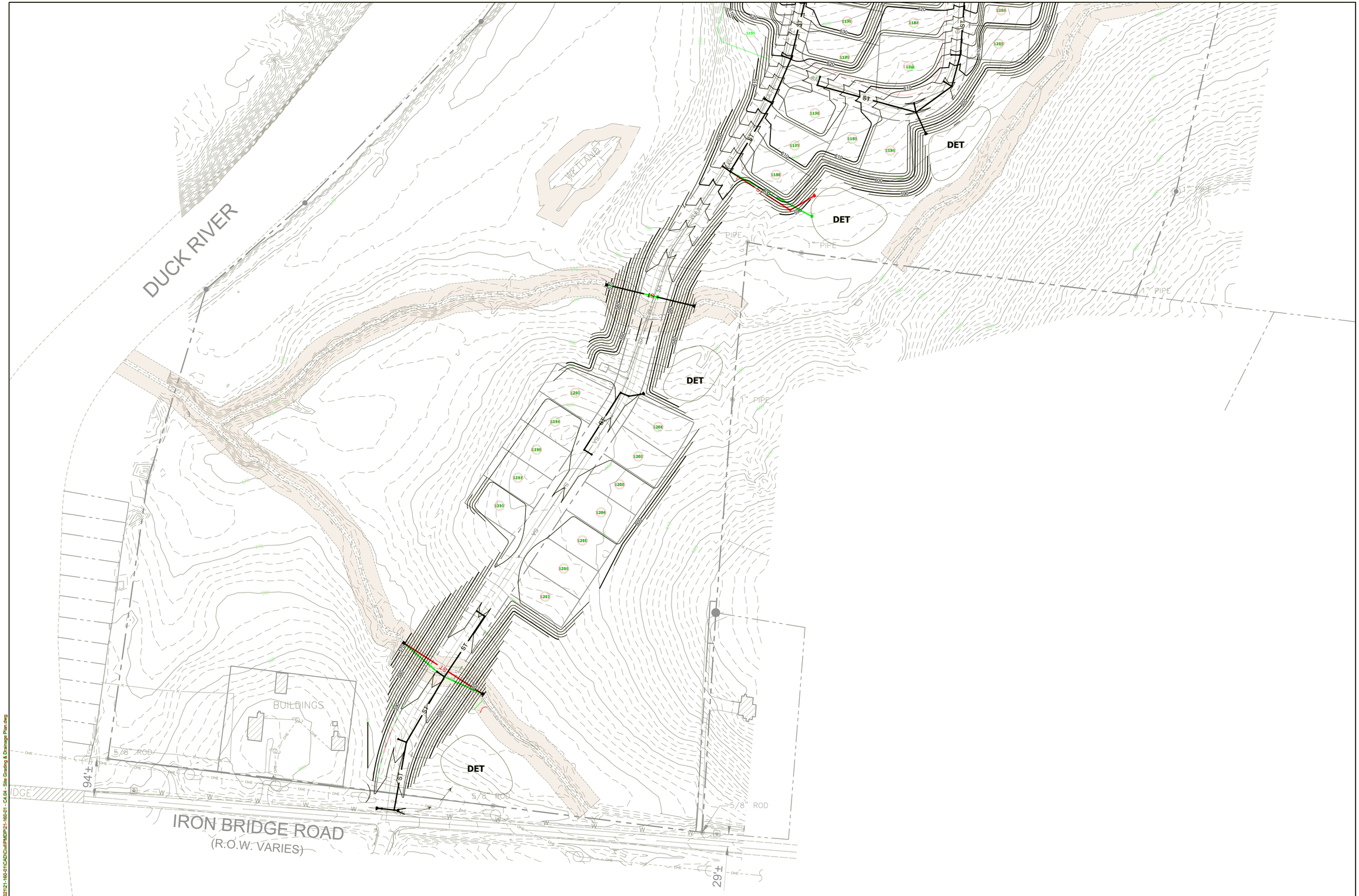
Rev.	Description	Date
1	Initial Submittal	~~12/18/2023~~
2	Tech Review Comments	~~12/18/2023~~
3	Tech Review Comments	01/23/24

DRAWN BY: TWG
CHECKED BY: TWG

SITE GRADING & DRAINAGE PLAN

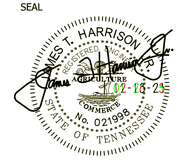
C4.03

PROJECT NO.: 21-160-01



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Nashville, TN 37203
615.866.9000
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SEAL



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
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2	Tech Review Comments	12/18/2023
3	Tech Review Comments	01/23/24

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CHECKED BY: TWG

SITE GRADING & DRAINAGE PLAN

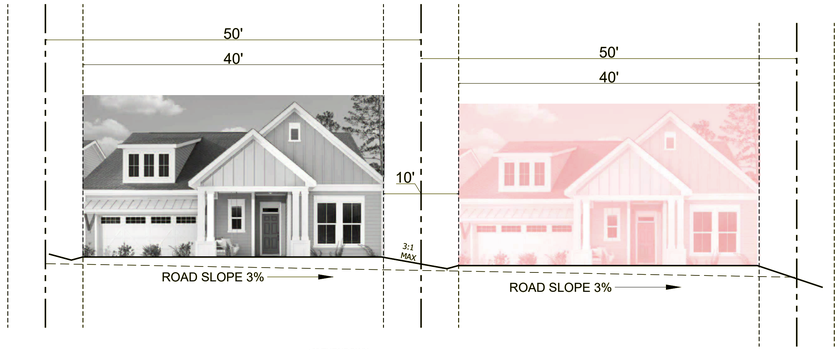
C4.04

PROJECT NO.: 21-160-01

N

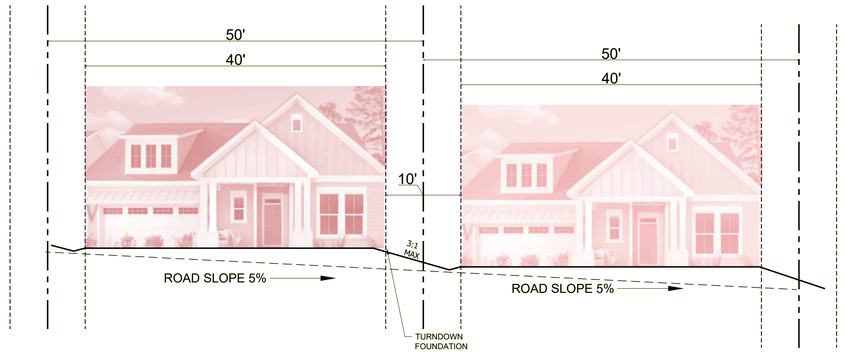
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Date: 2/1, 2024 - 7:33pm T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.04 - Site Grading & Drainage Plan.dwg



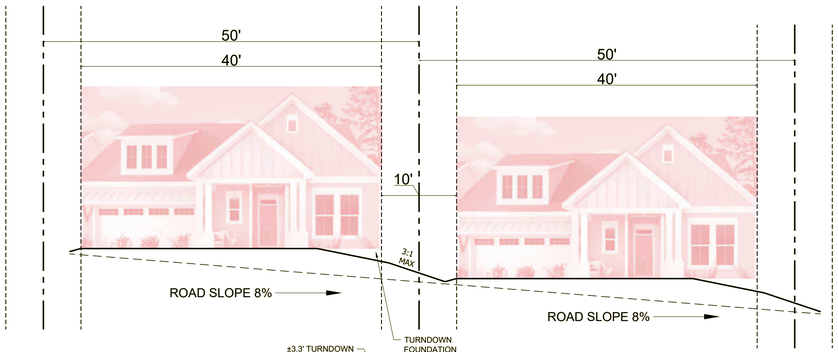
LOT GRADING DIAGRAM - 3% ROAD SLOPE

NTS



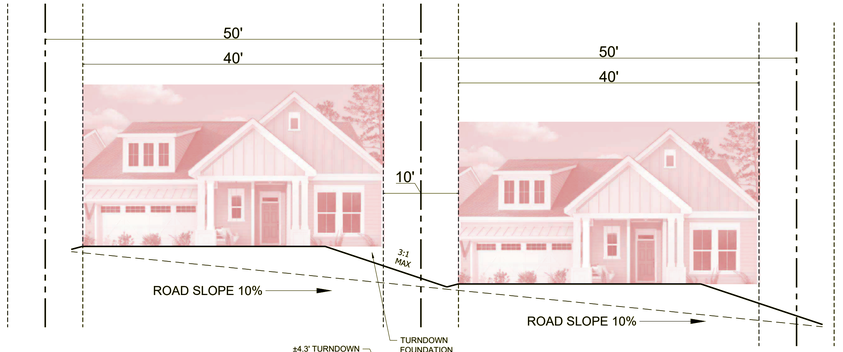
LOT GRADING DIAGRAM - 5% ROAD SLOPE

NTS



LOT GRADING DIAGRAM - 8% ROAD SLOPE

NTS



LOT GRADING DIAGRAM - 10% ROAD SLOPE

NTS

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SEAL



COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
INITIAL SUBMITTAL
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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

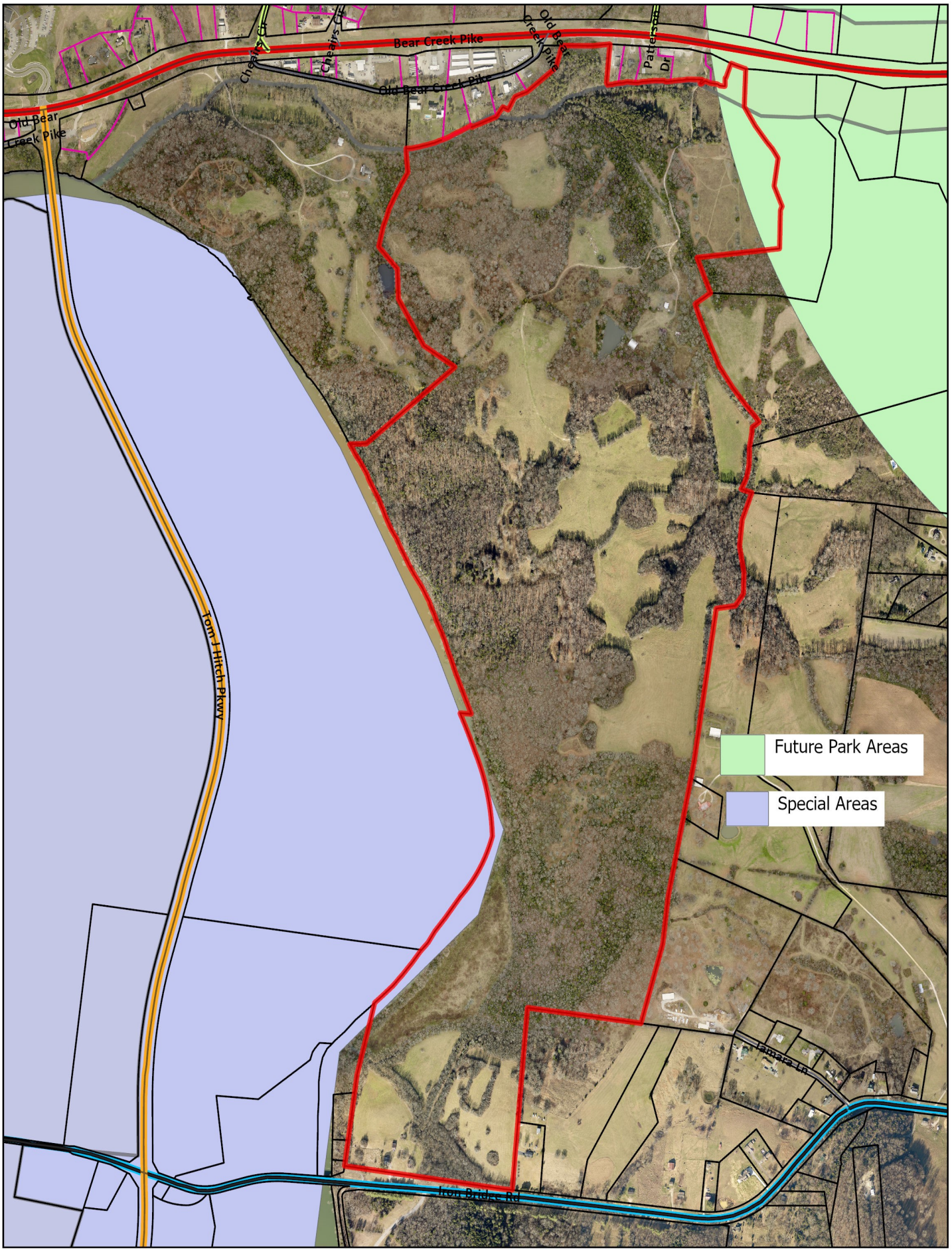
U.S. 412 - SR99

DUCK RIVER

DUCK RIVER

DUCK RIVER

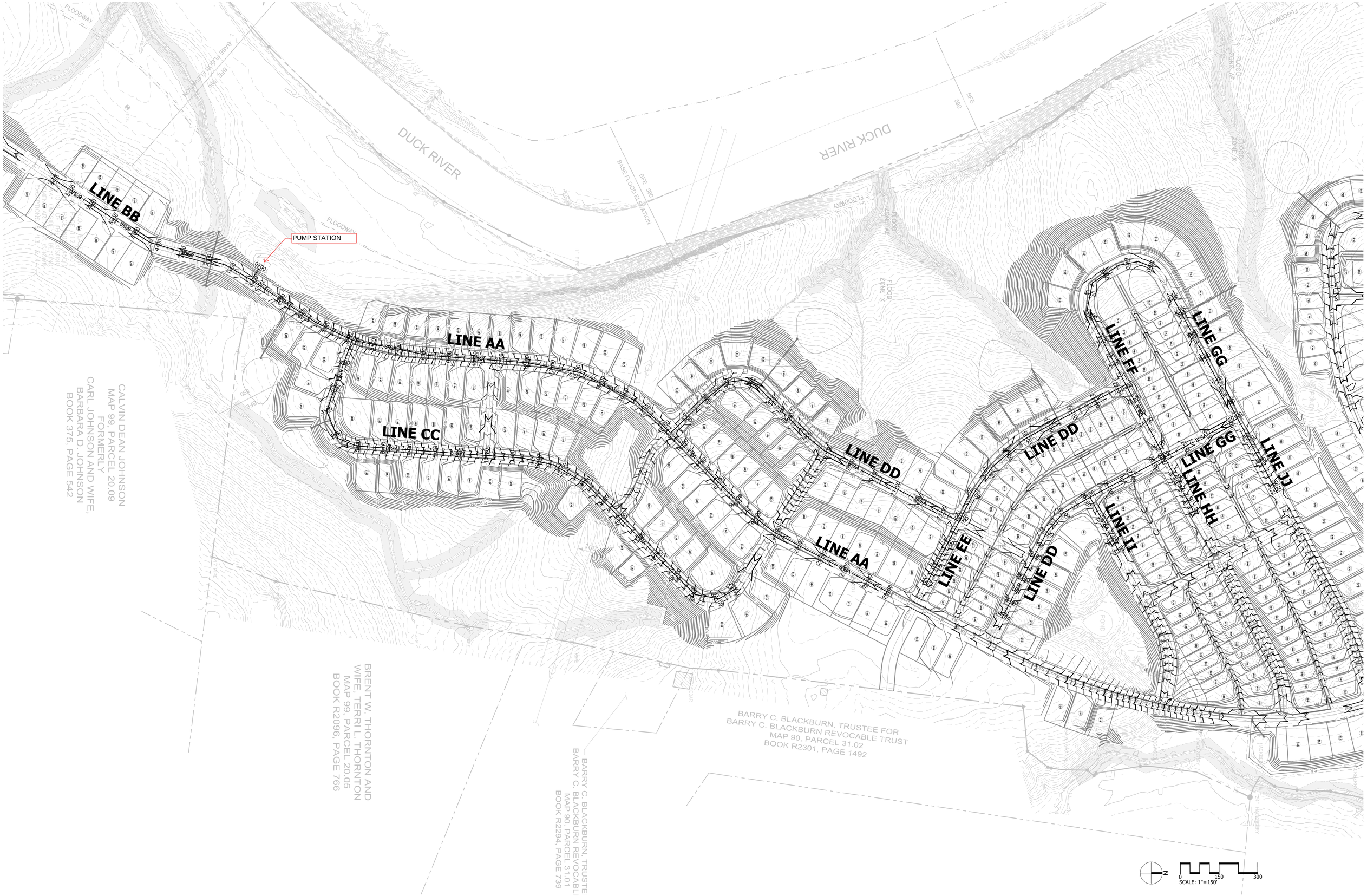
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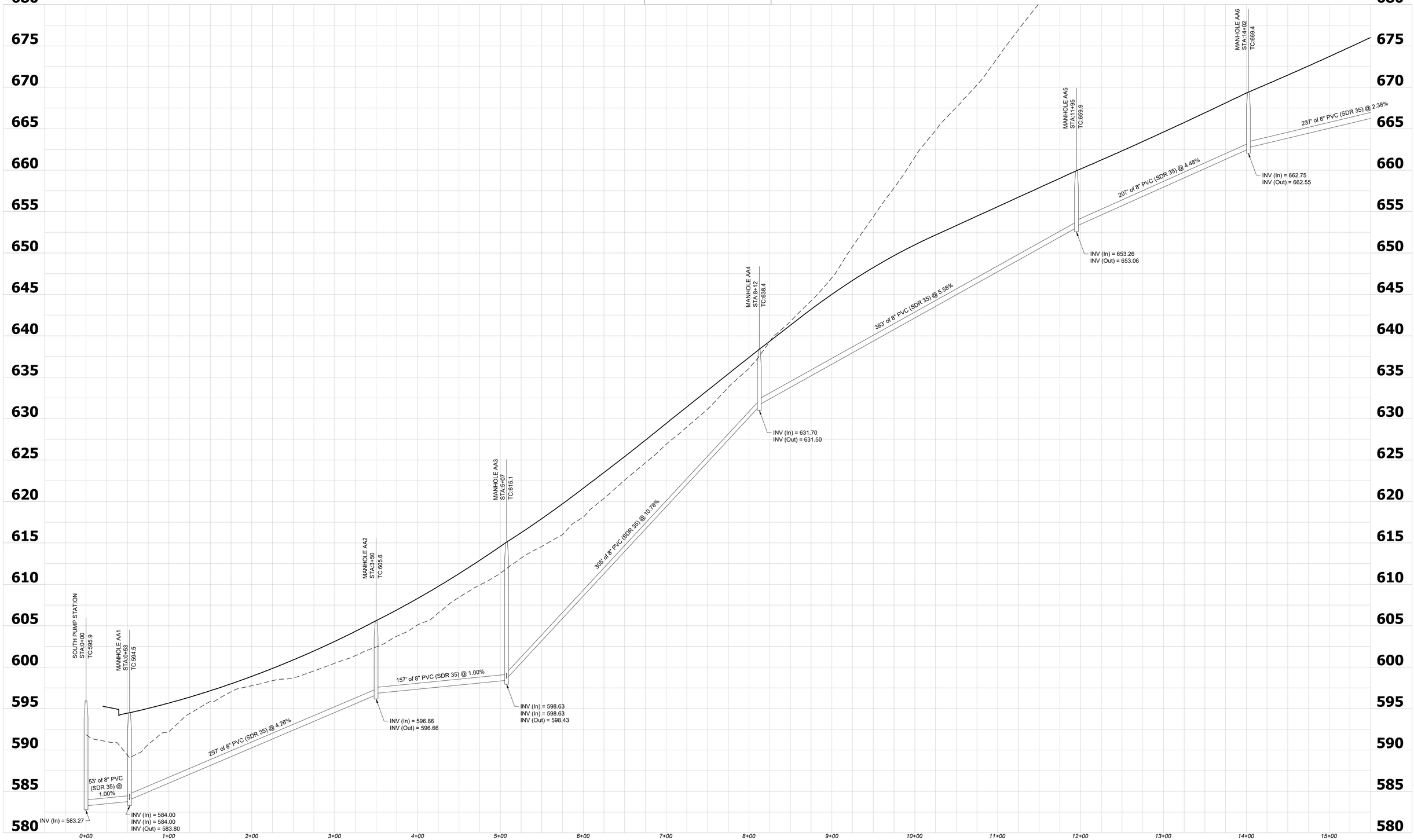
23-0414
Tax Map 90 Parcel 12.01
Bear Creek Pike/Iron Bridge Rd.

CITY OF COLUMBIA TENNESSEE

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


LINE BB
PUMP STATION
LINE AA
LINE CC
LINE DD
LINE EE
LINE FF
LINE GG
LINE HH
LINE II
LINE JJ
DUCK RIVER
FLOODWAY
BASE FLOOD ELEVATION
BFE 590
BFE 580
FLOOD ZONE AE
FLOOD ZONE X
CALVIN DEAN JOHNSON
MAP 99, PARCEL 20.09
FORMERLY
CARL JOHNSON AND WIFE,
BARBARA D. JOHNSON
BOOK 375, PAGE 542
BRENT W. THORNTON AND
WIFE, TERRI L. THORNTON
MAP 99, PARCEL 20.05
BOOK R2096, PAGE 766
BARRY C. BLACKBURN, TRUSTEE FOR
BARRY C. BLACKBURN REVOCABLE TRUST
MAP 90, PARCEL 31.02
BOOK R2301, PAGE 1492
BARRY C. BLACKBURN, TRUSTE
BARRY C. BLACKBURN REVOCABL
MAP 90, PARCEL 31.01
BOOK R2294, PAGE 739
N
0
150
300
SCALE: 1"= 150'

Sanitary Line AA



N

0 50 100

SCALE: 1"= 50'

Sanitary Line AA

735
730
725
720
715
710
705
700
695
690
685
680
675
670
665
660
655
650
645

16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00

MANHOLE AA7
STA: 16+40
TC:680.3

MANHOLE AA8
STA: 18+25
TC:688.8

MANHOLE AA9
STA:20+52
TC:699.1

MANHOLE AA10
STA:22+43
TC:707.8

MANHOLE AA11
STA:23+78
TC:711.6

MANHOLE AA12
STA:24+97
TC:712.8

MANHOLE AA13
STA:28+88
TC:716.8

INV (In) = 668.60
INV (Out) = 668.40

186' of 8" PVC (SDR 35) @ 1.00%

INV (In) = 682.12
INV (In) = 670.66
INV (Out) = 670.46

227' of 8" PVC (SDR 35) @ 4.47%

INV (In) = 692.46
INV (Out) = 692.26

191' of 8" PVC (SDR 35) @ 4.44%

INV (In) = 701.14
INV (Out) = 700.94

134' of 8" PVC (SDR 35) @ 2.66%

INV (In) = 704.92
INV (Out) = 704.72

119' of 8" PVC (SDR 35) @ 0.88%

INV (In) = 706.17
INV (Out) = 705.97

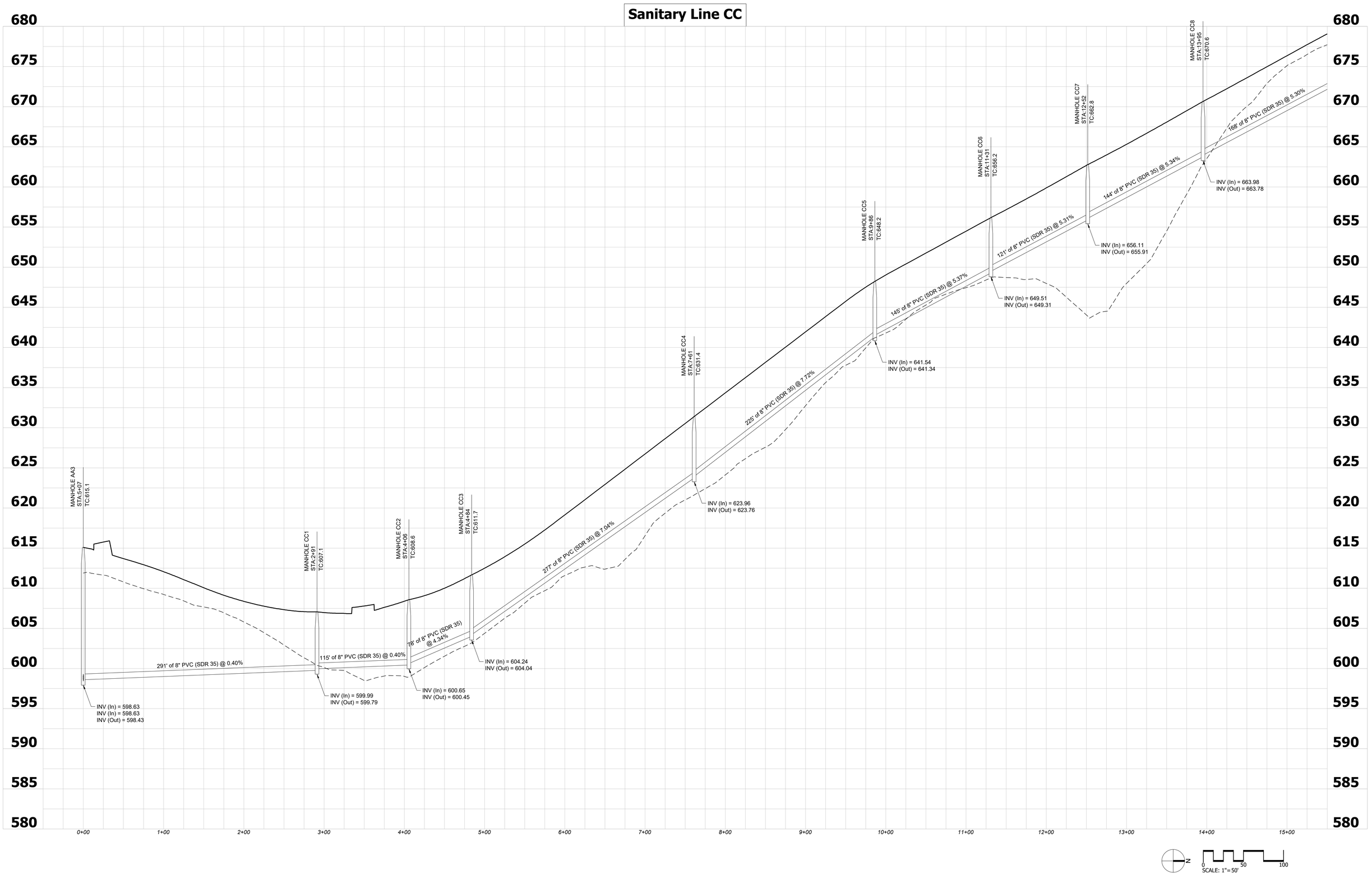
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INV (Out) = 710.09

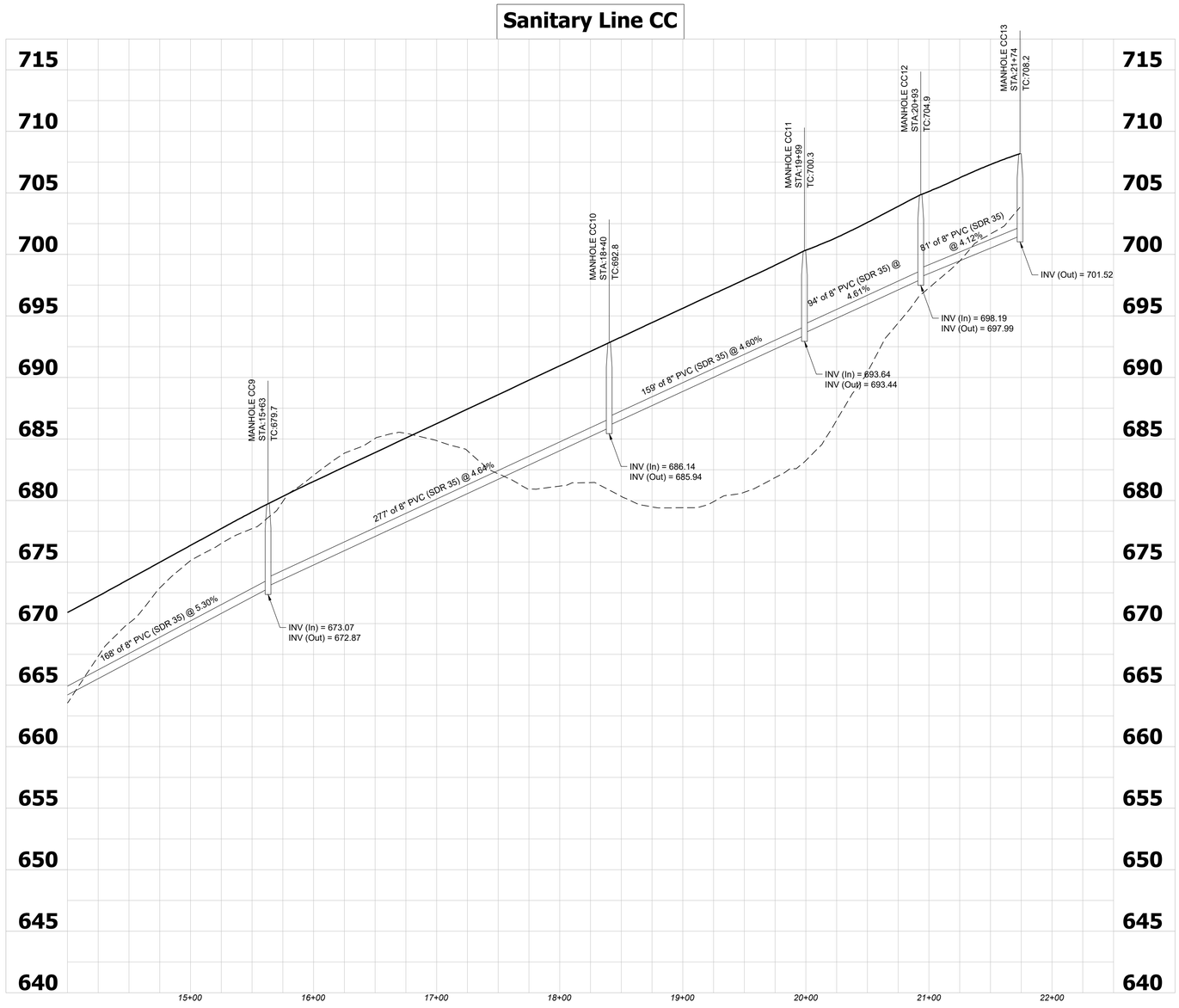
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SCALE: 1"= 50'

Sanitary Line CC



Sanitary Line CC

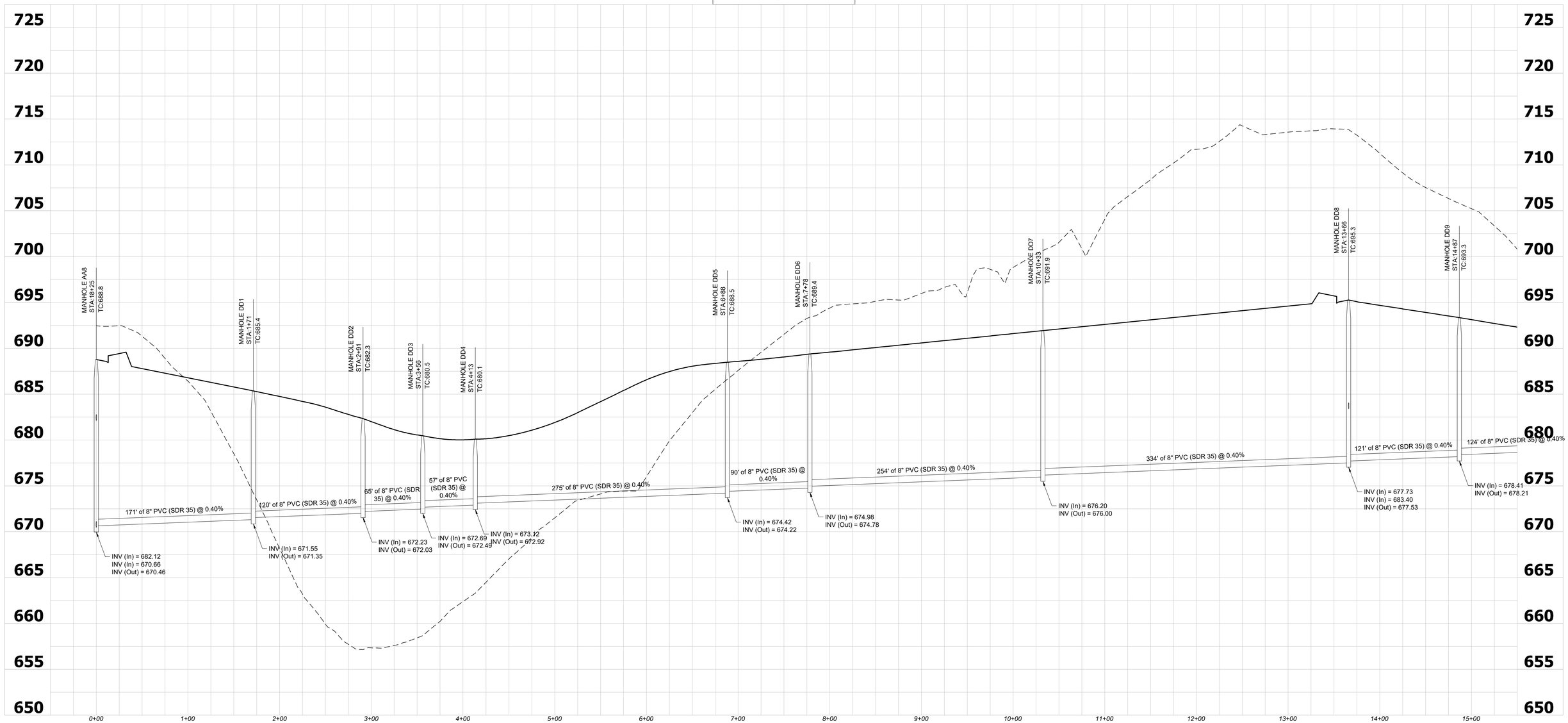


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SCALE: 1"= 50'

Sanitary Line DD

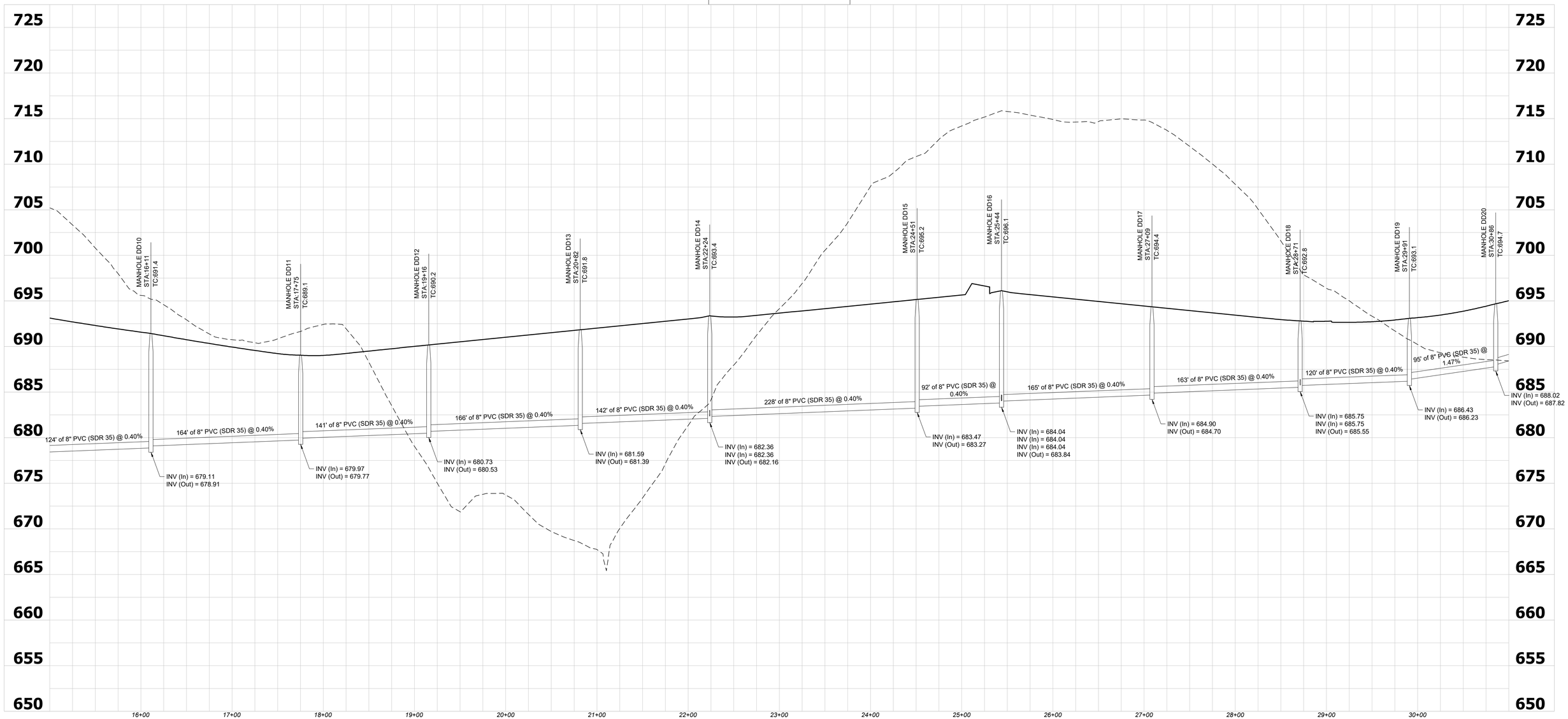


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SCALE: 1"=50'

Sanitary Line DD

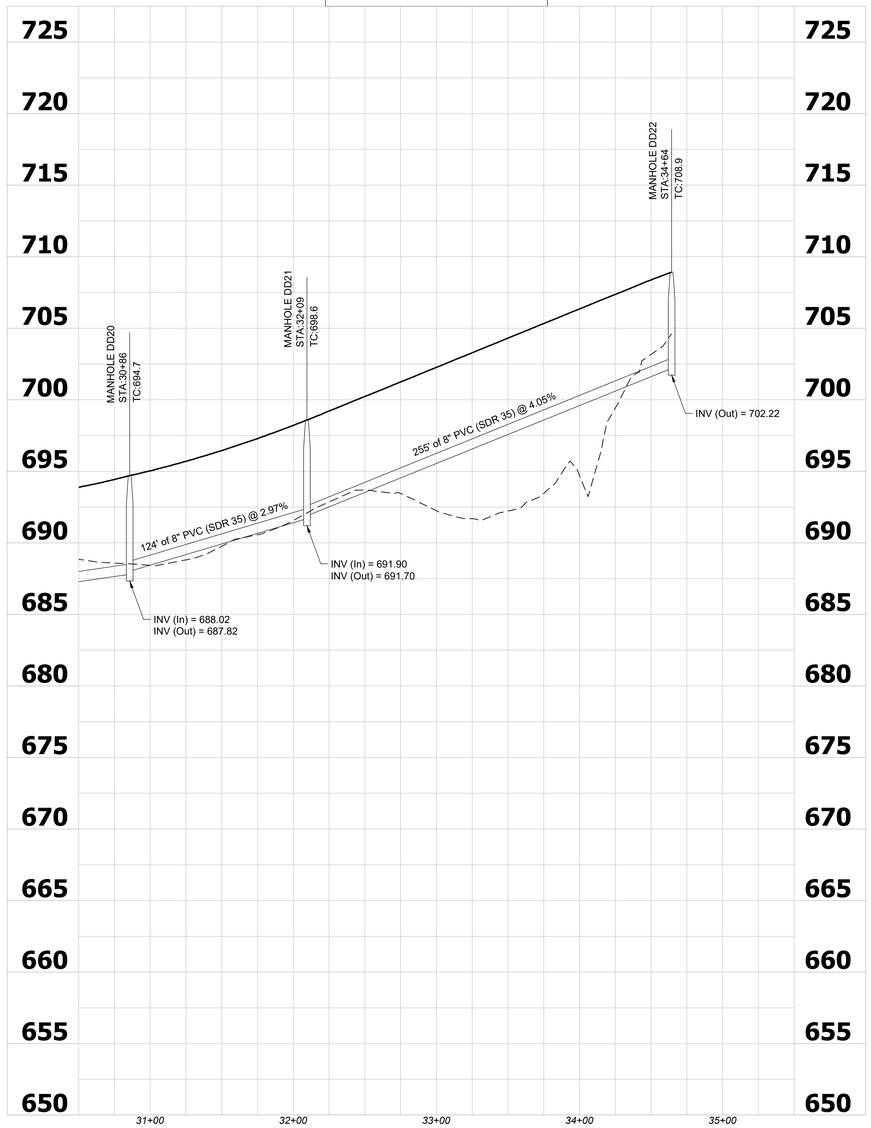


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SCALE: 1"= 50'

Sanitary Line DD

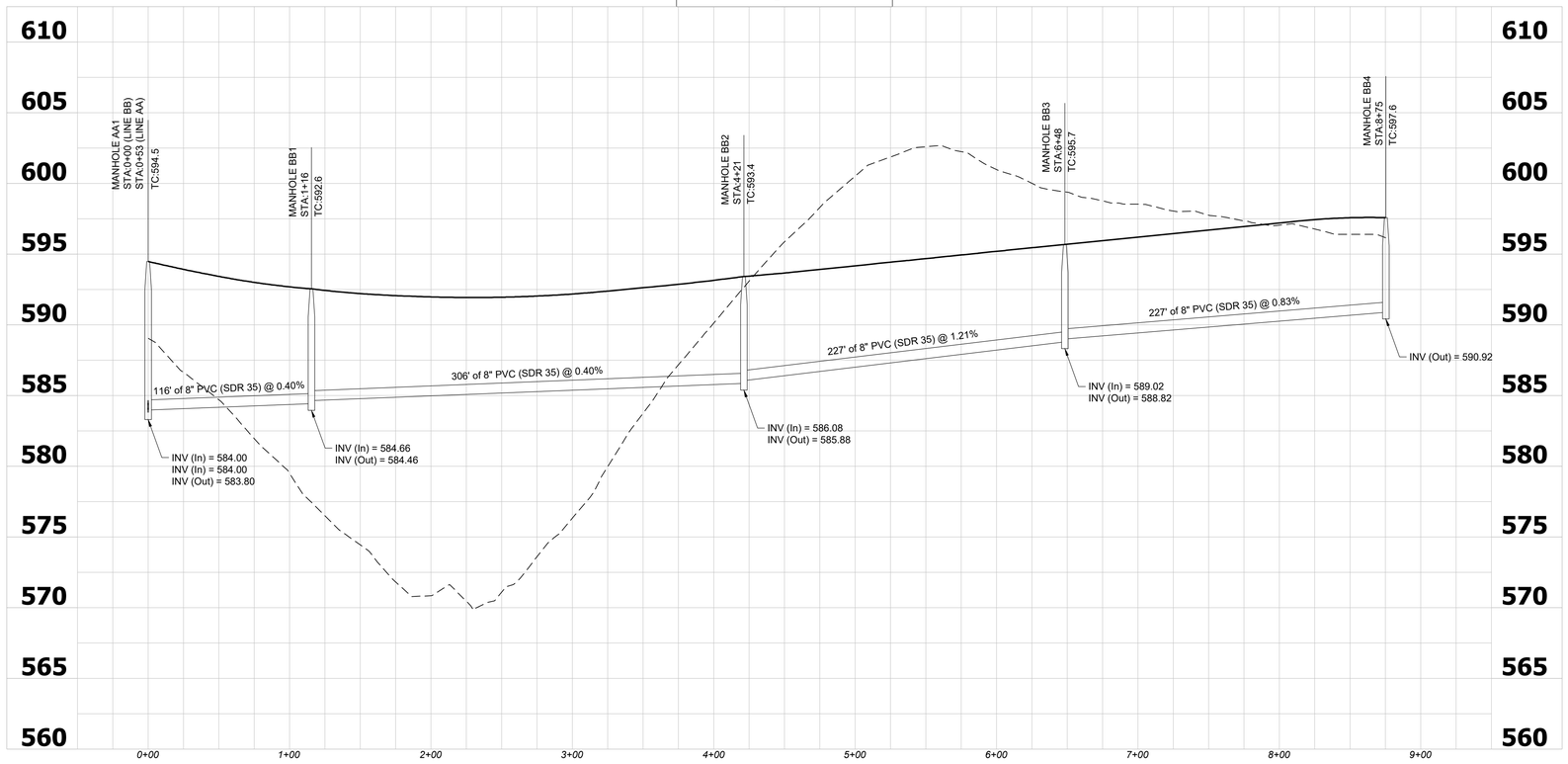


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SCALE: 1"=50'

Sanitary Line BB

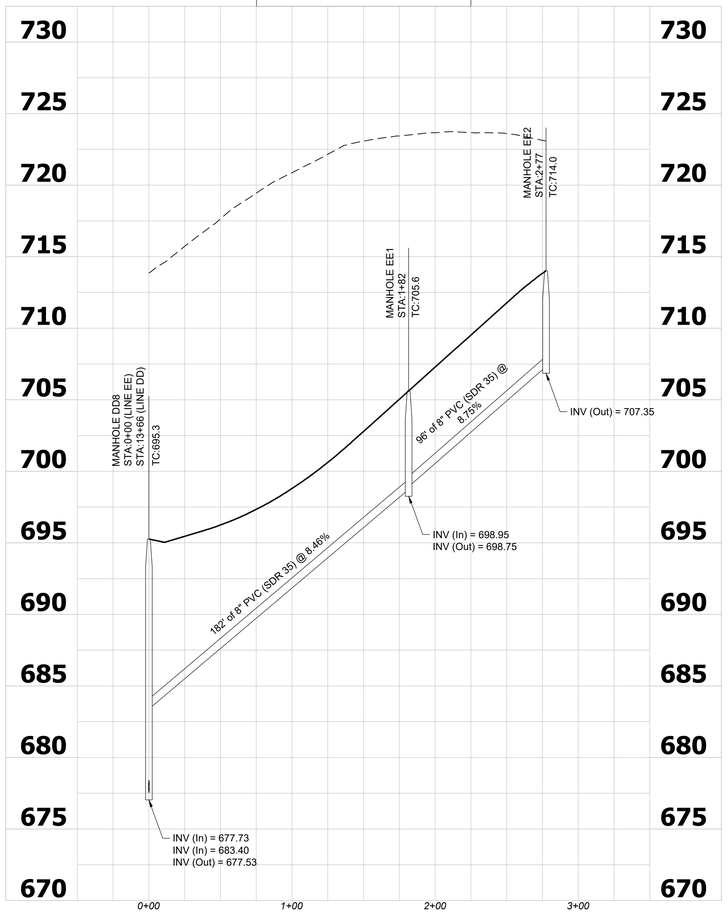


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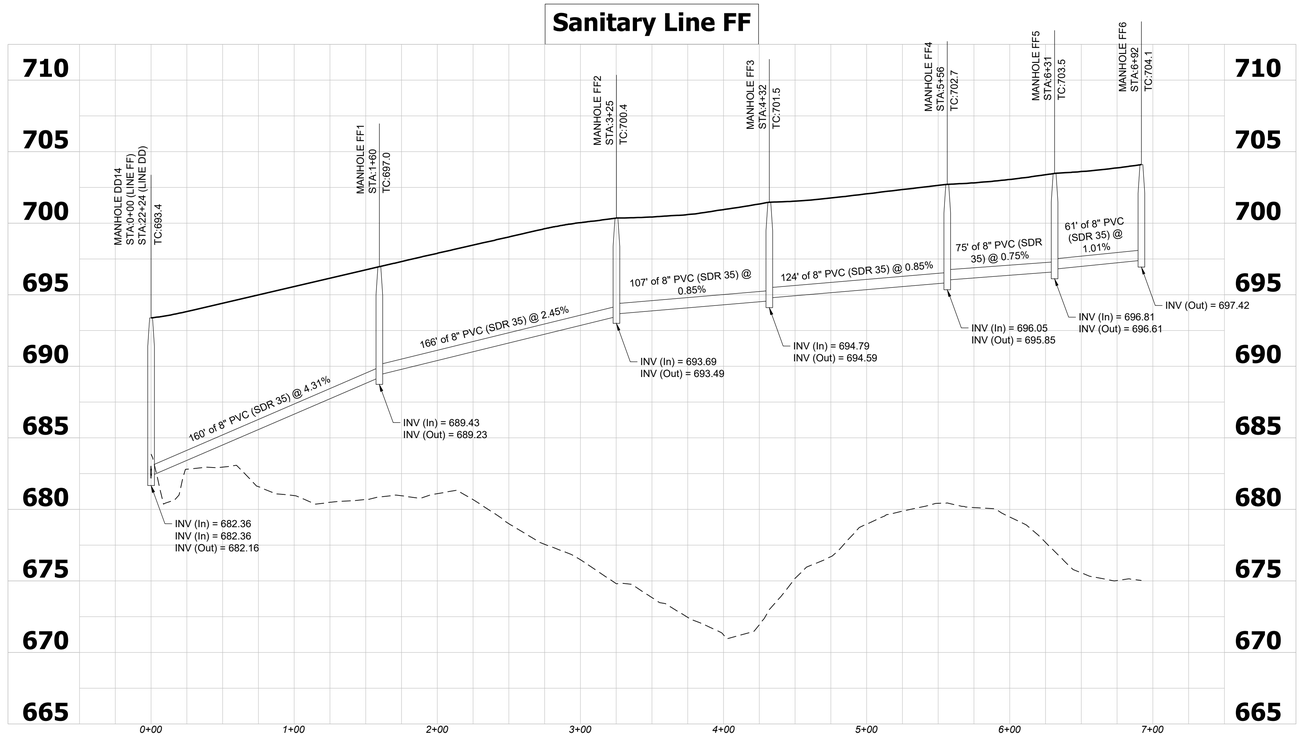
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SCALE: 1"= 50'

Sanitary Line EE



Sanitary Line FF

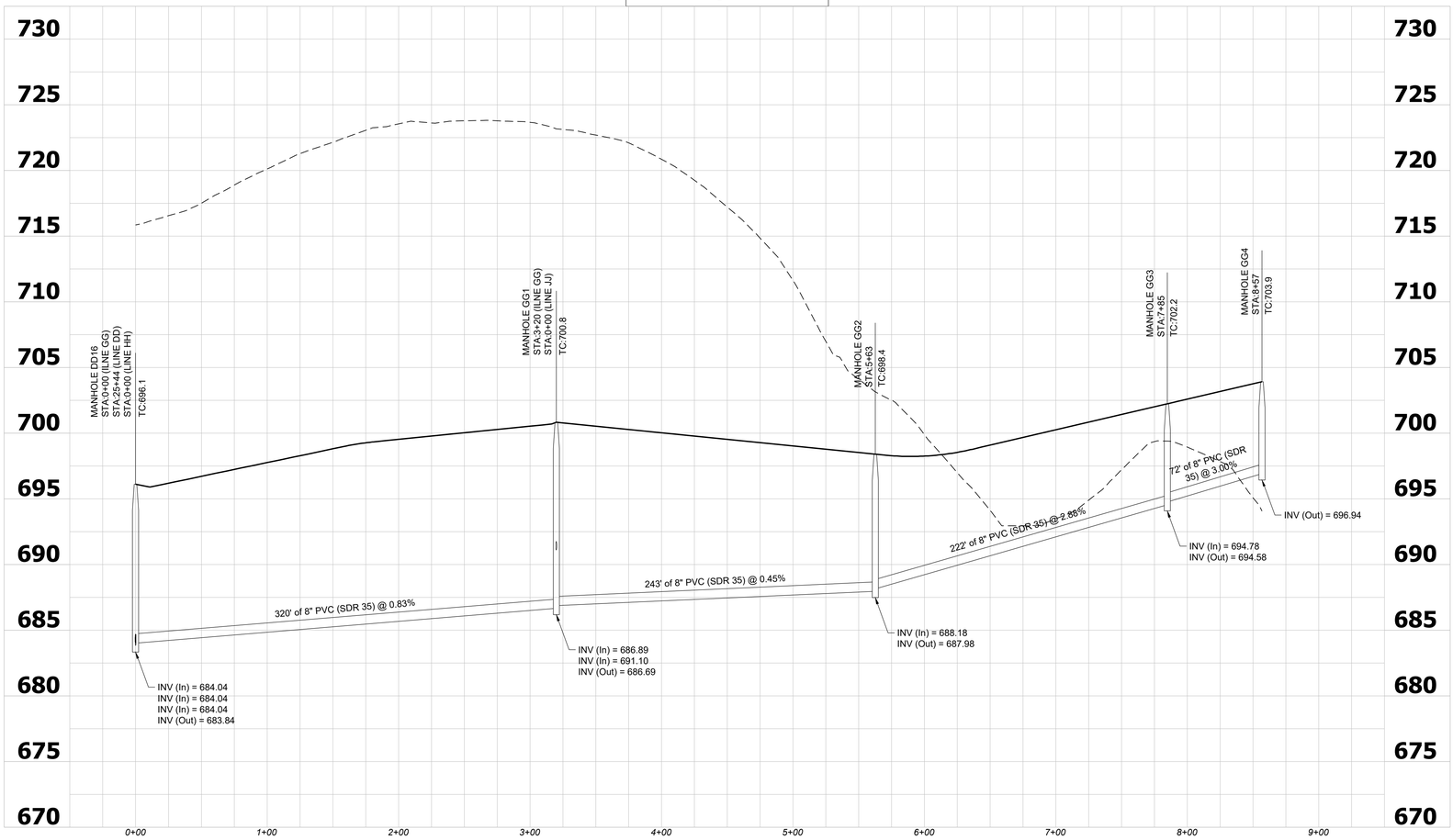


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SCALE: 1"=50'

Sanitary Line GG

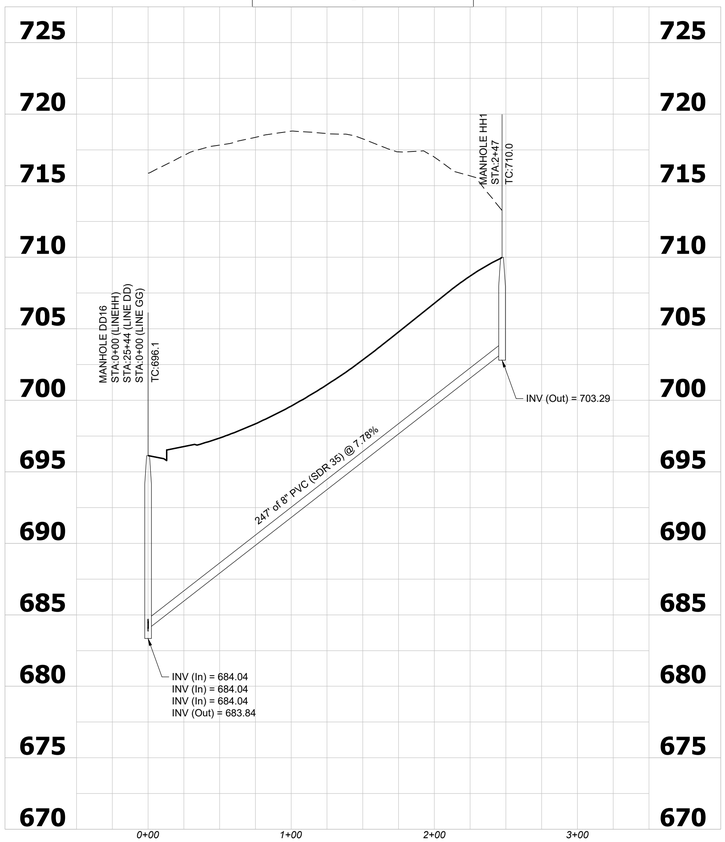


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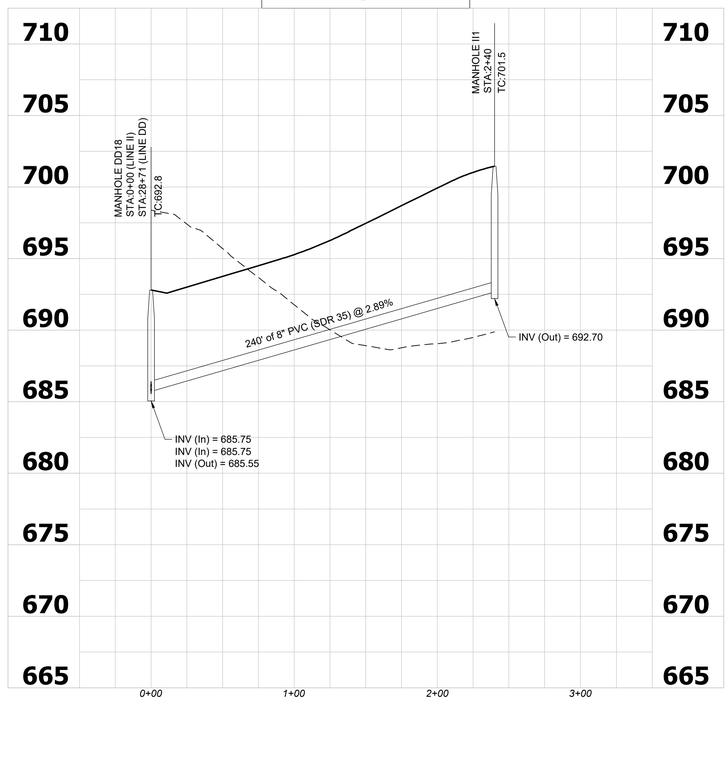
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SCALE: 1"= ##'

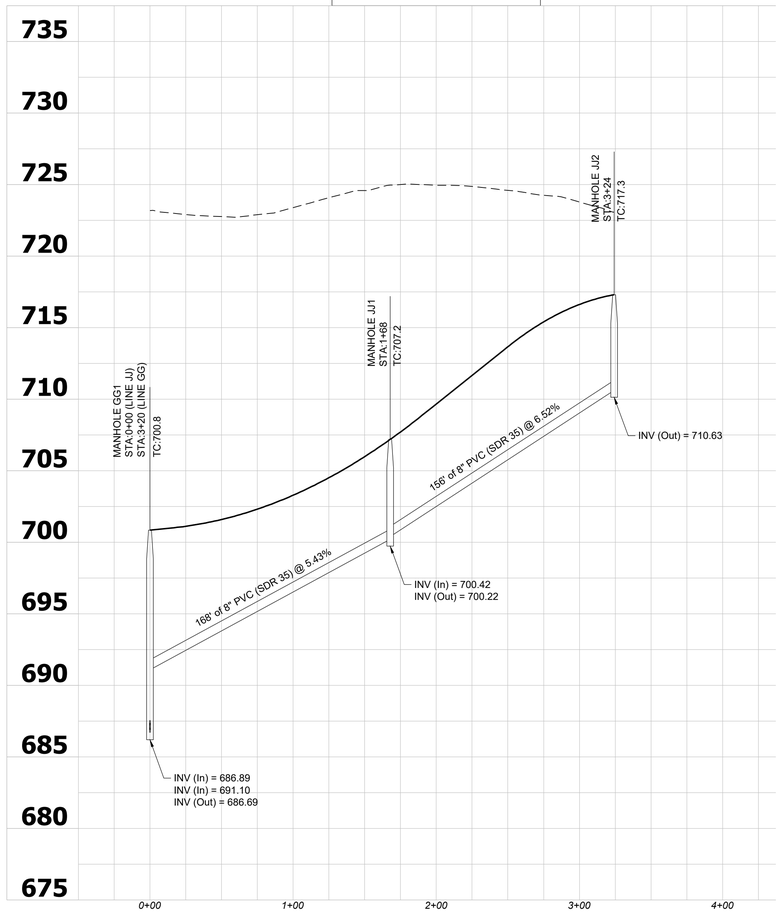
Sanitary Line HH



Sanitary Line II



Sanitary Line JJ



N

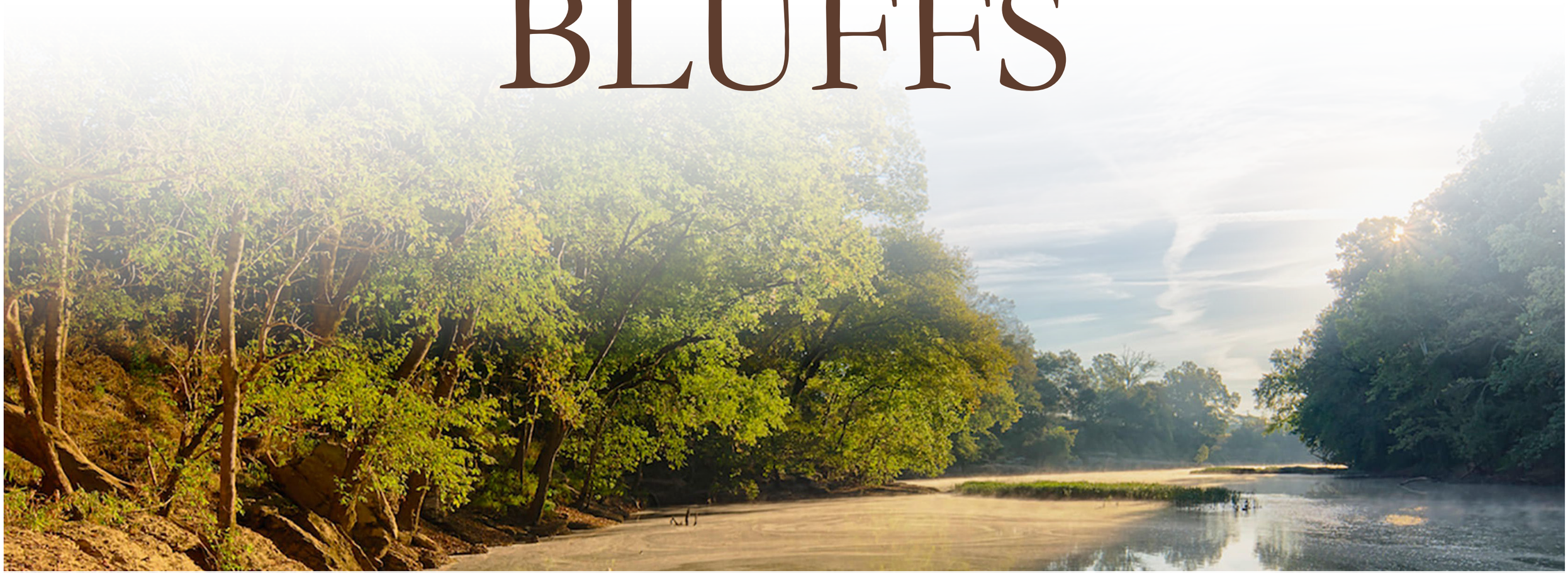
0 ## ###

SCALE: 1"= ##'

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

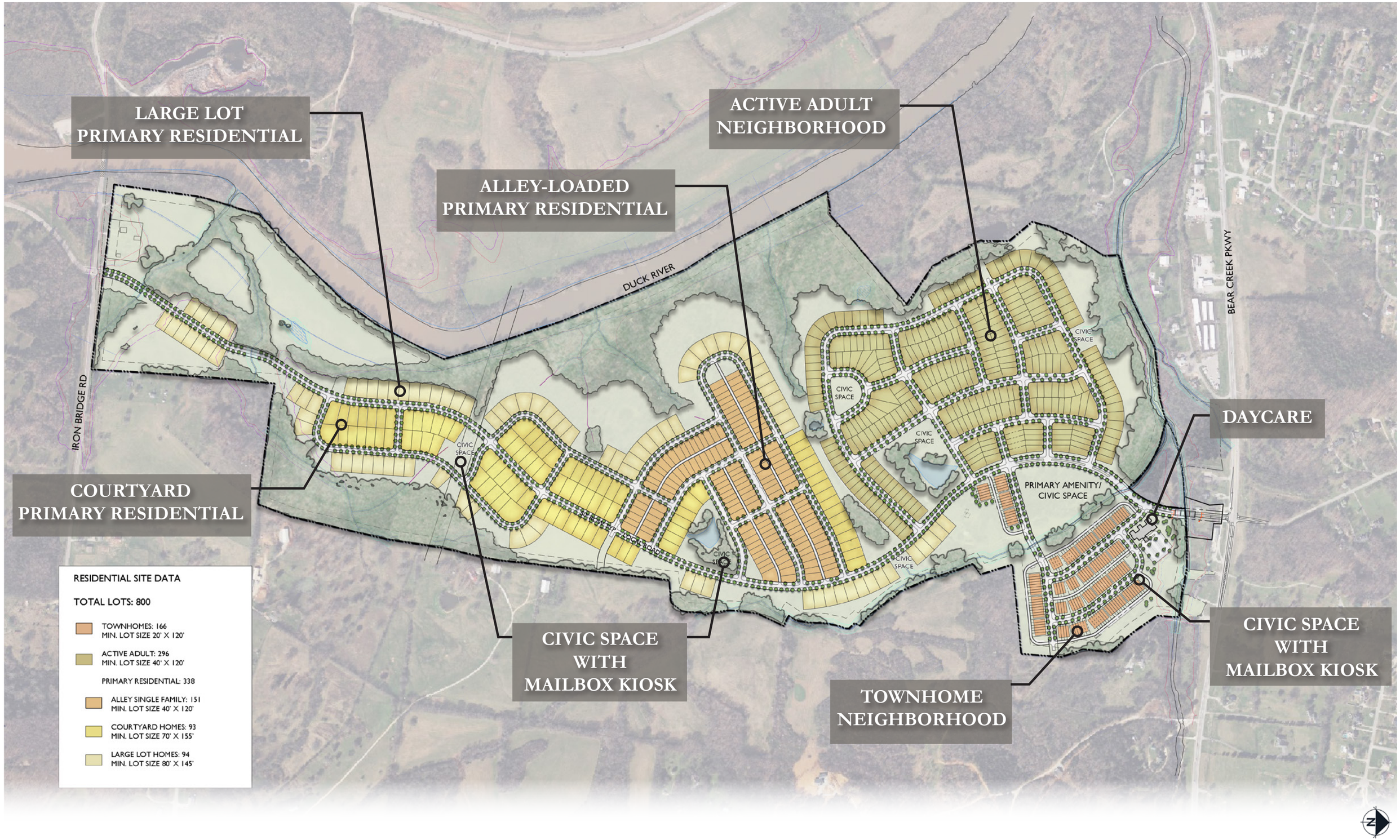
LANDSCAPE ARCHITECT
GREG GAMBLE
GAMBLE DESIGN COLLABORATIVE
3020 STANSBERRY LANE, SUITE 201
FRANKLIN, TN 37069

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2. DEVELOPMENT TEAM
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8. COURTYARD HOMES
10. LARGE LOT HOMES
12. ALLEY-LOADED PRIMARY RESIDENTIAL
14. TOWNHOMES
16. DAYCARE
17. MAIN AMENITY ARCHITECTURE
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

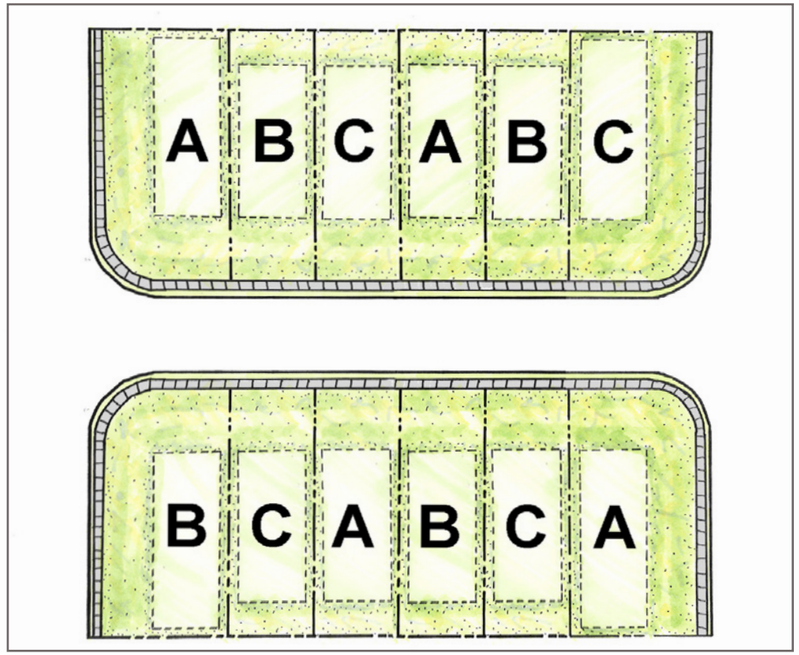








IMAGE OF HOMES REPRESENT AN EXAMPLE OF FACADE VARIETY ALONG SAME STREET. FINAL SELECTION OF MATERIALS AND STYLES TO BE APPROVED AT FMDP.



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







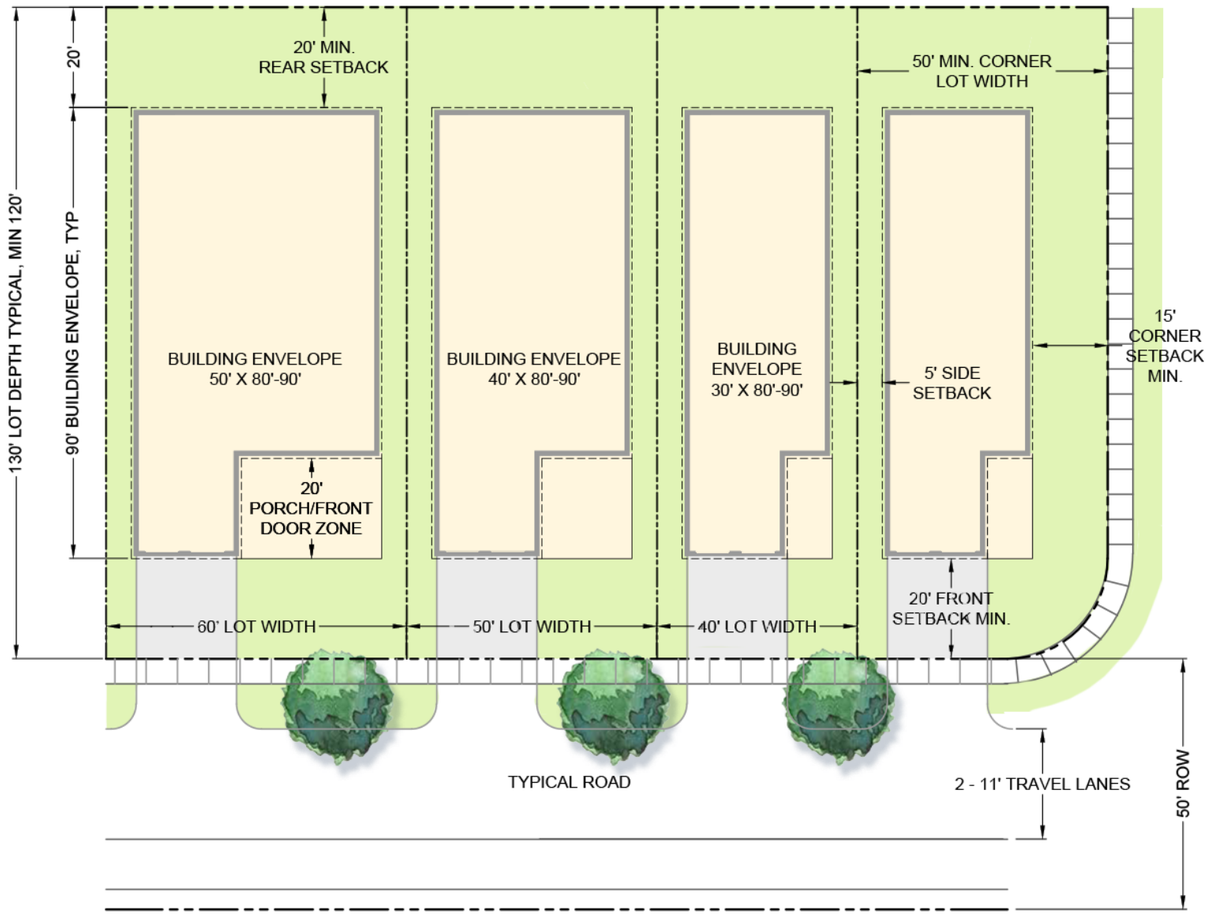


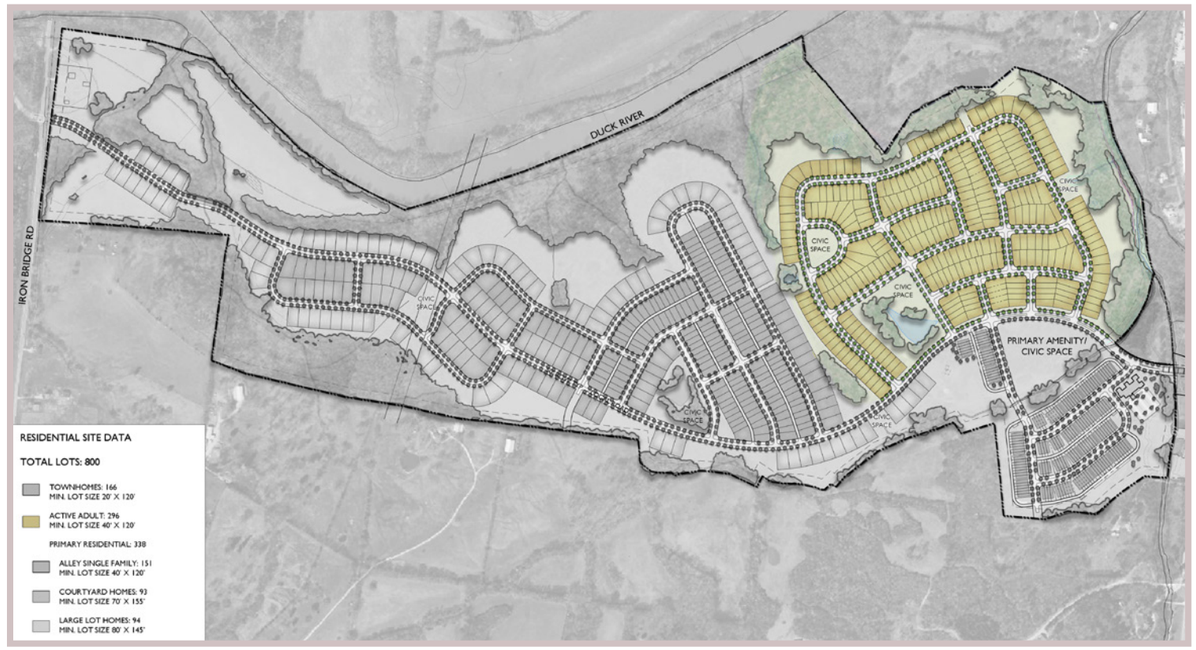
ACTIVE ADULT SINGLE FAMILY:

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











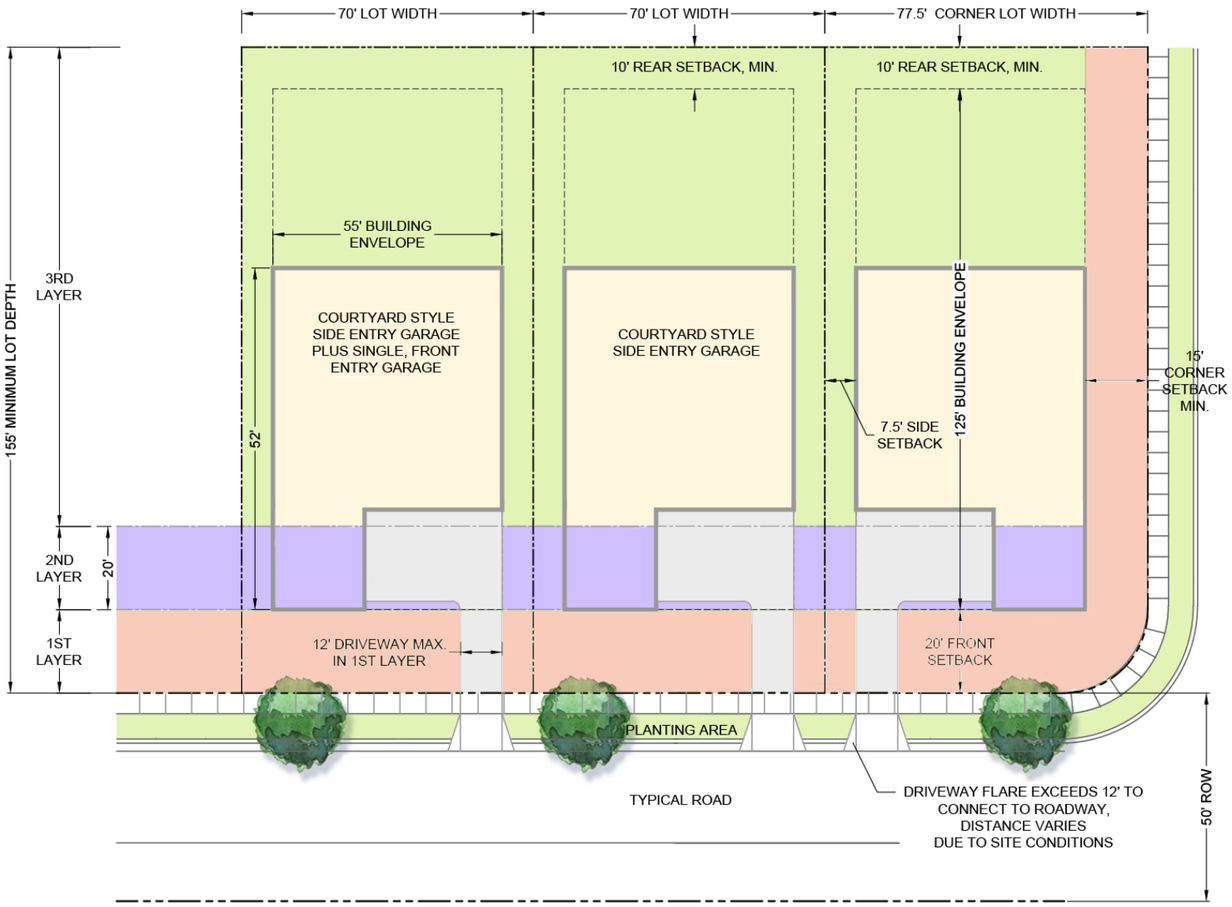


COURTYARD HOMES:

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











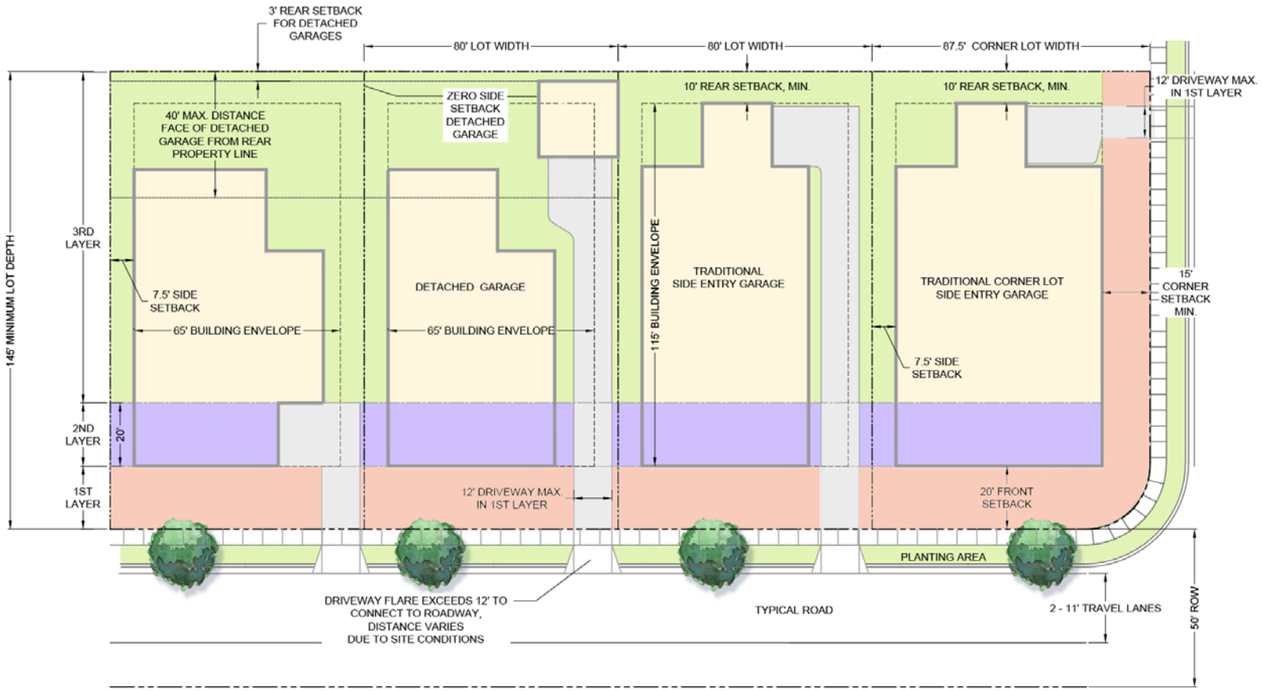


LARGE LOT HOMES:

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











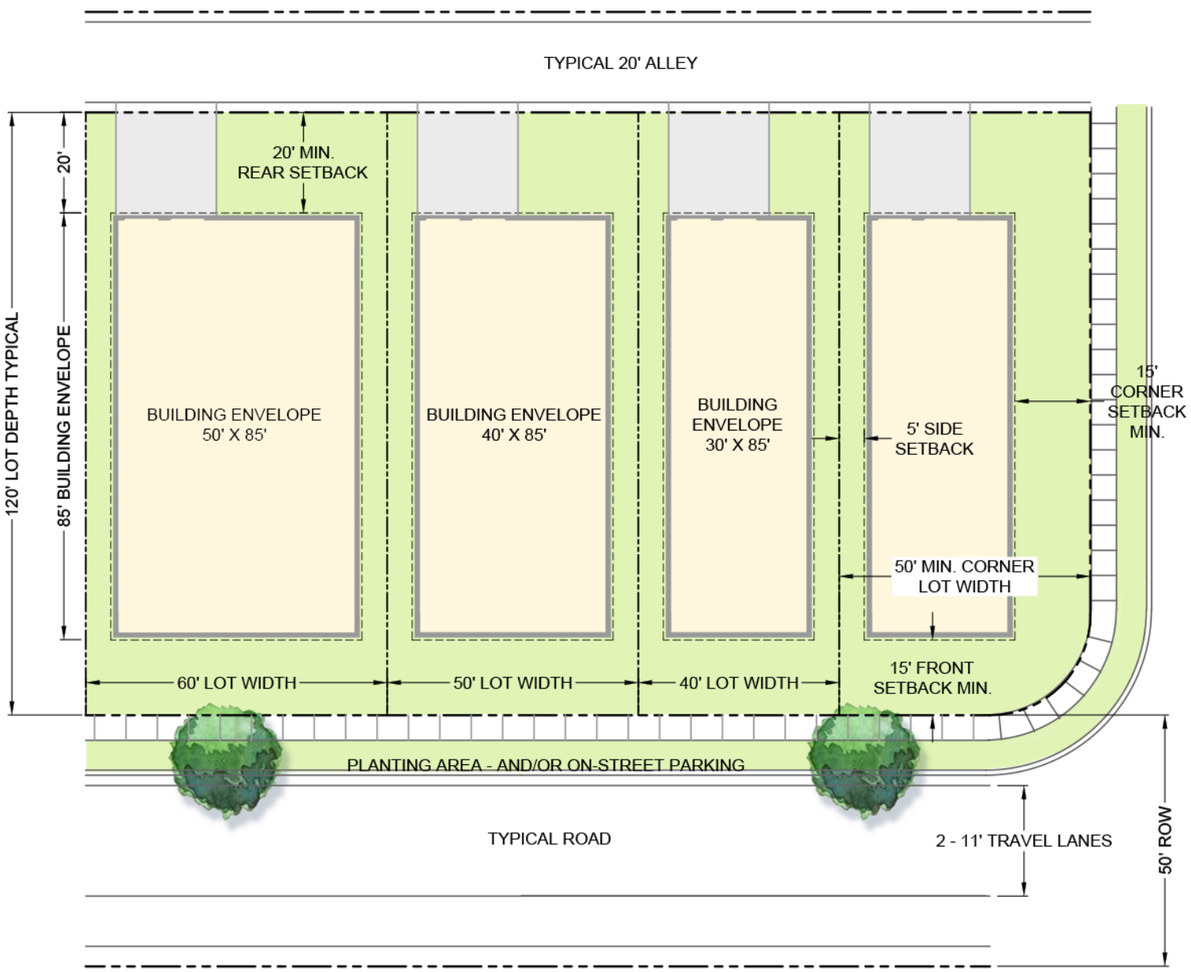


SINGLE-FAMILY ALLEY LOADED:

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



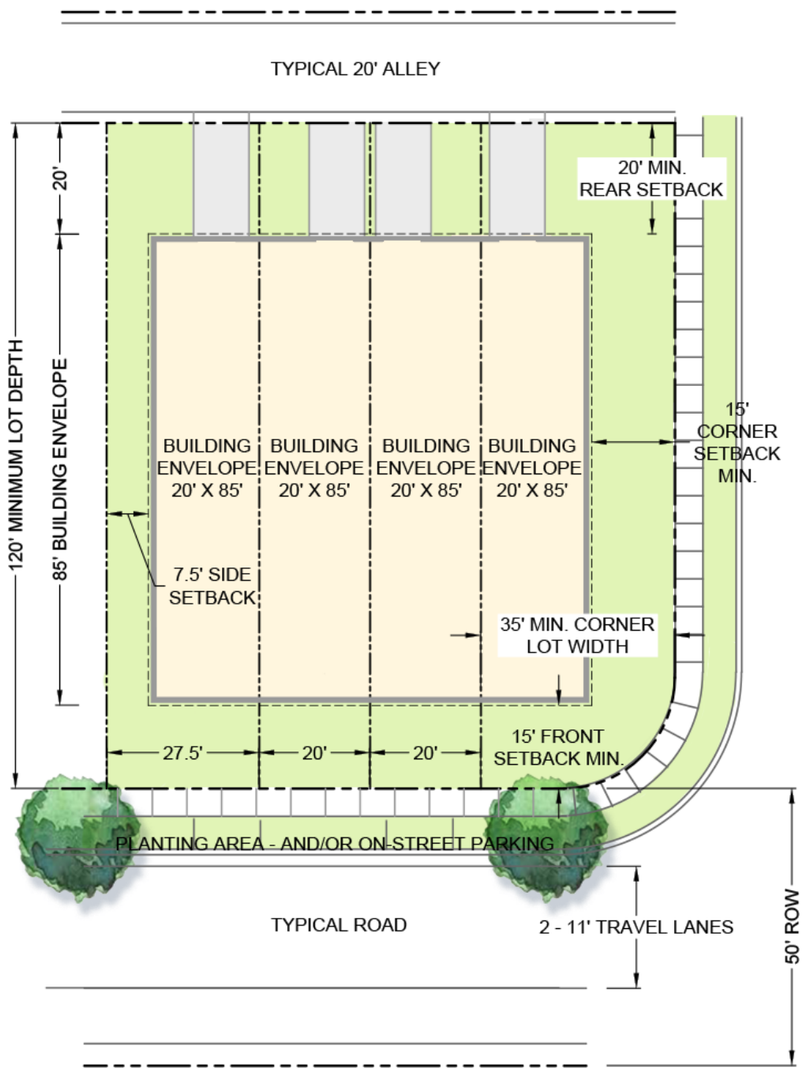


TOWNHOMES:

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





LOTS: 20' MINIMUM
166 HOMES

BUILDING SETBACKS:

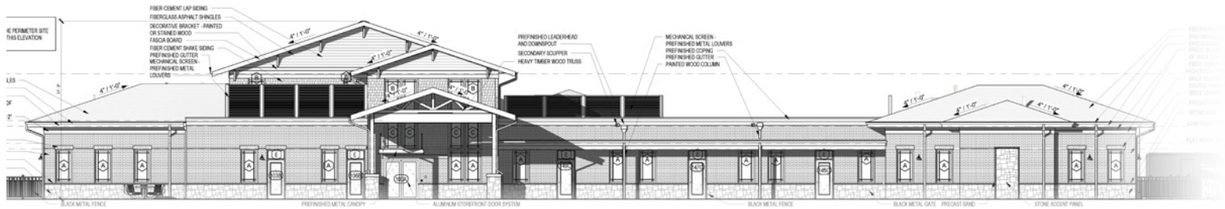
FRONT:	15'
REAR:	20'
SIDE:	7.5'
CORNER:	15'

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.

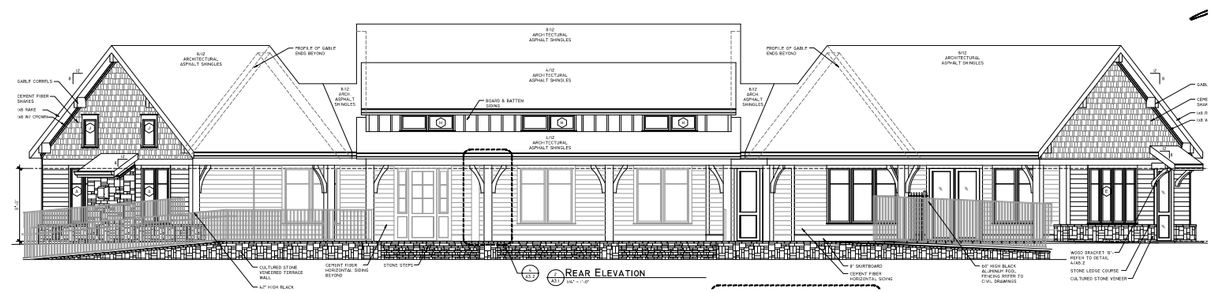
AMENITY PHOTOGRAPHS

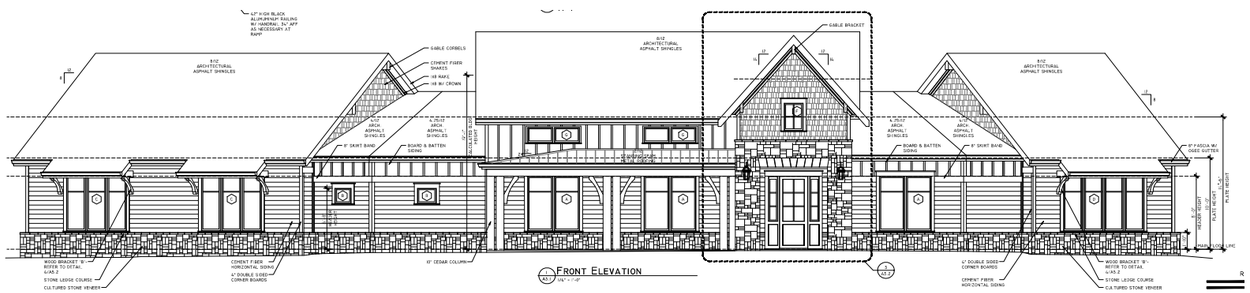




POOL AND CLUBHOUSE FROM SIMILAR KOLTER PROJECT

AMENITY ELEVATIONS





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.

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

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

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

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

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

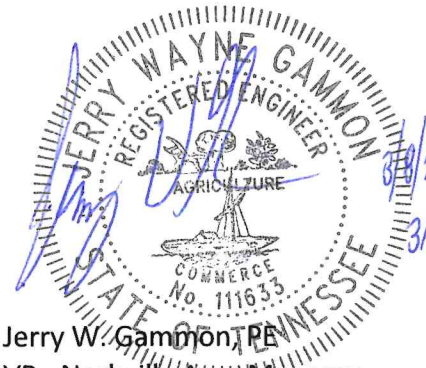
Dear Mr. Harvey:

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



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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APPENDICES

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

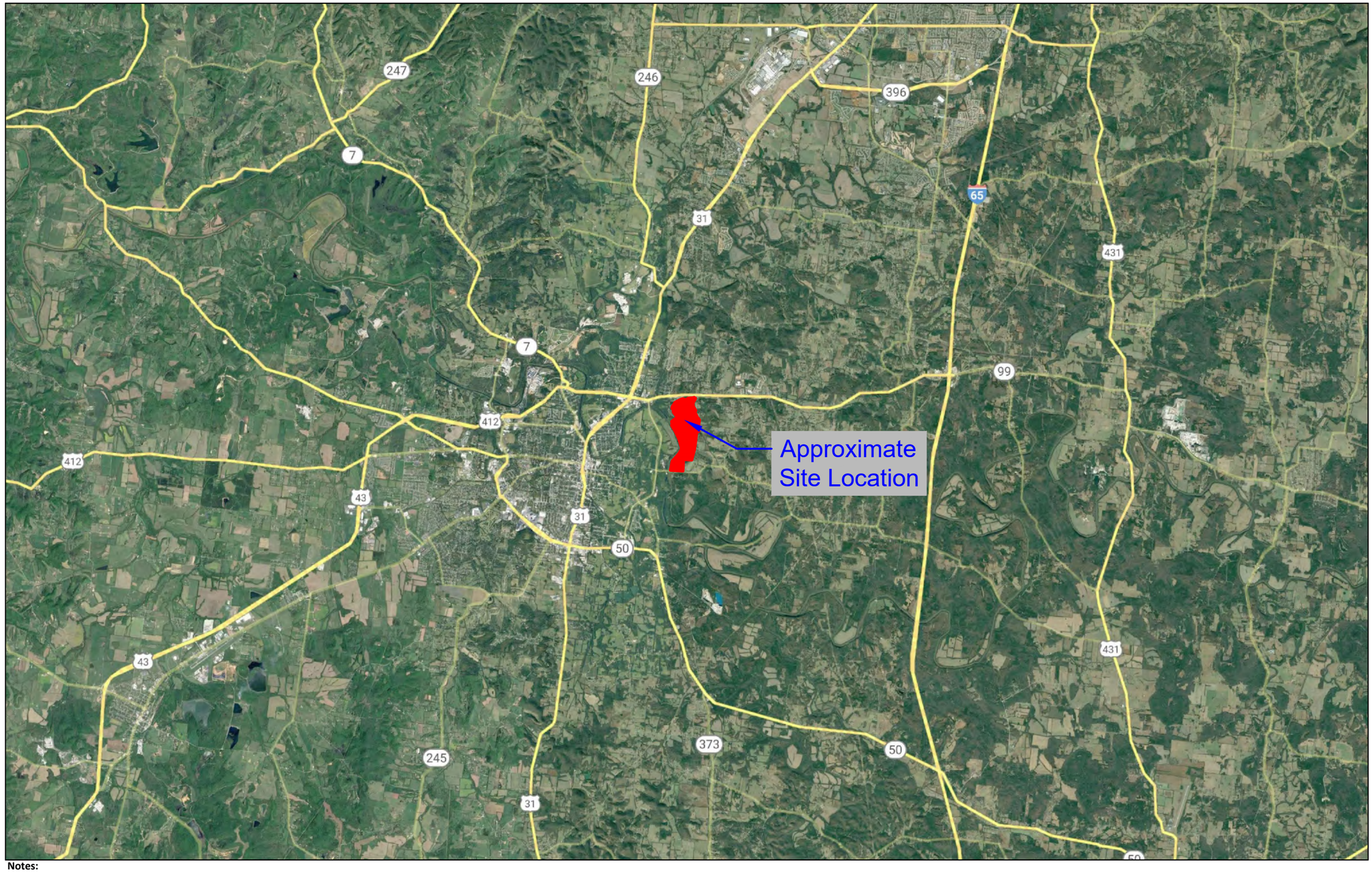
project construction in the field. GEOServices cannot accept responsibility for conditions which deviate from those described in this report if not retained to perform construction observation and testing. If variations appear evident, then we will re-evaluate the recommendations of this report. In the 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.

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

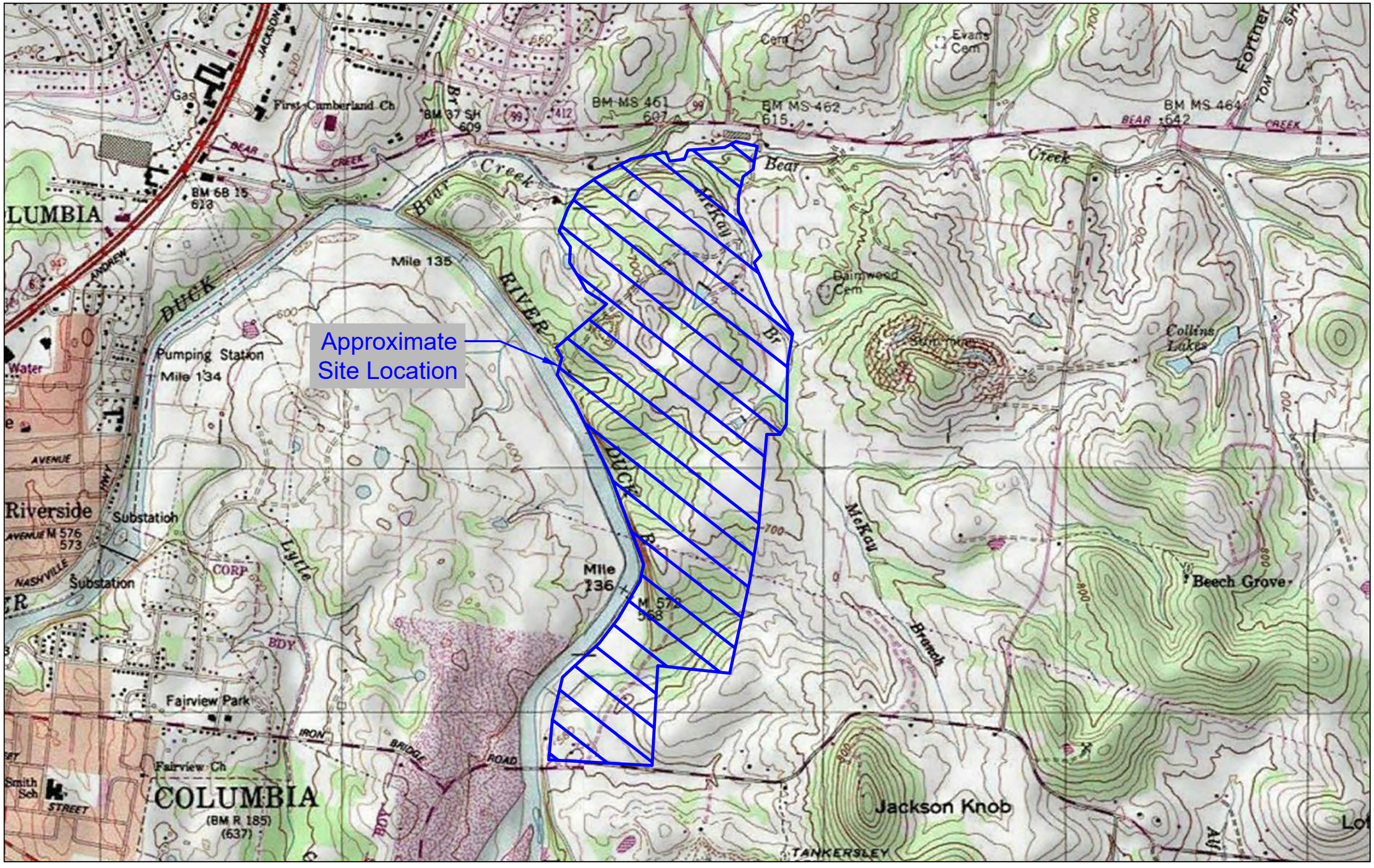
Site Vicinity Plan
Proposed Bear Creek Property
Bear Creek Pike to Iron Bridge Road
Columbia, Tennessee

DATE: 12/20/2021

GEOS Project No. 31-211695

FIGURE: 1

N



Source Provided by: MYTOPO

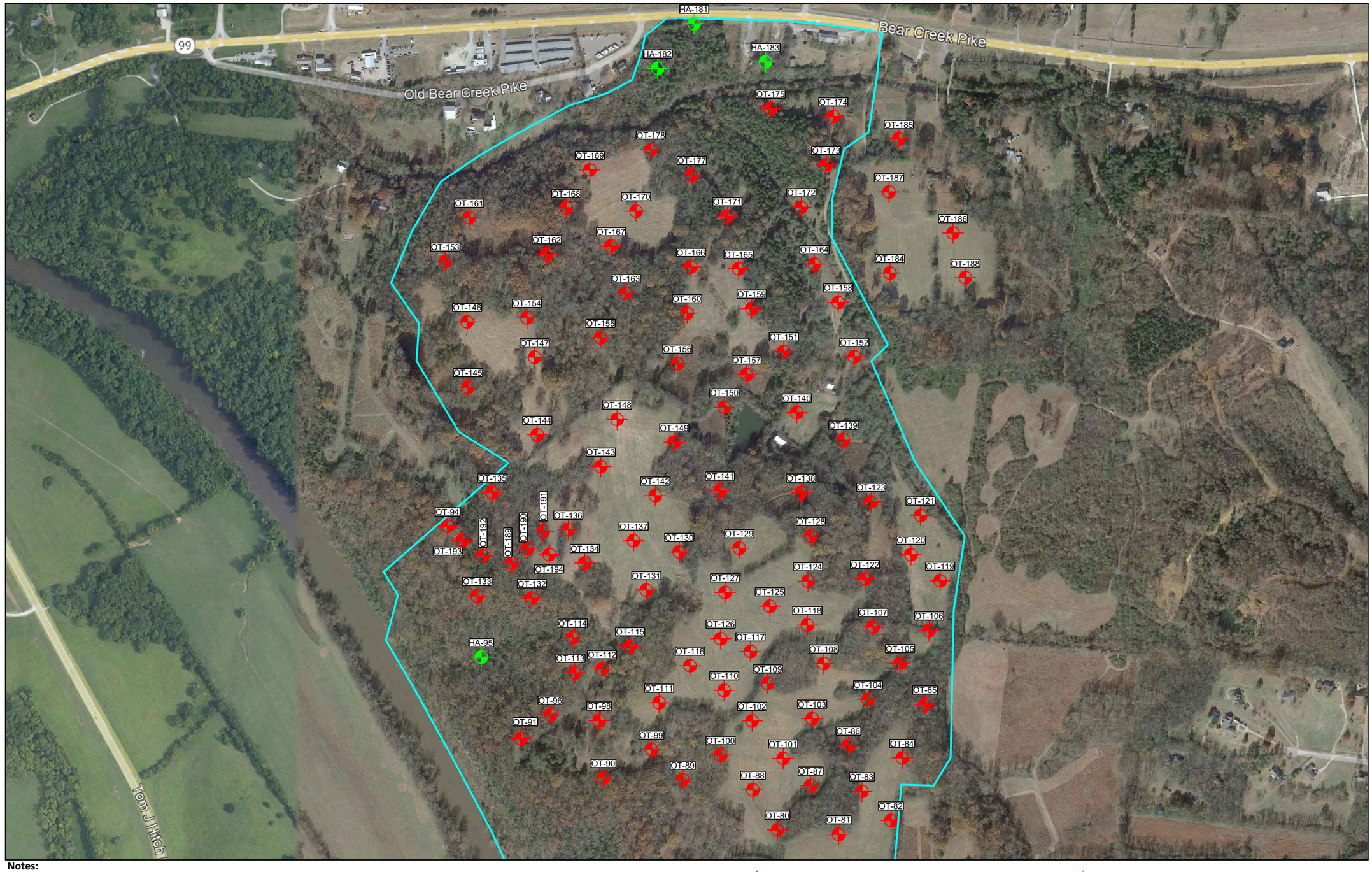
Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

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

N

Tom J Hitch Pkwy

Iron Bridge Rd

Tamara Ln

OT-76 OT-75 OT-79 OT-78 HA-74 OT-72 OT-71 OT-70 OT-69 HA-64 OT-65 OT-66 OT-67 OT-68 OT-55 OT-56 OT-57 OT-61 OT-63 OT-62 OT-58 OT-60 OT-59 OT-50 OT-51 OT-52 OT-53 OT-54 OT-49 OT-48 OT-47 OT-46 OT-45 OT-40 OT-41 OT-42 OT-43 OT-44 OT-28 OT-39 OT-38 OT-37 OT-36 OT-27 OT-32 OT-33 OT-34 OT-35 OT-26 OT-30 OT-31 OT-24 OT-73 OT-29 OT-25 OT-20 HA-22 OT-97 OT-21 HA-77 HA-16 HA-17 OT-179 OT-18 OT-9 OT-19 OT-8 OT-12 OT-10 OT-176 OT-7 OT-13 OT-11 OT-14 OT-23 OT-6 OT-15 OT-93 OT-5 OT-2 OT-180 OT-4 HA-1 OT-3 OT-92

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	TEST PIT OBSERVATION RECORD Test Pit No.: OT-6	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 (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	Fat CLAY (CH) - brown with trace black mottling; firm to stiff; moist; (RESIDUUM)					
2.0		6-7-8				
3.0						
4.0		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					
	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-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	Fat CLAY (CH) with chert fragments, small rock fragments at depth, trace siltstone at depth - brown; moist; (RESIDUUM)					
2.0		3-4-5				
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-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	TEST PIT OBSERVATION RECORD Test Pit No.: OT-31	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
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	TEST PIT OBSERVATION RECORD Test Pit No.: OT-32	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 (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	TEST PIT OBSERVATION RECORD Test Pit No.: OT-37	GEOServices 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 (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	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	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	Fat CLAY (CH) - brown, 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-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	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 GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-55	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 2.5 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	TEST PIT OBSERVATION RECORD Test Pit No.: OT-57	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 (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	TEST PIT OBSERVATION RECORD Test Pit No.: OT-63	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-211695		
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						
2.0						
		6-7-8				
3.0						
4.0						
	Fat CLAY (CH) - brown, reddish brown with trace black mottling; firm; moist; (RESIDUUM)	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	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 GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: HS-77	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
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	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 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	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		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						
	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-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	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	TEST PIT OBSERVATION RECORD Test Pit No.: OT-88	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 - 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
1.0	Topsoil (12 inches)					
2.0	Lean CLAY (CL) with trace weathered fragments, boulders - light brown; 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:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-90	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)					
	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	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	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	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 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	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 - 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	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		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)					
	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:

Bear Creek Property Columbia, Tennessee GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-114	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: 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	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 - 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 GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-127	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 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 GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-134	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		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						
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-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)					
	Fat CLAY (CH) - brown; moist; (RESIDUUM)					
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-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	Fat CLAY (CH) - orangish brown, light brown with black mottling; firm to stiff; moist; (RESIDUUM)	6-5-6				
5.0						
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		6-6-7				
5.0	Fat CLAY (CH) - orangish brown, light brown with black mottling; firm; moist; (RESIDUUM)					
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	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	TEST PIT OBSERVATION RECORD Test Pit No.: OT-141	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 (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						
	Observation Trench Termination at 7.5 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-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	TEST PIT OBSERVATION RECORD Test Pit No.: OT-149	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 (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	TEST PIT OBSERVATION RECORD Test Pit No.: OT-169	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) 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 GEOServices Project No. 31-211695	TEST PIT OBSERVATION RECORD Test Pit No.: OT-191	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; 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	TEST PIT OBSERVATION RECORD Test Pit No.: OT-193	GEOServices 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) 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-194	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	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



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, (11/25/2019)

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: 8



Photo: 25



Photo: 26



Representative Photos
Proposed Bear Creek Property
Bear Creek Pike to Iron Bridge Road
Columbia, Tennessee

DATE: 12/20/2021

GEOS Project No. 31-211695

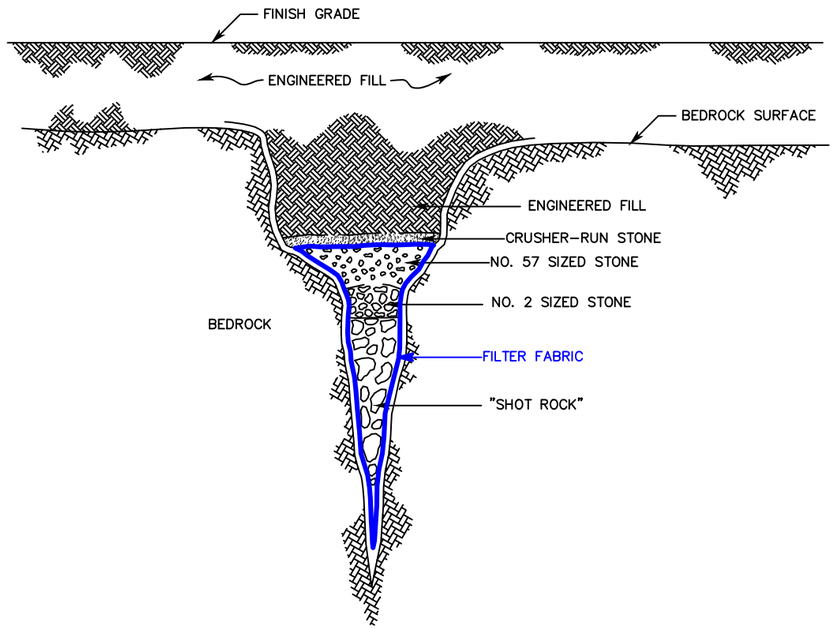
FIGURE: 9

Notes:

1) Site Source Provided by: Client
2) Aerial Provided by: Google Earth Pro, (11/25/2019)

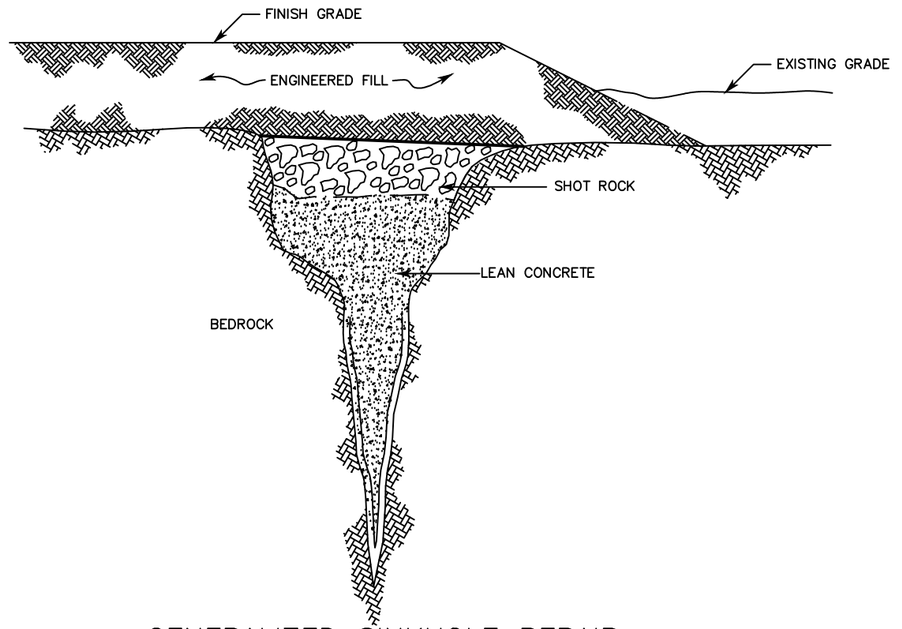
GEOServices, LLC, Geotechnical and Materials Engineers

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

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

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

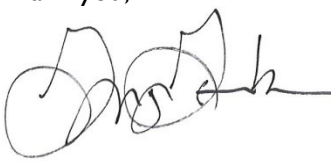
38. A water availability letter was issued on October 13, 2023, it remains valid for 120 days. The availability of capacity to serve is based on a determination by the Fire Marshal of fire flow requirements and the information submitted on the Water Service Availability Request application. Any off-site 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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Franklin, TN 370

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.

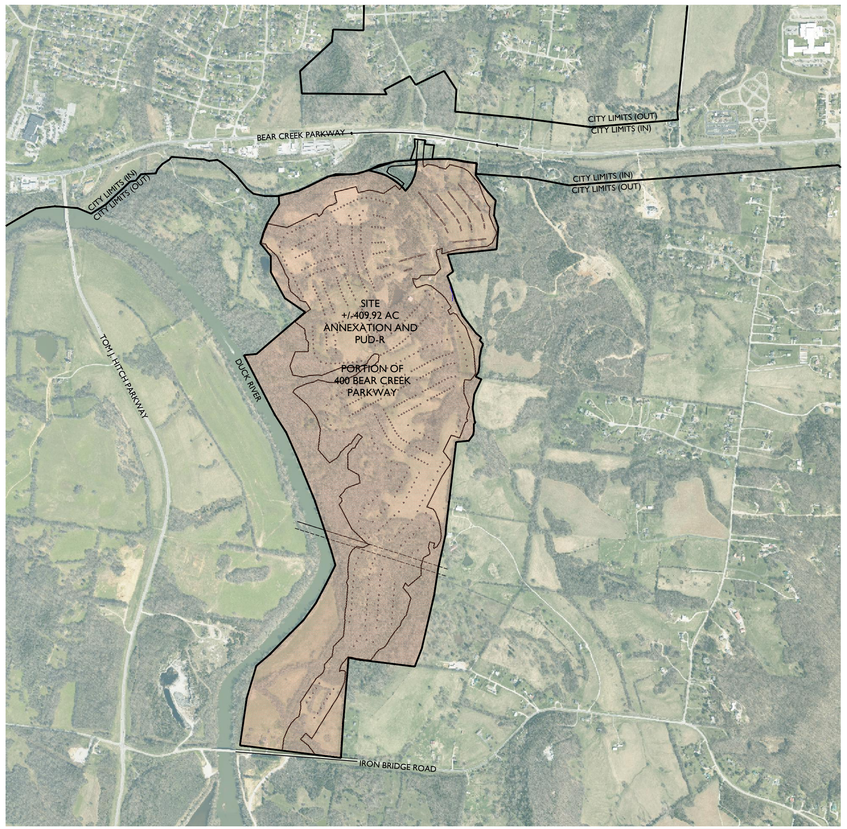
Thank you,



Gamble Design Collaborative
Greg Gamble

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

PRE-APP: August 30, 2023
INITIAL SUBMITTAL: October 16, 2023
RESUBMITTAL: December 18, 2023
RESUBMITTAL: January 23, 2024

GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT
1-23-24

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE



CSDG
Planning | Engineering
Landscape Architecture
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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:\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 700-845 (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/ VARIES)

DUCK RIVER

BEAR CREEK

N

0 300 600
SCALE: 1"= 300'

CSDG
Planning | Engineering
Landscape Architecture
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csdgtn.com

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

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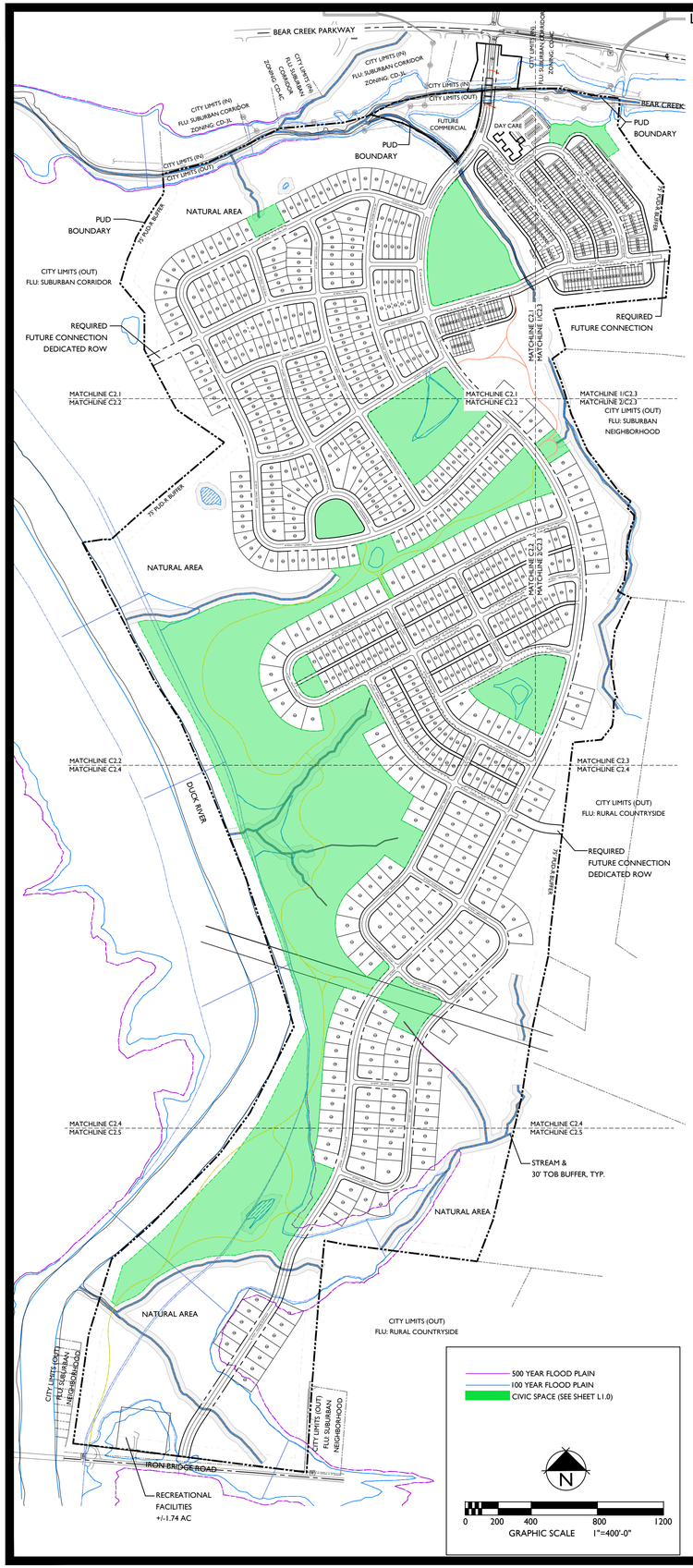
DRAWN BY: TWG
CHECKED BY: TWG

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°46'25" 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°11'15" 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°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 4-5" 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 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°46'26" 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 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 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 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 mimimum 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

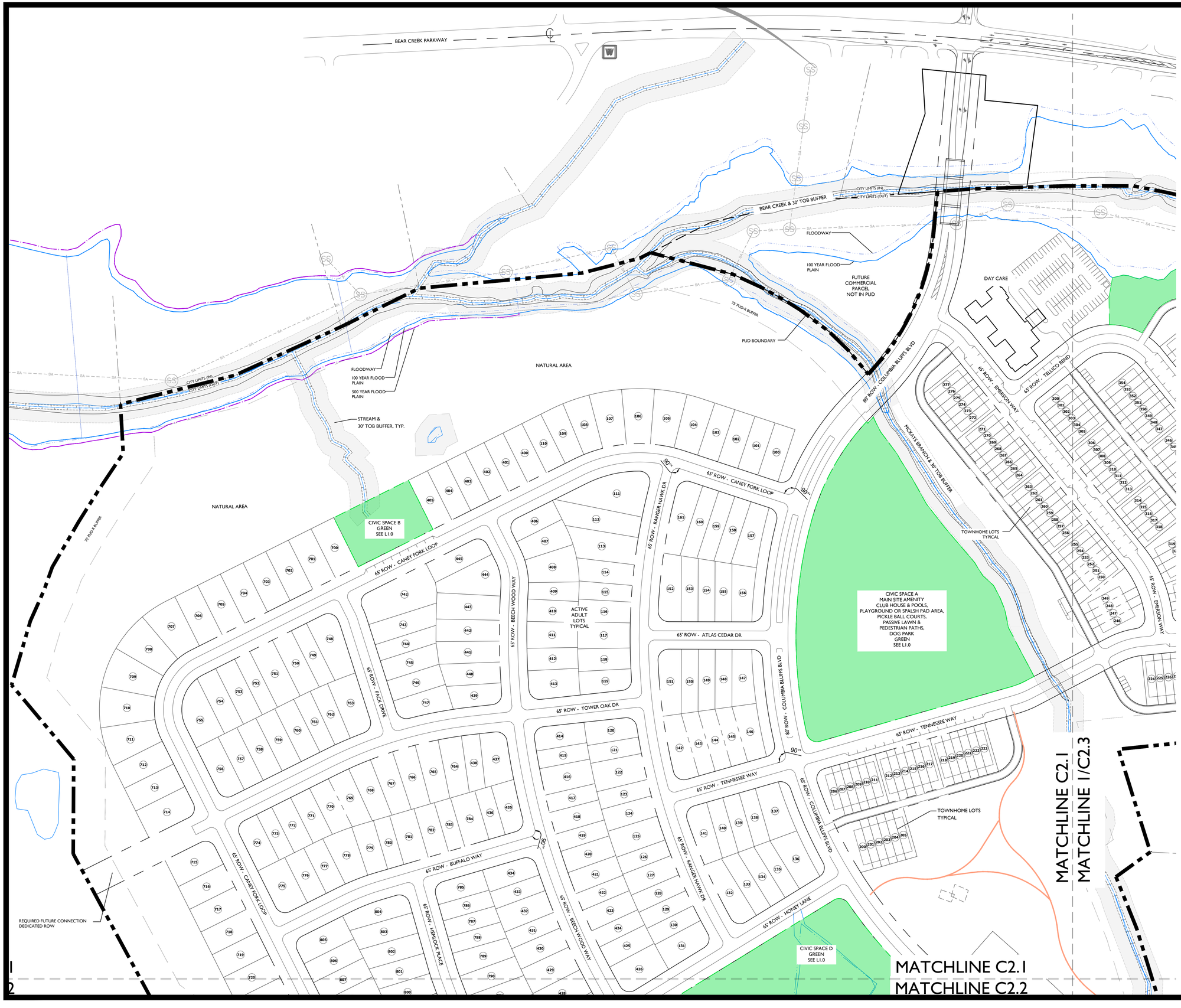
COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee



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

LARGE LOTS TYPICAL

ALLEY HOMES 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

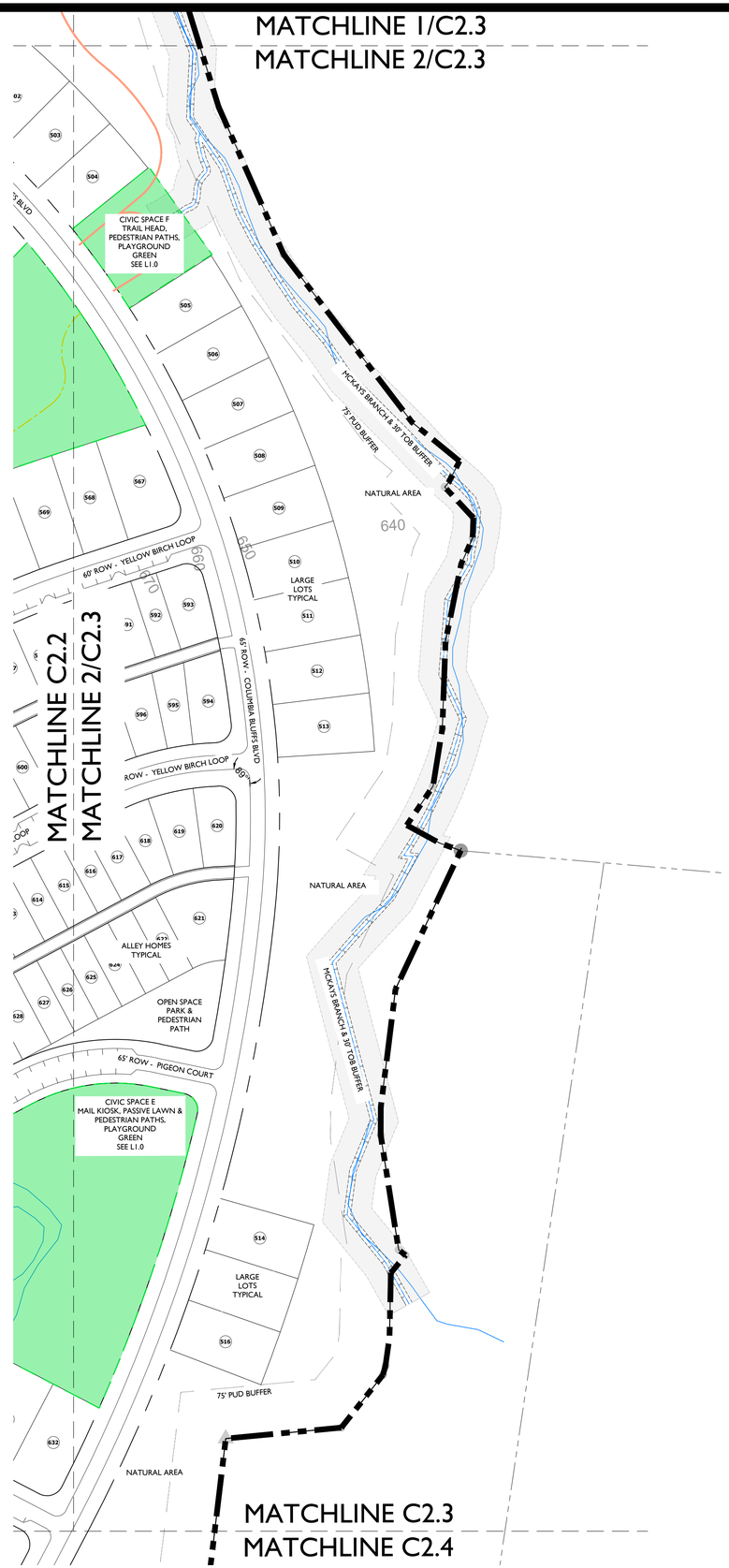
GREGORY C. GAMBLE
REGISTERED
TENNESSEE
LANDSCAPE ARCHITECT
1-23-24

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
10.25.24

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
TENNESSEE
LANDSCAPE ARCHITECT
1283

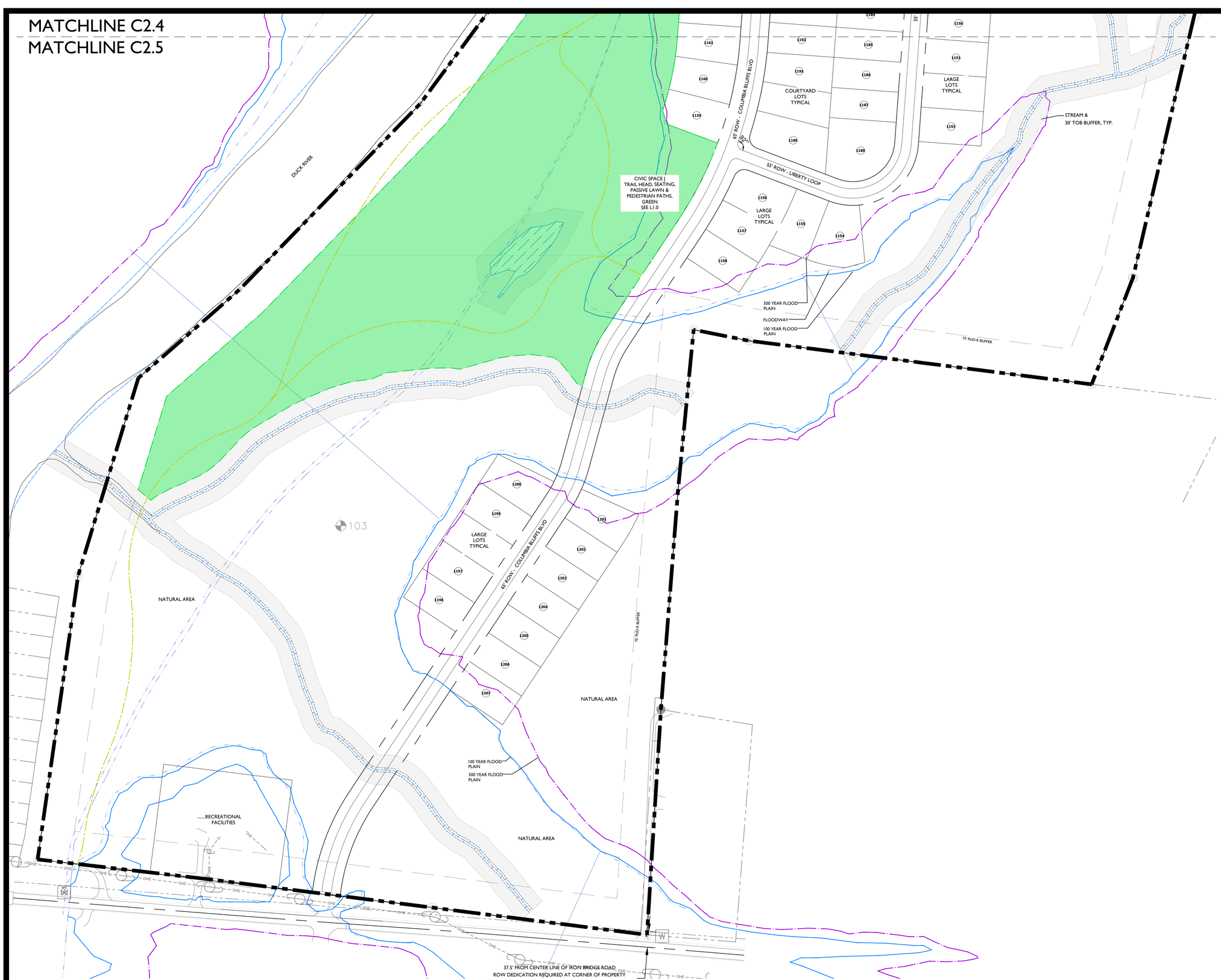
Date: October 16, 2023

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

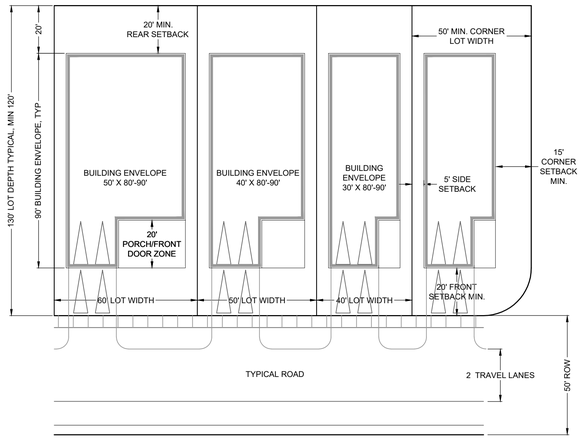
Revision Date
1 December 18, 2023
2 January 23, 2024
3

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'

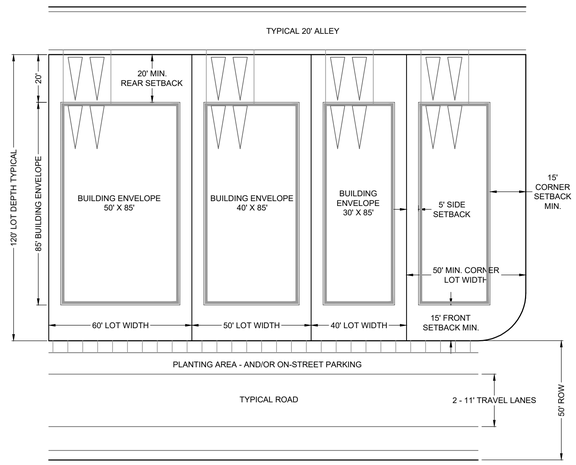
SETBACKS:	MODIFICATION REQUESTS:	LOT DISTRIBUTION:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 5' MIN. CORNER: 15' MIN. REAR: 20' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 5' GARAGE LOCATED IN 2ND LAYER DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16' DRIVEWAY TO BE 18' WIDE IN FIRST LAYER WINDOW SILL HEIGHT 3' ABOVE MIN. GRADE AT FACADE	60' LOTS: 60 50' LOTS: 139 40' LOTS: 97	60%



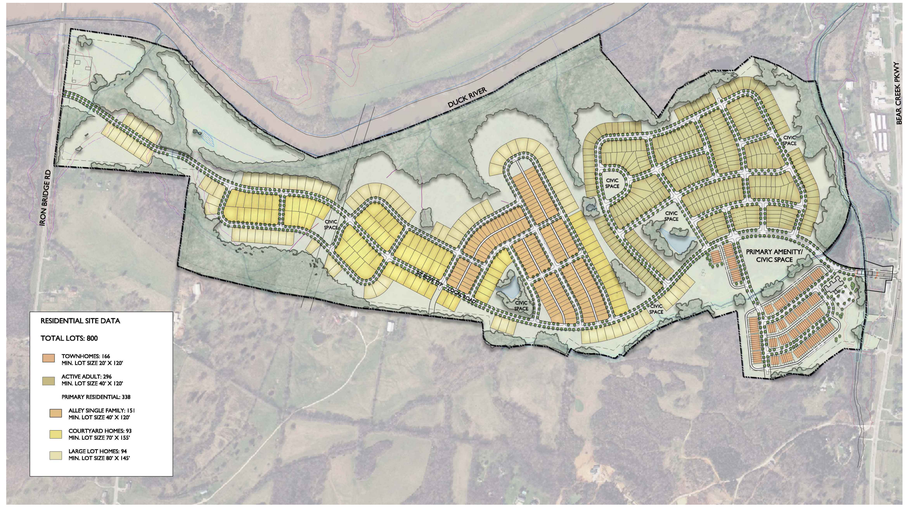
1 C2.6 ACTIVE ADULT LOT DIAGRAM N.T.S

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%



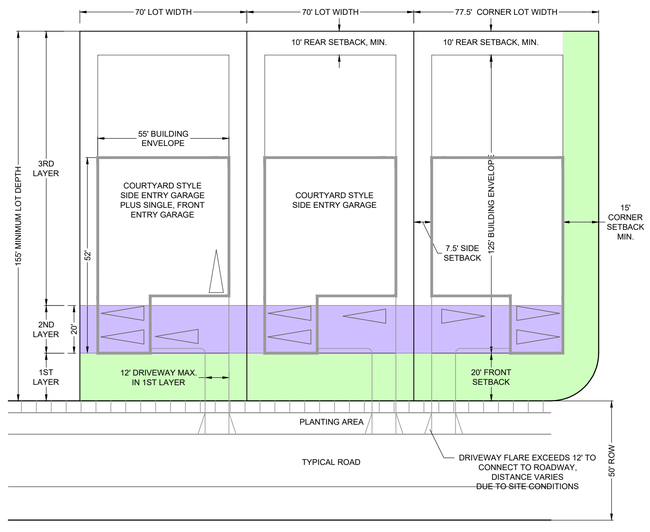
2 C2.6 SINGLE-FAMILY ALLEY LOT DIAGRAM N.T.S



3 C2.6 KEY MAP N.T.S

PRIMARY RESIDENTIAL COURTYARD SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 70' MIN. X 155'

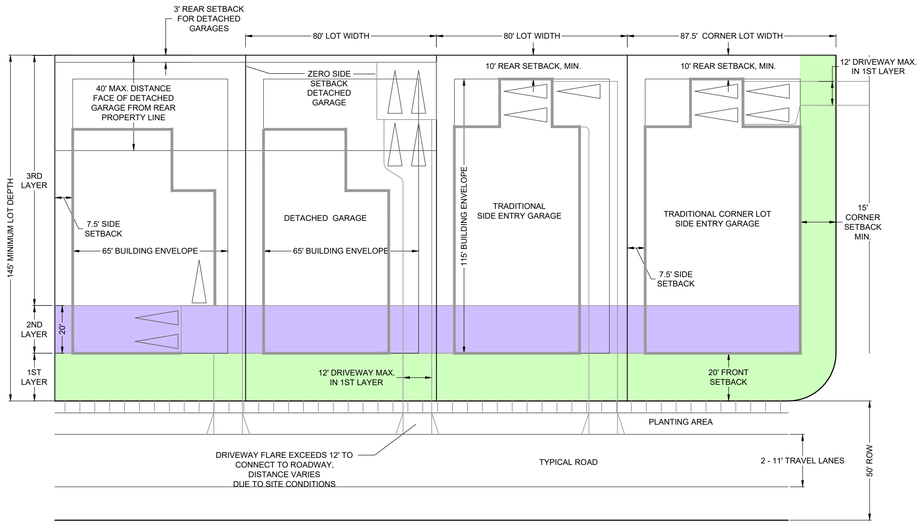
SETBACKS:	MODIFICATION REQUESTS:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 7.5' MIN. CORNER: 15' MIN. REAR: 10' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5' GARAGE LOCATED IN 2ND LAYER DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16' DRIVEWAY TO BE 12' WIDE IN FIRST LAYER WINDOW SILL HEIGHT 3' ABOVE FINISHED 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'

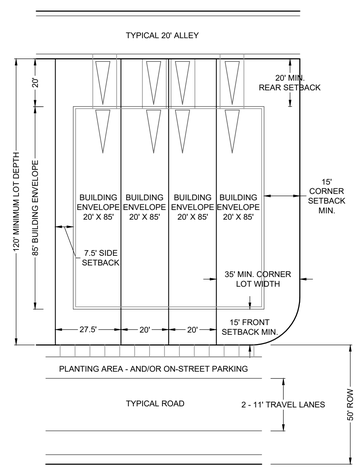
SETBACKS:	MODIFICATION REQUESTS:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 7.5' MIN. CORNER: 15' MIN. REAR: 10' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5' GARAGE LOCATED IN 2ND LAYER DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16' DRIVEWAY TO BE 12' WIDE IN FIRST LAYER	60%



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

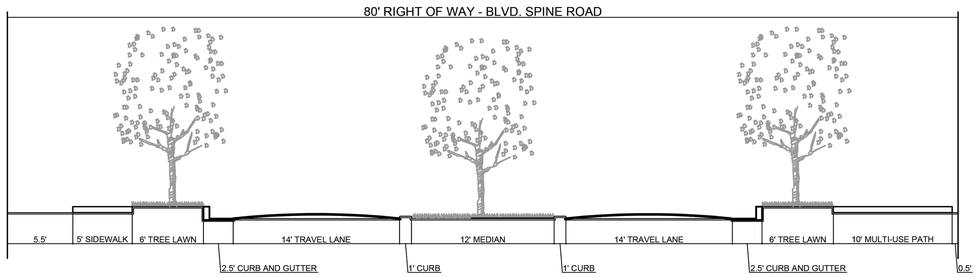
GREGORY C. GAMBLE REGISTERED LANDSCAPE ARCHITECT 1282

Date: October 16, 2023

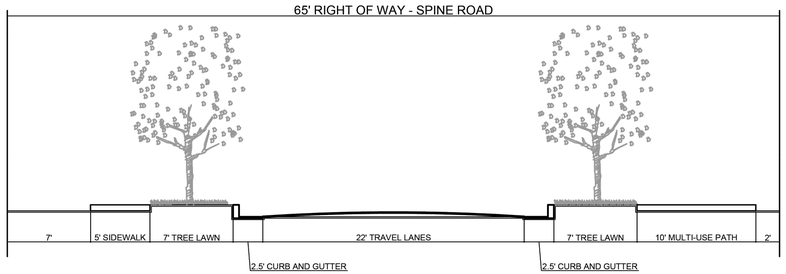
Revision Date
1 December 18, 2023
2 January 23, 2024
3

LOT DIAGRAMS

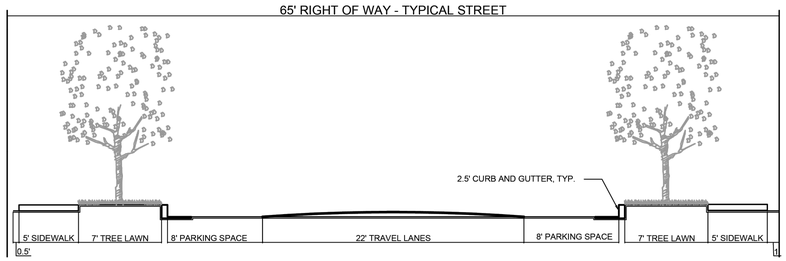
SHEET C2.6



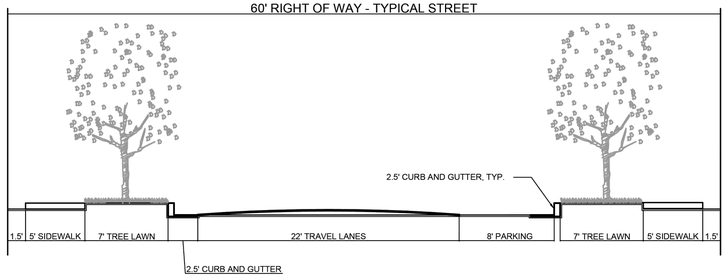
1 C2.7 80' ROW - COLUMBIA BLUFFS BLVD STREET SECTION N.T.S



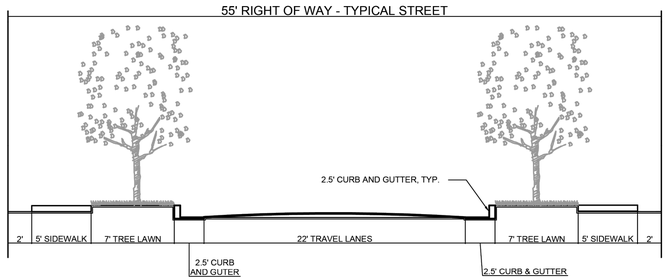
2 C2.7 65' ROW - COLUMBIA BLUFFS BLVD STREET SECTION N.T.S



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
400 Bear Creek Parkway, Columbia, Tennessee

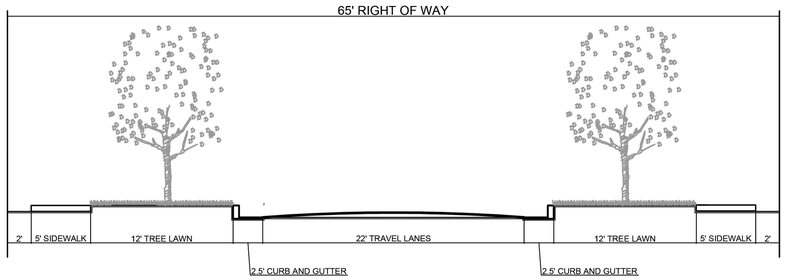
GREGORY C. GAMBLE — REGISTERED LANDSCAPE ARCHITECT — 1.25.24

Date: October 16, 2023

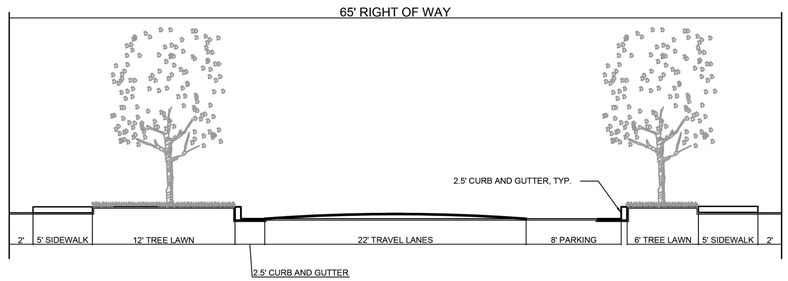
Revision	Date
1	December 18, 2023
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STREET SECTIONS

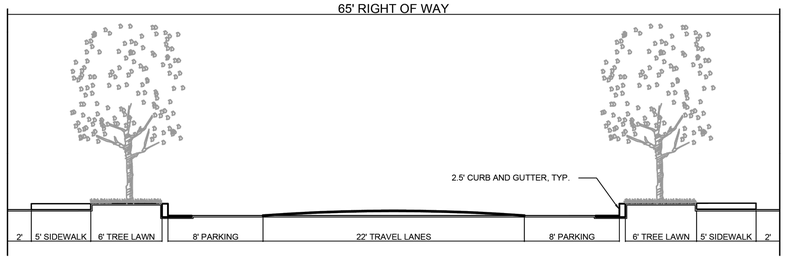
SHEET C2.7



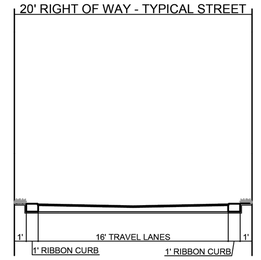
1 C2.8 65' ROW - CD4 STREET SECTION - NO ON-STREET PARKING N.T.S



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
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

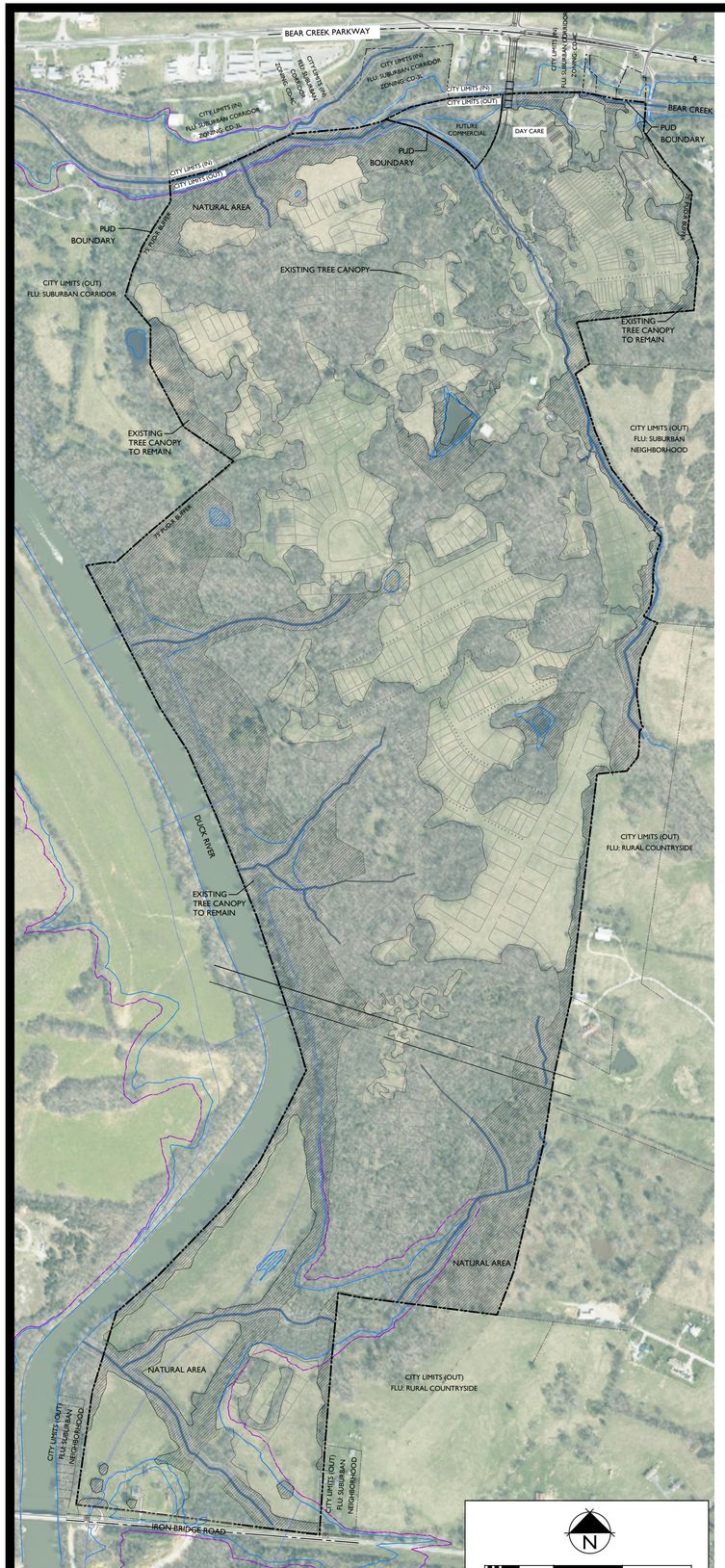


Date: October 16, 2023

Revision Date
1 December 18, 2023
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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
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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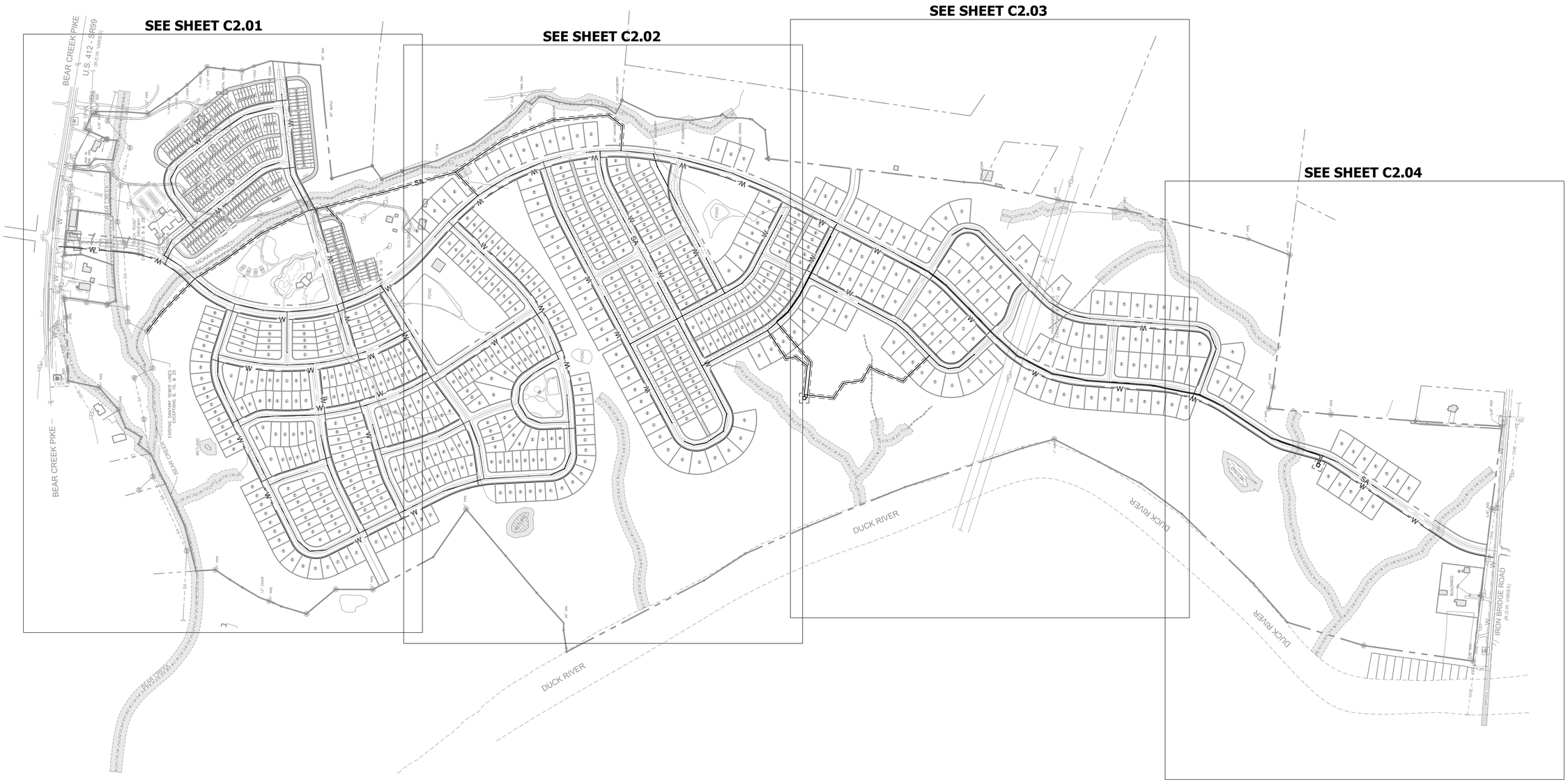
GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT
1.25.24

Date: October 16, 2023

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OVERALL PUD-R PMDP

SHEET
C2.9



CSDG
Planning | Engineering
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2305 Kline Ave, Ste 300
Nashville, TN 37211
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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

OVERALL UTILITY PLAN

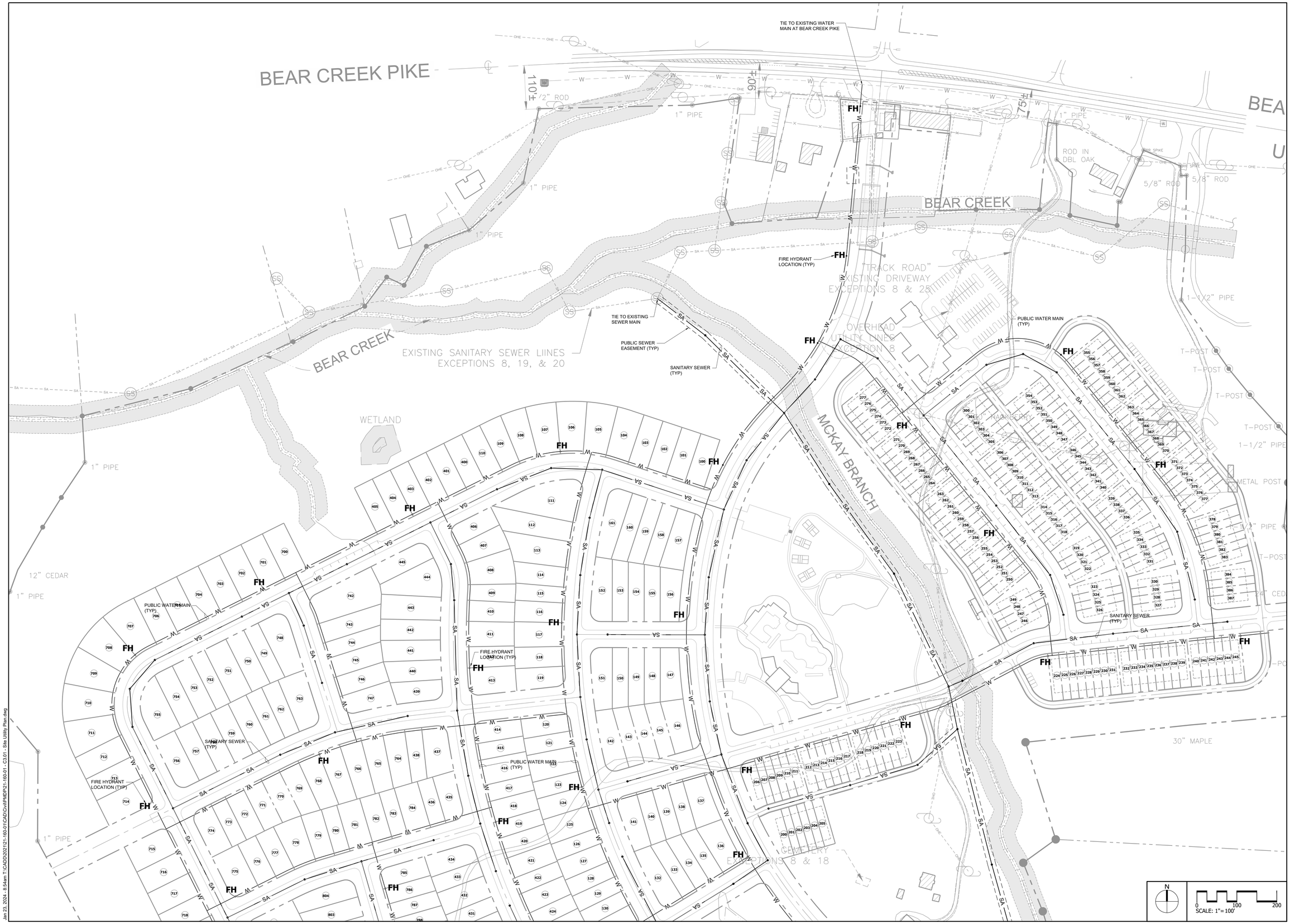
C3.00

PROJECT NO.: 21-160-01

N

0 300 600
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



Jan 23, 2024 - 8:54am T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.01 - Site Utility Plan.dwg

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Nashville, TN 37211
615.248.9999
csdgtn.com

SEAL

JAMES T. HARRISON IV
REGISTERED
PROFESSIONAL
ENGINEER
No. 021998
STATE OF TENNESSEE
10-23-24

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

SITE UTILITY PLAN

C3.01
PROJECT NO.: 21-160-01



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Landscape Architecture
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Nashville, TN 37211
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SEAL



COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

Review Comments

ISSUE DATE: 01/23/24

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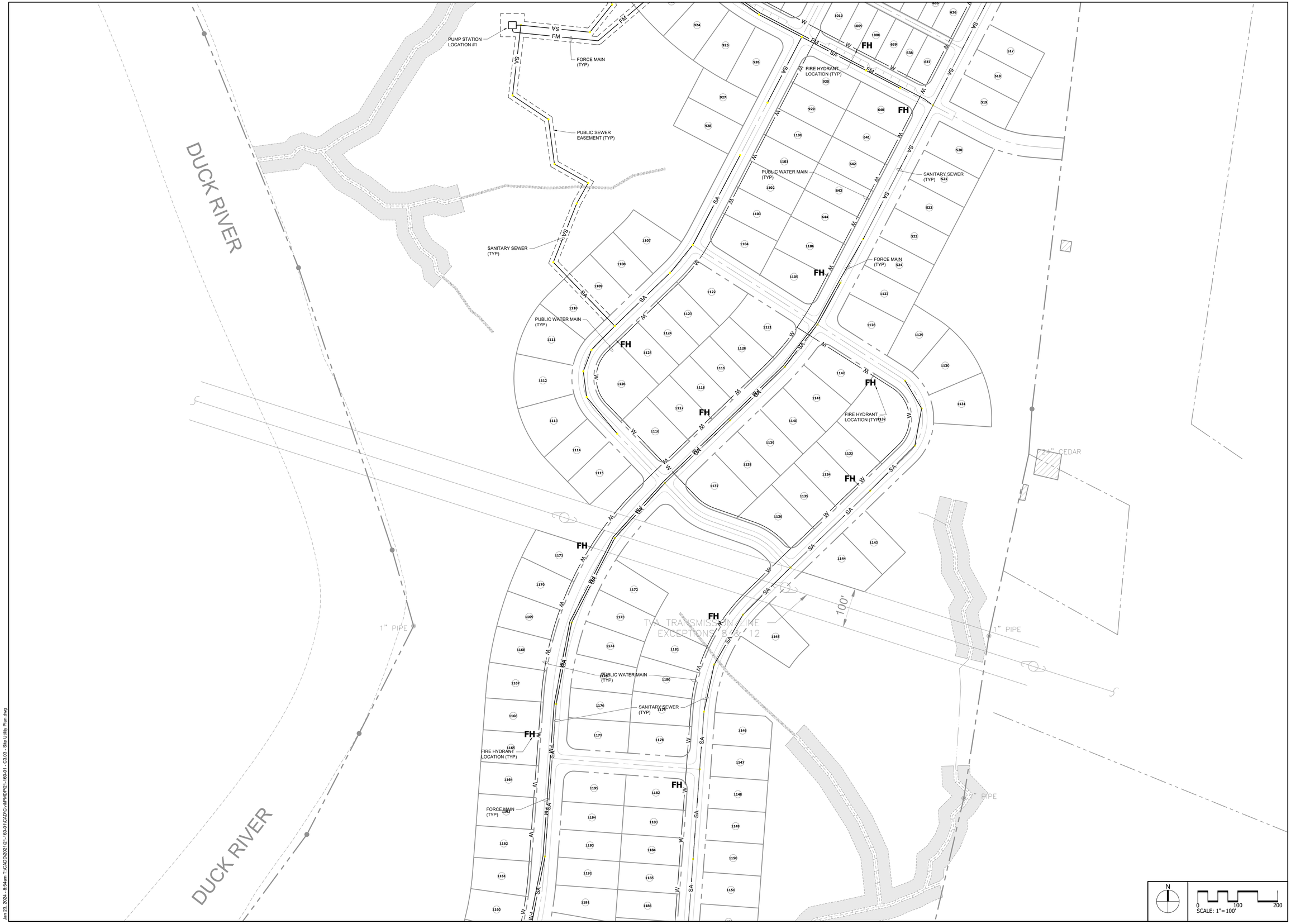
DRAWN BY: TWG
CHECKED BY: TWG

SITE UTILITY PLAN

C3.02

PROJECT NO.: 21-160-01

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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SEAL

JAMES T. HARRISON IV
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No. 021998
STATE OF TENNESSEE
01-23-24

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
Review Comments
ISSUE DATE: 01/23/24

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1	Initial Submittal	10/16/23
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DRAWN BY: TWG
CHECKED BY: TWG

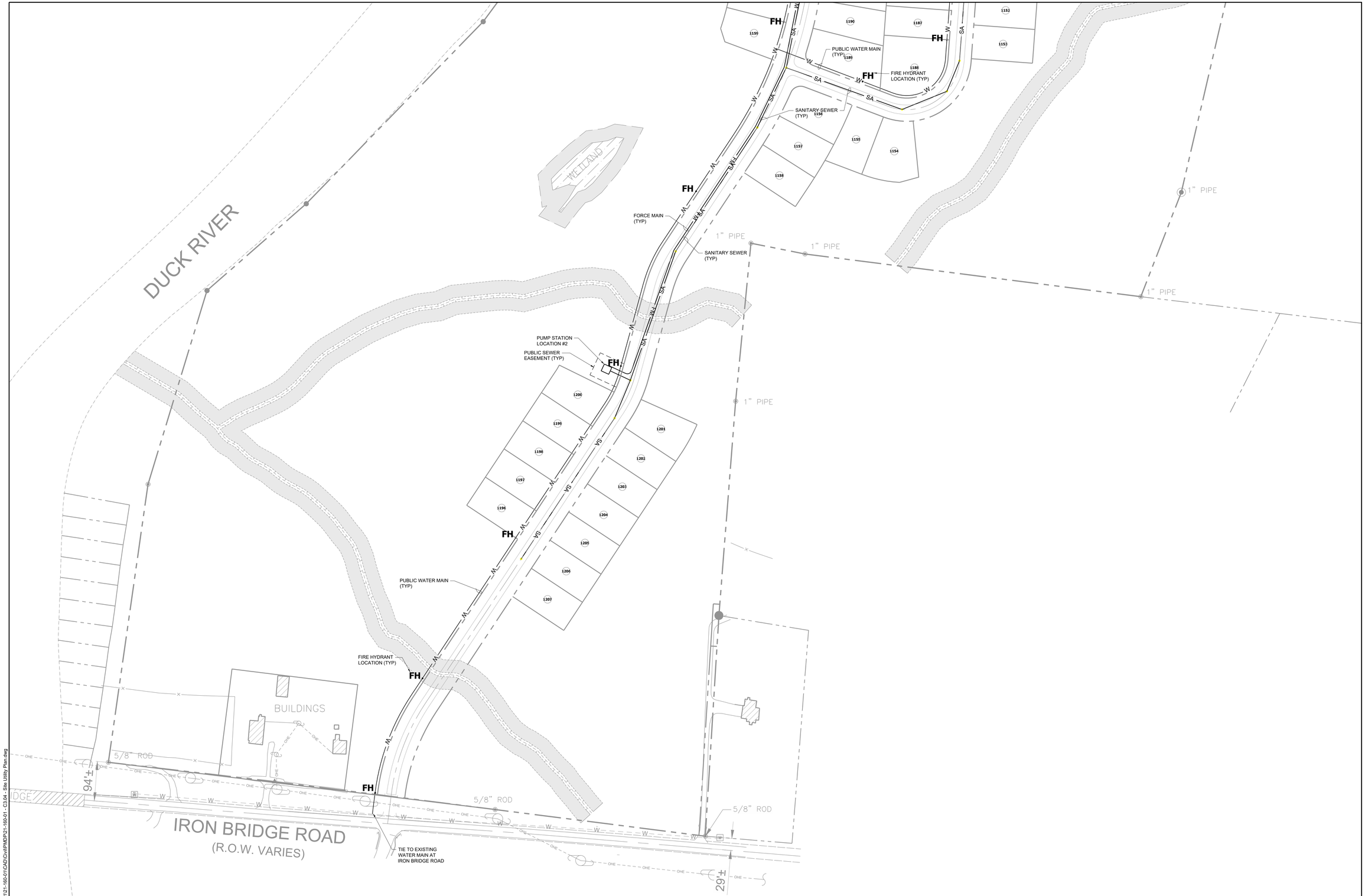
SITE UTILITY PLAN

C3.03

PROJECT NO.: 21-160-01

N
0 100 200
SCALE: 1"= 100'

Jan 23, 2024 - 8:54am T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.03 - Site Utility Plan.dwg



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STATE OF TENNESSEE
10-23-24

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
Review Comments

ISSUE DATE: 01/23/24

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CHECKED BY: TWG

SITE UTILITY PLAN

C3.04

PROJECT NO.: 21-160-01

N

0 100 200
SCALE: 1"= 100'

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N

0 300 600
SCALE: 1"= 300'

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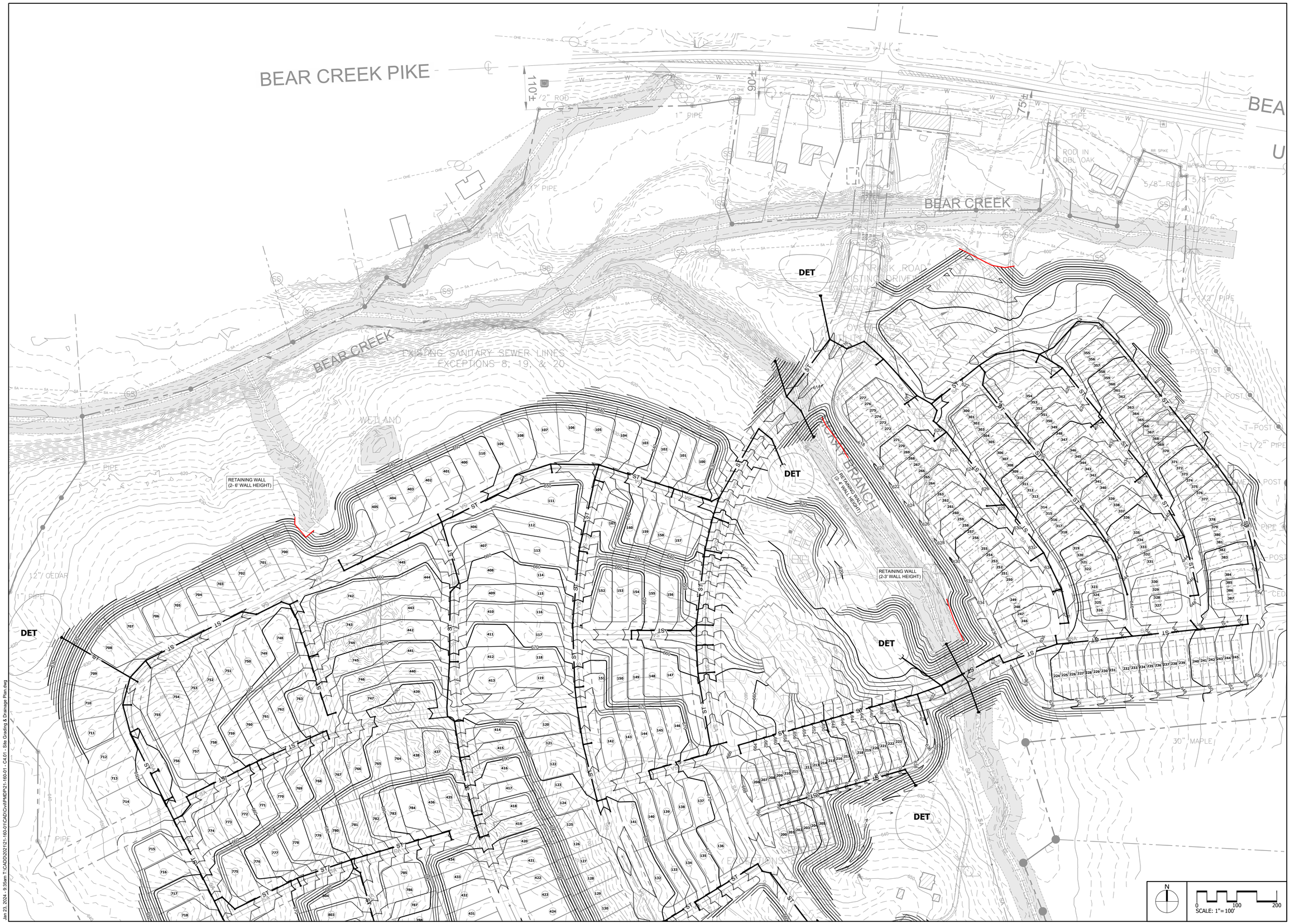
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OVERALL GRADING & DRAINAGE PLAN

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



Jan 23, 2024 - 9:35am T:\CAD\D\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.01 - Site Grading & Drainage Plan.dwg

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SITE GRADING & DRAINAGE PLAN

C4.01

PROJECT NO.: 21-160-01

N

0 100 200
SCALE: 1"= 100'



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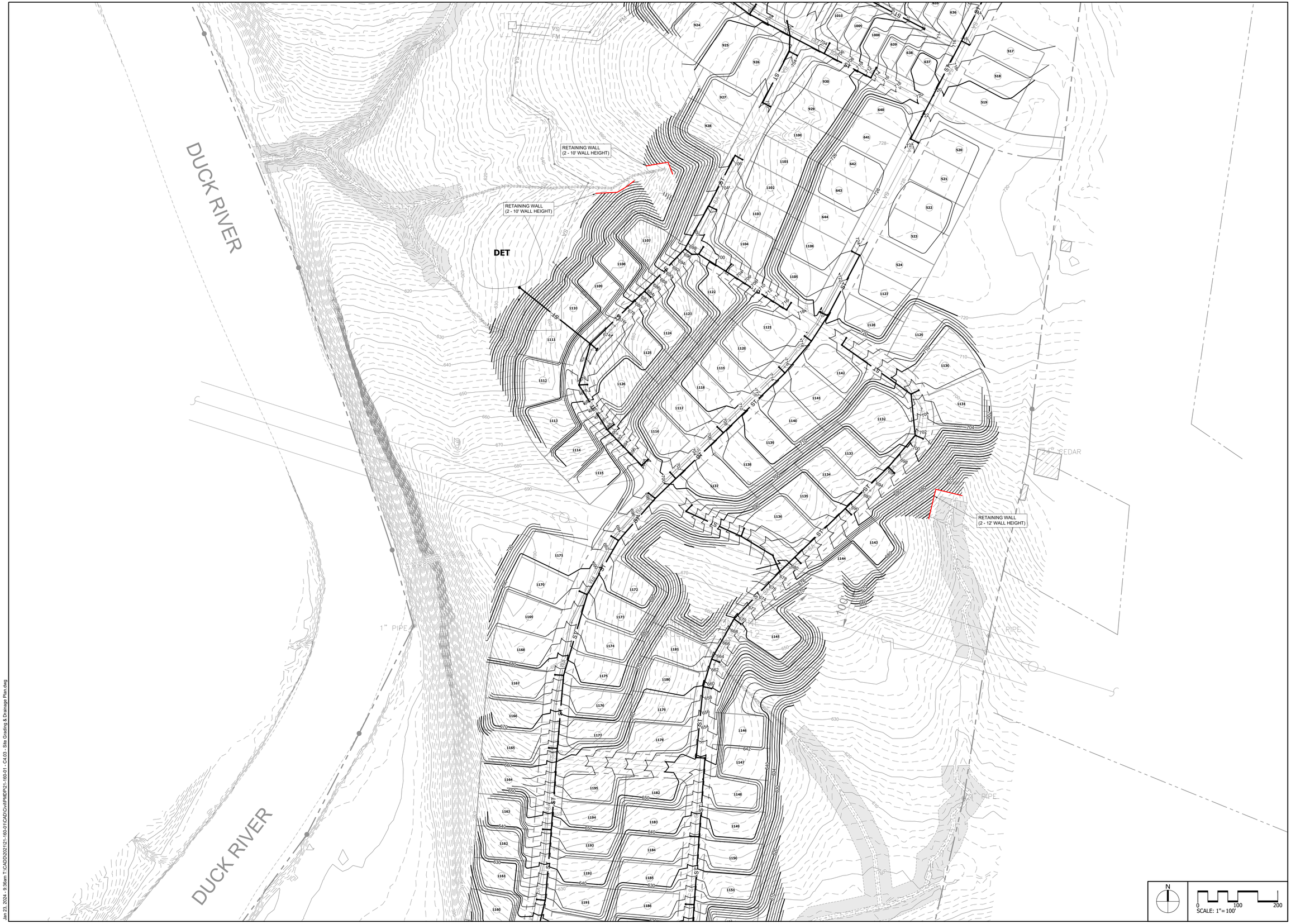
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SITE GRADING & DRAINAGE PLAN

C4.02

PROJECT NO.: 21-160-01

Jan 23, 2024 - 9:36am T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.02 - Site Grading & Drainage Plan.dwg



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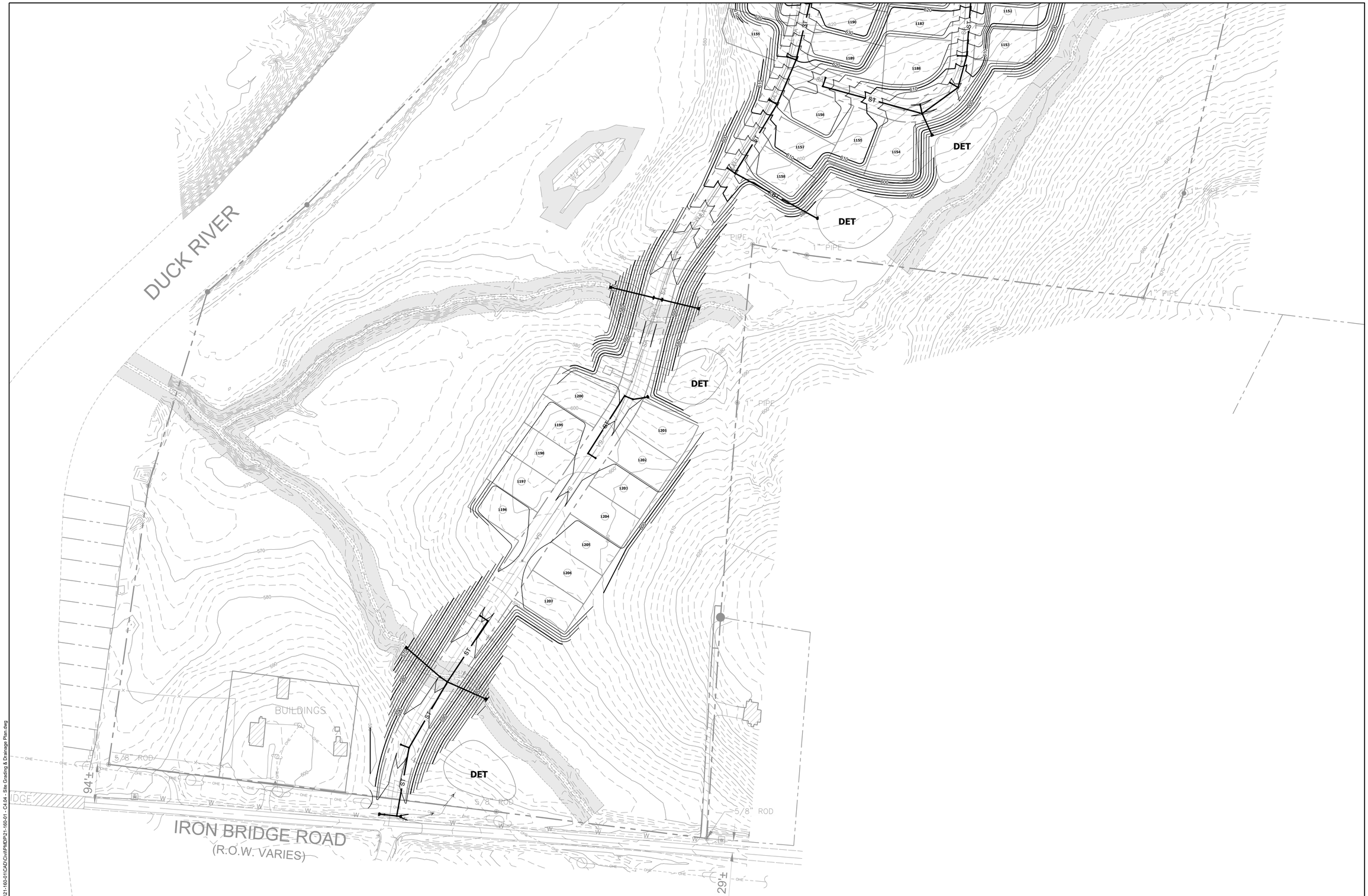
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SITE GRADING & DRAINAGE PLAN

C4.03

PROJECT NO.: 21-160-01

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SITE GRADING & DRAINAGE PLAN

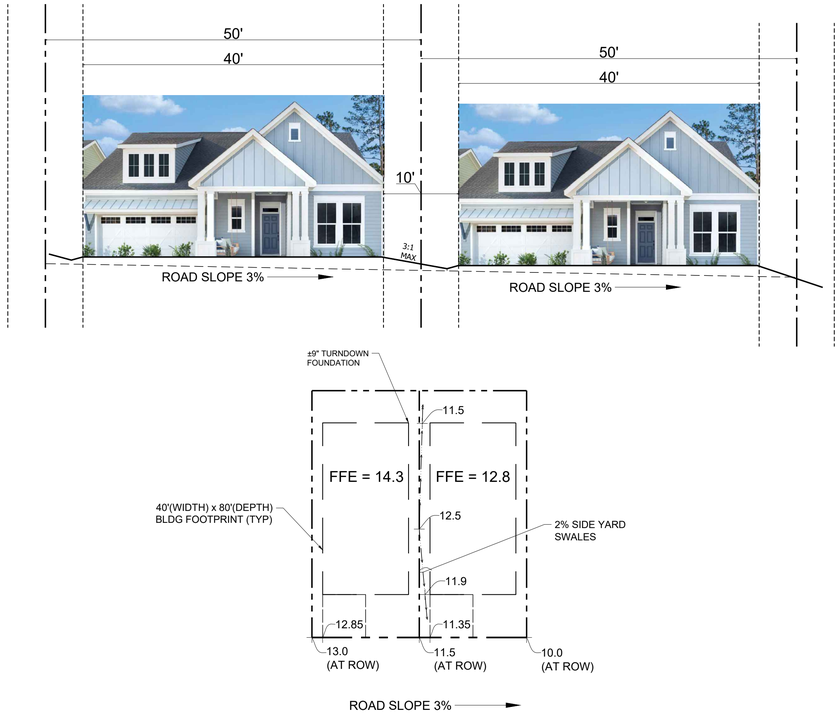
C4.04

PROJECT NO.: 21-160-01

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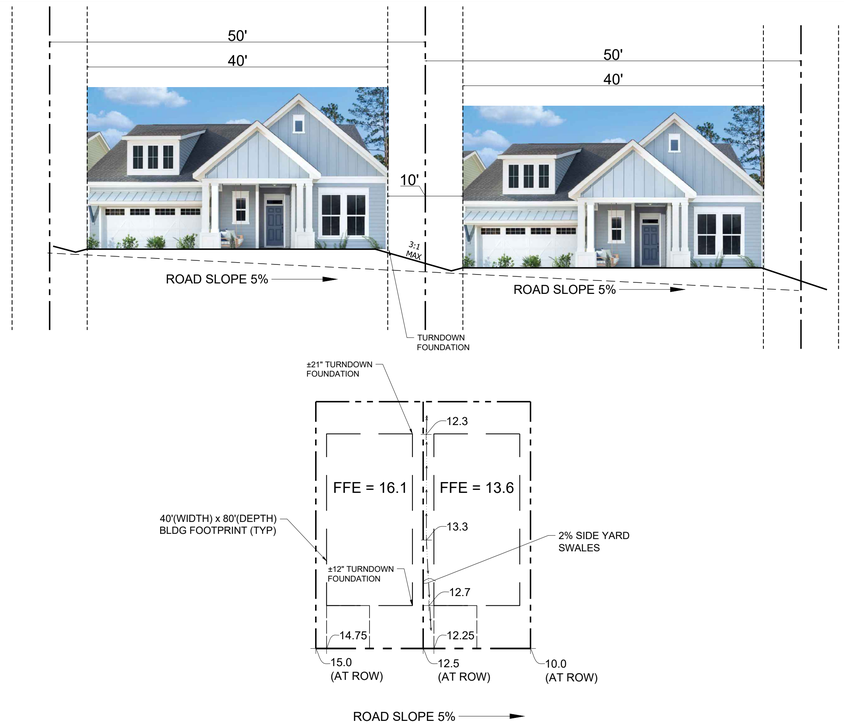
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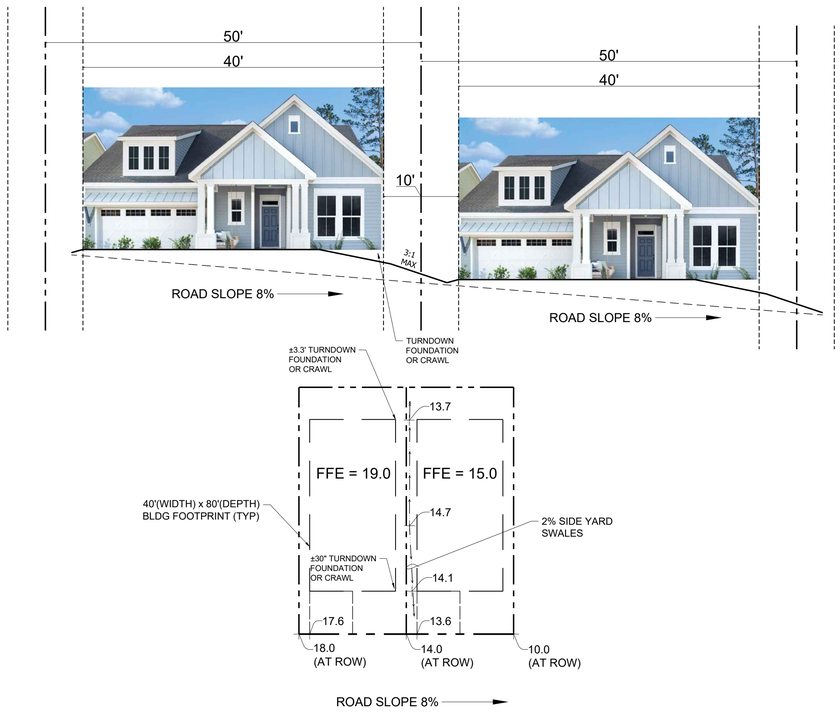
LOT GRADING DIAGRAM - 3% ROAD SLOPE

NTS



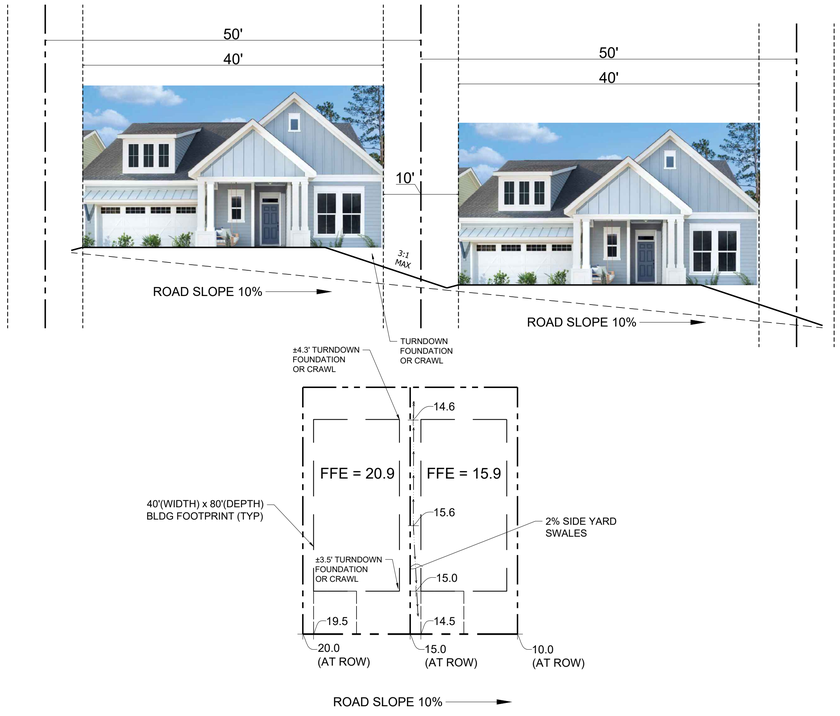
LOT GRADING DIAGRAM - 5% ROAD SLOPE

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LOT GRADING DIAGRAM - 8% ROAD SLOPE

NTS

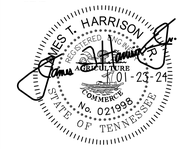


LOT GRADING DIAGRAM - 10% ROAD SLOPE

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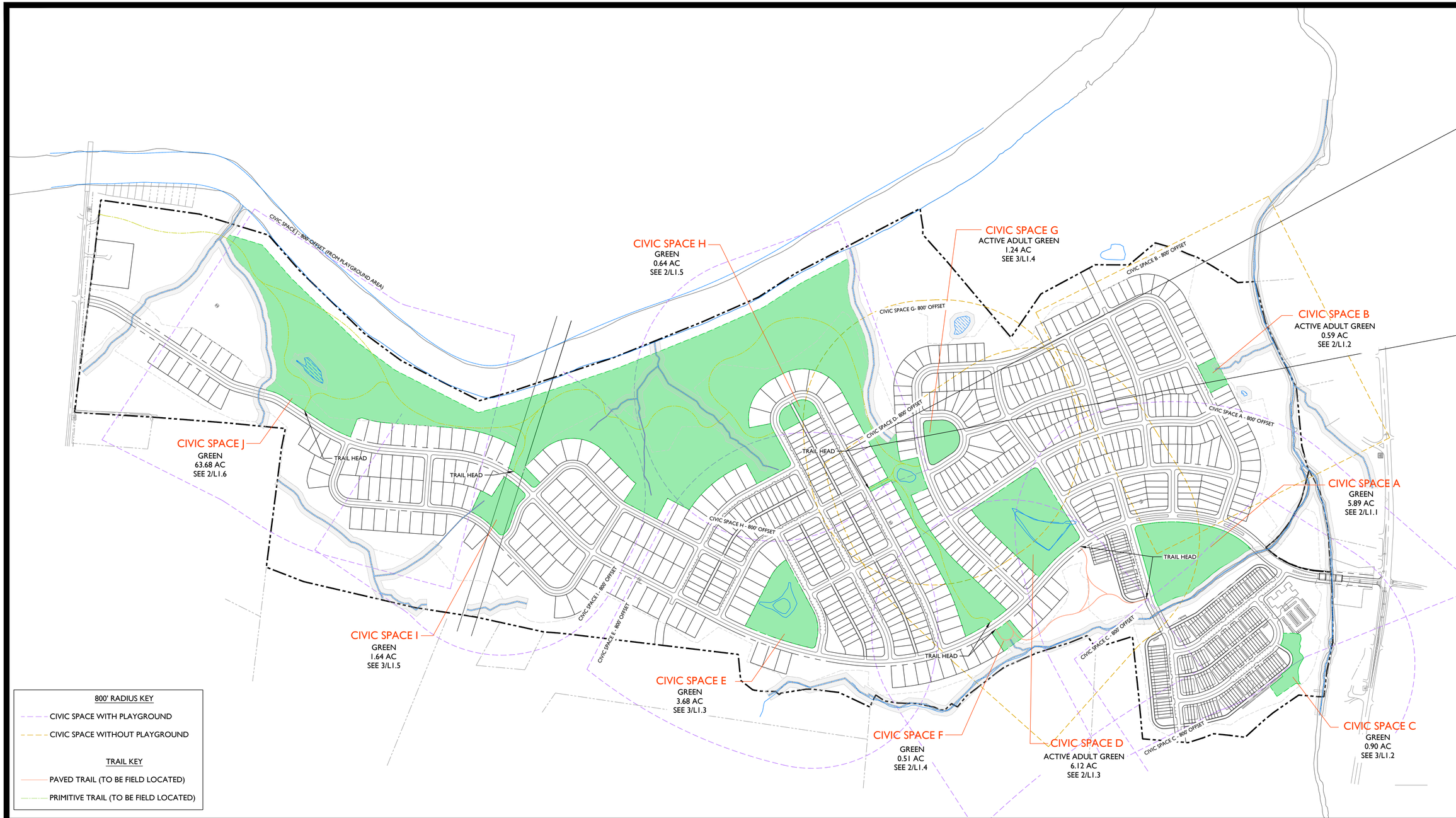
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LOT DRAINAGE DIAGRAMS

C4.05

PROJECT NO.: 21-160-01

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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
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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

0' 50' 100'

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

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COLUMBIA BLUFFS
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400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE
REGISTERED LANDSCAPE ARCHITECT
1.25.24

Date: October 16, 2023
Revision Date
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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

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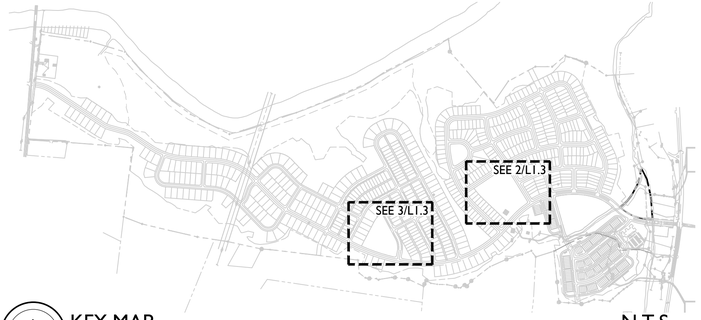
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OVERALL CIVIC SPACE PLAN

SHEET LI.2





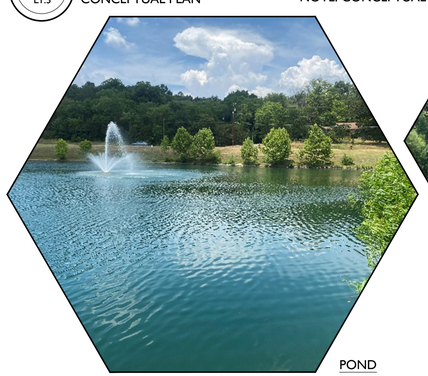
1 / L1.3 KEY MAP N.T.S



2 / L1.3 CIVIC SPACE - D
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

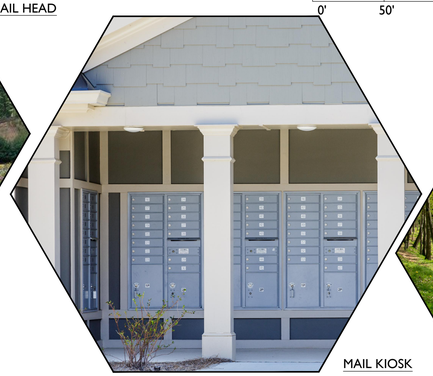
0' 50' 100'



POND



TRAIL HEAD



MAIL KIOSK

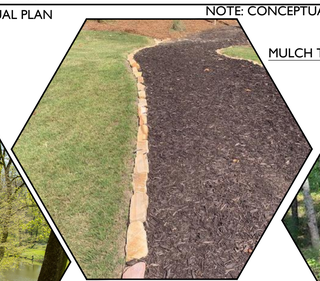
3 / L1.3 CIVIC SPACE - E
CONCEPTUAL PLAN

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 LI.4 CIVIC SPACE - F

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'



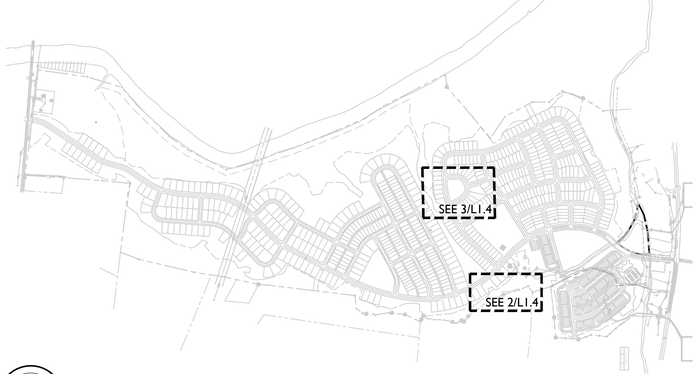
SWINGS



FORMAL PARK



PLAYGROUND



1 LI.4 KEY MAP N.T.S



3 LI.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

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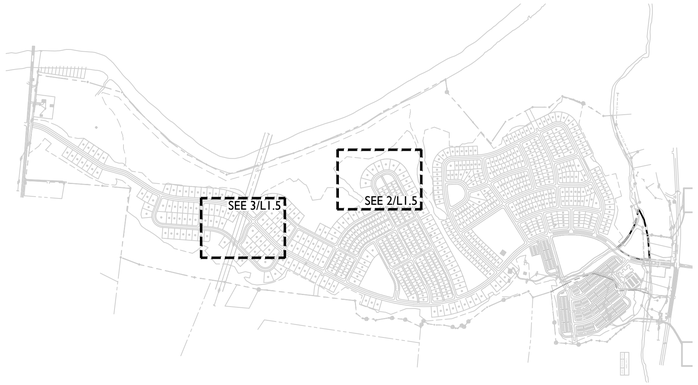
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OVERALL CIVIC SPACE PLAN

SHEET LI.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
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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.



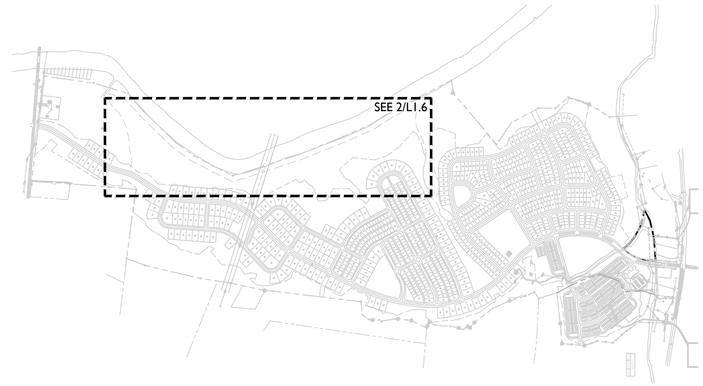
OPEN FIELD



TRAIL HEAD



MULTI-PURPOSE FIELD



1 / L1.6 KEY MAP N.T.S

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OVERALL CIVIC SPACE PLAN

SHEET L1.6

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.

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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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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.*

Tom J Hitch Pkwy

Iron Bridge Rd

Mapleash Ave

Downtown Columbia

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.*

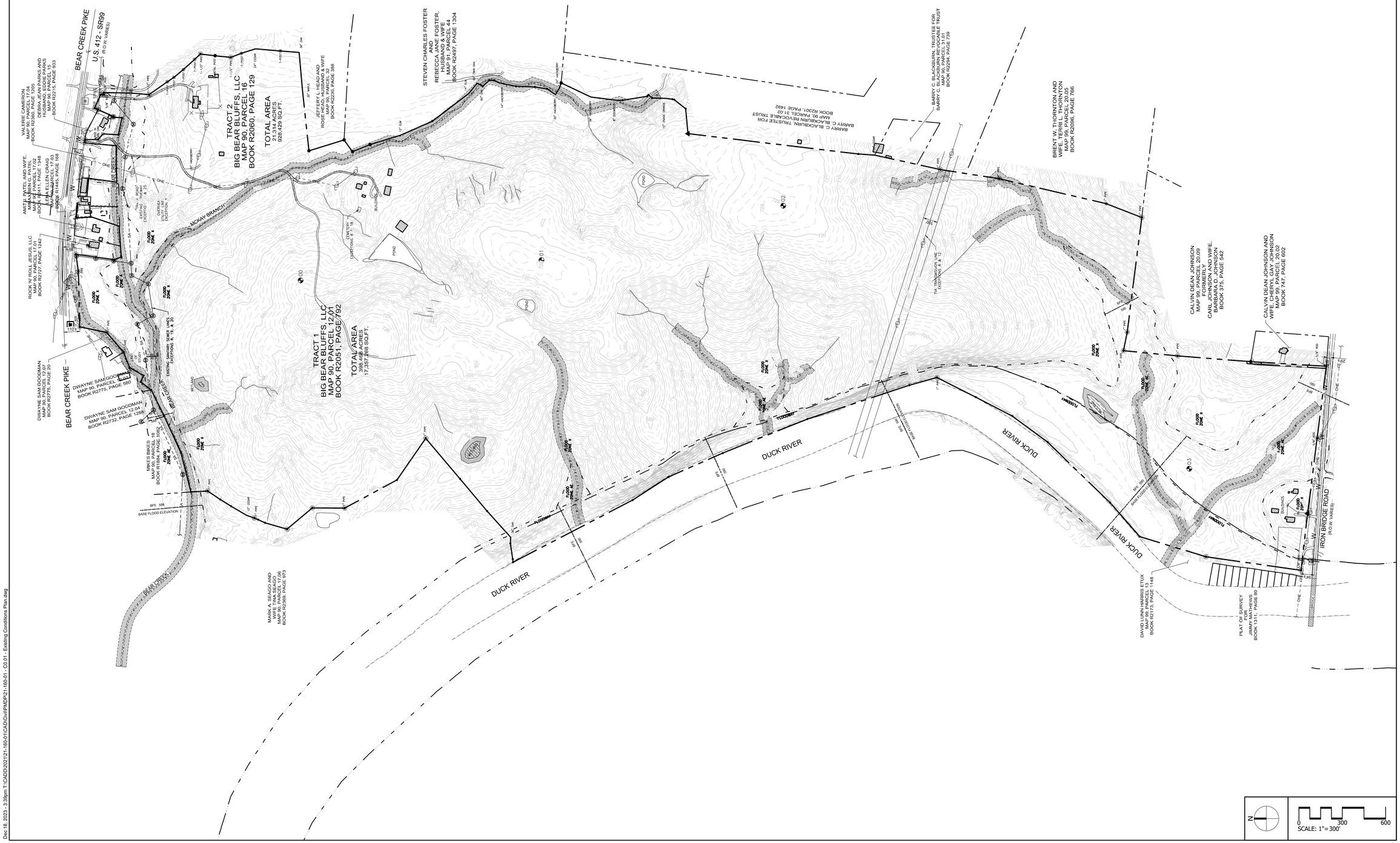
Projected Phase Completion

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	

1985

Google Earth

35°39'04.30" N 87°03'21.51" W elev 590 ft eye alt 34245 ft



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SEAL

JAMES T. HARRISON
REGISTERED
LANDSCAPE
ARCHITECT
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

EXISTING CONDITIONS PLAN

C0.01

PROJECT NO.: 21-160-01

Dec 18, 2023 - 3:39pm T:\CAD\D\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.

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615.248.9999
csdgtn.com

SEAL



COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
INITIAL SUBMITTAL
ISSUE DATE: 12/18/2023

REVISION HISTORY:

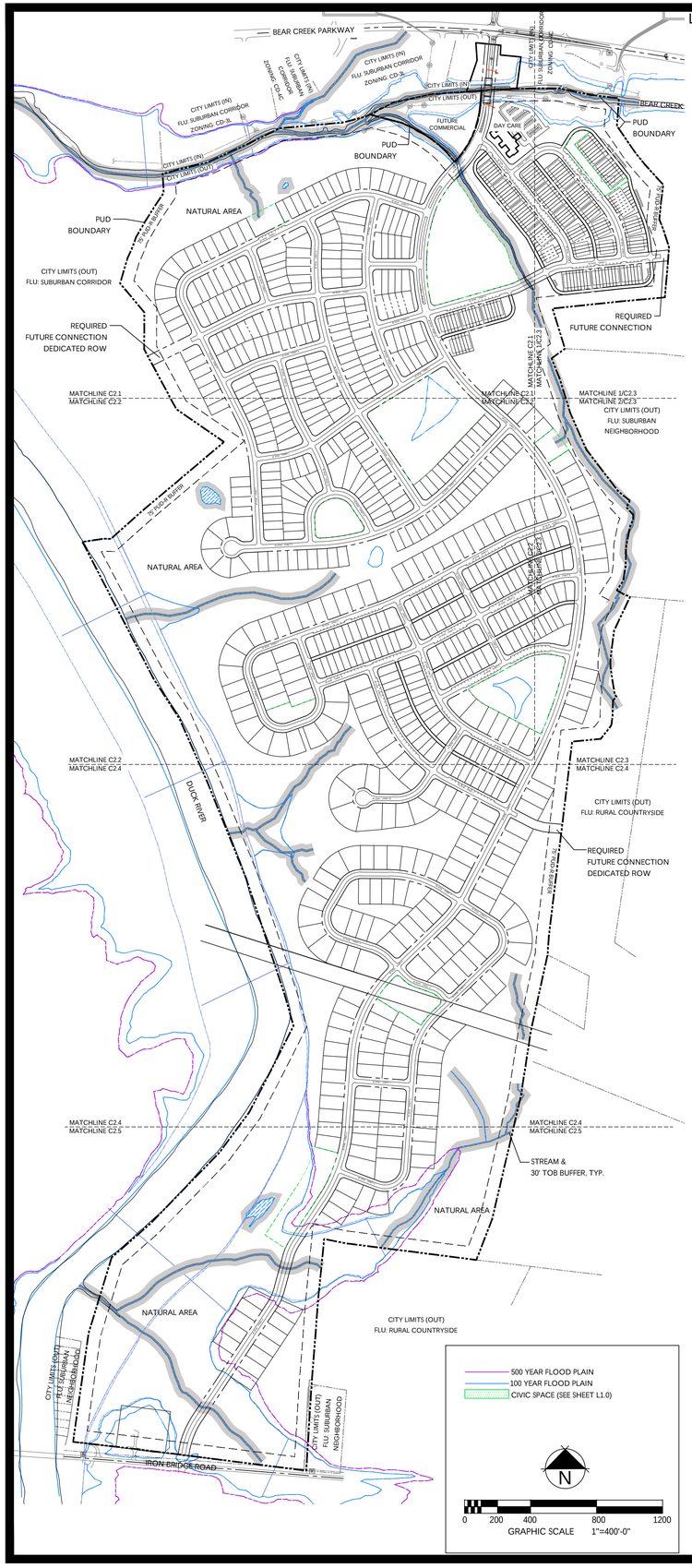
Rev.	Description	Date
1	Initial Submittal	10/16/23
2	Tech Review Comments	12/18/23

DRAWN BY: TWG
CHECKED BY: TWG

PHASING PLAN

C1.00
PROJECT NO.: 21-160-01

Dec 18, 2023 - 3:39pm T:\CAD\D2023\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 673 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 1,872,944.21;

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 68°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°57'58" E, FOR A DISTANCE OF 168.90 FEET TO A POINT;
S 78°39'57" E, FOR A DISTANCE OF 77.46 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 84°05'39" W, FOR A DISTANCE OF 414.11 FEET TO A FENCE POST;
S 12°15'08" 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 2°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 413.40 FEET TO A 24" HACKBERRY FLAGGED;
S 5°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 83°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 4°48'57" E, FOR A DISTANCE OF 352.94 FEET TO A POINT;
N 4°10'58" E, FOR A DISTANCE OF 690.76 FEET TO A POINT;
N 3°57'06" E, FOR A DISTANCE OF 396.02 FEET TO A POINT;
N 2°37'32" 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°31'24" 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 80°29'25" 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 397.26 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°17'58" 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°28'48" 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 84°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 MOXAY BRANCH,
CONTINUING ALONG MOXAY 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 83°39'27" E, FOR A DISTANCE OF 42.65 FEET TO A POINT;
S 63°17'26" E, FOR A DISTANCE OF 86.37 FEET TO A POINT;
S 45°49'08" 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 MOXAY 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 526.33 FEET, CHORD BEARING N 24°52'52" E WITH A CHORD DISTANCE OF 373.16 FEET TO A POINT OF TANGENCY;
N 05°01'54" 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

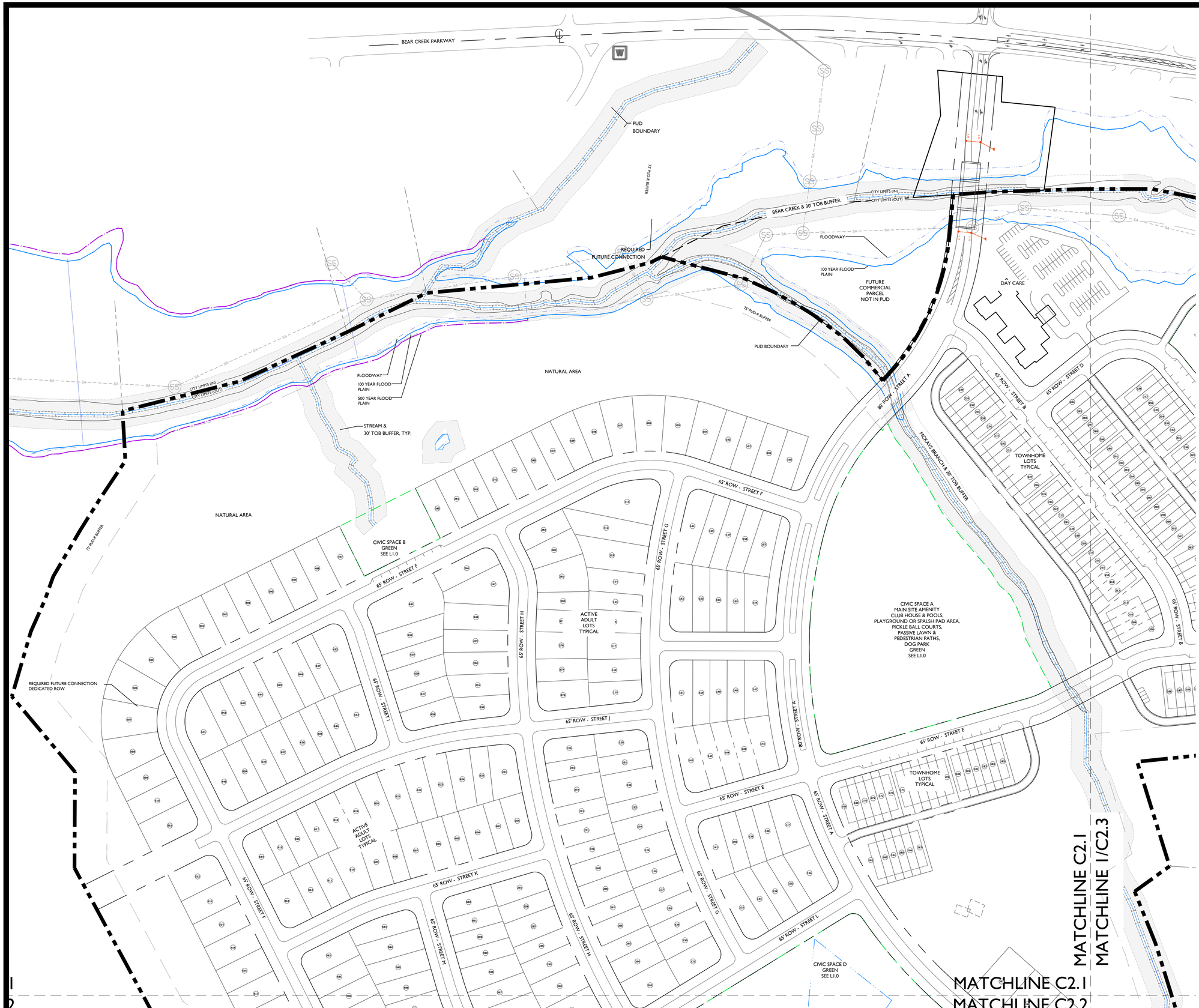
JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT 12.18.23

Date: October 16, 2023

Revision	Date
1	December 18, 2023
△	
△	

OVERALL PUD-R PMDP

SHEET
C2.0



GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS
REGISTERED
LANDSCAPE ARCHITECT
12.18.23

Date: October 16, 2023

Revision Date
⚠ December 18, 2023
△
△

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-R BUFFER

75' PUD-R BUFFER

ACTIVE ADULT LOTS TYPICAL

65' ROW - STREET L

65' ROW - STREET F

65' ROW - STREET H

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

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 2/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

55' ROW - STREET P

55' ROW - STREET P

60' ROW - STREET Q

60' ROW - STREET T

60' ROW - STREET S

ALLEY HOMES TYPICAL

55' ROW - STREET R

65' ROW - STREET C

CIVIC SPACE E
MAIL KIOSK, PASSIVE LAWN &
PEDESTRIAN PATHS,
PLAYGROUND
GREEN
SEE L1.0

NATURAL AREA

DUCK RIVER

NATURAL AREA

CIVIC SPACE H
PASSIVE LAWN &
PEDESTRIAN PATHS,
PLAYGROUND
GREEN
SEE L1.0

NATURAL AREA

LARGE LOTS TYPICAL

COURTYARD LOTS TYPICAL

55' ROW - STREET W

60' ROW - STREET S

MATCHLINE C2.2
MATCHLINE C2.4

OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300
GRAPHIC SCALE 1"=100'-0"

GAMBLE DESIGN COLLABORATIVE

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COLUMBIA BLUFFS
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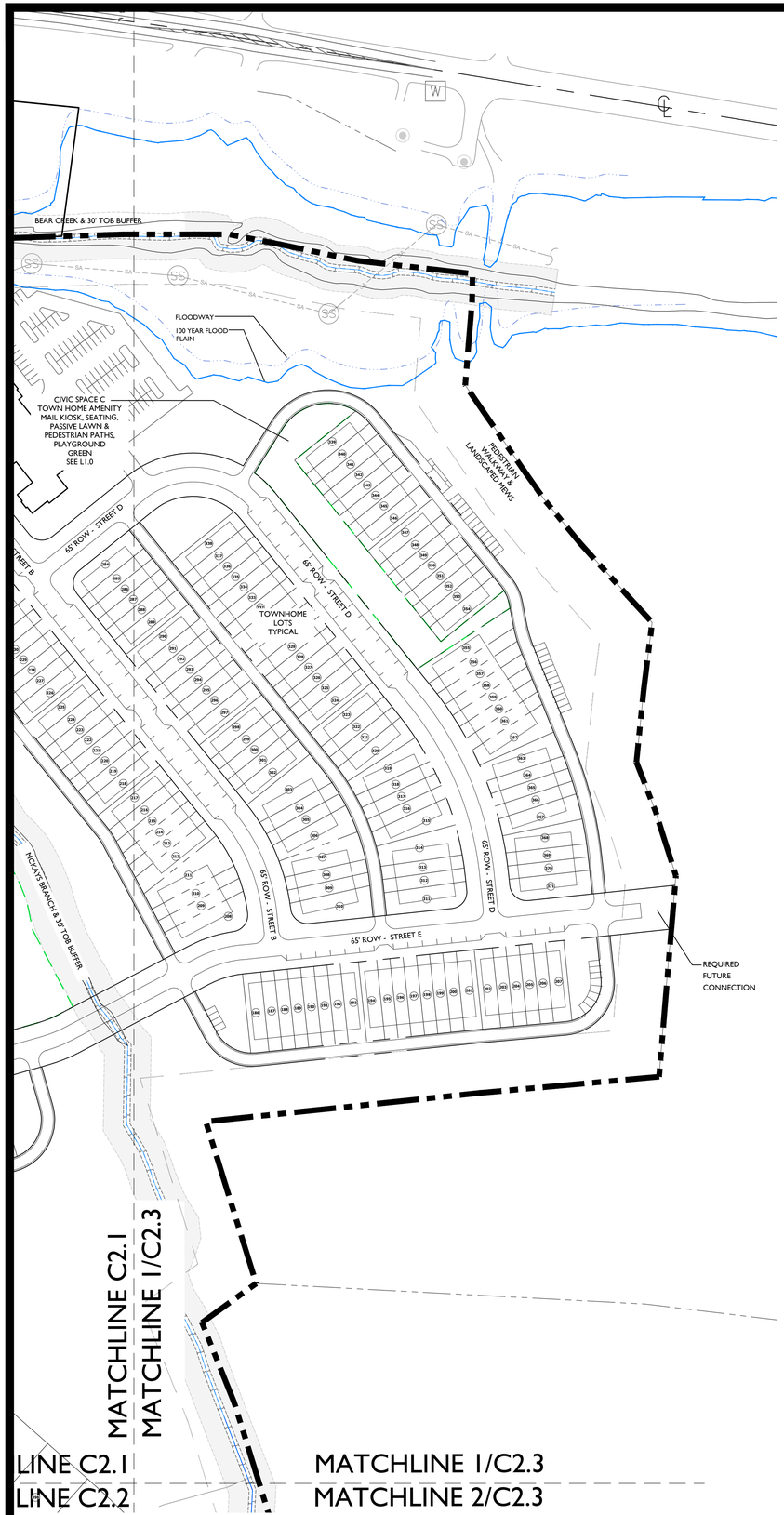
JEFFREY A. ROSS
REGISTERED
LANDSCAPE ARCHITECT
12.18.23

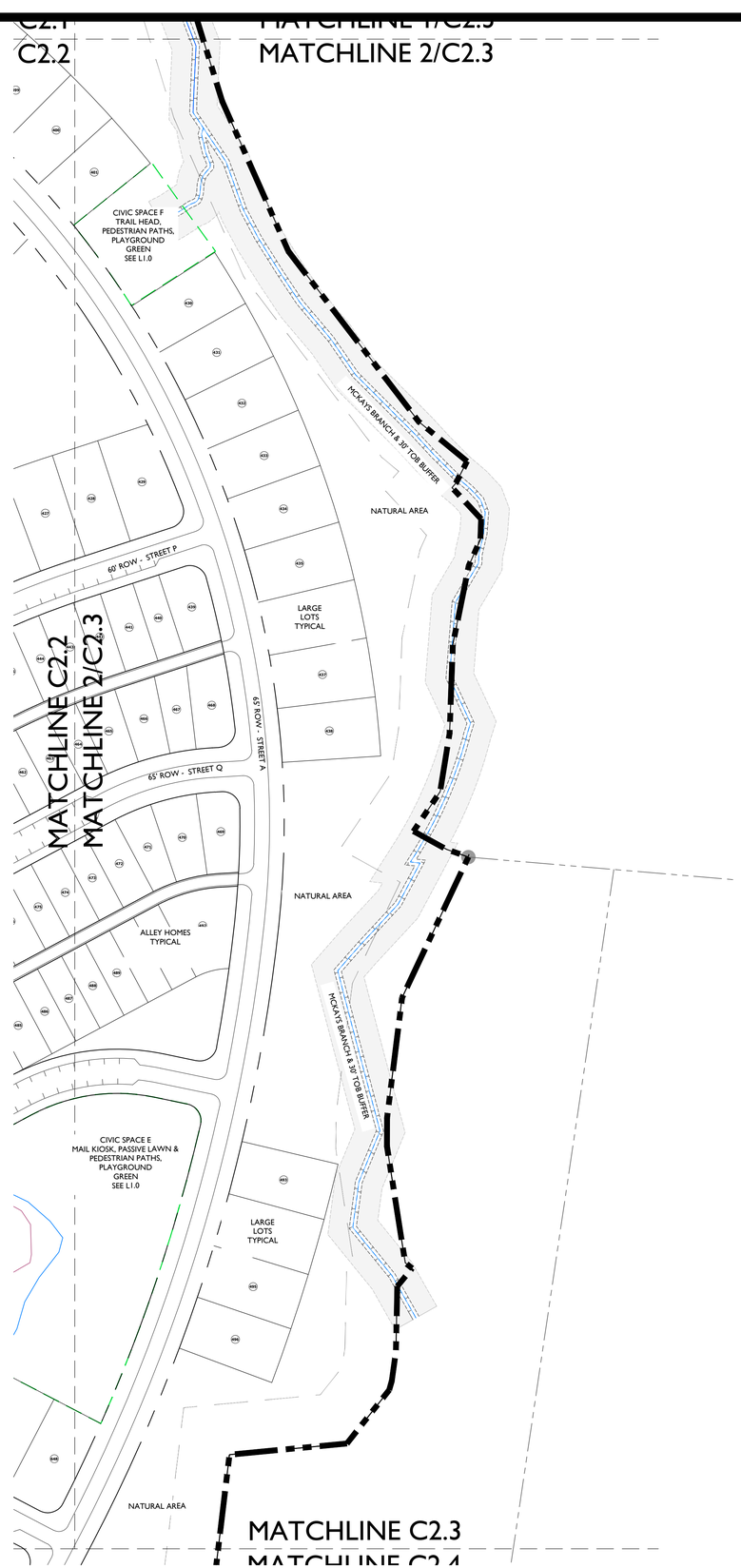
Date: October 16, 2023

Revision Date
⚠ December 18, 2023
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△

ENLARGED PUD-R PMDP

SHEET
C2.2





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
12.18.23

Date: October 16, 2023

Revision Date
1 December 18, 2023
2
3

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
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JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT 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

LARGE LOTS TYPICAL

LARGE LOTS TYPICAL

CIVIC SPACE J
TRAIL HEAD, SEATING, PASSIVE LAWN & PEDESTRIAN PATHS, GREEN
SEE L1.0

STREAM & 30' TOB BUFFER, TYP.

500 YEAR FLOOD PLAIN

FLOODWAY

100 YEAR FLOOD PLAIN

75' PUD-R BUFFER

65' ROW - STREET A

75' PUD-R BUFFER

NATURAL AREA

NATURAL AREA

NATURAL AREA

100 YEAR FLOOD PLAIN

500 YEAR FLOOD PLAIN

RECREATIONAL FACILITIES

OHE

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

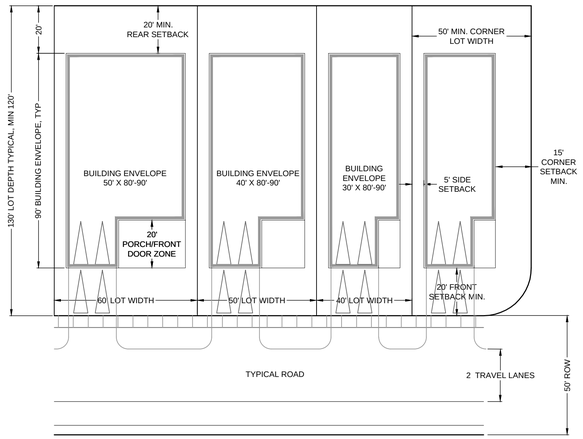
Revision Date
1 December 18, 2023
2
3

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'

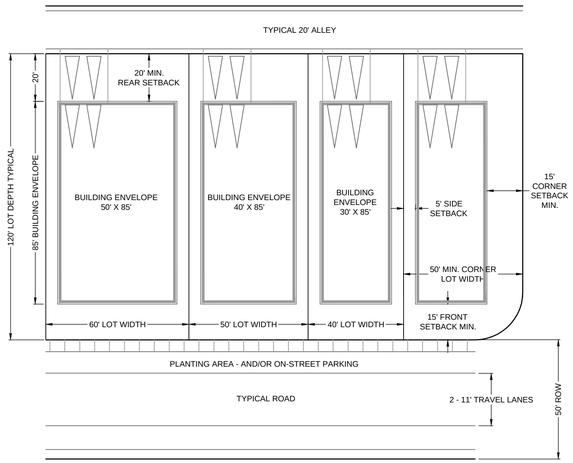
SETBACKS:	MODIFICATION REQUESTS:	LOT DISTRIBUTION:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 5' MIN. CORNER: 15' MIN. REAR: 20' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 5' GARAGE LOCATED IN 2ND LAYER DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16' DRIVEWAY TO BE 18' WIDE IN FIRST LAYER WINDOW SILL HEIGHT 3' ABOVE MIN. GRADE AT FACADE	60' LOTS: 61 50' LOTS: 141 40' LOTS: 97	60%



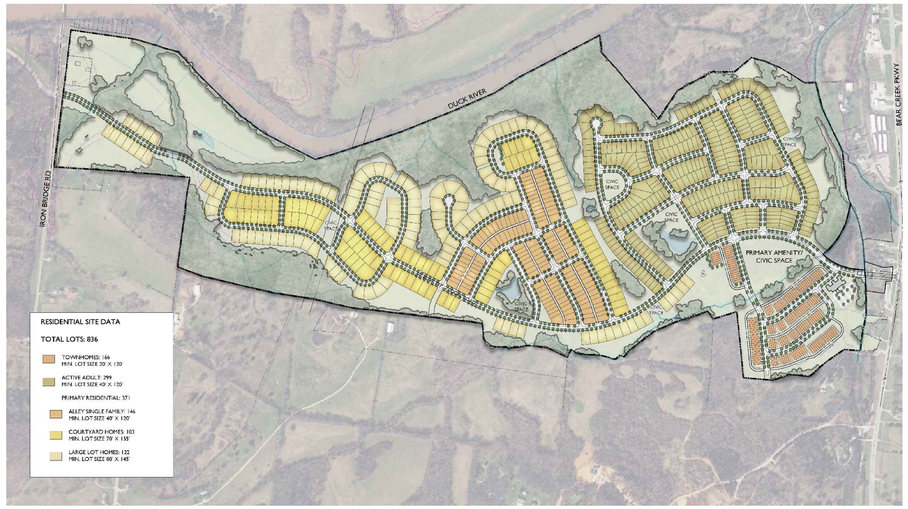
1 C2.6 ACTIVE ADULT LOT DIAGRAM N.T.S

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%



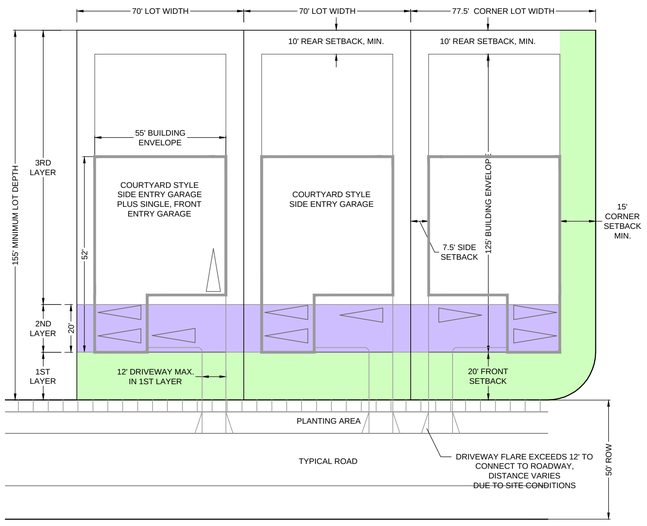
2 C2.6 SINGLE-FAMILY ALLEY LOT DIAGRAM N.T.S



3 C2.6 KEY MAP N.T.S

PRIMARY RESIDENTIAL COURTYARD SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 70' MIN. X 155'

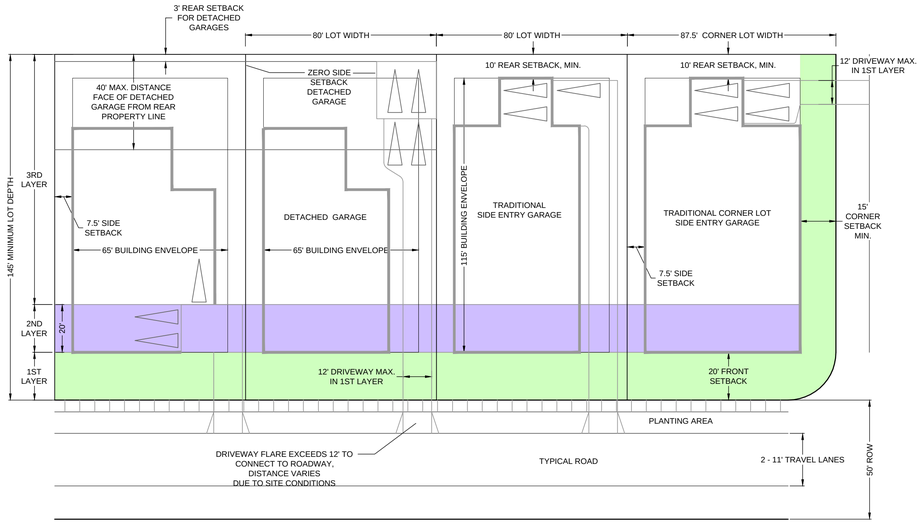
SETBACKS:	MODIFICATION REQUESTS:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 7.5' MIN. CORNER: 15' MIN. REAR: 10' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5' GARAGE LOCATED IN 2ND LAYER DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16' DRIVEWAY TO BE 12' WIDE IN FIRST LAYER WINDOW SILL HEIGHT 3' ABOVE FINISHED 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'

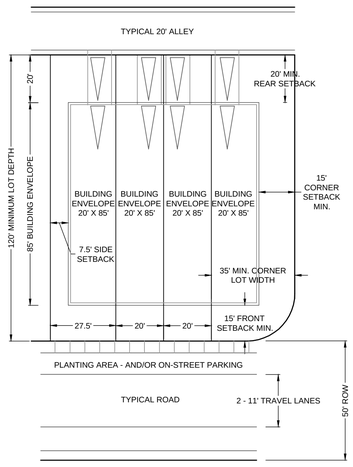
SETBACKS:	MODIFICATION REQUESTS:	TYPICAL ISR:
FRONT: 20' MIN. SIDE : 7.5' MIN. CORNER: 15' MIN. REAR: 10' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5' GARAGE LOCATED IN 2ND LAYER DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16' DRIVEWAY TO BE 12' WIDE IN FIRST LAYER	60%



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

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400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT TENNESSEE
12.18.23

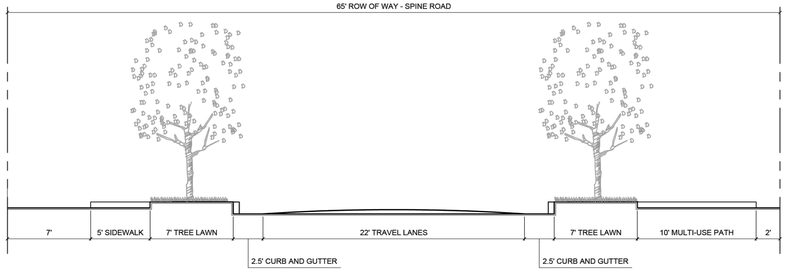
Date: October 16, 2023

Revision Date
1 December 18, 2023
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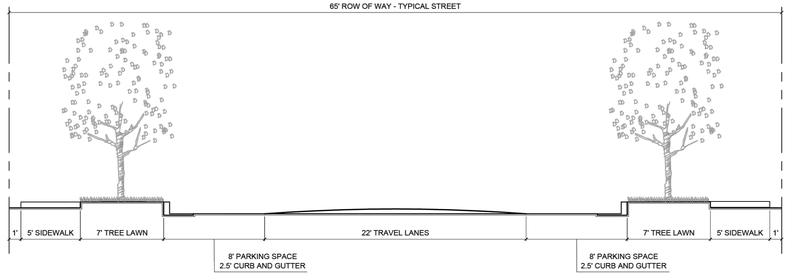
LOT DIAGRAMS

SHEET C2.6

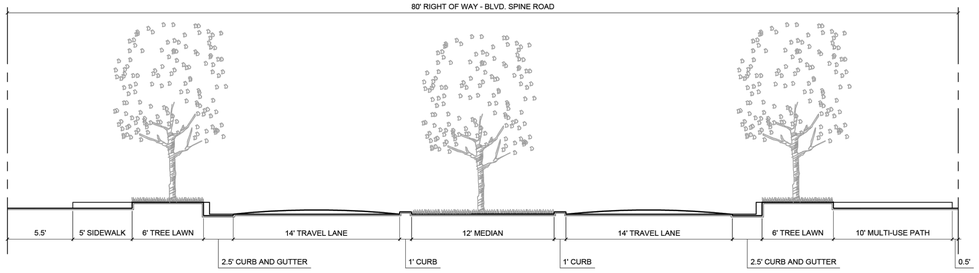
65' ROW OF WAY - SPINE ROAD



65' ROW OF WAY - TYPICAL STREET

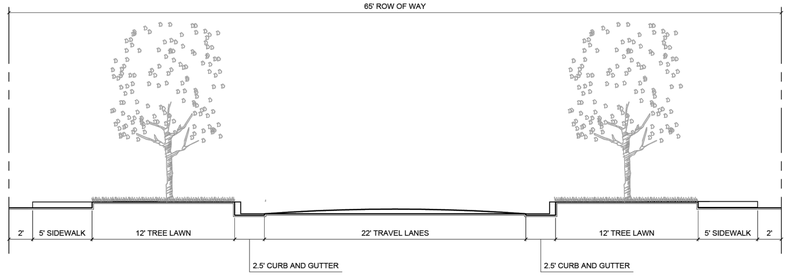


80' RIGHT OF WAY - BLVD. SPINE ROAD

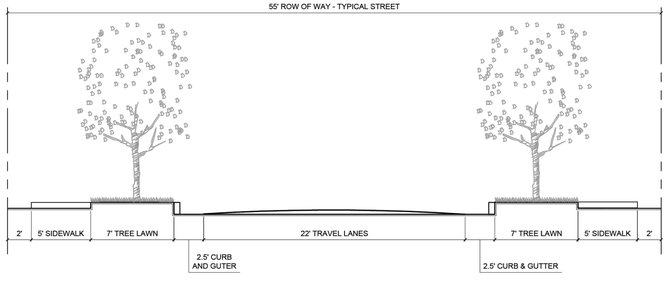


65' ROW - CD4 - NO PARKING

65' ROW OF WAY

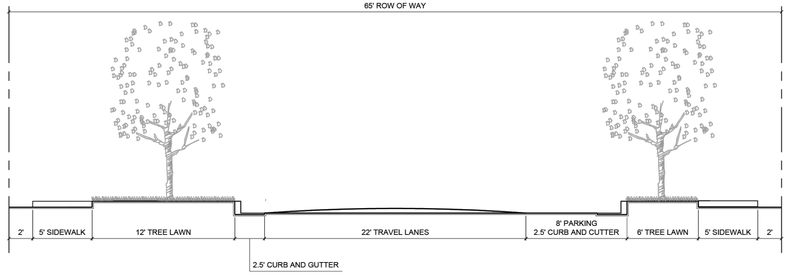


55' ROW OF WAY - TYPICAL STREET

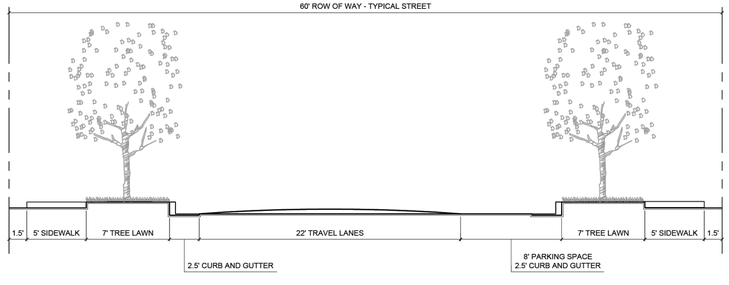


65' ROW - LOCAL CD4
WITH PARKING ONE SIDE

65' ROW OF WAY

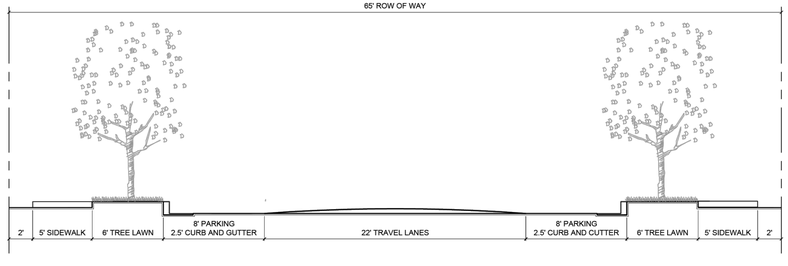


60' ROW OF WAY - TYPICAL STREET



65' ROW - LOCAL CD4
WITH PARKING ONE SIDE

65' ROW OF WAY



GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS
REGISTERED
LANDSCAPE ARCHITECT
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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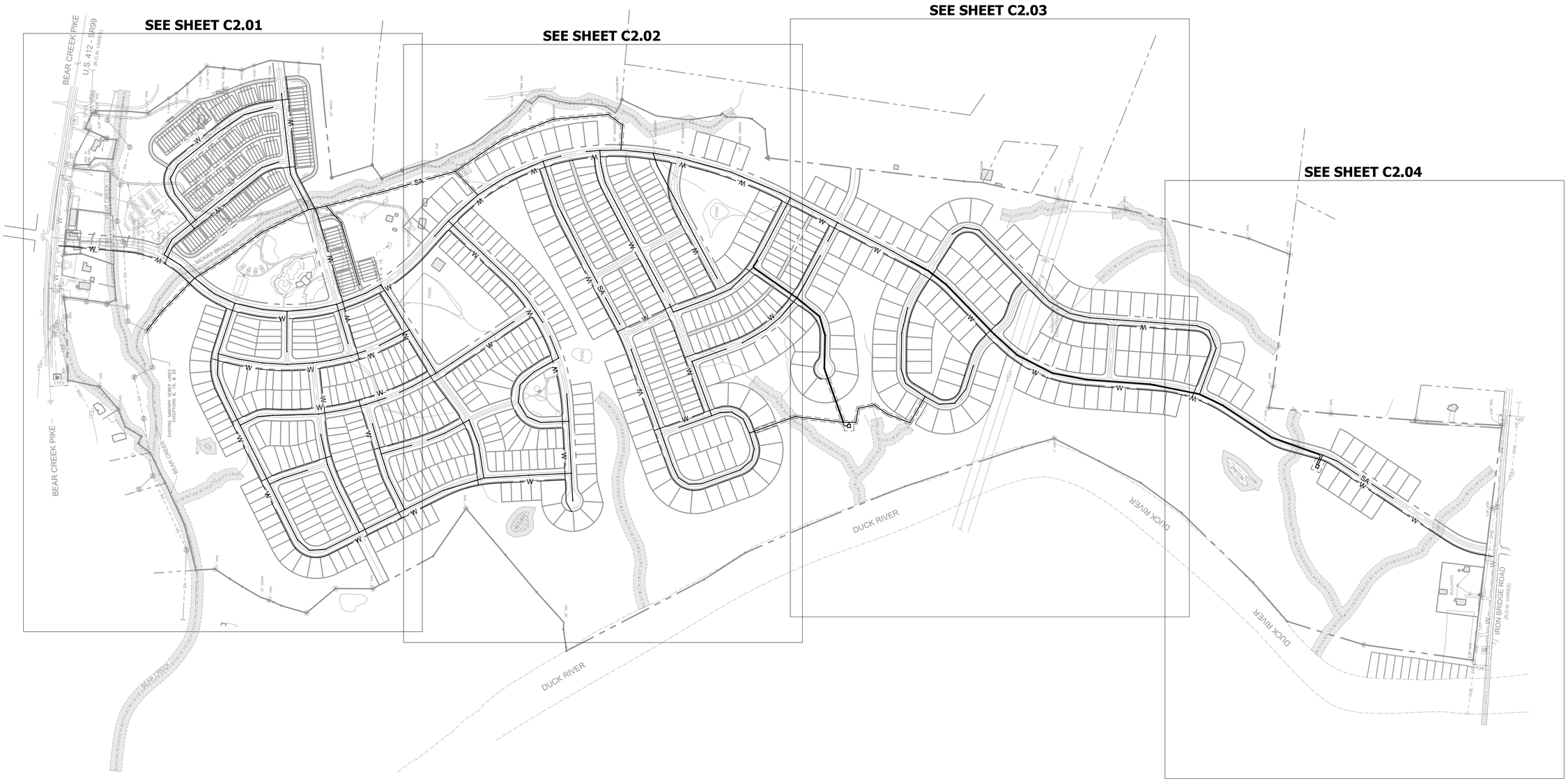
JEFFREY A. ROSS
REGISTERED LANDSCAPE ARCHITECT
STATE OF TENNESSEE
12.18.23

Date: October 16, 2023

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⚠ December 18, 2023
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△

OVERALL PUD-R PMDP

SHEET
C2.8



CSDG
Planning | Engineering
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:

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

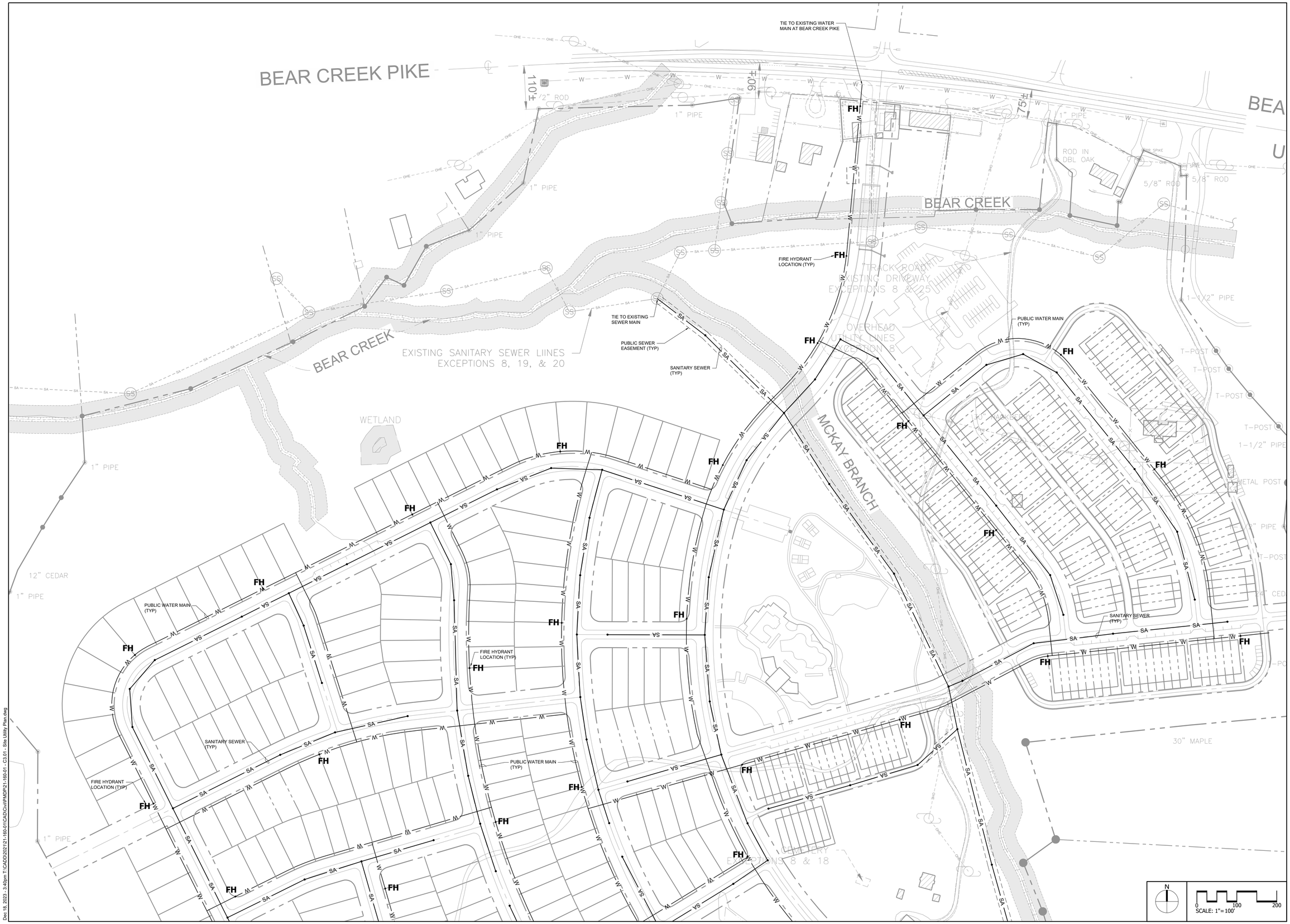
C3.00

PROJECT NO.: 21-160-01

N

0 300 600
SCALE: 1"=300'

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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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
12-16-23
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:

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

C3.01

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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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:

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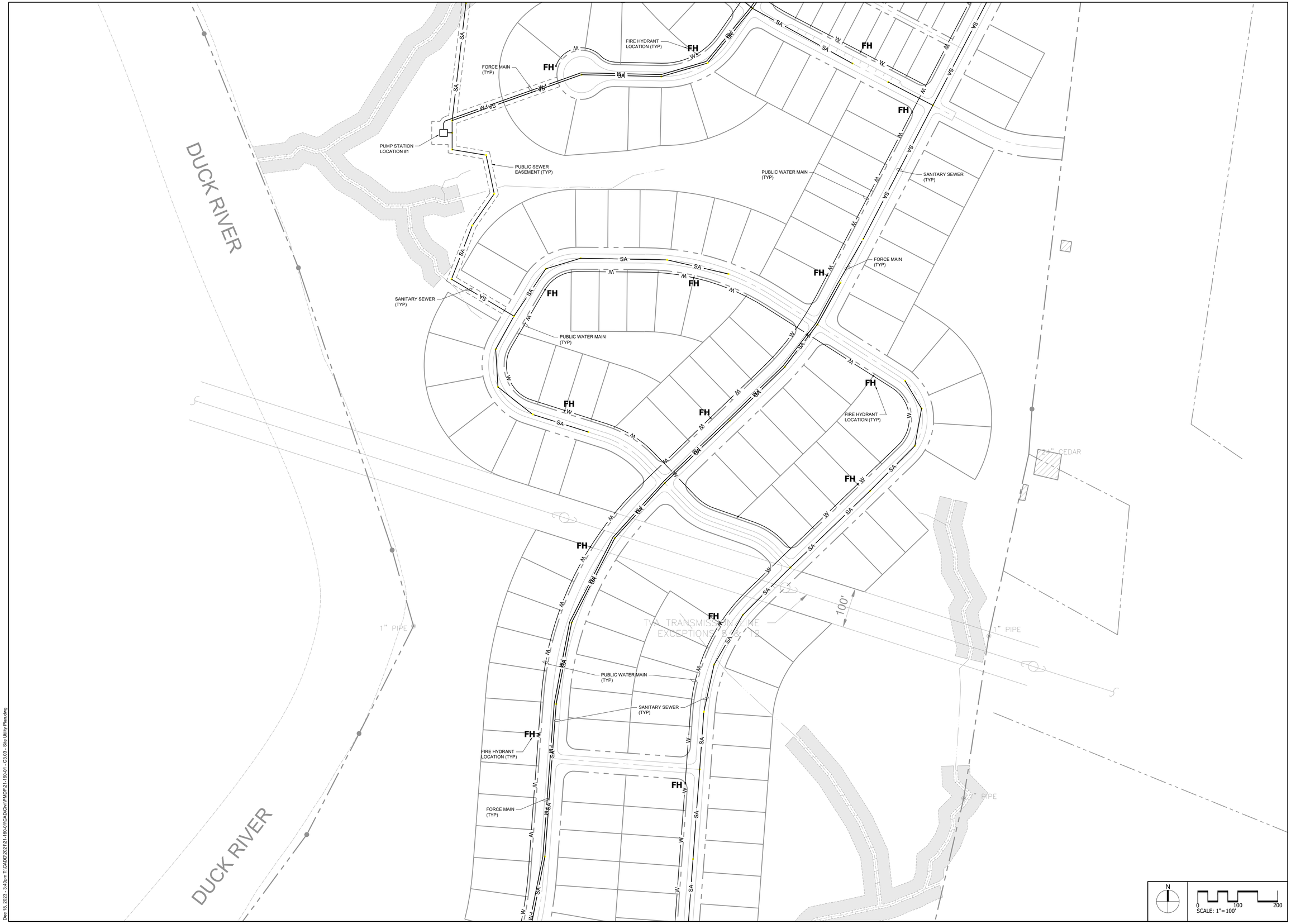
DRAWN BY: TWG
CHECKED BY: TWG

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



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csdgtn.com

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:

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

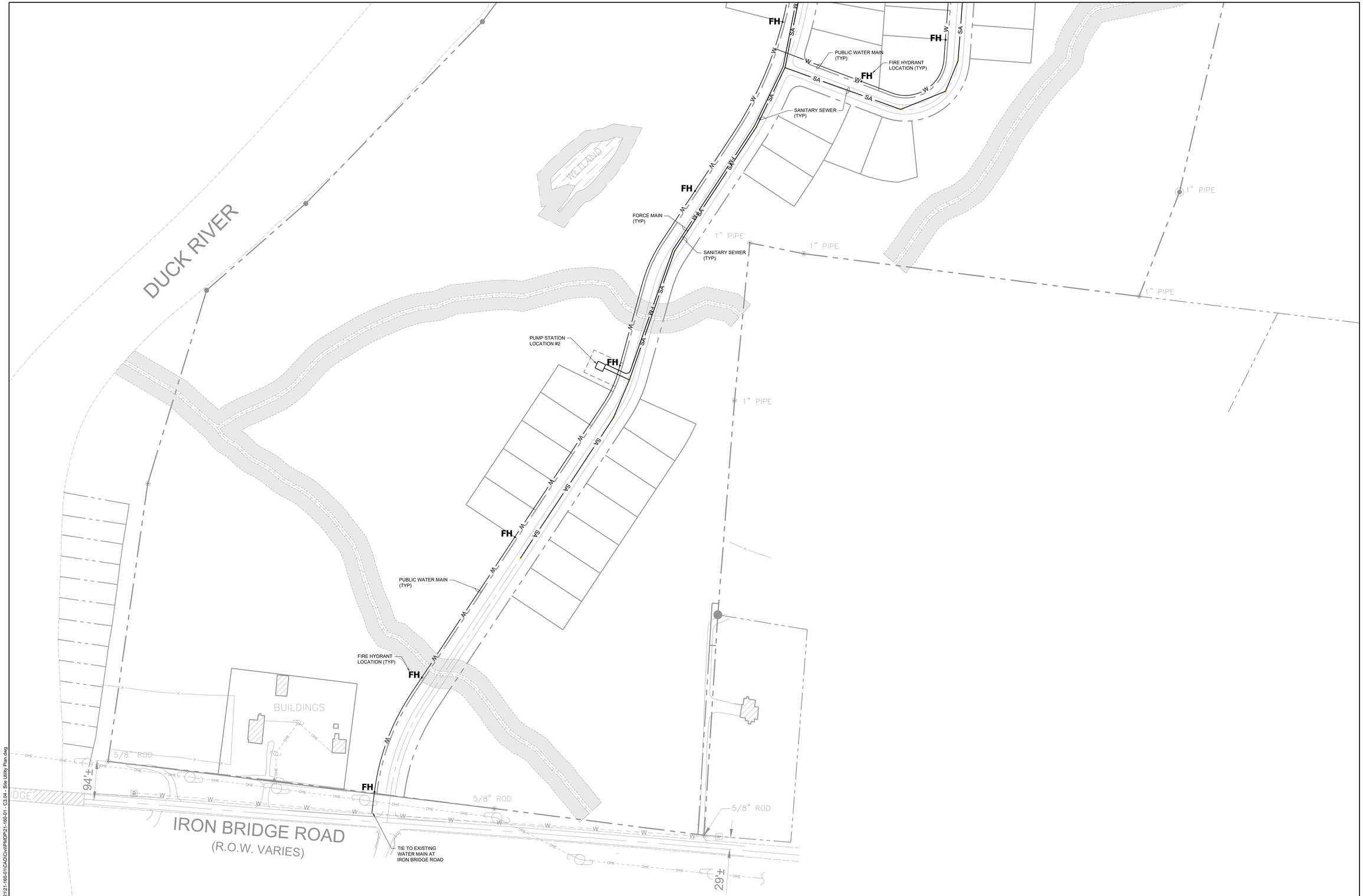
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SITE UTILITY PLAN

C3.03

PROJECT NO.: 21-160-01

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csdgtn.com

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COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

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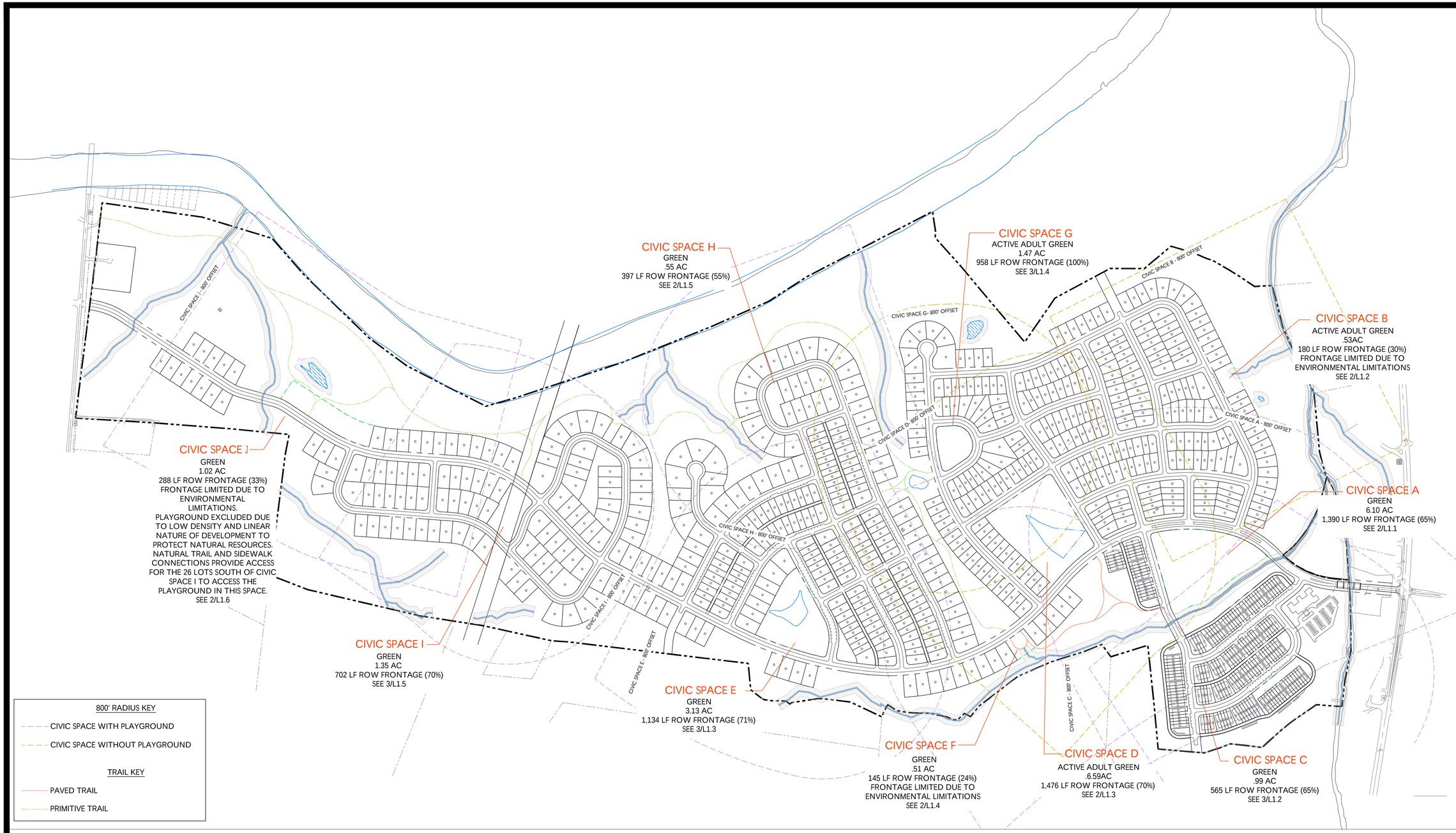
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CHECKED BY: TWG

SITE UTILITY PLAN

C3.04
PROJECT NO.: 21-160-01

N
0 100 200
SCALE: 1"= 100'

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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

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS
Registered
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



SWING BENCH



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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COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT TENNESSEE PE 12.18.23

Date: December 18, 2023
Revision Date
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△
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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

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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JEFFREY A. ROSS Registered ARCHITECT 12.18.23

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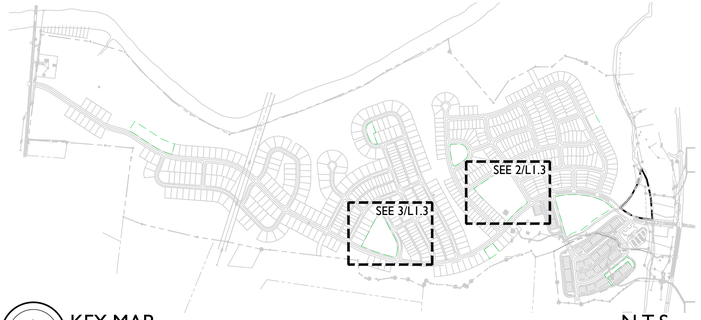
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OVERALL CIVIC SPACE PLAN

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

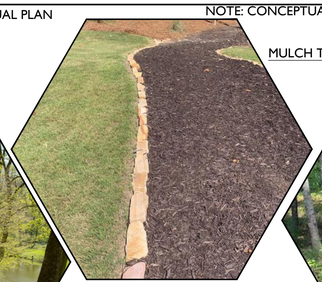

MAIL KIOSK

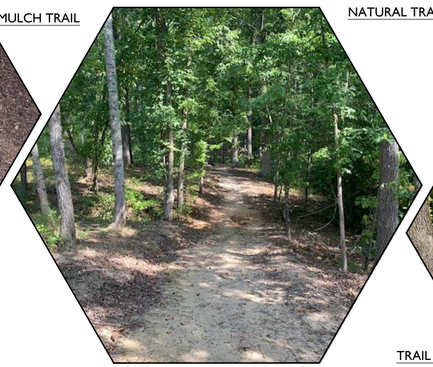
3 / L1.3 CIVIC SPACE - E
CONCEPTUAL PLAN

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

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT PE 12.18.23

Date: December 18, 2023

Revision Date
△
△
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OVERALL CIVIC SPACE PLAN

SHEET
LI.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

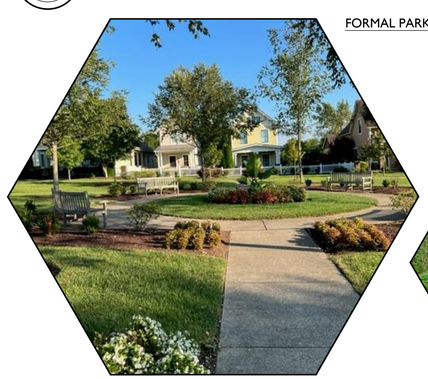


3 L1.4 CIVIC SPACE - G

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

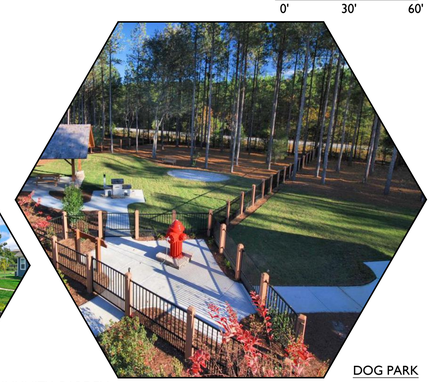
0' 30' 60'



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

JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT TENNESSEE 12.18.23

Date: December 18, 2023

Revision Date

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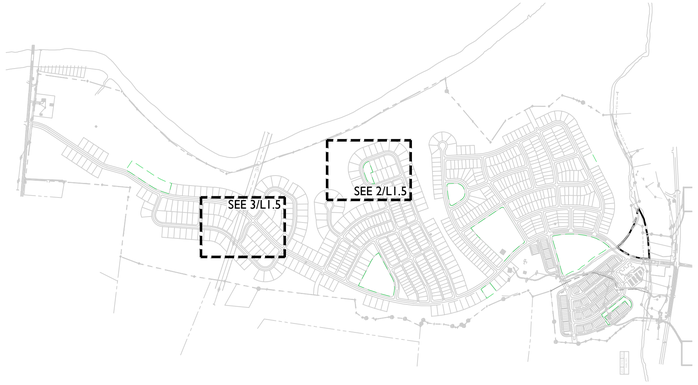
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OVERALL CIVIC SPACE PLAN

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

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

JEFFREY A. ROSS REGISTERED PROFESSIONAL ENGINEER PE 12.18.23

Date: December 18, 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'

NOTE: PRIMITIVE WALKING TRAILS TO BE FIELD LOCATED.



TRAIL HEAD



OPEN FIELD



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

JEFFREY A. ROSS REGISTERED LANDSCAPE ARCHITECT TENNESSEE 12.18.23

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.

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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: 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.

DEVELOPMENT PLANNING | DESIGN | MANAGEMENT
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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

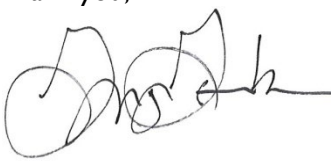
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1. Howell Elementary, Cox Middle School, Central High School. Possible rezone to BCHS 24/25SY for 9th/10 grade. See Attached Capacity Numbers. The development combined with current neighborhoods and additional approved developments in these zones may 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.

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).

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.

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.

    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.

ATT

30. ATT Plans to serve. Contact AT representative regarding connections to the site.

Maury County Schools

31. 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.

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.

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.
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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.

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28. No comment.

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    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.

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Maury County Schools

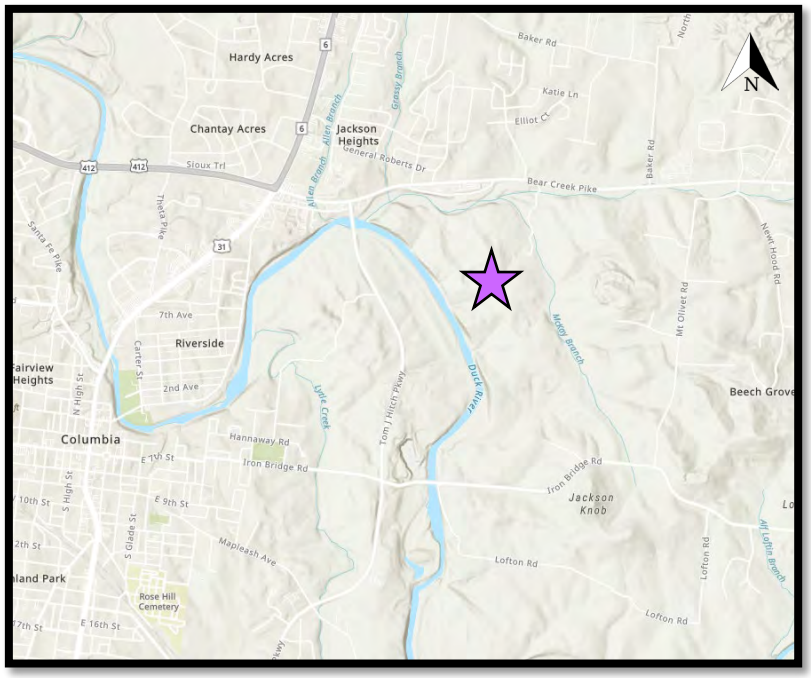
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COLUMBIA BLUFFS

Traffic Impact Study

10/16/2023



Vicinity Map
(Not to Scale)

400 BEAR CREEK PIKE
COLUMBIA, TENNESSEE

Prepared For:
KOLTER GROUP ACQUISITIONS LLC

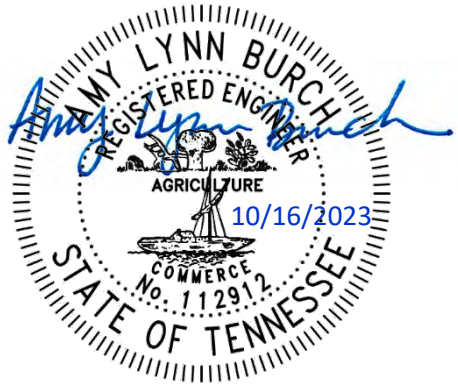
BURCH TRANSPORTATION

1114 17th Ave S, Suite 103 ● Nashville, TN 37212
(615) 258-8551 ● www.burchtransportation.com

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.

<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.

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.

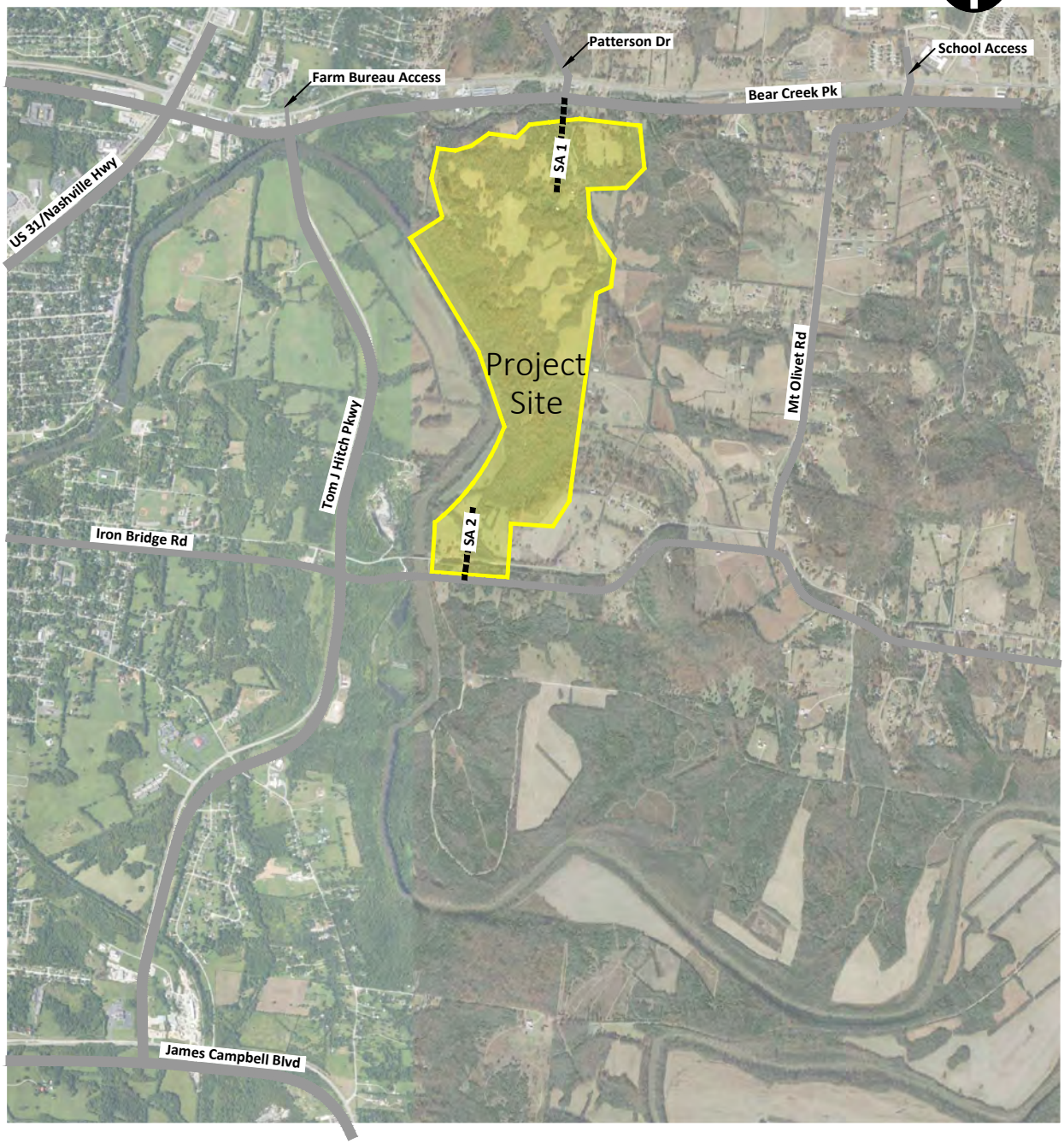
According to Kolter Group Acquisitions LLC, the construction and phasing will begin at the north end of the project site and work towards the south. The connection to Iron Bridge Road is not planned to be constructed until the beginning of Phase 4. Therefore, the following two (2) development scenarios 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.

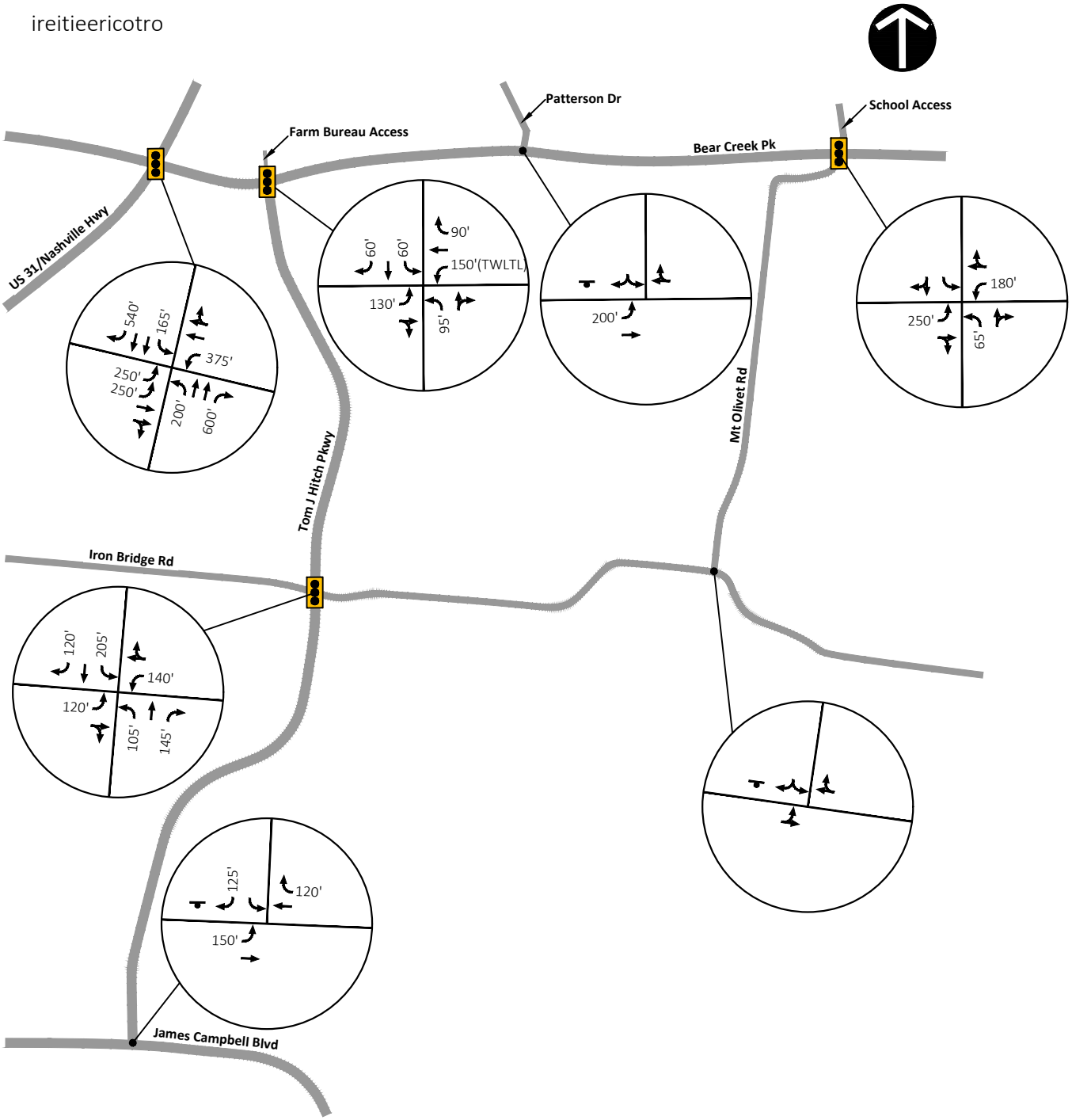
The intersection of **Iron Bridge Road and Mt Olivet Road** is unsignalized with three approaches. The eastbound approach of Iron Bridge Road includes one shared lane for left turn and through movements. The westbound approach of Iron Bridge Road includes one shared lane for through and right turn

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.

ireitieericotro



Legend:

→ Existing Laneage

XXX' Storage Length (feet)

TWLTL Two-way Left-Turn Lane

Stcotro

ri

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.

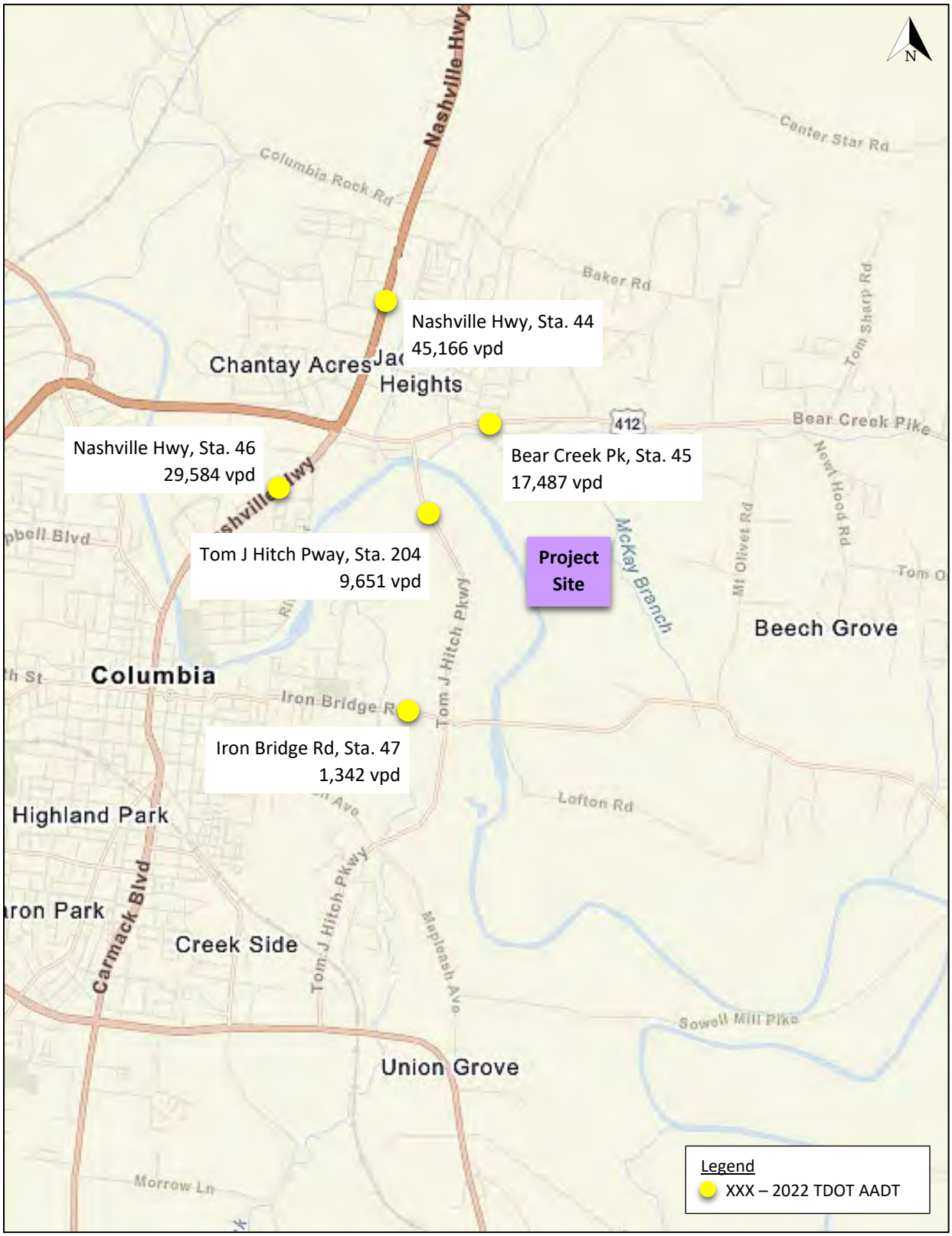
Turning movement count data conducted for the study intersections in May 2021 by Marr Traffic were obtained from a TIS prepared by Ragan-Smith for the same project site. Although the AADT comparison appears to show that traffic volumes in the study area have normalized, a peak hour comparison of the 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.

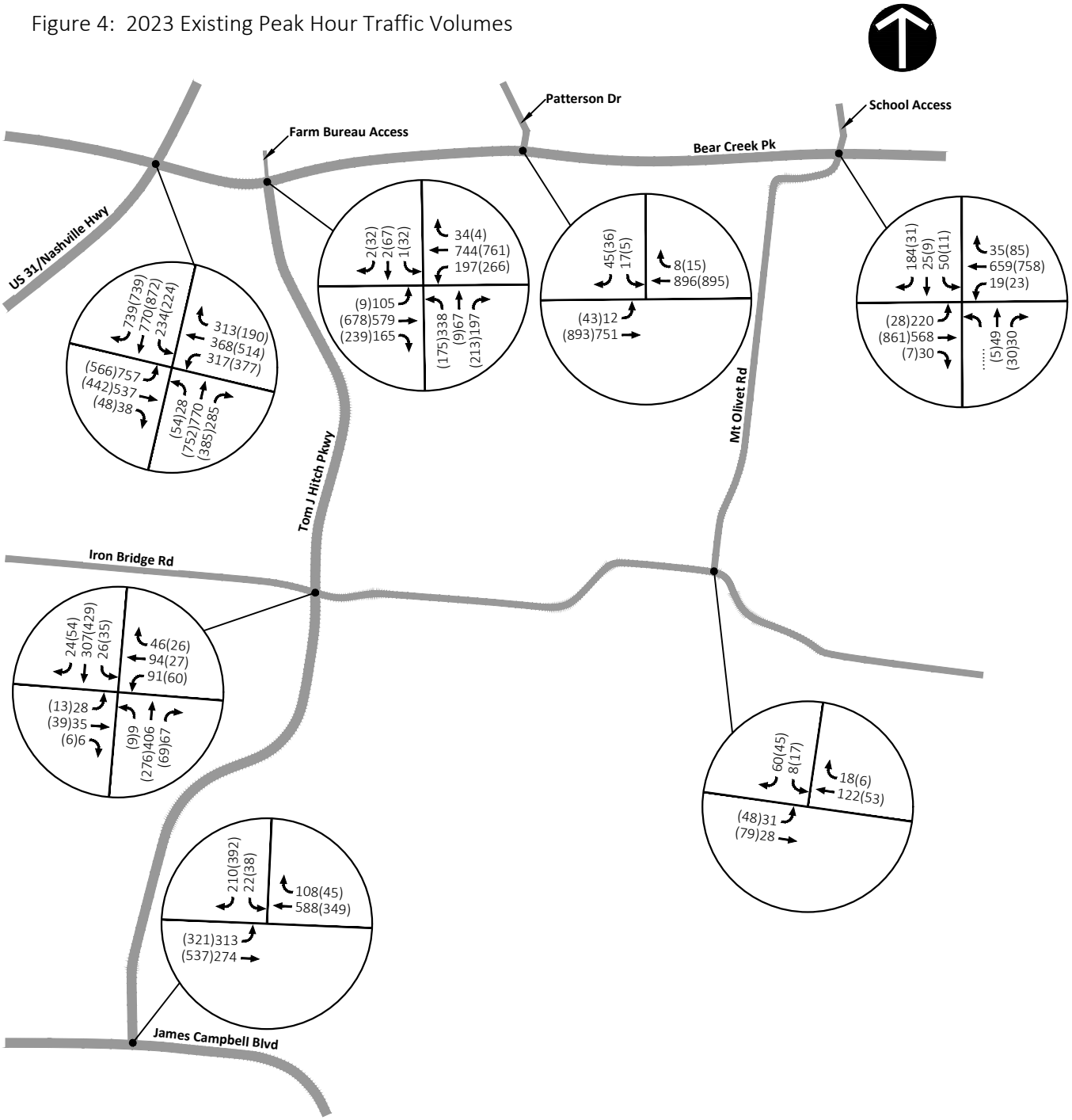
The 2023 Existing Conditions Peak Hour Traffic Volumes are presented in Figure 4. This represents the baseline conditions for the traffic analysis. The turning movement count data that was used to establish baseline conditions is included in Appendix D.

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)

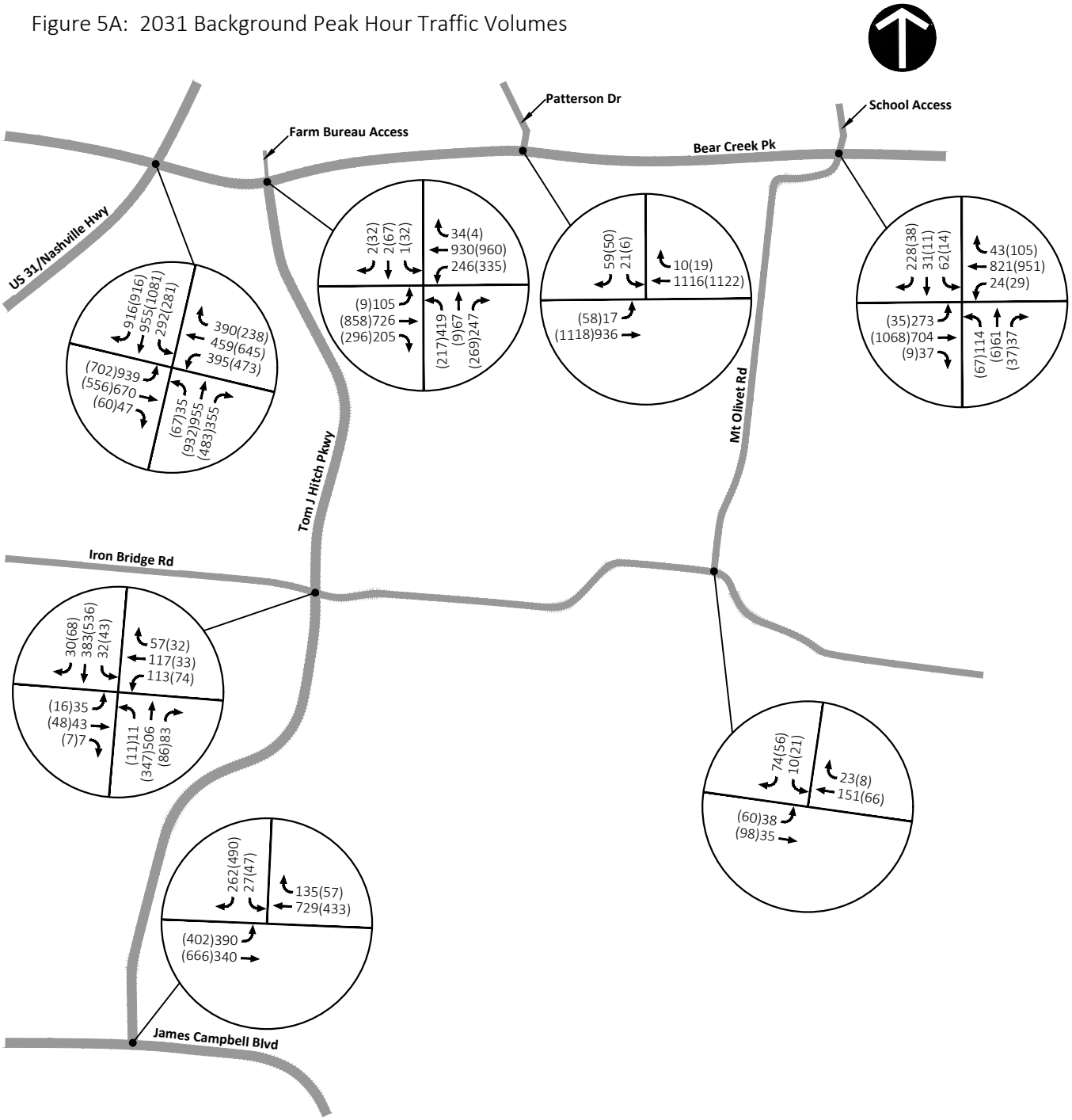
4. Background Conditions

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.

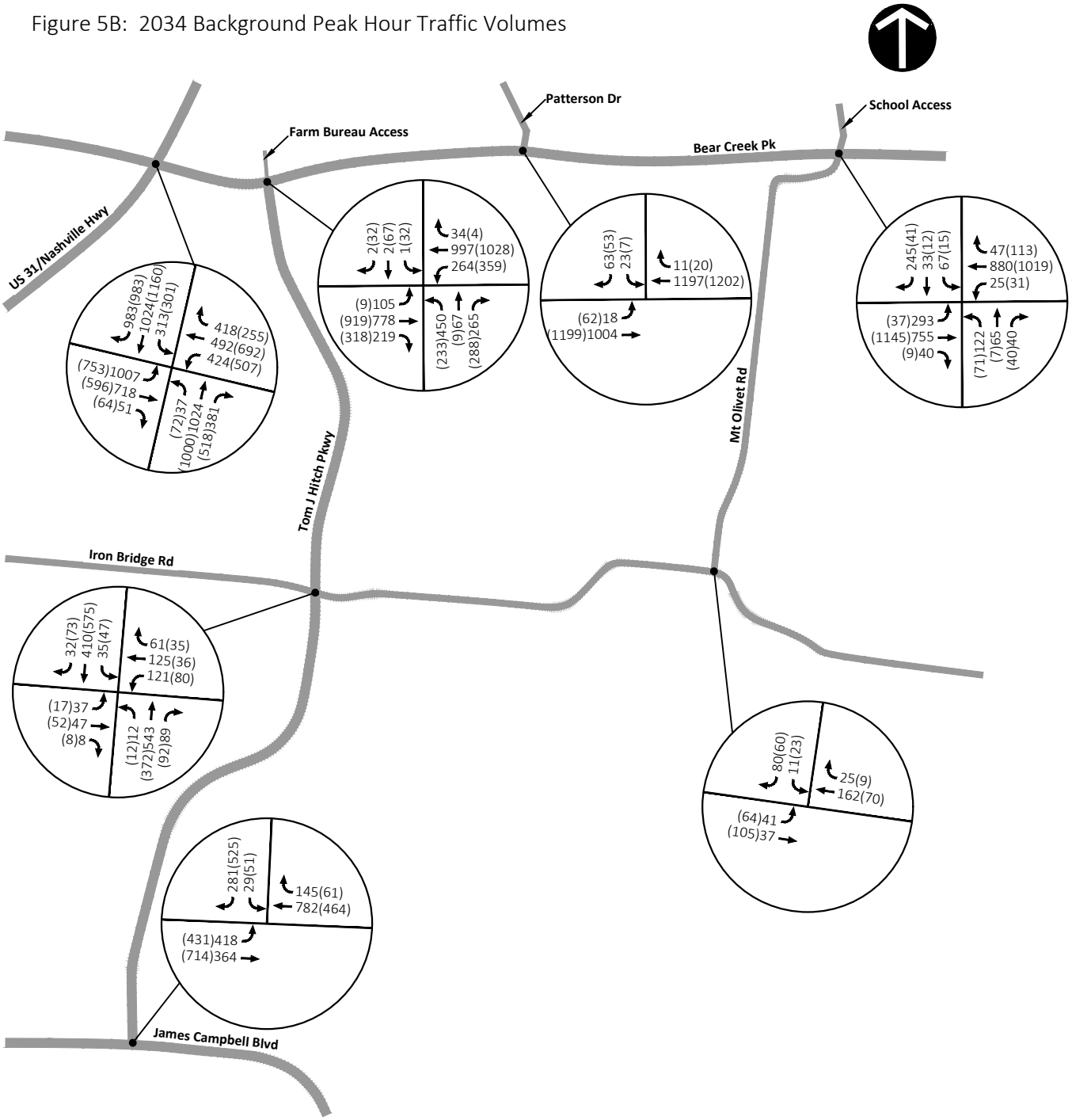
Figure 5A: 2031 Background Peak Hour Traffic Volumes



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.

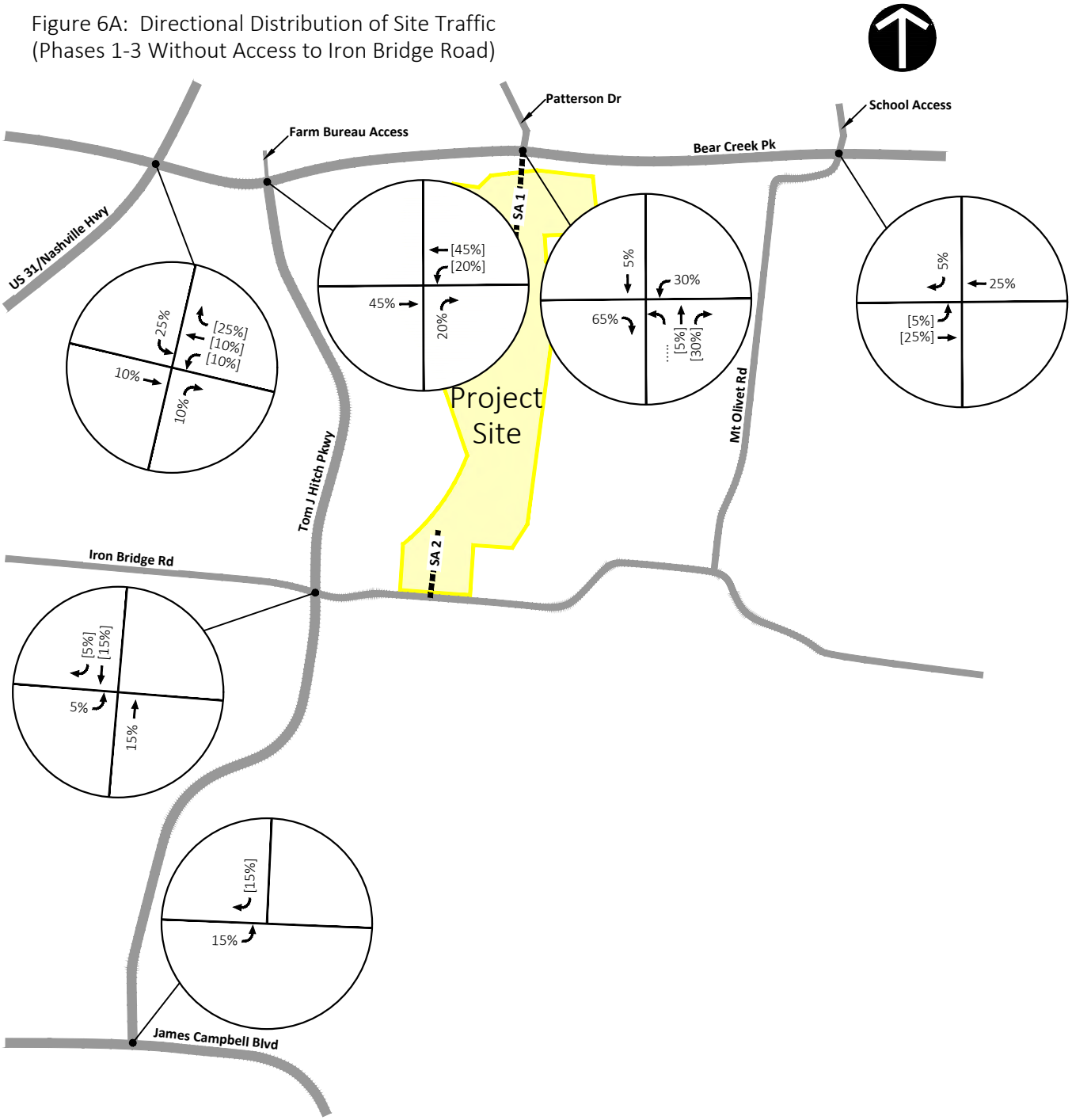
Table 3: Directional Distribution

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.

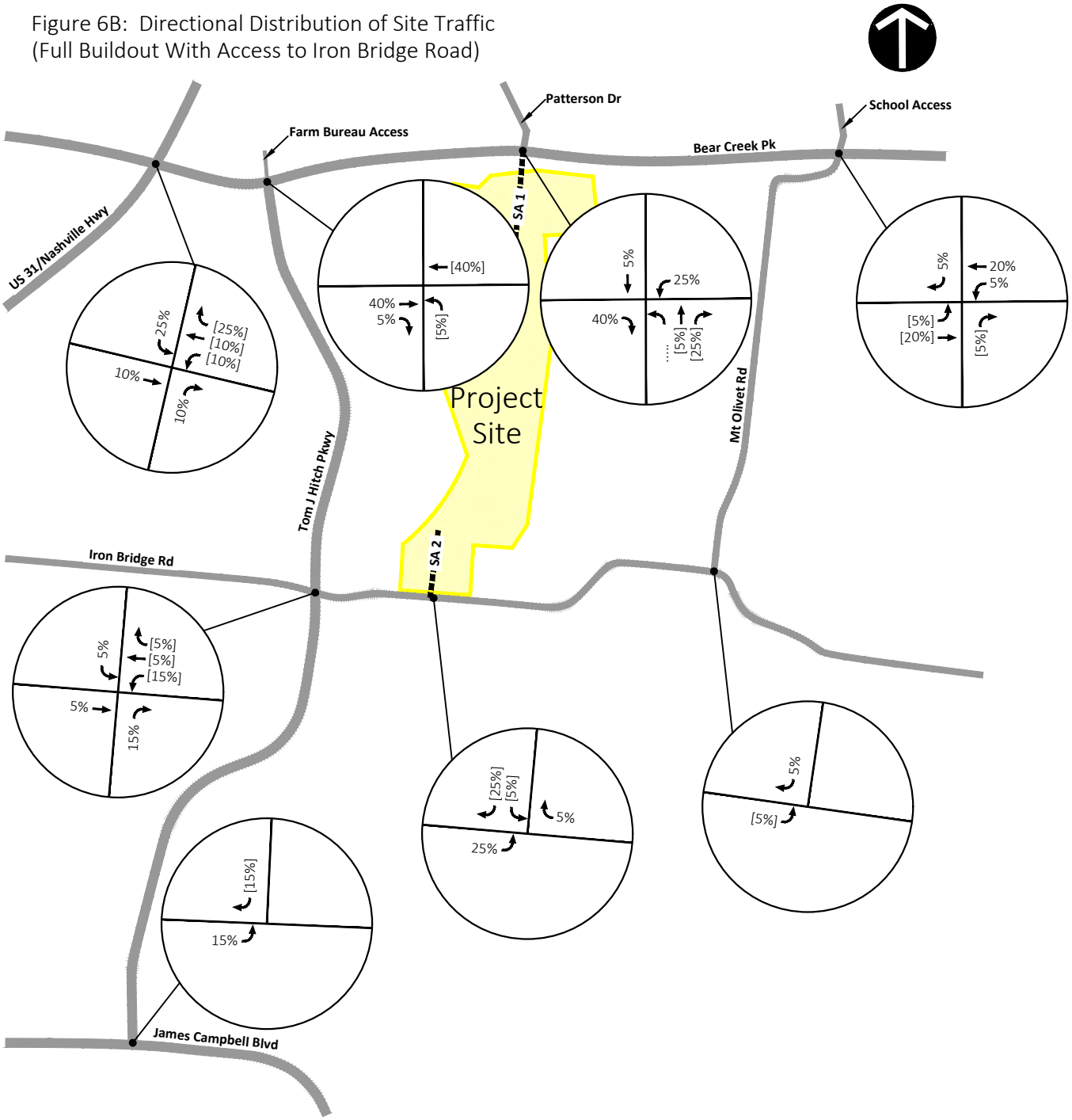
Figure 6A: Directional Distribution of Site Traffic
(Phases 1-3 Without Access to Iron Bridge Road)



Legend:
XX% - Enter
[XX%] - Exit

(Not to Scale)

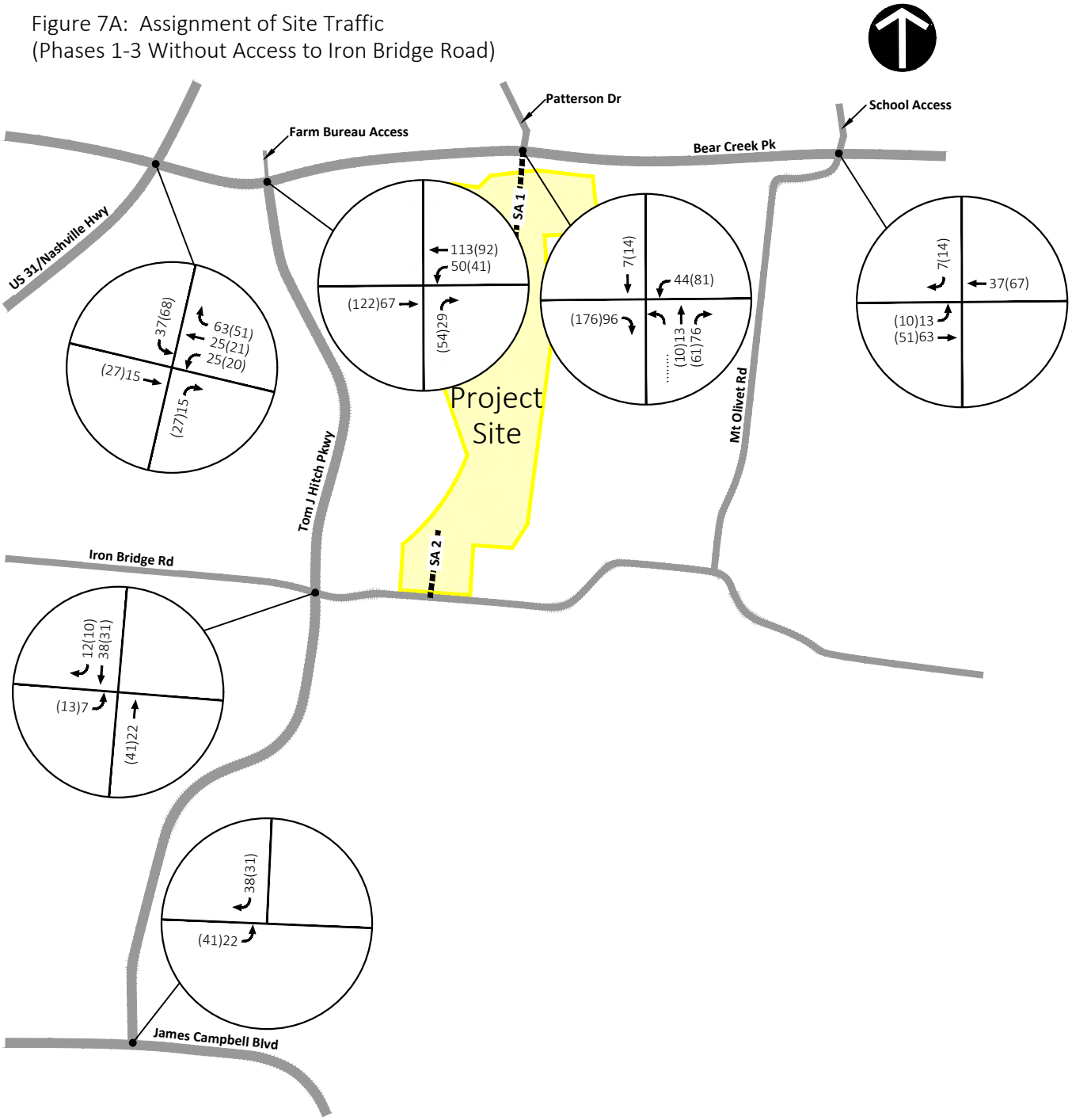
Figure 6B: Directional Distribution of Site Traffic
(Full Buildout With Access to Iron Bridge Road)



Legend:
XX% - Enter
[XX%] - Exit

(Not to Scale)

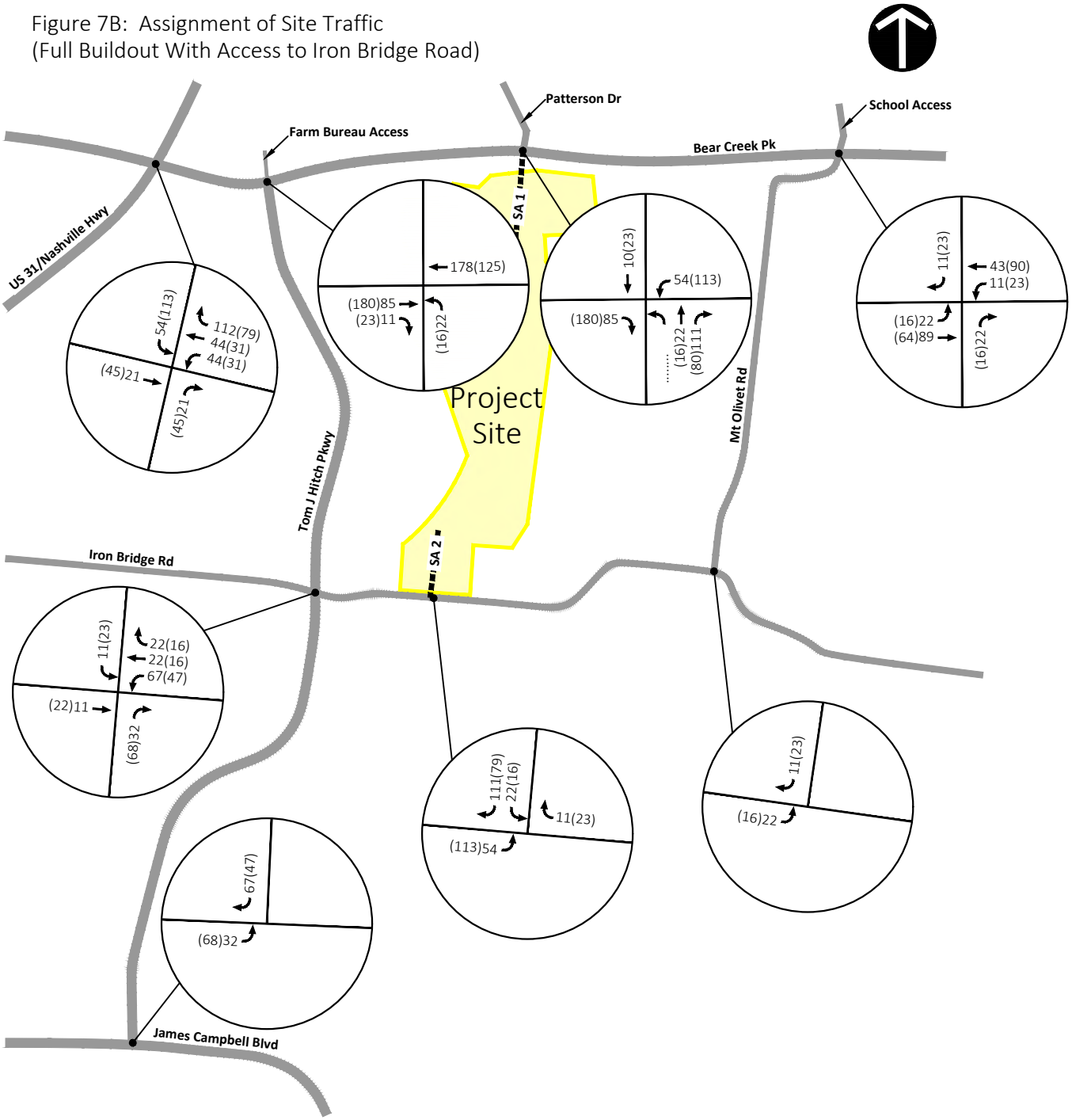
Figure 7A: Assignment of Site Traffic
(Phases 1-3 Without Access to Iron Bridge Road)



Legend:
XXX - AM Peak Hour Traffic Volumes
(XXX) - PM Peak Hour Traffic Volumes

(Not to Scale)

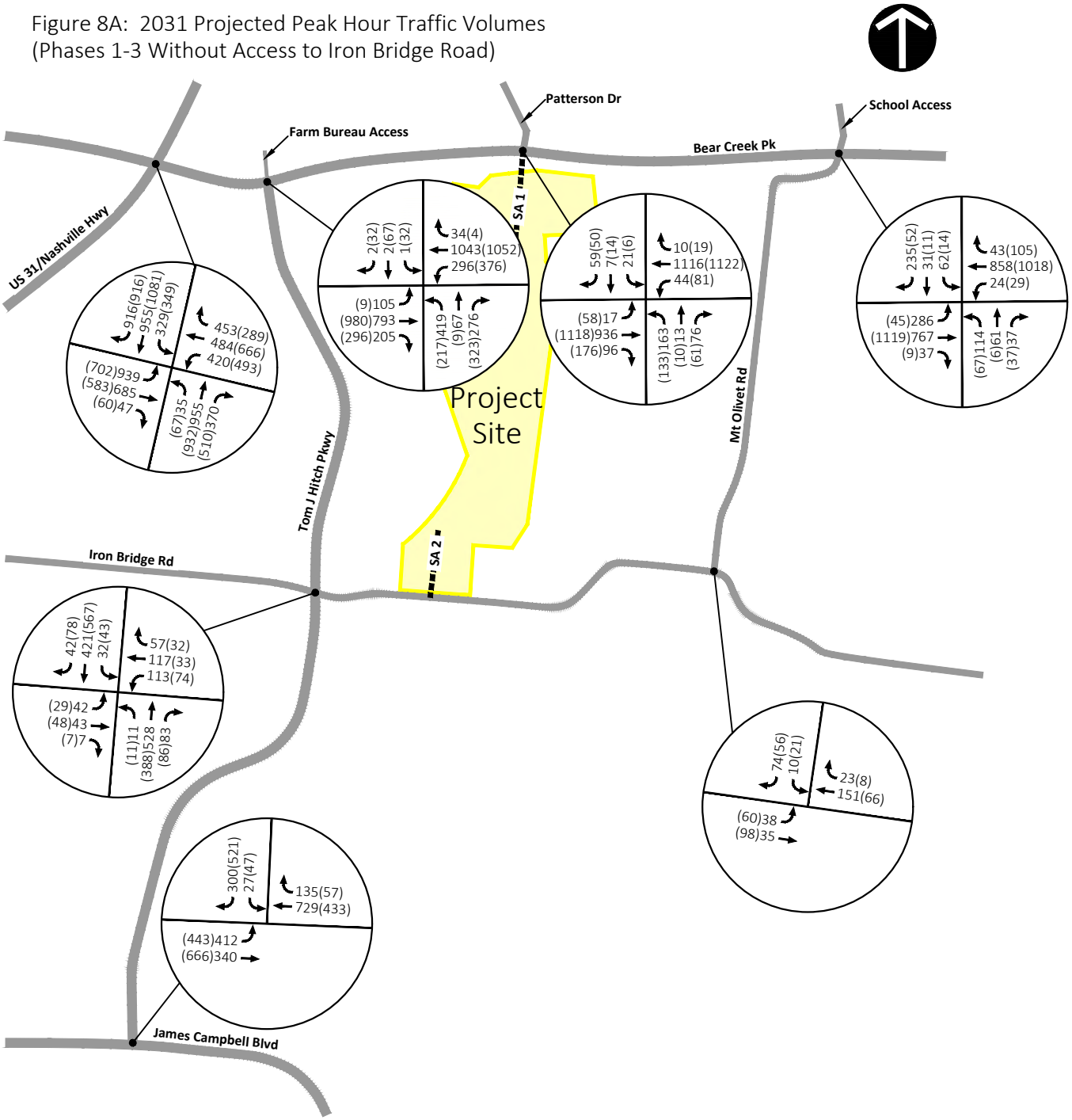
Figure 7B: Assignment of Site Traffic
(Full Buildout With Access to Iron Bridge Road)



Legend:
XXX - AM Peak Hour Traffic Volumes
(XXX) - PM Peak Hour Traffic Volumes

(Not to Scale)

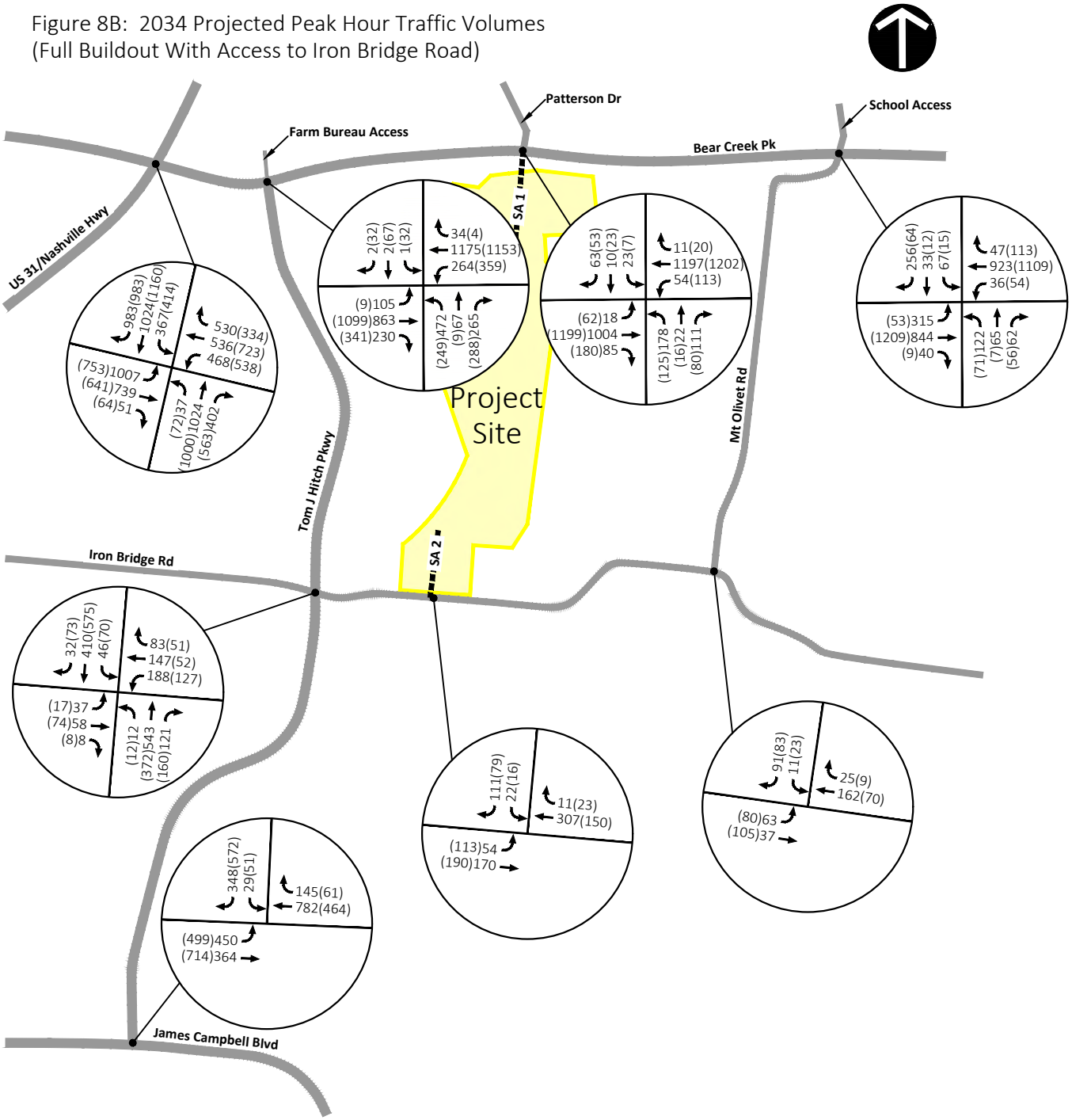
Figure 8A: 2031 Projected Peak Hour Traffic Volumes
(Phases 1-3 Without Access to Iron Bridge Road)



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>

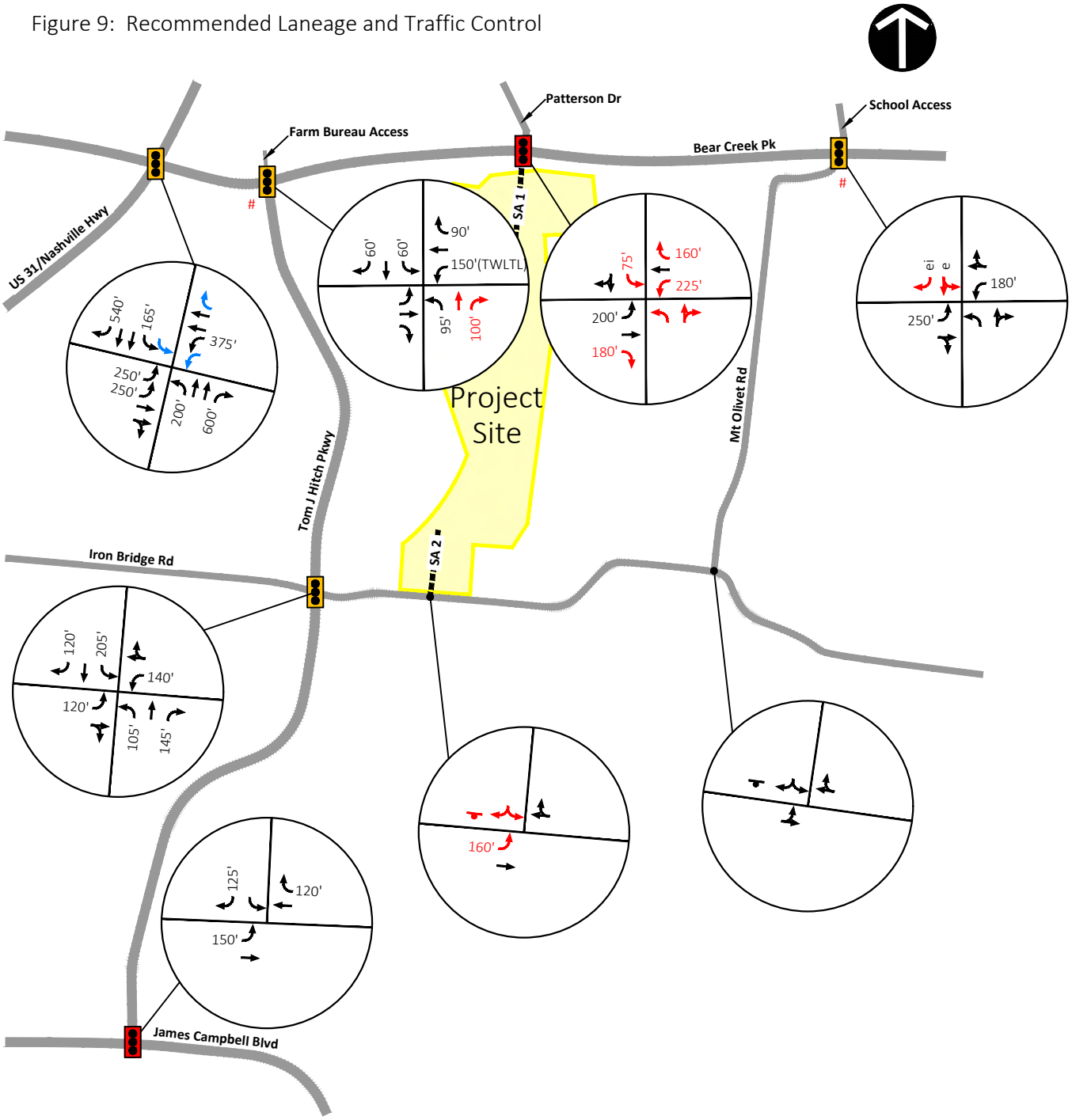
With the planned widening of Bear Creek Pike between Nashville Highway and Tom J Hitch Parkway, the following improvements should be made:

- 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

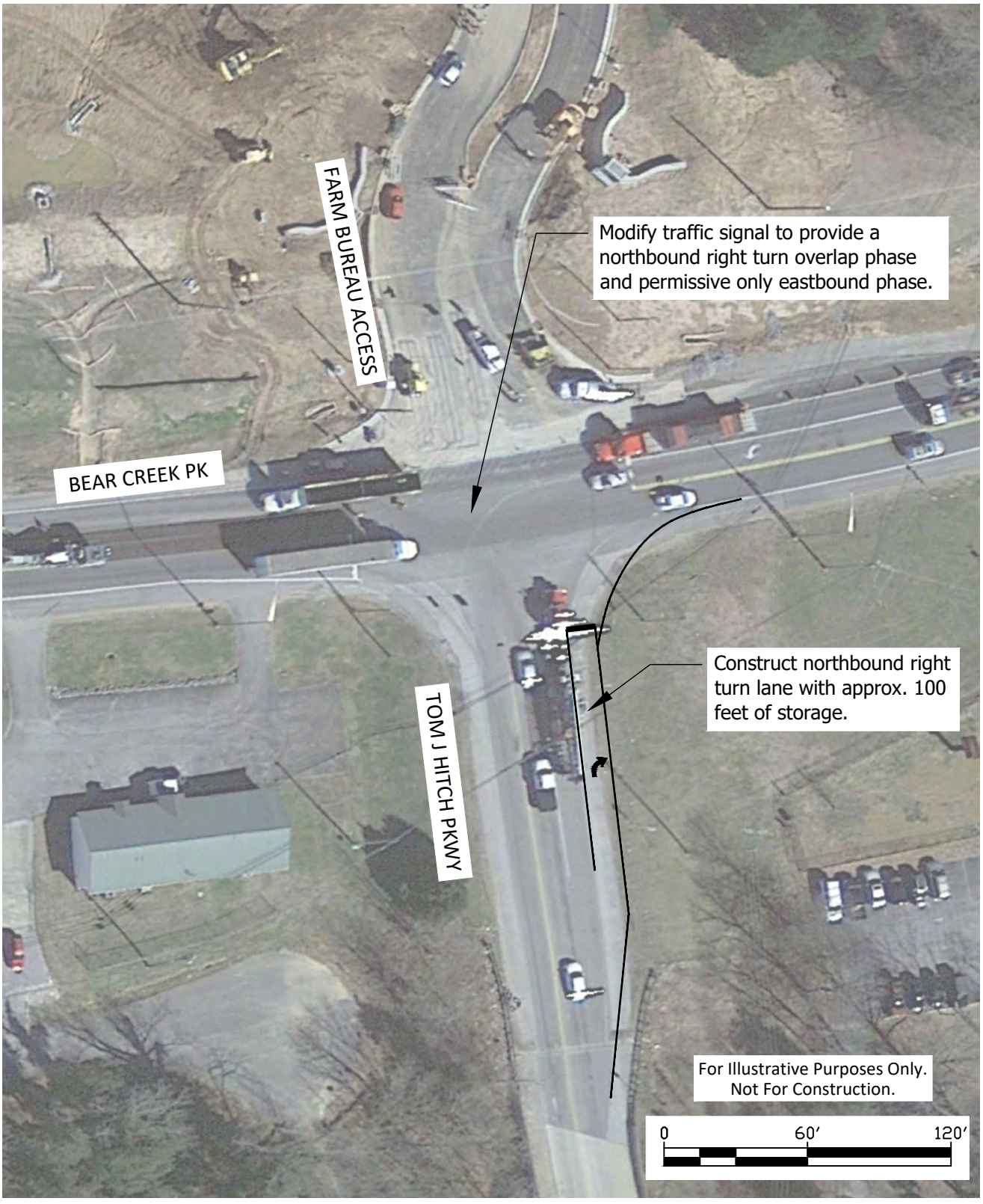


Figure 10B: Conceptual Layout of Recommended Improvements at Bear Creek Pike and Patterson Drive/Site Access 1

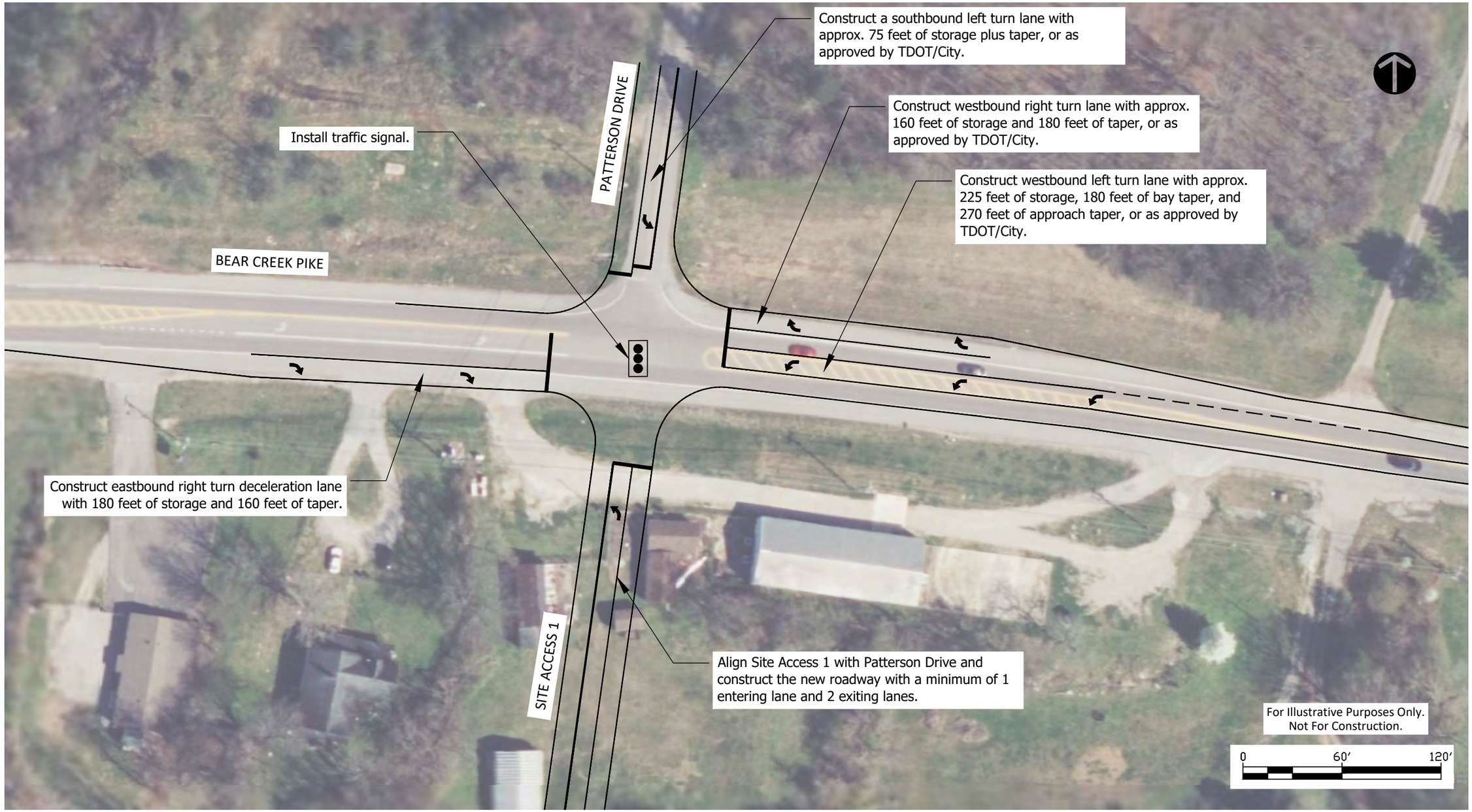


Figure 10C: Conceptual Layout of Recommended Improvements at Bear Creek Pike and Mt Olivet Road/School Access

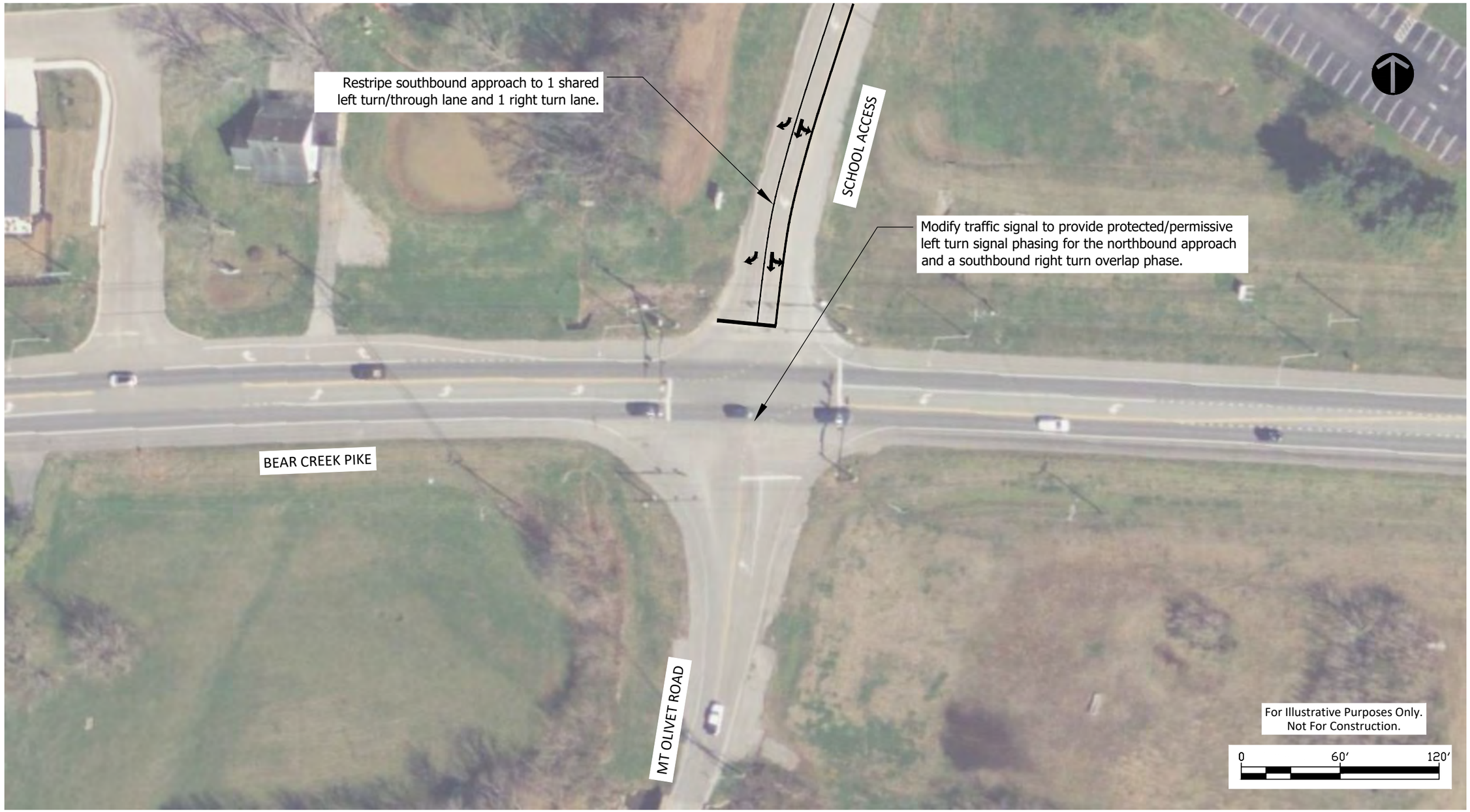


Figure 10D: Conceptual Layout of Recommended Improvements at Iron Bridge Road and Site Access 2



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

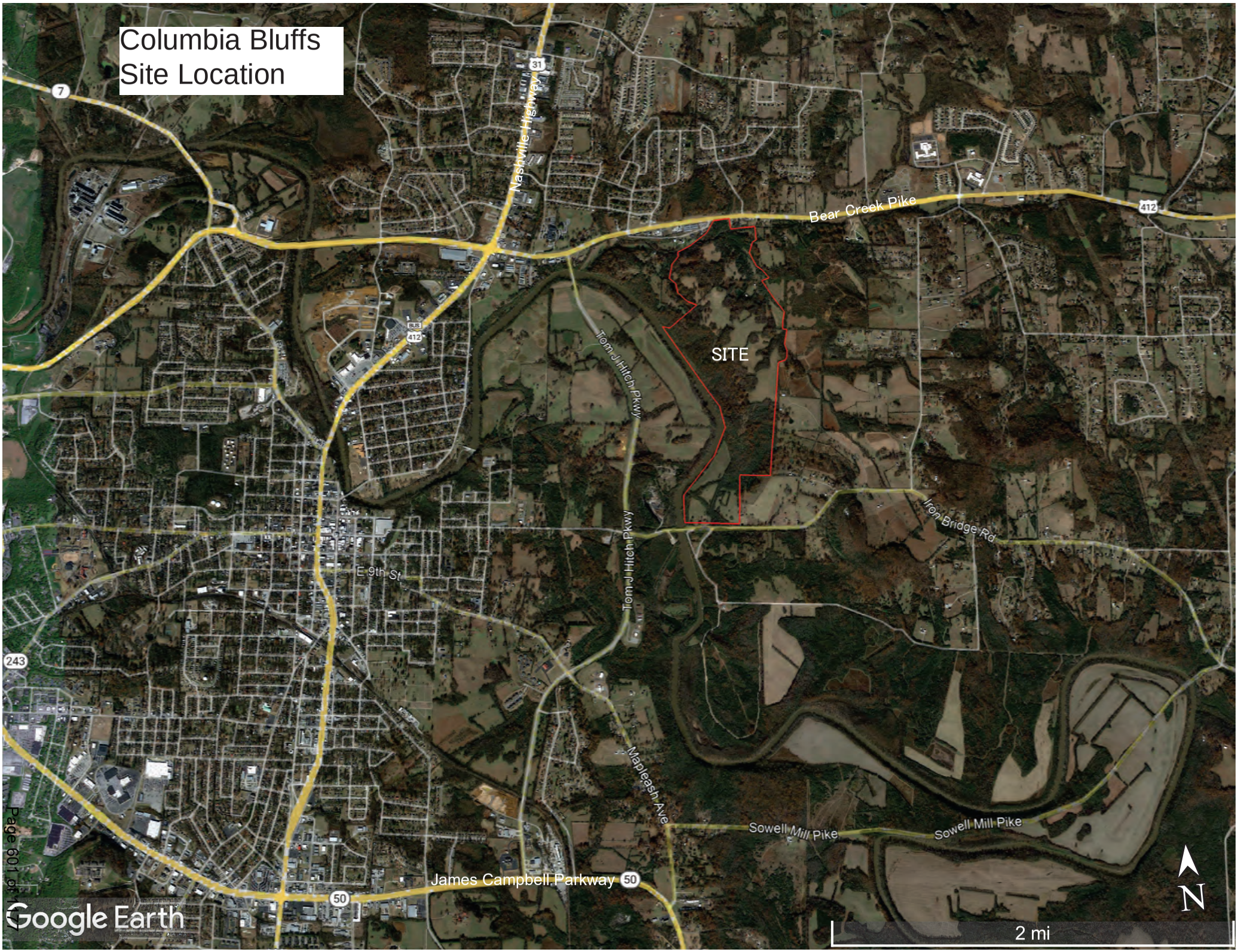
MEMORANDUM OF UNDERSTANDING SIGN OFF:

	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
Nashville Highway
Bear Creek Pike
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

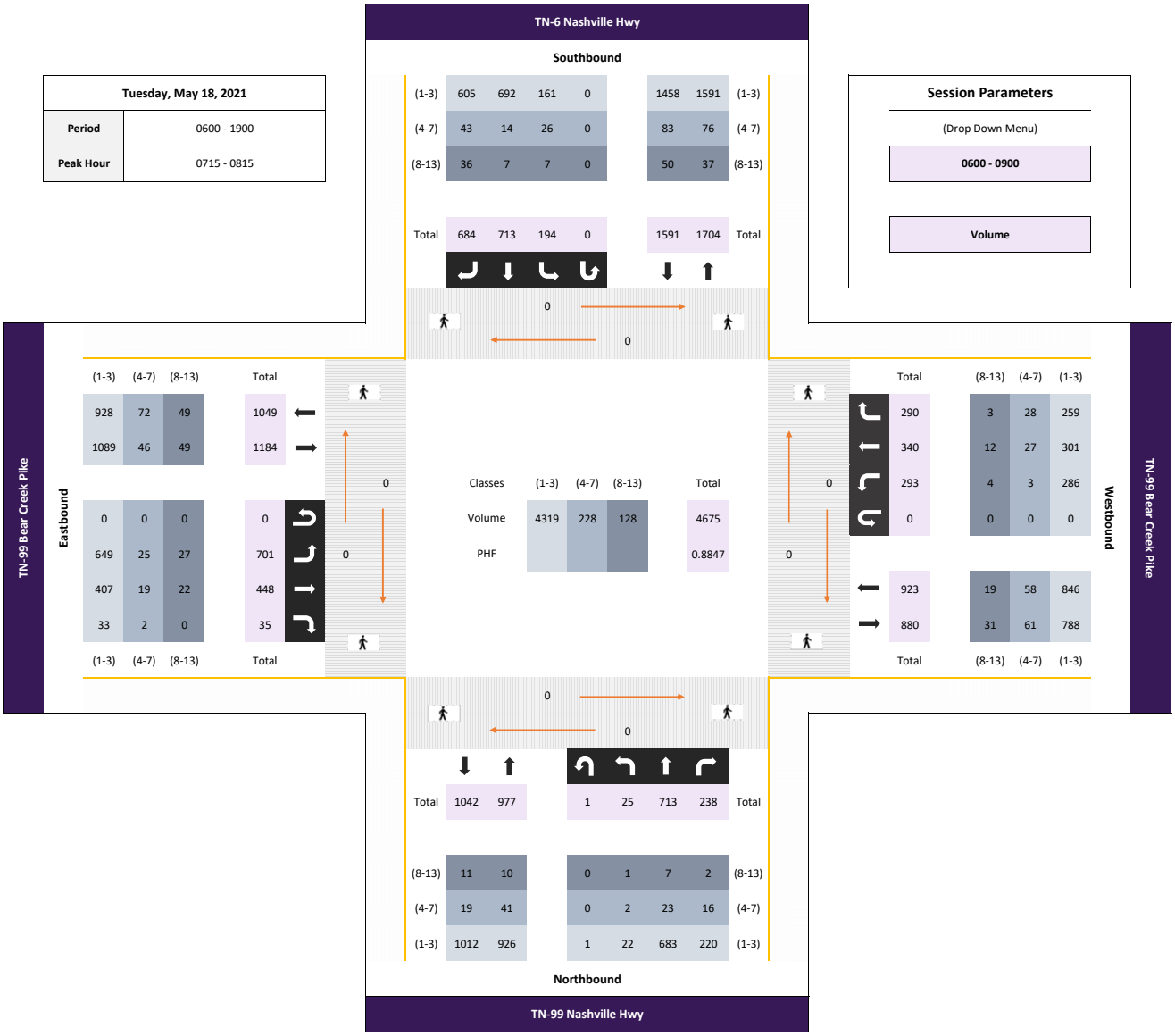
Click here for Map

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**

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	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)					
	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
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)					
	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
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)					
	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
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)					
	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
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)					
	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
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)					
	EB	WB			App					App	NB	SB			App	NB	SB			App	Int
Time	6a	6b			Total					Total	6e	6f			Total	6g	6h			Total	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**

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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	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**

Peak Hour Turning Movement Count

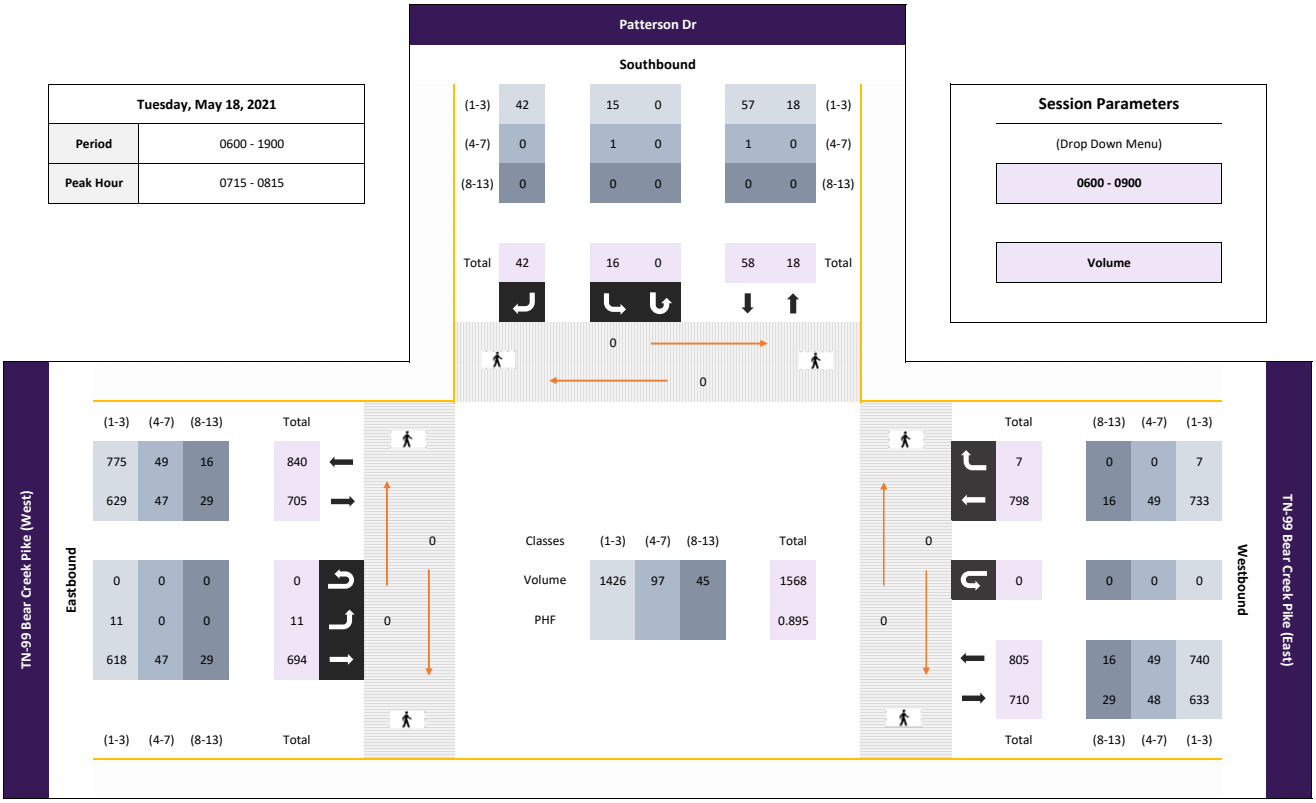
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Columbia, TN

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

	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
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					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
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					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
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					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
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					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
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					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
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**

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Peak Hour Turning Movement Count

Columbia, TN

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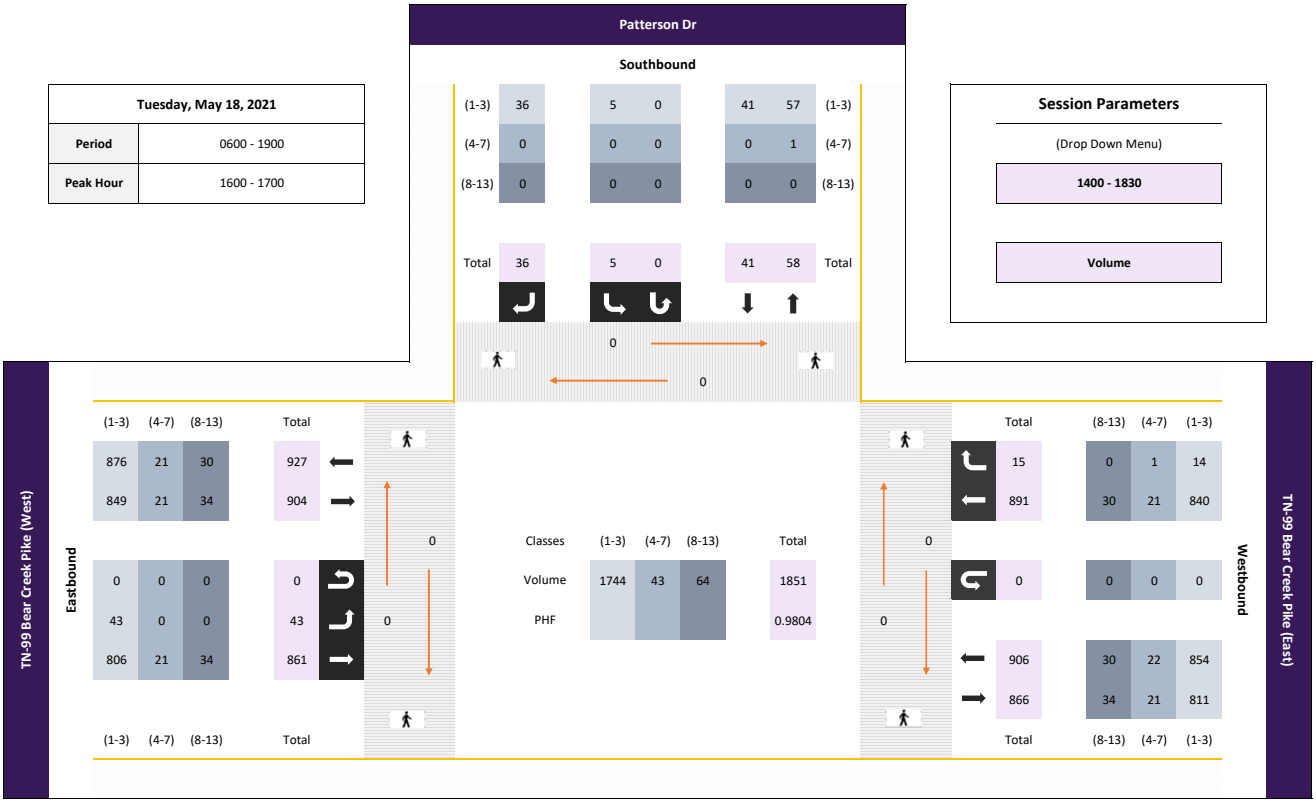
Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	1600 - 1700

Session Parameters

(Drop Down Menu)

1400 - 1830

Volume



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

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					
	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

Marr Traffic DATA COLLECTION

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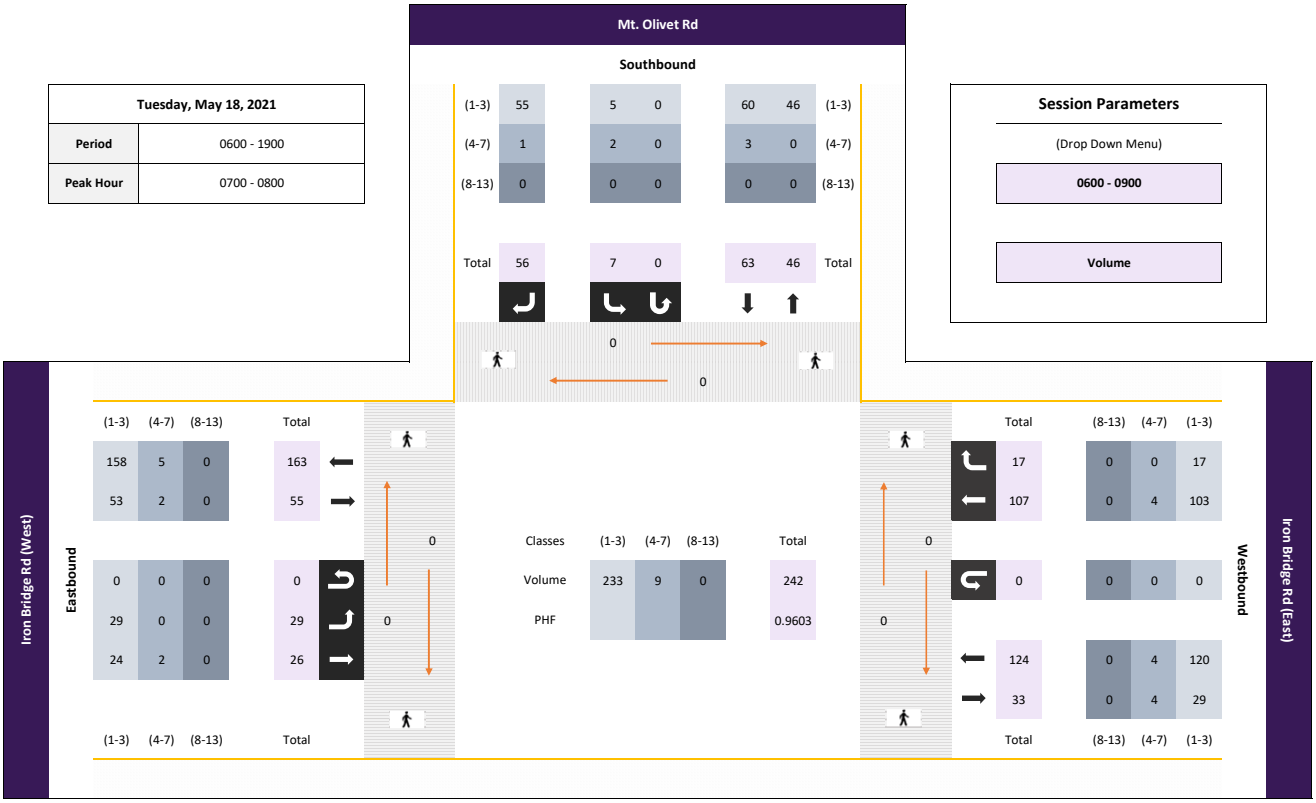
Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	0700 - 0800

Session Parameters

(Drop Down Menu)

0600 - 0900

Volume



All vehicles

						Southbound					Eastbound					Westbound					
						Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	8.1		8.2	8.3	Total	8.4	8.5		8.6	Total		8.7	8.8	8.9	Total	Total
0700 - 0715	-	-	-	-	0	2	-	9	0	11	7	5	-	0	12	-	33	1	0	34	57
0715 - 0730	-	-	-	-	0	1	-	10	0	11	8	6	-	0	14	-	30	5	0	35	60
0730 - 0745	-	-	-	-	0	3	-	17	0	20	10	4	-	0	14	-	23	6	0	29	63
0745 - 0800	-	-	-	-	0	1	-	20	0	21	4	11	-	0	15	-	21	5	0	26	62
Total	0	0	0	0	0	7	0	56	0	63	29	26	0	0	55	0	107	17	0	124	242
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	86.29	13.71	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	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)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	8.1		8.2	8.3	Total	8.4	8.5		8.6	Total		8.7	8.8	8.9	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					
						Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	8.1		8.2	8.3	Total	8.4	8.5		8.6	Total		8.7	8.8	8.9	Total	Total
0700 - 0715	-	-	-	-	0	1	-	9	0	10	7	4	-	0	11	-	32	1	0	33	54
0715 - 0730	-	-	-	-	0	0	-	10	0	10	8	5	-	0	13	-	28	5	0	33	56
0730 - 0745	-	-	-	-	0	3	-	17	0	20	10	4	-	0	14	-	22	6	0	28	62
0745 - 0800	-	-	-	-	0	1	-	19	0	20	4	11	-	0	15	-	21	5	0	26	61
Total	0	0	0	0	0	5	0	55	0	60	29	24	0	0	53	0	103	17	0	120	233
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	85.83	14.17	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	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)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	8.1		8.2	8.3	Total	8.4	8.5		8.6	Total		8.7	8.8	8.9	Total	Total
0700 - 0715	-	-	-	-	0	1	-	0	0	1	0	1	-	0	1	-	1	0	0	1	3
0715 - 0730	-	-	-	-	0	1	-	0	0	1	0	1	-	0	1	-	2	0	0	2	4
0730 - 0745	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	1	0	0	1	1
0745 - 0800	-	-	-	-	0	0	-	1	0	1	0	0	-	0	0	-	0	0	0	0	1
Total	0	0	0	0	0	2	0	1	0	3	0	2	0	0	2	0	4	0	0	4	9
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	100.00	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	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)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	8.1		8.2	8.3	Total	8.4	8.5		8.6	Total		8.7	8.8	8.9	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**

Pedestrians

						Southbound					Eastbound					Westbound					
						Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
					App	EB	WB			App	NB	SB			App	NB	SB			App	Int
Time					Total	8c	8d			Total	8e	8f			Total	8g	8h			Total	Total
0700 - 0715	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
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
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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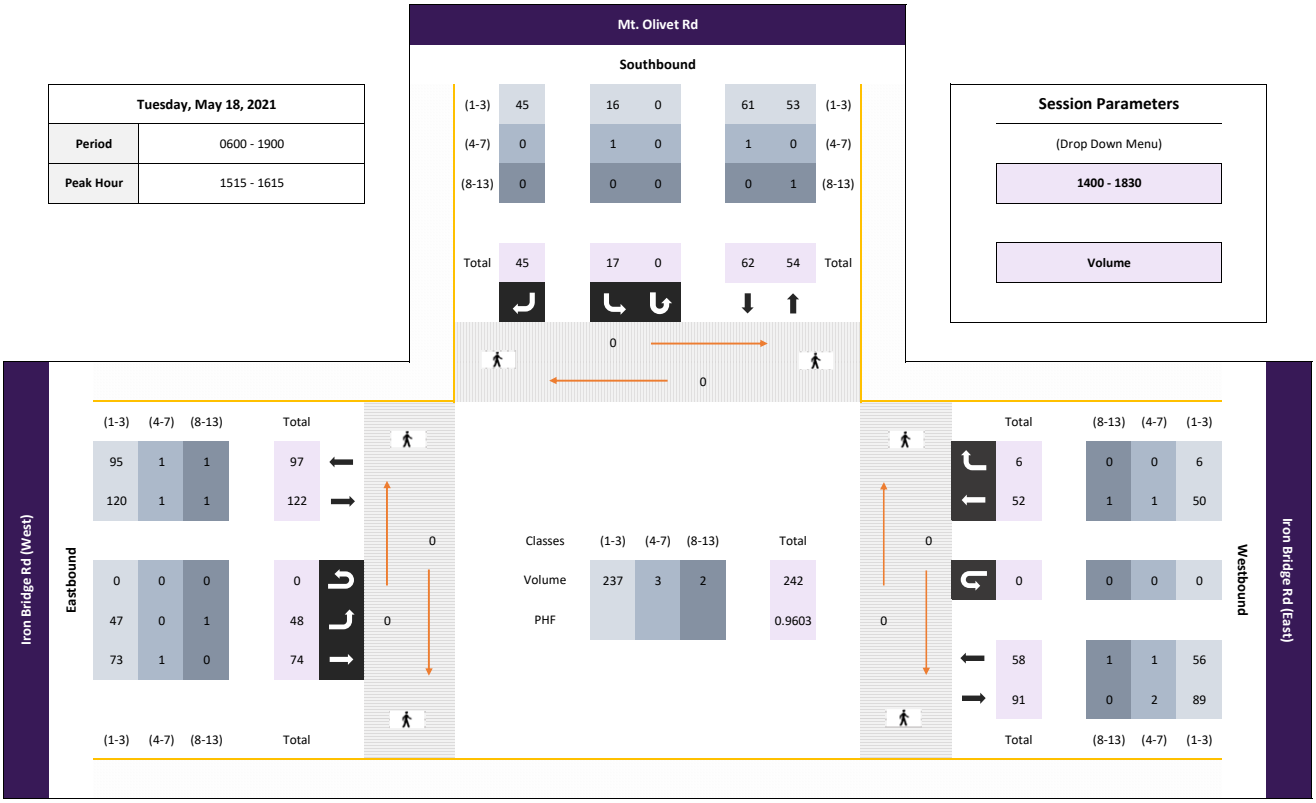
Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	1515 - 1615

Session Parameters

(Drop Down Menu)

1400 - 1830

Volume



All vehicles

						Southbound					Eastbound					Westbound					
						Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	8.1		8.2	8.3	Total	8.4	8.5		8.6	Total		8.7	8.8	8.9	Total	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)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	8.1		8.2	8.3	Total	8.4	8.5		8.6	Total		8.7	8.8	8.9	Total	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)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	8.1		8.2	8.3	Total	8.4	8.5		8.6	Total		8.7	8.8	8.9	Total	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)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	8.1		8.2	8.3	Total	8.4	8.5		8.6	Total		8.7	8.8	8.9	Total	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)					
					App	Left		Right	U-Turn	App	Left	Thru		U-Turn	App		Thru	Right	U-Turn	App	Int
Time					Total	8.1		8.2	8.3	Total	8.4	8.5		8.6	Total		8.7	8.8	8.9	Total	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)					
					App	EB	WB			App	NB	SB			App	NB	SB			App	Int
Time					Total	8c	8d			Total	8e	8f			Total	8g	8h			Total	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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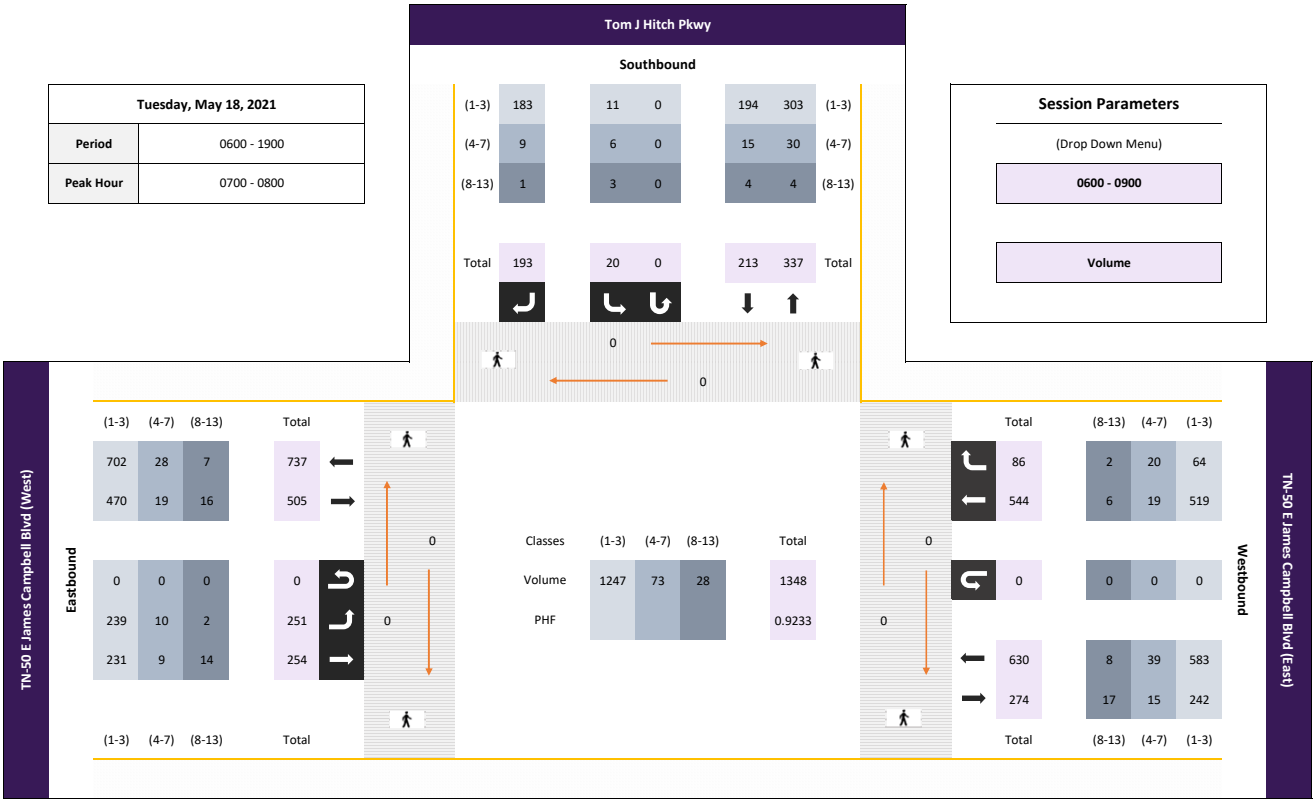
Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	0700 - 0800

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**

Click here for Map

Peak Hour Turning Movement Count

Columbia, TN

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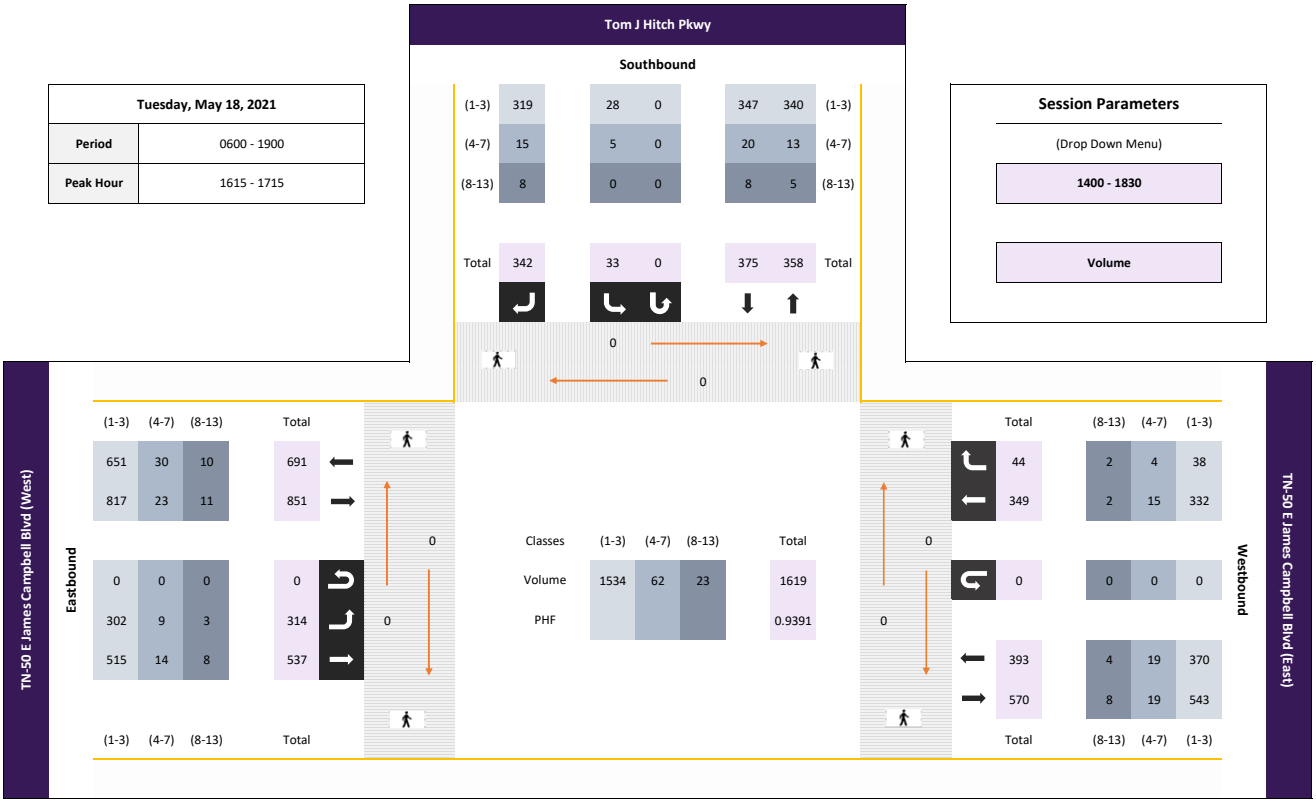
Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	1615 - 1715

Session Parameters

(Drop Down Menu)

1400 - 1830

Volume



All vehicles

	Southbound					Tom J Hitch Pkwy					Eastbound					TN-50 E James Campbell Blvd (West)					Westbound					TN-50 E James Campbell Blvd (East)	
Time					App Total	Left 4.1		Right 4.2	U-Turn 4.3	App Total	Left 4.4	Thru 4.5		U-Turn 4.6	App Total		Thru 4.7	Right 4.8	U-Turn 4.9	App Total	Int 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					Tom J Hitch Pkwy					Eastbound					TN-50 E James Campbell Blvd (West)					Westbound					TN-50 E James Campbell Blvd (East)	
Time					App Total	Left 4.1		Right 4.2	U-Turn 4.3	App Total	Left 4.4	Thru 4.5		U-Turn 4.6	App Total		Thru 4.7	Right 4.8	U-Turn 4.9	App Total	Int 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					Tom J Hitch Pkwy					Eastbound					TN-50 E James Campbell Blvd (West)					Westbound					TN-50 E James Campbell Blvd (East)	
Time					App Total	Left 4.1		Right 4.2	U-Turn 4.3	App Total	Left 4.4	Thru 4.5		U-Turn 4.6	App Total		Thru 4.7	Right 4.8	U-Turn 4.9	App Total	Int 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					Tom J Hitch Pkwy					Eastbound					TN-50 E James Campbell Blvd (West)					Westbound					TN-50 E James Campbell Blvd (East)	
Time					App Total	Left 4.1		Right 4.2	U-Turn 4.3	App Total	Left 4.4	Thru 4.5		U-Turn 4.6	App Total		Thru 4.7	Right 4.8	U-Turn 4.9	App Total	Int 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					Tom J Hitch Pkwy					Eastbound					TN-50 E James Campbell Blvd (West)					Westbound					TN-50 E James Campbell Blvd (East)	
Time					App Total	Left 4.1		Right 4.2	U-Turn 4.3	App Total	Left 4.4	Thru 4.5		U-Turn 4.6	App Total		Thru 4.7	Right 4.8	U-Turn 4.9	App Total	Int 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					Tom J Hitch Pkwy					Eastbound					TN-50 E James Campbell Blvd (West)					Westbound					TN-50 E James Campbell Blvd (East)	
Time		WB 4b			App Total	EB 4c	WB 4d			App Total	NB 4e	SB 4f			App Total	NB 4g	SB 4h			App Total	Int 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

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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

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Columbia, TN

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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

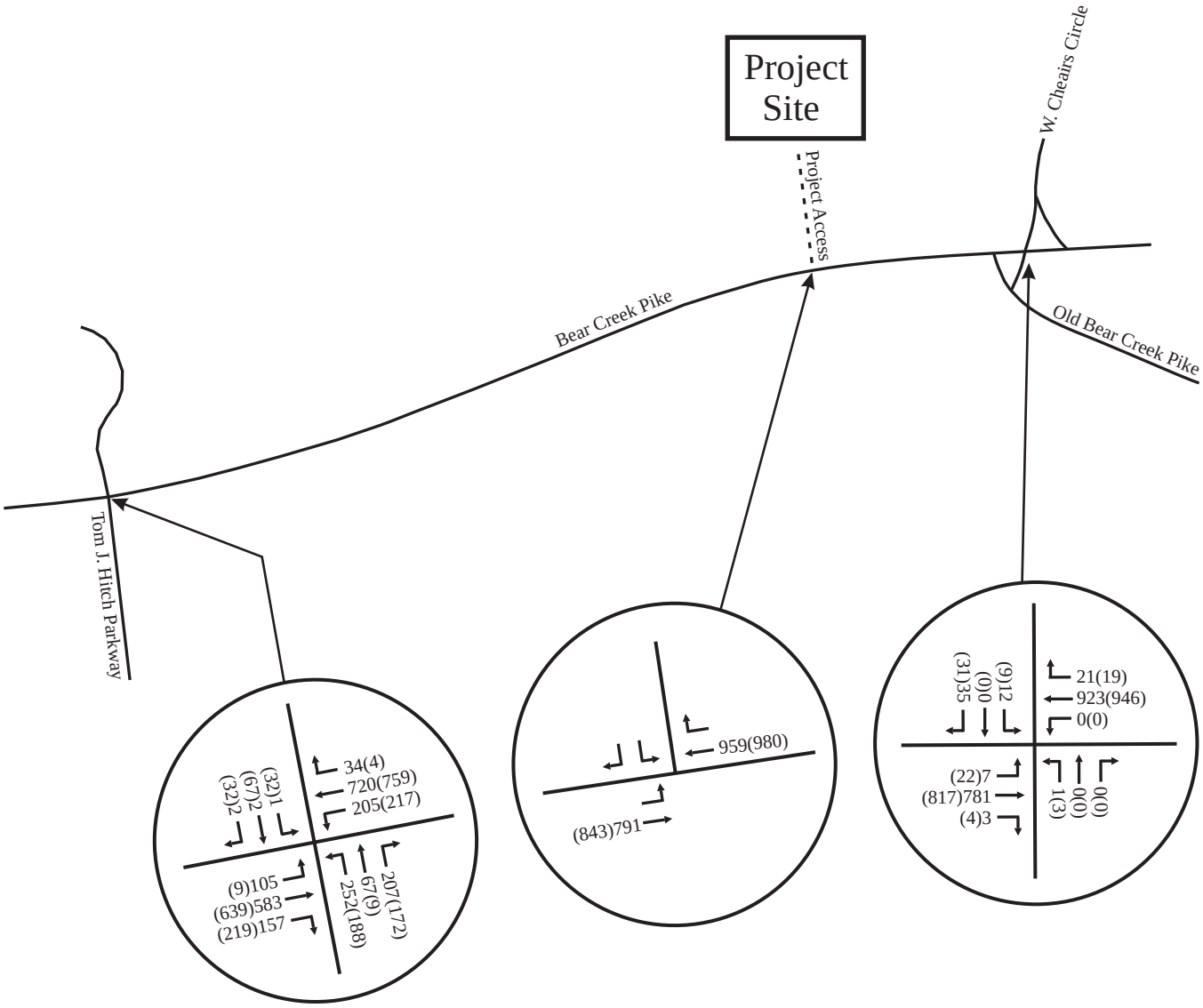
Weather
Cloudy
60°F

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**

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 4.
Existing Year 2023 Peak Hour Traffic Volumes

Peak Hour Turning Movement Count

Columbia, TN

Click here for Map

Marr Traffic DATA COLLECTION

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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

www.marrtraffic.com

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**

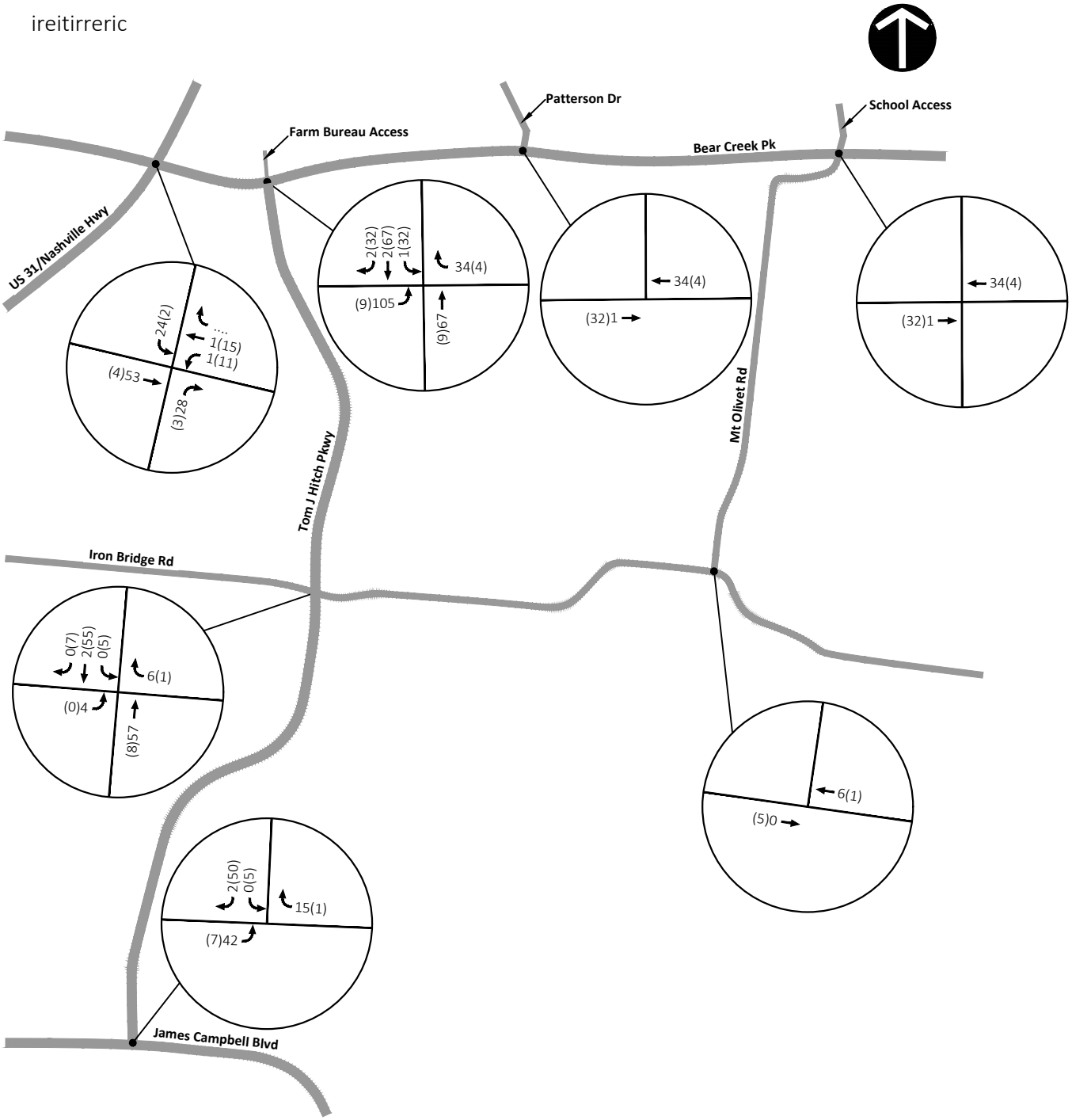
Combination Trucks (8-13)

	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**

ireitirreric

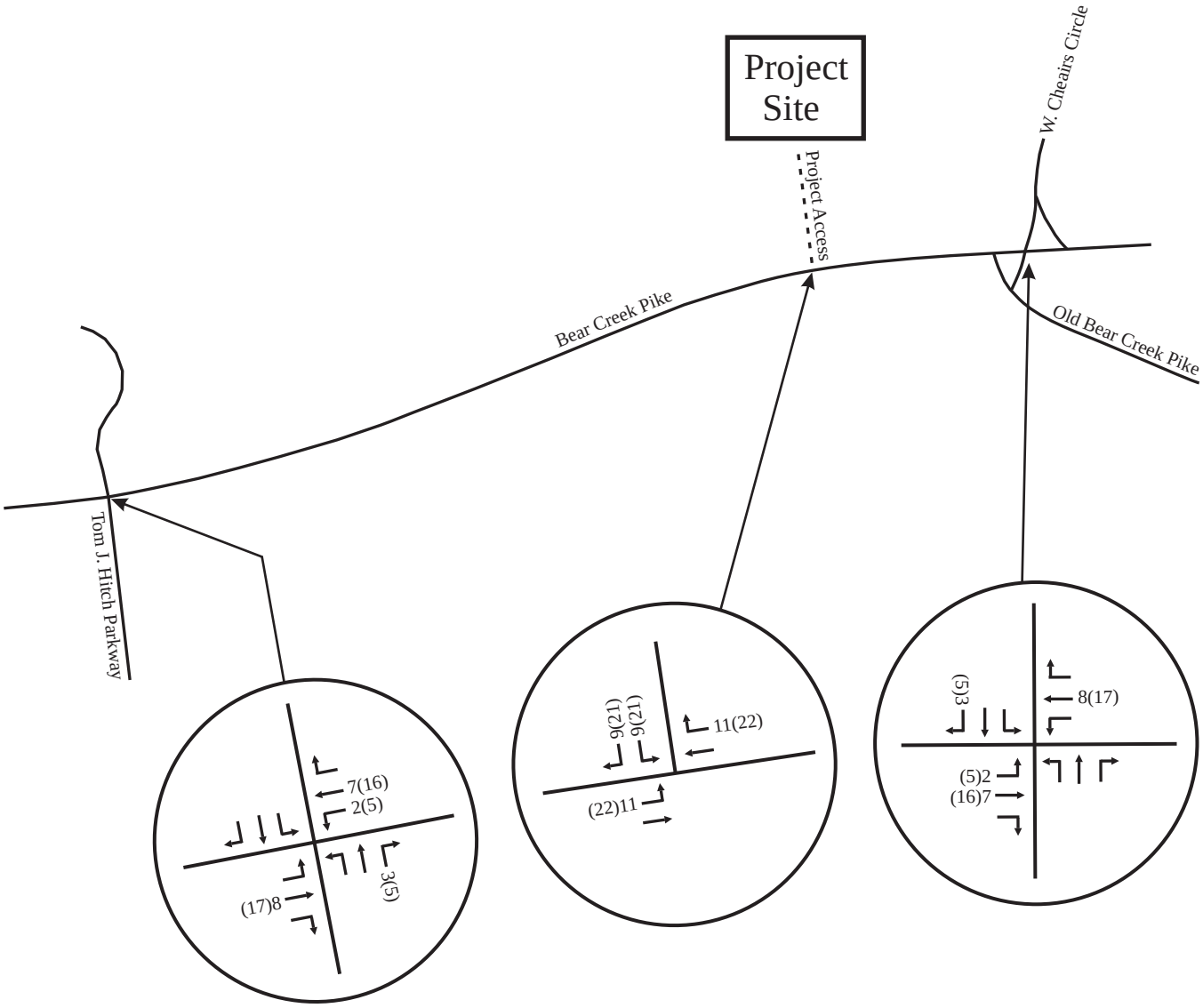


Legend:
XXX - AM Peak Hour Traffic Volumes
(XXX) - PM Peak Hour Traffic Volumes

(Not to Scale)

APPENDIX E
BACKGROUND PROJECT DATA

F i s c h b a c h
Transportation Group, LLC
Traffic Engineering and Planning



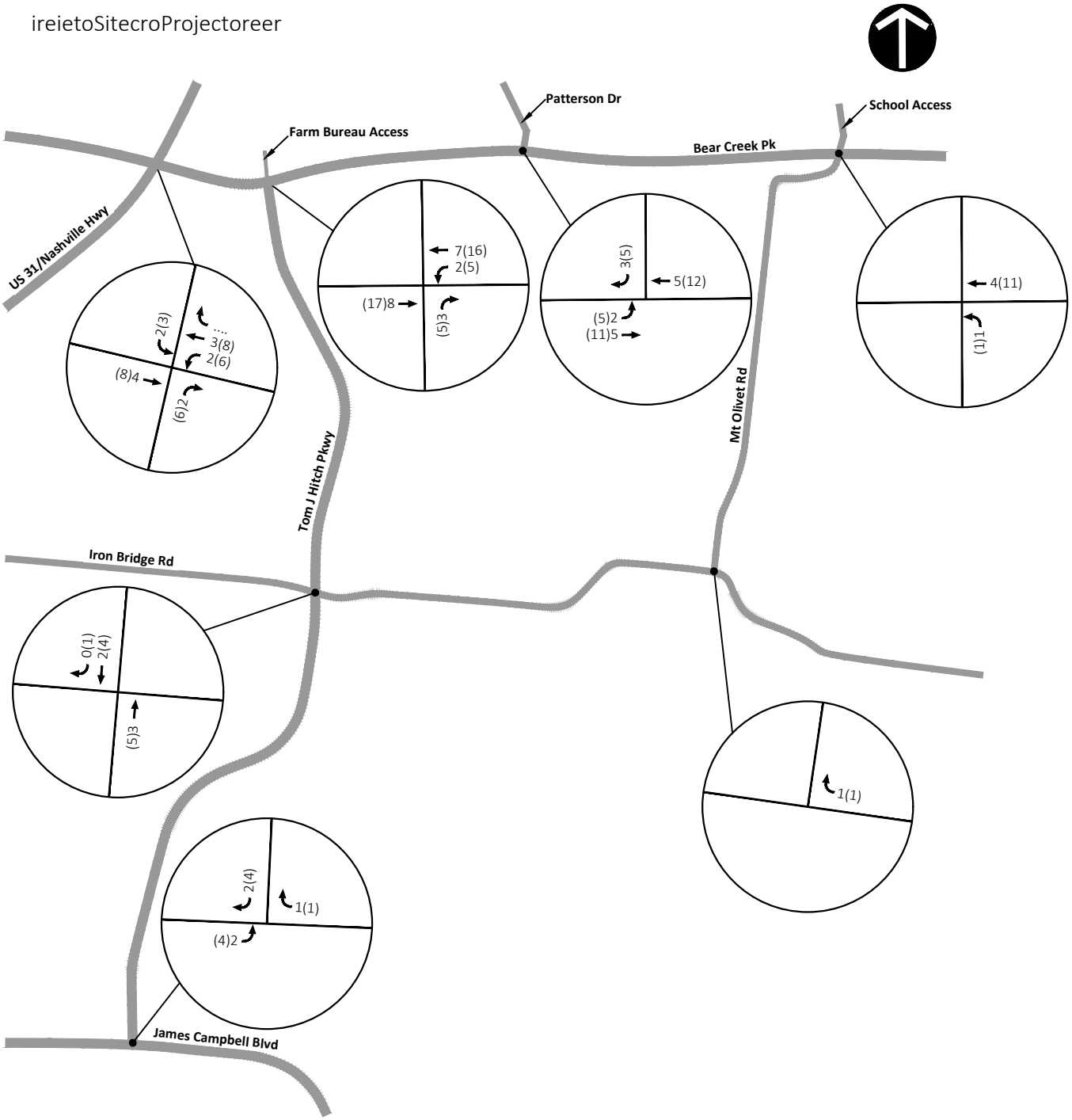
N

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)

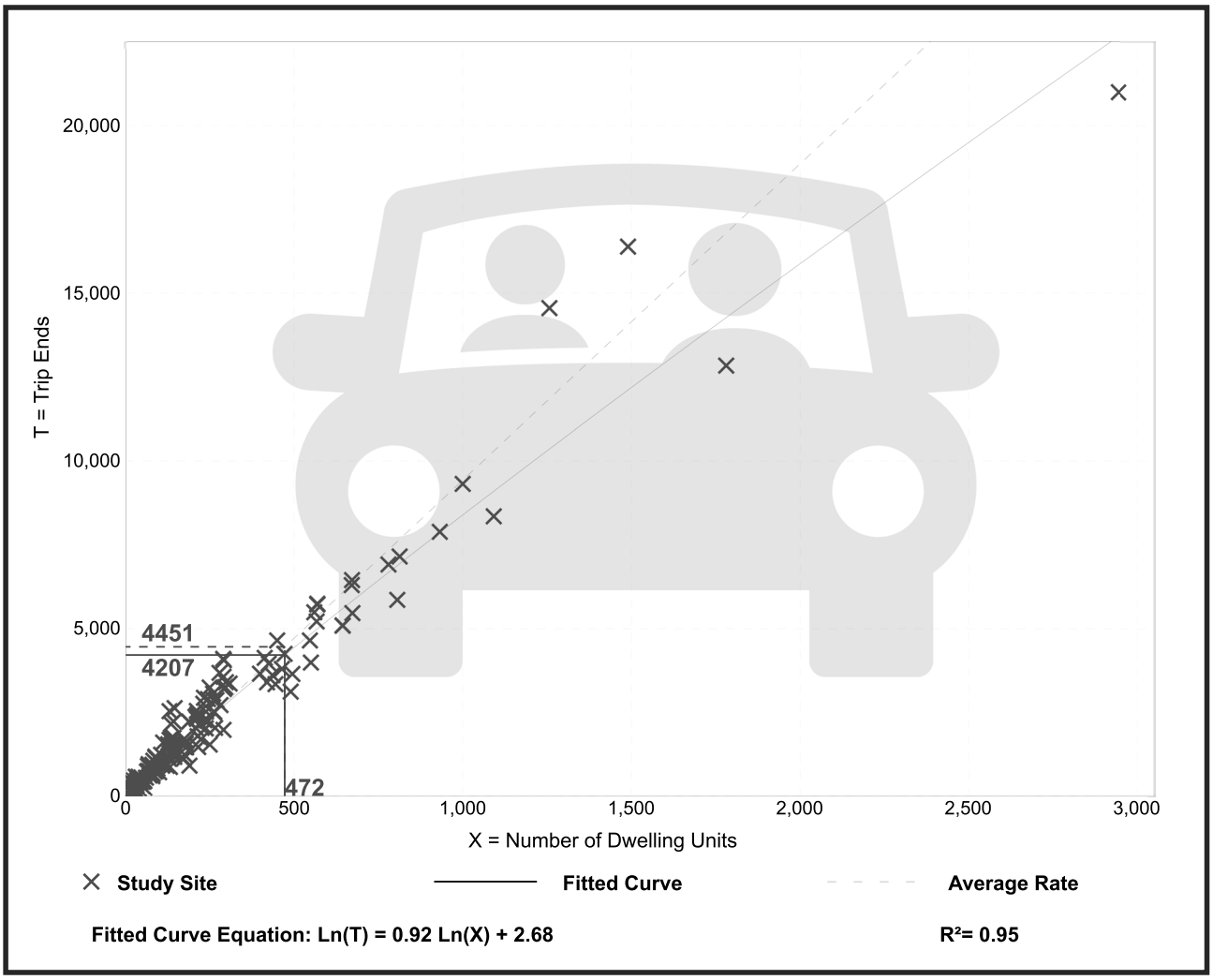
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

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



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

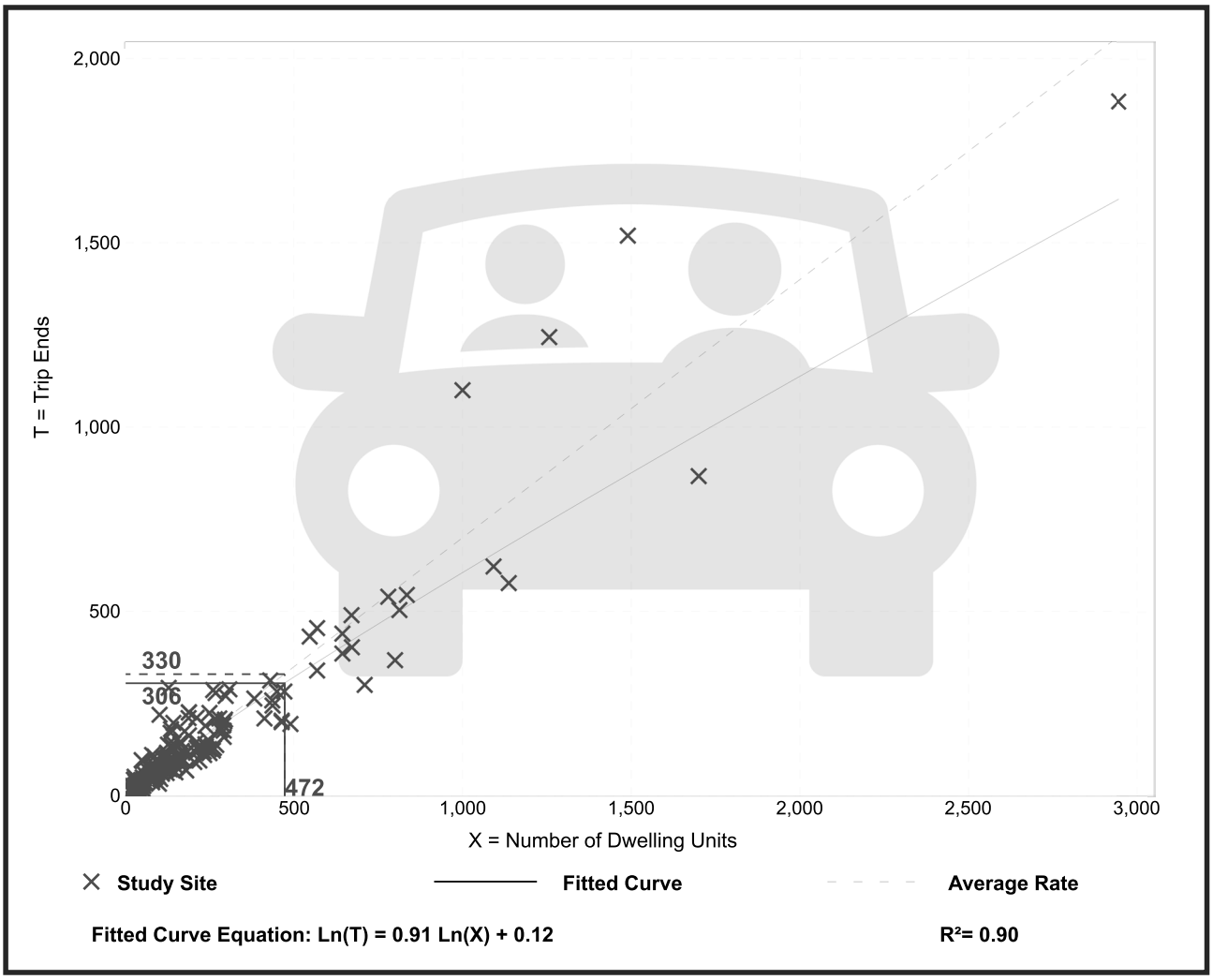
Single-Family Detached Housing
(210)

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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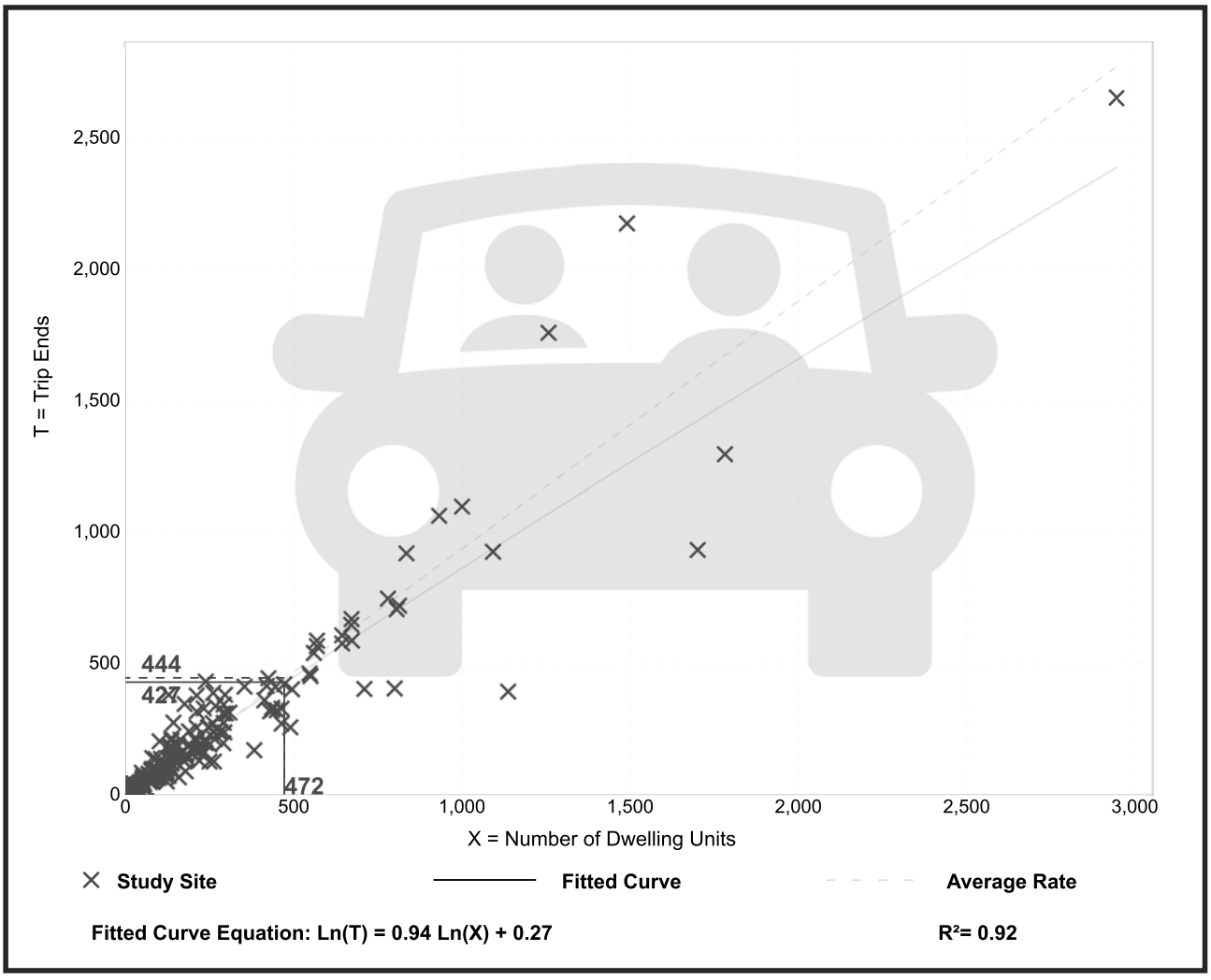
Single-Family Detached Housing
(210)

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)

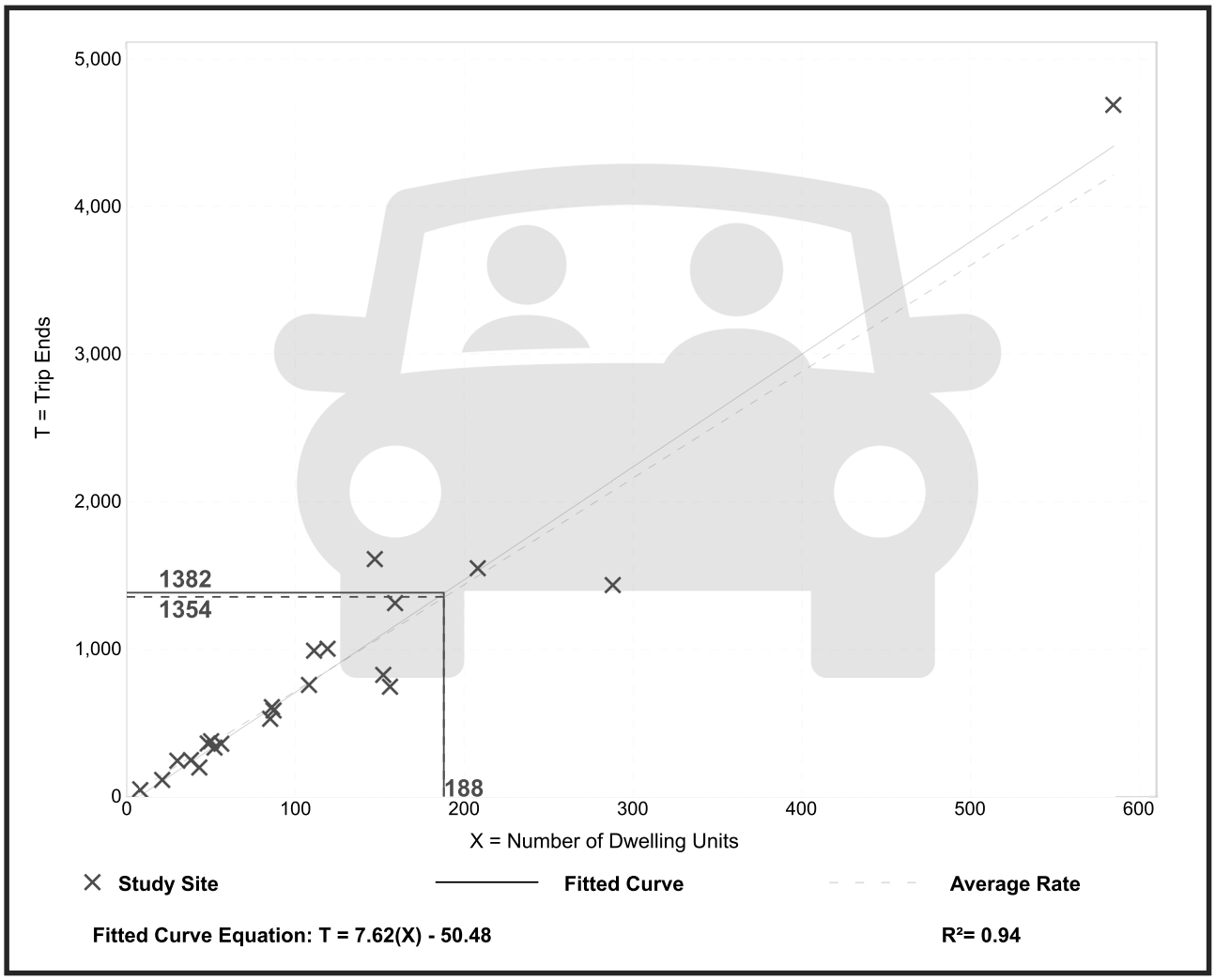
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

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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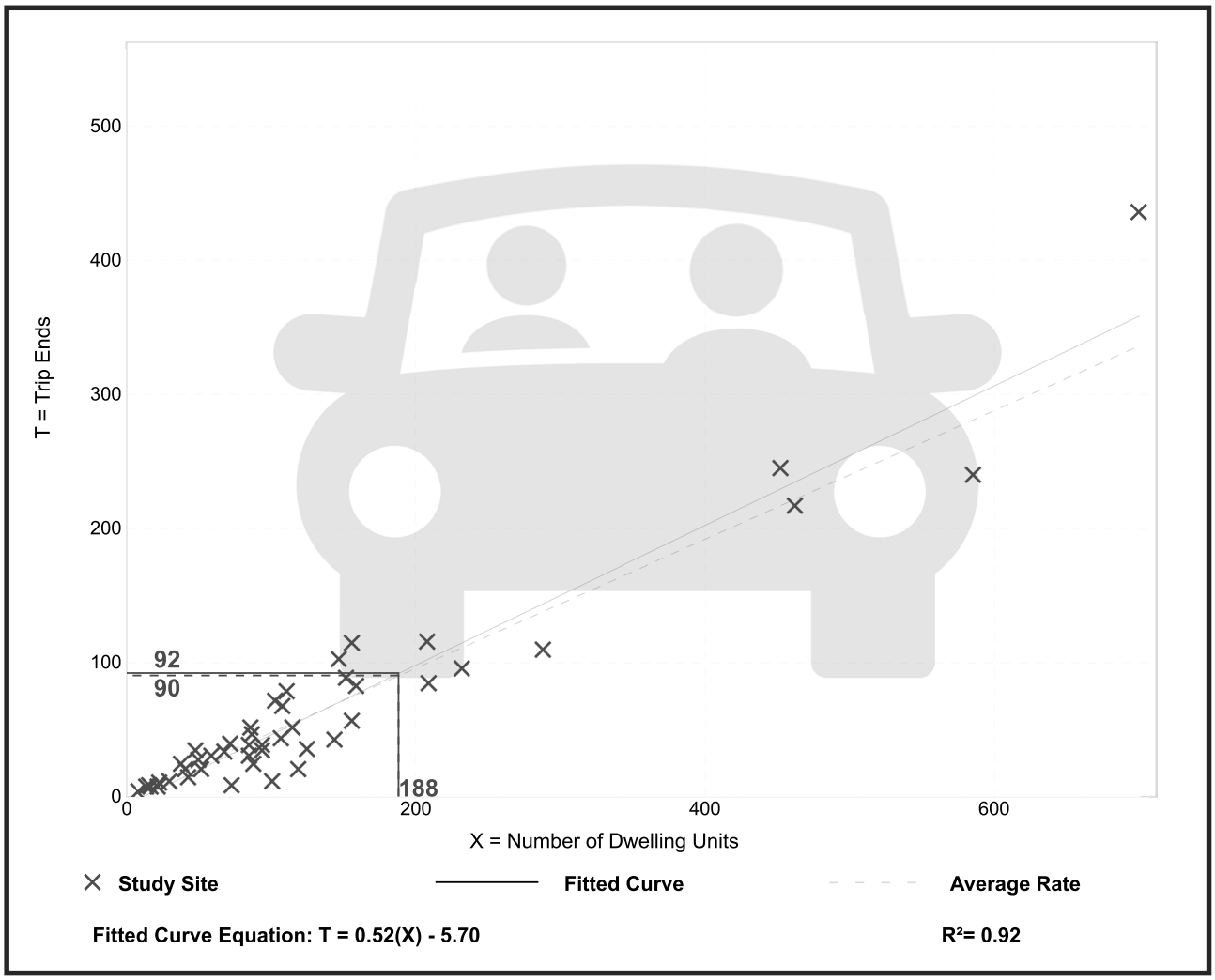
Single-Family Attached Housing
(215)

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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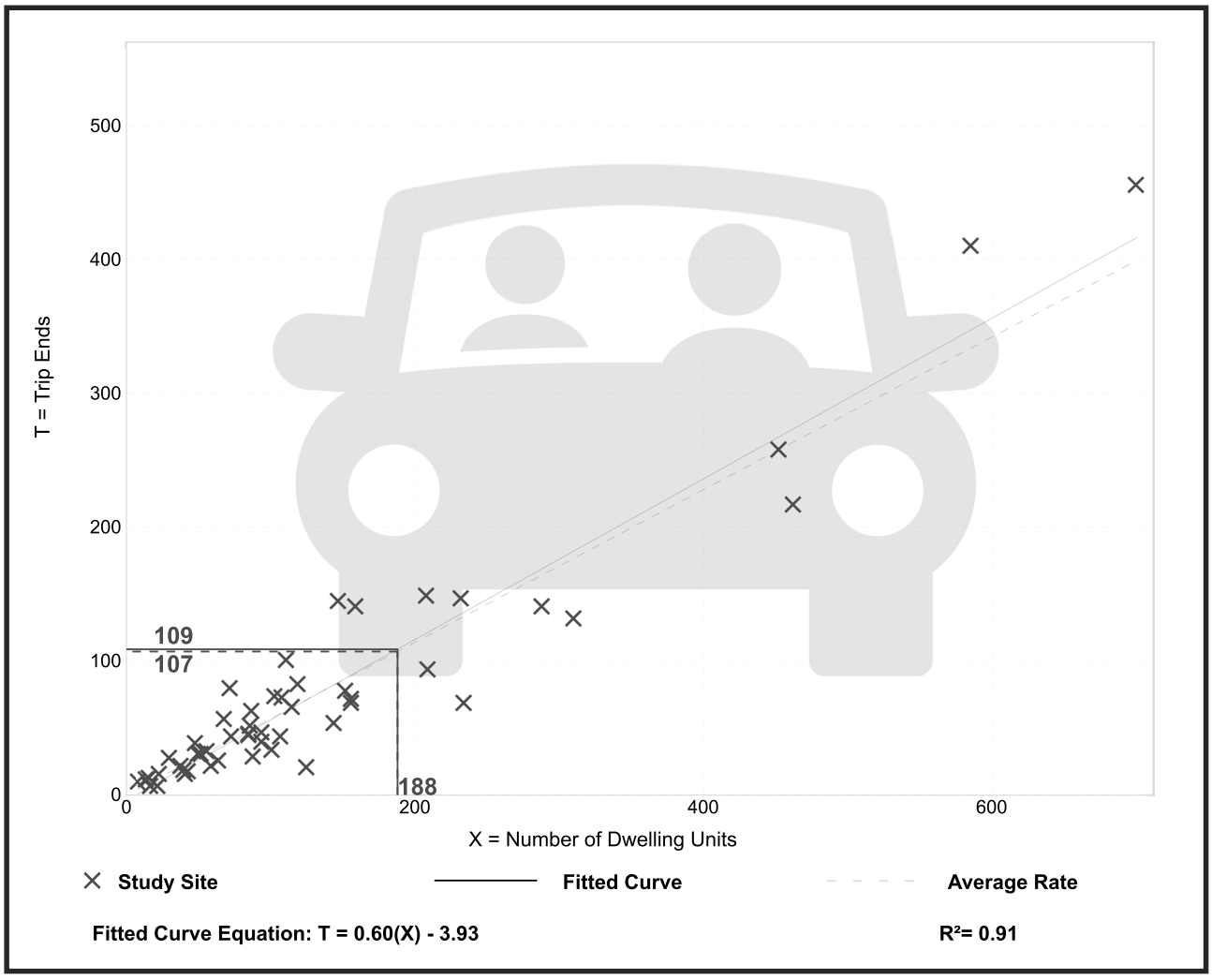
Single-Family Attached Housing
(215)

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)

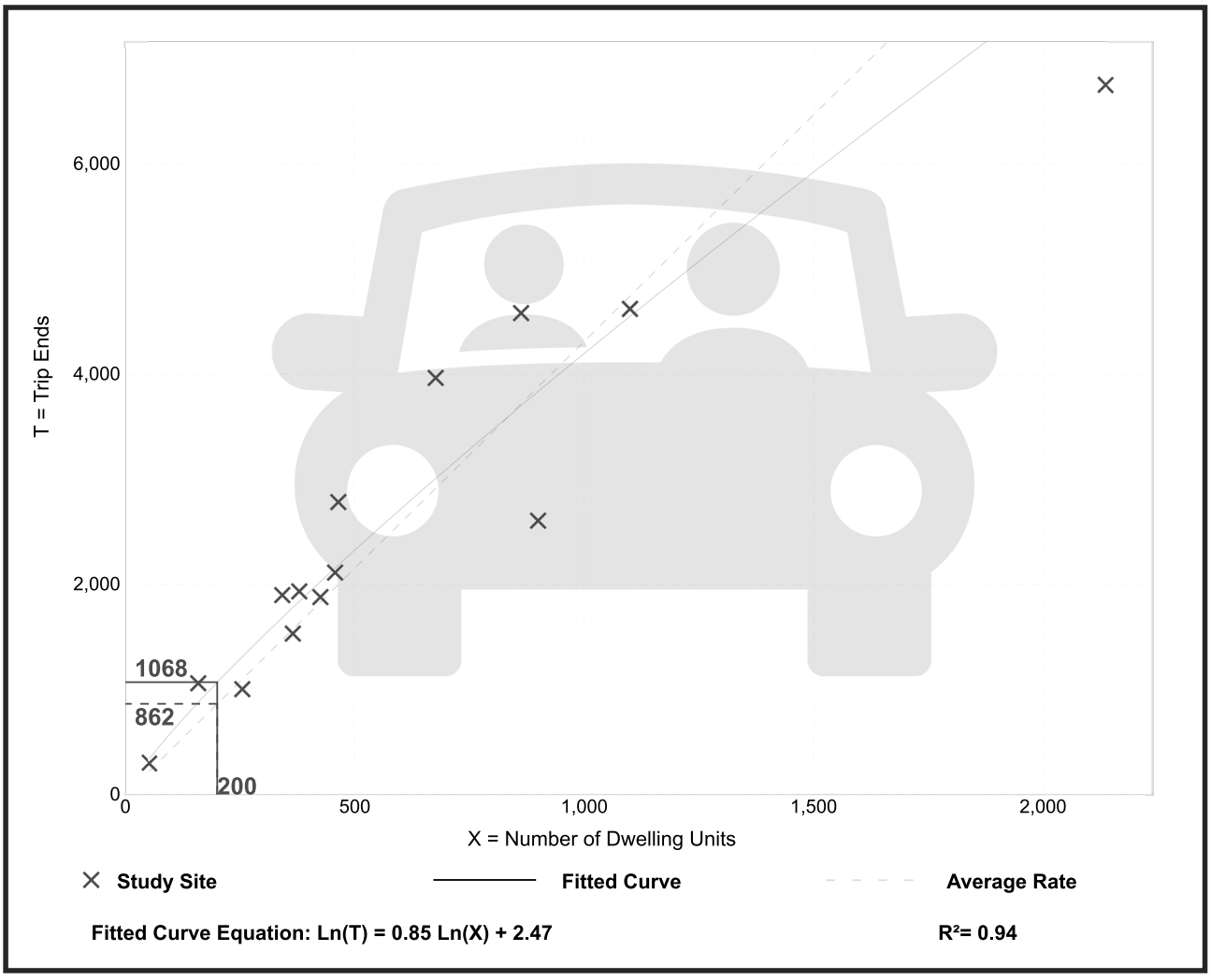
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

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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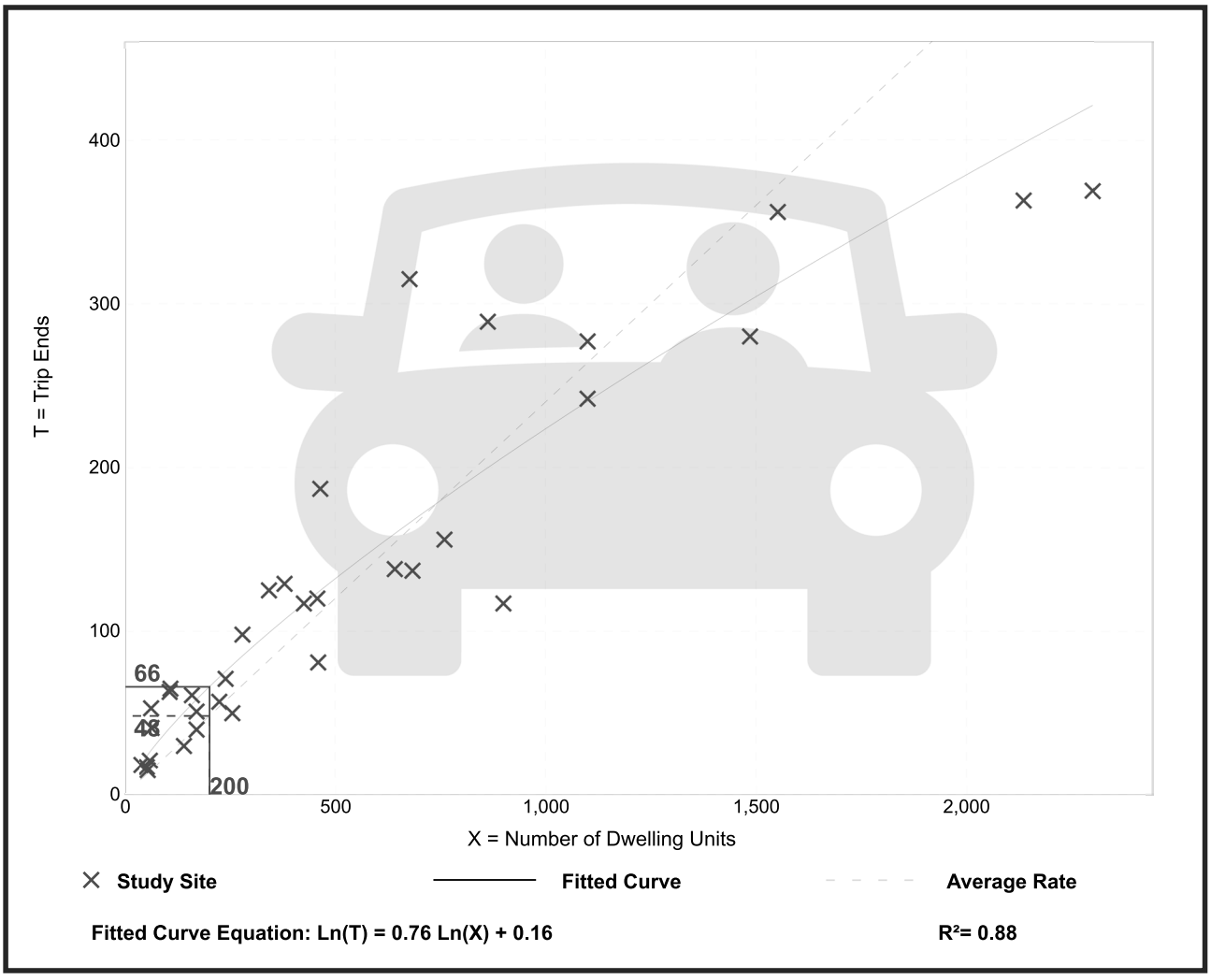
Senior Adult Housing - Single-Family
(251)

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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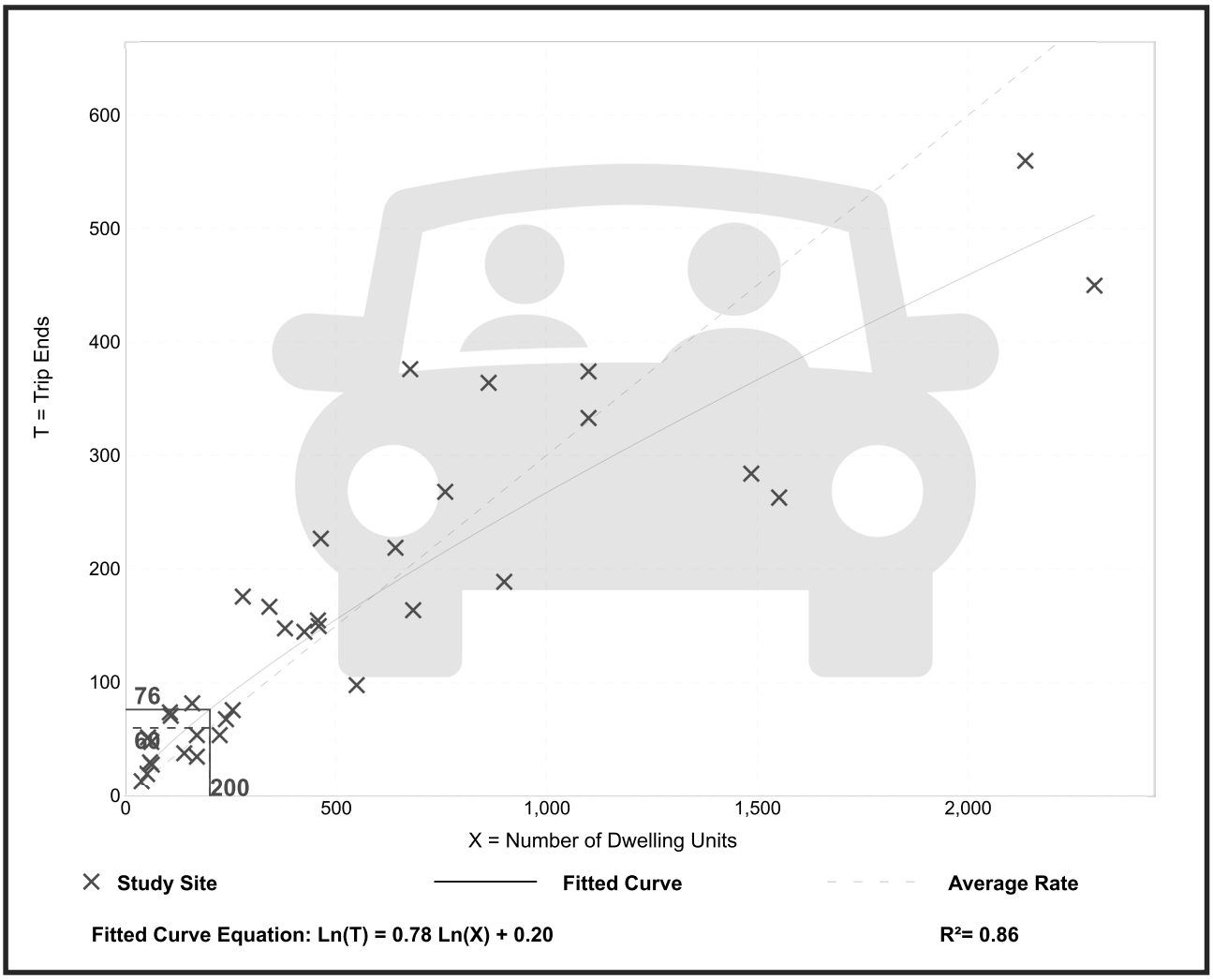
Senior Adult Housing - Single-Family
(251)

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



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Single-Family Detached Housing
(210)

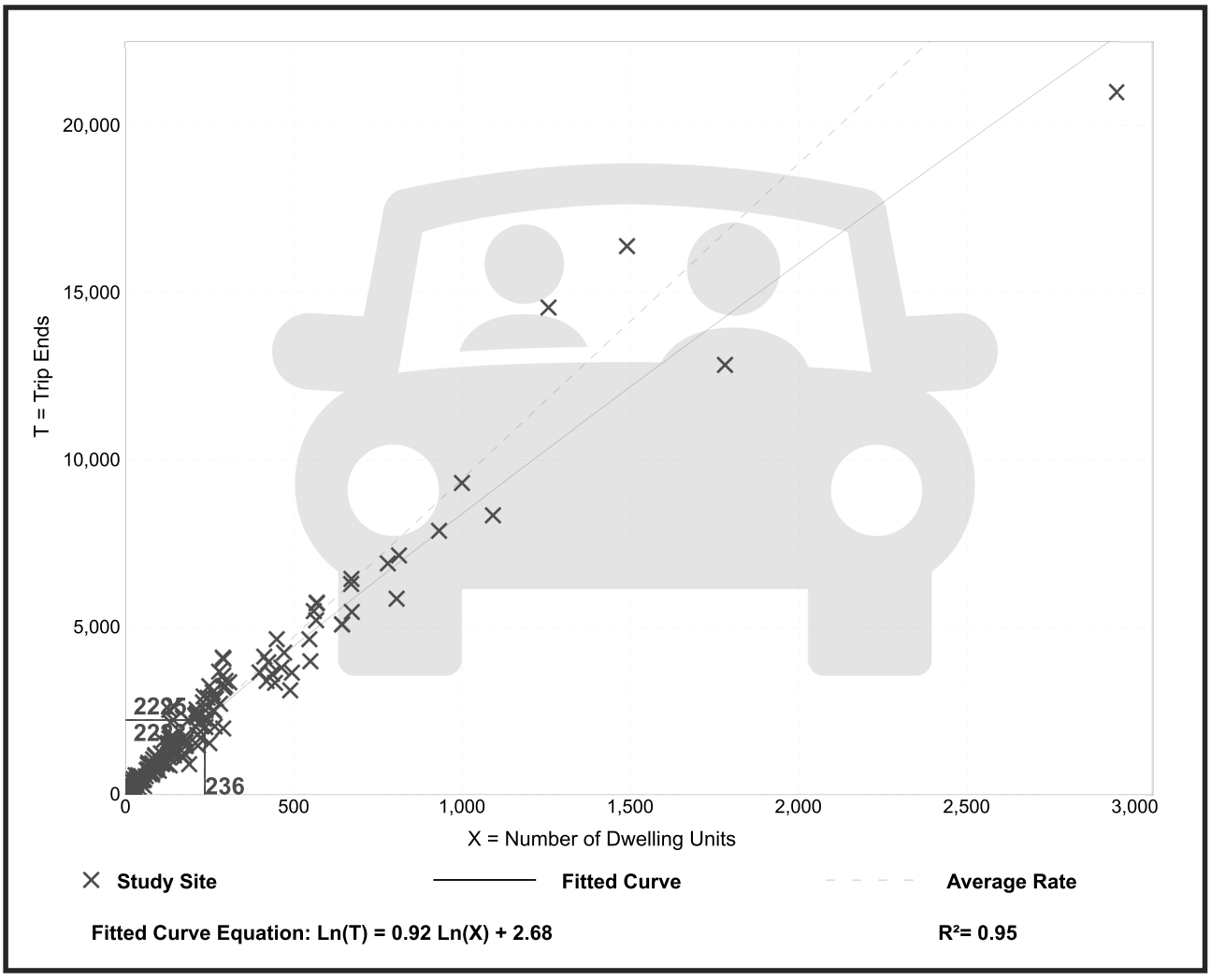
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

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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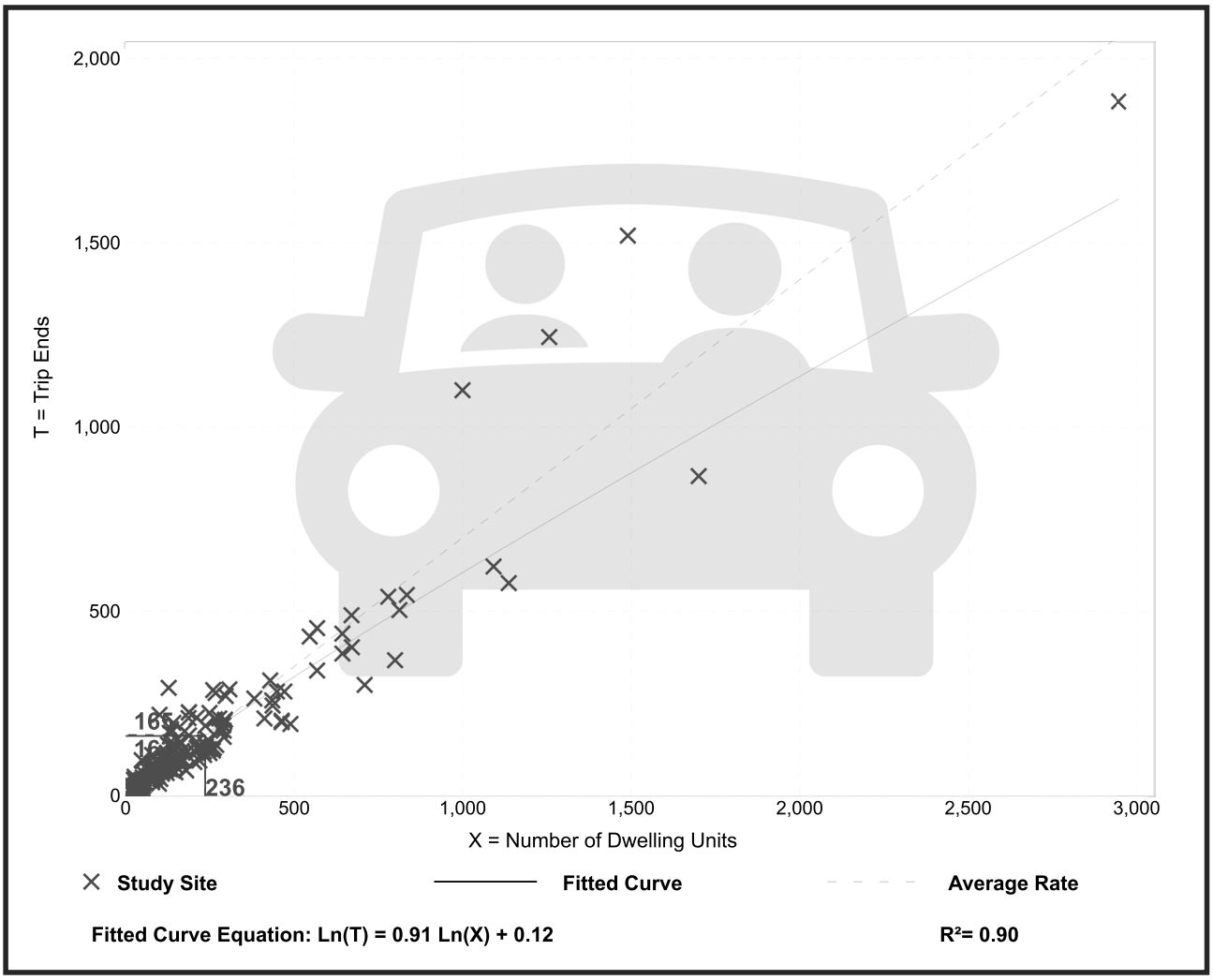
Single-Family Detached Housing
(210)

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



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

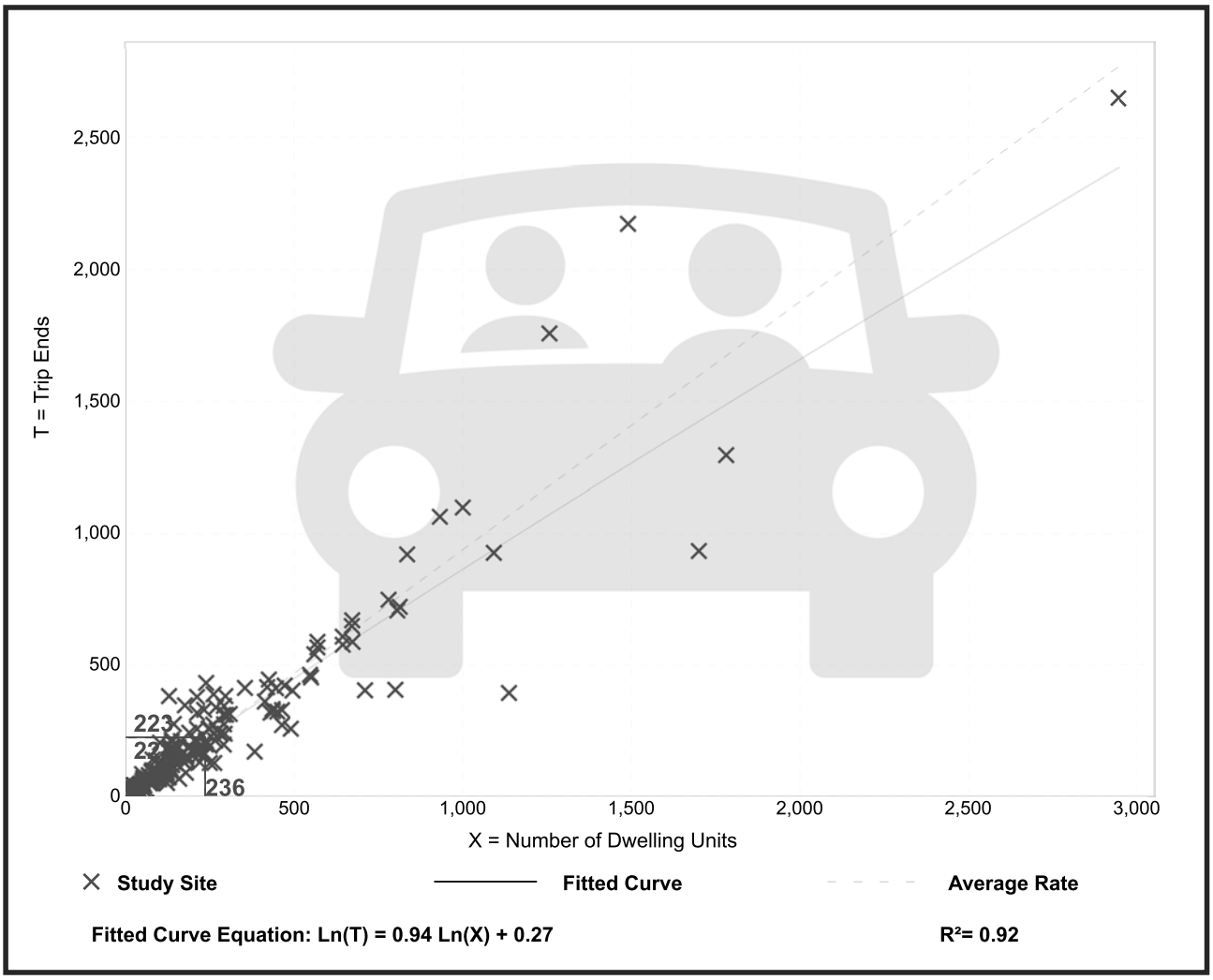
Single-Family Detached Housing
(210)

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)

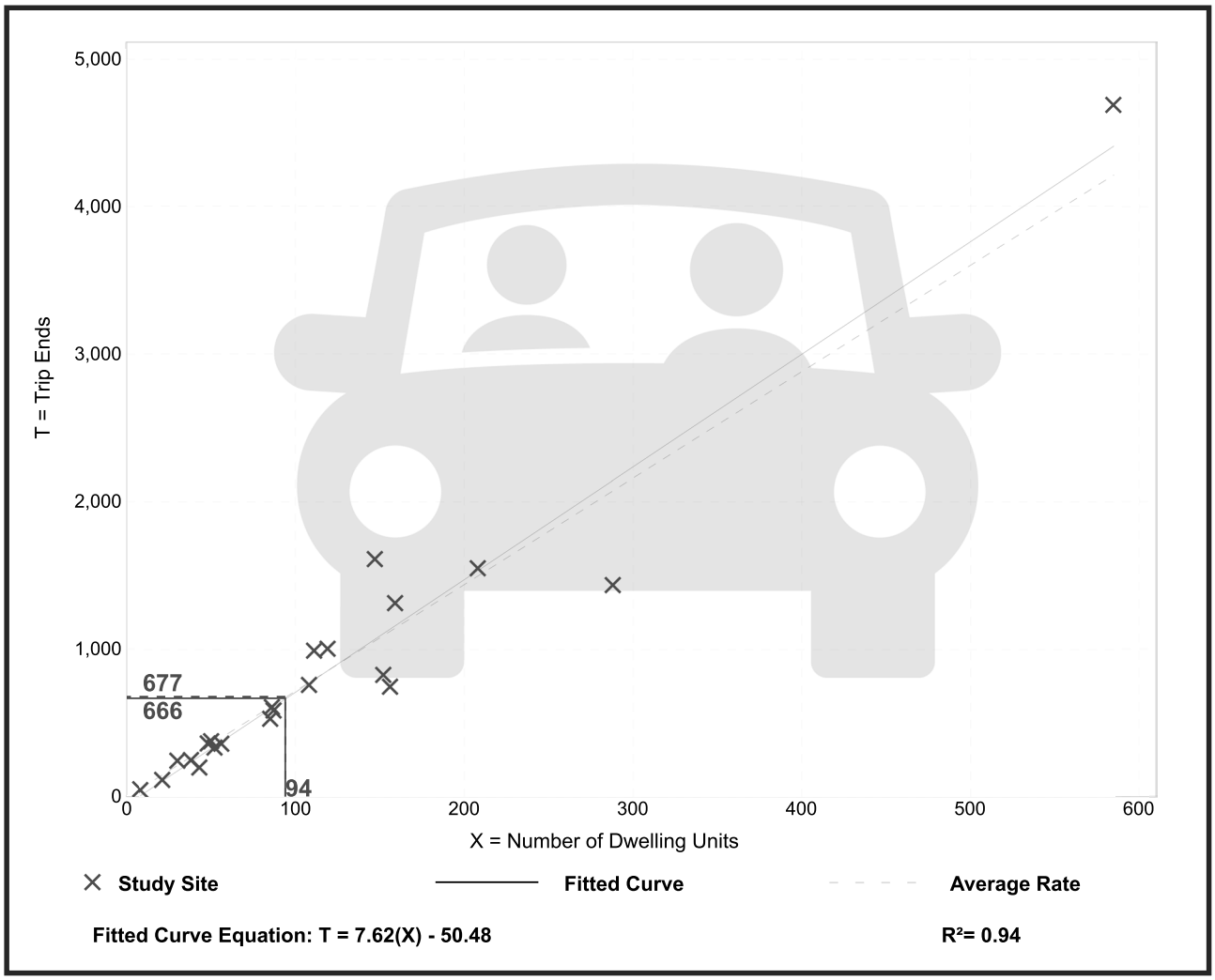
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

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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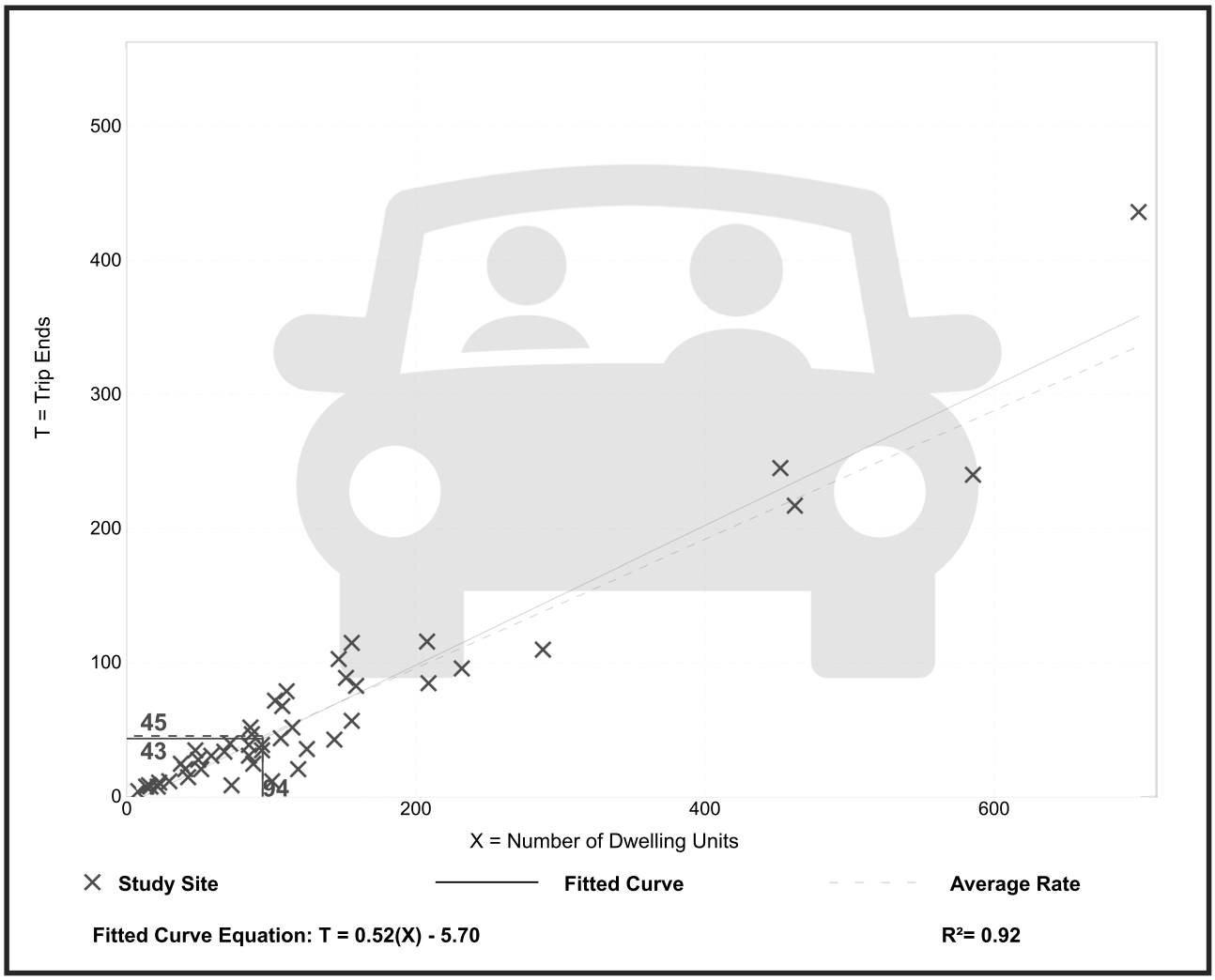
Single-Family Attached Housing
(215)

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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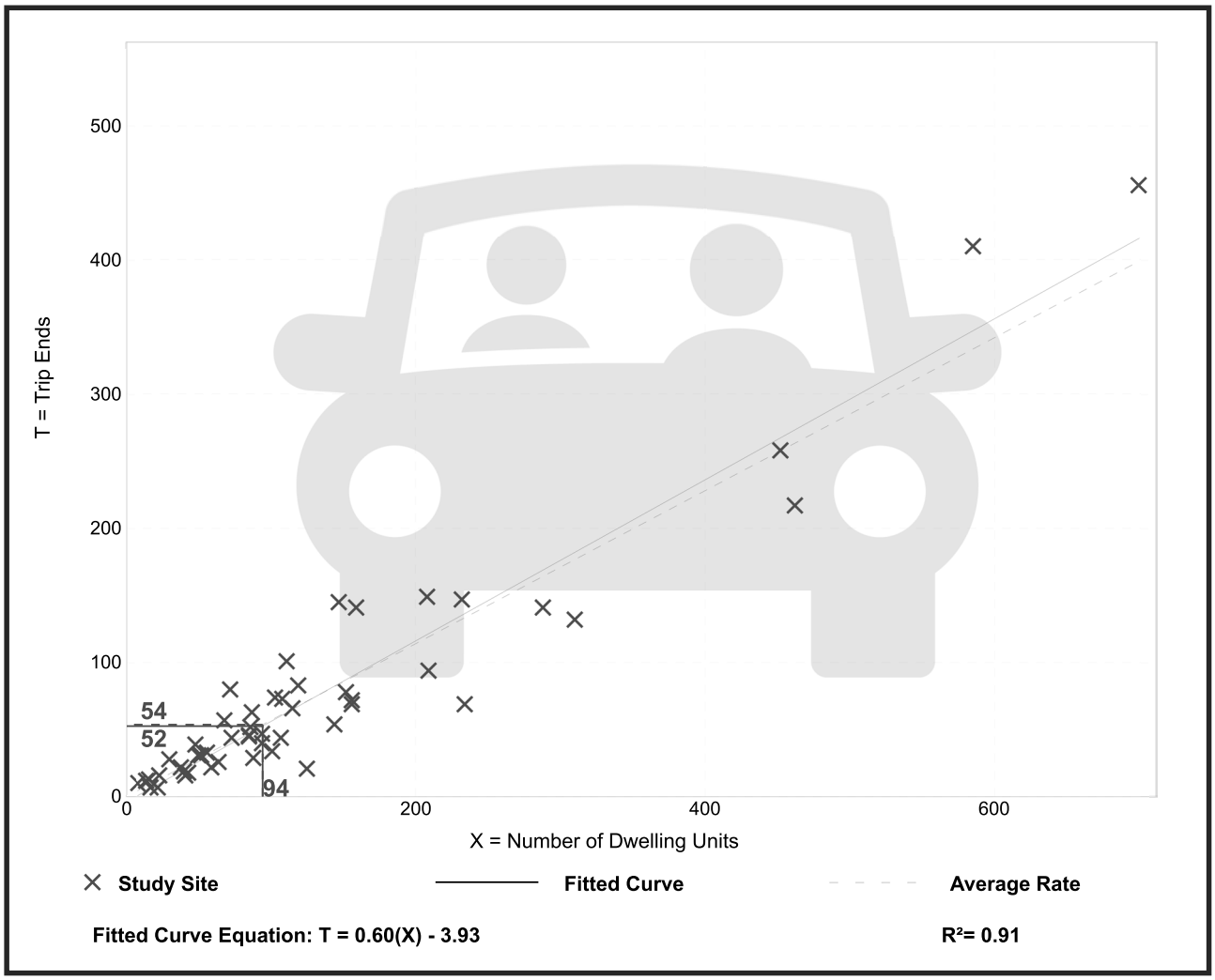
Single-Family Attached Housing
(215)

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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Day Care Center
(565)

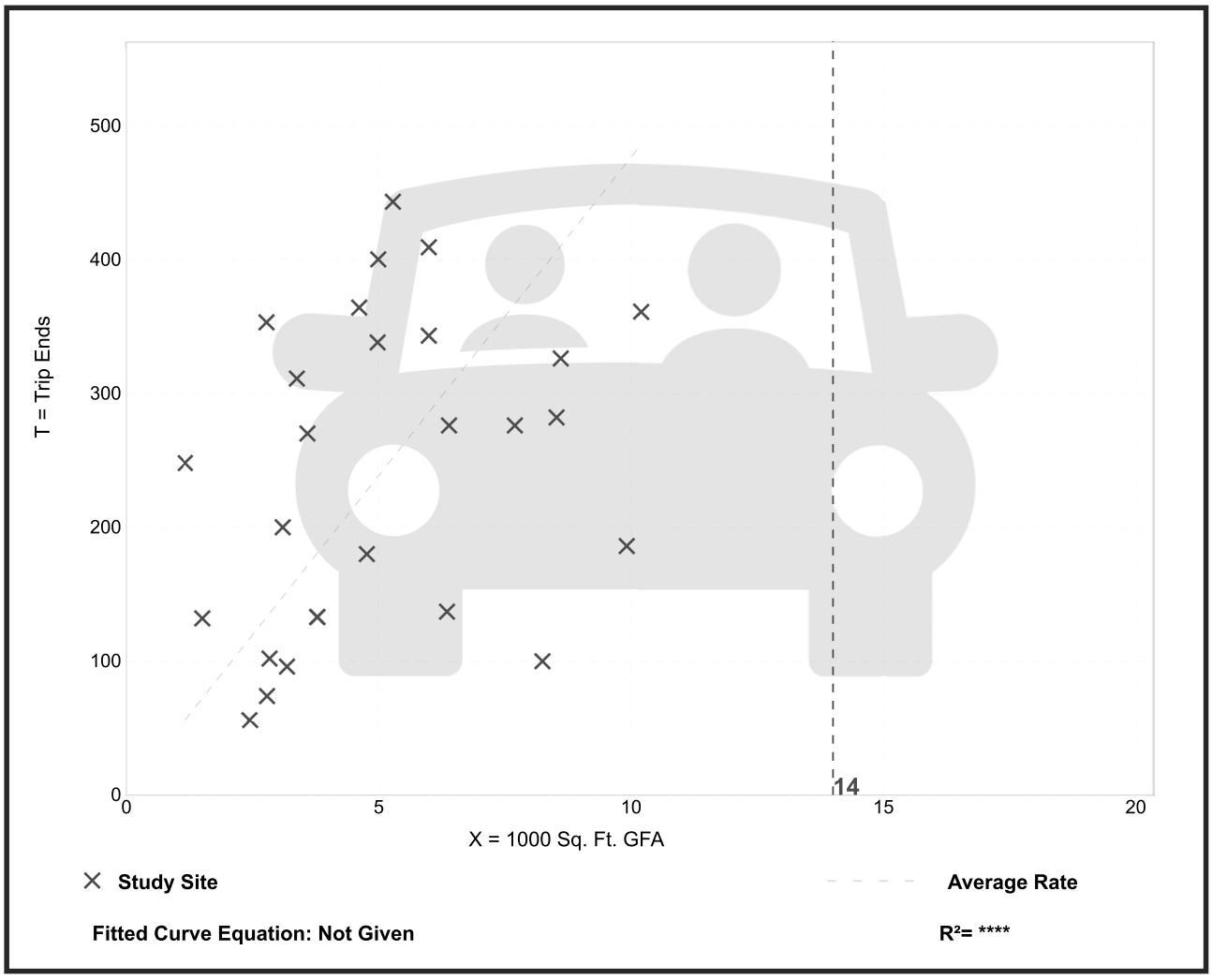
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

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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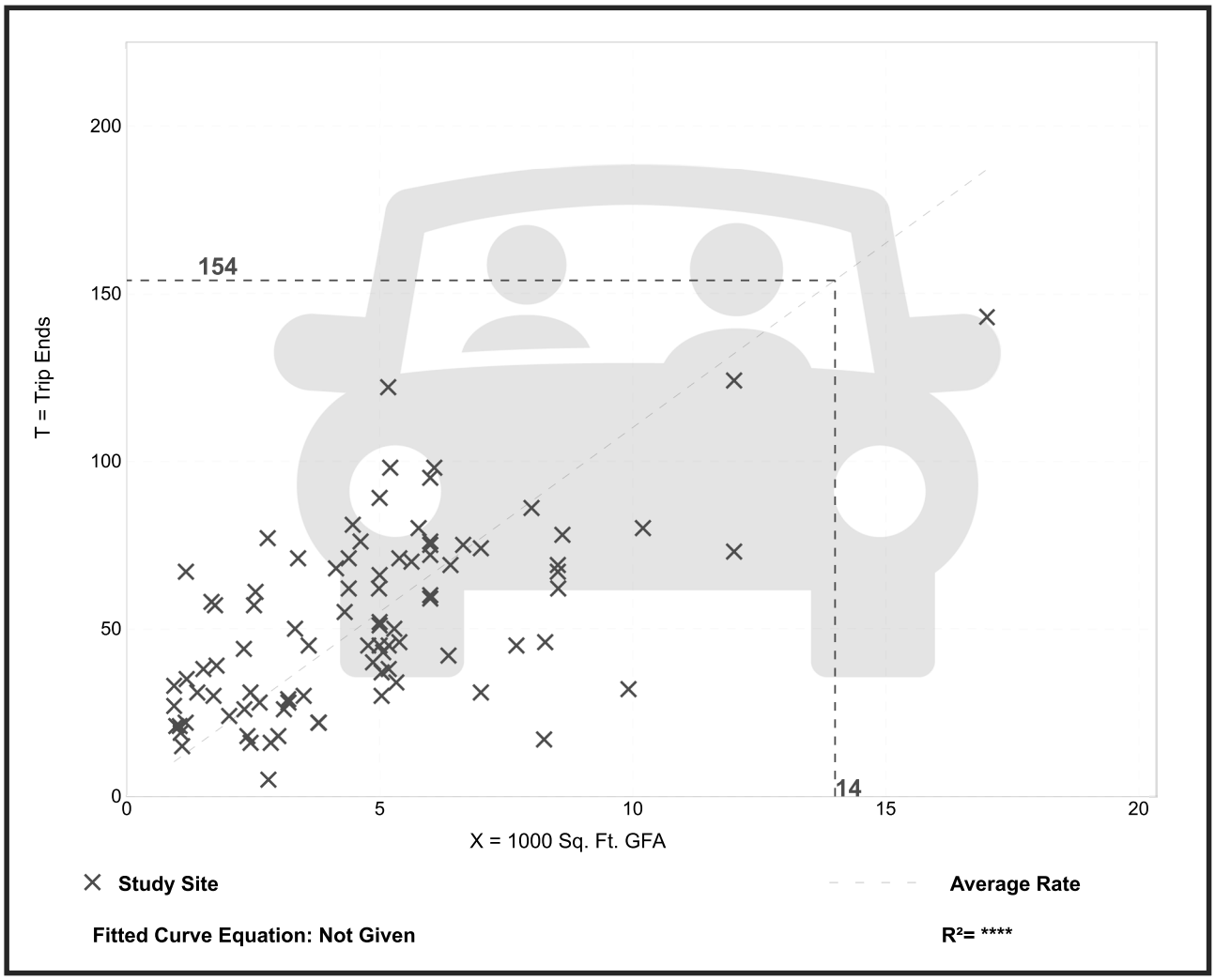
Day Care Center
(565)

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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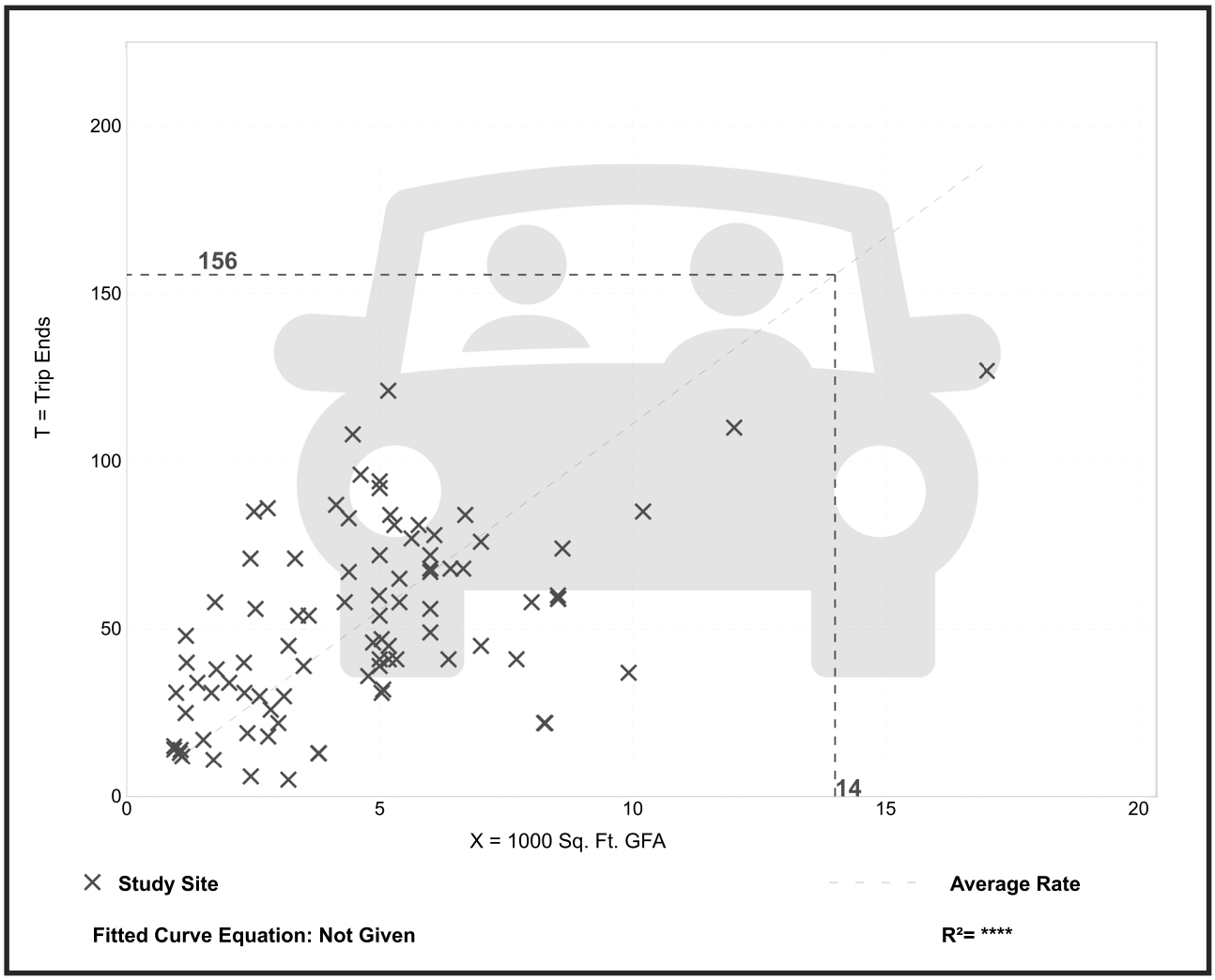
Day Care Center
(565)

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



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Senior Adult Housing - Single-Family
(251)

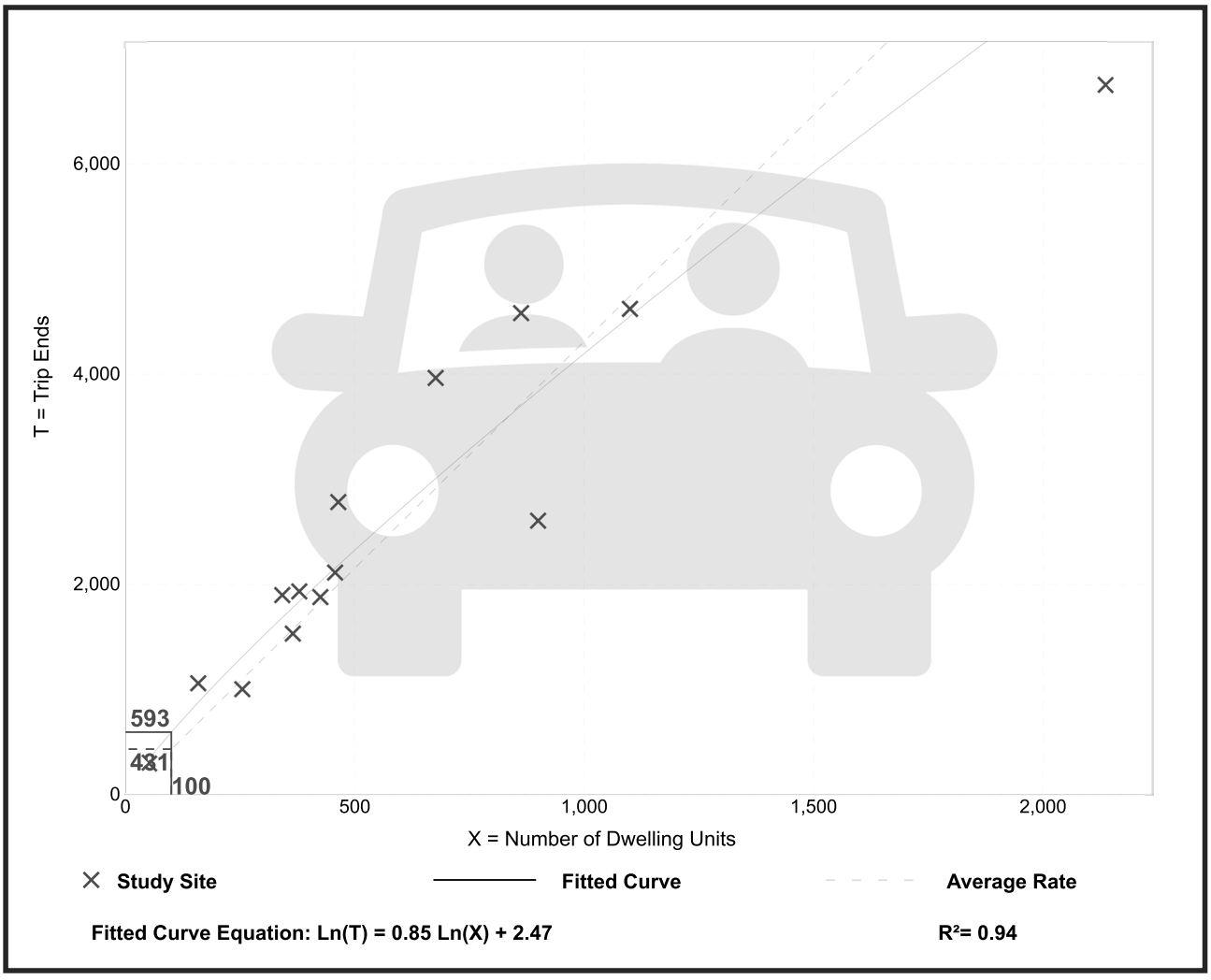
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

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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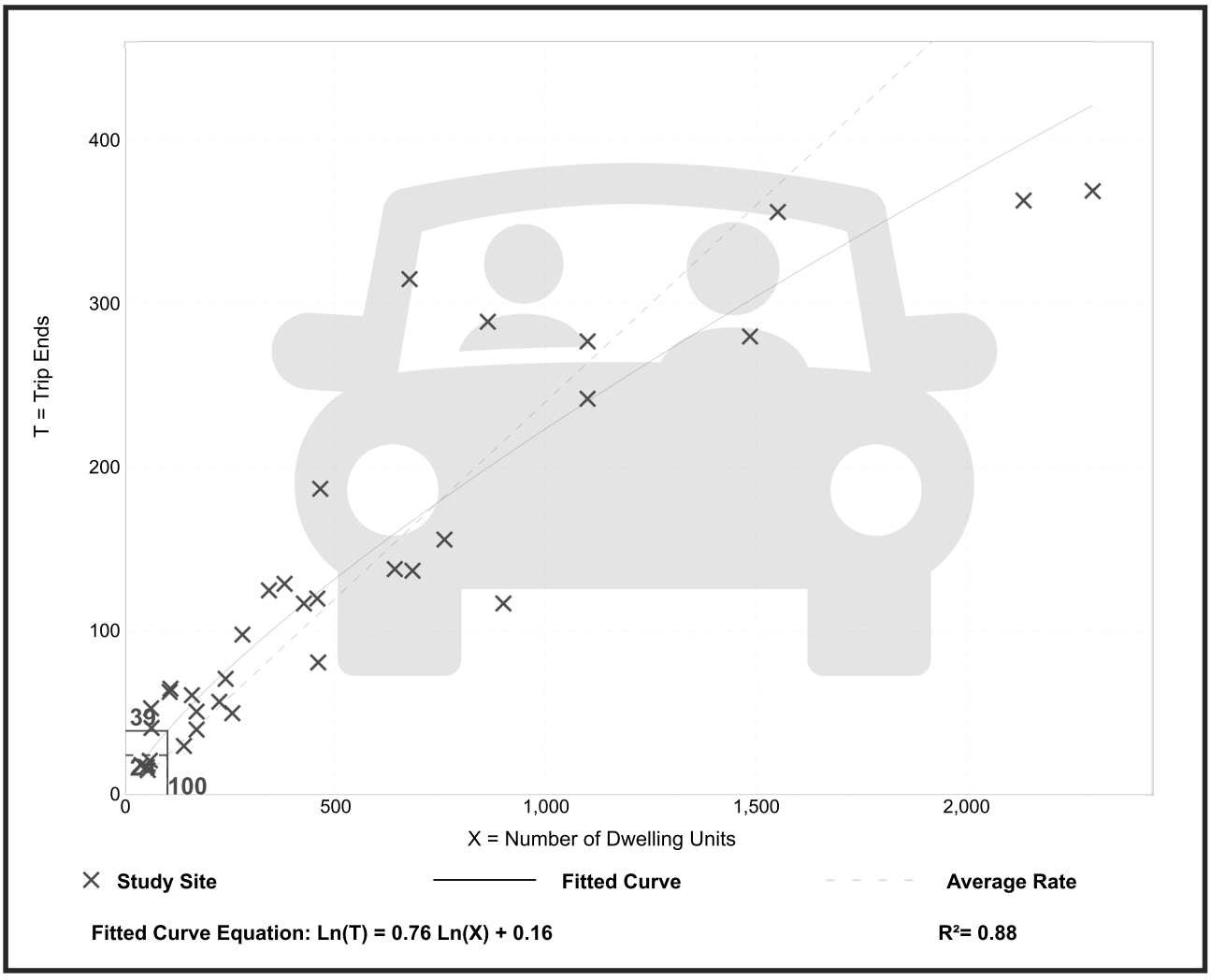
Senior Adult Housing - Single-Family
(251)

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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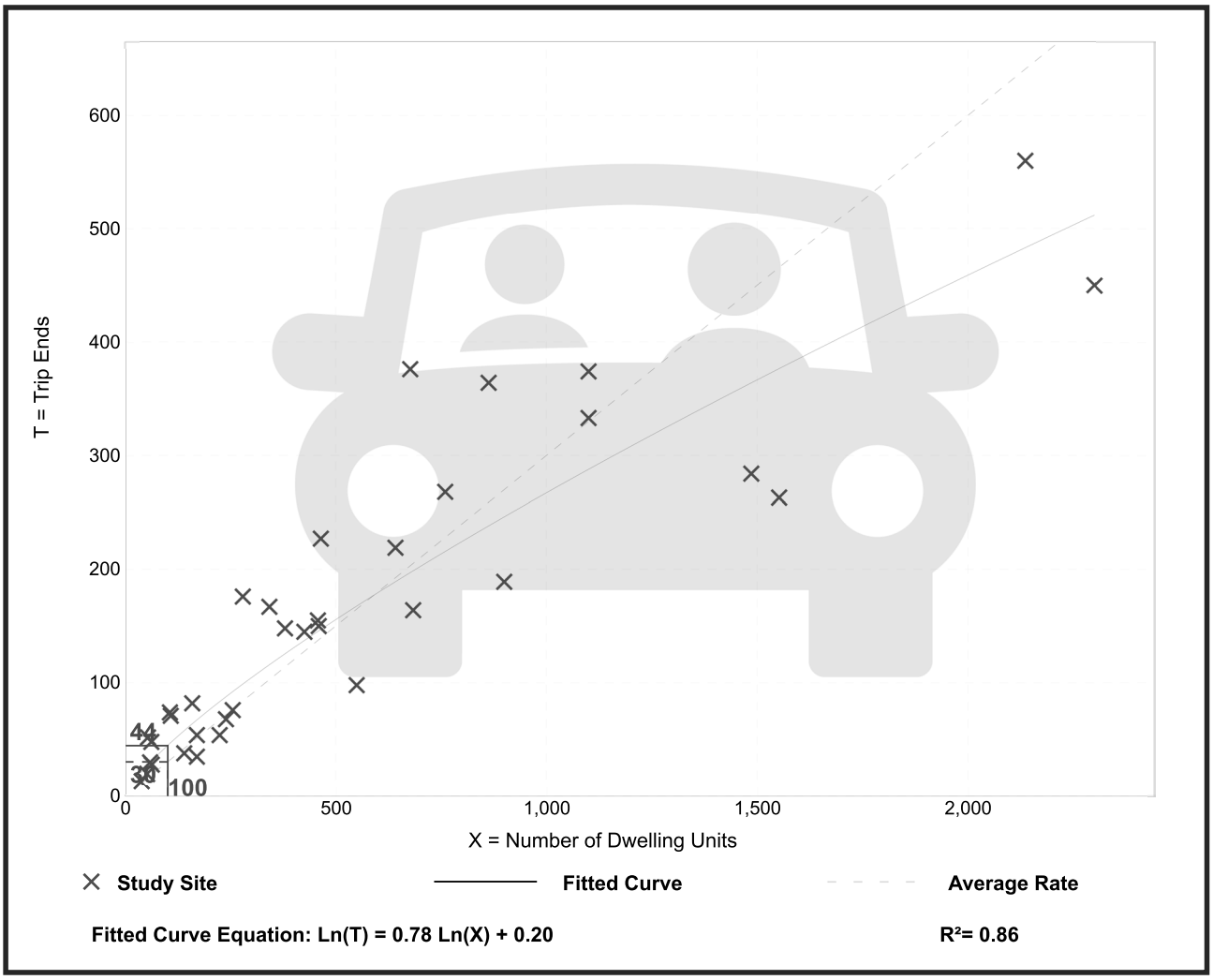
Senior Adult Housing - Single-Family
(251)

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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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.

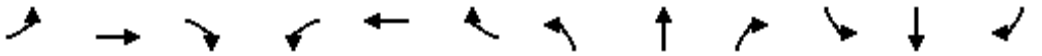
PM PEAK HOUR									
Intersection	Control	Turning Movement	Level of Service (Delay in sec/veh)						
			2023 Existing	2031			2034		
				Background	Projected	Projected w/ Imps	Background	Projected	Projected w/ Imps
Nashville Hwy & US 43/Bear Creek Pk	Signal	EB Left Turn	E (59.7)	E (68.2)	E (68.2)	F (93.3)	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

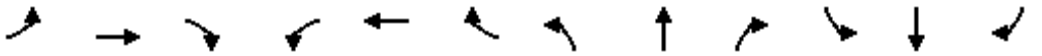
Intersection	
Int Delay, s/veh	1.6

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

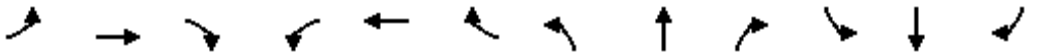
Intersection	
Int Delay, s/veh	6.4

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

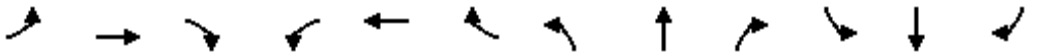
Intersection	
Int Delay, s/veh	0.8

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

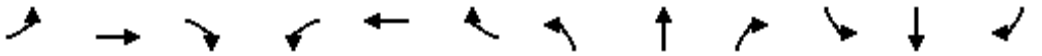
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	321	537	349	45	38	392
Future Vol, veh/h	321	537	349	45	38	392
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	120	0	125
Veh in Median 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

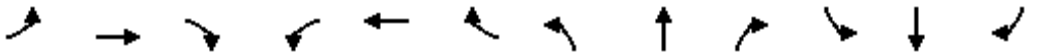
Intersection	
Int Delay, s/veh	5.2

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

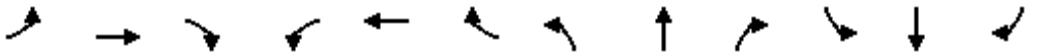
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	390	340	729	135	27	262
Future Vol, veh/h	390	340	729	135	27	262
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	120	0	125
Veh in Median 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

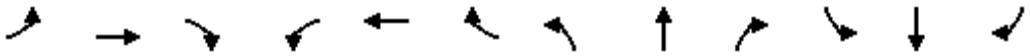
Intersection	
Int Delay, s/veh	1.4

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

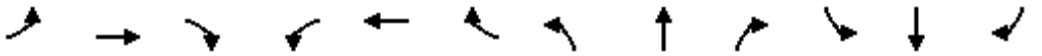
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	522	0	-	0	2026	461
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	1565	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1044	-	-	-	63	600
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

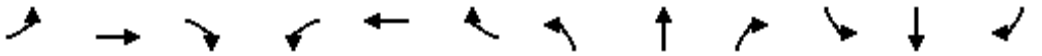
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	412	340	729	135	27	300
Future Vol, veh/h	412	340	729	135	27	300
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	120	0	125
Veh in Median 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

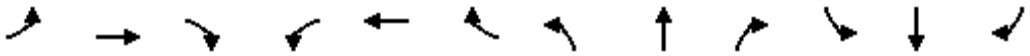
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	58	1118	176	81	1122	19	133	10	61	6	14	50
Future Vol, veh/h	58	1118	176	81	1122	19	133	10	61	6	14	50
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	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

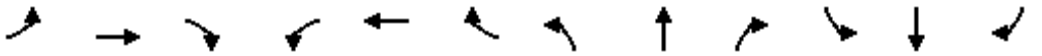
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	522	0	-	0	2112	461
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	1651	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1044	-	-	-	56	600
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

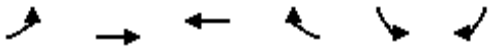
Intersection Summary	
HCM 6th Ctrl Delay	32.3
HCM 6th LOS	C



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

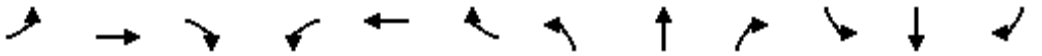
Intersection Summary	
HCM 6th Ctrl Delay	50.6
HCM 6th LOS	D



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

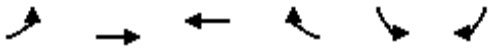
Intersection Summary	
HCM 6th Ctrl Delay	27.5
HCM 6th LOS	C



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

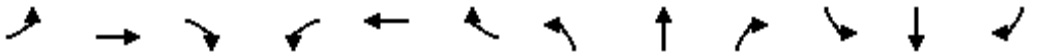


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	443	666	433	57	47	521
Future Volume (veh/h)	443	666	433	57	47	521
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
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



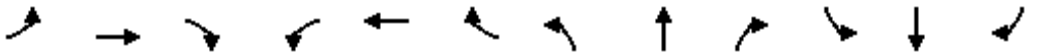
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	793	205	296	1043	34	419	67	276	1	2	2
Future Volume (veh/h)	105	793	205	296	1043	34	419	67	276	1	2	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	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	

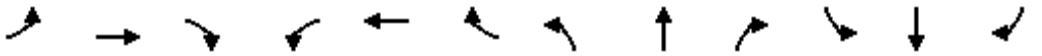
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	33.0	87.2		13.2	8.1	112.1		16.6				
Change Period (Y+Rc), s	6.4	6.9		5.6	6.4	6.9		5.6				
Max Green Setting (Gmax), s	26.6	80.3		7.6	5.0	101.9		11.0				
Max Q Clear Time (g_c+I1), s	28.6	82.3		7.8	2.4	63.9		13.0				
Green Ext Time (p_c), 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

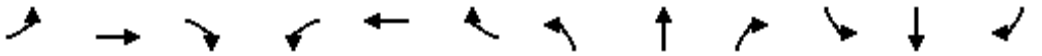
Intersection	
Int Delay, s/veh	9.6

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

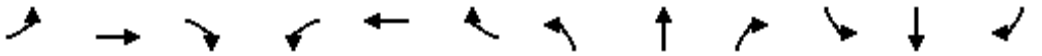
Intersection	
Int Delay, s/veh	0

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

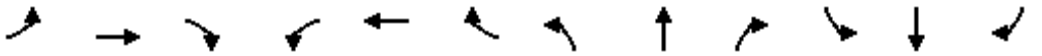
Intersection	
Int Delay, s/veh	1.9

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

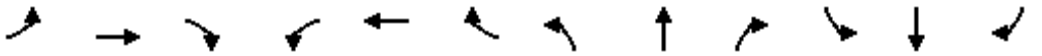
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	143	113	0	0	0
Future Vol, veh/h	0	143	113	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	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

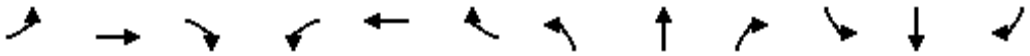
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	1004	85	54	1197	11	178	22	111	23	10	63
Future Vol, veh/h	18	1004	85	54	1197	11	178	22	111	23	10	63
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	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

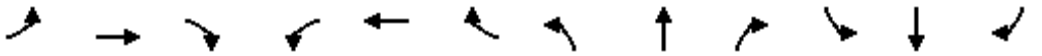
Intersection	
Int Delay, s/veh	3.1

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

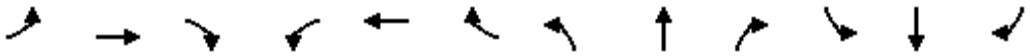
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	62	1199	180	113	1202	20	125	16	80	7	23	53
Future Vol, veh/h	62	1199	180	113	1202	20	125	16	80	7	23	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	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

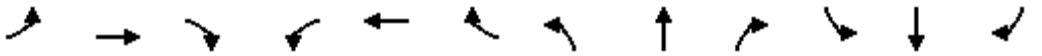
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	113	190	150	23	16	79
Future Vol, veh/h	113	190	150	23	16	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	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	13.6	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

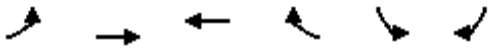
Intersection Summary	
HCM 6th Ctrl Delay	46.9
HCM 6th LOS	D



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

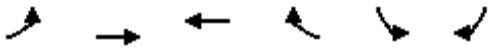
Intersection Summary	
HCM 6th Ctrl Delay	36.3
HCM 6th LOS	D



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



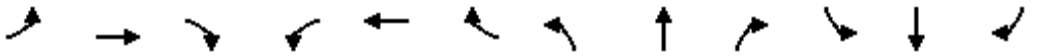
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	499	714	464	61	51	572
Future Volume (veh/h)	499	714	464	61	51	572
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
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

BURCH TRANSPORTATION



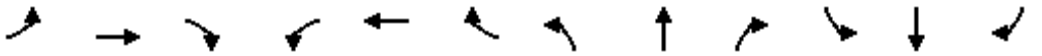
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	863	230	264	1175	34	472	67	265	1	2	2
Future Volume (veh/h)	105	863	230	264	1175	34	472	67	265	1	2	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	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

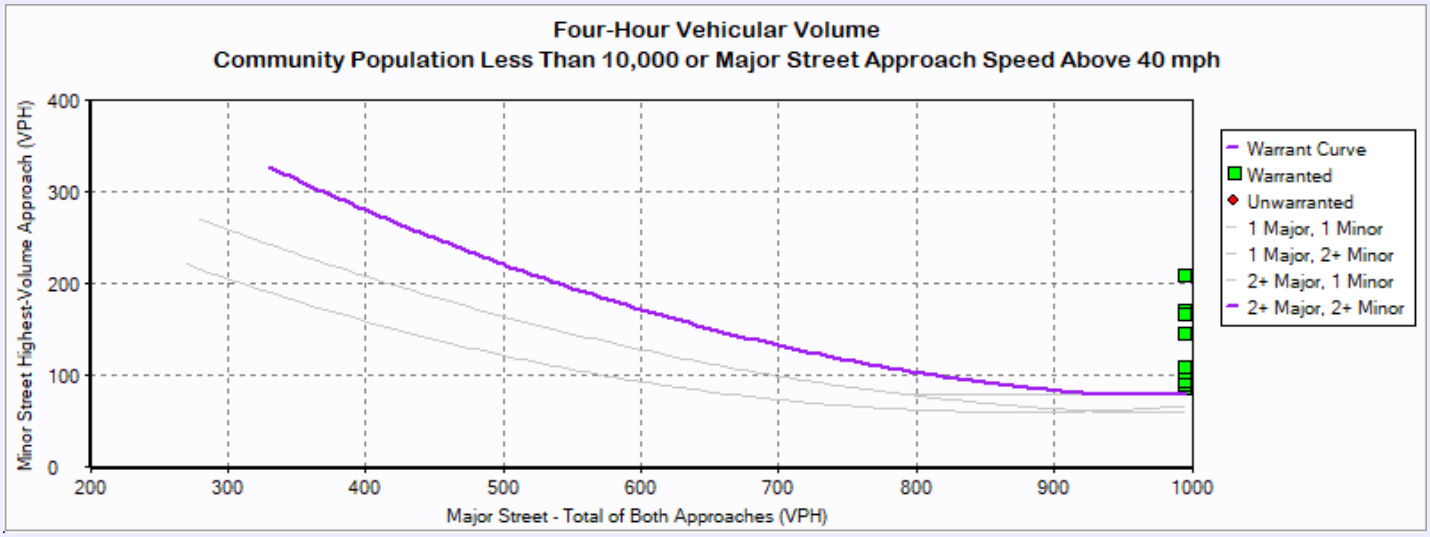
Intersection Informatior

	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

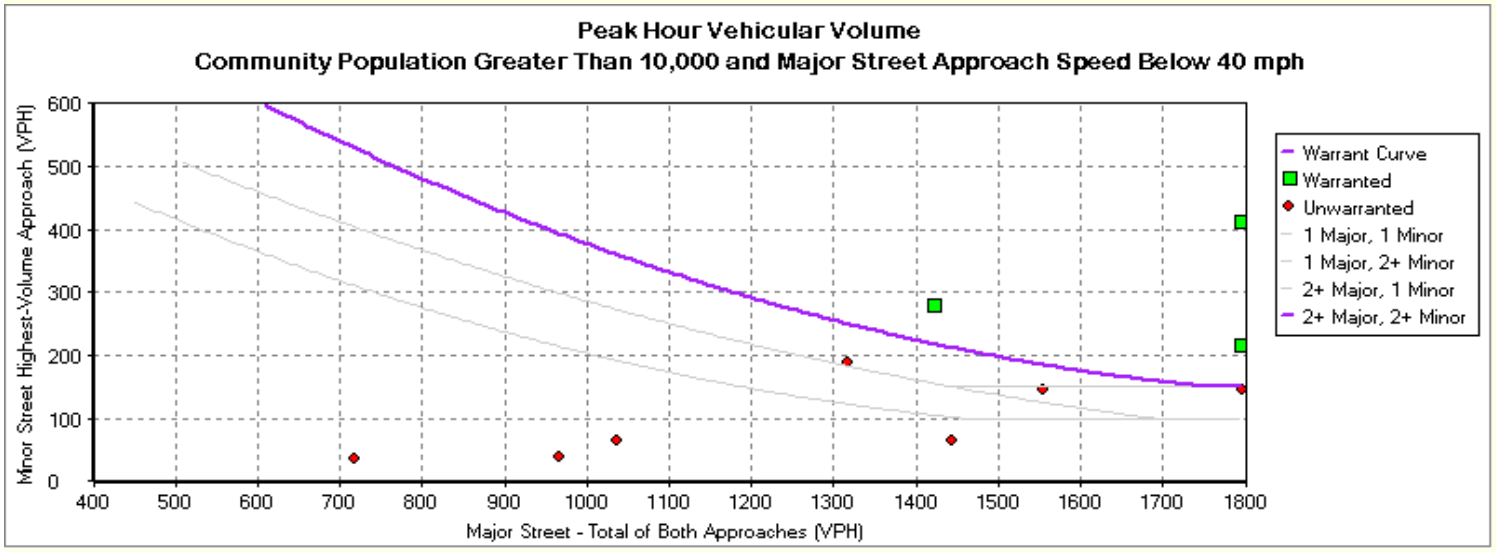
	Major Street	Minor Street
Street Name	Bear Creek Pk	Patterson Dr
Direction	EB/WB	NB/SB
Number of Lane:	2	2
Approch Speed	45	25

Warrant 3 Met? **Yes**

Details

Low Population?	No		
Condition A Met	No	**Condition B Met**	Yes
Notes	0 Hours met (1 required)	**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	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	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.

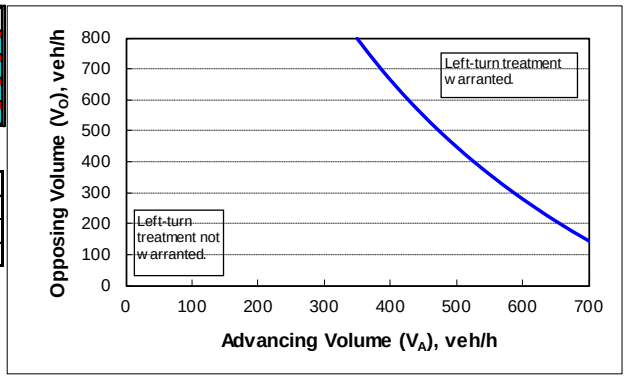
2-lane roadway (English)

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.

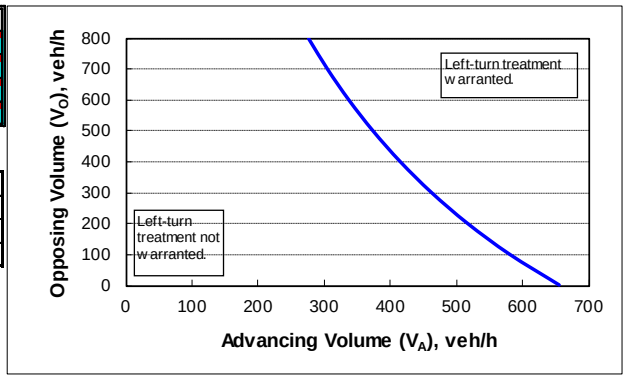
2-lane roadway (English)

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.

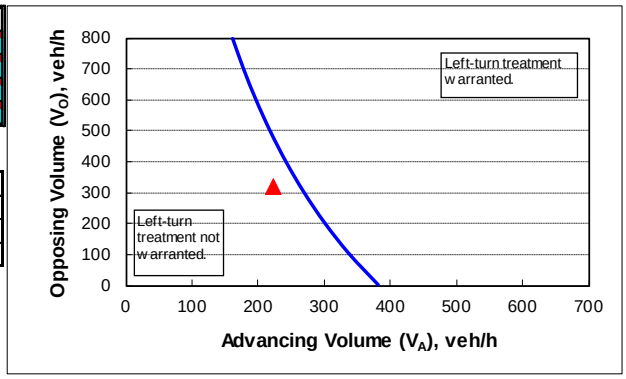
2-lane roadway (English)

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.

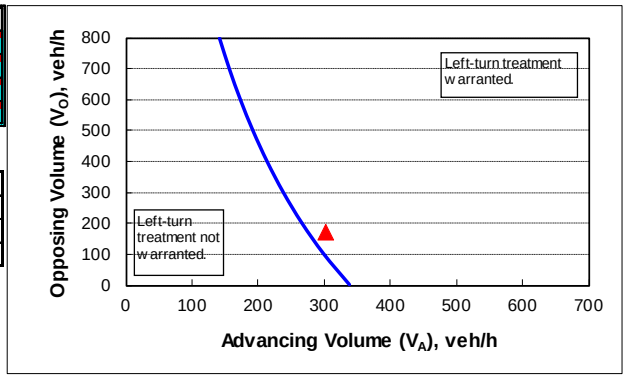
2-lane roadway (English)

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

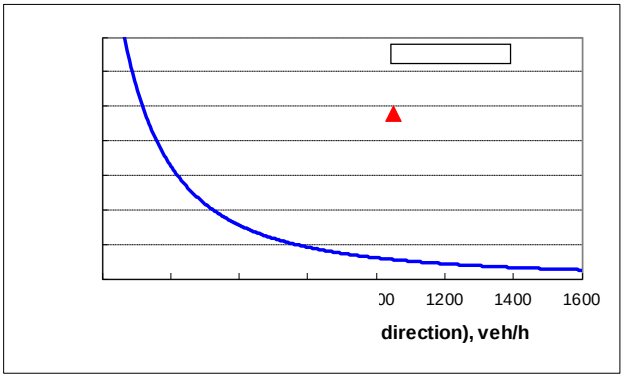
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

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

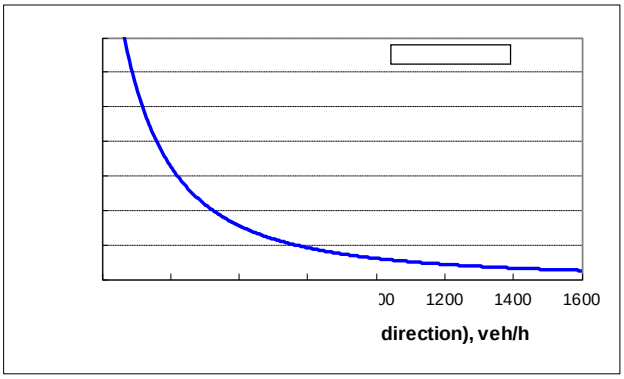
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

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

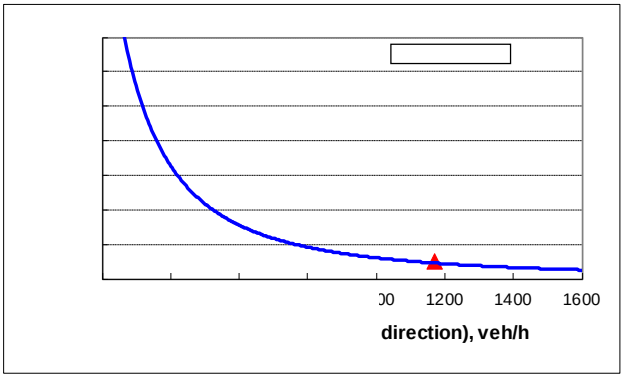
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

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

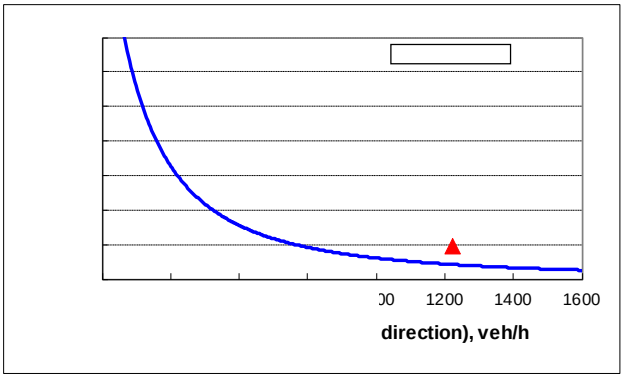
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

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

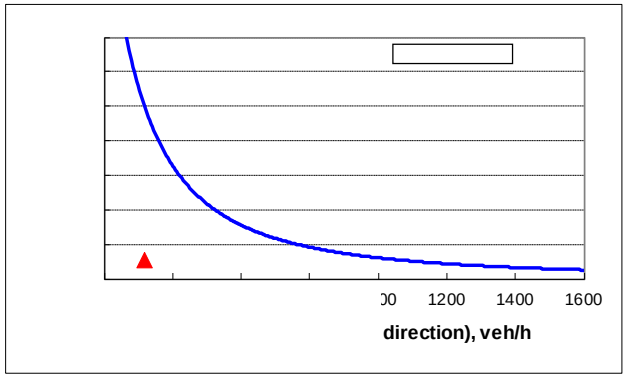
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

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

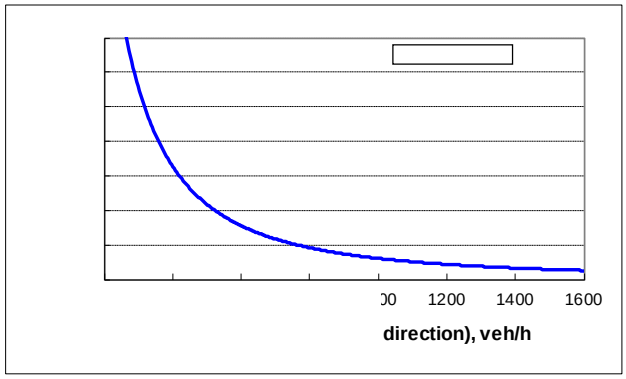
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

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	



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 LAWN



FORMAL PLANTING



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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COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE — REGISTERED LANDSCAPE ARCHITECT — TENNESSEE — 1001023

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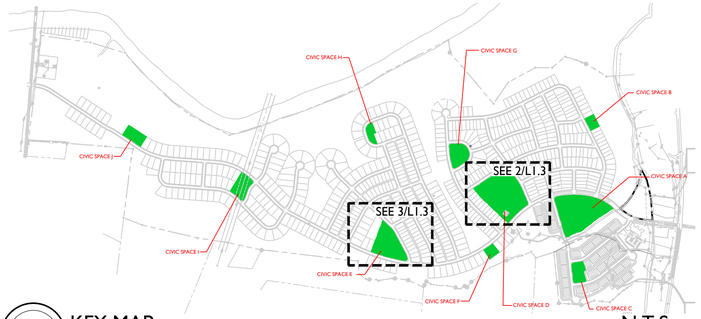
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OVERALL CIVIC SPACE PLAN

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.

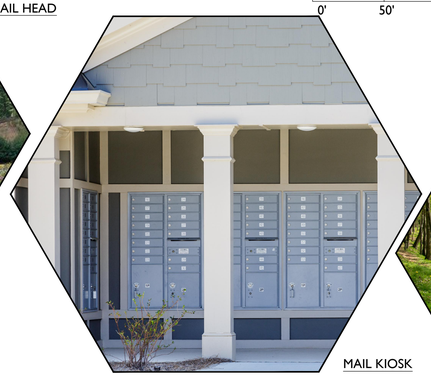
0' 50' 100'



POND



TRAIL HEAD



MAIL KIOSK

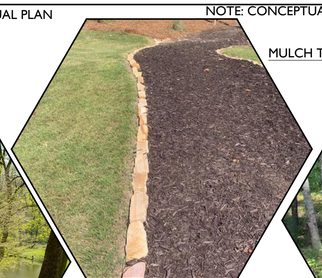
3 / L1.3 CIVIC SPACE - E
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

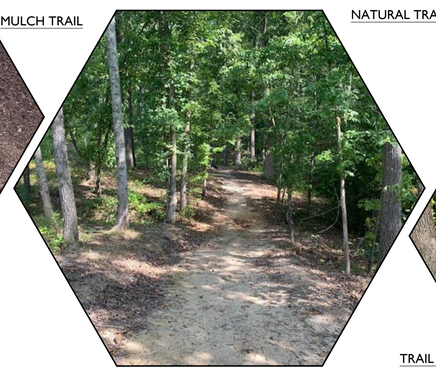
0' 30' 60'



NATURAL POND



MULCH TRAIL



NATURAL TRAIL



TRAIL SIGN

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

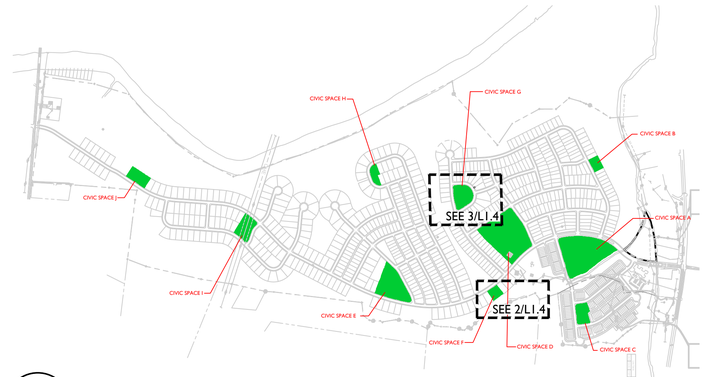
COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE — TENNESSEE — REGISTERED LANDSCAPE ARCHITECT — No. 1622

Date: October 16, 2023
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OVERALL CIVIC SPACE PLAN
SHEET
L1.3





1 / LI.4 KEY MAP N.T.S



2 / LI.4 CIVIC SPACE - F

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'



SWINGS



FORMAL PARK



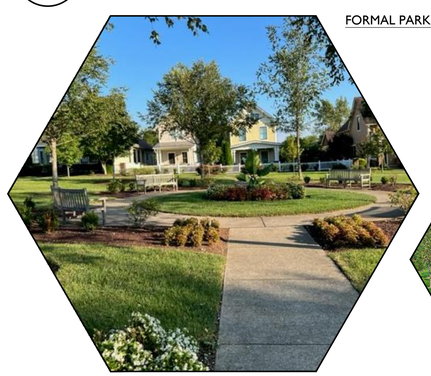
PLAYGROUND

3 / LI.4 CIVIC SPACE - G

CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

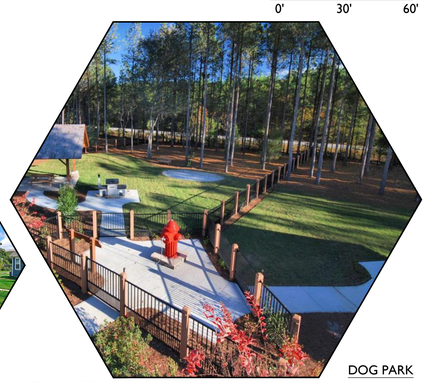
0' 30' 60'



FORMAL PARK



COMMUNITY GARDEN



DOG PARK

GAMBLE DESIGN COLLABORATIVE

DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

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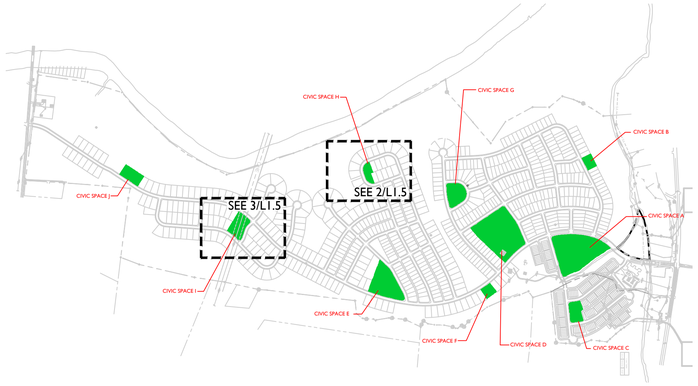
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OVERALL CIVIC SPACE PLAN

SHEET LI.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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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'



KAYAK LAUNCH

NOTE: PRIMITIVE WALKING TRAILS AND KAYAK LAUNCH TO BE FIELD LOCATED.



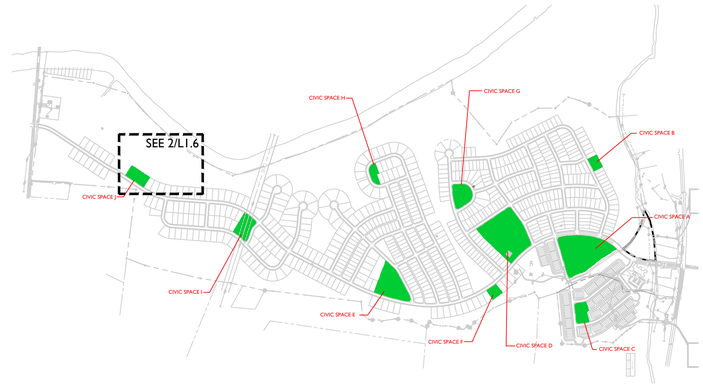
OPEN FIELD



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 — TENNESSEE REGISTERED LANDSCAPE ARCHITECT

Date: October 16, 2023

Revision	Date
△	
△	
△	

OVERALL CIVIC SPACE PLAN

SHEET L1.6

This Instrument Was Prepared by:
J. Bryan Echols
Thompson Burton PLLC
6100 Tower Circle, Suite 200
Franklin, Tennessee 37067

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

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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

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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
6100 Tower Circle, Suite 200
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

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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

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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

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(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

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,

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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

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.

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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

greg.gamble@gdc-tn.com | 615.975.5765 cell | 3020 Stansberry Lane, Suite 201, Franklin, TN 37069

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.

greg.gamble@gdc-tn.com | 615.975.5765 cell | 3020 Stansberry Lane, Suite 201, Franklin, TN 37069

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

greg.gamble@gdc-tn.com | 615.975.5765 cell | 3020 Stansberry Lane, Suite 201, Franklin, TN 37069

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;
S 39°46'13" 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 565.00 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.

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.

CITY OF COLUMBIA TENNESSEE

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

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.

CITY OF
COLUMBIA
TENNESSEE

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

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.

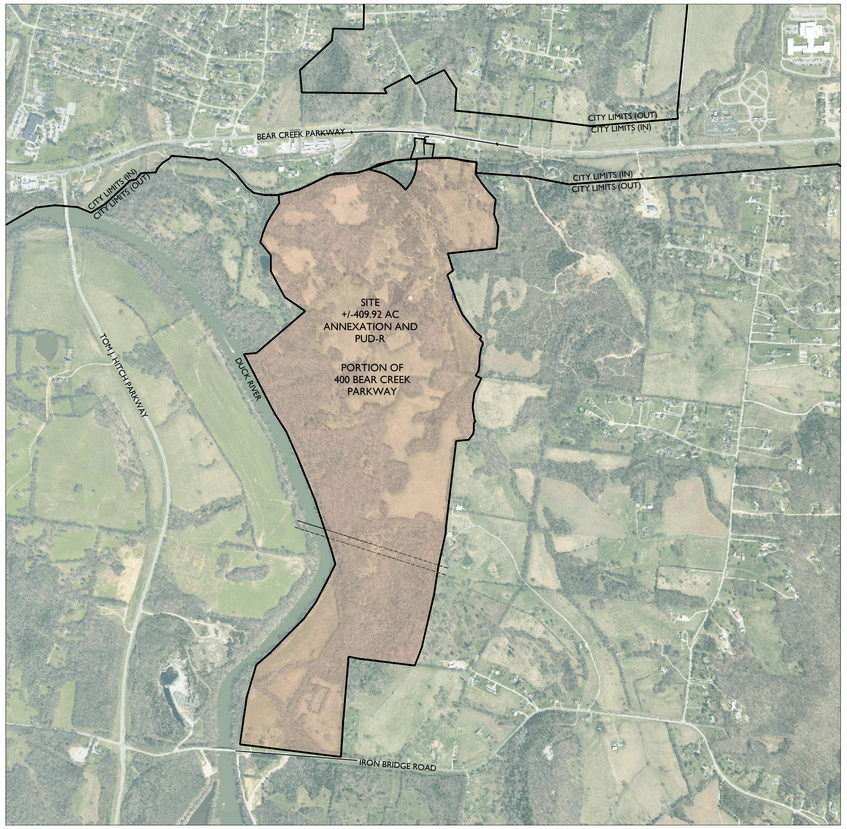
Checklist Completed By:

KELI FRYMIRE	[signature]	10/16/2023
Print Name	Signature	Date

Rev. 6/7/2022

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 OR JOSHUA GIBBS
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
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
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
TENNESSEE REGISTERED
LANDSCAPE ARCHITECT

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

PRE-APP: August 30, 2023
INITIAL SUBMITTAL: October 16, 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
10-16-23
No. 021998
STATE OF TENNESSEE

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

INITIAL SUBMITTAL

ISSUE DATE: 10/16/2023

REVISION HISTORY:

Rev.	Description	Date
1	Initial Submittal	10/16/23

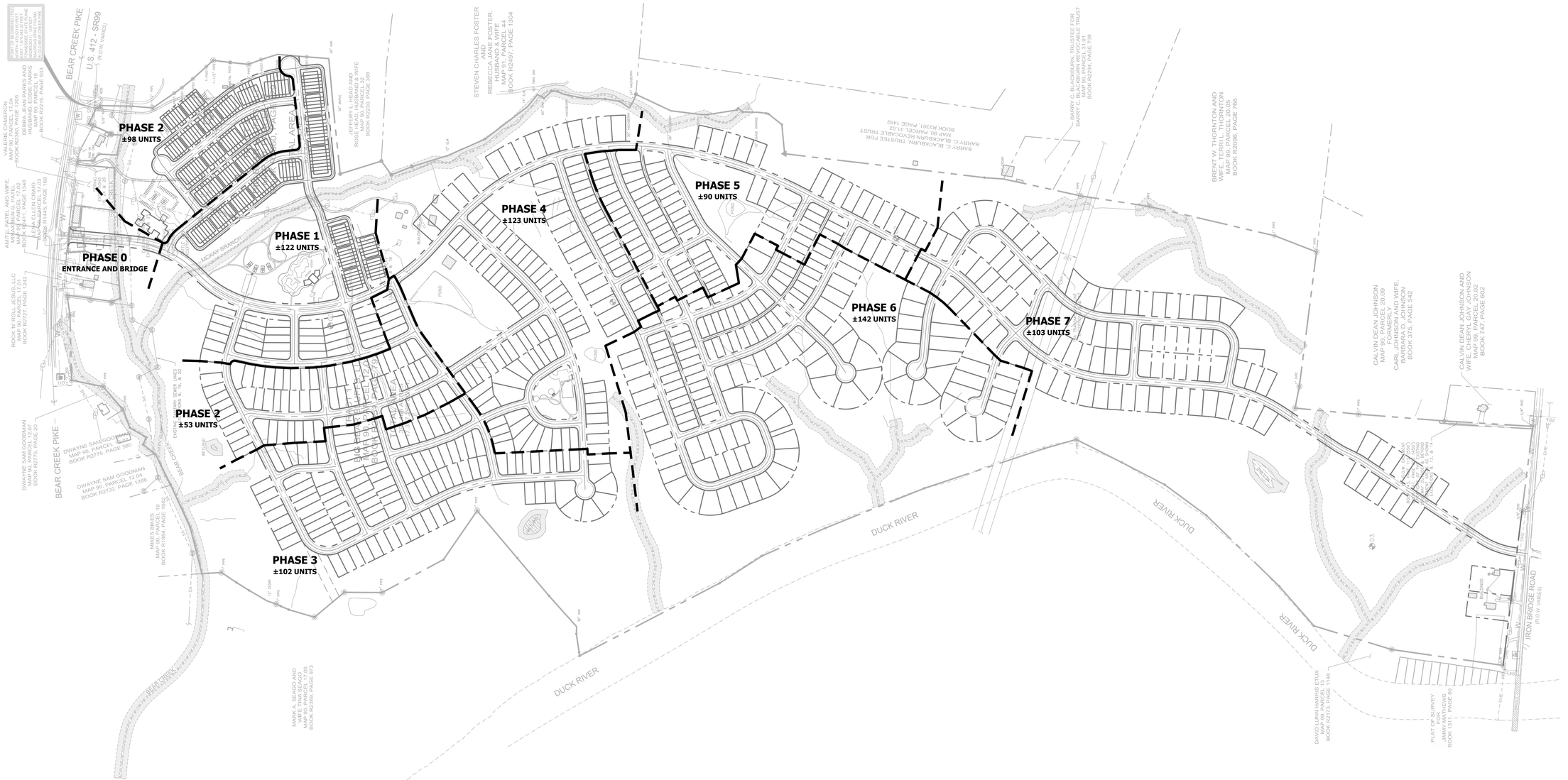
DRAWN BY: TWG
CHECKED BY: TWG

EXISTING CONDITIONS PLAN

C0.01

PROJECT NO.: 21-160-01

Oct 18, 2023 - 6:00pm T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C0.01 - Existing Conditions Plan.dwg



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SEAL



COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:
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REVISION HISTORY:

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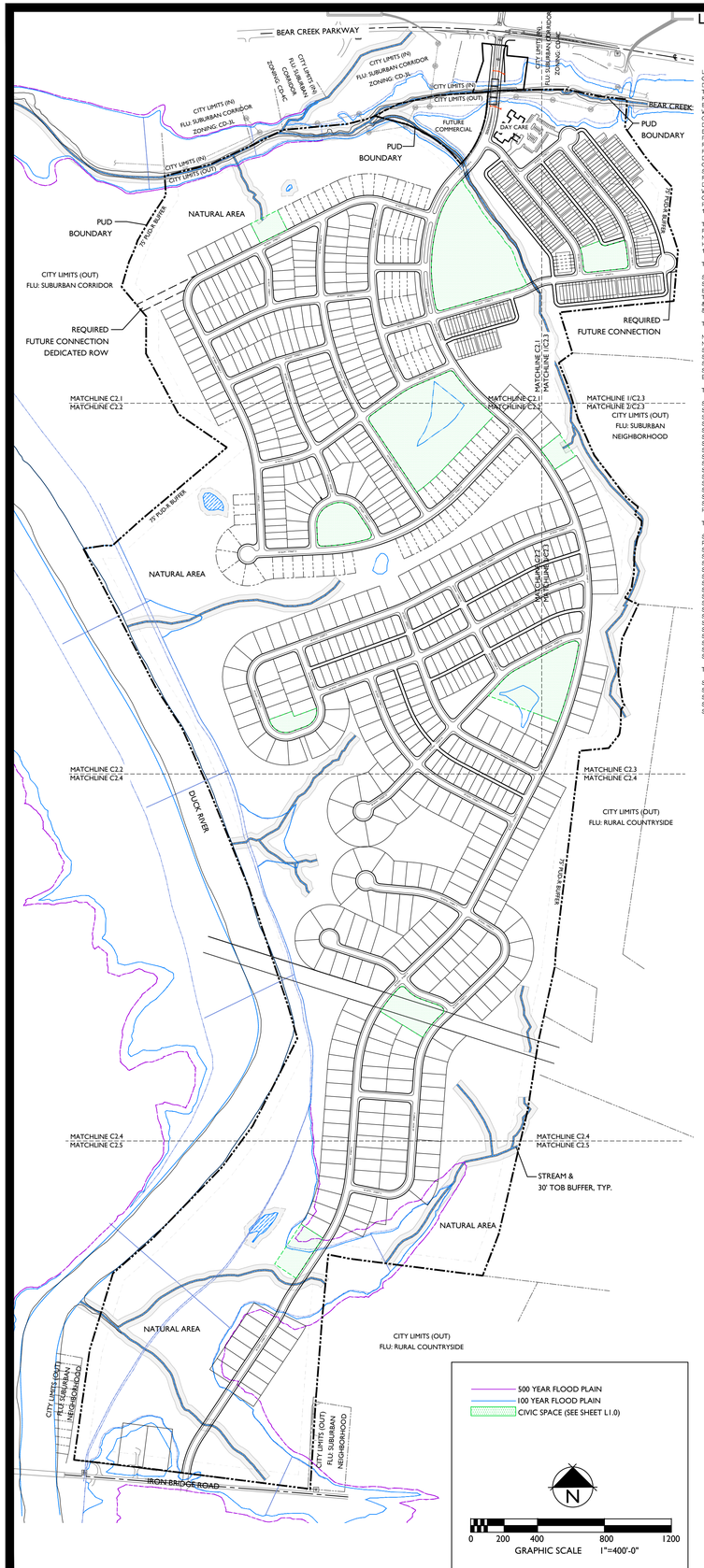
DRAWN BY: TWG
CHECKED BY: TWG

PHASING PLAN

C1.00
PROJECT NO.: 21-160-01

N
0 300 600
SCALE: 1" = 300'

Oct 18, 2023 - 6:00pm 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, 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;

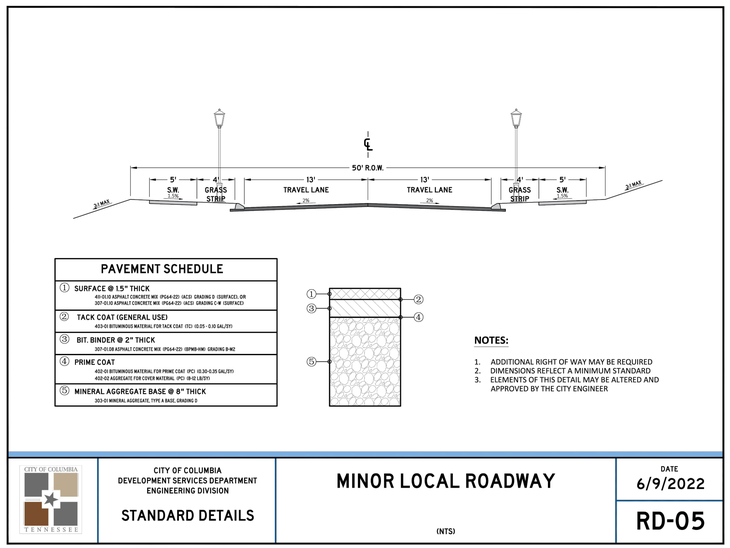
THENCE, ALONG SOUTH BOUNDARY OF GOODMAN, N 63°42'14" E, 199.86 FEET TO A POINT;

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.

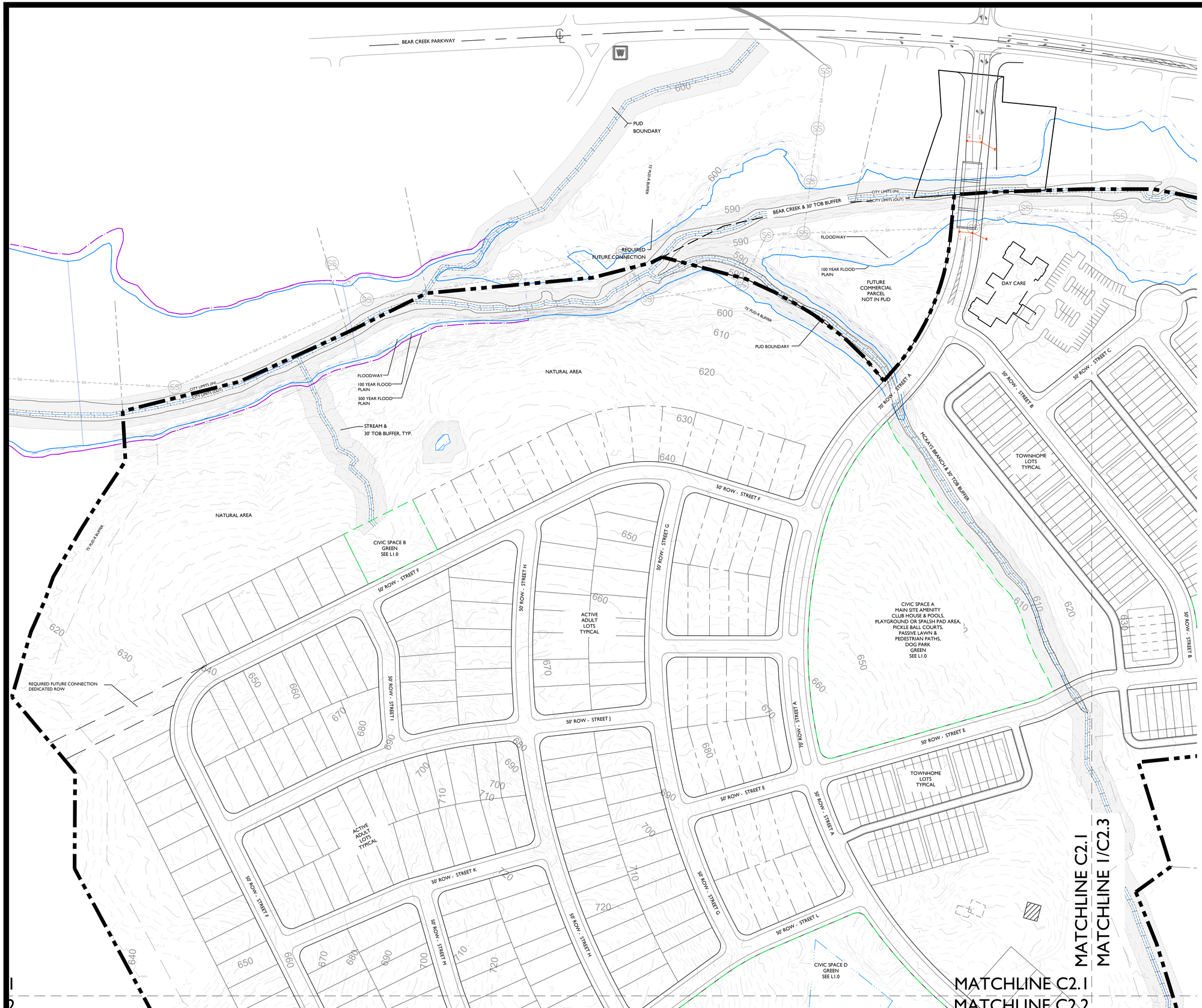
GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

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



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
TENNESSEE
10/16/23

Date: October 16, 2023

Revision Date
△
△
△

ENLARGED PUD-R PMDP

SHEET

C2.1

MATCHLINE C2.1
MATCHLINE C2.2

MATCHLINE C2.1
MATCHLINE C2.2

ACTIVE ADULT LOTS TYPICAL

CIVIC SPACE D
MAIL KIOSK
SEATING, PASSIVE LAWN & PEDESTRIAN PATHS, GREEN
SEE L1.0

50' ROW - STREET A

50' ROW - STREET L

50' ROW - STREET F

50' ROW - STREET M

50' ROW - STREET N

50' ROW - STREET H

50' ROW - STREET O

CIVIC SPACE G
ACTIVE ADULT AMENITY
COVERED SEATING, PASSIVE LAWN &
PEDESTRIAN PATHS,
DOG PARK,
COMMUNITY GARDEN,
GREEN
SEE L1.0

NATURAL AREA

ACTIVE ADULT LOTS TYPICAL

50' ROW - STREET P

COURTYARD LOTS TYPICAL

50' ROW - STREET R

50' ROW - STREET Q

50' ROW - STREET S

LARGE LOTS TYPICAL

ALLEY HOMES TYPICAL

50' ROW - STREET T

50' ROW - STREET W

PEDESTRIAN WALKWAY & PARK

CIVIC SPACE E
MAIL KIOSK, PASSIVE LAWN & PEDESTRIAN PATHS, PLAYGROUND
GREEN
SEE L1.0

CIVIC SPACE H
PASSIVE LAWN & PEDESTRIAN PATHS, PLAYGROUND
GREEN
SEE L1.0

75' MJD-R BUFFER

FLOODWAY
100 YEAR FLOOD PLAIN

STREAM &
30' TOB BUFFER, TYP.

DUCK RIVER

640 650 660 630 620 600 610 580 590 570 560 670 680 690 700 710 720

MATCHLINE C2.2
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

GREGORY C. GAMBLE
TENNESSEE
REGISTERED
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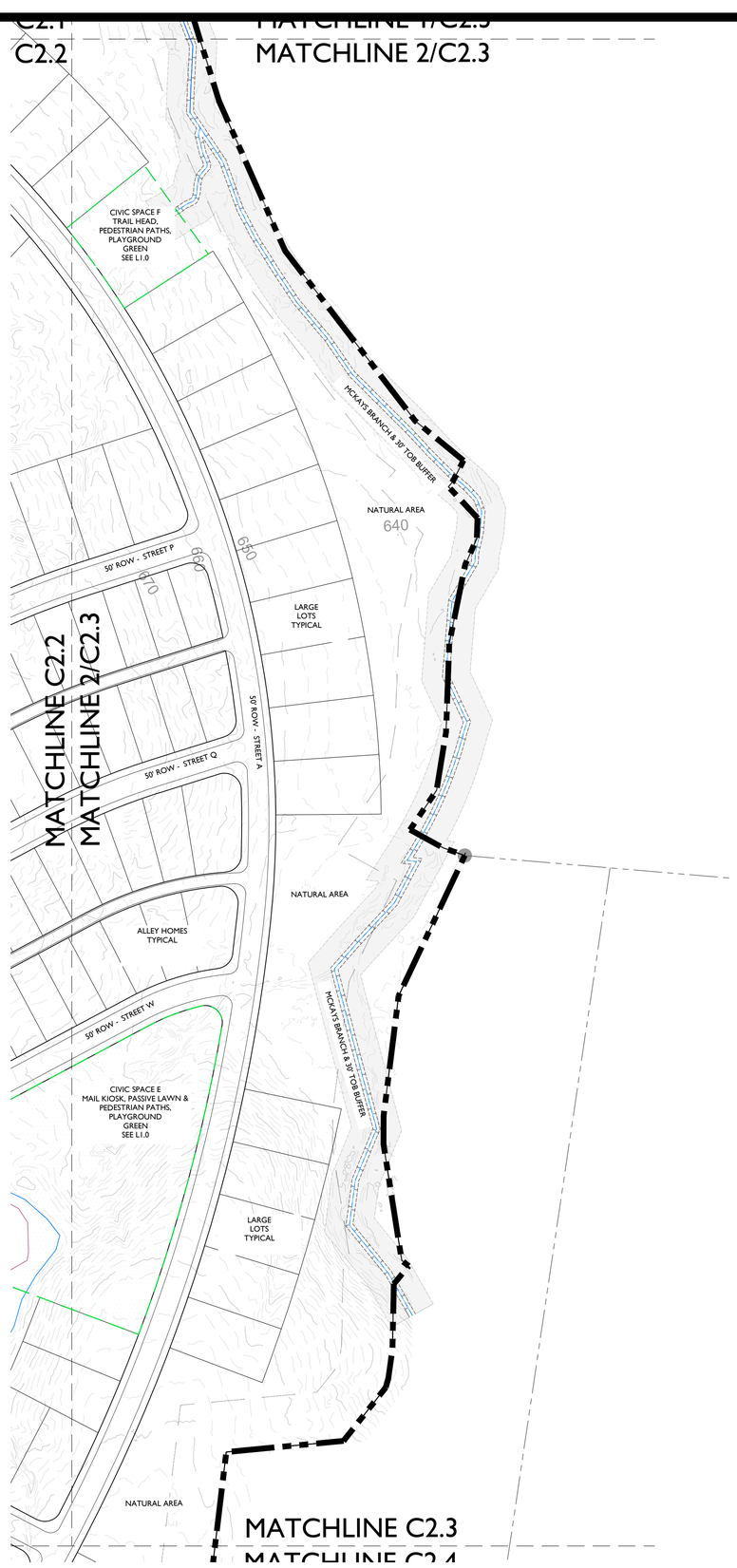
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ENLARGED PUD-R PMDP

SHEET
C2.2





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OVERALL CONCEPT DEVELOPMENT PLAN

N

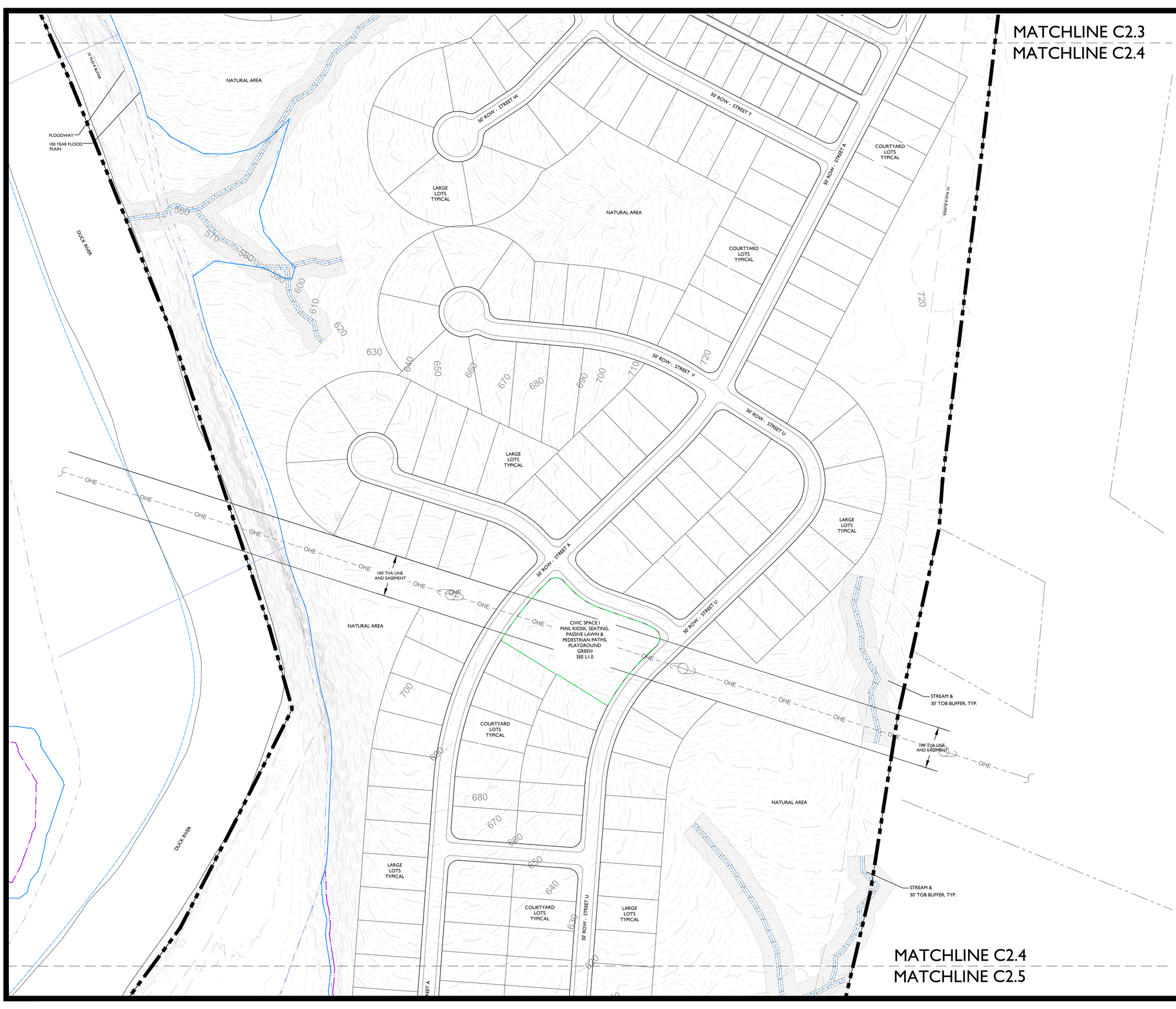
0 50 100 200 300

GRAPHIC SCALE 1"=100'-0"

ENLARGED PUD-R PMDP

SHEET C2.3

MATCHLINE C2.3
MATCHLINE C2.4



MATCHLINE C2.4
MATCHLINE C2.5

OVERALL CONCEPT DEVELOPMENT PLAN

N

0 50 100 200 300
GRAPHIC SCALE 1"=100'-0"

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ENLARGED PUD-R PMDP

SHEET
C2.4

MATCHLINE C2.4
MATCHLINE C2.5

NATURAL AREA
DUCK RIVER
50' ROW - STREET A
50' ROW - STREET U
COURTYARD LOTS TYPICAL
LARGE LOTS TYPICAL
STREAM & 30' TOB BUFFER, TYP.
CIVIC SPACE J TRAIL HEAD, SEATING, PASSIVE LAWN & PEDESTRIAN PATHS, GREEN SEE L1.0
500 YEAR FLOOD PLAIN
FLOODWAY
100 YEAR FLOOD PLAIN
75' PUD-R BUFFER
100 YEAR FLOOD PLAIN
500 YEAR FLOOD PLAIN
570
580
590
600
610
620
630
640
650
660

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TENNESSEE
10/16/23

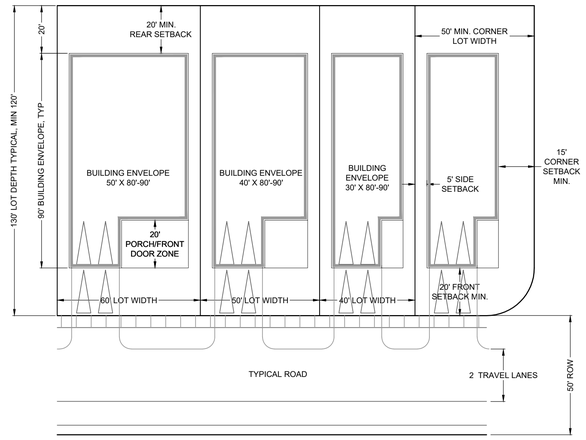
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OVERALL CONCEPT DEVELOPMENT PLAN
N
0 50 100 200 300
GRAPHIC SCALE 1"=100'-0"

ENLARGED PUD-R PMDP
SHEET
C2.5

ACTIVE ADULT/ AGE RESTRICTED DETACHED SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 40' X 120'; 50' X 120'; 60' X 120'

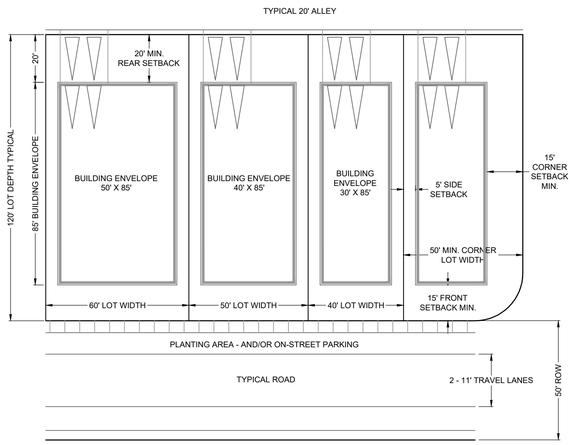
SETBACKS:	MODIFICATION REQUESTS:
FRONT: 20' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 5'
SIDE : 5' MIN.	GARAGE LOCATED IN 2ND LAYER
CORNER: 15' MIN.	DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16'
REAR: 20' MIN.	DRIVEWAY TO BE 18' WIDE IN FIRST LAYER



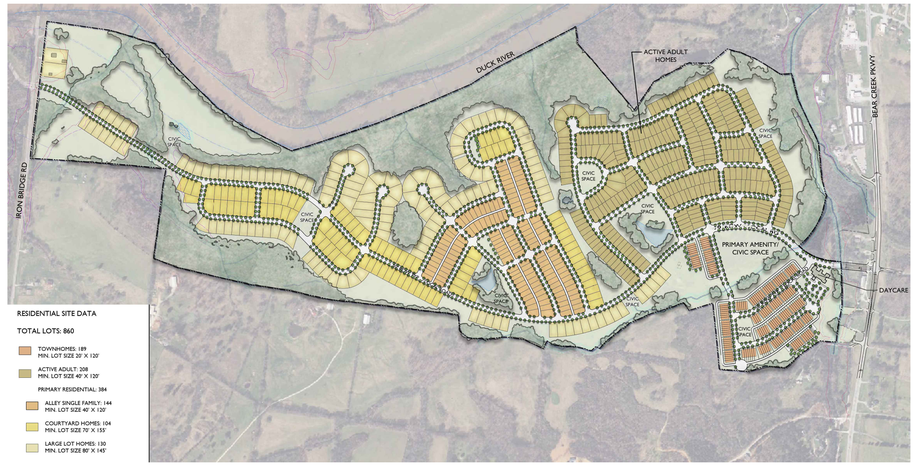
1 C2.6 ACTIVE ADULT LOT DIAGRAM N.T.S

PRIMARY RESIDENTIAL - ALLEY LOADED DETACHED SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 40' X 120'; 50' X 120'; 60' X 120'

SETBACKS:	MODIFICATION REQUESTS:
FRONT: 20' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 5'
SIDE : 5' MIN.	
CORNER: 15' MIN.	
REAR: 20' MIN.	



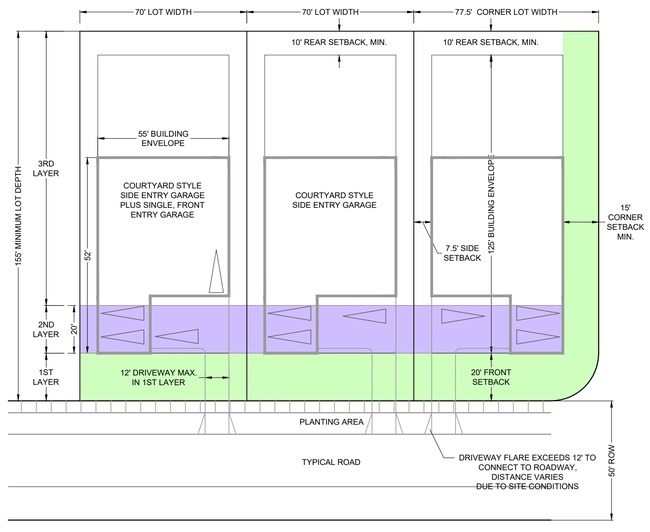
2 C2.6 SINGLE-FAMILY ALLEY LOT DIAGRAM N.T.S



3 C2.6 KEY MAP N.T.S

PRIMARY RESIDENTIAL COURTYARD SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 70' MIN. X 155'

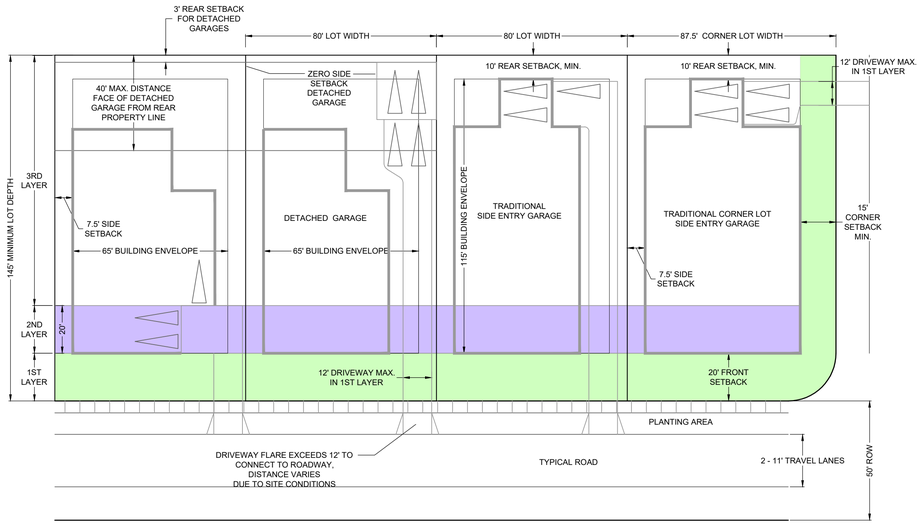
SETBACKS:	MODIFICATION REQUESTS:
FRONT: 20' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5'
SIDE : 7.5' MIN.	GARAGE LOCATED IN 2ND LAYER
CORNER: 15' MIN.	DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16'
REAR: 10' MIN.	DRIVEWAY TO BE 12' WIDE IN FIRST LAYER



4 C2.6 COURTYARD HOME LOT DIAGRAM N.T.S

PRIMARY RESIDENTIAL LARGE LOT SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 80' MIN. X 145'

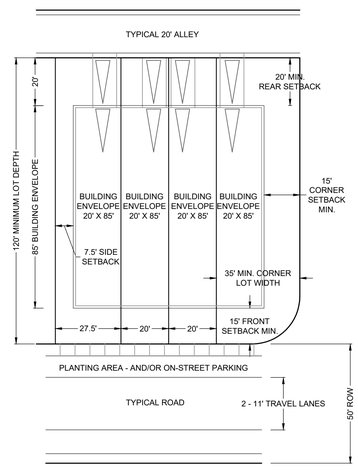
SETBACKS:	MODIFICATION REQUESTS:
FRONT: 20' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5'
SIDE : 7.5' MIN.	GARAGE LOCATED IN 2ND LAYER
CORNER: 15' MIN.	DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16'
REAR: 10' MIN.	DRIVEWAY TO BE 12' WIDE IN FIRST LAYER



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:
FRONT: 15' MIN.	REDUCTION IN SIDE SETBACK FROM 10' TO 7.5'
SIDE : 7.5' MIN.	
CORNER: 15' MIN.	
REAR: 20' MIN.	



6 C2.6 TOWN HOME LOT DIAGRAM N.T.S

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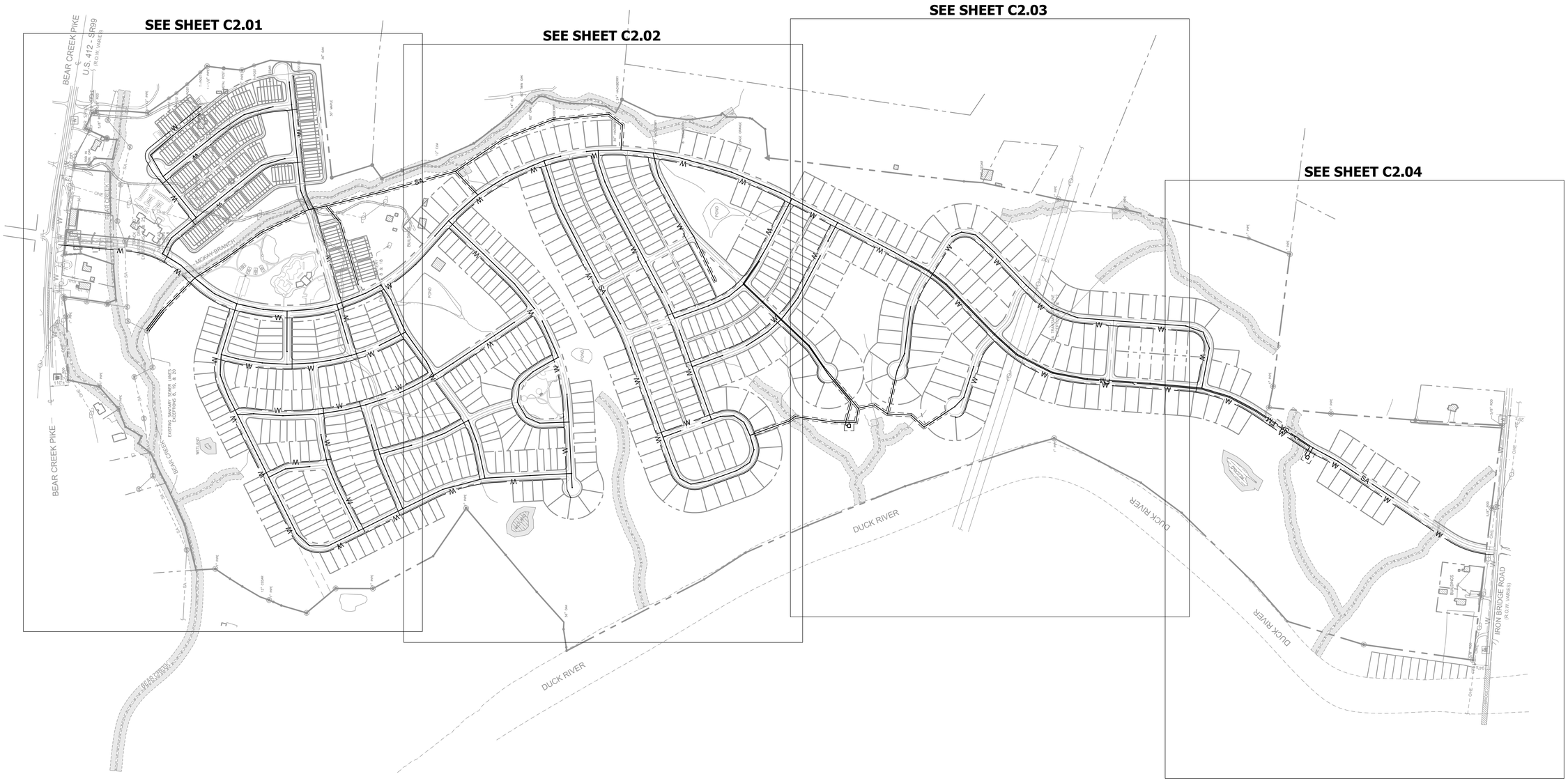
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LOT DIAGRAMS

SHEET C2.6



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ENGINEER
10-16-23
No. 021998
STATE OF TENNESSEE

COLUMBIA BLUFFS
PMDP
Bear Creek Pike
Columbia, Maury County, Tennessee

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OVERALL UTILITY PLAN

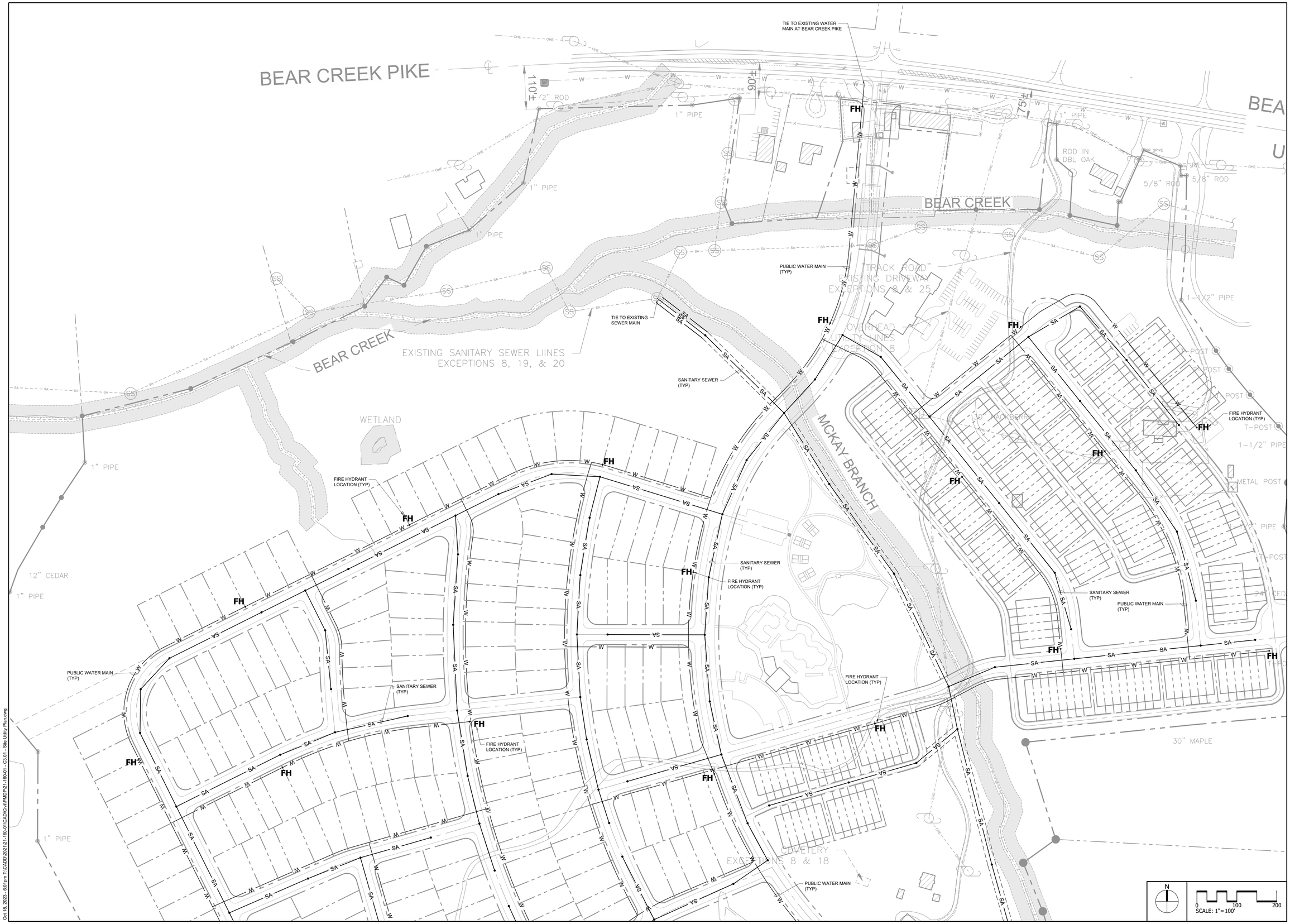
C3.00

PROJECT NO.: 21-160-01

N

0 300 600
SCALE: 1"= 300'

Oct 18, 2023 - 6:00pm T:\CAD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.00 - Overall Utility Plan.dwg



Oct 18, 2023 - 6:01pm T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C3.01 - Site Utility Plan.dwg

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SITE UTILITY PLAN

C3.01

PROJECT NO.: 21-160-01



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SITE UTILITY PLAN

C3.02
PROJECT NO.: 21-160-01

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SCALE: 1"= 100'

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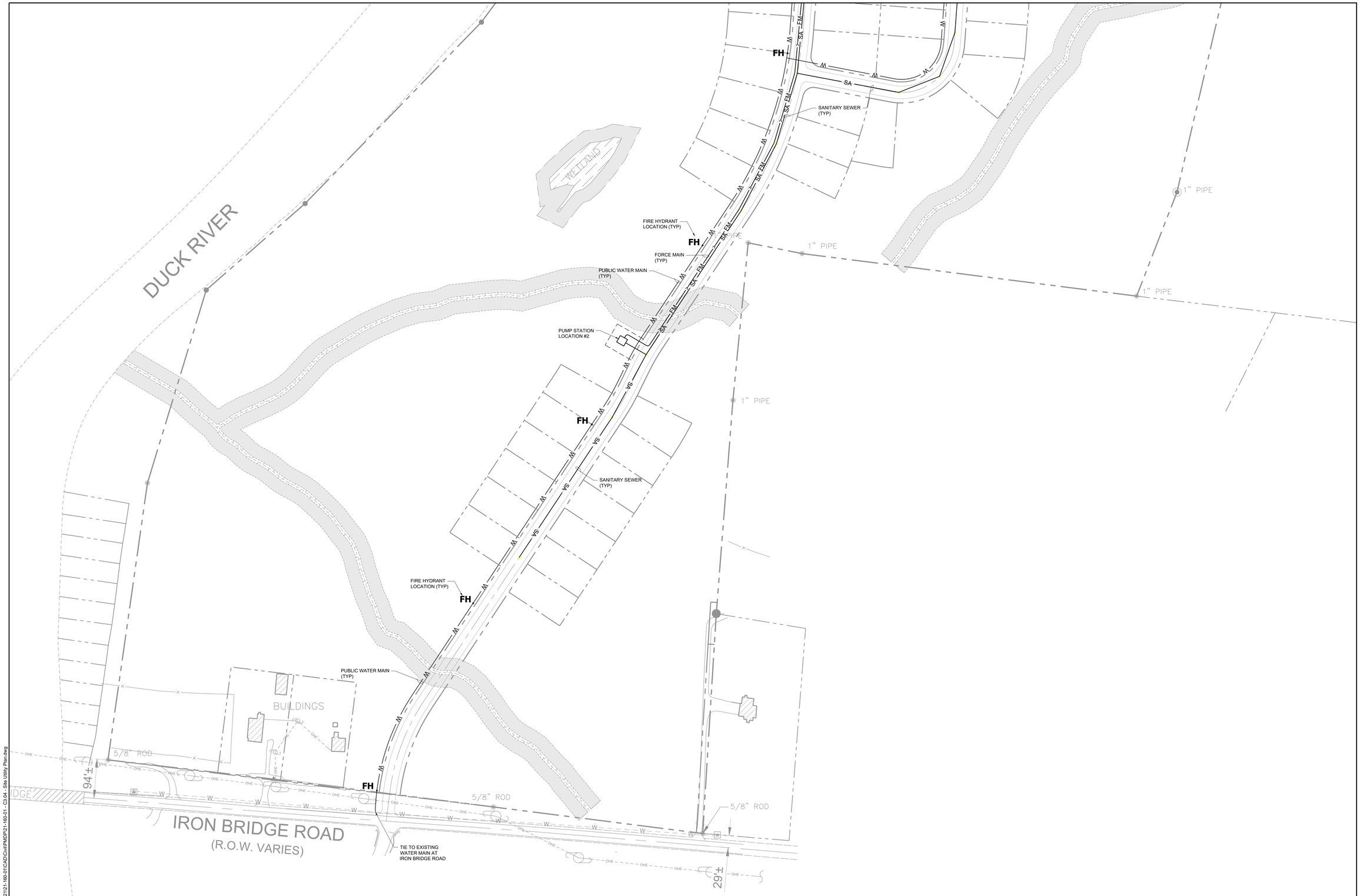
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SITE UTILITY PLAN

C3.03
PROJECT NO.: 21-160-01

N
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SCALE: 1"= 100'

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SITE UTILITY PLAN

N
0 100 200
SCALE: 1"= 100'

C3.04
PROJECT NO.: 21-160-01

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N

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SCALE: 1"= 300'

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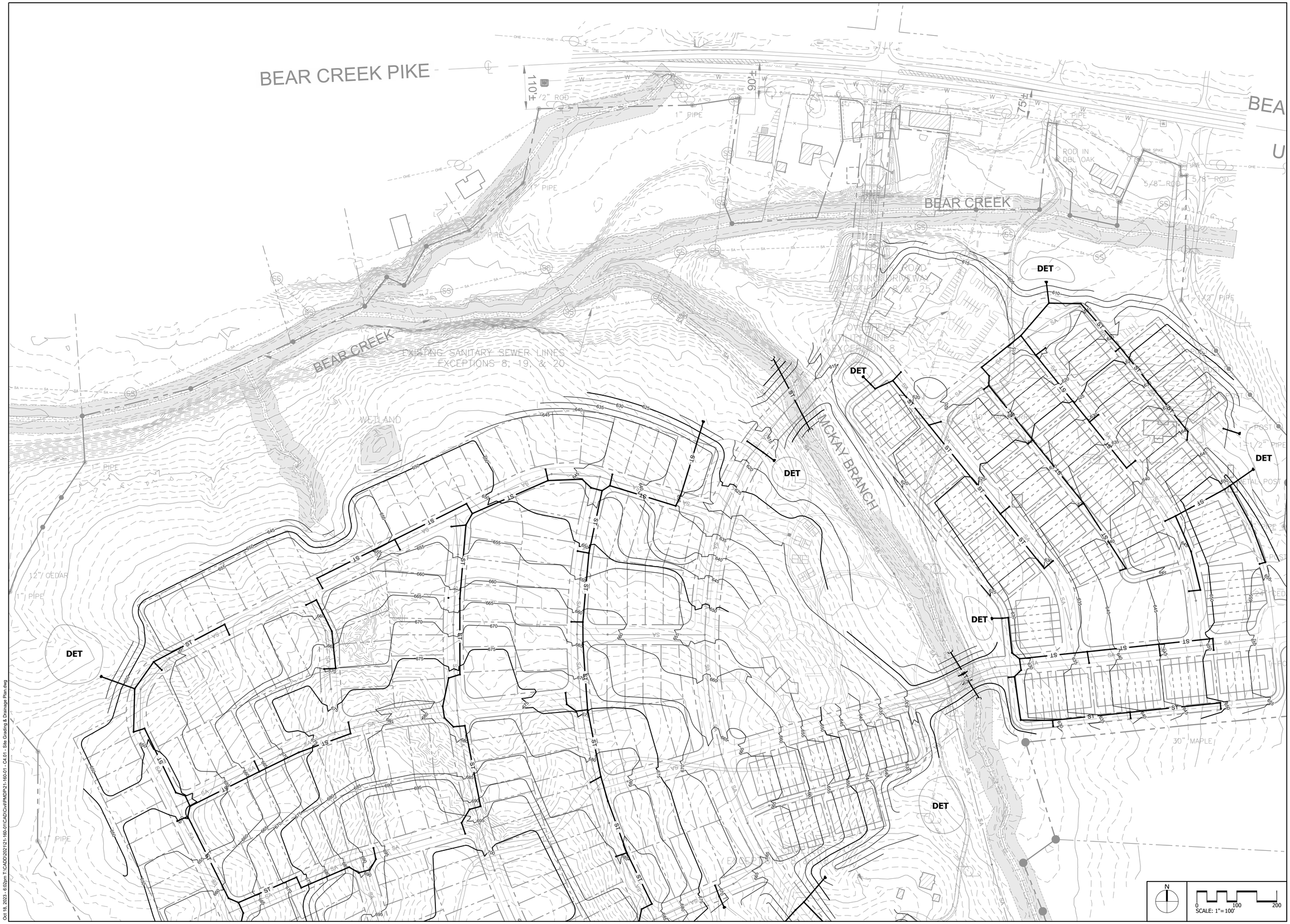
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OVERALL GRADING & DRAINAGE PLAN

C4.00

PROJECT NO.: 21-160-01

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SITE GRADING & DRAINAGE PLAN

C4.01

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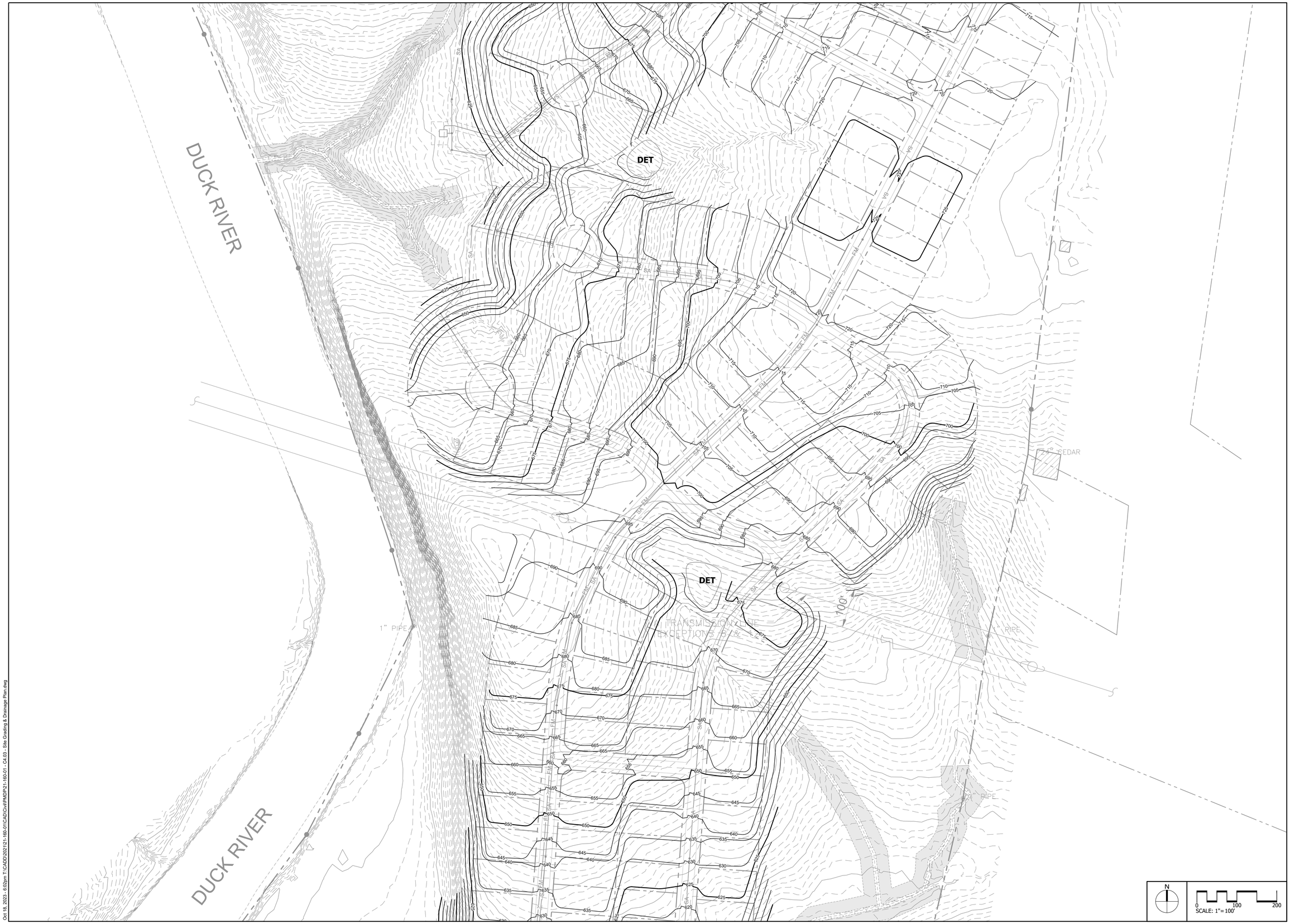
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SITE GRADING & DRAINAGE PLAN

C4.02

PROJECT NO.: 21-160-01

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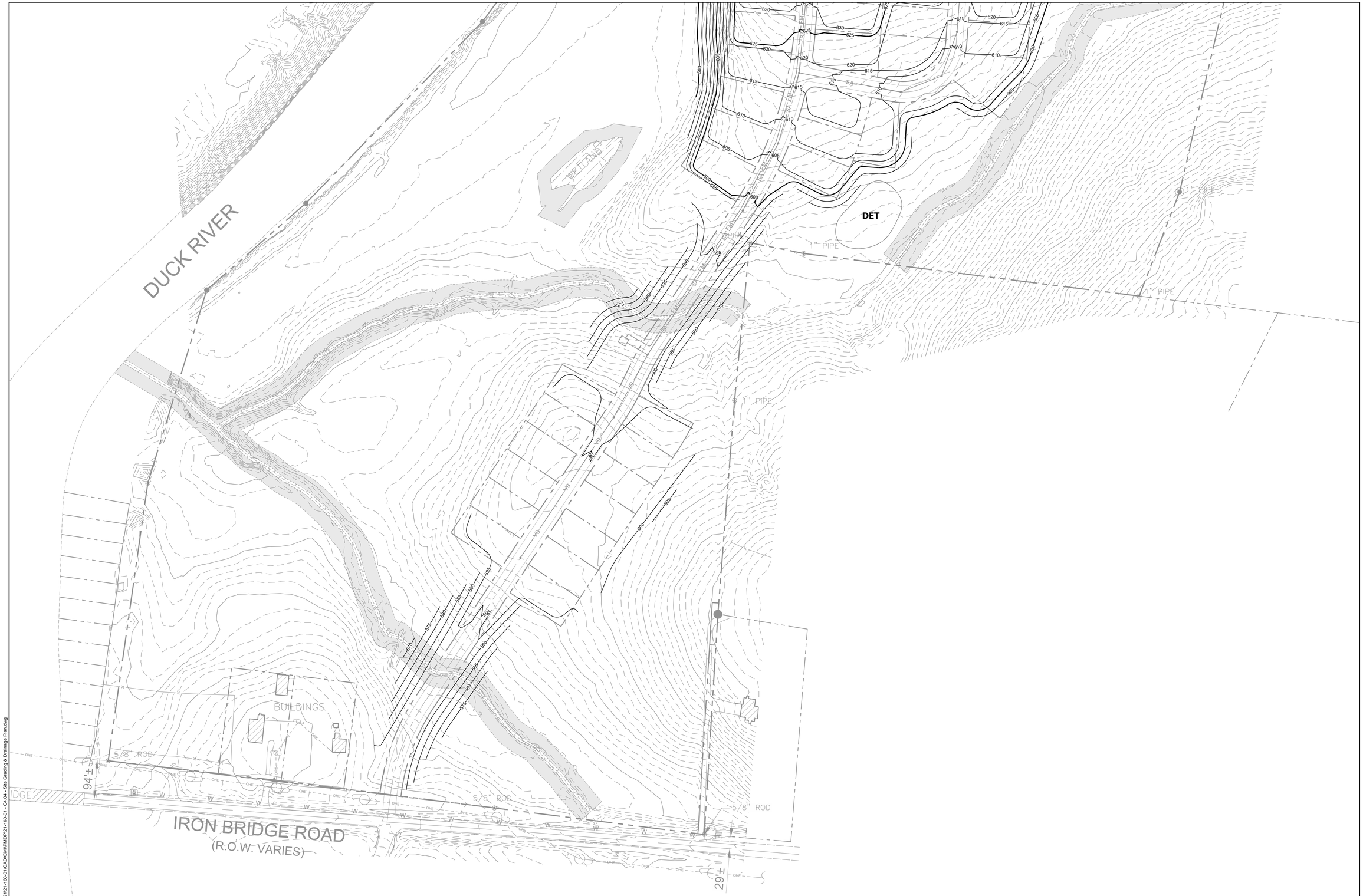
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SITE GRADING & DRAINAGE PLAN

C4.03

PROJECT NO.: 21-160-01

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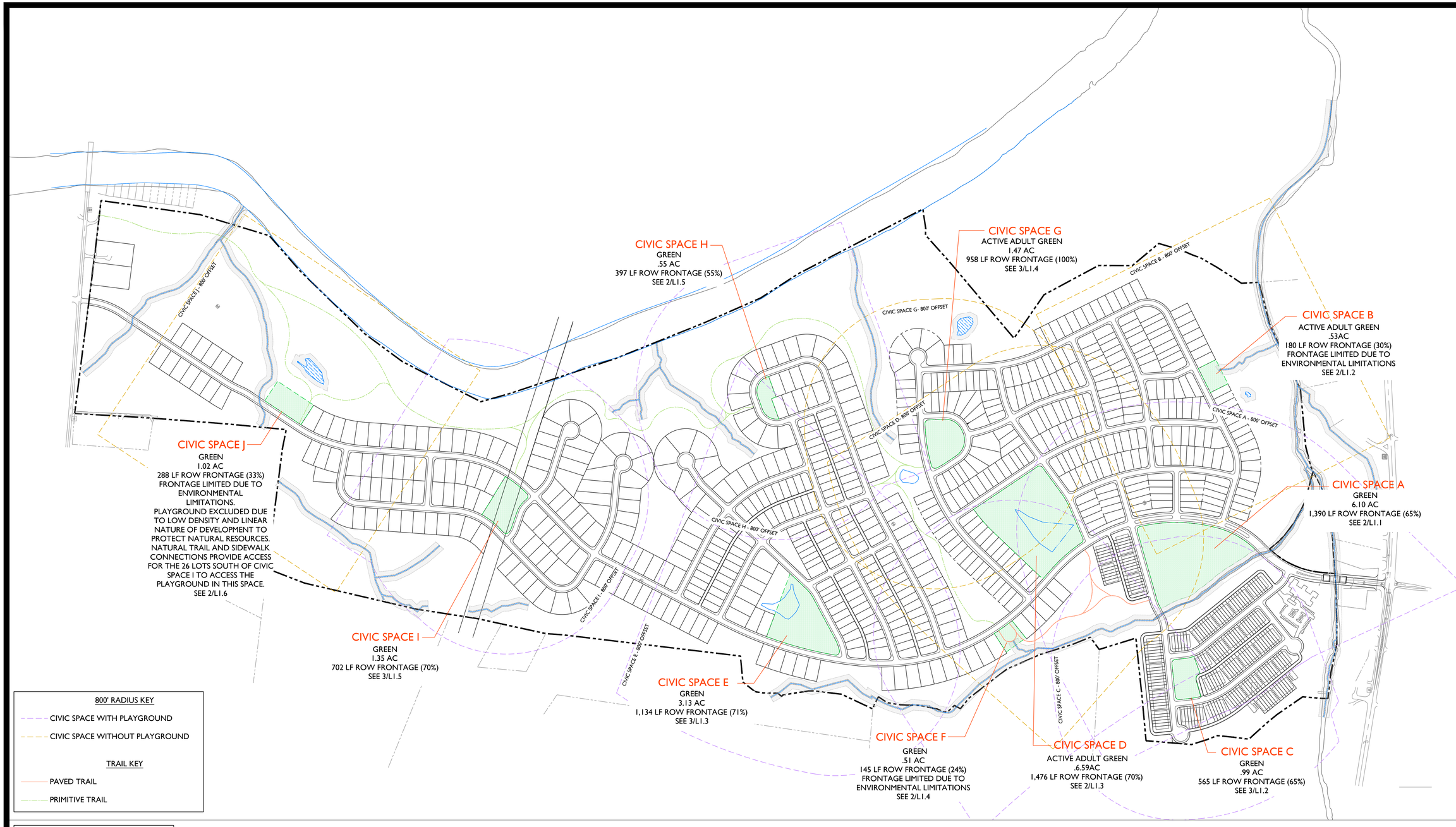
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SITE GRADING & DRAINAGE PLAN

C4.04

PROJECT NO.: 21-160-01

Oct 18, 2023 - 6:03pm T:\CADD\2021\21-160-01\CAD\Civil\PMDP\21-160-01 - C4.04 - Site Grading & Drainage 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

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE
REGISTERED
LANDSCAPE ARCHITECT
10/16/23

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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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GREGORY C. GAMBLE TENNESSEE REGISTERED LANDSCAPE ARCHITECT 10-0028

Date: October 16, 2023

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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 LAWN



FORMAL PLANTING



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

GREGORY C. GAMBLE REGISTERED LANDSCAPE ARCHITECT TENNESSEE 10/16/23

Date: October 16, 2023

Revision Date

△

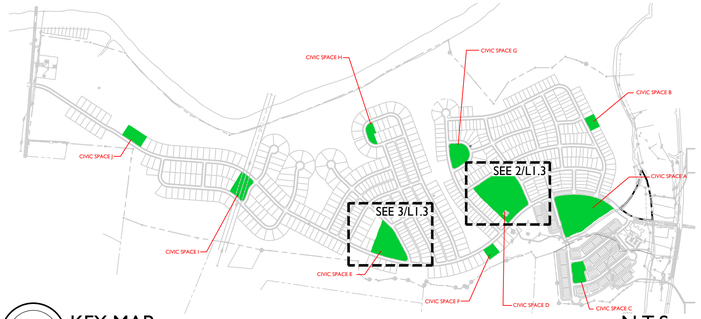
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OVERALL CIVIC SPACE PLAN

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.

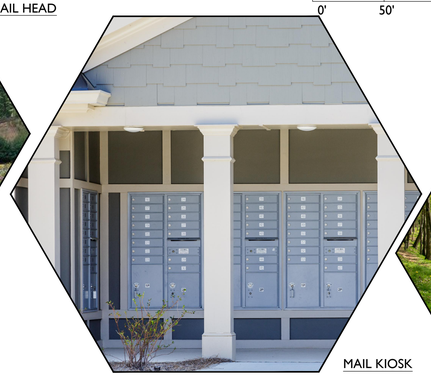
0' 50' 100'



POND



TRAIL HEAD



MAIL KIOSK

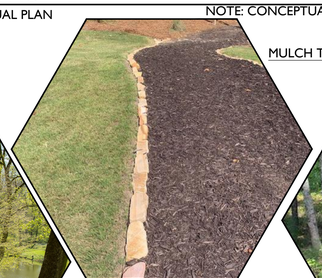
3 / L1.3 CIVIC SPACE - E
CONCEPTUAL PLAN

NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

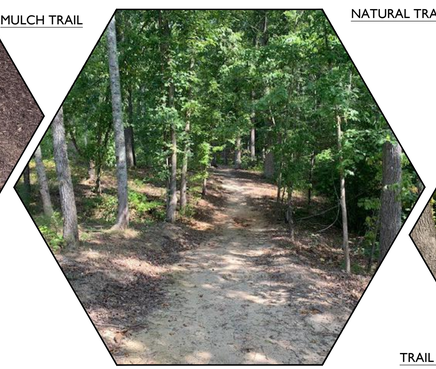
0' 30' 60'



NATURAL POND



MULCH TRAIL



NATURAL TRAIL



TRAIL SIGN

GAMBLE DESIGN COLLABORATIVE
DEVELOPMENT PLANNING AND LANDSCAPE ARCHITECTURE

COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE REGISTERED LANDSCAPE ARCHITECT TENNESSEE No. 1622

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'



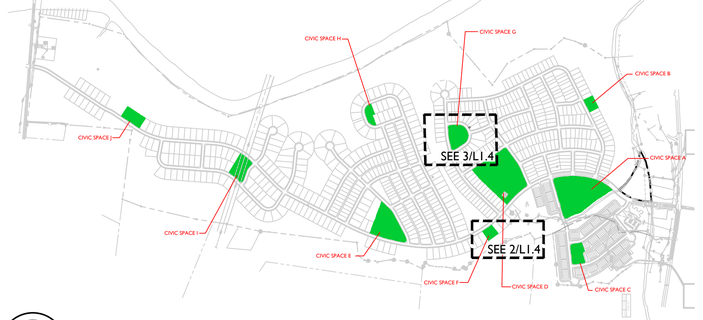
SWINGS



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.

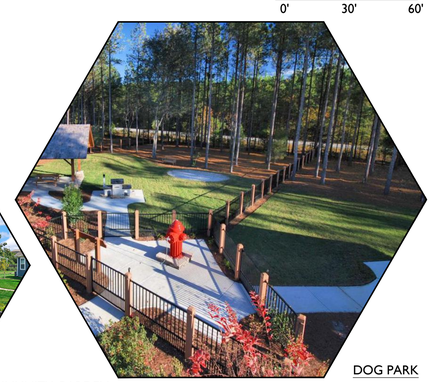
0' 30' 60'



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

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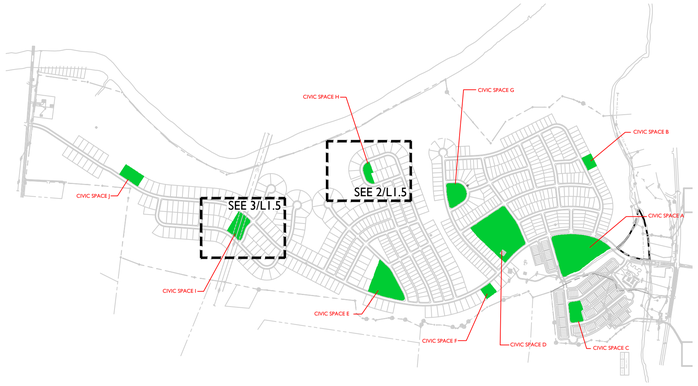
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OVERALL CIVIC SPACE PLAN

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
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE — REGISTERED LANDSCAPE ARCHITECT — TENNESSEE

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
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 Bear Creek Parkway, Columbia, Tennessee

GREGORY C. GAMBLE — TENNESSEE REGISTERED LANDSCAPE ARCHITECT

Date: October 16, 2023

Revision	Date
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△	

OVERALL CIVIC SPACE PLAN

SHEET L1.6

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 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	

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-4C (General Urban-Corridor).

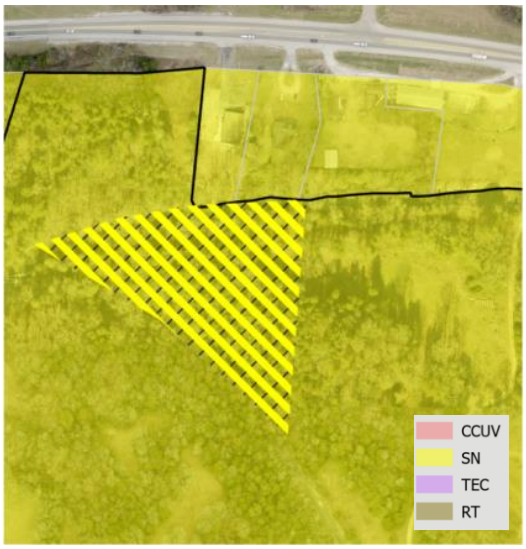
- The request is consistent with the Future Land Use Map of Connect Columbia, the city's comprehensive plan.
- The Areas of Change policy designation for the property is facilitate, indicating that the City neither encourages nor discourages changes to the land use pattern in the area around the subject site.
- The concept plan demonstrates that it may be 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.

SITE INFORMATION

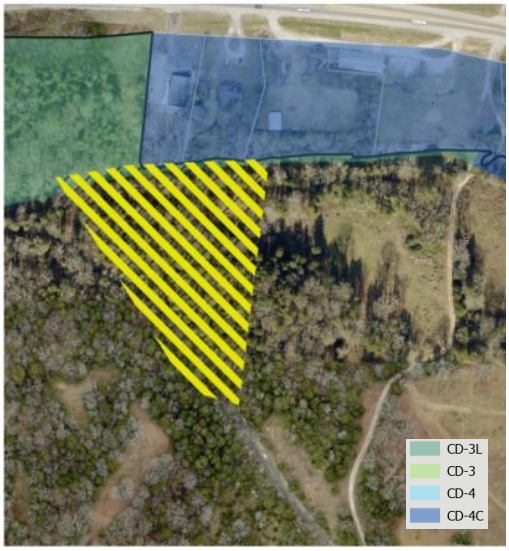
CURRENT ZONING	EXISTING USE	EXISTING IMP.	LAND AREA
Unincorporated	Vacant	Vacant	+/- 3.27



FUTURE LAND USE MAP



ZONING MAP



SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	Suburban Neighborhoods	Unincorporated	Vacant
North	Suburban Neighborhoods	CD-3L/CD-4C	Commercial
South	Suburban Neighborhoods	Unincorporated	Vacant
East	Suburban Neighborhoods	Unincorporated	Vacant
West	Suburban Neighborhoods	Unincorporated	Vacant

CONSISTENCY WITH CONNECT COLUMBIA

Suburban Neighborhoods: The requested CD-4C zoning is consistent with Connect Columbia. The intent of the Suburban Neighborhoods (SN) future land use is to enhance existing suburban areas and create new neighborhoods that will improve the quality of life in Columbia. Where appropriate, the SN future land use area also establishes mixed-use and commercial centers which serve residents' retail needs and provide a wider range of housing options. Each development parcel should add to Columbia's existing sense of place and extend the established form and pattern to create a more interconnected community. Future development should emphasize connectivity and continuity of the city as whole. The density and intensity of residential development increases in proximity to areas under the City Center Urban Village (CCUV) future land use classification. In the same way, density and intensity decrease in proximity to areas under the Rural Transition (RT) future land use classification. New development enhances pedestrian infrastructure with sidewalks and other multimodal routes. Public frontages may include sidewalks and street trees. Over time, new and infill development connects neighborhoods and community anchors such as libraries, neighborhood centers, health facilities, retail uses, parks, and schools. The future land use classification is usually implemented by the CD-3L and CD-3 character districts, as well as PUDs. However, where a development is located along a roadway with an arterial functional classification, CD-4C is an appropriate implementing zone. Connect Columbia identifies Bear creek pike as a principal arterial.

Character & Intent

The intent of the Suburban Neighborhoods (SN) future land use is to enhance existing suburban areas and create new neighborhoods that will improve the quality of life in Columbia. Where appropriate, the SN future land use area also establishes mixed-use and commercial centers which serve residents' retail needs and provide a wider range of housing options. Each development parcel should add to Columbia's existing sense of place and extend the established form and pattern to create a more interconnected community. Future development should emphasize connectivity and continuity of the city as whole. The density and intensity of residential development increases in proximity to areas under the CCUV future land use classification. In the same way, density and intensity decrease in proximity to areas under the Rural Transition (RT) future land use classification. New development enhances pedestrian infrastructure with sidewalks and other multimodal routes. Public frontages may include sidewalks and street trees. Over time, new and infill development connects neighborhoods and community anchors such as libraries, neighborhood centers, health facilities, retail uses, parks, and schools.

Land Use Considerations

The primary land use is low-density detached housing. Along arterial roadways, primary uses may include offices, retail, and all forms of medium-density housing. Secondary land uses include accessory dwellings, two-family homes, civic uses, institutional uses, schools, religious facilities, utility facilities, parks and open space. New industrial and warehouse uses are inappropriate.



Form & Pattern

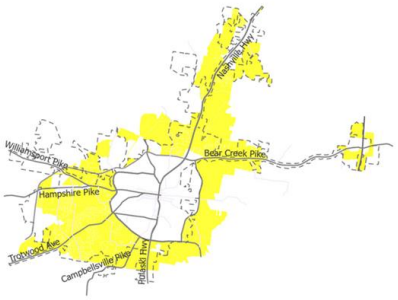
The SN future land use area is characterized by the organization of the built environment to extend a succession of large-lot neighborhoods and compact walkable neighborhoods. Development parcels extend established neighborhood patterns. Leap-frogging development is inappropriate. The SN future land use is distinguished from RT in the organization of lots and thoroughfares to form blocks. Physically separated developments which do not extend established block formation and roadway networks are inappropriate. The density of streets and blocks increases with proximity to CCUV and community anchors. Implementing bulk and design standards loosely delimit the public and domestic realms though the application of layers and front-to-back discipline of lots. Along arterial roadways, commercial corridors of varying intensities emerge over time with a high-quality built environment typified by a mix of building types and a balance between automobile-oriented and pedestrian-oriented design. The physical intensity of development along arterial corridors varies based on the surrounding residential density and the roadway's place in the transportation network. New development should accompany concurrent extension of complete urban services. Parking is provided on-site by private land users, supplemented by on-street spaces.

Implementing Districts

Neighborhood-Large Lot CD-3L
Neighborhood CD-3
General Urban-Corridor CD-4C (only along Arterial roadways)
Manufactured Home Park SD-MHP
Residential PUD PUD-R
Mixed Use PUD PUD-MU
Civic CV

Implementing Standards

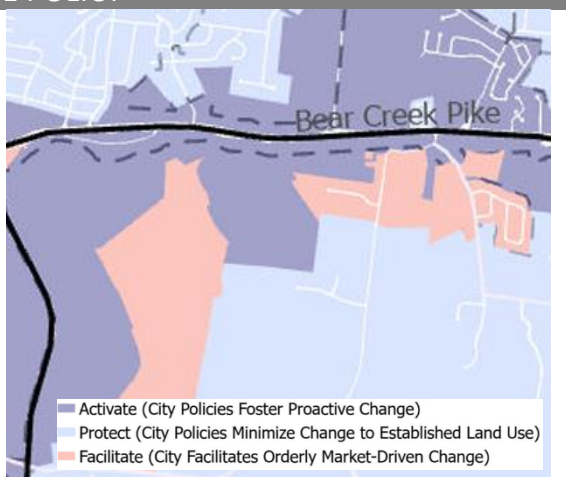
General Development Pattern: Mixed Uses & Isolated Uses
Density (density unites per ace): 4 - 24 du/ac
Building Height: 1 - 4 stories
Open Space Elements: Civic Spaces, Parks & Greenways





AREAS OF CHANGE POLICY

Connect Columbia established the Areas of Change Policy designation for the subject site as Facilitate. The classification indicates abasically neutral position to market-driven requests to amend the official zoning map. Change in these areas is market-driven. New and infill development should maintain or improve the level of service for municipal services. City policies facilitate change through a process of public deliberation and high standards for the built environment. (Connect Columbia p. 32).



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-E.**
    - 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-4C bulk and site standards listed in **Table 4.3.1-E** 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.**

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 original request was inconsistent with the comprehensive plan. The applicant subsequently revised the request to seek a zoning classification which implements the future land use.
- **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.

COMMENTARY FROM PROFESSIONAL PLANNING STAFF

The requested CD-4 zoning is consistent with Connect Columbia. 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. As discussed above, the subject site's future land use classification is Suburban Neighborhoods and the property is located along a roadway classified as an arterial on the functional classification map.

Development of the property depends on approval of the related PUD request. Access to the site depends on construction of a bridge across Bear Creek and alignment with Patterson Drive. Any subsequent site development plan will require construction of this costly infrastructure. The economic viability of such infrastructure likely requires development of the larger site. In response to technical comments, the applicant indicated that it would not proceed with this project if the PUD is not approved. Planning staff has urged the applicant to consolidate these requests and include the subject property in the Preliminary PUD Master Plan.

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.

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.

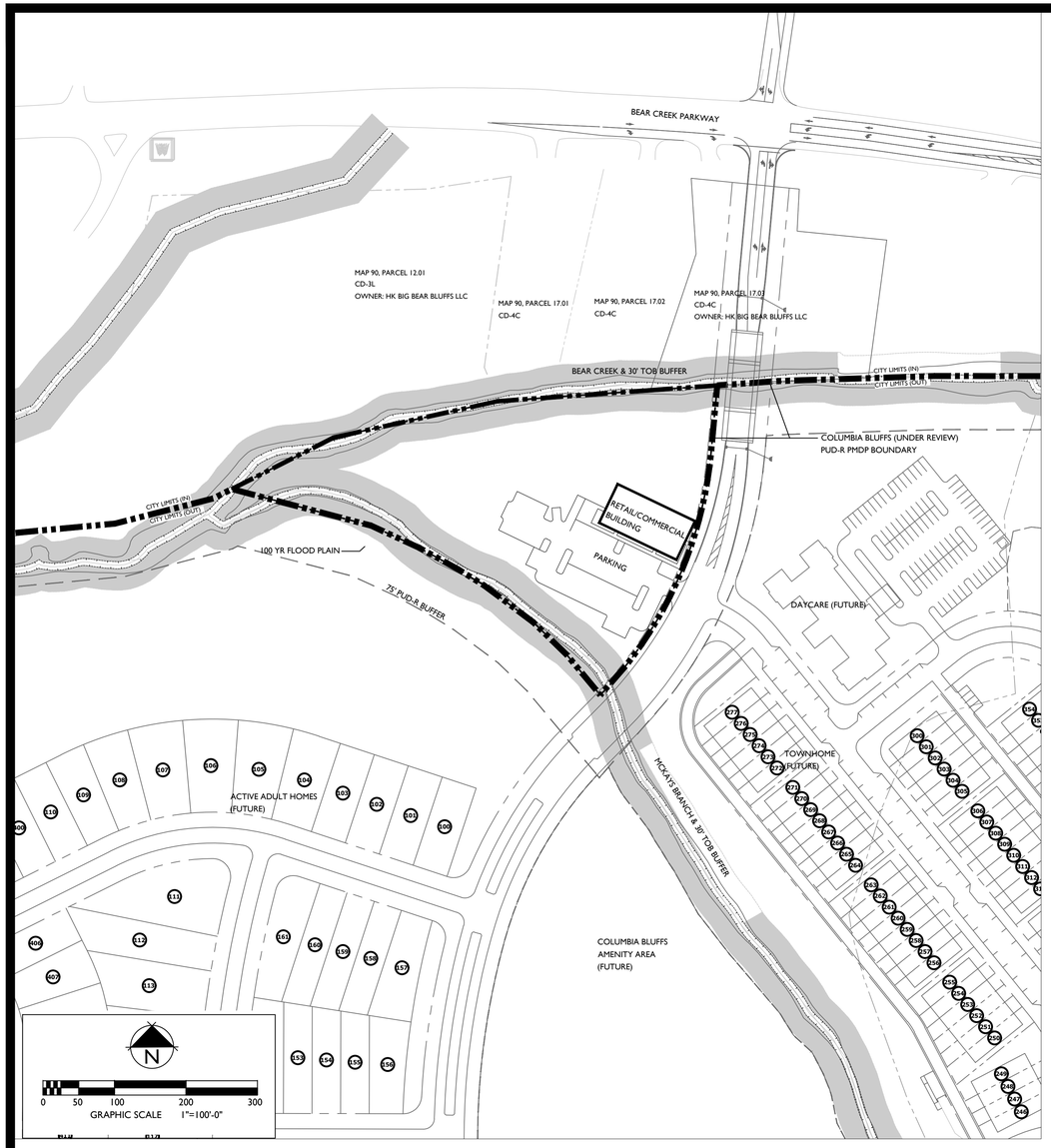
I. Power

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.



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 (R2878, 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°31'10" 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-4C 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

CONCEPTUAL PLAN CD-4C DESIGN CRITERIA:

GROSS SITE AREA: +/-3.36 AC

7,200 SF NON-RESIDENTIAL BUILDING (60'X120')

TOTAL IMPERVIOUS SURFACE RATIO: 80% MAX
MAXIMUM BUILDING SITE WIDTH: 200'

SETBACKS:
FRONT: 6' - 40'
SIDE: 0' 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)

ANNEXATION AND REZONING REQUEST:

REQUEST TO ANNEX +/-3.36 ACRES AND REZONE TO CD-4C
FUTURE LAND USE: SUBURBAN NEIGHBORHOOD (2018 CONNECT COLUMBIA) AND SUBURBAN NEIGHBORHOODS (2023 CONNECT COLUMBIA)

2018 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. The CD-4C parcels along Bear Creek Parkway offer limited space for neighborhood commercial services, and very limited options to access these parcels without entering Bear Creek Parkway. Allowing the expansion of commercial uses across Bear Creek will allow residents of the proposed Columbia Bluffs development to access limited commercial uses via a safe pedestrian route and local roadway.

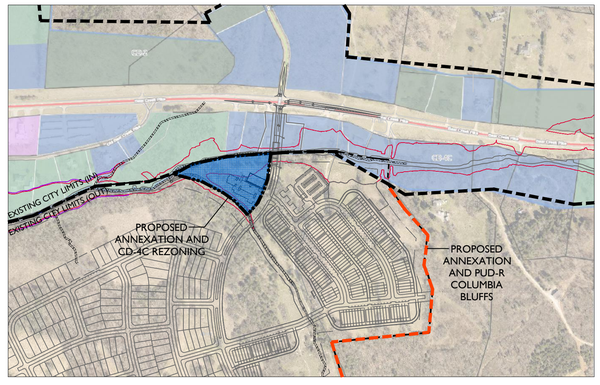
Suburban Neighborhood: Future development should emphasize connectivity and housing diversity. Additionally, new development should create a pedestrian-friendly environment by adding sidewalks and/or creating other pedestrian-friendly multiuse trail/bike routes linking current and future neighborhoods 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.

2023 CONNECT COLUMBIA FINDINGS:
Where appropriate, the SN future land use area also establishes mixed-use and commercial centers which serve residents' retail needs and provide a wider range of housing options.
Response: The Columbia Bluffs development is proposing 800 residential homes. As this development builds, small neighborhood serving commercial options should be available to residents. This parcel is immediately adjacent to CD-4C parcels and would seek to extend the land available for commercial development across Bear Creek so that it can be accessed from the main development road network instead of Bear Creek Parkway.

Along arterial roadways, primary uses may include offices, retail, and all forms of medium-density housing.
Response: The available land adjacent to Bear Creek Parkway and readily accessible to the future residents of Columbia Bluffs is very limited. One of these available parcels is being utilized for the entrance road to Columbia Bluffs and is no longer available for commercial development. By allowing the office and retail uses to extend to a small neighboring parcel, neighborhood serving commercial uses can still be developed adjacent to parcels which front the arterial roadway.

CD-4C REZONING REQUEST:

REQUESTED ZONING DISTRICT ADJACENT TO EXISTING CD-4C ZONED PARCELS ALONG BEAR CREEK PARKWAY.



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
2.20.24

Date: OCTOBER 16, 2023

Revision Date
1 February 20, 2024
2
3

CONCEPTUAL DEVELOPMENT PLAN

SHEET
L1.0

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 CD-4C Rezoning Request for a parcel of about 3 and a quarter acres between Bear Creek and MaKay's Branch, accessed from and adjacent to 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 CD-4C 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		2/22/2024
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	

February 20, 2024

Paul Keltner, Director
Development Services
City of Columbia, TN

RE: Project# 23-0421; Re-Submittal 400 Bear Creek Parkway – Annexation Request and CD4C Rezoning

Dear Mr. Keltner,
After coordination with staff, the applicant wishes to keep the existing Suburban Neighborhoods Land Use Policy (2023 Connect Columbia) and is requesting a CD-4C zoning district. 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 March 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)
2. Revised CD-4C Rezoning Request Conceptual Development Plan Sheet

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 has coordinated with staff and is now requesting a CD-4C zoning district, which is consistent with the Suburban Neighborhoods Future Land Use policy.
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.

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.

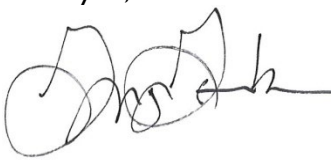
DEVELOPMENT PLANNING
DESIGN
MANAGEMENT

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

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

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

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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.

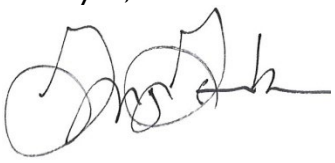
DEVELOPMENT PLANNING
DESIGN
MANAGEMENT

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

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.

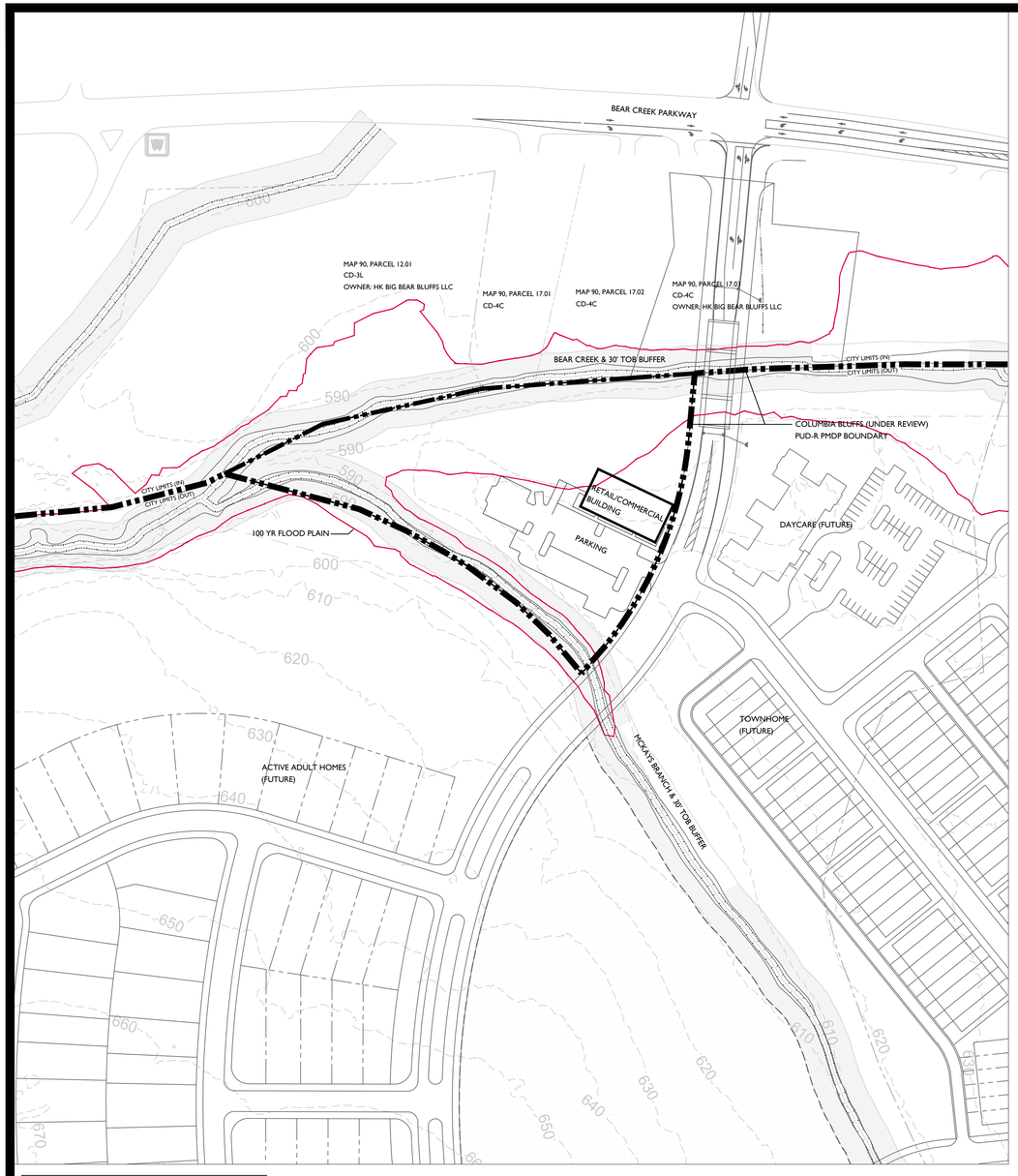
ATTACHMENTS: Concept Plan

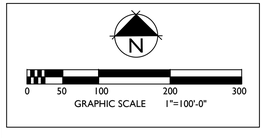
NOTE: All submittals shall be compliant with City standards prior to Planning Commission review. Items that are not adhering to the regulations and/or comments for that request will not be forwarded to the next agenda until such items are amended.

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	





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 — LANDSCAPE ARCHITECT

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

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 (R2878, 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:

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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

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.

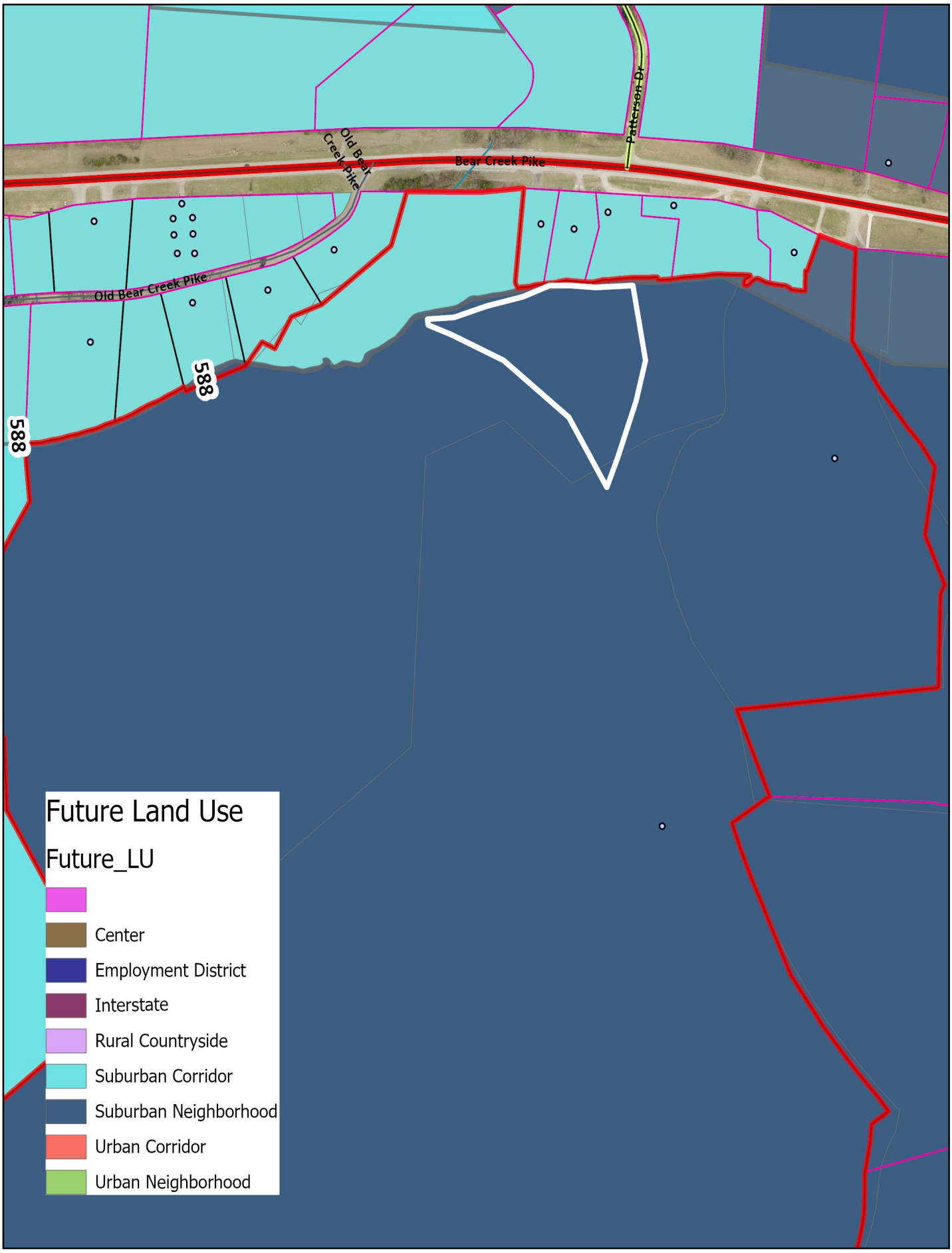
Greg Gamble		10/16/2023
APPLICANT NAME	APPLICANT SIGNATURE	DATE
HK Big Bear Bluffs LLC James P. Harvey		10/10/2023
PROPERTY OWNER NAME	PROPERTY OWNER SIGNATURE	DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	

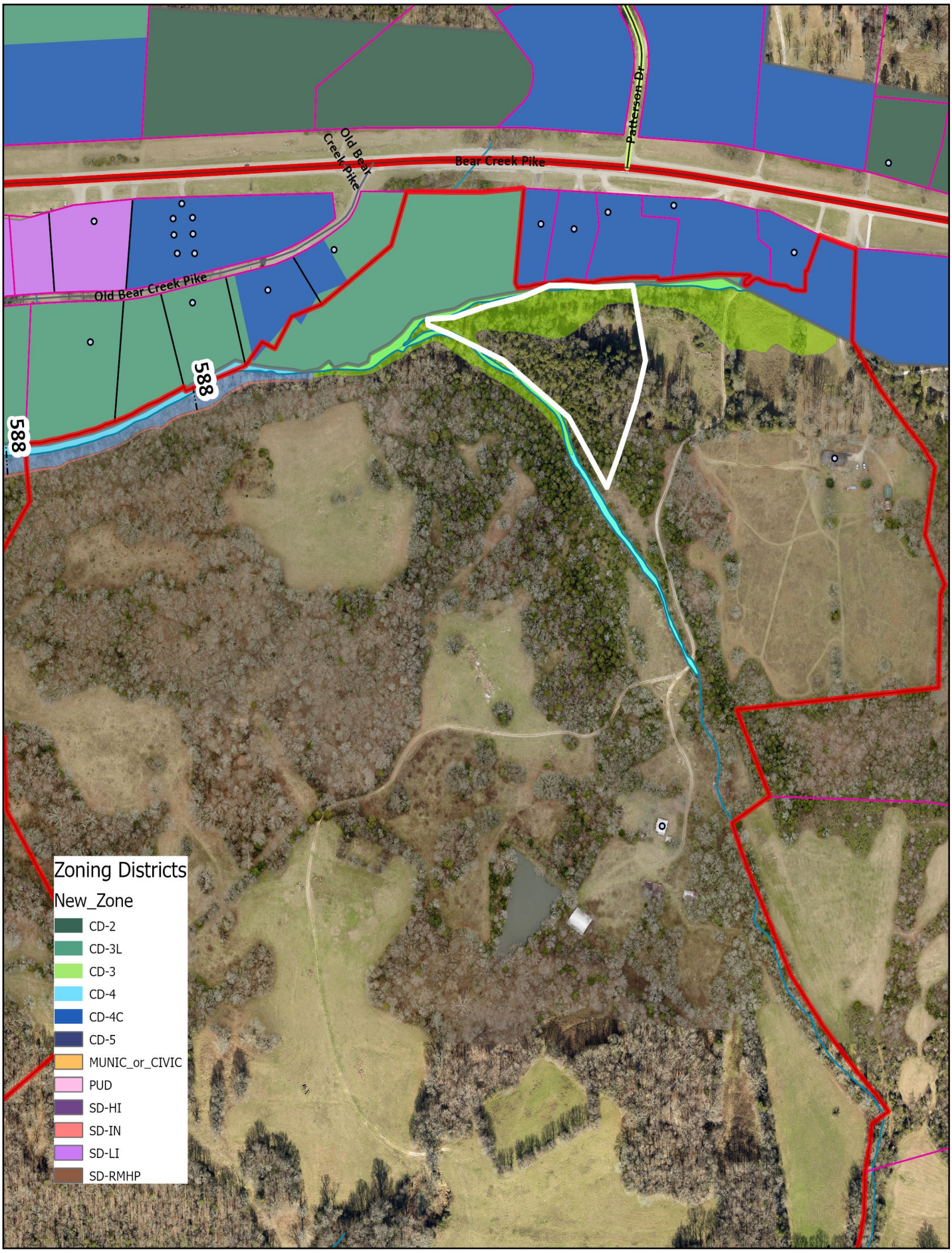
DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS	
DATE OF PUBLIC NOTICES IN DAILY HERALD	

BOARD ACTION	



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

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

Bowman Farm Annexation & Rezoning

Project #:	24-0031	Location:	Tax Map 72 Grp 5 Parcel 4, 4.01, 4.02
Applicant:	Josh Rowland	Case Type(s):	Annexation, CPA, Rezoning
Staff Planner:	Kevin C. McCarthy, AICP	Proposed Use:	Residential Subdivision

PROJECT SUMMARY

The applicant requests annexation with a plan of services of 55.1 acres east of I-65 on Bear Creek Pike. The applicant also requests an amendment to the future land use map of Connect Columbia, the comprehensive plan, from Rural Transitions to Suburban Neighborhood, as well as rezoning to CD-3 (Neighborhood Character District).

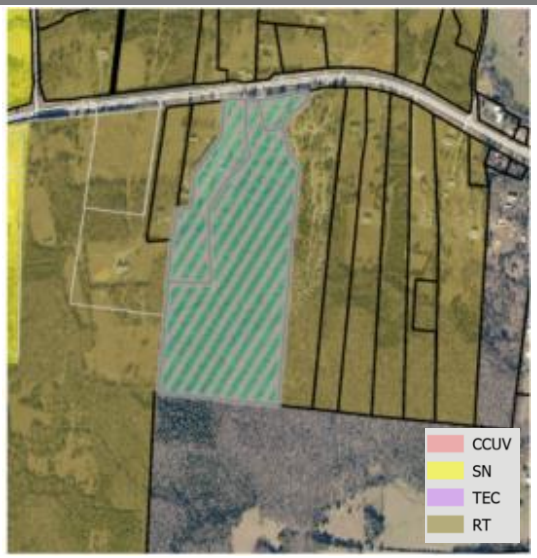
- Critical urban services, specifically fire protection, are not available to the subject site at this time.
- The request is inconsistent with policies and guiding principles outlined in Connect Columbia. Consequently, the request does not satisfy the criteria for a plan amendment at 8.5.20.f of the zoning ordinance.
- If the future land use map for the subject property were amended from Rural Transitions (fka Rural Countryside) to Suburban Neighborhoods (fka Suburban Neighborhood), the requested zoning would be consistent with the comprehensive plan.
- Without the amendment to the future land use map, the rezoning is inconsistent with the comprehensive plan and does not meet the criteria listed at 8.5.19.H.4.a. of the zoning ordinance.
- 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.

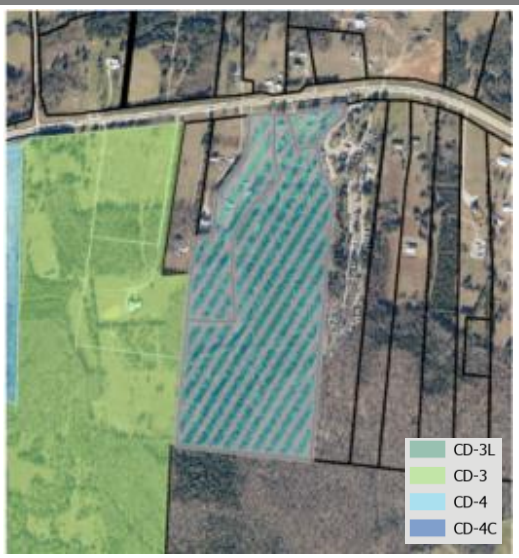
SITE INFORMATION

CURRENT ZONING	EXISTING USE	EXISTING IMP.	LAND AREA
Unincorporated	Vacant	Vacant	+/- 3.27



FUTURE LAND USE MAP	ZONING MAP





SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	Rural Transitions	Unincorporated	Residential
North	Rural Transitions	Unincorporated	Residential
South	Outside UGB	Unincorporated	Vacant
East	Rural Transitions	Unincorporated	Outdoor Recreation
West	Rural Transitions	CD-3	Residential (developing)

CONSISTENCY WITH CONNECT COLUMBIA

Rural Transition: The requested rezoning is not consistent with the future land use map. The future land use of the subject site is Rural Transition (RT). The RT future land use classification is comprised of unincorporated areas within Columbia's UGB as well as areas of low-intensity development. The area is characterized by very low density residential neighborhoods, large-lot semi-rural estates, open spaces, and legacy agricultural operations. The intent of the RT future land use classification is to create and maintain a discernable transition between agricultural uses in unincorporated Maury County and the suburban areas within Columbia. Future development is limited and emphasizes the preservation of agricultural uses, open spaces, and the semi-rural character of areas adjacent to the city. Natural and scenic features, such as rolling hills, rivers, rock outcroppings, and historic homes should be preserved. The applicant has requested an amendment to the future land use map to designate the property Suburban Neighborhoods (SN). The requested CD-3 (Neighborhood Character District) is consistent with the requested SN future land use classification.

Character & Intent

The Rural Transition (RT) future land use classification is comprised of unincorporated areas within Columbia's UGB as well as areas of low-intensity development. The area is characterized by very low-density residential neighborhoods, large-lot semi-rural estates, open spaces, and legacy agricultural operations. The intent of the RT future land use classification is to create and maintain a discernable transition between agricultural uses in unincorporated Maury County and the suburban areas within Columbia.

Future development is limited and emphasizes the preservation of agricultural uses, open spaces, and the semi-rural character of areas adjacent to the city. Natural and scenic features, such as rolling hills, rivers, rock outcroppings, and historic homes should be preserved.



Land Use Considerations

The primary land use is very low-density detached housing. Secondary land uses include accessory dwellings, low-intensity agricultural operations, utility facilities, civic spaces, parks, and open space. New mixed-use, medium-density residential, commercial, industrial and warehouse uses are inappropriate

Form & Pattern

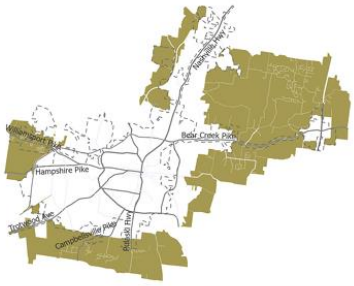
The RT future land use area is characterized by single-family detached residential areas and legacy agricultural operations. Implementing bulk and design standards prescribe large lots with very deep setbacks. In contrast to other areas, site and design requirements are minimal. Public frontages are insignificant and the delineation of public and private space is imprecise. Lots and roadways generally do not form blocks; however, large blocks become discernable in proximity to areas under other land use classifications. Complete urban services may not be available. Annexations and rezonings are inappropriate without concurrent extensions of urban services. Private land users provide their own parking.

Implementing Districts

Rural Character District CD-2
Civic CV

Implementing Standards

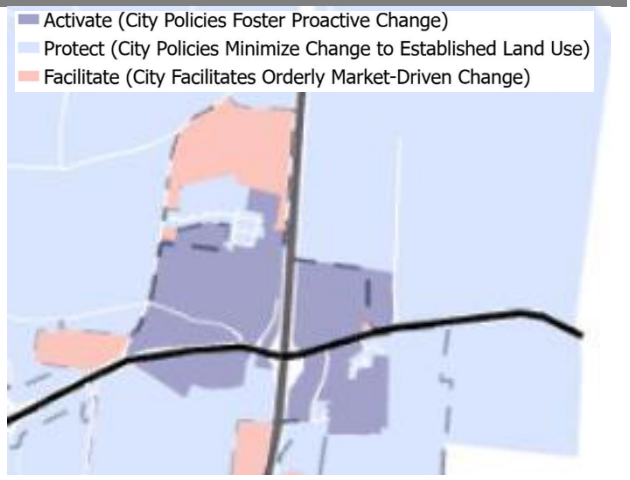
General Development Pattern: Isolated Uses
Density (density unites per ace): 1 du/ac
Building Height: 1-3 stories
Open Space Elements: Parks & Greenways, Occasional Civic Spaces, Private Yards





AREA OF CHANGE

Connect Columbia established the areas of change policy designation for the subject site as *protect*. The designation includes areas which are not expected to experience significant change in character. Occasional new or infill development within these areas may enhance quality of place and improve connectivity and transportation options. However, the land use pattern is established and major changes or intense development should provide clear public benefits. Review processes should emphasize compatibility and adequacy of municipal services.



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 may be 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-C.**
    - The plan depicts a mix of residential lots. Most are alley served lots with 47' of frontage, others are 80' wide estate lots.
    - The concept depicts tree save areas and civic spaces as required by **§ 4.3.16.L** and **§ 5.3.1** 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 consistency 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 was Rural Countryside.

- The 2024 version of Connect Columbia, adopted on February 8, 2024, places the subject property in the Rural Transitions future land use classification. The future land use classification is implemented by CD-2.
- The requested zoning is not consistent with the comprehensive plan.

- **The proposed annexation and rezoning is not consistent with the policies of connect Columbia**
  - The Zoning Ordinance outlines the review process for amendments to the comprehensive plan at **§ 8.5.20**.
  - The applicant requests an amendment to the future land use map within the Comprehensive Plan.
  - **§ 8.5.20.f.1** requires the Planning Commission to determine that all proposed plan amendments are consistent with the intent, goals, objectives, policies, and guiding principles of the plan.
  - A guiding principle of the plan is that Columbia is steadfast, meaning that "new development is cohesive and compatible" (Connect Columbia, p.16).
  - The plan outlines policies for future growth including *concurrency,* ensuring "that Columbia does not outgrow its capacity to provide services" (p. 31). Specifically, the plan indicates that "**the City shall not annex any new territory into the corporate limits of Columbia without a plan for the expansion of urban services concurrent with development. Similarly, the future land use map shall not be amended and land shall not be rezoned without a plan for concurrent urban services sufficient for the intensity of development permitted by the Zoning Ordinance for the proposed zoning designation**" (Connect Columbia, p. 16).
  - The subject property is located more than 10 miles from City Hall, well outside the traditional core of Columbia. It is also located east of the urban village emerging around the I-65 interchange. The "leap frog" pattern of development is not cohesive and compatible with the overall pattern of development.
  - The Fire Marshal has indicated that Columbia Fire and Rescue does not have current capacity in its system to provide adequate fire protection to the subject site.
  - Without a commitment from the developer to expand the response range of Columbia Fire and Rescue, the requested annexation and plan amendment is not consistent with the plan's policy of concurrency.
  - As a result, the annexation and rezoning does not conform to the requirements of the zoning ordinance at **§ 8.5.20.f.1.**

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 **8.5.20.f** of the Zoning Ordinance establishes the review criteria for approval of all changes to the future land use map, which is part of Connect Columbia, the 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;

[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."

4. *Whether conditions affecting the area have changed to a sufficient extent to warrant the*
5. *proposed change; and*
6. *Whether the subject parcel is of adequate shape and size to accommodate the proposed change.*

SUMMARY OF DEVELOPMENT REVIEW COMMITTEE COMMENTS

The DRC reviewed this proposal at its February 2024 meeting. A full list of comments, and the applicant's responses, is provided in the agenda packet. Some key comments are noted below.

- **Planning** 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.
- **Wastewater** indicated that capacity exists to serve the site, however, any future development of the property will require significant investment on the part of the developer to create a pump station on the north side of Bear Creek Pike. The applicant responded with a suggestion that the city fund these improvements with a per-dwelling unit fee spread across multiple developers.
- Other 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.
- **Maury County Schools** provided a standard comment indicating that the property is districted for Howell Elementary, Cox Middle School, and Battle Creek High School. 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.
- The **Fire Marshal** indicated that the subject property is too far from the nearest fire station. Columbia Fire & Rescue cannot serve the property with its existing capacity. The applicant believes this assessment is incorrect and provided "fire access map" indicating that points on the adjacent property, already in the city limits, are approximately 528 feet farther from the Fire Station #3 than the subject property.

COMMENTARY FROM PROFESSIONAL PLANNING STAFF

The requested CD-3 zoning is not consistent with Connect Columbia. As discussed above, the subject site's future land use classification is Rural Transitions (RT). The requested CD-3 zoning does not implement the RT future land use. 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.

The requested comprehensive plan amendment is not consistent with the guiding principles and policies of Connect Columbia. Section **8.5.20.f** requires the Planning Commission to determine the plan amendment is in agreement with the guiding principles and policies of the Connect Columbia prior to approval. Concurrent urban services, specially fire protection, are not available to support the requested Suburban Neighborhoods 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** and **8.5.20.f** 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** and **8.5.20.f** 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.

Kevin McCarthy

From: Rowland, Josh <Josh.Rowland@kimley-horn.com>
Sent: Tuesday, March 12, 2024 9:55 AM
To: Kevin McCarthy
Cc: Paul Keltner; Sandra Richardson; Melissa Sanders; Robertson, Andrew; Lang, Decker; Harrison, Gray
Subject: [Caution External Email] - RE: Bear Creek Pike Annexation

Kevin,
The Fire Department has a meeting scheduled this Thursday to discuss the 5-mile service plan analysis that was sent in with our Annexation application resubmittal and outlined in our response letter. We are also continuing to work with the Wastewater department on a scenario to serve the project through Dabbs. We are requesting the application for Planning Commission be deferred to the 4/10 meeting date.

Please confirm this is acceptable with Planning Staff.

Thanks,

Josh Rowland, PLA | Planning & Landscape Architecture
Kimley-Horn | 10 Lea Avenue, Suite 400, Nashville, Tennessee 37210
Direct: 615-823-2209 | Main: 615-564-2701 | Mobile: 303-345-1555
Connect with us: Twitter | LinkedIn | Facebook | YouTube

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From: Kevin McCarthy <kmccarthy@columbiatn.com>
Sent: Thursday, January 18, 2024 9:11 AM
To: Rowland, Josh <Josh.Rowland@kimley-horn.com>
Cc: Paul Keltner <paul@columbiatn.com>; Sandra Richardson <srichardson@columbiatn.com>; Melissa Sanders <msanders@columbiatn.com>
Subject: Re: Bear Creek Pike Annexation

Thank you, Josh.

Thanks!

Kevin C. McCarthy, AICP

City Planner

700 N. Garden Street

Columbia, TN 38401

Office Phone: 931.560.1531

kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com>

[City Logo-Email2]

_____
From: Rowland, Josh <Josh.Rowland@kimley-horn.com>
Sent: Thursday, January 18, 2024 8:22 AM
To: Kevin McCarthy
Cc: Paul Keltner
Subject: [Caution External Email] - RE: Bear Creek Pike Annexation

Kevin,

Here is our sewer letter for the submittal.

Thanks,

Josh Rowland, PLA | Planning & Landscape Architecture
Kimley-Horn | 10 Lea Avenue, Suite 400, Nashville, Tennessee 37210
Direct: 615-823-2209 | Main: 615-564-2701 | Mobile: 303-345-1555

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YouTube<http://www.youtube.com/user/KimleyHornAssociates>

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From: Kevin McCarthy <kmccarthy@columbiatn.com>
Sent: Thursday, January 18, 2024 12:13 AM
To: Rowland, Josh <Josh.Rowland@kimley-horn.com>
Cc: Paul Keltner <paul@columbiatn.com>
Subject: RE: Bear Creek Pike Annexation

Josh,

Yes, the applicant can proceed to City Council with a negative recommendation from Planning Commission. However, in

that situation, the City Council needs a majority of its entire membership to vote to override the Planning Commission recommendation (at least 4 members) regardless of the size of the quorum present.

Thanks!

Kevin C. McCarthy, AICP

City Planner

From: Rowland, Josh <Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com>>
Sent: Wednesday, January 17, 2024 1:16 PM
To: Kevin McCarthy <kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com>>
Subject: [Caution External Email] - RE: Bear Creek Pike Annexation

Kevin,

I got a question from the developer regarding the Planning Commission process. If we end up getting denied at Planning Commission, do we have the option of proceeding to City Council? If so, do we have to get a higher percentage of the vote to pass?

Thanks,

Josh Rowland, PLA | Planning & Landscape Architecture
Kimley-Horn | 10 Lea Avenue, Suite 400, Nashville, Tennessee 37210
Direct: 615-823-2209 | Main: 615-564-2701 | Mobile: 303-345-1555

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From: Kevin McCarthy <kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com>>
Sent: Tuesday, January 16, 2024 3:01 PM
To: Rowland, Josh <Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com>>; Sandra Richardson <srichardson@columbiatn.com<mailto:srichardson@columbiatn.com>>; Melissa Sanders <msanders@columbiatn.com<mailto:msanders@columbiatn.com>>
Cc: Austin Brass <abrass@columbiatn.com<mailto:abrass@columbiatn.com>>; Irby, William <William.Irby@kimley-horn.com<mailto:William.Irby@kimley-horn.com>>
Subject: Re: Bear Creek Pike Annexation

Josh,

These look higher than we will charge. If the requests run concurrently as one case, we'll only charge once for publication and mailing. You will also get a credit of $225 for the pre-app fee. We will review and send an invoice for the application fee. Yes, it's best to have the invoice number if you pay at the recorder's office. We do usually drop a copy in a shared file when we send the invoice to the applicant, so they should be able to find it by project name. You will also be able to pay online AFTER we do the completeness review and adjust the fees.

Thanks!

Kevin C. McCarthy, AICP

City Planner

700 N. Garden Street

Columbia, TN 38401

Office Phone: 931.560.1531

kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com>>

_____

From: Rowland, Josh <Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com>>
Sent: Tuesday, January 16, 2024 9:14 AM
To: Kevin McCarthy; Sandra Richardson; Melissa Sanders
Cc: Austin Brass; Irby, William
Subject: [Caution External Email] - RE: Bear Creek Pike Annexation

Kevin,

Would you also mind confirming that the attached fee summary is accurate? Do I need an application # to reference

when I call to make the payment?

Thanks,

Josh Rowland, PLA | Planning & Landscape Architecture
Kimley-Horn | 10 Lea Avenue, Suite 400, Nashville, Tennessee 37210
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From: Kevin McCarthy <kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com>>
Sent: Tuesday, January 16, 2024 7:57 AM
To: Rowland, Josh <Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com>>; Sandra Richardson <srichardson@columbiatn.com<mailto:srichardson@columbiatn.com>>; Melissa Sanders <msanders@columbiatn.com<mailto:msanders@columbiatn.com>>
Cc: Austin Brass <abrass@columbiatn.com<mailto:abrass@columbiatn.com>>; Irby, William <William.Irby@kimley-horn.com<mailto:William.Irby@kimley-horn.com>>
Subject: Re: Bear Creek Pike Annexation

Good morning, Josh. I will take a look and see what the issue is.

Kevin M.

_____

From: Rowland, Josh <Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com>>>
Sent: Tuesday, January 16, 2024 7:53 AM
To: Sandra Richardson; Melissa Sanders
Cc: Kevin McCarthy; Austin Brass; Irby, William
Subject: [Caution External Email] - RE: Bear Creek Pike Annexation

Sandra, Melissa and Austin,

We are trying to submit an annexation and rezoning today and your system isn't recognizing the parcels we are requesting annexation for.

Please advise on how to get the process started for the parcels below.

072 05402 000

072 05400 000

072 05401 000

55 acres total

Thanks,

Josh Rowland, PLA | Planning & Landscape Architecture
Kimley-Horn | 10 Lea Avenue, Suite 400, Nashville, Tennessee 37210
Direct: 615-823-2209 | Main: 615-564-2701 | Mobile: 303-345-1555

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From: Rowland, Josh
Sent: Tuesday, January 9, 2024 3:50 PM
To: Sandra Richardson <srichardson@columbiatn.com<mailto:srichardson@columbiatn.com<mailto:srichardson@columbiatn.com%3cmailto:srichardson@columbiatn.com>>>; Melissa Sanders <msanders@columbiatn.com<mailto:msanders@columbiatn.com<mailto:msanders@columbiatn.com%3cmailto:msanders@columbiatn.com>>>
Cc: Kevin McCarthy <kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com>>>; Austin Brass

<[abrass@columbiatn.com<mailto:abrass@columbiatn.com<mailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com>>>; Irby, William <[William.Irby@kimley-horn.com<mailto:William.Irby@kimley-horn.com<mailto:William.Irby@kimley-horn.com%3cmailto:William.Irby@kimley-horn.com>>>
Subject: FW: Bear Creek Pike Annexation

Sandra and Melissa,

A colleague (William Irby CC'd) and I recently created an account on the portal and were attempting to start an annexation and rezoning application. The system would not recognize the three applicable parcels listed below. Can you help me with this error?

072 05402 000

072 05400 000

072 05401 000

55 acres total

Also, can you confirm the Annexation/Rezoning Checklist requirements for me?

1. Written Legal Description (this is not an ALTA or formal survey, correct?)
2. Requested Zone Listed
3. Comp Plan Compliance statement or requested amendment
4. Annexation Permission form
5. Sketch Development Plan
6. CPWS availability letter

Also wanting to confirm the Fees for this 55 Acre project.

Thanks,

Josh Rowland, PLA | Planning & Landscape Architecture
Kimley-Horn | 10 Lea Avenue, Suite 400, Nashville, Tennessee 37210
Direct: 615-823-2209 | Main: 615-564-2701 | Mobile: 303-345-1555

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horn-and-associates-inc.%3chttp:/www.linkedin.com/company/kimley-horn-and-associates-inc.>>> | Facebook<https://www.facebook.com/KimleyHorn<https://www.facebook.com/KimleyHorn<https://www.facebook.com/KimleyHorn%3chttps:/www.facebook.com/KimleyHorn>>> | YouTube<http://www.youtube.com/user/KimleyHornAssociates<http://www.youtube.com/user/KimleyHornAssociates<http://www.youtube.com/user/KimleyHornAssociates%3chttp:/www.youtube.com/user/KimleyHornAssociates>>>

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From: Rowland, Josh
Sent: Monday, November 20, 2023 2:37 PM
To: Kevin McCarthy <kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com>>>>
Cc: Harrison, Gray <Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com>>>>; Frank, Kelley <Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com>>>>; Austin Brass <abrass@columbiatn.com<mailto:abrass@columbiatn.com<mailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com<mailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com>>>>; Paul Keltner <paul@columbiatn.com<mailto:paul@columbiatn.com<mailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com<mailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com>>>>
Subject: RE: Bear Creek Pike Annexation

Can you confirm the Annexation/Rezoning Checklist requirements for me?

1. Written Legal Description (this is not an ALTA or formal survey, correct?)
2. Requested Zone Listed
3. Comp Plan Compliance statement or requested amendment
4. Annexation Permission form
5. Sketch Development Plan
6. CPWS availability letter

Thanks,

Josh Rowland, PLA | Planning & Landscape Architecture

Kimley-Horn | 10 Lea Avenue, Suite 400, Nashville, Tennessee 37210
Direct: 615-823-2209 | Main: 615-564-2701 | Mobile: 303-345-1555

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From: Kevin McCarthy <kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com>>>>
Sent: Monday, November 20, 2023 2:27 PM
To: Rowland, Josh <Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com>>>>
Cc: Harrison, Gray <Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com>>>>; Frank, Kelley <Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com>>>>; Austin Brass <abrass@columbiatn.com<mailto:abrass@columbiatn.com<mailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com<mailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com>>>>; Paul Keltner <paul@columbiatn.com<mailto:paul@columbiatn.com<mailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com<mailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com>>>>
Subject: RE: Bear Creek Pike Annexation

Yes, of course. However, due to longer public notice requirements in state law for comprehensive plan updates, the first reading will actually be at the Council meeting in January 2024.

Thanks!

Kevin C. McCarthy, AICP

City Planner

From: Rowland, Josh <Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com>>>>
Sent: Monday, November 20, 2023 1:13 PM
To: Kevin McCarthy <kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com>>>>
Cc: Harrison, Gray <Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com>>>>; Frank, Kelley <Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com>>>>; Austin Brass <abrass@columbiatn.com<mailto:abrass@columbiatn.com<mailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com<mailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com>>>>; Paul Keltner <paul@columbiatn.com<mailto:paul@columbiatn.com<mailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com<mailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com>>>>
Subject: [Caution External Email] - RE: Bear Creek Pike Annexation

Kevin,

Can the seller make public comment at the work session and the formal meeting?

Thanks,

Josh Rowland, PLA | Planning & Landscape Architecture
Kimley-Horn | 10 Lea Avenue, Suite 400, Nashville, Tennessee 37210
Direct: 615-823-2209 | Main: 615-564-2701 | Mobile: 303-345-1555

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YouTube<http://www.youtube.com/user/KimleyHornAssociates<http://www.youtube.com/user/KimleyHornAssociates<http://www.youtube.com/user/KimleyHornAssociates%3chttp:/www.youtube.com/user/KimleyHornAssociates>>>

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Sent: Tuesday, November 14, 2023 11:23 PM
To: Rowland, Josh <Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com>>>>
Cc: Harrison, Gray <Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com>>>>; Frank, Kelley <Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com>>>>; Austin Brass <abrass@columbiatn.com<mailto:abrass@columbiatn.com<mailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com<mailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com>>>>; Paul Keltner <paul@columbiatn.com<mailto:paul@columbiatn.com<mailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com<mailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com>>>>
Subject: RE: Bear Creek Pike Annexation

Josh,

The Planning Commission recommended adoption of the proposed FLUM at its November meeting. First consideration

at City Council is in December. Public comment at the council meeting is the opportunity to suggest changes to the document as a whole. Your client can also apply to amend the FLUM for a specific parcel.

Thanks!

Keivn C. McCarthy, AICP

City Planner

From: Rowland, Josh <Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com>>>>
Sent: Monday, November 13, 2023 8:29 AM
To: Kevin McCarthy <kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com>>>>
Cc: Harrison, Gray <Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com>>>>; Frank, Kelley <Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com>>>>; Austin Brass <abrass@columbiatn.com<mailto:abrass@columbiatn.com<mailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com<mailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com%3cmailto:abrass@columbiatn.com>>>>; Paul Keltner <paul@columbiatn.com<mailto:paul@columbiatn.com<mailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com<mailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com%3cmailto:paul@columbiatn.com>>>>
Subject: [Caution External Email] - RE: Bear Creek Pike Annexation

Kevin,

My client is interested in CD-3 for these parcels. The draft future land use map isnt aligned with the sewer service area map showing devleopment in these areas. What is the best way to discuss getting properties added to the suburban subdivision category before the map gets finalized to be better aligned with the sewer capacity studied/allocated for this area?

[cid:image001.png@01DA4851.183E5520]

[cid:image002.png@01DA4851.183E5520]

Thanks,

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Sent: Saturday, November 11, 2023 3:58 PM
To: Rowland, Josh <Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com>>>>
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ilto:abrass@columbiatn.com>>>>
Subject: RE: Bear Creek Pike Annexation

Hi Josh. How does the client intend to develop the site? The property is within our UGB and contiguous with property inside Columbia. It is possible to request annexation. However, it is probably going to be a difficult request. Anything more intense than CD-2 (1 du/ac) will require a Future Land Use Map amendment. Eastward expansion beyond I-65 is limited by the range of fire protection. The developer will also need to extend sewer/water service to the site. Even if the annexation is successful, development of the site will be subject to the standards of the current zoning ordinance which require tree preservation and a network of complete thoroughfares. Those requirements will significantly reduce the developable area of the site. So, it's possible, but it will probably be difficult and expensive.

Thanks!

Kevin C. McCarthy, AICP

City Planner

From: Rowland, Josh <Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com<mailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com%3cmailto:Josh.Rowland@kimley-horn.com>>>>
Sent: Tuesday, November 7, 2023 11:50 AM
To: Kevin McCarthy <kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com<mailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com%3cmailto:kmccarthy@columbiatn.com>>>>
Cc: Harrison, Gray <Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com<mailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com%3cmailto:Gray.Harrison@kimley-horn.com>>>>; Frank, Kelley <Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com<mailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com%3cmailto:Kelley.Frank@kimley-horn.com>>>>
Subject: [Caution External Email] - Bear Creek Pike Annexation

Kevin,

I wanted to get your input on this potential annexation before scheduling a pre-application meeting. Is an annexation feasible given the current adjacency to the city limits?

Thanks,

Josh Rowland, PLA | Planning & Landscape Architecture
Kimley-Horn | 10 Lea Avenue, Suite 400, Nashville, Tennessee 37210
Direct: 615-823-2209 | Main: 615-564-2701 | Mobile: 303-345-1555

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PLAN OF SERVICES

FOR ANNEXATION

1748-1774 BEAR CREEK PIKE PROPERTY

+/-55.1 ACRES,

BEING

TAX MAP 072 PARCEL 400,401, 402

Fire Department Concern: *Distance from Fire Station No. 3 to the location of the development.*

Fire Department Recommendation: *CFR does not support annexation of this property.*

A. Water

"The project is within Columbia Power and Water's service area. A water availability letter was issued on January 15, 2024, it remains valid for 120 days. 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.

Requirements for this development are laid out in the Availability Letter: "The Sanitary Sewer Pump Station for this development shall be located off-site, across and north of Bear Creek Pike. Easements and property

acquisition is required to do so. The Pump Station shall be located such a manner as to allow the surrounding properties to be able to have sanitary sewer that can gravity flow to the Station. The station shall be seized for that sewer shed as well. The Station and its plans may need to be designed and/or reviewed by the City of Columbia's Engineers of Record."

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 1748, 1768, 1770, and 1774 Bear Creek Pike in Columbia, Tennessee. This location is approximately 5.7 miles from Columbia Fire Station #3 located at 705 Firefighter Drive, 10.1 miles from Fire Station #1 located at 1000 South Garden in downtown Columbia, and 10.7 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 5.5 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 5.5 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 5.5 minutes, the second fire apparatus should be on-scene within 5.5 minutes, and the third/fourth apparatus should be on-scene within 5.5 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 5.5 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-3 (Neighborhood 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

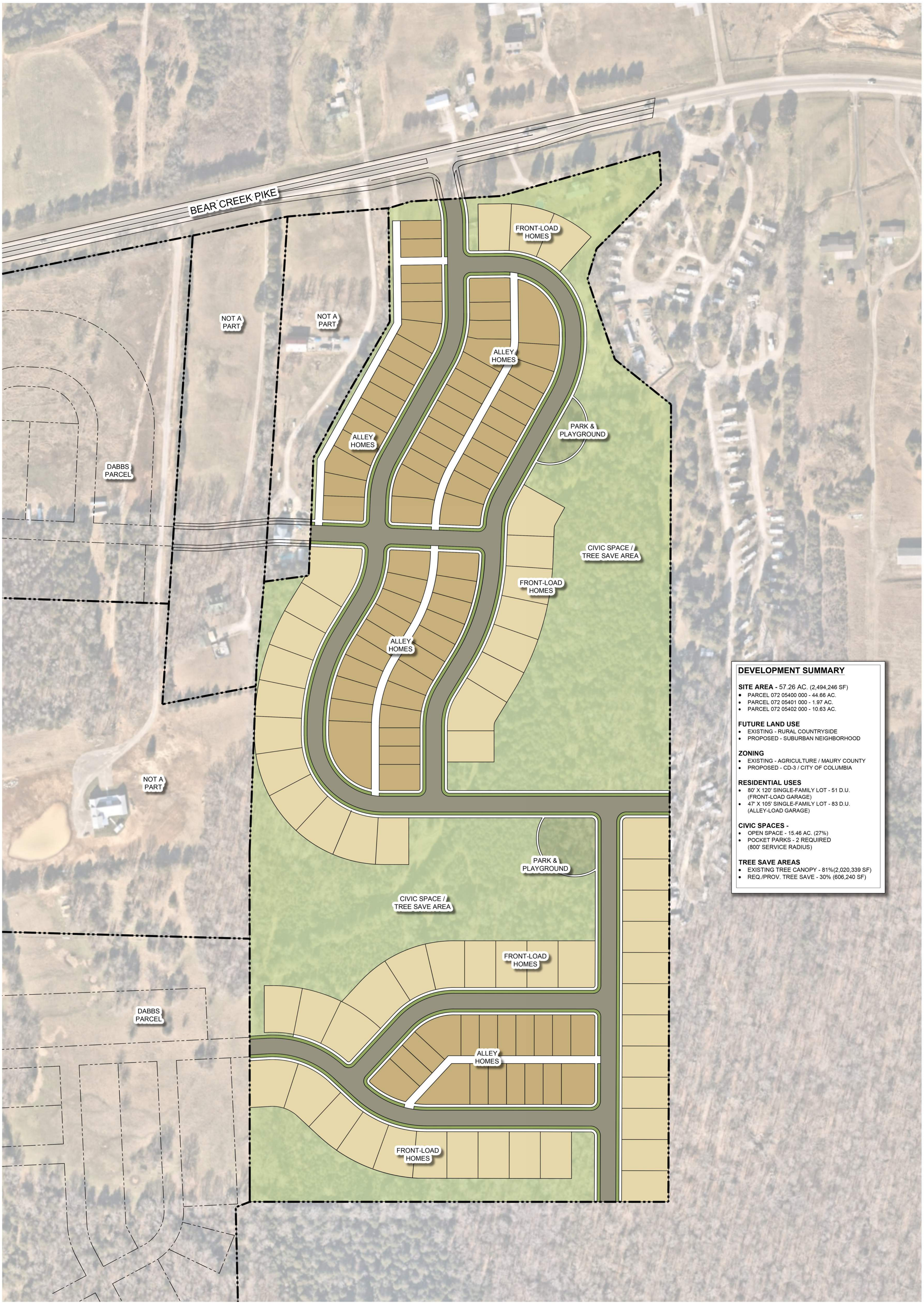
Single family homes will receive City of Columbia trashcan service.
Residential customers will be issued one 96-gallon garbage receptacle with the option to purchase up to two additional garbage receptacles. The Sanitation Department will provide weekly curbside garbage collection. Bi-weekly curbside 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.

I. Power

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.
Once all requirements are met, Duck River Electric Membership Corp. plan to serve. Need Final Plat and Subdivision requirements sent to cisley@dremc.com and thooper@dremc.com. Special note: Keep in mind supply chain issues may affect timeline in which we will be able to provide materials.

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 SUMMARY

SITE AREA - 57.26 AC. (2,494,246 SF)
- PARCEL 072 05400 000 - 44.66 AC.
- PARCEL 072 05401 000 - 1.97 AC.
- PARCEL 072 05402 000 - 10.63 AC.

FUTURE LAND USE
- EXISTING - RURAL COUNTRYSIDE
- PROPOSED - SUBURBAN NEIGHBORHOOD

ZONING
- EXISTING - AGRICULTURE / MAURY COUNTY
- PROPOSED - CD-3 / CITY OF COLUMBIA

RESIDENTIAL USES
- 80' X 120' SINGLE-FAMILY LOT - 51 D.U. (FRONT-LOAD GARAGE)
- 47' X 105' SINGLE-FAMILY LOT - 83 D.U. (ALLEY-LOAD GARAGE)

CIVIC SPACES -
- OPEN SPACE - 15.46 AC. (27%)
- POCKET PARKS - 2 REQUIRED (800' SERVICE RADIUS)

TREE SAVE AREAS
- EXISTING TREE CANOPY - 81%(2,020,339 SF)
- REQ./PROV. TREE SAVE - 30% (606,240 SF)

Kimley»Horn

Bowman Farm Property - Columbia, TN

CONCEPTUAL MASTER PLAN for RYAN HOMES

NORTH

February 19, 2024

0 50 100 200 300

CROSS-CONNECTIVITY TO REMOVE HOMES WITH SINGLE ACCESS POINT

5 MILE MARK FROM FIRE STATION No.3

DABBS SUBDIVISION

1.2 MILES FROM 5 MILE MARK ON BEAR CREEK PIKE

1.0 MILES FROM 5 MILE MARK VIA DABBS SUBD

1.3 MILES FROM 5 MILE MARK ON BEAR CREEK PIKE

1.0 MILES FROM 5 MILE MARK ON BEAR CREEK PIKE

Bear Creek Pike

24) Distribution Airbus DS © 2024 TomTom

Bowman Parcel - Fire Access Map

LAYOUT

February 16, 2024

0 250 500 1000

NORTH

Drawing name: K:\NSH_LDEV\118285005 – Bowman Farms\4–CADD\Exhibits\2024–02–16 Fire Access Map\Bowman Parcel – Fire Access Map.dwg Layout1 Feb 16, 2024 12:36pm by: claudia.forrester

BARKER ROAD

APPROXIMATE LOCATION OF PROPOSED SEWER LINE AND MANHOLES FROM TKG PLANS FOR DABBS SUBDIVISION PHASES 1-4 DATED 05/24/2023

APPROXIMATE LOCATION OF FORCE MAIN TO END AND GRAVITY SEWER TO START

RIM 698.85
INV IN: 683.80
INV OUT: 683.60

RIM 699.48
INV IN: 682.10
INV OUT: 681.90

BEAR CREEK PIKE

EXISTING LOW POINT

EXISTING HIGH POINT

FORCE MAIN SEWER

GRAVITY SEWER

CONSIDER RELOCATING TO NE CORNER

PARK W/ PLAYGROUND

APPROXIMATE PUMP STATION LOCATION

STORM WATER POND

85 UNITS
ALLEY HOMES
(47'x100')

CIVIC SPACE / TREE SAVE
(293,000 SF)

CONSIDER TAKING FM SOUTH AND EAST TO DABBS GRAVITY LINE

CIVIC SPACE / TREE SAVE
(315,000 SF)

53 UNITS
ESTATE HOMES
(80'x120')

DEVELOPMENT SUMMARY

ALLEY HOMES - 84 UNITS
(47'x100' UNITS W/ 2-CAR GARAGE)

ESTATE HOMES - 52 UNITS
(80'x120' UNITS W/ 2-CAR GARAGE)

SITE AREA - 55.1 Acres
(2,397,954 sq.ft.)

CIVIC SPACES -
POCKET PARKS - 2 REQUIRED (800' RADIUS)

TREE SAVE AREAS -
EXISTING TREE CANOPY - 82% (1,966,320 sq.ft.)
REQUIRED TREE SAVE - 30% (589,900 sq.ft.)

Kimley»Horn

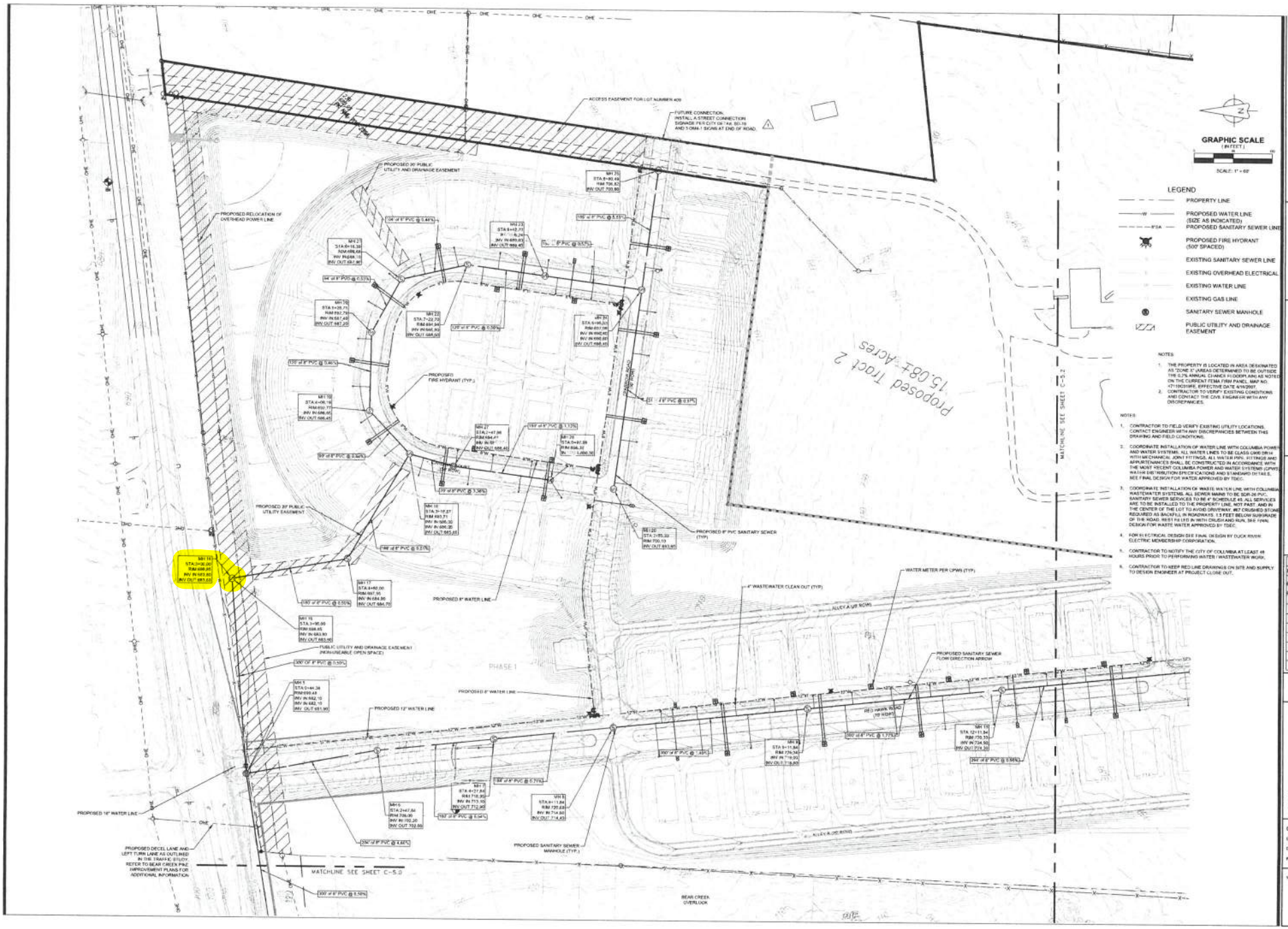
Bowman Farm Property - Columbia, TN

CONCEPTUAL SANITARY SEWER LAYOUT

NORTH

November 30, 2023

0 100 150 300 450



TKC
ARCHITECTURE
INTERIORS
CIVIL SITE

DABBS SUBDIVISION
PHASES 1 - 4

STATE OF TENNESSEE
COLE D. NEWTON
11/7/2023
COLE D NEWTON - TN
REG.#118292

Revision		
No.	Date	Description
1	07/31/23	PER CITY COMMEN
2	11/7/23	PER CITY/TDOT COMMENTS

UTILITY PLAN 2
(60-SCALE)

CONSTRUCTION PLANS
DATE: 07/24/2023
DRAWN BY: TS
PROJECT NO.: 2124

C - 5.1

Kimley»Horn

February 19, 2024

City of Columbia, TN
Development Services
700 N. Garden Street
Columbia, TN 38401

RE: Bowman Farms – Annex-Rezone Comment Response Letter

The purpose of this letter is to provide satisfactory answers to the comments/questions issued in a comment letter dated on February 13, 2024. The answers are listed below in **bold** and are preceded by the comments/questions listed in the original letter.

ITEM NO. 24-0031

DESCRIPTION: Annexation, Amend Future Land Use Plan from Rural Countryside to Suburban Neighborhood, and Rezone to CD-3.

Parcel - 072 05400 000 - 44.66 acres

Parcel - 072 05401 000 - 1.97 acres

Parcel - 072 05402 000 - 10.63 acres

57.26 acres total

Comments – Planning

Comment 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 1: **Noted.**

Comment 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.

Response 2: **Noted, this letter is provided to address the comments.**

Comment 3: Please be advised that due to longer notice requirements imposed by TCA 13-4-202, this request for amendment to the comprehensive plan will be on the City Council agenda two months following a recommendation by the Planning Commission.

Response 3: **Noted.**

Comment 4: A current water availability letter is required throughout the entitlement process. The current letter will expire on May 14, 2024. Presuming a timely resubmittal to technical comments and a favorable recommendation from the planning Commission in March, the second reading for this item at City Council will occur on June 13th. Consequently, 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 4: **Noted.**

Comment 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 5: Criteria 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.

Connect Columbia Guiding Principles:

Connection – Provide options for safe and efficient movement throughout the city by a variety of transportation modes on an interconnected network. **The proposed project and amendment to the future land use plan allows the extension of planned vehicular access from approved neighborhoods to Bear Creek Pike that will improve the dispersion of traffic patterns and provide first responders with better access to communities.**

Vitality – Columbia is a safe community with opportunities for healthy living at all stages of life, natural resources for the benefit of current and future residents, and high standards for the quality of the built environment.

The proposed project and amendment to the future land use plan allows for a high-quality planned development that preserves and places active recreation uses along a natural stream resource for the enjoyment of the future residents. Homes and amenities will have high standards for quality and design.

Steadfast – Columbia is a fiscally stable municipality where growth is economically sustainable, history is preserved, new development is cohesive and compatible, and the unique character of each neighborhood is celebrated.

The proposed project and amendment to the future land use plan proposes a community that will meet the growing demand for new high-quality single-family homes. This new development is cohesive and compatible with the neighboring Dabbs development with a similar lot size and density. The addition of alley homes will add a unique character to the development that is not found in surrounding communities.

Connect Columbia Goals & Objectives

Goal #1: Sustain the unique character of Columbia as it grows over time.

Objective 1.1 – Ensure a high-quality built environment

Objective 1.2 – Protect Columbia's natural assets and scenic views

The proposed project and amendment to the future land use plan allows for a high-quality planned development that preserves and places active recreation uses along a natural stream resource for the enjoyment of the future residents.

Goal #2: Accelerate Columbia's Future.

Objective 2.5 – Create a range of housing options for all households and income levels.

The proposed project and amendment to the future land use plan allows for a high-quality planned development that provides a housing option that compliments other options in the vicinity.

Goal #4: Invest in Columbia.
Objective 4.3 – Develop sustainable long-range plan for improved infrastructure and amenities.
The proposed project and amendment to the future land use plan allows for the consideration of a new regional sewer pump station that will support growth in the vicinity of the project.

Criteria 2 – Whether the proposed change would be compatible with the existing land use pattern and designated future land uses.
The current Comp Plan has mislabeled the adjacent Dabbs property as Rural Transition which borders the property for the proposed amendment. The Dabbs property is zoned as CD-3 (approved with 2.5 du/ac) which places it in the Suburban Neighborhood Category. The proposed Comp Plan land use map amendment is consistent and compatible with the adjacent Suburban Neighborhood/CD-3 character of the Dabbs Property

Criteria 3 – Whether the proposed change would create substantial adverse impacts in the adjacent area or the City in general.
The proposed project and amendment to the future land use plan allows for a high-quality planned development that does not create adverse impacts in the area by providing for the planned extension of an existing community while also providing for a second connection to Bear Creek Pike which will improve traffic circulation in the area.

Criteria 4 – Whether conditions affecting the area have changed to a sufficient extent to warrant the proposed change.
The proposed project and amendment to the future land use plan is in keeping with the ongoing progression of the development of single-family communities in the area.

Criteria 5 – Whether subject parcel is of adequate shape and size to accommodate the proposed change.
The proposed project and amendment to the future land use plan allows for a high-quality planned development is over 55 acres and is adequate to meet the zoning ordinance development criteria for a development of this type and nature.

Comment 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.

Response 6: **The adjacent Dabbs property is zoned as CD-3 (approved with 2.5 du/ac) which provides public road connections to expand similar development to the subject property. The proposed zoning amendment is consistent and compatible with the adjacent Suburban Neighborhood/CD-3 character of the Dabbs Property and will provide roof-tops to support the growing commercial corridor in the area.**

Comment 7: If you have not done so already, please obtain a will-serve letter from the Columbia Wastewater Department: https://www.columbiatn.com/FormCenter/Development-Services-12/Wastewater-WillServeLetter-Request-80 . Please include the letter with your resubmittal.

Response 7: **The City of Columbia Wastewater Department provided a will-serve letter dated January 12, 2024.**

Comments – Fire

Comment 8: The fire department would not support the annexation of this property. It is too far from the nearest fire station, over 5 miles.

Response 8: **A "Fire Access Map" is provided showing the location of the 5-mile mark along Bear Creek Pike. The lots proposed in the Bowman Farms Rezoning are equal in distance from the 5-mile mark to the lots located in the Dabbs development. The proposed rezoning also provides for a second point of access to Dabbs lots on dead-end streets. The project can be viewed as simply an extension of the Dabbs development that further improves access and provides redundancy for emergency service vehicles.**

Comments – Wastewater

Comment 9: 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 acceptance. Please contact the Wastewater Department for standard design details and equipment. Requirements for this development are laid out in the Availability Letter.

Response 9: **Coordination is currently ongoing with staff and a meeting has been requested to understand the Bear Creek and specifically, Pumpkin Creek Sewer basin and potential pump station within this area. Future growth, development, and demands are approximate and unknown at this time and it would be beneficial to strategically plan a sewer pump station location and design at a future date when a larger portion of the sewer basin or more contributing developments are being planned and designed. Design and installation at this time may require major revisions in the future. Since this subdivision would tie to any future pump station, the applicant proposes the analysis of cost estimates for the city's infrastructure (i.e., pump station and force main) to serve this sewer basin and identify per-dwelling unit fees in lieu of design and installation at this time."**

Comment 10: Requirements for this development are laid out in the Availability Letter: "The Sanitary Sewer Pump Station for this development shall be located off-site, across and north of Bear Creek Pike. Easements and property acquisition is required to do so. The Pump Station shall be located in such a manner as to allow the surrounding properties to be able to have sanitary sewer that can gravity flow to the Station. The station shall be sized for that sewer shed as well. The Station and its plans may need to be designed and/or reviewed by the City of Columbia's Engineers of Record."

Response 10: **Noted.**

Comments – Wastewater

Comment 11: No comments at this time on rezoning.

Response 11: **Noted.**

Comments – Maury County E911

Comment 12: No comments at this time on rezoning.

Response 12: **Noted.**

Comments – Maury County Schools

Comment 13: 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.

Response 13: **Noted.**

Comments – Columbia Power

Comment 14: 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.

Response 14: **Noted.**

Comments – Public Works

Comment 15: Single family homes will receive City of Columbia trashcan service. Please see attached Plan of Services.

Response 15: **Noted.**

Comments – Duck Rover Electric

Comment 16: Once all requirements are met, we plan to serve. Need Final Plat and Subdivision requirements sent to cisley@dremc and thooper@dremc.com. Special note: Keep in mind supply chain issues may affect timeline in which we will be able to provide materials.

Response 16: **Noted.**

Comments – ATT

Comment 17: ATT intends to serve.

Response 17: **Noted.**

Comments – Columbia Water

Comment 18: A water availability letter was issued on January 15, 2024, 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 18: **Noted.**

ATTACHMENTS:
Concept Plan, Fire Access Plan, Columbia Wastewater Will-Serve Letter

We appreciate your review and assistance. Further clarification on any of the items above may be found by emailing me at Josh.Rowland@kimley-horn.com, or by calling me at (615) 823-2209.

Sincerely,

Josh Rowland, P.L.A.
Kimley-Horn

CITY OF COLUMBIA
TENNESSEE

WASTEWATER DEPARTMENT

12 January 2024

Gray Harrison
4031 Aspen Grove Drive
Franklin, TN 37067

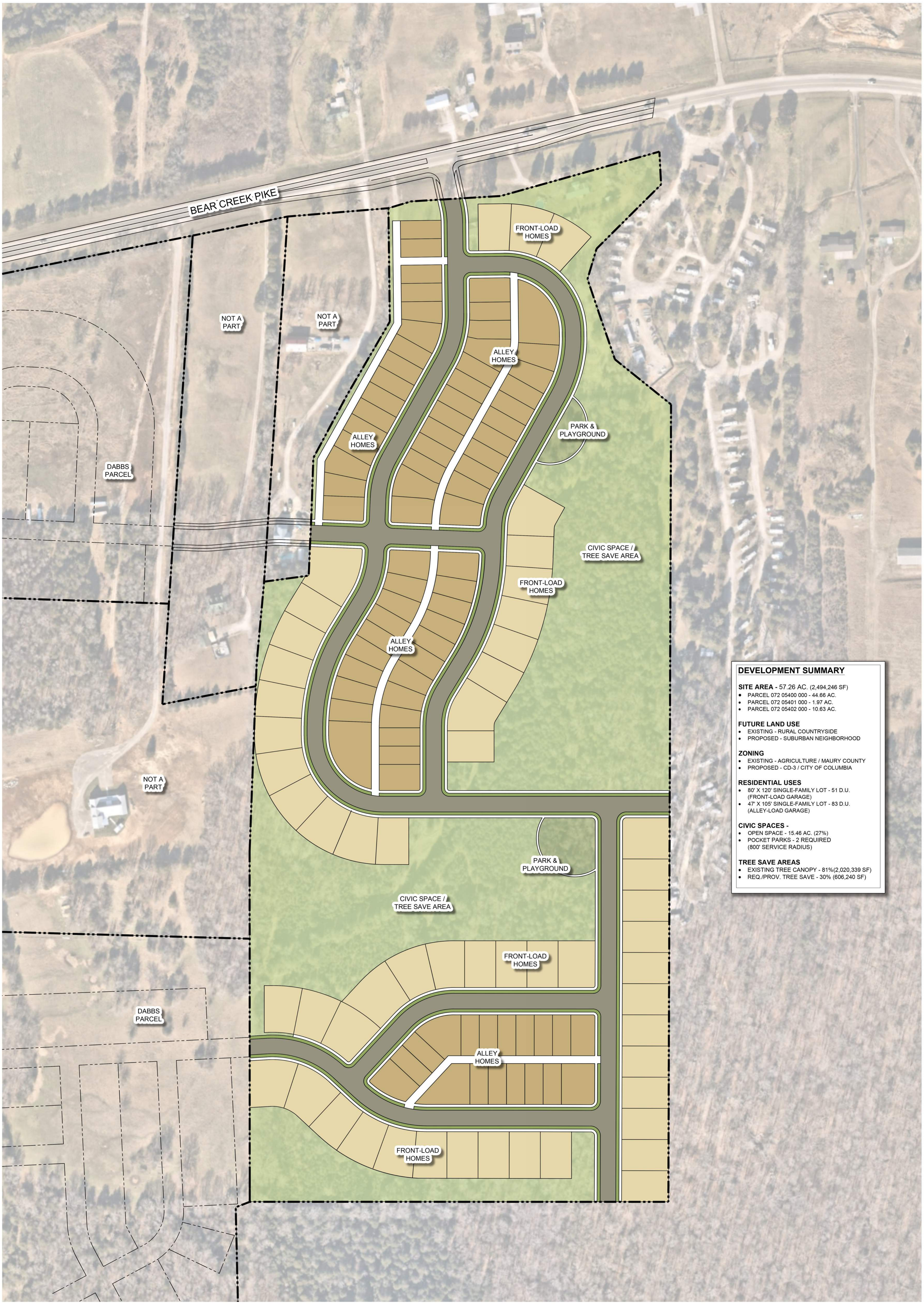
RE: Bowman Farms, 1748 Bear Creek Pike, 072 05400, 072 05401, 072 05402

Gray,

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. 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.

The Sanitary Sewer Pump Station for this development shall be located off-site, across and north of Bear Creek Pike. Easements and property acquisition is required to do so. The Pump Station shall be located in such a manner as to allow the surrounding properties to be able to have sanitary sewer that can gravity flow to the Station. The station shall be sized for that sewer shed as well. The Station and its plans may need to be designed and/or reviewed by the City of Columbia's Engineers of Record.

Donnie Boshers, Director
City of Columbia, TN
Wastewater Department



DEVELOPMENT SUMMARY

SITE AREA - 57.26 AC. (2,494,246 SF)
- PARCEL 072 05400 000 - 44.66 AC.
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- PARCEL 072 05402 000 - 10.63 AC.

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- PROPOSED - SUBURBAN NEIGHBORHOOD

ZONING
- EXISTING - AGRICULTURE / MAURY COUNTY
- PROPOSED - CD-3 / CITY OF COLUMBIA

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- OPEN SPACE - 15.46 AC. (27%)
- POCKET PARKS - 2 REQUIRED (800' SERVICE RADIUS)

TREE SAVE AREAS
- EXISTING TREE CANOPY - 81%(2,020,339 SF)
- REQ./PROV. TREE SAVE - 30% (606,240 SF)

Kimley»Horn

Bowman Farm Property - Columbia, TN

CONCEPTUAL MASTER PLAN for RYAN HOMES

NORTH

February 19, 2024

0 50 100 200 300

CROSS-CONNECTIVITY TO REMOVE HOMES WITH SINGLE ACCESS POINT

5 MILE MARK FROM FIRE STATION No.3

DABBS SUBDIVISION

1.2 MILES FROM 5 MILE MARK ON BEAR CREEK PIKE

1.0 MILES FROM 5 MILE MARK VIA DABBS SUBD

1.3 MILES FROM 5 MILE MARK ON BEAR CREEK PIKE

1.0 MILES FROM 5 MILE MARK ON BEAR CREEK PIKE

Bear Creek Pike

24) Distribution Airbus DS © 2024 TomTom

Bowman Parcel - Fire Access Map

LAYOUT

February 16, 2024

0 250 500 1000

NORTH

Drawing name: K:\NSH_LDEV\118285005 – Bowman Farms\4–CADD\Exhibits\2024–02–16 Fire Access Map\Bowman Parcel – Fire Access Map.dwg Layout1 Feb 16, 2024 12:36pm by: claudia.forrester

CITY OF COLUMBIA
TENNESSEE

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, February 13, 2024

ITEM NO.
24-0031

DESCRIPTION: Annexation, Amend Future Land Use Plan from Rural Countryside to Suburban Neighborhood, and Rezone to CD-3.
Parcel - 072 05400 000 - 44.66 acres
Parcel - 072 05401 000 - 1.97 acres
Parcel - 072 05402 000 - 10.63 acres
57.26 acres total

RECOMMENDATION: For final recommendation please see staff report.

COMMENTS:

Wastewater

1. 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 acceptance. Please contact the Wastewater Department for standard design details and equipment. Requirements for this development are laid out in the Availability Letter.
2. Requirements for this development are laid out in the Availability Letter: "The Sanitary Sewer Pump Station for this development shall be located off-site, across and north of Bear Creek Pike. Easements and property acquisition is required to do so. The Pump Station shall be located in such a manner as to allow the surrounding properties to be able to have sanitary sewer that can gravity flow to the Station. The station shall be sized for that sewer shed as well. The Station and its plans may need to be designed and/or reviewed by the City of Columbia's Engineers of Record."

Planning

3. 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.

4. 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.
5. Please be advised that due to longer notice requirements imposed by TCA 13-4-202, this request will be on the City Council agenda two months following a recommendation by the Planning Commission.
6. A current water availability letter is required throughout the entitlement process. The current letter will expire on May 14, 2024. Presuming a timely resubmittal to technical comments and a favorable recommendation from the planning Commission in March, the second reading for this item at City Council will occur on June 13th. Consequently, 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.
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. 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.
9. Please obtain a will-serve letter from the Columbia Wastewater Department: https://www.columbiatn.com/FormCenter/Development-Services-12/Wastewater-WillServeLetter-Request-80 . Please include the letter with your resubmittal.

Engineering

10. No comment on rezoning

Fire

11. The fire department would not support the annexation of this property. It is too far from the nearest fire station, over 5 miles.

Maury County E911

12. No comment at this time on rezoning.

Maury County Schools

13. 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.

Columbia Power

14. 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.

Public Works

15. Single family homes will receive City of Columbia trashcan service. Please see attached Plan of Services.

Building

16. No comments.

Police

17. No comments provided.

Atmos Energy

18. No comments provided.

Duck River Electric Membership Corp

19. Once all requirements are met, we plan to serve. Need Final Plat and Subdivision requirements sent to cisley@dremc.com and thooper@dremc.com.
20. Special note: Keep in mind supply chain issues may affect timeline in which we will be able to provide materials.

Maury County Highway Dept.

21. No comments provided.

ATT

22. ATT TO SERVE

Columbia Water

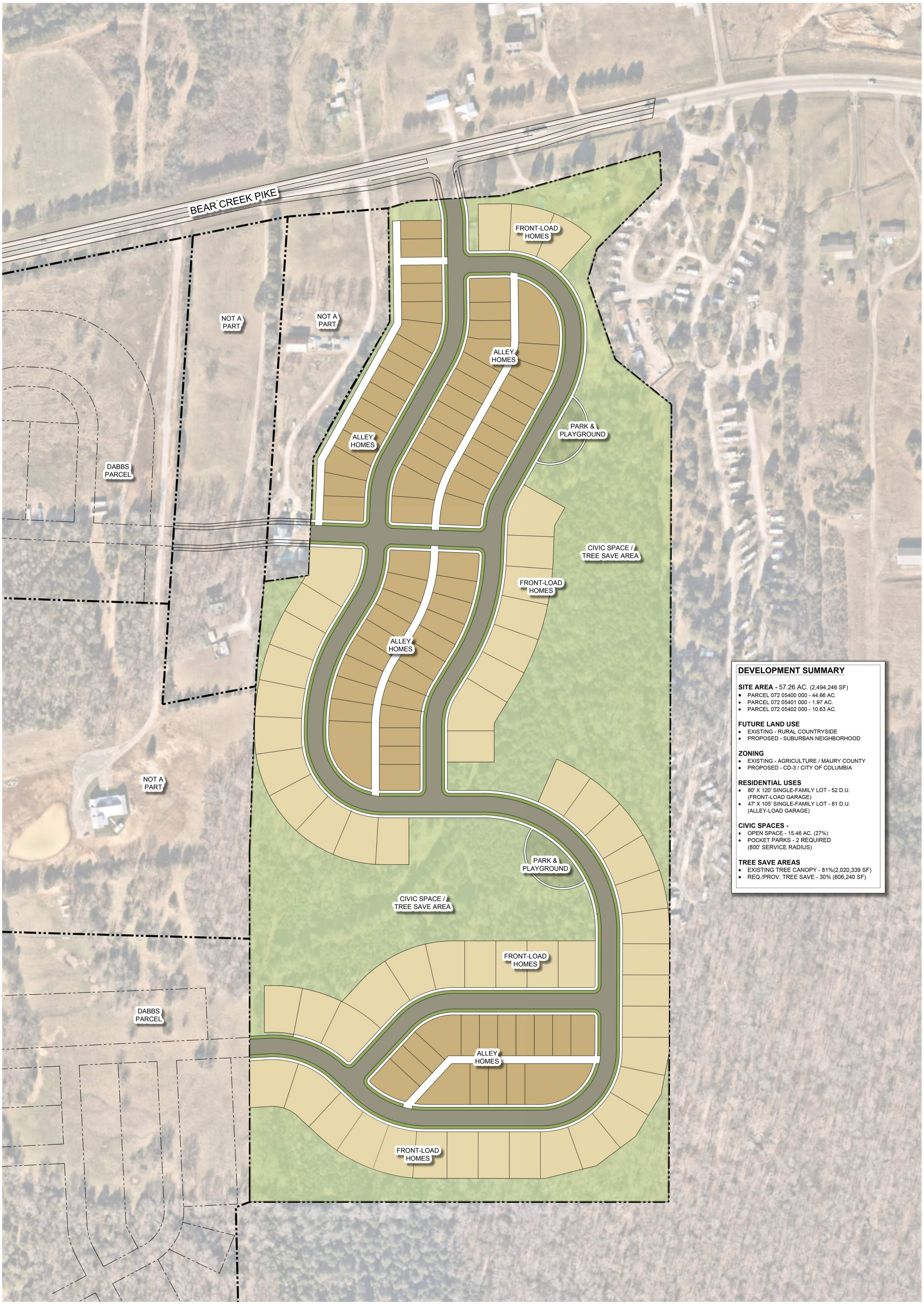
23. "A water availability letter was issued on January 15, 2024, it remains valid for 120 days. The availability of capacity to serve is based on a determination by the Fire Marshal of fire flow requirements and the information submitted on the Water Service Availability Request application. Any off-site 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."

CPWS BB

24. Do not 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.



DEVELOPMENT SUMMARY

SITE AREA - 57.26 AC. (2,494,246 SF)
- PARCEL 072 05400 000 - 44.66 AC.
- PARCEL 072 05401 000 - 1.97 AC.
- PARCEL 072 05402 000 - 10.63 AC.

FUTURE LAND USE
- EXISTING - RURAL COUNTRYSIDE
- PROPOSED - SUBURBAN NEIGHBORHOOD

ZONING
- EXISTING - AGRICULTURE / MAURY COUNTY
- PROPOSED - CD-3 / CITY OF COLUMBIA

RESIDENTIAL USES
- 80' X 120' SINGLE-FAMILY LOT - 52 D.U. (FRONT-LOAD GARAGE)
- 47' X 105' SINGLE-FAMILY LOT - 81 D.U. (ALLEY-LOAD GARAGE)

CIVIC SPACES -
- OPEN SPACE - 15.46 AC. (27%)
- POCKET PARKS - 2 REQUIRED (800' SERVICE RADIUS)

TREE SAVE AREAS
- EXISTING TREE CANOPY - 81%(2,020,339 SF)
- REQ./PROV. TREE SAVE - 30% (606,240 SF)

Kimley»Horn

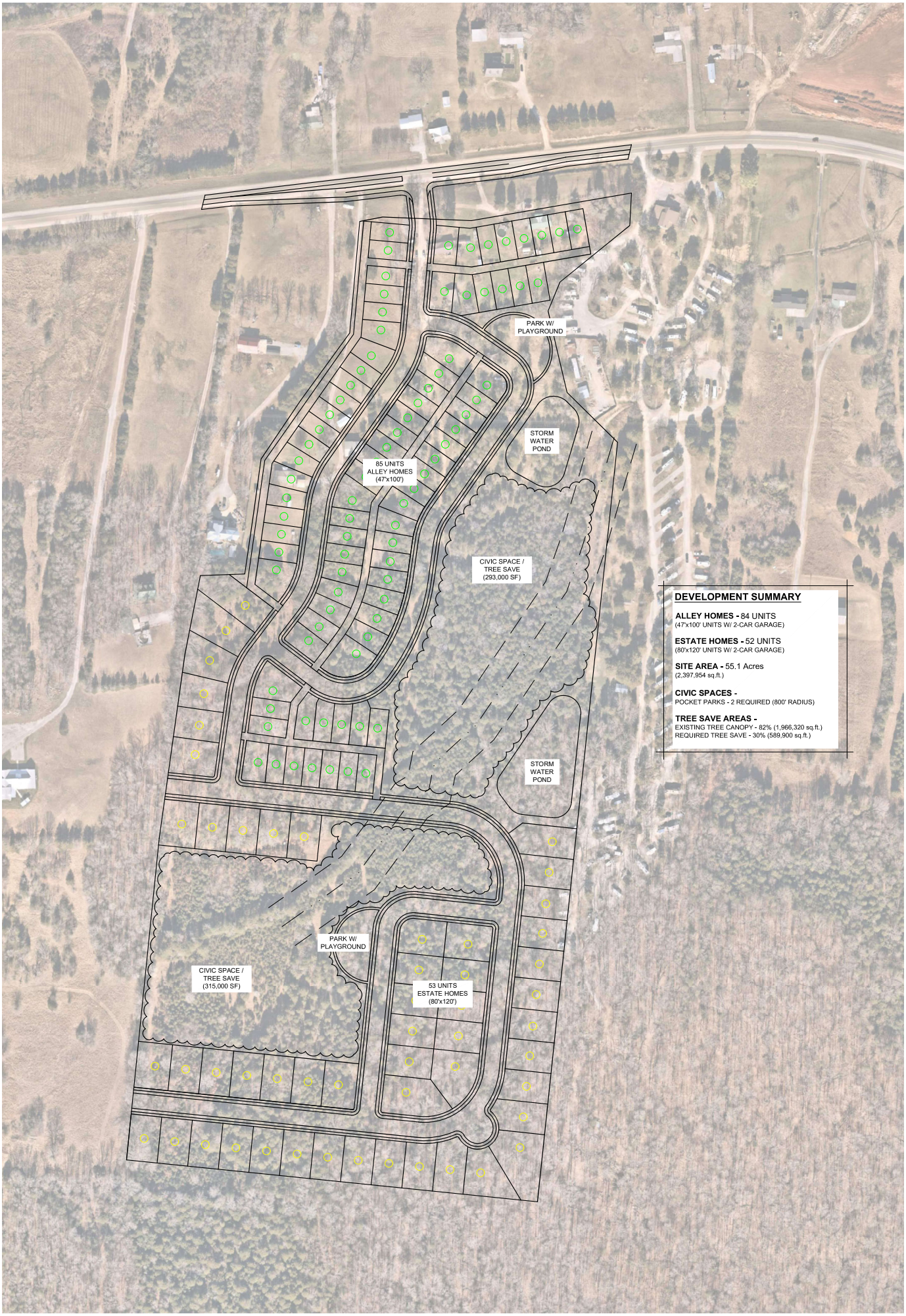
Bowman Farm Property - Columbia, TN

CONCEPTUAL MASTER PLAN for RYAN HOMES

NORTH

January 16, 2024

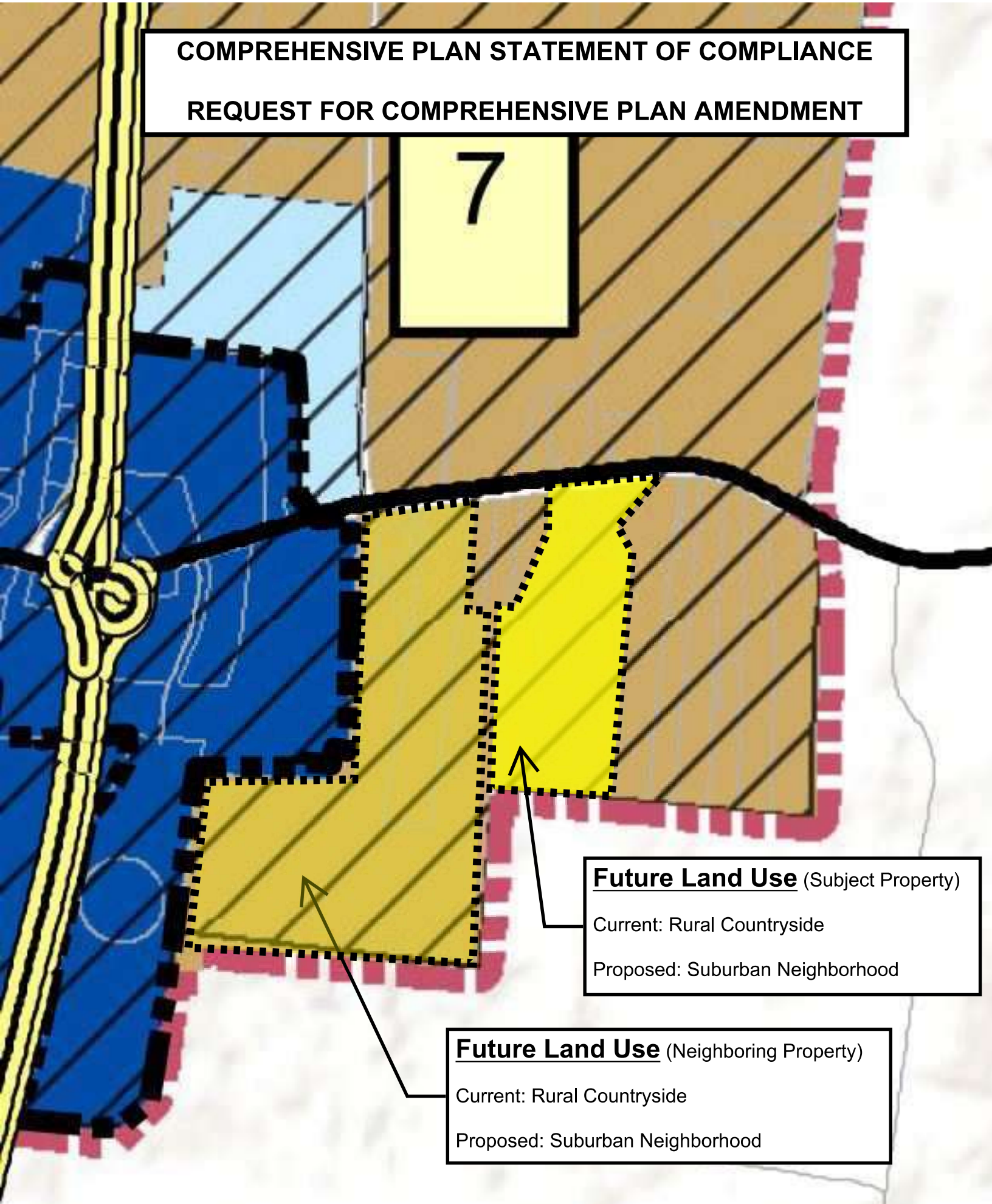
0 50 100 200 300


PARK W/ PLAYGROUND
STORM WATER POND
85 UNITS ALLEY HOMES (47'x100')
CIVIC SPACE / TREE SAVE (293,000 SF)
STORM WATER POND
PARK W/ PLAYGROUND
CIVIC SPACE / TREE SAVE (315,000 SF)
53 UNITS ESTATE HOMES (80'x120')
DEVELOPMENT SUMMARY
ALLEY HOMES - 84 UNITS
(47'x100' UNITS W/ 2-CAR GARAGE)
ESTATE HOMES - 52 UNITS
(80'x120' UNITS W/ 2-CAR GARAGE)
SITE AREA - 55.1 Acres
(2,397,954 sq.ft.)
CIVIC SPACES -
POCKET PARKS - 2 REQUIRED (800' RADIUS)
TREE SAVE AREAS -
EXISTING TREE CANOPY - 82% (1,966,320 sq.ft.)
REQUIRED TREE SAVE - 30% (589,900 sq.ft.)

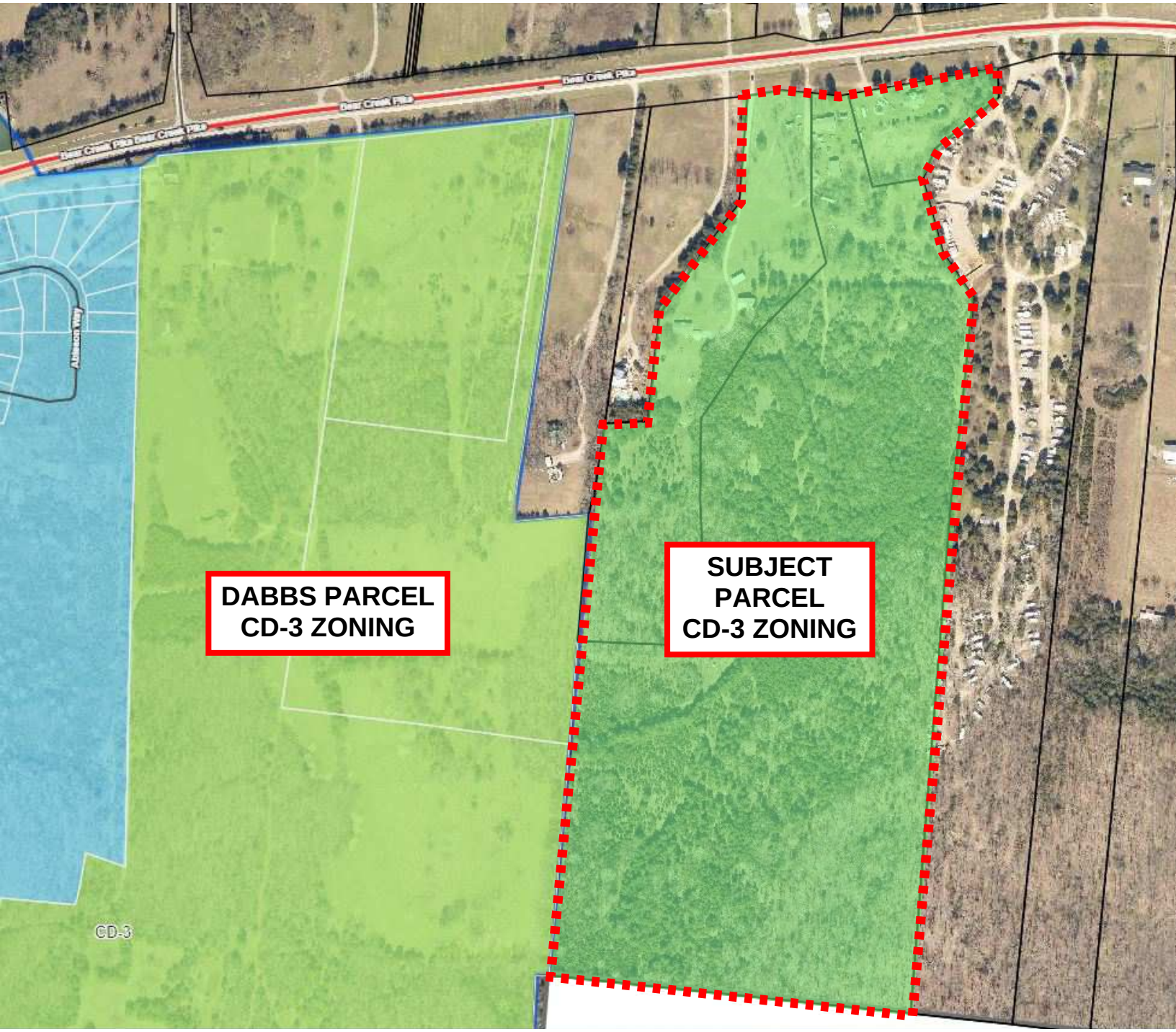
COMPREHENSIVE PLAN STATEMENT OF COMPLIANCE

REQUEST FOR COMPREHENSIVE PLAN AMENDMENT

7



REQUESTING REZONING FROM MAURY COUNTY / AGRICULTURAL USE TO CD-3 TO MATCH ADJACENT DABBS ZONING



January 15, 2024

Mr. Gray Harrison
Kimley-Horn
4031 Aspen Grove Drive Suite 200
Franklin, TN 37067
Sent via email: gray.harrison@kimley-horn.com

RE: Water Availability Letter
Bowman Farms – 135 Units
1748 Bear Creek Pike
Tax Map 72, Parcel 54.00, 54.01, 54.02
Columbia, Maury County, TN

Dear Mr. Harrison:

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 135 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:

- A minimum size 12-inch diameter water main must be extended from the existing 16-inch main West of Merkel Road to the entrance of the development, or to the mid-point of the frontage on Bear Creek Pike, whichever is furthest. Coordination with other developments on Bear Creek Pike may reduce the length of pipe installation required.
- Minimum size 8-inch water mains will be required throughout the development.

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.

CPWS

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 (135 SFUs)	$51,450.00

- 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: $540 per 3/4" meter (135 meters)	$72,900.00
Impact Fee: $4,500 per 3/4" meter (135 meters)	$607,500.00
Total Meter and Impact Fees Due =	**$680,400.00**

- 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 23-063

CITY OF COLUMBIA
TENNESSEE

WASTEWATER DEPARTMENT

12 January 2024

Gray Harrison
4031 Aspen Grove Drive
Franklin, TN 37067

RE: Bowman Farms, 1748 Bear Creek Pike, 072 05400, 072 05401, 072 05402

Gray,

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. 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.

The Sanitary Sewer Pump Station for this development shall be located off-site, across and north of Bear Creek Pike. Easements and property acquisition is required to do so. The Pump Station shall be located in such a manner as to allow the surrounding properties to be able to have sanitary sewer that can gravity flow to the Station. The station shall be sized for that sewer shed as well. The Station and its plans may need to be designed and/or reviewed by the City of Columbia's Engineers of Record.

Donnie Boshers, Director
City of Columbia, TN
Wastewater Department

PERSON RESPONSIBLE FOR TAXES:

mail: Bobby Bobo
Rt. 2
Columbia, Tenn.
c/o Homer Brown

INSTRUMENT PREPARED BY:

Stella L. Hargrove
Attorney at Law
Columbia, Tennessee

WARRANTY DEED

KNOW ALL MEN BY THESE PRESENTS, that for and in consideration of the sum of Ten ($10.00) Dollars, cash in hand paid, and other good and valuable considerations, including the love and affection which I have for my daughter, I, EULA BROWN, hereinafter called "Grantor", have this date bargained and sold and do hereby sell, transfer and convey unto BOBBY BOBO and wife, TERESA BOBO, hereinafter called "Grantees", as tenants by the entirety, their heirs and assigns, the following described real estate located in the Fourth (4th) Civil District of Maury County, Tennessee, to-wit:

BOUNDED on the North by State Highway 99; East by Phillips Recreational Enterprises, Inc.; South by Phillips Recreational Enterprises, Inc. and Eula Brown; and West by Eula Brown, and more particularly described as follows:

BEGINNING at an iron pin in the South margin of State Highway 99 Right-of-way, being the Northwest corner of Phillips Recreational Enterprises, Inc. tract, and the Northeast corner of the herein described tract; thence South with fence and Phillips Recreational Enterprises, Inc. South 6° 47' East, 112.27 feet to an iron pin; thence with fence and Phillips Recreational Enterprises, Inc. South 58° 34' West, 84.70 feet to an angle iron; thence with fence and Phillips Recreational Enterprises, Inc. South 51° 21' West, 94.93 feet to an iron pin; thence with fence and Phillips Recreational Enterprises, Inc. South 14° 42' West 107.01 feet to an angle iron; thence with fence and Eula Brown South 80° 18' West 177.84 feet to an angle iron; thence along a staked line and with Eula Brown North 18° 24' West 272.68 feet to a concrete highway Right-of-way monument in the South margin of State Highway 99 Right-of-way; thence with fence and State Highway 99 Right-of-way North 79° 52' East 350.42 feet to a concrete highway Right-of-way monument in the South margin of State Highway 99 Right-of-way; thence with highway Right-of-way North 69° 56' East 81.69 feet to the point of beginning, containing 1.97 acres, by survey of James D. Webb, Engineer-Surveyor, Maury County, Tennessee, dated August 28, 1980.

Being a portion of the same property conveyed to Homer Brown and wife, Eula Brown, by Deed of record in Book 409, page 402, Register's Office, Maury County, Tennessee. The said Homer Brown being now deceased, Eula Brown is the sole owner of this property by operation of law; and the said Eula Brown

I hereby certify that I registered the above Instrument the 8 day of Sept 1980
Louise W. Andrews Register
Katherine H. Scott D.C.

REGISTER OFFICE MAURY COUNTY, TENNESSEE
Received for record this 5 day of Sept 1980
at 3:55 P M. and noted in
Book T63 Page 682
Fee
Louise W. Andrews Register
Katherine H. Scott D.C.

remains a widow as of the date of this conveyance.

TO HAVE AND TO HOLD said real estate together with all of the rights, titles, interests, easements and appurtenances thereunto belonging unto Bobby Bobo and wife, Teresa Bobo, as tenants by the entirety, their heirs and assigns, in fee simple forever.

I COVENANT with the said Grantees, their heirs and assigns, that I am lawfully seized and possessed of said real estate, have a good and lawful right to sell and convey the same and that it is unencumbered.

I FURTHER COVENANT and hereby bind myself, my heirs and personal representatives, that I will forever warrant and defend the title to said real estate unto the Grantees, their heirs and assigns, against the lawful claims and demands of all persons whomsoever.

WITNESS my signature, this the 5 day of September, 1980.

Eula Brown
EULA BROWN

STATE OF TENNESSEE
COUNTY OF MAURY

Personally appeared before me, the undersigned ~~Notary Public~~ Deputy Clerk in and for the said state and county, the within named Eula Brown, the bargainor, with whom I am personally acquainted and who acknowledged that she executed the within instrument for the purposes therein contained and expressed.

WITNESS my hand and official seal at Columbia, Tennessee, this the 5 day of September, 1980.

Nancy W. Thompson, Clerk
by Jan Maddux DC
~~NOTARY PUBLIC~~ County Clerk

My commission expires: 9-1-82

STATE OF TENNESSEE
COUNTY OF MAURY

I, or we, hereby swear or affirm that the actual consideration for this transfer or value of the property transferred, whichever is greater is $3,000.00, which amount is equal to or greater than the amount which the property transferred would command at a fair voluntary sale.

Eula Brown
AFFIANT

SWORN TO AND SUBSCRIBED before me, this the 5 day of September, 1980.

Nancy W. Thompson, Clerk
by Jan Maddux DC
~~NOTARY PUBLIC~~ County Clerk

My commission expires: 9-1-82

STATE OF TENNESSEE, MAURY COUNTY
Transfer Tax $2.80 Mortgage Tax $
Recording Fee $.50 Total Paid $3.30
Receipt No 8277 Received By KL
3 Day Of Sept. 1980

This instrument prepared by Bobby W. Sands, Sands & Sands, P.O. Box 1660, Columbia, TN 38402-1660.

Send Tax Bills to:

Mrs. Eula Brown
1768 Bear Creek Pike
Columbia, TN 38401

MAP 72
PARCEL 54

QUITCLAIM DEED

FOR AND IN CONSIDERATION for the love and affection of my daughter and son-in-law, the receipt of which is hereby acknowledged, **EULA BROWN**, a widow, Grantor, by these presents, does hereby quitclaim and convey unto **TERESA BOBO and husband, BOBBY BOBO**, Grantees, their successors and assigns of all her right, title and interest, with the exception that I retain a life estate for and during my natural life, in and to the following described property located in the Fourth (4th) Civil District of Maury County, Tennessee, to-wit:

Beginning at a stake in the corner of Salmon's line, thence S. 88 deg. E. with Salmon and Burt's line 88 poles to a stake, thence N. 3 deg. E. 200 poles to a rock pile, thence N. 88 deg. W. 80 poles to a stake, thence 200 poles with Salmon's line to the beginning, containing 100 acres, more or less. Included in the above description but excluded from this conveyance is one acre heretofore sold to Davis Hays and 14 acres heretofore sold to Sam Jones, making 15 acres all of which lies on the N. side of the Bear Creek Pike; leaving 85 acres more or less, hereby conveyed which is generally bounded on the N. by the Bear Creek Pike; East by Silas Derryberry; South by Will Jones and W. by C. W. Knight, containing 85 acres, more or less. Being all of the land lying S. of said Bear Creek Pike, conveyed to Mrs. Nannie Peay by deed of record in Book 181, Page 227, and the same property conveyed by Mrs. Nannie Peay to Homer Brown and wife, Eula Brown, by deed dated January 31, 1956, and recorded in Book 317, Page 253, and being the same property conveyed by Homer Brown and wife, Eula Brown, to J. L. Gobble by deed dated February 2, 1963, recorded in Book 409, Page 123, all in the Register's Office of Maury County, Tennessee.

Being the same property conveyed to Homer Brown and wife, Eula Brown, by deed of record in Book 409, Page 402, Register's Office of Maury County, Tennessee. The said Homer Brown having died on the 10th day of October, 1975. The said Eula Brown being the surviving tenant by the entirety.

THE ABOVE DESCRIPTION IS THE SAME AS IN PRIOR DEED.

INCLUDED IN THE ABOVE DESCRIPTION BUT SPECIFICALLY EXCLUDED therefrom are the following parcels of land:

EXCLUSION ONE: A tract of land containing 21.28 acres conveyed to Ross Anderson, Jr. and wife, Mary Jean Anderson, being more particularly described in Deed of

MAURY COUNTY, STATE OF TENNESSEE
Received for record this 15 day of SEP 1995 at 11:20 o'clock A.M.
Note Book 17 Page 68 Receipt #58327 Recording Fee 8.00
State Tax 70 Probate Fee Total 8.00
Book 1264 Page 920 Witness my Hand,
MAURY COUNTY REGISTER OF DEEDS
A. Wayne White

record in Book 505, Page 306, Register's Office of Maury County, Tennessee.

EXCLUSION TWO: A tract of land containing 1.97 acres conveyed to Bobby Bobo and wife, Teresa Bobo, being more particularly described in Deed of record in Book 665, Page 385, Register's Office of Maury County, Tennessee.

EXCLUSION THREE: A tract of land containing 14.87 acres conveyed to Ricky Eugene Brown, being more particularly described in Deed of record in Book 669, Page 653, Register's Office of Maury County, Tennessee. See also Deed Book 689, Page 305, Register's Office of Maury County, Tennessee.

IN WITNESS WHEREOF, I have hereunto set my hand, this the 13th day of September, 1995.

Eula R. Brown
EULA BROWN

STATE OF TENNESSEE

COUNTY OF MAURY

Personally appeared before me, a Notary Public in and for said State and County, the within named **EULA BROWN**, a widow, the bargainor, with whom I am personally acquainted, or proved to be on the basis of satisfactory evidence, and who acknowledged that she executed the foregoing instrument for the purposes therein contained.

Witness my hand and official seal at office in Columbia, Tennessee, this the 13th day of September, 1995.

Notary Public

My Commission Expires:

10-29-95

AS PROVIDED IN T.C.A. 67-4-409(3)(5) THIS CONVEYANCE IS EXEMPT FROM THE PAYMENT OF RECORDATION TAX.

MAURY COUNTY REGISTER, STATE OF TENNESSEE
I or we hereby swear or affirm that the actual Consideration or value of the property transferred by the foregoing deed is -0-, which amount is equal to or greater than the amount which the property transferred would command at a fair voluntary sale.
Eula R. Brown Affiant
Subscribed and sworn before me this 15 day of SEPT 19 95
R. Wayne [illegible]

BOOK 1264 PAGE 921

BK/PG:R1912/1430-1431

06005629

2 PGS : AL - QUITCLAIM DEED
SUSIE BATCH: 48076
04/12/2006 - 03:55 PM

VALUE	0.00
MORTGAGE TAX	0.00
TRANSFER TAX	0.00
RECORDING FEE	10.00
DP FEE	2.00
REGISTER'S FEE	0.00
TOTAL AMOUNT	12.00

STATE of TENNESSEE, MAURY COUNTY
JOHN FLEMING
REGISTER OF DEEDS

Prepared By:
Security Title & Escrow Co., LLC
500 West 7th Street
Columbia, TN 38401

QUITCLAIM DEED

KNOW ALL MEN BY THESE PRESENTS, this indenture entered into between **Jo Ann Brown**, FIRST PARTY, which expression shall include heirs, assigns and personal representatives, and **Chrissy Potts,** SECOND PARTY, which expression shall include heirs, assigns, and Personal Representatives.

WITNESSETH:

For the consideration of the sum of TEN DOLLARS ($10.00), and other good and valuable considerations, the receipt of all of which is hereby acknowledged, FIRST PARTY conveys, and quitclaims unto SECOND PARTY the following described property:

See Exhibit "A"

Being the same property conveyed to Jo Ann Brown and Chrissy Potts by Co-Administrators' Deed of record in Book R1805, Page 963-966, Register's Office for Maury County, Tennessee.

Map 72, Parcel 54.02

IN WITNESS WHEREOF, this conveyance has been executed on the 10 day of ~~March~~ April, 2006.

Jo Ann Brown

STATE OF TENNESSEE
COUNTY OF MAURY

Personally appeared before me, the undersigned, **Jo Ann Brown**, with whom I am personally acquainted, and who acknowledged that he executed this instrument for the purposes therein contained.

WITNESS my hand, at office, this the 10 day of ~~March~~ April, 2006.

My commission expires:
8-21-06

Notary Public

STATE OF TENNESSEE – MAURY COUNTY

I hereby affirm that the actual consideration for this transfer or value of the property transferred, whichever is greater is $ **-0-**.

Affiant

Subscribed and sworn to before me, this 10th day of ~~March~~ April, 2006.

My commission expires:
August 16, 2008

Notary Public

NEW PROPERTY OWNER:

Chrissy Potts
528 Bragg Avenue
Smyrna, TN 37167

PERSON RESPONSIBLE FOR TAXES:

SAME

EXHIBIT A

Located in the Fourth (4th) Civil District of Maury County, Tennessee and more particularly bounded and described as follows:

Bounded on the N. by State Highway 99; E. by Eula Brown; S. by Eula Brown, and W. by James L. Waldrum, and more particularly described as follows: Beginning at an angle iron in the S. margin of State Highway 99 right-of-way, being the NE corner of James L. Waldrum tract, and the NW corner of the herein described tract; thence with highway right-of-way N. 79 deg. 50 min E. 378.17 ft., to a concrete highway right-of-way monument; thence with highway right-of -way N. 89 deg. 48 min. E. 166.68 ft. to a railroad spike in center of driveway, being the NW corner of Eula Brown tract and the NE corner of the herein described tract; thence with the center of driveway and Eula Brown S. 1 deg. 46 min, E. 164.72 ft. to a railroad spike in center of driveway; thence wiht center of driveway and Eula Brown S. 6 deg. 31 min, E. 169.66 ft. to a railroad spike in ceter of driveway; thence with driveway and Eula Brown S. 15 deg. 36 min. E. 160.66 ft. to an angle iron near edge of driveway; thence along a staked line and with Eula Brown S. 41 deg. 56 min, W. 322.13 ft. to an angle iron; thence along staked line and with Eula Brown S. 27 deg. 15, min W. 264.61 ft. to an angle iron; thence along a staked line with Eula Brown S. 6 deg. 30 min E. 680.07 ft. to an angle iron in an old fence line, being the SE corner of the herein described tract; thence with old fence line and Eula Brown S. 88 deg. 25 min, W. 387.41 ft. to an angle iron in fence line, being the E. boundary line of James L. Waldrum tract and being the SW corner of the herein described tract; thence with fence and James L. Waldrum N. 3 deg. 19 min, E. 648.87 ft. to an angle iron in fence line, being the E. boundary line of James L. Waldrum tract and the W. boundary line of the herein described tract; thence with fence and James L. Waldrum N. 4 deg 12 min E. 916.94 ft. to the beginning, containing 14.87 acres by survey of James D. Webb, Engineer-Surveyor, Maury County, Tennessee, dated August 28, 1980.

Included in the above description, but excluded from the conveyance herein is the following described property: Located in the Fourth (4th) Civil District of Maury County, Tennessee, and being the same property described but excluding the following: Bounded on the north by State Highway 99, on the east and south by the remaining lands of Ricky Brown, and on the west on the west by Billy Pressnell, Deed Book 817, Page 508, and more particularly described as follows:

Beginning at an angle iron set in the south margin of State Highway 99, the northeast corner of Billy Pressnell, the northwest corner of Ricky Brown, Deed Book 689, Page 305, and the northwest corner of the tract being described; thence with the south margin of Highway 99, North 79 deg. 50 mins. east 293.20 feet to an iron pipe; thence leaving State Highway 99 and with the remaining lands of Ricky Brown as follows: South 1 deg. 54 mins. west 306.00 feet to an iron pipe, south 32 deg. 54 mins. west 358.20 ft. to an iron pipe, south 3 deg. 50 mins. west 326.47 feet to an iron pipe, and south 85 deg. 58 mins. west 124.30 ft. to an iron pipe set in the fence row, the southwest corner of the tract being described, and a point on the east boundary of Pressnell; thence with Pressnell and a fence north 4 deg. 00 mins. east 891.46 feet to the beginning and containing 4.24 acres as surveyed by William J. Heischman, R.L.S. #1315, on August 8, 1990.

CITY OF COLUMBIA
TENNESSEE

DEVELOPMENT SERVICES

I, __Chrissy Paul____ being the sole owner of the _1748 Bear Creek Pike property _ more particularly described as ___Parcel/Tax ID 072 054.02_ on Plat of Record in Plat Book __R1912__ Page _1430&1431____ in the Maury County Register of Deeds office, do hereby, formally, request that the City of Columbia, Tennessee annex such property into such City.

Chrissy Paul
Print Name

1/16/2024
Date

Chrissy Paul
Signature

STAFF USE ONLY	
Docket Number:	Requested Agenda:

CITY OF COLUMBIA
TENNESSEE

DEVELOPMENT SERVICES

I, __Teresa Bobo___ being the sole owner of the _1768 & 1774 Bear Creek Pike properties__ more particularly described as __parcel Tax IDs 072 054.00 & 072 054.01__ on Plat of Record in Plat Book _665___ Page _385&386____, Plat of Record in Plat Book _1264__ Page _920&921____ and in the Maury County Register of Deeds office, do hereby, formally, request that the City of Columbia, Tennessee annex such property into such City.

Teresa Bobo
Print Name

1/16/2024
Date

Teresa Bobo
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			
	TAX MAP: 072	GROUP: 05	PARCEL: 402
SUMMARY OF NATURE OF REQUEST AND WORK	Requesting Annexation, CD-3 Zoning, Comprehensive Plan Amendment from Rural Transition to Suburban Neighborhood		

DATE OF PRE-APPLICATION CONFERENCE	12/6/2023	*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: Future Land Use Plan 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) _____ ☐ 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.

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	Josh Rowland	PHONE	615-823-2209
ADDRESS	10 Lea Avenue, Suite 400	EMAIL	josh.rowland@kimley-horn.com

PROPERTY OWNER NAME	Chrissy Paul	PHONE	
ADDRESS	1748 Bear Creek Pike	EMAIL	chrissy.paul@gmail.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.

Josh Rowland	Josh Rowland	1/16/2024
APPLICANT NAME	APPLICANT SIGNATURE	DATE
Chrissy Paul	Chrissy Paul	1/16/2024
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	

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			
	TAX MAP: 072	GROUP: 05	PARCEL: 400, 401, 402
SUMMARY OF NATURE OF REQUEST AND WORK	Requesting Annexation, CD-3 Zoning, Comprehensive Plan Amendment from Rural Transition to Suburban Neighborhood		

DATE OF PRE-APPLICATION CONFERENCE	12/6/2023	*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: Future Land Use Plan 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) _____ ☐ 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.

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	Josh Rowland	PHONE	615-823-2209
ADDRESS	10 Lea Avenue, Suite 400	EMAIL	josh.rowland@kimley-horn.com

PROPERTY OWNER NAME	Teresa Bobo	PHONE	
ADDRESS	1768 Bear Creek Pike	EMAIL	boboteresa1@gmail.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.

Josh Rowland	Josh Rowland	1/16/2024
APPLICANT NAME	APPLICANT SIGNATURE	DATE

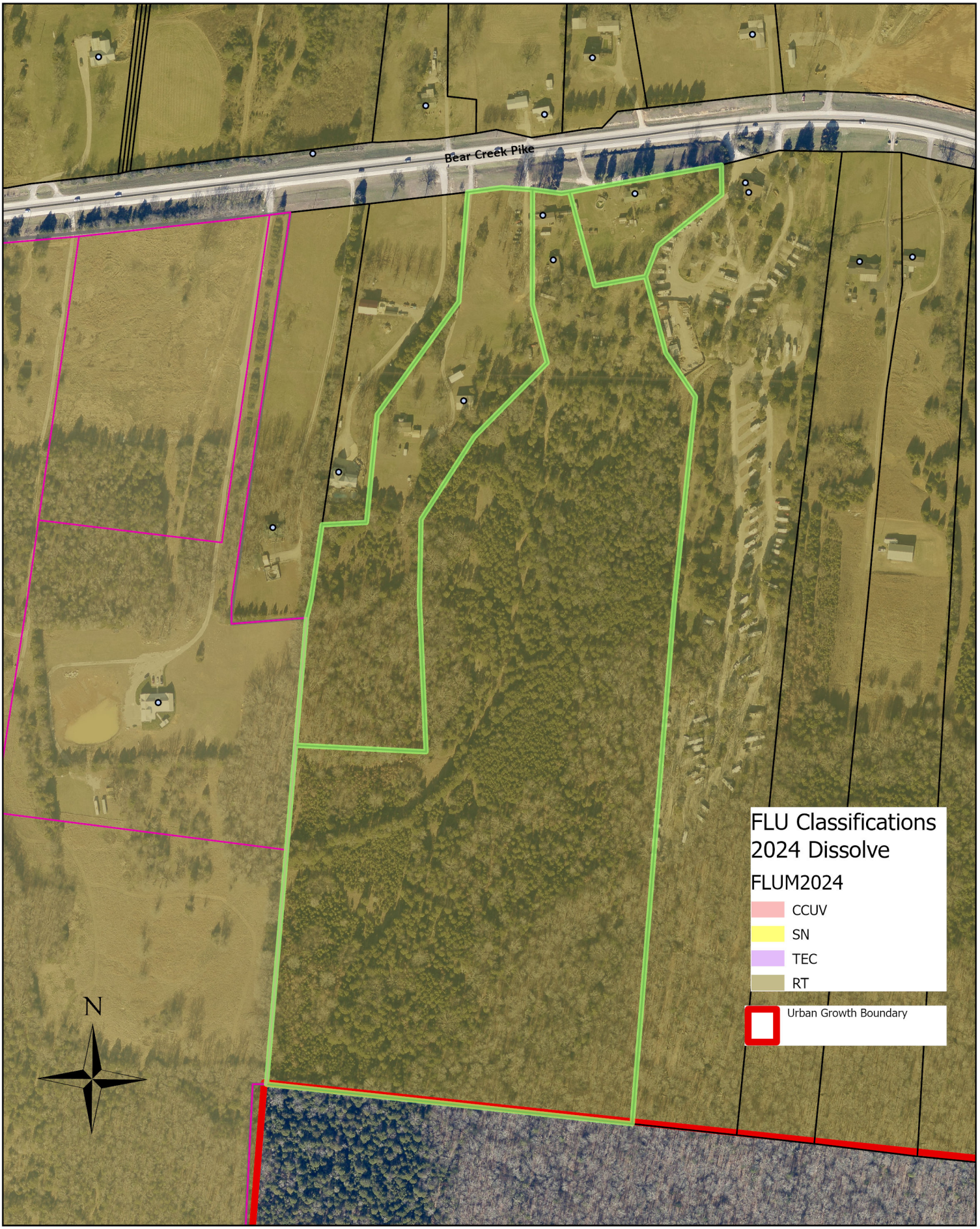
Teresa Bobo	Teresa Bobo	1/16/2024
PROPERTY OWNER NAME	PROPERTY OWNER SIGNATURE	DATE

STAFF USE ONLY

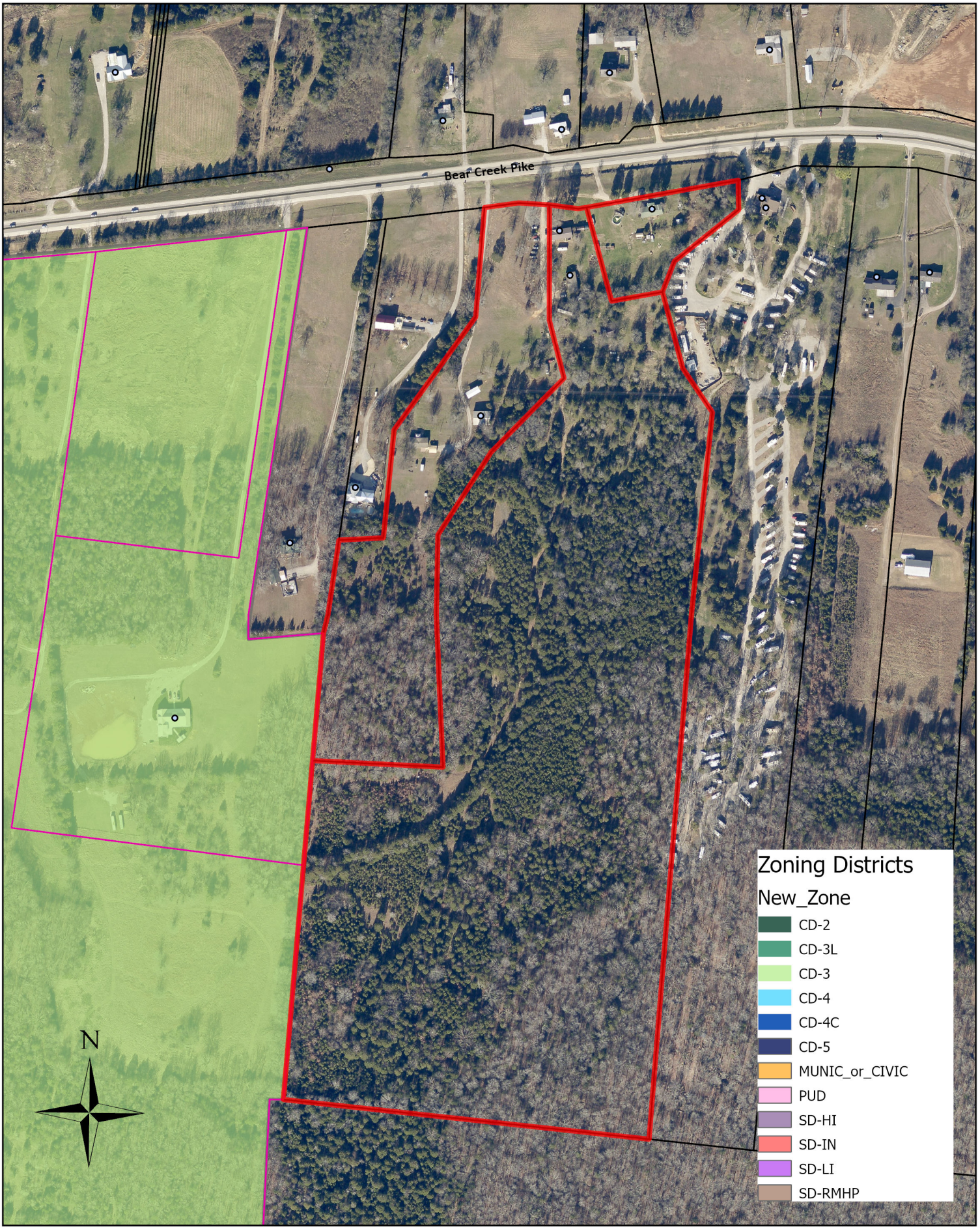
DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	

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

BOARD ACTION	



Case #24-0031
Bear Creek Pike, 1768-1770, 1748, 1774
TM 72 Parcels 54-54.02



Case #24-0031
Bear Creek Pike, 1768-1770, 1748, 1774
TM 72 Parcels 54-54.02

1209 Galloway Rezoning

Project #:	24-0096	Location:	100E G 29.0
Applicant:	Richard Woodson	Case Type(s):	Rezoning
Staff Planner:	Kevin C. McCarthy, AICP	Proposed Use:	Single Family

PROJECT SUMMARY

The applicant requests rezoning of a 0.52-acres lot on Galloway from CD-3 (Neighborhood Character District) to CD-4 (General Urban Character District). The current CD-3 zoning permits detached houses and some duplexes at four density units per acre. The requested CD-4 zoning permits a mix of uses and structure types, including townhomes, at twelve density units per acre.

- The requested zoning is consistent with the City Center Urban Village (CCUV) future land use classification in Connect Columbia.
- The applicant has provided a concept plan depicting division of the property into two lots.
- Subsequent development and division of the property will require additional reviews.
- 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-3	Residential	Vacant	+/- 0.52



FUTURE LAND USE MAP	ZONING MAP





SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	City Center Urban Village	CD-3	Single Family
North	City Center Urban Village	CD-3	Single Family
South	City Center Urban Village	CD-3	Single Family
East	City Center Urban Village	CD-3	Single Family
West	City Center Urban Village	CD-3	Single Family

CONSISTENCY WITH CONNECT COLUMBIA

City Center Urban Village: The requested rezoning is consistent with the future land use map. The future land use of the subject site is City Center Urban Village (CCUV). The CCUV future land use area comprises Columbia's iconic core and ancillary focal points (Connect Columbia, p. 35). It includes the historic courthouse square and the places residents of Columbia associate with worship, commerce, the arts, community activities and government administration. The CCUV also supports the creation of urbanized nodes which provide identifiable commercial hubs for Columbia's emerging neighborhoods. Each development parcel should add to Columbia's existing sense of place and extend its established form and pattern to create a more interconnected community. The future land use classification is implemented by the CD-4 and CD-5 character districts, as well as PUDs. In some cases, the Planning Commission may determine that CD-3 and CD-4C are also appropriate implementing zones.



Character & Intent

The City Center & Urban Village (CCUV) future land use area comprises Columbia's iconic core and ancillary focal points. It includes the historic courthouse square and the places residents of Columbia associate with worship, commerce, the arts, community activities and government administration. The CCUV also supports the creation of urbanized nodes which provide identifiable commercial hubs for Columbia's emerging neighborhoods. Each development parcel should add to Columbia's existing sense of place and extend its established form and pattern to create a more interconnected community.

Primary Land Uses are horizontally and vertically mixed in a variety of structure types. The intensity and mix of uses is largely determined by context. New residential development provides a mixture of housing within walking distance of commercial and civic spaces. New non-residential development in established residential areas shall be comprised of low-intensity uses which serve residents' daily needs. Higher intensity uses should complement and extend the traditional pattern of development in Columbia's core, or establish identifiable centers for emerging nodes.

Future development should emphasize connectivity and continuity of the city as a whole. Additionally, new development shall create a pedestrian-friendly environment by filling gaps in sidewalks and enhancing multi-modal infrastructure. All new and infill development shall emphasize linkages to identifiable community anchors such as mixed-use commercial centers, schools, parks, or civic institutions.

Land Use Considerations

Primary uses include government, civic uses, parks, religious facilities, offices, retail, and all forms of medium-density housing. Secondary land uses include utility facilities, institutional uses, low-density housing, and neighborhood retail. New industrial and warehouse uses are inappropriate.

Form & Pattern

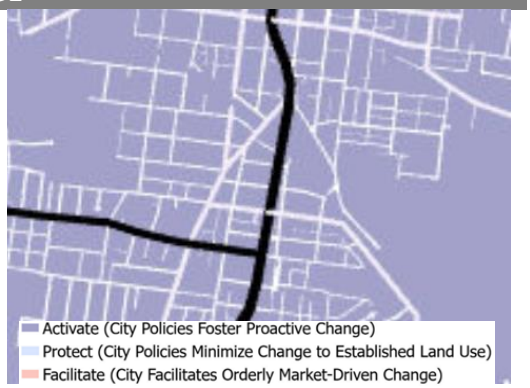
The CCUV includes established and infill neighborhoods at medium to high densities organized along a well-connected transportation network. Infill development supports and extends the formation of blocks and eliminates gaps in the built environment. The CCUV future land use is distinguished from Suburban Neighborhoods (SN) by the unambiguous prominence of public frontages. A high density of streets and thoroughfares with complete public frontages extends the public sphere outward from civic and commercial spaces. Implementing bulk and design standards clearly delineate the public and private realms though the application of layers and front-to-back discipline of lots. Bulk and design standards are occasionally modified to accommodate historic preservation, artistic innovation, redevelopment, and other place-based policies of the City. New development should accompany concurrent extension of complete urban services in places where they do not already exist. Parking is provided on an area-wide basis as a utility supplemented by private land users.

Implementing Districts
Neighborhood CD-3 (Only where compatible with established pattern)
General Urban CD-4
Urban Center CD-5
General Urban-Corridor CD-4C (only along Arterial roadways)
Urban Center – Corridor CD-5C (only along Arterial roadways)*
Mixed Use PUD PUD-MU
Civic CV

Implementing Standards
General Development Pattern: Mixed Uses & Isolated Uses
Density (density unites per ace): ≥ 12 du/ac
Building Height: 1-5 stories
Open Space Elements: Civic Spaces, Parks & Greenways

AREA OF CHANGE

Connect Columbia established the areas of change policy designation for the subject site as *activate*. The designation includes areas where significant and beneficial change is occurring or is desired. These areas are the focus of proactive City policies to bring the community's values to fruition. Public investment and increased coordination with the private sector will achieve transformational changes envisioned by the community (Connect Columbia p. 32).



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 subdivide the site in conformity with the bulk and design standard of the Ordinance at Table 4.3.1-D.**
    - The plan depicts the division of the property into two conforming 50-foot wide lots.
- **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.**
    - 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.
        - Lots – Planning & Zoning will ensure that lots conform to the dimensional standards of the Ordinance at the time of subdivision.
        - Buildings – Staff will evaluate any proposed structures for zoning compliance as part of the building permit review.

REVIEW PROCESS

The Development Review Committee evaluated the proposed rezoning at its March 2024 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];*
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 March 2024 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.
- Due to the small scale of the request, the applicant could not obtain a standard water availability letter. Planning directed the applicant to obtain written confirmation from the Office of Fire Marshal and CPWS's consultant that sufficient water is available to serve the property for domestic use and fire protection. The applicant provided this information at resubmittal.
- Planning directed the applicant to obtain a Will-Serve Letter from the Columbia Wastewater Department. The applicant provided this information at resubmittal.

COMMENTARY FROM PROFESSIONAL PLANNING STAFF

The requested CD-4 zoning is consistent with Connect Columbia. As discussed above, the subject site's future land use classification is City Center Urban Village (CCUV). The requested CD-4 (General Urban) character district implements the future land use. The Area of Change Policy for the property is *activate*, indicating that the city encourages beneficial changes to the land use pattern in the area.

The CD-4 design standards are more prescriptive than the current CD-3 standards. The Zoning Ordinance contains highly prescriptive design standards which provide an improved built environment over time. Single family homes in exclusively residential zoning districts are exempt from most of these standards. However, design standards apply to all structure types in mixed-use zones, beginning with CD-4. The subject property is in an area with a mix of zoning designations, including CD-3 and Light Industrial. Standards vary between these districts. The owner and any subsequent purchaser should be on notice that new structures on the property will be subject to CD-4 design standards.

Any division of the property must conform to the standards of the Ordinance and Subdivision Regulations. Rezoning amends the regulatory map and determines which section of the Ordinance applies to the site. Zoning map amendments do not approve any specific plan of development. The applicant provided a concept plan for the rezoning which indicates the parcel is of sufficient size to create more than one conforming CD-4 lot. Subdivision of the property will require a plat prepared by a registered land surveyor. If the applicant succeeds in rezoning the

property, additional applications prepared with the aid of qualified professionals will be necessary to accomplish the goal of subdividing the property.

SAMPLE MOTIONS

Approve:

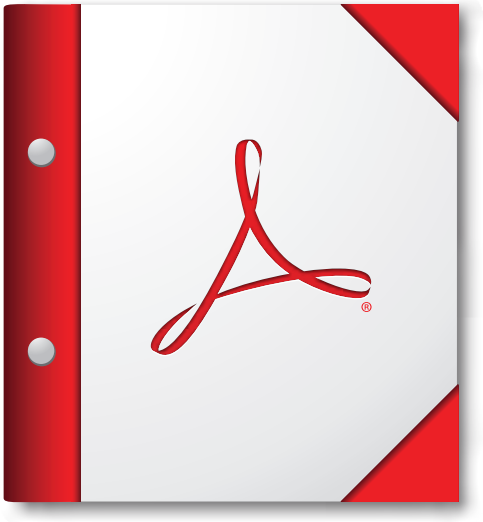
Move to find, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in sections **8.5.19.H** of the City of Columbia Zoning Ordinance have been satisfied and recommend approval of the proposed rezoning *[, subject to technical comments and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



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CITY OF COLUMBIA
TENNESSEE

WASTEWATER DEPARTMENT

21 March 2024

Richard Woodson
815 Woodside Street
Columbia, TN 38401

RE: 1209 Galloway Street, Columbia, TN 38401

Richard,

This letter serves as confirmation that the City of Columbia Wastewater Department has the available capacity to service the subject 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

CITY OF COLUMBIA
TENNESSEE

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, March 12, 2024

ITEM NO.
24-0096

DESCRIPTION: CD-4

COMMENTS: No 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. 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.
3. Please provide a narrative response to criterion 8.5.19.H.4(e) of the Zoning Ordinance explaining why the applicant believes conditions affecting the area have changed sufficiently to warrant the Zoning Map Amendment.
4. Please provide written confirmation from the Fire Marshal and CPWS/Inflo that adequate water supply can be made available to the property for uses and intensity permitted in the requested character district. CPWS may decline to issue a water availability letter for a property of this size; an email or technical comment from CPWS/Inflo will suffice. • See Comment ELEVEN
5. Please obtain a will-serve letter from Columbia Wastewater Department indicating that there is adequate wastewater treatment capacity and sewerage (with or without developer provided improvements) for uses and intensity permitted in the requested character district. An online form is available to submit the request: https://www.columbiatn.com/FormCenter/Development-Services-12/Wastewater-WillServeLetter-Request-80.

columbiatn.com
Development Services Dept
Zoning + Planning
Development Review Process
Wastewater online form

Engineering

6. No comments on rezoning.

Wastewater

7. Columbia Wastewater has no concern. / Thanks alot Columbia Wastewater

AT&T

8. Existing poles may impact proposed driveways.

No Comments

Maury County E911

9. No comment at this time.

Columbia Power

10. 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.

No Comments

Columbia Water

11. Two lots, no availability letter required. Lots will be served from existing 4" main.

CPWS BB

12. Plan to Serve

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. Applications which are not complete and responsive to all technical comments following two resubmittal deadlines will be closed.

Wastewater Availability

https://www.columbiatn.com/FormCenter/Development-Services-12/Wastewater-WillServeLetter-Request-80

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CITY OF COLUMBIA
TENNESSEE

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, March 12, 2024

ITEM NO.
24-0096

DESCRIPTION: CD-4

RECOMMENDATION: For final recommendation please see staff report.

COMMENTS:

Planning

1. 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.
2. Please provide written confirmation from the Fire Marshal and CPWS/Inflo that adequate water supply can be made available to the property for uses and intensity permitted in the requested character district. CPWS may decline to issue a water availability letter for a property of this size; an email or technical comment from CPWS/Inflo will suffice.
3. Please obtain a will-serve letter from Columbia Wastewater Department indicating that there is adequate wastewater treatment capacity and sewerage (with or without developer provided improvements) for uses and intensity permitted in the requested character district. An online form is available to submit the request: https://www.columbiatn.com/FormCenter/Development-Services-12/Wastewater-WillServeLetter-Request-80.
4. 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.

Engineering

5. No comments on rezoning.

Wastewater

6. Columbia Wastewater has no concern.

Fire

7. No comments

Maury County Highway Dept.

8. No comment.

ATT

9. EXISTING POLES MAY IMPACT PROPOSED DRIVEWAYS.

Maury County E911

10. No comment at this time.

Maury County Schools

11. No Comment

Columbia Power

12. 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.

Building

13. No comment.

Police

14. No comment.

Public Works

15. No comment.

Columbia Water

16. "Two lots, no availability letter required. Lots will be served from existing 4" main."

Atmos Energy

17. No comment.

Duck River Electric Membership Corp

18. No comment provided.

CPWS BB

19. Plan to Serve

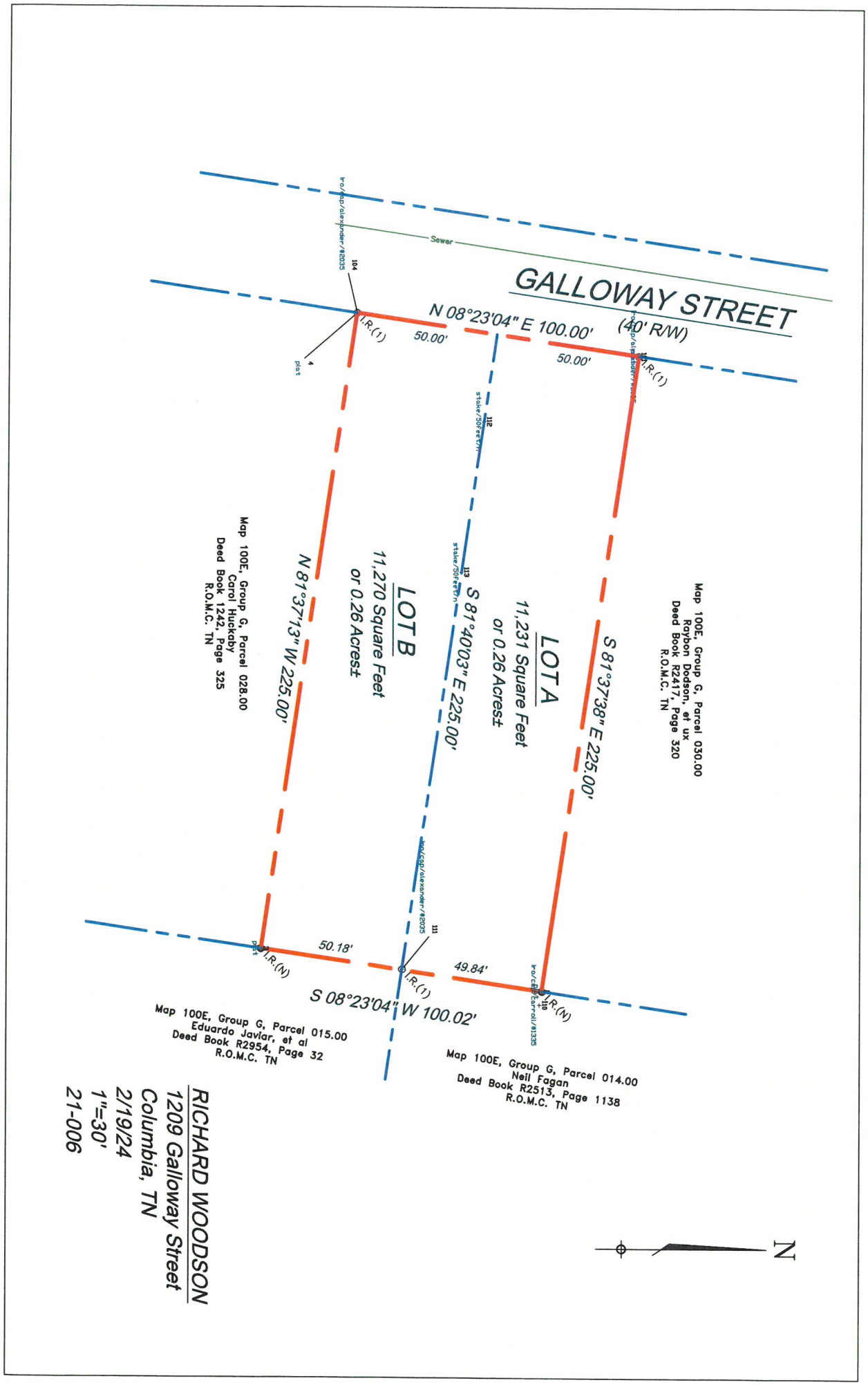
ATTACHMENTS: Concept Plan

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.

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	Open Seats
322	94.7%	18
636	90.9%	64
369	91.1%	36
314	82.6%	66
594	84.9%	106
575	91.3%	55
401	80.2%	99
449	83.1%	91
563	93.8%	37
599	80.9%	141
4822	***87.1%***	**713**
727	80.8%	173
64	7.1%	836
416	75.6%	134
527	55.5%	423
973	92.7%	77
2707	***62.2%***	**1643**
1382	81.3%	318
370	61.7%	230
1198	99.8%	2
2950	***84.3%***	**550**
874	85.7%	146
412	82.4%	88
512	78.8%	138
1798	***82.9%***	**372**
173		
12450		3105


GALLOWAY STREET
(40' R/W)
Sewer
N 08°23'04" E 100.00'
50.00'
50.00'
I.R.(1)
I.R.(1)
plot
104
112
113
111
110
N 81°37'13" W 225.00'
S 81°40'03" E 225.00'
S 81°37'38" E 225.00'
LOT B
11,270 Square Feet
or 0.26 Acres±
LOT A
11,231 Square Feet
or 0.26 Acres±
50.18'
49.84'
I.R.(N)
I.R.(1)
I.R.(N)
S 08°23'04" W 100.02'
Map 100E, Group G, Parcel 028.00
Carol Huckaby
Deed Book 1242, Page 325
R.O.M.C. TN
Map 100E, Group G, Parcel 030.00
Raybon Dodson, et ux
Deed Book R2417, Page 320
R.O.M.C. TN
Map 100E, Group G, Parcel 015.00
Eduardo Javiar, et al
Deed Book R2954, Page 32
R.O.M.C. TN
Map 100E, Group G, Parcel 014.00
Nell Fagan
Deed Book R2513, Page 1138
R.O.M.C. TN
N
RICHARD WOODSON
1209 Galloway Street
Columbia, TN
2/19/24
1"=30'
21-006

BK/PG: R2640/323-324
20009711

2 PGS:AL-WARRANTY DEED	
JANE BATCH: 230174	06/12/2020 - 01:22 PM
VALUE	50000.00
MORTGAGE TAX	0.00
TRANSFER TAX	185.00
RECORDING FEE	10.00
ARCHIVE FEE	0.00
DP FEE	2.00
REGISTER'S FEE	1.00
TOTAL AMOUNT	198.00

STATE OF TENNESSEE, MAURY COUNTY
JOHN FLEMING
REGISTER OF DEEDS

This Instrument Prepared By:
Frank K. Dale, Esq.
Lawwell, Dale, Graham & Hutto
805 South Garden Street
P.O. Box 1017
Columbia, TN 38402-1017

WARRANTY DEED

KNOW ALL MEN BY THESE PRESENTS, this indenture entered into between **CARLOS VALERO,** FIRST PARTY, which expression shall include heirs, assigns and personal representatives, and, **RICHARD E. WOODSON, A MARRIED MAN,** SECOND PARTY, which expression shall include heirs, assigns and personal representatives.

WITNESSETH:

For the consideration of TEN DOLLARS ($10.00), and other good and valuable considerations, the receipt of all of which is hereby acknowledged, FIRST PARTY conveys to SECOND PARTY the following described property:

Located in the Ninth (9th) Civil District of Maury County, Tennessee and being Lot 1 (containing 0.52 acres) on the Minor Plat of Ronald and Rita Maggi as shown by map of record in Plat Book P20 at page 162 in the Maury County, Tennessee Register of Deeds Office.

Being the same property conveyed to Carlos Valero by Deed dated August 17, 2018, recorded October 22, 2018, in Book R2523, Page 1373, in the Official Records of Maury County, Tennessee.

FIRST PARTY certifies that this property is not currently used by FIRST PARTY or a spouse or dependent of FIRST PARTY as a principal place of residence.

This property is shown on the tax records of Maury County, Tennessee as Map 100E, Group G, Parcel 029.00.

Legal description obtained from prior deed.

TO HAVE AND TO HOLD said real estate unto SECOND PARTY, together with all rights, titles, easements and appurtenances thereunto belonging, forever.

FIRST PARTY COVENANTS that it is lawfully seized and possessed of said real estate and that FIRST PARTY has a good and lawful right to convey the same, and that it is unencumbered, except for current year's property taxes, which are prorated and will be paid by SECOND PARTY; all matters shown on plat of record in Plat Book P20, Page 162, Register's Office of Maury County, Tennessee; all matters shown on plat of record in Plat Book P16, Page 8, Register's Office of Maury County, Tennessee; and any other matters of record.

FIRST PARTY FURTHER COVENANTS to forever warrant and defend the title to the above described property unto SECOND PARTY against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, this conveyance has been executed on this 11th day of June, 2020.

Carlos Valero

STATE OF TENNESSEE
COUNTY OF MAURY

On this 11th day of June, 2020, before me personally appeared **CARLOS VALERO**, to me known to be the person (or persons) described in and who executed the foregoing instrument, and acknowledged that such person (or persons) executed the same as such person's (or persons') free act and deed.

Witness my hand, at office, this 11th day of June, 2020.

Notary Signature

My commission expires: 7/10/2021

THOMAS M. HUTTO STATE OF TENNESSEE NOTARY PUBLIC MAURY COUNTY

STATE OF TENNESSEE - MAURY COUNTY

I hereby affirm that the actual consideration for this transfer or value of the property transferred, whichever is greater is **$50,000.00.**

Affiant

Sworn and subscribed to before me,

11th day of June, 2020.

Notary Public

My commission expires: 7/10/2024

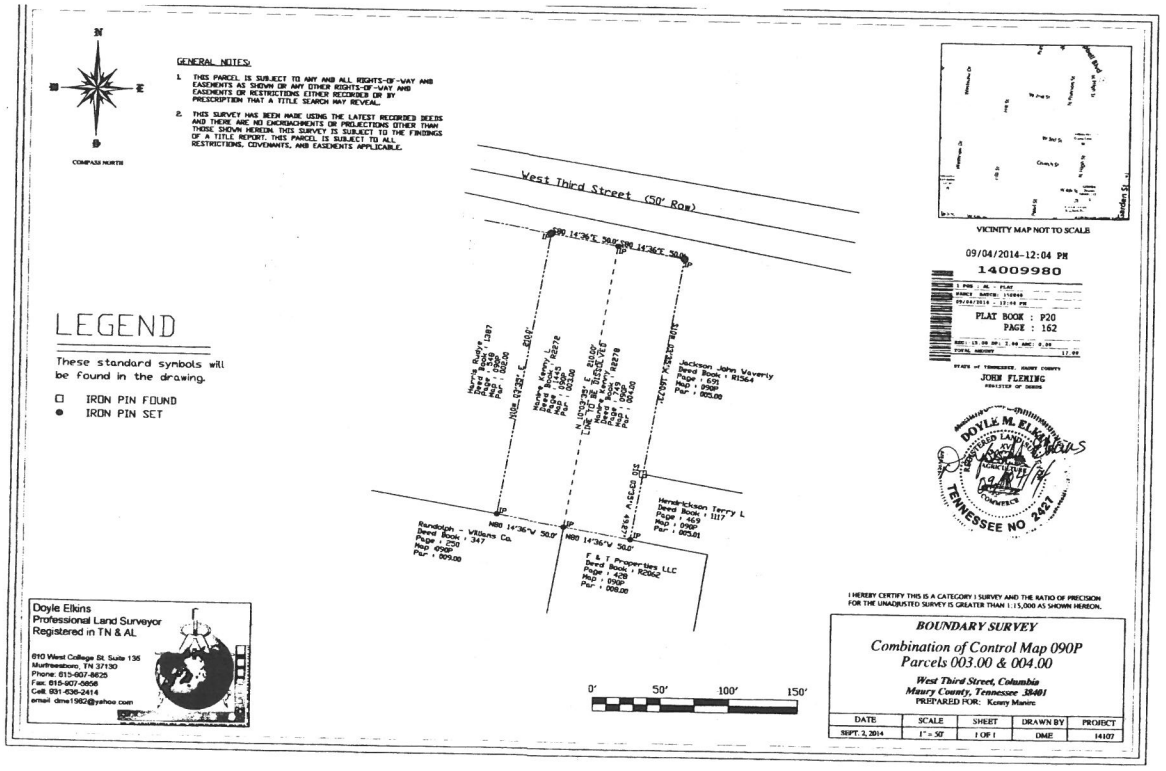
THOMAS M. HUTTO STATE OF TENNESSEE NOTARY PUBLIC MAURY COUNTY

PERSON OR AGENCY RESPONSIBLE FOR TAXES:

Same

NAME AND ADDRESS OF PROPERTY OWNERS:

Richard Edwardson
1612 Jeremy Dr
Columbia TN 38401


N
W
E
S
COMPASS NORTH
GENERAL NOTES:
1. THIS PARCEL IS SUBJECT TO ANY AND ALL RIGHTS-OF-WAY AND EASEMENTS AS SHOWN OR ANY OTHER RIGHTS-OF-WAY AND EASEMENTS OR RESTRICTIONS EITHER RECORDED OR BY PRESCRIPTION THAT A TITLE SEARCH MAY REVEAL.
2. THIS SURVEY HAS BEEN MADE USING THE LATEST RECORDED DEEDS AND THERE ARE NO ENCROACHMENTS OR PROJECTIONS OTHER THAN THOSE SHOWN HEREON. THIS SURVEY IS SUBJECT TO THE FINDINGS OF A TITLE REPORT. THIS PARCEL IS SUBJECT TO ALL RESTRICTIONS, COVENANTS, AND EASEMENTS APPLICABLE.
LEGEND
These standard symbols will be found in the drawing.
IRON PIN FOUND
IRON PIN SET
West Third Street (50' Row)
N88 14'36"W 599.00'
N88 14'36"W 50.0'
N88 14'36"W 50.0'
Harris Rudy Deed Book : 1287 Page : 0356 Par : 009.00
Harris Larry L Deed Book : 1287 Page : 0356 Par : 009.00
N 01°23'24" E 600'
Harris Larry L Deed Book : 1287 Page : 0356 Par : 009.00
Harris Rudy Deed Book : 1287 Page : 0356 Par : 009.00
Jackson John Waverly Deed Book : R1364 Page : 079P Par : 005.00
1.43±0 AC
Hendrickson Terry L Deed Book : 1117 Page : 069P Par : 005.01
Randolph - Wilkins Co. Deed Book : 250 Page : 347 Map : 090P Par : 009.00
E & T Properties, LLC Deed Book : R2662 Page : 428 Map : 090P Par : 008.00
0' 50' 100' 150'
VICINITY MAP NOT TO SCALE
09/04/2014-12:04 PM
14009980
PLAT BOOK : P20
PAGE : 162
STATE of TENNESSEE, MAURY COUNTY
JOHN FLEMING
REGISTER OF DEEDS
DOYLE M. ELKINS
REGISTERED LAND SURVEYOR
TENNESSEE NO. 2427
Doyle Elkins
Professional Land Surveyor
Registered in TN & AL
810 West College St. Suite 136
Murfreesboro, TN 37130
Phone: 615-907-8625
Fax: 615-907-5656
Cell: 931-636-2414
email: dme1982@yahoo.com
I HEREBY CERTIFY THIS IS A CATEGORY I SURVEY AND THE RATIO OF PRECISION FOR THE UNADJUSTED SURVEY IS GREATER THAN 1:15,000 AS SHOWN HEREON.
BOUNDARY SURVEY
Combination of Control Map 090P
Parcels 003.00 & 004.00
West Third Street, Columbia
Maury County, Tennessee 38401
PREPARED FOR: Kenny Mannc
DATE | SCALE | SHEET | DRAWN BY | PROJECT
SEPT. 2, 2014 | 1" = 50' | 1 OF 1 | DME | 14107

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	1209 Galloway St. ~~416 West 15th Street~~, Columbia TN.		
	TAX MAP:	GROUP:	PARCEL:
SUMMARY OF NATURE OF REQUEST AND WORK	CD4 30'x54' House built Create 2 51'Ft Lots		

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 CD-4. ☐ Compliance with Comprehensive Plan - Urban Neighborhood ☐ Annexation Permission Form ☐ Plans and/or Plats conforming to City standards with check list completed ☐ Columbia Water System Availability Letter - N-A **Plats/PUDs:** ☐ Project Name (include Sections & Phases) _____ ☑ Total Number of Lots 1 ☐ Total acreage Half ~~Acre~~ Point 52

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	Richard Woodson	PHONE	931-797-0597
ADDRESS	416 West 15th Street	EMAIL	woodsonrichard11@gmail.com

PROPERTY OWNER NAME	Richard Woodson	PHONE	931-797-0597
ADDRESS	416 West 15th Street Columbia TN.	EMAIL	WoodsonRichard11@Gmail.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.

Richard Woodson	Richard Woodson	2/15/24
APPLICANT NAME	APPLICANT SIGNATURE	DATE
Richard Woodson	Richard Woodson	2/15/24
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	

815 Woodside Rezoning

Project #:	24-0095	Location:	Map 99A G 32
Applicant:	Richard Woodson	Case Type(s):	Rezoning
Staff Planner:	Kevin C. McCarthy, AICP	Proposed Use:	Single Family

PROJECT SUMMARY

The applicant requests rezoning of a 0.39-acres lot on Woodside Street from CD-3 (Neighborhood Character District) to CD-4 (General Urban Character District). The current CD-3 zoning permits detached houses and some duplexes at four density units per acre. The requested CD-4 zoning permits a mix of uses and structure types, including townhomes, at twelve density units per acre.

- The requested zoning is consistent with the City Center Urban Village (CCUV) future land use classification in Connect Columbia.
- The applicant has provided a concept plan depicting division of the property into two lots.
- Subsequent development and division of the property will require additional reviews.
- 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-3	Residential	House	+/- 0.39



FUTURE LAND USE MAP	ZONING MAP





SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	City Center Urban Village	CD-3	Single Family
North	City Center Urban Village	CD-3	Single Family
South	City Center Urban Village	CD-3	Single Family
East	City Center Urban Village	CD-3	Single Family
West	City Center Urban Village	CD-3	Single Family

CONSISTENCY WITH CONNECT COLUMBIA

City Center Urban Village: The requested rezoning is consistent with the future land use map. The future land use of the subject site is City Center & Urban Village (CCUV). The CCUV future land use area comprises Columbia's iconic core and ancillary focal points (Connect Columbia, p. 35). It includes the historic courthouse square and the places residents of Columbia associate with worship, commerce, the arts, community activities and government administration. The CCUV also supports the creation of urbanized nodes which provide identifiable commercial hubs for Columbia's emerging neighborhoods. Each development parcel should add to Columbia's existing sense of place and extend its established form and pattern to create a more interconnected community. The future land use classification is implemented by the CD-4 and CD-5 character districts, as well as PUDs. In some cases, the Planning Commission may determine that CD-3 and CD-4C are also appropriate implementing zones.

Character & Intent

The City Center & Urban Village (CCUV) future land use area comprises Columbia's iconic core and ancillary focal points. It includes the historic courthouse square and the places residents of Columbia associate with worship, commerce, the arts, community activities and government administration. The CCUV also supports the creation of urbanized nodes which provide identifiable commercial hubs for Columbia's emerging neighborhoods. Each development parcel should add to Columbia's existing sense of place and extend its established form and pattern to create a more interconnected community.

Primary Land Uses are horizontally and vertically mixed in a variety of structure types. The intensity and mix of uses is largely determined by context. New residential development provides a mixture of housing within walking distance of commercial and civic spaces. New non-residential development in established residential areas shall be comprised of low-intensity uses which serve residents' daily needs. Higher intensity uses should complement and extend the traditional pattern of development in Columbia's core, or establish identifiable centers for emerging nodes.

Future development should emphasize connectivity and continuity of the city as a whole. Additionally, new development shall create a pedestrian-friendly environment by filling gaps in sidewalks and enhancing multi-modal infrastructure. All new and infill development shall emphasize linkages to identifiable community anchors such as mixed-use commercial centers, schools, parks, or civic institutions.



Land Use Considerations

Primary uses include government, civic uses, parks, religious facilities, offices, retail, and all forms of medium-density housing. Secondary land uses include utility facilities, institutional uses, low-density housing, and neighborhood retail. New industrial and warehouse uses are inappropriate.

Form & Pattern

The CCUV includes established and infill neighborhoods at medium to high densities organized along a well-connected transportation network. Infill development supports and extends the formation of blocks and eliminates gaps in the built environment. The CCUV future land use is distinguished from Suburban Neighborhoods (SN) by the unambiguous prominence of public frontages. A high density of streets and thoroughfares with complete public frontages extends the public sphere outward from civic and commercial spaces. Implementing bulk and design standards clearly delineate the public and private realms though the application of layers and front-to-back discipline of lots. Bulk and design standards are occasionally modified to accommodate historic preservation, artistic innovation, redevelopment, and other place-based policies of the City. New development should accompany concurrent extension of complete urban services in places where they do not already exist. Parking is provided on an area-wide basis as a utility supplemented by private land users.

Implementing Districts
Neighborhood CD-3 (Only where compatible with established pattern)
General Urban CD-4
Urban Center CD-5
General Urban-Corridor CD-4C (only along Arterial roadways)
Urban Center – Corridor CD-5C (only along Arterial roadways)*
Mixed Use PUD PUD-MU
Civic CV

Implementing Standards
General Development Pattern: Mixed Uses & Isolated Uses
Density (density unites per ace): ≥ 12 du/ac
Building Height: 1-5 stories
Open Space Elements: Civic Spaces, Parks & Greenways





AREA OF CHANGE

Connect Columbia established the areas of change policy designation for the subject site as *activate*. The designation includes areas where significant and beneficial change is occurring or is desired. These areas are the focus of proactive City policies to bring the community's values to fruition. Public investment and increased coordination with the private sector will achieve transformational changes envisioned by the community (Connect Columbia p. 32).



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 subdivide the site in conformity with the bulk and design standard of the Ordinance at Table 4.3.1-D.**
    - The plan depicts the division of the property, which spans the block between Wilkes Street and Woodside Street into two lots.
        - The existing home, enfronting Woodside Street, is depicted on Lot B.
        - The remainder of the property is depicted on Lot A.
    - One of the lots shown in the concept does not conform to the standards of the Zoning Ordinance. Specifically, Lot B would create a "through lot" which is prohibited by § 4.3.3.D of the Zoning Ordinance (p. 190).
    - There are at least two possible alternatives which would create conforming CD-4 lots.
        - Presuming the property measurements shown in the concept are correct, the there is sufficient frontage to create two lots enfronting Wilkes Street. This would produce three total lots, each with a front, a back, and two sides.
        - Alternatively, the existing lot could be divided with a line parallel to the streets, creating a total of two lots each with a front, a back, and two sides. In this scenario, the lot enfronting Wilkes Street would ± 102.01-feet wide while the lot enfronting Woodside Street would be ± 59.71-feet wide.
    - Regardless of which option the property owner chooses, the concept plan does indicate that it is possible to divide the property into conforming CD-4 lots.

- **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.**
    - 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.
        - Lots – Planning & Zoning will ensure that lots conform to the dimensional standards of the Ordinance at the time of subdivision.
        - Buildings – Staff will evaluate any proposed structures for zoning compliance as part of the building permit review.

REVIEW PROCESS

The Development Review Committee evaluated the proposed rezoning at its March 2024 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];
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 March 2024 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.
- Due to the small scale of the request, the applicant could not obtain a standard water availability letter. Planning directed the applicant to obtain written confirmation from the Office of Fire Marshal and CPWS's consultant that sufficient water is available to serve the property for domestic use and fire protection. The applicant provided this information at resubmittal.
- Planning directed the applicant to obtain a Will-Serve Letter from the Columbia Wastewater Department. The applicant provided this information at resubmittal.

COMMENTARY FROM PROFESSIONAL PLANNING STAFF

The requested CD-4 zoning is consistent with Connect Columbia. As discussed above, the subject site's future land use classification is City Center Urban Village (CCUV). The requested CD-4 (General Urban) character district implements the future land use. The Area of Change Policy for the property is *activate*, indicating that the city encourages beneficial changes to the land use pattern in the area.

The CD-4 design standards are more prescriptive than the current CD-3 standards. The Zoning Ordinance contains highly prescriptive design standards which provide an improved built environment over time. Single family homes in exclusively residential zoning districts are exempt from most of these standards. However, design standards apply to all structure types in mixed-use zones, beginning with CD-4. As the first property on the block to rezone into consistency with the future land use map, the property owner, or any subsequent purchaser, should be on notice that new structures on the property will be subject to more onerous standards.

Any division of the property must conform to the standards of the Ordinance and Subdivision Regulations. Rezoning amends the regulatory map and determines which section of the Ordinance applies to the site. Zoning map amendments do not approve any specific plan of development. The applicant provided a concept plan for the rezoning which indicates the parcel is of sufficient size to create more than one conforming CD-4 lot. Subdivision of the property will require a plat prepared by a registered land surveyor. If the applicant succeeds in rezoning the property, additional applications prepared with the aid of qualified professionals will be necessary to accomplish the goal of subdividing 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** 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.

Sandra Richardson

From: Kevin McCarthy
Sent: Monday, March 18, 2024 1:05 PM
To: Brad Massey
Cc: Sandra Richardson; Melissa Sanders
Subject: RE: 816 Wilkes rezone

Thank you, Brad!

From: Brad Massey <bmassey@columbiatn.com>
Sent: Monday, March 18, 2024 11:49 AM
To: Kevin McCarthy <kmccarthy@columbiatn.com>
Subject: 816 Wilkes rezone

For the proposed purpose of a single family dwelling unit, there is adequate water for fire fighting purposes. Any structure other than single family dwelling unit or townhomes will require a water availability letter from CPWS.

Thank you,

Brad Massey
Fire Marshal
Columbia Fire & Rescue

bmassey@columbiatn.com
931-560-1740
931-626-1236
700 North Garden Street
Columbia, TN 38401
Columbiatn.com

CITY OF COLUMBIA
TENNESSEE

WASTEWATER DEPARTMENT

21 March 2024

Richard Woodson
815 Woodside Street
Columbia, TN 38401

RE: 815 Woodside Street, Columbia, TN 38401

Richard,

This letter serves as confirmation that the City of Columbia Wastewater Department has the available capacity to service the subject 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

CITY OF COLUMBIA
TENNESSEE

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, March 12, 2024

ITEM NO.
24-0095

DESCRIPTION: Rezoning. Applicant listed address as 816 Wilkes Street.

COMMENTS: No 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 provide written confirmation from the Fire Marshal and CPWS/Inflo that adequate water supply can be made available to the property (with or without developer provided improvements) for uses and intensity permitted in the requested character district.
3. Please obtain a will-serve letter from Columbia Wastewater Department indicating that there is adequate wastewater treatment capacity and sewerage (with or without developer provided improvements) for uses and intensity permitted in the requested character district. An online form is available to submit the request: https://www.columbiatn.com/FormCenter/Development-Services-12/Wastewater-WillServeLetter-Request-80. Brad
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.
5. Advisory: The concept plan depicts the creation of a through-lot extending from Wilkes to Woodside. The Zoning Ordinance prohibits the creations of through lots and building sites. If the rezoning is successful, any further subdivision of the property must conform to the Ordinance. In this case, that will likely involve the creation of three conforming lots.

Engineering

6. No comments on rezoning. ThankYou

Wastewater

7. Columbia Wastewater has no concern. ThankyouColumbia wastewater

Columbia Power

8. 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.

Atmos Energy

9. 2" pe gas main along Woodside Street

Columbia Water

10. Two lots, no availability letter required. Lots will be served from existing 8" main.

CPWS BB

11. Plan to Serve.

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. Applications which are not complete and responsive to all technical comments following two resubmittal deadlines will be closed.

Wastewater Availability

https://www.columbiatn.com/FormCenter/Development-Services-12/Wastewater-WillServeLetter-Request-80

102.47
200
.4705

CITY OF COLUMBIA
TENNESSEE

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, March 12, 2024

ITEM NO.
24-0095

DESCRIPTION: Rezoning. Applicant listed address as 816 Wilkes Street.

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 provide written confirmation from the Fire Marshal and CPWS/Inflo that adequate water supply can be made available to the property (with or without developer provided improvements) for uses and intensity permitted in the requested character district.
3. Please obtain a will-serve letter from Columbia Wastewater Department indicating that there is adequate wastewater treatment capacity and sewerage (with or without developer provided improvements) for uses and intensity permitted in the requested character district. An online form is available to submit the request: https://www.columbiatn.com/FormCenter/Development-Services-12/Wastewater-WillServeLetter-Request-80.
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.
5. Advisory: The concept plan depicts the creation of a through-lot extending from Wilkes to Woodside. The Zoning Ordinance prohibits the creations of through lots and building sites. If the rezoning is successful, any further subdivision of the property must conform to the Ordinance. In this case, that will likely involve the creation of three conforming lots.

Engineering

6. No comments on rezoning.

Wastewater

7. Columbia Wastewater has no concern.

Fire

8. No comments

Maury County Highway Dept.

9. No comment.

ATT

10. NO COMMENT

Maury County E911

11. No comment at this time.

Maury County Schools

12. No comments.

Columbia Power

13. 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

14. No comment provided.

Atmos Energy

15. 2" pe gas main along Woodside Street

Duck River Electric Membership Corp

16. No comments.

Columbia Water

17. "Two lots, no availability letter required. Lots will be served from existing 8" main."

CPWS BB

18. Plan to Serve.

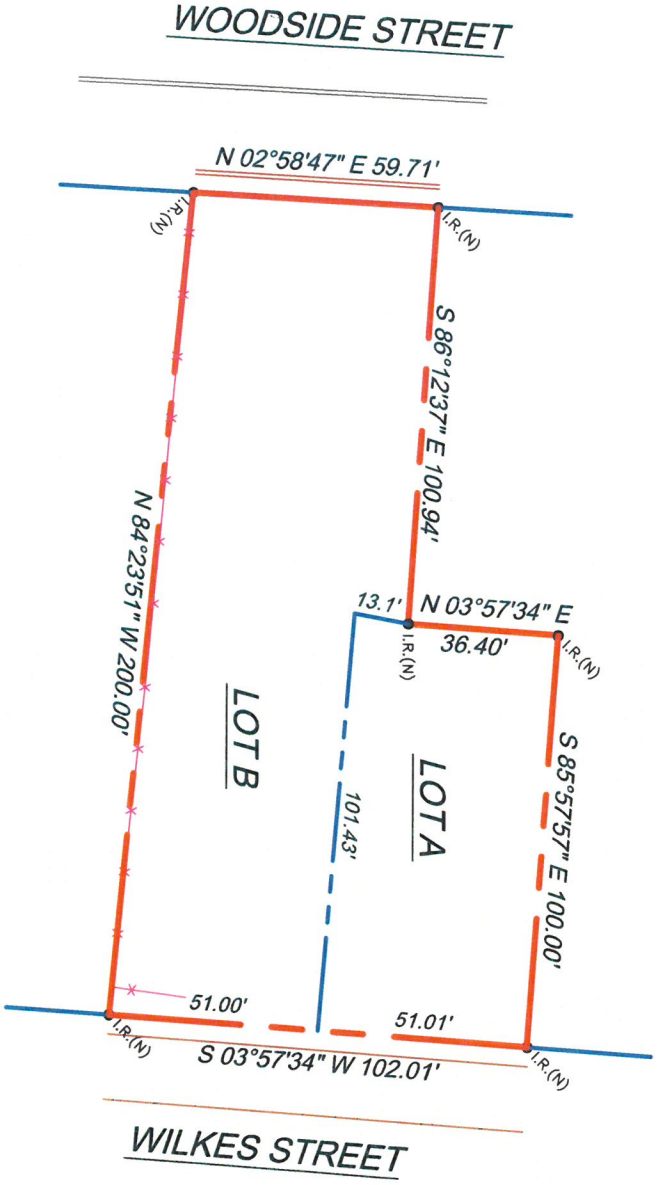
ATTACHMENTS: Concept Plan

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.

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	Open Seats
322	94.7%	18
636	90.9%	64
369	91.1%	36
314	82.6%	66
594	84.9%	106
575	91.3%	55
401	80.2%	99
449	83.1%	91
563	93.8%	37
599	80.9%	141
4822	***87.1%***	**713**
727	80.8%	173
64	7.1%	836
416	75.6%	134
527	55.5%	423
973	92.7%	77
2707	***62.2%***	**1643**
1382	81.3%	318
370	61.7%	230
1198	99.8%	2
2950	***84.3%***	**550**
874	85.7%	146
412	82.4%	88
512	78.8%	138
1798	***82.9%***	**372**
173		
12450		3105



RICHARD WOODSON
815 Woodside Street
Columbia, TN
2/19/24
1"=30'
21-007

N

AFTER RECORDING RETURN TO:
BAY NATIONAL TITLE CO.
13577 FEATHER SOUND DRIVE, STE. 250
CLEARWATER, FL 33762
File No. CITI-35316

Mail

This document prepared by:
JOHN O. WINDSOR, ESQ.
1775 LELIA DRIVE SUITE E (2ND FLOOR)
JACKSON, MS 39216
866-333-3081

Tax ID No.: 099A-G-032.00-000

BK/PG:R2348/948-951

15015219

4 PGS : AL - WARRANTY DEED	
JANE BATCH: 167063	
12/01/2015 - 03:17 PM	
VALUE	15000.00
MORTGAGE TAX	0.00
TRANSFER TAX	55.50
RECORDING FEE	20.00
DP FEE	2.00
REGISTER'S FEE	1.00
TOTAL AMOUNT	78.50

STATE of TENNESSEE, MAURY COUNTY
JOHN FLEMING
REGISTER OF DEEDS

SPECIAL WARRANTY DEED

THIS DEED made and entered into on this 28th day of September, 2015, by and between **CITIFINANCIAL SERVICING, LLC**, a mailing address of 1000 TECHNOLOGY DRIVE, O'FALLON, MO 63368 hereinafter referred to as Grantor(s) and **RICHARD E. WOODSON AND ANITA V. WOODSON, HUSBAND AND WIFE**, a mailing address of 1612 JEREMY DRIVE, COLUMBIA, TN 38401, hereinafter referred to as Grantee(s).

WITNESSETH: That the said Grantor, for and in consideration of the sum of FIFTEEN THOUSAND AND 00/100 ($15,000.00) DOLLARS, cash in hand paid, the receipt of which is hereby acknowledged, have this day given, granted, bargained, sold, conveyed and confirmed and do by these presents give, grant, bargain, sell, convey and confirm unto the said Grantee(s) the following described real estate located in MAURY County, TENNESSEE:

SEE ATTACHED EXHIBIT "A" FOR LEGAL DESCRIPTION.

SUBJECT TO EASEMENTS, COVENANTS, CONDITIONS, RESTRICTIONS, RESERVATIONS, AND LIMITATIONS OF RECORD, IF ANY.

Being the same property conveyed to the Grantor(s) in a prior Deed recorded under DOCUMENT NO. 15005858, recorded on 05/21/2015 in MAURY County, TENNESSEE.

Book * R2320 PG 1339

TO HAVE AND TO HOLD the lot or parcel above described together with all and singular the rights, privileges, tenements, hereditaments and appurtenances thereunto belonging or in anywise appertaining unto the said Grantee(s) and unto the heirs, administrators, successors or assigns of the Grantee(s) forever in fee simple.

Grantor hereby warrants to the Grantee(s) that title to the subject real property described herein is the same quality which was received by the Grantor. Grantor's warranty is limited solely to matters arising from the acts or omissions of the Grantor occurring solely during the period of the Grantor's ownership of the subject real property. This limited warranty is binding upon the Grantor, its successors and assigns.

1

Tax ID No.: 099A-G-032.00-000

IN WITNESS WHEREOF, the said Grantor has hereunto set their hand and seal on this 21st day of August, 2015.

CITIFINANCIAL SERVICING, LLC

By Olympus Asset Management as Attorney in Fact

BY: [signature] 8/21/15

PRINT NAME: Kendra Stratton

TITLE: Closing Analyst

Olympus Asset Management, Inc. INCORPORATED MAINE 2001

STATE OF Maine
COUNTY OF Cumberland

Before me, Kayla Emery, a Notary Public, of the state and county mentioned, personally appeared Kendra Stratton, Closing Analyst, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who, upon oath, acknowledged such person to be president (or other officer authorized to execute the instrument) of Olympus Asset Management as Attorney in Fact for CITIFINANCIAL SERVICING, LLC, the within named bargainer and that such president or officer executed the foregoing instrument for the purpose therein contained.

Witness my hand and seal, at office in Scarborough, ME, this 21st day of August, 2015.

[signature]
Notary Public
My Commission expires: [illegible]

KAYLA M. EMERY
Notary Public-Maine
My Commission Expires
October 15, 2020

KAYLA M. EMERY NOTARY PUBLIC COMMISSION EXPIRES 10-15-2020 MAINE

No title search was performed on the subject property by the preparer. The preparer of this deed makes neither representation as to the status of the title nor property use or any zoning regulations concerning described property herein conveyed nor any matter except the validity of the form of this instrument. Information herein was provided to preparer by Grantor/Grantee and/or their agents; no boundary survey was made at the time of this conveyance.

VALUATION AFFIDAVIT

I, hereby swear or affirm that to the best of my knowledge, information, and belief, the actual consideration for this transfer or value of the property transferred, whichever is greater is $15,000.00, which amount is equal to or greater than the amount which the property transferred would command at a fair voluntary audit.

Richard E. Woodson
RICHARD E. WOODSON

STATE OF Tennessee
COUNTY OF Maury

Sworn to before me this 28 day of September, 2015.

Sharon Roberson
Notary Public
My Commission Expires: 06-18-2019

SHARON ROBERSON
STATE OF TENNESSEE
NOTARY PUBLIC
MAURY COUNTY, TENN.

Name and address for person(s) responsible for taxes:

RICHARD E. WOODSON AND ANITA V. WOODSON
1612 JEREMY DRIVE
COLUMBIA, TN 38401

Name and address of property owner:

RICHARD E. WOODSON AND ANITA V. WOODSON
1612 JEREMY DRIVE
COLUMBIA, TN 38401

3

EXHIBIT A
LEGAL DESCRIPTION

THE FOLLOWING DESCRIBED REAL ESTATE LOCATED IN THE COUNTY OF MAURY, STATE OF TENNESSEE; HOUSE AND LOT SITUATED IN THE 9TH CIVIL DISTRICT OF MAURY COUNTY, TENNESSEE, THE 3RD WARD OF THE CITY OF COLUMBIA BOUNDED ON THE NORTH BY MCMEEN AND ALINE STREET, ON THE EAST BY WILKES STREET; IN THE SOUTH BY D.E. GREEN, AND ON THE EAST BY BEASLEY AND WOODSIDE STREET.

TAX ID NUMBER: 099A-G-032.00-000

PROPERTY COMMONLY KNOWN AS: 815 WOODSIDE STREET, COLUMBIA, TN 38401

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	816 Wilkes St. Columbia TN.		
	TAX MAP:	GROUP:	PARCEL:
SUMMARY OF NATURE OF REQUEST AND WORK	CD4 built		

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 CD-4 ☐ Compliance with Comprehensive Plan - URBAN NEIGHBORHOOD ☐ Annexation Permission Form ☐ Plans and/or Plats conforming to City standards with check list completed ☐ Columbia Water System Availability Letter - N-A LESS THAN 4 LOTS - **Plats/PUDs:** ☐ Project Name (include Sections & Phases) ☑ Total Number of Lots 1 ☐ Total acreage Acre Half

* CONCEPT PLAN REQUIRED - SHOW LAYOUT OF HOUSE ON LOT.

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	Richard Woodson	PHONE	931-797-0597
ADDRESS	816 Wilkes St.	EMAIL	woodsonrichard11@gmail.com

PROPERTY OWNER NAME	Richard Woodson	PHONE	9317970597
ADDRESS	816 Wilkes St.	EMAIL	woodsonrichard11@gmail.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.

Richard Woodson	Richard Woodson	2/15/24
APPLICANT NAME	APPLICANT SIGNATURE	DATE
Richard Woodson	Richard Woodson	2/15/24
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	

1316 Hampshire Pike

Project #:	24-0094	Location:	89P A 39.0
Applicant:	Ben Beasley	Case Type(s):	Preliminary Plat Revision
Staff Planner:	Kevin C. McCarthy, AICP	Proposed Use:	Single Family

PROJECT SUMMARY

The applicant requests approval of a Preliminary Plat for 43 lots as well as associated infrastructure and open spaces on a 15.64-acre tract yielding a density of 2.76 density units per acre (du/ac). The Planning Commission approved the Preliminary Plat for Hampshire Hills in July of 2022. It was one of the last developments approved under the previous zoning ordinance. The plat created a vested right to develop 42 lots with associated infrastructure and open spaces under the RS-10 Low Density Residential standards of ordinance 3638. The applicant revised the location of stormwater facilities during site construction plan review. This change made it feasible to create two additional home sites. The applicant now requests that the Planning Commission consider a modification to the approved plan to add another lot.

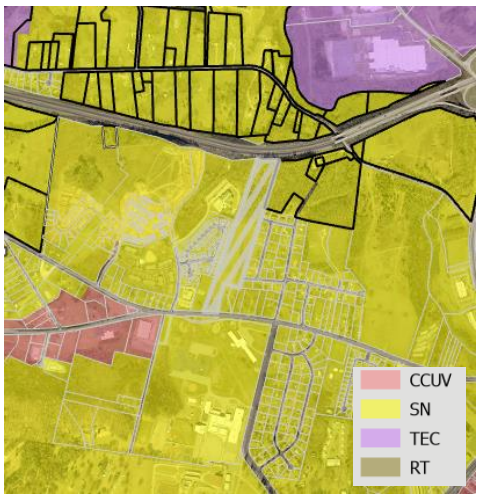
- The requested modification conforms to the applicable standards of ordinance 3638.
- The Planning Commission is the **decision-making authority** for the Preliminary Plat.
- The Zoning Ordinance permits the decisions-making authority to approve modifications of vested plans under limited circumstances.
- Templates are provided at the end of the report to assist the Planning Commission in crafting properly formatted motions.

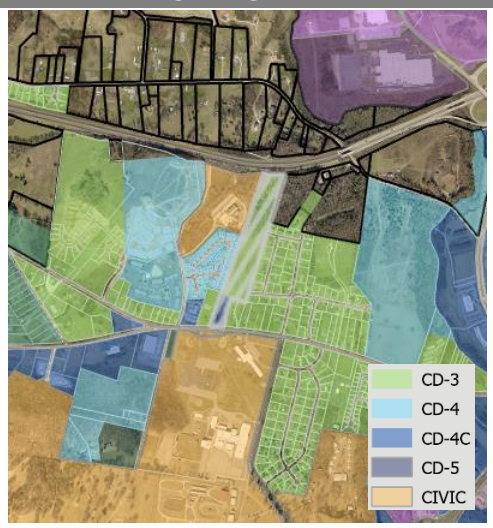
SITE INFORMATION

CURRENT ZONING	EXISTING USE	EXISTING IMP.	LAND AREA
CD-3	Residential	Single-Family Homes	15.64



FUTURE LAND USE MAP	ZONING MAP





SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	Suburban Neighborhoods	CD-3 (RS-10 Vested)	Single Family
North	Suburban Neighborhoods	Unincorporated	Single Family
South	Suburban Neighborhoods	CD-4	Single Family
East	Suburban Neighborhoods	CD-3/Unincorporated	Single Family/Vacant
West	Suburban Neighborhoods	Civic/CD-4	Civic/Two Family

CONSISTENCY WITH CONNECT COLUMBIA

Suburban Neighborhoods: The current CD-3 zoning is consistent with Connect Columbia. The intent of the Suburban Neighborhoods (SN) future land use is to enhance existing suburban areas and create new neighborhoods that will improve the quality of life in Columbia. Where appropriate, the SN future land use area also establishes mixed-use and commercial centers which serve residents' retail needs and provide a wider range of housing options. Each development parcel should add to Columbia's existing sense of place and extend the established form and pattern to create a more interconnected community. Future development should emphasize connectivity and continuity of the city as whole. The density and intensity of residential development increases in proximity to areas under the City Center Urban Village (CCUV) future land use classification. In the same way, density and intensity decrease in proximity to areas under the Rural Transition (RT) future land use classification. New development enhances pedestrian infrastructure with sidewalks and other multimodal routes. Public frontages may include sidewalks and street trees. Over time, new and infill development connects neighborhoods and community anchors such as libraries, neighborhood centers, health facilities, retail uses, parks, and schools. The future land use classification is usually implemented by the CD-3L and CD-3-character districts, as well as PUDs.

Character & Intent

The intent of the Suburban Neighborhoods (SN) future land use is to enhance existing suburban areas and create new neighborhoods that will improve the quality of life in Columbia. Where appropriate, the SN future land use area also establishes mixed-use and commercial centers which serve residents' retail needs and provide a wider range of housing options. Each development parcel should add to Columbia's existing sense of place and extend the established form and pattern to create a more interconnected community. Future development should emphasize connectivity and continuity of the city as whole. The density and intensity of residential development increases in proximity to areas under the CCUV future land use classification. In the same way, density and intensity decrease in proximity to areas under the Rural Transition (RT) future land use classification. New development enhances pedestrian infrastructure with sidewalks and other multimodal routes. Public frontages may include sidewalks and street trees. Over time, new and infill development connects neighborhoods and community anchors such as libraries, neighborhood centers, health facilities, retail uses, parks, and schools.

Land Use Considerations

The primary land use is low-density detached housing. Along arterial roadways, primary uses may include offices, retail, and all forms of medium-density housing. Secondary land uses include accessory dwellings, two-family homes, civic uses, institutional uses, schools, religious facilities, utility facilities, parks and open space. New industrial and warehouse uses are inappropriate.



Form & Pattern

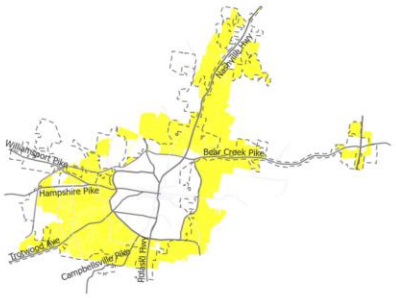
The SN future land use area is characterized by the organization of the built environment to extend a succession of large-lot neighborhoods and compact walkable neighborhoods. Development parcels extend established neighborhood patterns. Leap-frogging development is inappropriate. The SN future land use is distinguished from RT in the organization of lots and thoroughfares to form blocks. Physically separated developments which do not extend established block formation and roadway networks are inappropriate. The density of streets and blocks increases with proximity to CCUV and community anchors. Implementing bulk and design standards loosely delimit the public and domestic realms though the application of layers and front-to-back discipline of lots. Along arterial roadways, commercial corridors of varying intensities emerge over time with a high-quality built environment typified by a mix of building types and a balance between automobile-oriented and pedestrian-oriented design. The physical intensity of development along arterial corridors varies based on the surrounding residential density and the roadway's place in the transportation network. New development should accompany concurrent extension of complete urban services. Parking is provided on-site by private land users, supplemented by on-street spaces.

Implementing Districts

Neighborhood-Large Lot CD-3L
Neighborhood CD-3
General Urban-Corridor CD-4C (only along Arterial roadways)
Manufactured Home Park SD-MHP
Residential PUD PUD-R
Mixed Use PUD PUD-MU
Civic CV

Implementing Standards

General Development Pattern: Mixed Uses & Isolated Uses
Density (density unites per ace): 4 - 24 du/ac
Building Height: 1 - 4 stories
Open Space Elements: Civic Spaces, Parks & Greenways





AREA OF CHANGE

Connect Columbia established the areas of change policy designation for the subject site as *activate*. The designation includes areas where change is market-driven. New and infill development should maintain or improve the level of service of municipal services. City policies facilitate change through a process of public deliberation and high standards for the built environment. (Connect Columbia p. 32).



CONFORMITY WITH ZONING ORDINANCE

The applicable standard for review is §6.3.8 of ordinance 3638. The Planning Commission determined that the lots conformed to the applicable standard when it approved the Preliminary Plat in 2022.

The proposed revision relocates a lot within the development and adds one new lot which conforms to the applicable standard. The revised plan also includes the location of a mail kiosk. These adjustments are made possible by the consolidation of water quality and detention ponds within the development. The changes are illustrated below.



BEFORE (42 Lots)



AFTER (43 Lots)

REVIEW PROCESS

The Development Review Committee evaluated the proposed rezoning at its March 2024 meeting, as directed by section **8.3.7** of the Zoning Ordinance and **2.2.4** of the Subdivision Regulations. Technical comments are provided in the agenda package.

Section **1.24.7** of the Zoning Ordinance establishes the review criteria for amendments to previously approved and vested plans. Changes are subject to approval by Decision-Making Authority which is the Planning Commission in this case. A proposed amendment may be denied based upon a written finding by the Decision-Making Authority that the amendment:

1. Changes the proposed Use;
2. Increases the overall area of the Development;
3. Changes the size of any non-Residential Structures included in the Development Plan or Master PUD Development Plan;
4. Increases the Density of the Development so as to affect traffic, noise or other environmental impacts; or
5. Increases any City expenditure necessary to implement or sustain the proposed Use.

The Planning Commission may decline to approve the amendment without impacting the property owner's vested rights.

Section **2.2.6** of the Subdivision Regulations establishes the review criteria for approval of Preliminary 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.*

In the event of a denial, **§ 2.2.5** 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.

SUMMARY OF DEVELOPMENT REVIEW COMMITTEE COMMENTS

The DRC reviewed this proposal at its March 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 that the applicant clarify the ordinance under which the plan is vested and to clarify the purpose of the plat revision.
- **Engineering** directed the applicant to appropriately label roadways according to their functional classifications and indicated requirements for the phasing of off-site improvements.
- **Maury County Schools** provided attendance zones for the subject property and indicated that these are subject to change due to realignment or construction of new facilities based on the operational needs of the school system. This is a standard comment on residential projects.

COMMENTARY FROM PROFESSIONAL PLANNING STAFF

Revision of the vested plan is at the discretion of the Planning Commission. The applicant has a right to develop the site based on the previous approval. The City of Columbia has adopted new standards for development. The Zoning Ordinance makes clear that the Planning Commission, as the decision-making authority for subdivisions, may approve revisions to vested plans. It may also decline to approve changes without affecting the underlying vested right. Under §1.24.7, the Planning Commission may deny the request based on a finding that the additional unit will a) have negative impacts related to traffic, noise, or the environment; or b) increase City expenditures related to urban services. Alternatively, the Planning Commission may find that the addition of one unit does not change the layout of the development has a de minimis impact on the community.

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 **1.24.7** of the City of Columbia Zoning Ordinance, and Section **2.2.6** of the Subdivision Regulations, have been satisfied and approve revised Preliminary Plat as presented *[,subject to technical comments and other conditions presented by planning staff*].

Approve Subject to Conditions:

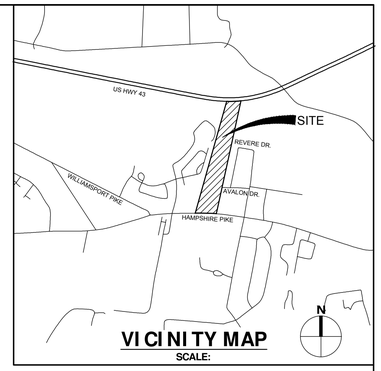
Move to find, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in section **1.24.7** of the City of Columbia Zoning Ordinance, and Section **2.2.6** of the Subdivision Regulations, have been satisfied and approve the revised Preliminary Plat subject to the following conditions: [*list conditions of approval crafted by Planning Commission*].

Deny:

Move to deny the Site Development Plan and Preliminary Plat having found, based on the information presented by the applicant and the analysis provided by city staff, that the criteria listed in section **1.24.7** of the City of Columbia Zoning Ordinance, and Section **2.2.6** of the Subdivision Regulations 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 that future meeting.



VICINITY MAP
SCALE:

CSDG
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Nashville, TN 37211
615.248.9999
csdgtn.com

SEAL



CONSTRUCTION PLANS
HAMPSHIRE HILLS

NIGHTENGALE RIDGE
COLUMBIA, MAURY COUNTY, TENNESSEE
MAP 89 & PARCEL 15.00 & 39.00

CURRENT ZONING CD3 PLAT IS SUBJECT TO RS-10 STANDARDS WITH PREVIOUSLY APPROVED PLAT

DISTRICT 1

SHEET INDEX

	COVER
C0.01	EXISTING CONDITIONS
C1.00	OVERALL SITE LAYOUT PLAN
C1.01	SITE LAYOUT PLAN
C1.02	SITE LAYOUT PLAN
C2.00	OVERALL GRADING & DRAINAGE PLAN
C3.00	OVERALL SANITARY LAYOUT PLAN
C4.00	OVERALL UTILITY LAYOUT PLAN

PRE-CONSTRUCTION	POST-CONSTRUCTION
PREVIOUS: 17.13 AC	PREVIOUS: 12.16 AC
IMPERVIOUS: 0.24 AC	IMPERVIOUS: 5.21 AC

PROJECT CONTACTS

OWNER/ DEVELOPER

Cypress Homes LLC

CONTACT: Benjamin Beasley
ADDRESS: 1805 Gunnerson Ln
Franklin, TN 37064
PH: 615-497-1511
E-MAIL: ben@cypresshomestn.com

PLANNER | ENGINEER

CSDG

CONTACT: JOE HADDIX, PE
2305 KLINE AVE, STE 300
NASHVILLE, TN 37211
PH: (615) 248-9999
E-MAIL: joeh@csdgtn.com

HAMPSHIRE HILLS
PRELIMINARY PLAT SET
Nightengale Ridge
Columbia, Maury County, Tennessee
Map 89 - Parcel 39.00

ISSUE SET:

ISSUE DATE:08/10/22

REVISION HISTORY:

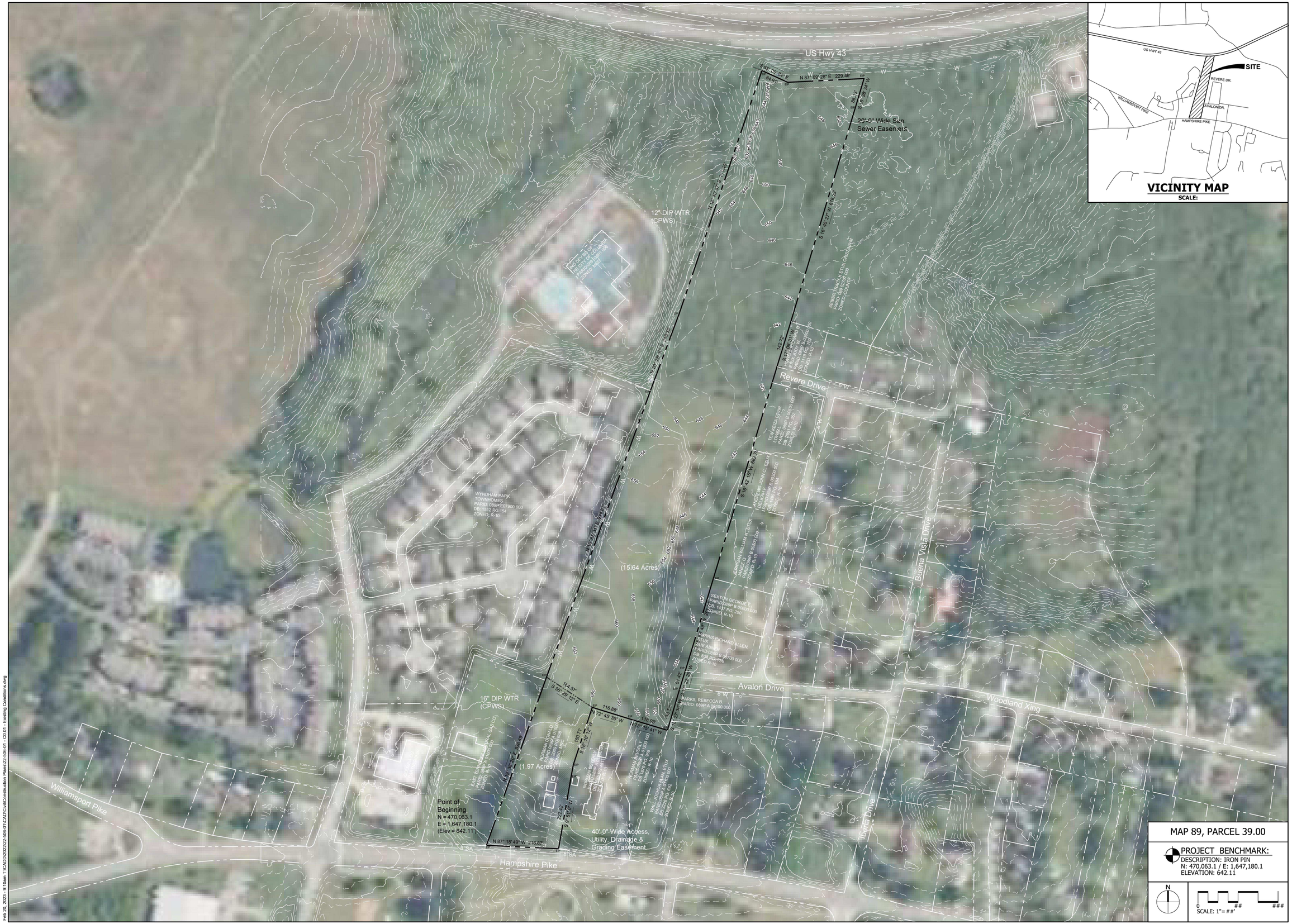
Rev.	Description	Date
1	CD RESUBMITTAL	01/04/23
2	CPWS COMMENTS	02/08/23
3	SANIATRY COMMENTS	02/16/23

DRAWN BY:
CHECKED BY:

COVER

C0.00

PROJECT NO.: 22-506-01



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SEAL

JOSEPH M. HOOD
REGISTERED
ENGINEER
No. 116561
STATE OF TENNESSEE
02/16/23

HAMPSHIRE HILLS
PRELIMINARY PLAT SET
Nightengale Ridge
Columbia, Maury County, Tennessee
Map 89 - Parcel 39.00

ISSUE SET:

ISSUE DATE: 08/10/22

REVISION HISTORY:

Rev.	Description	Date
1	CD RESUBMITTAL	01/04/2
2	CPWS COMMENTS	02/08/2
3	SANIATRY COMMENTS	02/16/2

DRAWN BY:
CHECKED BY:

EXISTING CONDITIONS

C0.01

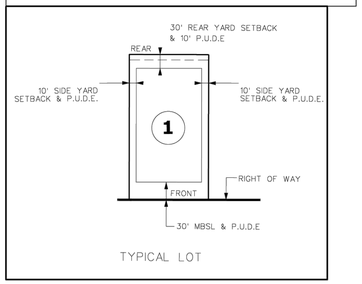
PROJECT NO.: 22-506-01

Feb 20, 2023 - 9:10am T:\CAD\D\2022\22-506-01\CAD\Civil\Construction Plans\22-506-01 - C0.01 - Existing Conditions.dwg

SITE DATA CHART

PARCEL ID: 39.00
PARCEL SIZE: 15.64 AC
EXISTING ZONING: RS-10
DENSITY ALLOWED: 15.64 - 2.8 = 12.84 * 43,560 / 10,000 = 55 LOTS
DENSITY PROPOSED: 43 LOTS
% IMPERVIOUS ALLOWED: 30%
% IMPERVIOUS PROPOSED:
OPEN SPACE REQUIRED: EXEMPT, LESS THAN 25 AC.
MINIMUM LOT SIZE: 10,000 S.F.
AVERAGE LOT SIZE PROPOSED:
MAX HEIGHT: 35'

LOT SETBACK LINES:
Front yard: 30'
Side yard: 10'
Rear yard: 30'



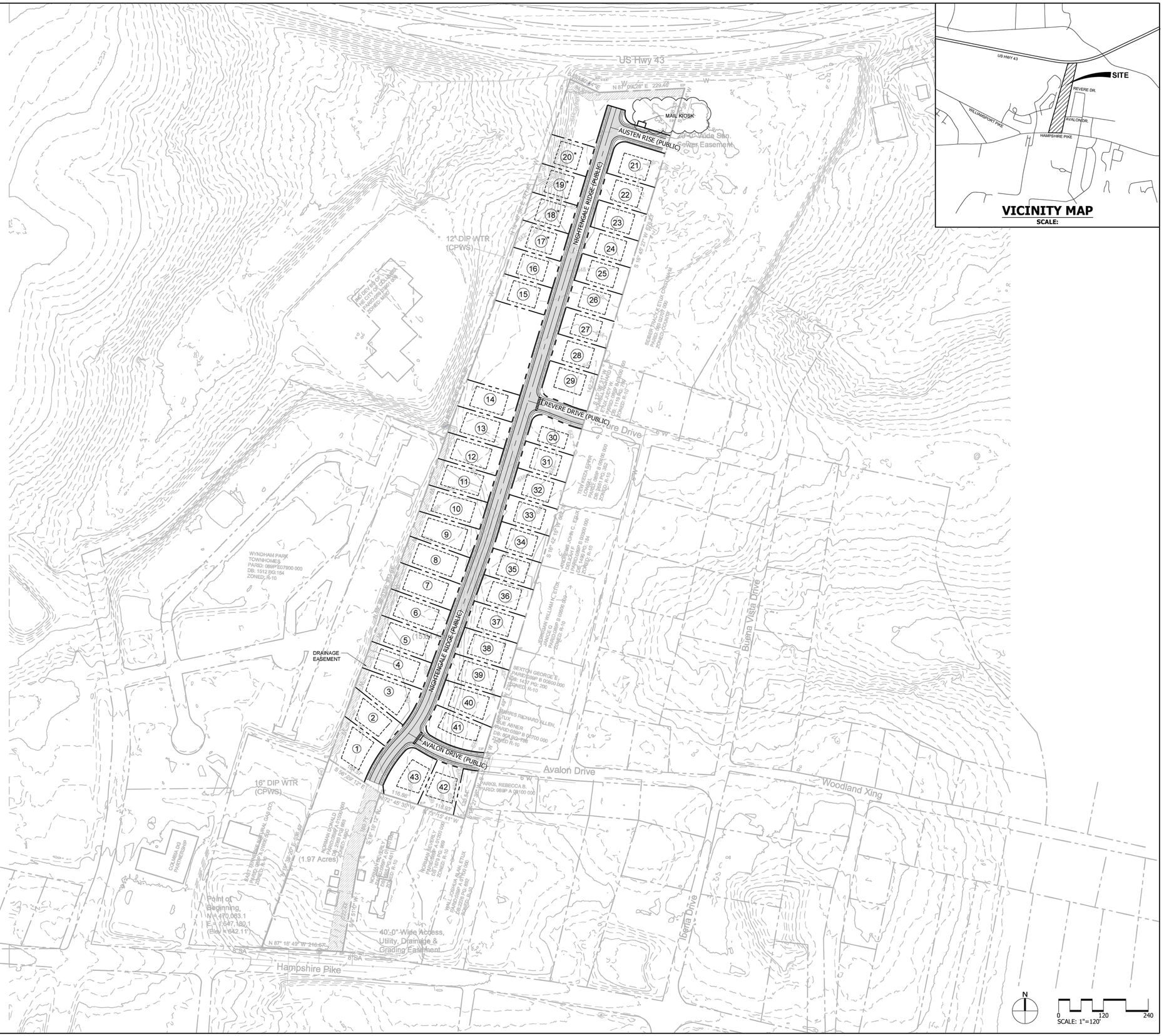
TYPICAL LOT

NOTES:

1. THIS PROPERTY IS NOT IN AN AREA OF FLOOD HAZARD, AS SHOWN ON THE FEMA COMMUNITY MAP/PANEL NUMBER 47119C0165E AND 47119C0280E, EFFECTIVE DATE APRIL 16, 2007.

PARCEL AREA TABLE

Parcel #	Area (Sq. Ft.)	Area (Ac.)
1	13,819	0.32
2	11,407	0.26
3	13,829	0.32
4	12,862	0.30
5	12,862	0.30
6	12,862	0.30
7	12,862	0.30
8	12,862	0.30
9	12,972	0.30
10	12,573	0.29
11	12,264	0.28
12	11,954	0.27
13	11,606	0.27
14	11,243	0.26
15	10,198	0.23
16	10,002	0.23
17	10,064	0.23
18	10,110	0.23
19	10,139	0.23
20	10,030	0.23
21	12,637	0.29
22	10,132	0.23
23	10,134	0.23
24	10,136	0.23
25	10,138	0.23
26	10,140	0.23
27	10,142	0.23
28	10,140	0.23
29	12,704	0.29
30	10,659	0.24
31	10,099	0.23
32	10,107	0.23
33	10,114	0.23
34	10,124	0.23
35	10,282	0.24
36	10,595	0.24
37	10,911	0.25
38	11,222	0.26
39	11,517	0.26
40	12,305	0.28
41	13,658	0.31
42	11,022	0.25
43	13,759	0.32



VICINITY MAP
SCALE:

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csdgtn.com

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HAMPSHIRE HILLS
PRELIMINARY PLAT SET

Nightengale Ridge
Columbia, Maury County, Tennessee
Map 89 - Parcel 39.00

ISSUE SET:

ISSUE DATE: 08/10/22

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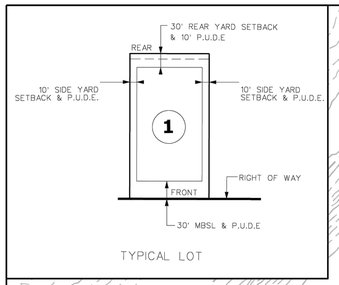
DRAWN BY:
CHECKED BY:

OVERALL SITE LAYOUT

C1.00

PROJECT NO.: 22-506-01

Feb 20, 2023 - 9:10am T:\CADD\2022\22-506-01\CAD\Civil\Construction Plans\22-506-01 - C1.00 - Overall Site Layout.dwg



TYPICAL LOT

PARCEL CURVE DATA

Curve #	Delta	Length	Radius	Chord	
C1	22° 37' 55"	141.41'	358.00'	S31° 42' 31"W	140.49'
C2	23° 05' 58"	124.17'	308.00'	S31° 28' 30"W	123.33'
C3	23° 05' 58"	124.17'	308.00'	S31° 28' 30"W	123.33'
C8	3° 08' 45"	48.04'	875.00'	N18° 21' 09"E	48.03'
C9	3° 08' 45"	48.04'	875.00'	N18° 21' 09"E	48.03'
C11	90° 28' 37"	39.48'	25.00'	N14° 03' 39"W	35.50'

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HAMPSHIRE HILLS
PRELIMINARY PLAT SET

Nightengale Ridge
Columbia, Maury County, Tennessee
Map 89 - Parcel 39.00

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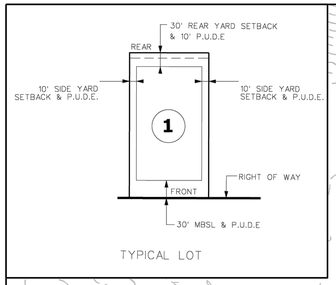
DETAILED SITE LAYOUT

C1.01

PROJECT NO.: 22-506-01

SCALE: 1"=50'

Feb 20, 2023 - 9:10am T:\CADD\2022\22-506-01\CAD\Civil\Construction Plans\22-506-01 - C1.01 - Detailed Site Layout.dwg



TYPICAL LOT

PARCEL CURVE DATA

Curve #	Delta	Length	Radius	Chord	
C4	90° 00' 00"	47.12'	30.00'	S28° 13' 14"E	42.43'
C5	90° 00' 00"	47.12'	30.00'	N61° 46' 46"E	42.43'
C6	4° 23' 25"	27.43'	358.00'	N69° 38' 01"W	27.43'

US Hwy 43

S 65° 20' 24" E 84.91'

N 87° 09' 28" E 229.46'

S 16° 38' 34" W 86.33'

WMH T.I.C. 648.87

EIP

12"W

WQ / DETAIL #2

WQ / DETAIL #1

AUSTEN RISE (50' R.O.W.)

NIGHTENGALE RIDGE (50' R.O.W.)

REVERE DRIVE (50' R.O.W.)

50' ROW

20'-0" Wide San. Sewer Easement

12" DIP WTR (CPWS)

Revere Drive

20* | 19* | 18* | 17* | 16 | 15 | 14 | 13 | 12

21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31

S73° 13' 14"E 120.89'

S73° 13' 14"E 123.76'

S73° 13' 14"E 126.58'

S73° 13' 14"E 129.35'

S73° 13' 14"E 132.05'

S73° 13' 14"E 134.67'

S73° 13' 14"E 137.29'

S73° 13' 14"E 147.49'

S73° 13' 14"E 152.33'

S73° 13' 14"E 157.17'

S73° 13' 14"E 161.46'

N73° 13' 14"W 135.00'

S87° 29' 18"E 32.01'

S72° 50' 00"E 134.61'

N 18° 46' 57" E 77.45'

N 30° 28' 38" E 246.35'

S 17° 06' 31" W 142.22'

S 16° 45' 27" W 676.23'

HANDICAP RAMP PAD
TACTILE WARNING
CROSSWALK
STOP & STREET SIGN
STOP BAR

1" EXTRUDED CURB
4" GRASS STRIP
4" CONCRETE SIDEWALK

IND DEV BD OF THE CITY OF COLUMBIA
PARID: 089 03901 000
ZONED: MRC

SEIBER TRACY K ETUX CRISTINA M
PARID: 089 02707 000
ZONED: COUNTY

HOWELL RICHARD B. ETUX JUDY W.
PARID: 089P B 03000 000
DB: 1119 PG: 769
ZONED: R-10

PARID: 089 00100 000
DB: 352

N

0 50 100
SCALE: 1"=50'

CSDG
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Landscape Architecture

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Nashville, TN 37211
615.249.9999
csdgtn.com

SEAL

JOSEPH M. HADDIX
REGISTERED
PROFESSIONAL
ENGINEER
NO. 119452
STATE OF TENNESSEE
02/16/23

HAMPSHIRE HILLS
PRELIMINARY PLAT SET

Nightengale Ridge
Columbia, Maury County, Tennessee
Map 89 - Parcel 39.00

ISSUE SET:

ISSUE DATE: 08/10/22

REVISION HISTORY:

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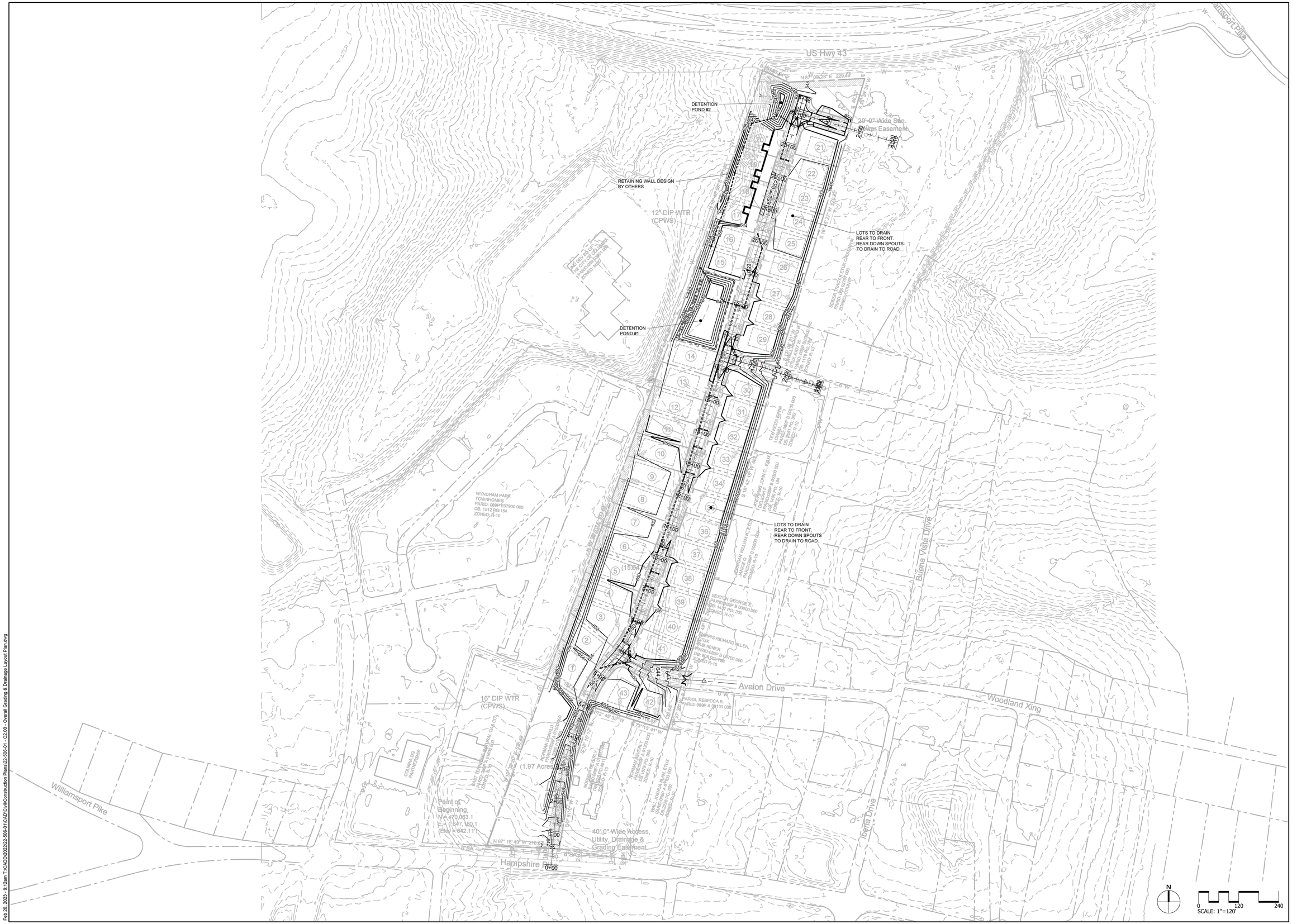
DRAWN BY:
CHECKED BY:

DETAILED SITE LAYOUT

C1.02

PROJECT NO.: 22-506-01

Feb 20, 2023 - 9:11am T:\CADD\2022\22-506-01\CAD\Civil\Construction Plans\22-506-01 - C1.02 - Detailed Site Layout.dwg



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HAMPSHIRE HILLS
PRELIMINARY PLAT SET

Nightengale Ridge
Columbia, Maury County, Tennessee
Map 89 - Parcel 39.00

ISSUE SET:

ISSUE DATE: 08/10/22

REVISION HISTORY:

Rev.	Description	Date
1	CD RESUBMITTAL	01/04/23
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3	SANIATRY COMMENTS	02/16/23

DRAWN BY:
CHECKED BY:

OVERALL GRADING & DRAINAGE LAYOUT PLAN

C2.00

PROJECT NO.: 22-506-01

SCALE: 1"=120'

Feb 20, 2023 - 9:12am T:\CAD\2022\22-506-01\CAD\Civil\Construction Plans\22-506-01 - C2.00 - Overall Grading & Drainage Layout Plan.dwg



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2305 Kline Ave, Ste 300
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615.248.9999
csdgtn.com

SEAL

JOSEPH M. HADWIN
REGISTERED
LICENSED
ENGINEER
No. 119432
STATE OF TENNESSEE
02/16/23

HAMPSHIRE HILLS
PRELIMINARY PLAT SET

Nightengale Ridge
Columbia, Maury County, Tennessee
Map 89 - Parcel 39.00

ISSUE SET:

ISSUE DATE: 08/10/22

REVISION HISTORY:

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3	SANIATRY COMMENTS	02/16/23

DRAWN BY:
CHECKED BY:

OVERALL SANITARY PLAN

C3.00

PROJECT NO.: 22-506-01

Feb 20, 2023 - 9:14am T:\CAD\2022\22-506-01\CAD\Civil\Construction Plans\22-506-01 - C3.00 - Overall Sanitary Plan.dwg


US Hwy 43
Williamsport Pike
INSTALL:
1 - 16" x 8" TEE
2 - 16" GATE VALVE
1- 8" GATE VALVE
INSTALL:
1 - 16" x 16" TEE
1 - 6" RWG VALVE W/ BOX
1 - FIRE HYDRANT ASSEMBLY (COMPLETE)
3 - CONCRETE KICKERS
FIRE HYDRANT
12" DIP WTR (CPWS)
INSTALL:
1 - 16" x 16" TEE
1 - 6" RWG VALVE W/ BOX
1 - FIRE HYDRANT ASSEMBLY (COMPLETE)
3 - CONCRETE KICKERS
FIRE HYDRANT
INSTALL:
1 - 16" x 8" TEE
2 - 16" GATE VALVE
1- 8" GATE VALVE
INSTALL:
1 - 16" x 16" TEE
1 - 6" RWG VALVE W/ BOX
1 - FIRE HYDRANT ASSEMBLY (COMPLETE)
3 - CONCRETE KICKERS
FIRE HYDRANT
INSTALL:
1 - 16" x 16" TEE
1 - 8" RWG VALVE W/ BOX
1 - FIRE HYDRANT ASSEMBLY (COMPLETE)
3 - CONCRETE KICKERS
FIRE HYDRANT
CONNECT TO EXISTING WATERLINE
1 - 16" x 16" TAPPING SLEEVE & VALVE
16" DIP WTR (CPWS)
Point of Beginning
N = 470,063.1
E = 1,647,180.1
(Elev = 642.11')
(1.97 Acres)±
40'-0" Wide Access, Utility, Drainage & Grading Easement
20'-0" Wide San. Sewer Easement
INSTALL
1 - 8" GATE VALVE
1 - TEMPORARY BLOWOFF VALVE
PROPOSED WATER SERVICE (TYP)
PROPOSED WATER SERVICE (TYP)
PROPOSED 8" WATER MAIN
PROPOSED WATER SERVICE (TYP)
PROPOSED WATER SERVICE (TYP)
INSTALL:
1 - 16" x 8" TEE
2 - 16" GATE VALVE
1- 8" GATE VALVE
INSTALL
1 - 6" x 6" TAPPING SLEEVE & VALVE
1 - 8" x 6" REDUCER
REMOVE BLOWOFF ASSEMBLY
INSTALL:
1 - 8" x 6" REDUCER
Hampshire Pike
Avalon Drive
Woodland Xing
Buena Vista Drive
Sierra Drive
Avalon Drive (Public)
Hampshire Hills Drive (Public)
Hampshire Hills Drive (Public)
Hampshire Hills

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: Hampshire Hills

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
- ☒ Approximate height, bulk, and the utilization of structures including activities and the number of living units.

CITY OF COLUMBIA
TENNESSEE

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

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.
- ☒ 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

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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TENNESSEE

DEVELOPMENT SERVICES
700 NORTH GARDEN STREET
COLUMBIA, TN 38401
PHONE: (931) 560-1560
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PUD Specific Items

- ❑ List of all deviations from PUD Standards 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 plan.

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:

Benjamin Beasley		3/18/2024
Print Name	Signature	Date

Response to Columbia Development Review Committee 3/12/24

Below is the question and response to the following item from the Development Review Committee.

Engineering

1. *Provide brief description of the lots being affected and the reasoning for the change from the originally approved preliminary plat.*

The following lots and detention areas are what is being affected by the preliminary plat change:

On the West side of Nightengale Lane the requested plat change is increasing the size of the detention area and changing the number of lots from (21) to (20). Lots impacted by this change specifically are lots 15-21.

South of Austen Rise and North of Revere Drive the number of lots (9) remains the same, however some of the lot sizes have changed, yet all are still greater than 10,000sf.

South of Revere Drive and North of Avalon Drive a detention pond has been removed in order to allow for (2) additional lots to be placed on the East side of Nightengale Lane.

No change has been made to the (2) lots shown South of Avalon Drive.

Several reasons for the preliminary plat change as listed below.

1. Mailbox Kiosk location space needed to added.
2. Maintenance and upkeep of 2 detention ponds reduced to 1 larger detention area.
3. By making the above changes, (1) additional lot is viable.

Sincerely,

Benjamin Beasley, Member
Cypress Homes LLC
PO Box 682447
Franklin, TN 37068
ben@cypresshomestn.com
615-497-1511

CITY OF COLUMBIA
TENNESSEE

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, March 12, 2024

ITEM NO.
24-0094

DESCRIPTION: Preliminary Plat request from 42 to 43 single family lots in accordance with the construction drawings and land disturbance permit. All other submittal items have already been submitted for this project.

RECOMMENDATION: For final recommendation please see staff report.

COMMENTS:

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 question about the development review process or technical comments.

Engineering

2. Provide brief description of the lots being affected and the reasoning for the change from the originally approved preliminary plat.
3. Provide the grading/drainage sheet.
4. Label sheet(s) as Preliminary Plat and provide items as outline in 2.2.8 Contents of the Preliminary Plat Submittal of the Subdivision Regulations.

Maury County Highway Dept.

5. No comment.

ATT

6. PLAN TO SERVE

Maury County E911

7. Hampshire Hills - approved and reserved Austen Rise and Nightengale Ridge have been approved and reserved. * These names will need a street suffix added.

Atmos Energy

15. Gas available several surrounding streets and High Pressure main along Hampshire Pike.

Duck River Electric Membership Corp

16. No comments provided.

Columbia Water

17. "Previously approved, no comments."

CPWS BB

18. Plan to Serve

ATTACHMENTS: 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	Open Seats
322	94.7%	18
636	90.9%	64
369	91.1%	36
314	82.6%	66
594	84.9%	106
575	91.3%	55
401	80.2%	99
449	83.1%	91
563	93.8%	37
599	80.9%	141
4822	***87.1%***	**713**
727	80.8%	173
64	7.1%	836
416	75.6%	134
527	55.5%	423
973	92.7%	77
2707	***62.2%***	**1643**
1382	81.3%	318
370	61.7%	230
1198	99.8%	2
2950	***84.3%***	**550**
874	85.7%	146
412	82.4%	88
512	78.8%	138
1798	***82.9%***	**372**
173		
12450		3105

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

Final Plat: * *1 hard copy of all materials for submittal + PDF copy on a USB flash drive (no multiple applications on one storage device)*
Fold hard copy submittals larger than 8½"x11"
All Others: * Please submit the Application online at City of Columbia | Permitting (onlama.com)

ADDRESS/LOCATION			
	TAX MAP: 89P	GROUP: A	PARCEL: 39.00
SUMMARY OF NATURE OF REQUEST AND WORK	Hampshire Hills development site was previously approved for 42 single family lots. The current construction drawings and land disturbance permit issued are for 43 single family lots. Request is for a new preliminary plat to include the additional lot for a total of 43 lots.		

DATE OF PRE-APPLICATION CONFERENCE		*Pre-application meetings are scheduled for Wednesdays.*

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
❑ Comprehensive Plan Amendment ❑ Annexation ❑ Rezoning ☒ Preliminary Plat ❑ Final Plat ❑ PUD Preliminary Master Plan ❑ PUD Final Site Plan ❑ Site Development Plan ❑ Other: **File naming nomenclature examples:* *Freedom Point Site Plan* *Freedom Point Master Plan* *Freedom Point Final Plat*	**Annexations:** ❑ Annexation Permission Form **Annexations/Rezoning/Plan Amendments:** ❑ Requested Zone Listed ❑ Statement of Compliance with Comprehensive Plan ❑ Concept Plan **Preliminary Plats/Site Development Plans:** ☒ Plans and/or Plats conforming to City standards with signed and completed check list **All Annexations/Rezoning/Preliminary Plats/Site Development Plans and PUDS:** ❑ Receipt of Payment for Pre-Application Meeting ❑ Written Legal Description copy ❑ Columbia Water System Availability Letter ❑ Columbia Waste Water Department Will Serve Letter

Hampshire Hills. 43 single family lots. 15.64 acres	**Plats/PUDs:** ❑ Project Name (include Sections & Phases) ❑ Total Number of Lots/Residential Units ❑ Square Footage of Non-Residential Floor Space ❑ 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. Any requests to defer or move the item to future meeting 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	Ben Beasley	PHONE	615-497-1511
ADDRESS	1805 Gunnerson Ln Franklin, TN 37064	EMAIL	ben@cypresshomestn.com

PROPERTY OWNER NAME	Cypress Homes LLC	PHONE	615-497-1511
ADDRESS	PO Box 682447 Franklin, TN 37068	EMAIL	ben@cypresshomestn.com

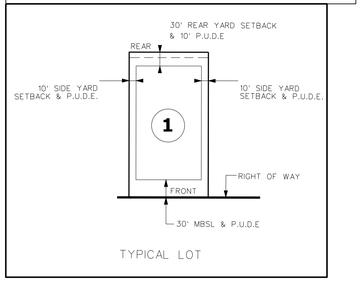
If owner is not a natural person, documentation must be provided showing signing authority on behalf of the entity. If multiple persons are listed as owners in the records of the Maury County Assessor, all owners must sign or the signatory must provide documentation of authority to apply on behalf of record owner (i.e., Power of Attorney or notarized Letter of Authorization). 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.

Benjamin Beasley		2/19/2024
APPLICANT NAME	APPLICANT SIGNATURE	DATE
Cypress Homes LLC		2/19/2024
PROPERTY OWNER NAME	PROPERTY OWNER SIGNATURE	DATE

SITE DATA CHART

PARCEL ID: 39.00
PARCEL SIZE: 15.64 AC
EXISTING ZONING: RS-10
DENSITY ALLOWED: 15.64 - 2.8 = 12.84 * 43,560 / 10,000 = 55 LOTS
DENSITY PROPOSED: 43 LOTS
% IMPERVIOUS ALLOWED: 30%
% IMPERVIOUS PROPOSED:
OPEN SPACE REQUIRED: EXEMPT, LESS THAN 25 AC.
MINIMUM LOT SIZE: 10,000 S.F.
AVERAGE LOT SIZE PROPOSED:
MAX HEIGHT: 35'

LOT SETBACK LINES:
Front yard: 30'
Side yard: 10'
Rear yard: 30'



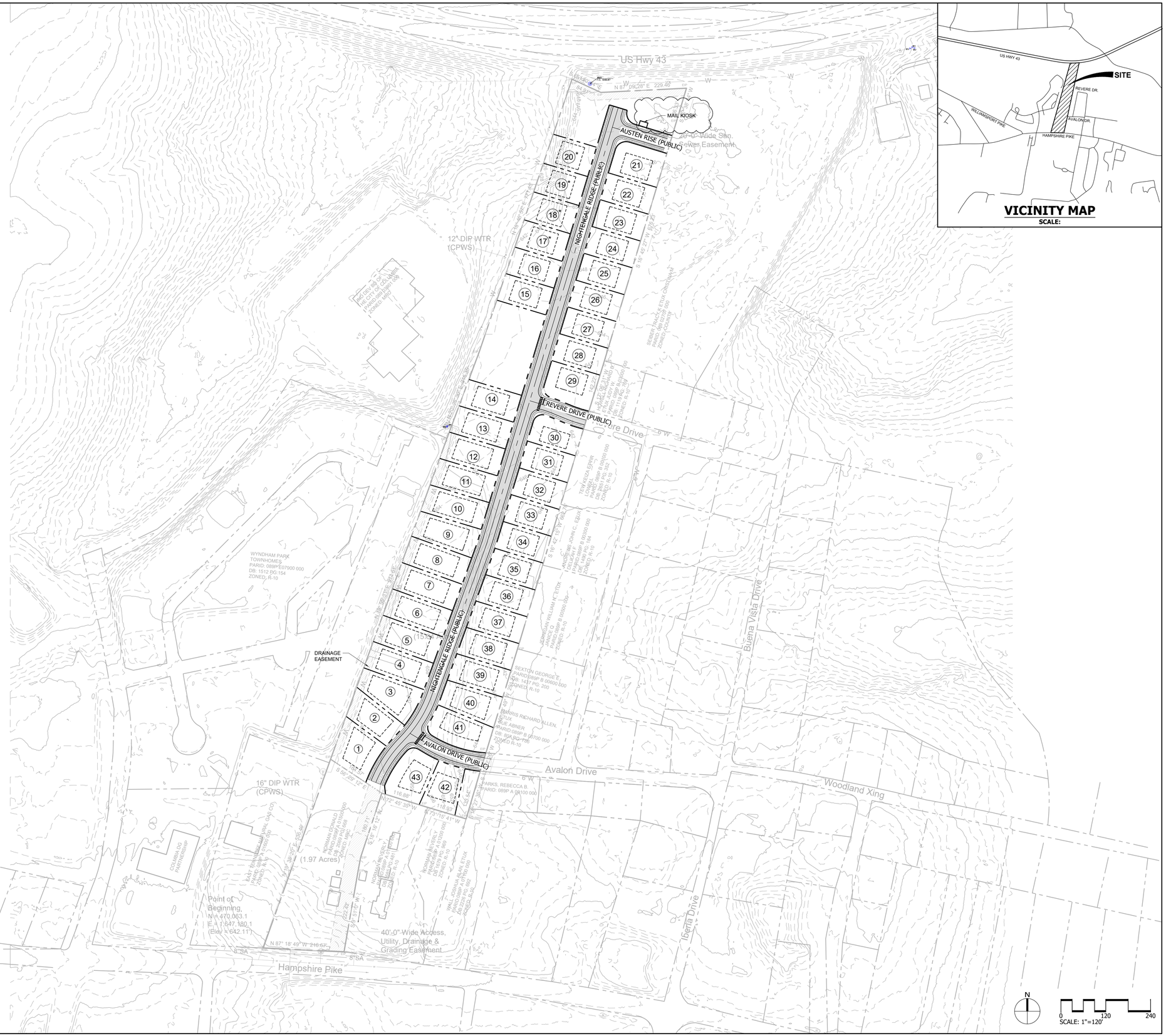
TYPICAL LOT

NOTES:

1. THIS PROPERTY IS NOT IN AN AREA OF FLOOD HAZARD, AS SHOWN ON THE FEMA COMMUNITY MAP/PANEL NUMBER 47119C0165E AND 47119C0280E, EFFECTIVE DATE APRIL 16, 2007.

PARCEL AREA TABLE

Parcel #	Area (Sq. Ft.)	Area (Ac.)
1	13,819	0.32
2	11,407	0.26
3	13,829	0.32
4	12,862	0.30
5	12,862	0.30
6	12,862	0.30
7	12,862	0.30
8	12,862	0.30
9	12,972	0.30
10	12,573	0.29
11	12,264	0.28
12	11,954	0.27
13	11,606	0.27
14	11,243	0.26
15	10,198	0.23
16	10,002	0.23
17	10,064	0.23
18	10,110	0.23
19	10,139	0.23
20	10,030	0.23
21	12,637	0.29
22	10,132	0.23
23	10,134	0.23
24	10,136	0.23
25	10,138	0.23
26	10,140	0.23
27	10,142	0.23
28	10,140	0.23
29	12,704	0.29
30	10,659	0.24
31	10,099	0.23
32	10,107	0.23
33	10,114	0.23
34	10,124	0.23
35	10,282	0.24
36	10,595	0.24
37	10,911	0.25
38	11,222	0.26
39	11,517	0.26
40	12,305	0.28
41	13,658	0.31
42	11,022	0.25
43	13,759	0.32


US Hwy 43
MAIL KIOSK
AUSTEN RISE (PUBLIC)
NIGHTENGALE RIDGE (PUBLIC)
REVERE DRIVE (PUBLIC)
AVALON DRIVE (PUBLIC)
20' Wide San. Sewer Easement
12" DIP WTR (CPWS)
16" DIP WTR (CPWS)
DRAINAGE EASEMENT
40'-0" Wide Access, Utility, Drainage & Grading Easement
(1.97 Acres)
Point of Beginning, N: 470,063.1 E: 1,647,120.1 (Elev. = 642.11')
Revere Drive
Avalon Drive
Woodland Xing
Buena Vista Drive
Iberia Drive
Hampshire Pike
WYNDHAM PARK TOWNHOMES PARID: 089PE07900 000 DB: 1512 PG: 154 ZONED: R-10
COLUMBIA DG PARTNERSHIP
EAST TENNESSEE NATURAL GAS CO. PARID: 089 01700 000 ZONED: R-10
NORMAN DONALD DEVORE PARID: 089P B 00600 000 DB: 1437 PG: 689 ZONED: R-10
NORMAN BEVERLY DEVORE PARID: 089P B 01000 000 DB: 1437 PG: 689 ZONED: R-10
WALL ADRIANA ALAN ETOK PARID: 089P B 01100 000 DB: 1437 PG: 692 ZONED: R-10
SEXTON GEORGE E. PARID: 089P B 00900 000 D.B. 1437 PG. 200 ZONED: R-10
HARRIS RICHARD ALLEN, ETUX BLUE ABNER PARID: 089P B 00700 000 DB: 1512 PG: 195 ZONED: R-10
PARKS, REBECCA B. PARID: 089P A 00100 000
SIEBER FRANCK ETUX CHRISTIAN PARID: 089 01700 000 ZONED: COUNTY
N 87° 09' 28" E 229.46'
N 87° 18' 46" W 216.67'
S 16° 42' 15" W 682.25'
S 56° 29' 12" E 116.88'
S 73° 15' 41" W 118.93'
S 16° 12' 14" W 189.71'
S 45° 51' 16" W 222.25'
N 16° 39' 20" E 555.48'
S 16° 42' 15" W 682.25'
S 16° 42' 15" W 682.25'
S 16° 42' 15" W 682.25

Baker Road Rezoning

Project #:	24-0033	Location:	Map 75 Parcel 11.17
Applicant:	TKC Architects	Case Type(s):	Rezoning
Staff Planner:	Kevin C. McCarthy, AICP	Proposed Use:	Single Family Subdivision

PROJECT SUMMARY

The applicant requests revocation of a Planned Unit Development (PUD) and rezoning of a 57.43-acre property north of Baker Road. The site is accessed via Blaise Road and Langley Lane. In 2017, the City Council approved a 144-lot Planned Unit Development Master plan for the subject property. The Planning Commission subsequently approved Preliminary Plats for the property in 2017 and 2018. These approvals have expired. The current applicant requests that the Planning Commission recommend revocation of the PUD and rezoning of the property as CD-2 (Rural Character District) and CD-3L (Neighborhood Large Lot Character District). Specifically, the applicant requests that 26.82 acres be zoned CD-3L and 30.61 acres be zones CD-2.

- The requested zoning is consistent with the Suburban Neighborhoods (SN) and Hillsides & Natural Spaces future land use classifications in Connect Columbia.
- The applicant has provided a concept plan depicting development of the property as twenty-six 100-foot wide lots and thirty-nine 125-foot wide single family lots.
- Subsequent development and division of the property will require additional reviews.
- 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.

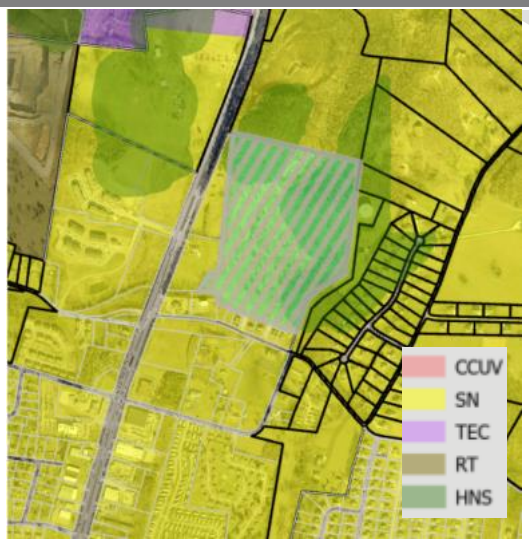
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SITE INFORMATION

CURRENT ZONING	EXISTING USE	EXISTING IMP.	LAND AREA
RS-10 PUD	Vacant	Former Agricultural Acc. Structure	+/- 57.43



FUTURE LAND USE MAP



ZONING MAP



SITE CONTEXT/ADJACENT PROPERTIES			
	Future Land Use	Zoning	Current Use
Subject Property	Suburban Neighborhoods	PUD	Vacant
North	Suburban Neighborhoods	Unincorporated	Vacant
South	Suburban Neighborhoods	PUD	Single Family
East	Suburban Neighborhoods	Unincorporated	Utility Facility
West	Suburban Neighborhoods	CD-2	Single Family

CONSISTENCY WITH CONNECT COLUMBIA

The subject property lies within two future land use classifications. Most of the property is within the Suburban Neighborhoods (SN) classification. Portions at an elevation above 775' are designated Hillsides & Natural Spaces (HNS).

Suburban Neighborhoods: The requested CD-3L zoning is consistent with Connect Columbia. The intent of the Suburban Neighborhoods (SN) future land use is to enhance existing suburban areas and create new neighborhoods that will improve the quality of life in Columbia. Where appropriate, the SN future land use area also establishes mixed-use and commercial centers which serve residents' retail needs and provide a wider range of housing options. Each development parcel should add to Columbia's existing sense of place and extend the established form and pattern to create a more interconnected community. Future development should emphasize connectivity and continuity of the city as whole. The density and intensity of residential development increases in proximity to areas under the City Center Urban Village (CCUV) future land use classification. In the same way, density and intensity decrease in proximity to areas under the Rural Transition (RT) future land use classification. New development enhances pedestrian infrastructure with sidewalks and other multimodal routes. Public frontages may include sidewalks and street trees. Over time, new and infill development connects neighborhoods and community anchors such as libraries, neighborhood centers, health facilities, retail uses, parks, and schools. The future land use classification is usually implemented by the CD-3L and CD-3 character districts, as well as PUDs. CD-4C is also an appropriate zone where the subject property is accessed by an arterial roadway.

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Character & Intent

The intent of the Suburban Neighborhoods (SN) future land use is to enhance existing suburban areas and create new neighborhoods that will improve the quality of life in Columbia. Where appropriate, the SN future land use area also establishes mixed-use and commercial centers which serve residents' retail needs and provide a wider range of housing options. Each development parcel should add to Columbia's existing sense of place and extend the established form and pattern to create a more interconnected community. Future development should emphasize connectivity and continuity of the city as whole. The density and intensity of residential development increases in proximity to areas under the CCUV future land use classification. In the same way, density and intensity decrease in proximity to areas under the Rural Transition (RT) future land use classification. New development enhances pedestrian infrastructure with sidewalks and other multimodal routes. Public frontages may include sidewalks and street trees. Over time, new and infill development connects neighborhoods and community anchors such as libraries, neighborhood centers, health facilities, retail uses, parks, and schools.

Land Use Considerations

The primary land use is low-density detached housing. Along arterial roadways, primary uses may include offices, retail, and all forms of medium-density housing. Secondary land uses include accessory dwellings, two-family homes, civic uses, institutional uses, schools, religious facilities, utility facilities, parks and open space. New industrial and warehouse uses are inappropriate.



Form & Pattern

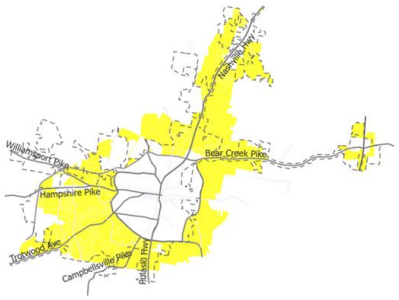
The SN future land use area is characterized by the organization of the built environment to extend a succession of large-lot neighborhoods and compact walkable neighborhoods. Development parcels extend established neighborhood patterns. Leap-frogging development is inappropriate. The SN future land use is distinguished from RT in the organization of lots and thoroughfares to form blocks. Physically separated developments which do not extend established block formation and roadway networks are inappropriate. The density of streets and blocks increases with proximity to CCUV and community anchors. Implementing bulk and design standards loosely delimit the public and domestic realms though the application of layers and front-to-back discipline of lots. Along arterial roadways, commercial corridors of varying intensities emerge over time with a high-quality built environment typified by a mix of building types and a balance between automobile-oriented and pedestrian-oriented design. The physical intensity of development along arterial corridors varies based on the surrounding residential density and the roadway's place in the transportation network. New development should accompany concurrent extension of complete urban services. Parking is provided on-site by private land users, supplemented by on-street spaces.

Implementing Districts

Neighborhood-Large Lot CD-3L
Neighborhood CD-3
General Urban-Corridor CD-4C (only along Arterial roadways)
Manufactured Home Park SD-MHP
Residential PUD PUD-R
Mixed Use PUD PUD-MU
Civic CV

Implementing Standards

General Development Pattern: Mixed Uses & Isolated Uses
Density (density unites per ace): 4 - 24 du/ac
Building Height: 1 - 4 stories
Open Space Elements: Civic Spaces, Parks & Greenways





Hillsides & Natural Spaces: The Hillsides & Natural Spaces (HNS) future land use classification is comprised of visually impactful and environmentally sensitive areas within Columbia's UGB. The area is characterized by parks, civic spaces, open spaces, and legacy agricultural operations. The intent of the HNS future land use classification is to protect riparian areas, hillsides with elevations greater than 775 feet, and other sensitive lands. Natural and scenic features, such as rolling hills, rivers, rock outcroppings, and historic homes should be preserved. The future land use classification is implemented by the CD-2 and Civic character districts, as well as PUDs.

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Character & Intent
The Hillsides & Natural Spaces (HNS) future land use classification is comprised of visually impactful and environmentally sensitive areas within Columbia's UGB. The area is characterized by parks, civic spaces, open spaces, and legacy agricultural operations. The intent of the HNS future land use classification is to protect riparian areas, hillsides with elevations greater than 775 feet, and other sensitive lands. Natural and scenic features, such as rolling hills, rivers, rock outcroppings, and historic homes should be preserved.





Land Use Considerations
Primary land uses are civic uses, conservation, and utility facilities. Secondary land uses include agricultural uses and very-low-density housing.

Form & Pattern
Development within the HNS future land use classification is limited and should emphasize the preservation of natural and scenic features. Legacy agricultural sites may be preserved but not expanded. Existing extractive operations will gradually phase out and cease. Future development is limited to park spaces, civic uses, and occasional detached single-family homes. Rolling hills, waterways, floodplains, historic rock outcroppings, and tree cover should be preserved. New development should provide benefits to the general public in the form of preservation, storm water facilities, communications infrastructure, municipal services, or increased access to natural and recreational amenities. Complete urban services may not be available. Where parking is necessary, it is provided on-site and designed to be minimally impactful

Implementing Districts
Rural Character District CD-2
Civic CV
Residential PUD PUD-R

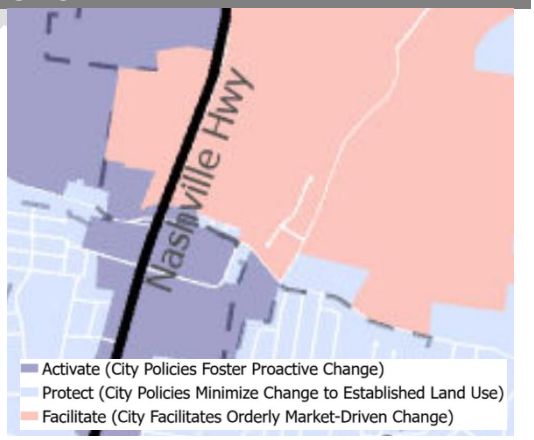
Implementing Standards
General Development Pattern: Isolated Uses
Density (density unites per ace): 1 du/ac
Building Height: Residential: 3 stories
Other Uses: N/A
Open Space Elements: Parks & Greenways





AREAS OF CHANGE POLICY

Connect Columbia established the Areas of Change Policy designation for the subject site as Facilitate. The classification indicates abasically neutral position to market-driven requests to amend the official zoning map. Change in these areas is market-driven. New and infill development should maintain or improve the level of service for municipal services. City policies facilitate change through a process of public deliberation and high standards for the built environment. (Connect Columbia p. 32).



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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 subdivide the site in conformity with the bulk and design standard of the Ordinance at Tables 4.3.1-A and B.**
    - The concept plan depicts a development with 26.82 acres utilizing CD-3L standards and 30.61 acres utilizing CD-2 standards.
    - The concept includes a total of sixty-five lots:
        - Twenty-six 100-foot wide lots conforming to CD-3L standards; and
        - Thirty-nine 125-foot wide lots conforming to CD-2 standards.

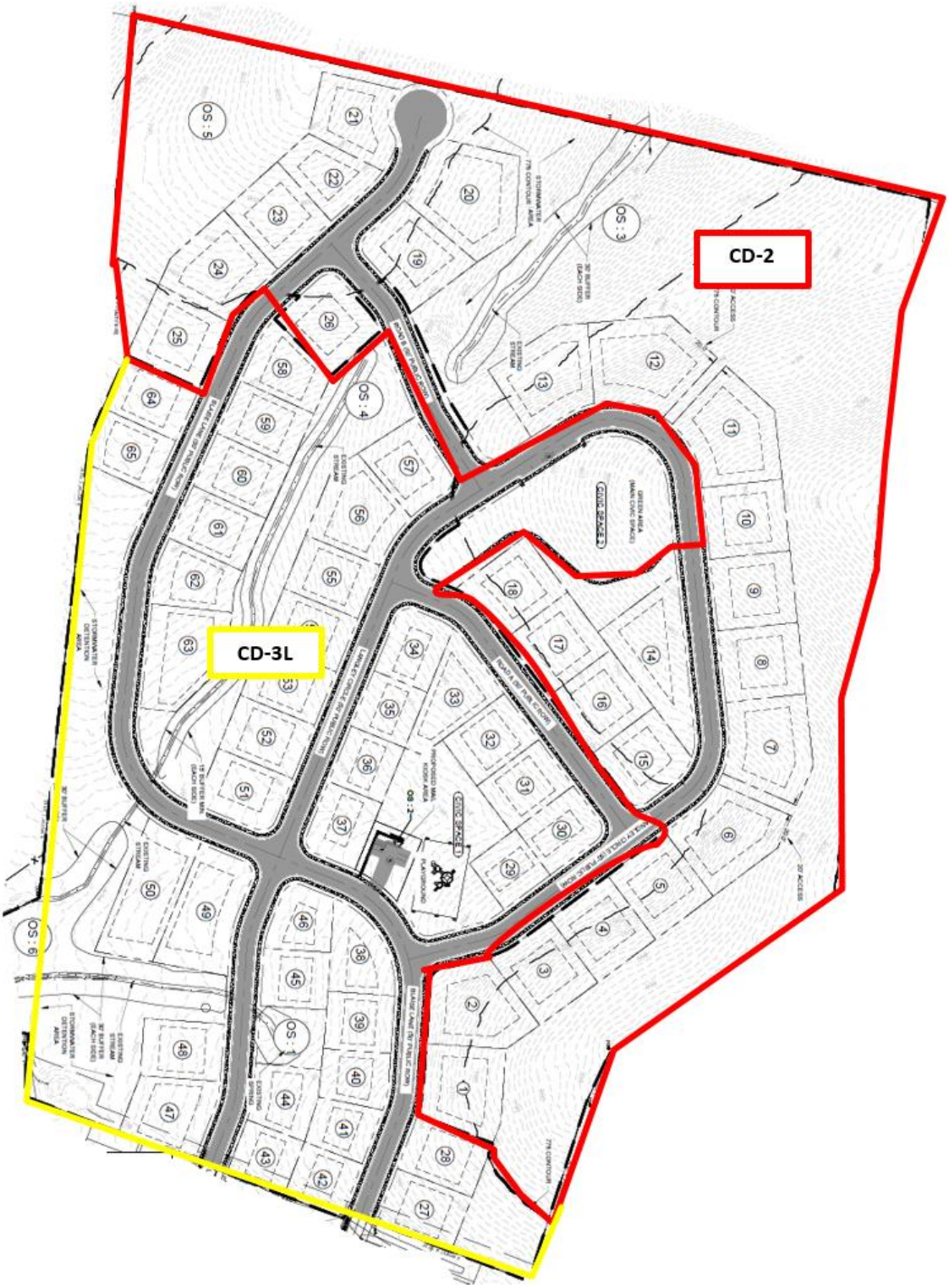
Tree Preservation

- The concept plan depicts tree preservation required by **§ 4.3.16.L** of the ordinance.
- The current tree canopy, as estimated by the applicant, covers 17.45 acres (30.4%) of the site.
- The concept depicts preservation of 10.07 acres of tree canopy.
- If the rezoning is successful, Planning staff will review any subsequent Site Development Plan for conformity with this requirement.

Civic Spaces

- The concept plan depicts civic space required by **§ 5.3** of the ordinance.
- Civic Space accounts for 5% of the total site area shown in the concept plan.
- The concept depicts an additional 21.4 acres of open space, including a space designed around an existing spring (between lots 44 and 45).

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Proposed Split Zoning of Property

REVIEW PROCESS

The Development Review Committee evaluated the proposed rezoning at its March 2024 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];*
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*

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SUMMARY OF DEVELOPMENT REVIEW COMMITTEE COMMENTS

The DRC reviewed this proposal at its March 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** 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. The applicant provided a through response indicating that the standards for the applicable low-density character districts in the ordinance provide the quality and predictability desired by the applicant.
- Planning also directed the applicant to revise the request and the concept to include CD-2 standards consistent with the HNS future land use designation.
- **CPWS (Water)/Inflo** and Planning directed the applicant to monitor the status of the water commitment letter.
- **Maury County Highway Department** noted that the nearby section of Baker Road will be maintained by the City of Columbia.

COMMENTARY FROM PROFESSIONAL PLANNING STAFF

The requested split zoning is consistent with Connect Columbia. As discussed above, the subject site's future land use classification is divided between Suburban Neighborhoods (SN) and Hillsides & Natural Spaces (HNS). The requested CD-3L (Neighborhood Large Lot Character District) and CD-2 (Rural Character District) zoning are consistent with the future land use map. Although split-zonings are generally discouraged, the use of multiple standards on high hillsides protects important viewsheds which characterize Columbia as well as environmentally sensitive sites. The Area of Change Policy for the property is *facilitate*, indicating that the city takes a neutral position to market-driven changes to the land use pattern in the area.

Any development of the property must conform to the standards of the Ordinance and Subdivision Regulations. The concept plan demonstrates that it is possible to develop the site in conformity with the Ordinance. If the applicant succeeds in rezoning the property, planning staff will review any future site development plan for conformity with the standards of the zoning ordinance.

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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 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.

DRAFT

TKC ARCHITECTURE INTERIORS CIVIL SITE

818 South Main Street
COLUMBIA, TN 38401
TKC-AE.COM
615.617.7477

March 18th, 2024

Development Services
City of Columbia
700 N. Garden Street
Columbia, TN 38401

Project: 24-0033 – Rezone / Annexation Plan for Baker Road Development

Subject: Rezone / Annexation Re-Submittal

Mr. McCarthy,

We are requesting annexation / rezoning approval for a project located off Baker Road. The plan follows the City's Zoning Ordinance 4400. The plan proposes a split zone of CD-2 and CD-3L to follow the latest City Comprehensive Plan (Feb 2024). CD-2 zoning is for all development above the 775 contour with the CD-3L zoning being the development below the 775 contour for a total of 65 lots.

The below is a response to comments received at the City's Technical Meeting on Tuesday 3/12/24.

Planning

1) An updated water availability letter will be required before the review process is complete. A current water availability letter is required throughout the entitlement process. The current letter will expire on May 14, 2024. Presuming a timely resubmittal to technical comments and a favorable recommendation from the planning Commission in April, the second consideration for this item will occur on June 13th. 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.
   a) The project will have an updated water letter prior to letter expiring on/near May 15th.
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.
   a) Comment is noted. This is our response letter and all plans have been updated to address the comments in this letter.
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.
   a) The property is currently zoned Planned Unit Development – Residential. That zoning was in place prior to the new zoning code (Ordinance 4400). Now that the City has a new zoning code, the vision to develop this property and to be able to preserve the natural features can be done in a more straight forward manor under the low density zoning districts of CD-2 and CD-3L which follow the City's Comprehensive Plan adopted in February of 2024. The properties along Baker Road that this property abuts are already developed as single family homes, the property to the north is currently in the County and would more than likely follow our proposed zoning if they ever did develop, the property to the west between this property and Nashville Highway are zoned CD-2 and the property to the east is a City water tower. By rezoning this property to follow the current zoning code it allows this development to be brought up to the current zoning standards and lets home builders follow the zoning code and not bring each individual building plan to Planning Commission. The concept plan we are proposing provides large lots that we envision pushing the development to be a custom or simi-custom home development with abundant

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open space. The area of the property that is reserved for tree save could have trails added to it, the civil spaces are easily accessible from each lot and the natural low areas are proposed with buffers and open space.

4) The portions of the development at an elevation greater than 775 feet have a future land use classification of Hillsides and Natural Spaces (HNS). The requested CD-3L character district is not consistent with the HNS future land use classification. Please revise the application appropriately (i.e. modify request to CD-2 for portions of the site above 775' or request to amend the future land use map).
   a) The proposed rezoning of the site has been updated to be CD-2 for development above the 775 contour and CD-3L for development below the 775 contour per the future land use classification of Hillsides and Natural Spaces (HNS).
5) Advisory: If the request for rezoning is successful, future development plans will need to include a tree canopy preservation plan with recent aerial image conforming to 4.3.16.L of the zoning ordinance. Civic Spaces will need to be shown conforming to standards of Article 5 with sufficient detail for Planning Commission review.
   a) See sheets C-2.2 & C-2.3 for Trees Preservation Plan and Civic Space plans.
6) Advisory: If the request for rezoning is successful, please note the information in the Wastewater Availability Letter indicating that subsequent development plans may require developer-provided off-site improvements to extend sewerage to the site and connect to the existing wastewater treatment capacity.
   a) Noted.

Engineering

7) No comments on rezoning.

Wastewater

8) Columbia Wastewater has stated its concerns in the availability letter.
   a) Noted

Maury County Highway Dept.

9) Because both sides of Baker Road are shown as being annexed into the City of Columbia at the connections of Langley Lane an Blaise Road on the City of Columbia GIS mapping,our understanding is that this portion of Baker Road is City of Columbia owned / maintained ROW and roadway. With this consideration, we have no comment on behalf of the Maury County Highway Department (MCHD).
   a) Noted

AT&T

10) Plan to serve.
   a) Noted

Maury County E911

11) Contact Maury County 911 at cgideon@maury911.org for street names and subdivision name.
   a) Noted

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615.617.7477

Columbia Power

12) 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.
    a) Noted.

Columbia Water

13) A water availability letter was issued on 2-16-24 and is 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.
    a) Noted.

CPWS BB

14) Plan to serve.
    a) Noted

If you have any comments or questions please contact Cole Newton at TKC Architecture and Engineering at cole@tkc-ae.com or 615.617.7477.

Thank you,

Cole Newton, PE, LEED AP
TKC Architecture and Engineering LLC
615.617.7477 (o)
931.797.3323 (c)
cole@tkc-ae.com

REZONE PLAN
FOR
BAKER ROAD DEVELOPMENT

Property Information:

Columbia / Maury County, Tennessee
Total Acres: 57.43 ACRES +/-

Owner / Developer:
Muletown Homes LLC.

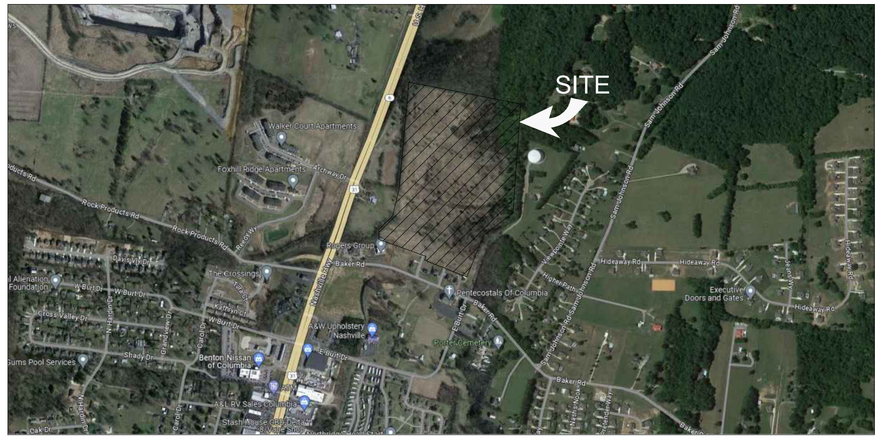
Civil Engineer:
TKC ARCHITECTURE AND ENGINEERING LLC
Cole Newton
cole@tkc-ae.com
615.617.7477
www.tkc-ae.com

Surveyor:
WES ENGINEERS & SURVEYORS
Allen B. O'Leary B.
2486 Nashville Highway
Columbia, TN 38401
931.3882329

Topographic Boundary Survey, including property lines, legal description, existing utilities, site topography with spot elevations, outstanding physical features and existing structure locations was provided by the WES ENGINEERS & SURVEYORS. TKC ARCHITECTURE AND ENGINEERING and its associates will not be held responsible for its accuracy or for design errors or emissions resulting from potential survey inaccuracies.

Contractor to contact civil engineer with any discrepancies with these drawings and actual field conditions.

Utility Providers:
Water - Columbia Power & Water Systems (CPWS)
Wastewater - Columbia Power & Water Systems (CPWS)
Electric - Columbia Power & Water Systems (CPWS)



N.T.S.

LOCATION MAP

COLUMBIA / MAURY COUNTY, TN

MAP 75 PARCEL 11.17

Total Site Data	
	PROVIDED
TOTAL PROPERTY ACREAGE	57.43 +/- AC
EXISTING ZONING	PUD-R
PROPOSED ZONING	REZONE TO CD-3L (26.82 AC) & CD-2 (30.61 AC)
LOT WIDTH	CD-3L: 100 FT. (MIN.) CD-2: 125 FT. (MIN.)
TREE SAVE AREA	10.07 AC > 8.38 AC (REQUIRED)
SINGLE-FAMILY	24.3 AC
TOTAL OPEN SPACE	21.42 AC
TOTAL CIVIC SPACE	2.87 AC (5.0% OF GROSS ACREAGE
RIGHT OF WAY	8.7 AC
TOTAL LOTS	65
CD-3L DENSITY	1.45 UNITS / AC
CD-2 DENSITY	0.85 UNITS / AC

Sheet Schedule

C - 0.0 Cover Sheet
C - 1.0 Existing Conditions
C - 2.0 Preliminary Concept Plan
C - 2.1 Preliminary Concept Plan (With Contours)
C - 2.2 Preliminary Tree Preservation Plan
C - 2.3 Preliminary Civic Space & Pedestrian Shed Plan

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ARCHITECTURE
INTERIORS
CIVIL SITE
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CONSULTANTS:

PROJECT TITLE:
BAKER ROAD DEVELOPMENT
Columbia, Maury County
Parcel 11.17, Tax Map 75

PRELIMINARY DRAWINGS

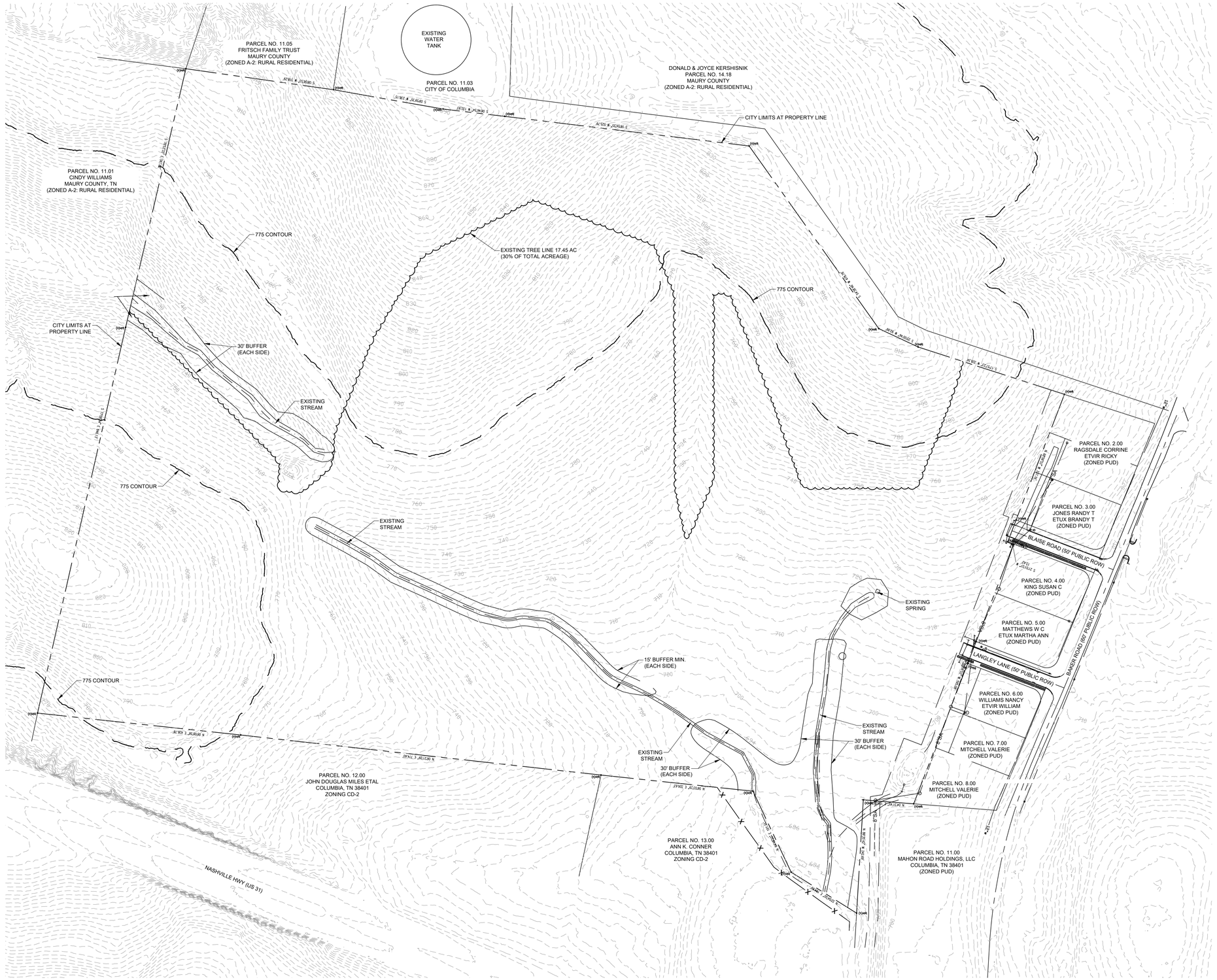
Revision		
No.	Date	Description

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SHEET TITLE:
COVER SHEET

PRELIMINARY
DATE: 12/04/2023
DRAWN BY: TS
PROJECT NO.: 2353

SHEET NO.:
C - 0.0



GRAPHIC SCALE
(IN FEET)

0 100 200

SCALE: 1" = 100'

LEGEND

- PROPERTY LINE
- 775 CONTOUR
- CONTOURS

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CONSULTANTS:

PROJECT TITLE:

BAKER ROAD DEVELOPMENT

Columbia, Maury County
Parcel 113.17, Tax Map 75

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SHEET TITLE:

EXISTING CONDITIONS

PRELIMINARY

DATE: 12/04/2023

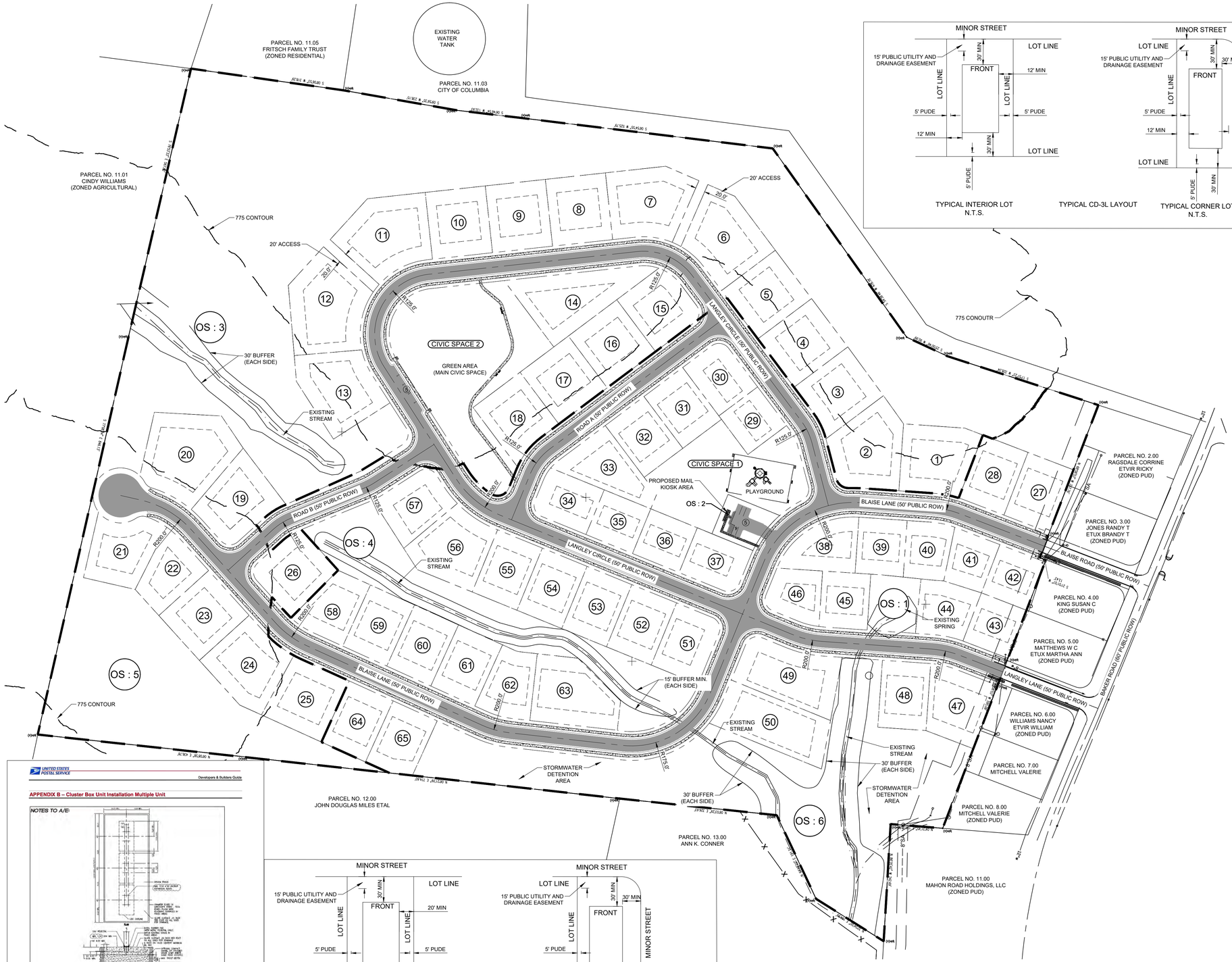
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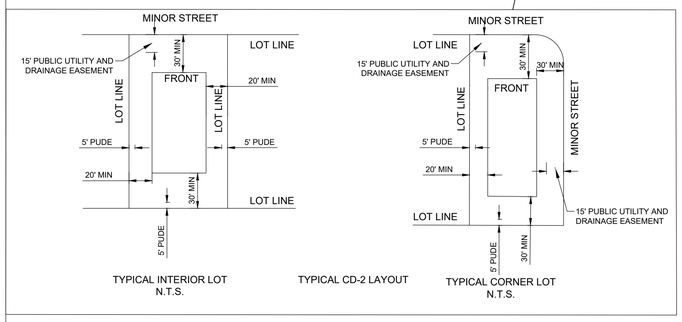
PROJECT NO.: 2353

SHEET NO.:

C - 1.0

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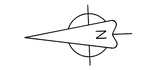




UNITED STATES POSTAL SERVICE
Developers & Builders Guide

APPENDIX B – Cluster Box Unit Installation Multiple Unit

Page 13 of 15 USPS National Delivery Planning Guide for Builders & Developers Date published 12/21/2017



LEGEND

- PROPERTY LINE
- 775 CONTOUR
- CD-2 BOUNDS (30.61 AC)
- CD-3L BOUNDS (26.82 AC)

Total Site Data	
	PROVIDED
TOTAL PROPERTY ACREAGE	57.43 +/- AC
EXISTING ZONING	PUD
PROPOSED ZONING	REZONE TO CD-3L (26.82 AC) & CD-2 (30.61 AC)
LOT WIDTH	CD-3L: 100 FT. (MIN.) CD-2: 125 FT. (MIN.)
TREE SAVE AREA	10.07 AC > 8.38 AC (REQUIRED)
SINGLE-FAMILY	24.3 AC
TOTAL OPEN SPACE	21.42 AC
TOTAL CIVIC SPACE	2.87 AC (5.0% OF GROSS ACREAGE
RIGHT OF WAY	8.7 AC
TOTAL LOTS	65
CD-3L DENSITY	1.45 UNITS / AC
CD-2 DENSITY	0.85 UNITS / AC

NOTES:

1. SEE SHEET C-2.1 FOR THE TYPICAL SECTION.
2. OS-5 TO BE 10.07 ACRES OF TREE SAVE AREA WHICH IS GREATER THAN THE 8.38 ACRES REQUIRED SEE SHEET C-2.2.
3. CIVIC SPACE 1 TO BE PLAYGROUND, GREEN AREA (CIVIC SPACE)
4. CIVIC SPACE 2 TO BE GREEN AREA (MAIN CIVIC SPACE)
5. OS-9 TO BE MAIL KIOSK AREA
6. LOTS 1 - 26 - CD-2 ZONING (MIN. 125 FT WIDTH)
7. LOTS 27 - 65 - CD-3L ZONING (MIN. 100 FT WIDTH)

Parcel Area Table		
PARCEL	SQ. FT.	ACRES
1	20393.85	0.47
2	22367.85	0.51
3	17503.59	0.40
4	17375.00	0.40
5	17375.00	0.40
6	22901.01	0.53
7	22890.81	0.53
8	17375.98	0.40
9	17375.98	0.40
10	17375.98	0.40
11	25644.75	0.59
12	27385.17	0.63
13	22508.87	0.52
14	24634.04	0.57
15	16339.13	0.38
16	16750.00	0.38
17	16750.00	0.38
18	16781.77	0.39
19	19714.33	0.45
20	28362.77	0.65
21	17618.01	0.40
22	13792.93	0.32
23	17375.00	0.40
24	21002.76	0.48
25	18240.20	0.42
26	17313.69	0.40
27	14010.97	0.32
28	13902.64	0.32
29	10000.00	0.23
30	12365.87	0.28
31	13400.00	0.31
32	13400.00	0.31
33	16521.16	0.38
34	12241.64	0.28
35	10400.00	0.24
36	10400.00	0.24
37	12268.23	0.28
38	13805.04	0.32
39	11630.32	0.27
40	10834.68	0.25

Parcel Area Table		
PARCEL	SQ. FT.	ACRES
41	9946.94	0.23
42	10692.37	0.25
43	10669.76	0.24
44	12571.20	0.29
45	11557.56	0.27
46	10974.38	0.25
47	17596.85	0.40
48	13900.00	0.32
49	23108.48	0.53
50	23373.47	0.54
51	14460.87	0.33
52	13900.00	0.32
53	13900.00	0.32
54	13900.00	0.32
55	13900.00	0.32
56	19877.70	0.46
57	14966.11	0.34
58	13625.70	0.31
59	13900.00	0.32
60	13900.00	0.32
61	13900.20	0.32
62	13474.56	0.31
63	21540.87	0.49
64	13900.00	0.32
65	13565.26	0.31

OPEN SPACE TABLE		
PARCEL	SQ. FT.	ACRES
1	11731.70	0.27
2	8845.36	0.20
3	532728.86	12.23
4	75541.32	1.73
5	120118.31	2.76
6	193082.14	4.43

Parcel Area Table		
PARCEL	SQ. FT.	ACRES
CIVIC SPACE 1	46319.71	1.06
CIVIC SPACE 2	78855.74	1.81

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SHEET TITLE: PRELIMINARY CONCEPT PLAN

PRELIMINARY
DATE: 12/04/2023
DRAWN BY: TS
PROJECT NO.: 2353

SHEET NO.:
C - 2.0

Revision		
No.	Date	Description

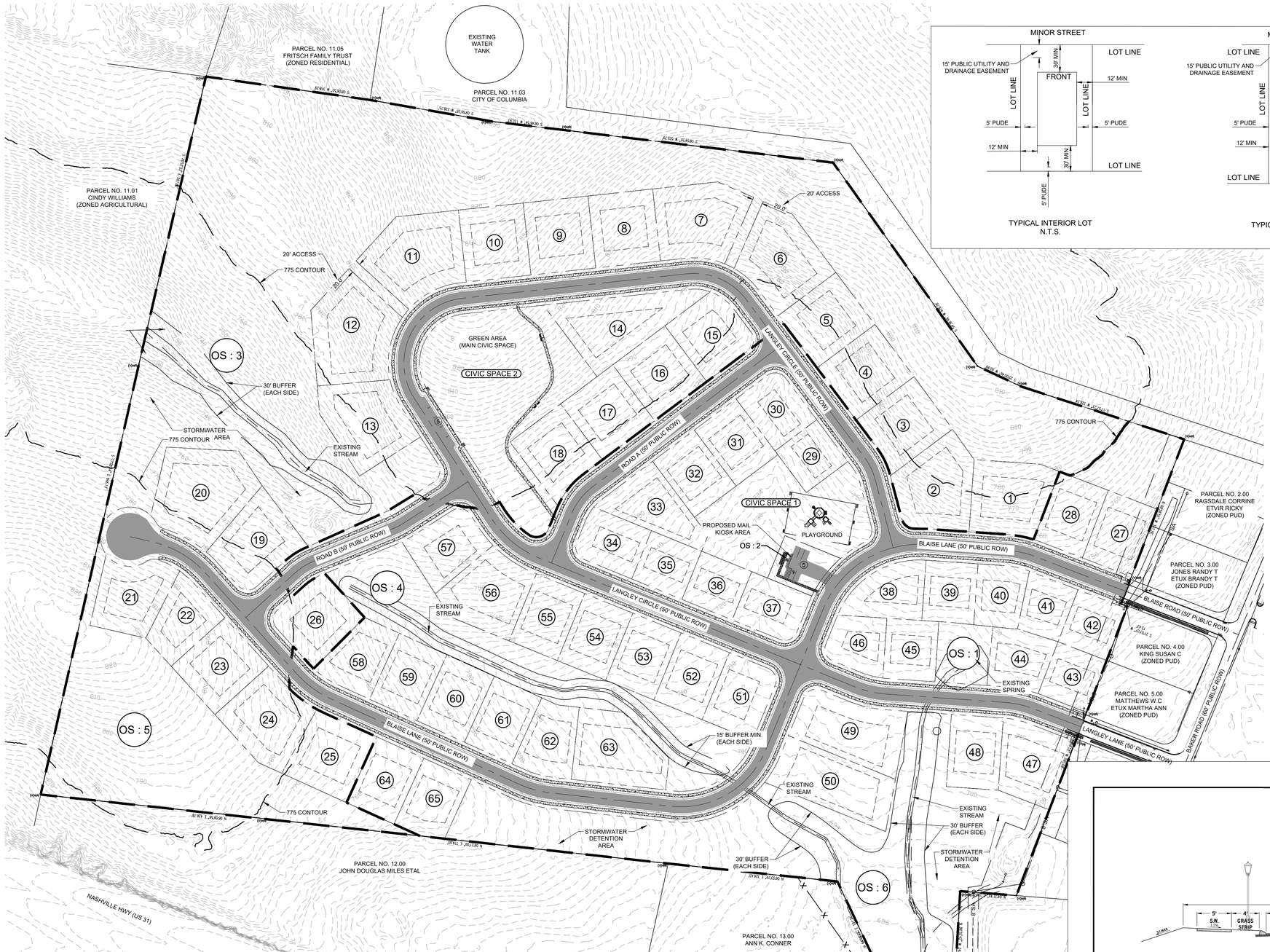
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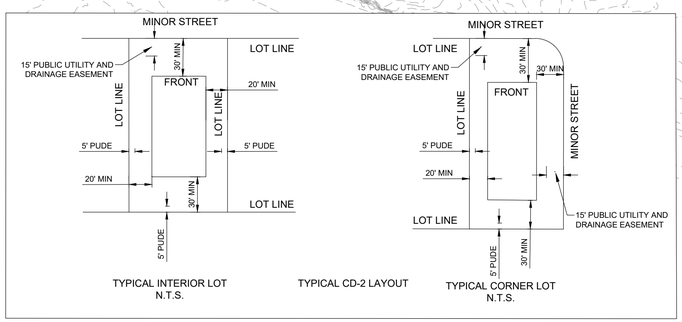
PROJECT TITLE: BAKER ROAD DEVELOPMENT
Columbia, Maury County
Parcel 113.17, Tax Map 75

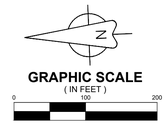
PRELIMINARY DRAWINGS

CONSULTANTS:

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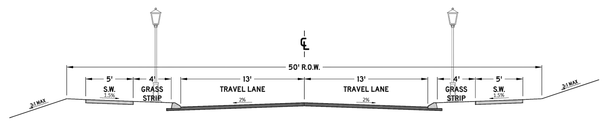
LEGEND

- PROPERTY LINE
- 775 CONTOUR
- CD-2 BOUNDS (30.61 AC)
- CD-3L BOUNDS (26.82 AC)

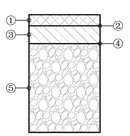
Total Site Data	
	PROVIDED
TOTAL PROPERTY ACREAGE	57.43 +/- AC
EXISTING ZONING	PUD
PROPOSED ZONING	REZONE TO CD-3L (26.82 AC) & CD-2 (30.61 AC)
LOT WIDTH	CD-3L: 100 FT. (MIN.) CD-2: 125 FT. (MIN.)
TREE SAVE AREA	10.07 AC > 8.38 AC (REQUIRED)
SINGLE-FAMILY	24.3 AC
TOTAL OPEN SPACE	21.42 AC
TOTAL CIVIC SPACE	2.87 AC (5.0% OF GROSS ACREAGE
RIGHT OF WAY	8.7 AC
TOTAL LOTS	65
CD-3L DENSITY	1.45 UNITS / AC
CD-2 DENSITY	0.85 UNITS / AC

NOTES:

1. SEE SHEET C-2.1 FOR THE TYPICAL SECTION.
2. OS-5 TO BE 10.07 ACRES OF TREE SAVE AREA WHICH IS GREATER THAN THE 8.38 ACRES REQUIRED SEE SHEET C-2.2.
3. CIVIC SPACE 1 TO BE PLAYGROUND, GREEN AREA (CIVIC SPACE)
4. CIVIC SPACE 2 TO BE GREEN AREA (MAIN CIVIC SPACE)
5. OS-9 TO BE MAIL KIOSK AREA
6. LOTS 1 - 26 - CD-2 ZONING (MIN. 125 FT WIDTH)
7. LOTS 27 - 65 - CD-3L ZONING (MIN. 100 FT WIDTH)



PAVEMENT SCHEDULE	
①	SURFACE @ 1.5" THICK 411-01.03 ASPHALT CONCRETE MIX. (PG64-22) (ACS) GRADING D (SURFACE), OR 307-01.03 ASPHALT CONCRETE MIX. (PG64-22) (ACS) GRADING C-M (SURFACE)
②	TACK COAT (GENERAL USE) 403-01 BITUMINOUS MATERIAL FOR TACK COAT. (TC) 10.05 - 0.15 GAL/SY)
③	BIT. BINDER @ 2" THICK 307-01.08 ASPHALT CONCRETE MIX. (PG64-22) (SPNB-190) GRADING B-M2
④	PRIME COAT 402-01 BITUMINOUS MATERIAL FOR PRIME COAT (PC) (0.30-0.35 GAL/SY) 402-02 AGGREGATE FOR COVER MATERIAL (PC) (8-12 LB/SY)
⑤	MINERAL AGGREGATE BASE @ 8" THICK 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D



NOTES:

1. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED
2. DIMENSIONS REFLECT A MINIMUM STANDARD
3. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

STANDARD DETAILS

MINOR LOCAL ROADWAY

(NTS)

DATE 6/9/2022

RD-05

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TKC
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INTERIORS
CIVIL SITE
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CONSULTANTS:

PROJECT TITLE:
BAKER ROAD DEVELOPMENT
Columbia, Maury County
Parcel 113.7, Tax Map 75

PRELIMINARY DRAWINGS

Revision		
No.	Date	Description

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SHEET TITLE:
PRELIMINARY CONCEPT PLAN (WITH CONTOURS)

PRELIMINARY

DATE: 12/04/2023

DRAWN BY: TS

PROJECT NO.: 2353

SHEET NO.:

C - 2.1



N

GRAPHIC SCALE
(IN FEET)

0 100 200

SCALE: 1" = 100'

LEGEND

- PROPERTY LINE
- EXISTING CONTOURS
- EXISTING TREE CANOPY COVER 17.45 AC
- TREE SAVE AREA 10.07 AC

Total Site Data	
	PROVIDED
TOTAL PROPERTY ACREAGE	57.43 +/- AC
EXISTING ZONING	PUD
PROPOSED ZONING	REZONE TO CD-3L (26.82 AC) & CD-2 (30.61 AC)
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7. LOTS 27 - 65 - CD-3L ZONING (MIN. 100 FT WIDTH)

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ARCHITECTURE | INTERIORS | CIVIL SITE
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CONSULTANTS:

PROJECT TITLE:
BAKER ROAD DEVELOPMENT
Columbia, Maury County
Parcel 11.01, Tax Map 75

PRELIMINARY DRAWINGS

Revision		
No.	Date	Description

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SHEET TITLE:
PRELIMINARY TREE PRESERVATION PLAN

PRELIMINARY

DATE: 12/04/2023

DRAWN BY: TS

PROJECT NO.: 2353

SHEET NO.:

C - 2.2

PARCEL NO. 11.05
FRITSCH FAMILY TRUST
(ZONED RESIDENTIAL)

EXISTING
WATER
TANK

PARCEL NO. 11.03
CITY OF COLUMBIA

PARCEL NO. 11.01
CINDY WILLIAMS
(ZONED AGRICULTURAL)

1300' MAX DISTANCE FROM PLAYGROUND (CIVIC SPACE)

R1300.0'

775 CONTOUR

OS : 3

30' BUFFER
(EACH SIDE)

EXISTING
STREAM

BENCHES

PROPOSED
WALKING TRAIL
(GRAVEL)

CIVIC SPACE 2

BIKE RACK

GREEN AREA
(MAIN CIVIC SPACE)

LANGLEY CIRCLE (50' PUBLIC ROW)

ROAD A (50' PUBLIC ROW)

CIVIC SPACE 1

PLAYGROUND

BENCHES

OS : 2

BIKE RACK

BLAISE LANE (50' PUBLIC ROW)

ROAD B (50' PUBLIC ROW)

OS : 4

LANGLEY CIRCLE (50' PUBLIC ROW)

BLAISE LANE (50' PUBLIC ROW)

15' BUFFER MIN.
(EACH SIDE)

OS : 5

OS : 1

EXISTING
SPRING

OS : 6

EXISTING
STREAM

30' BUFFER
(EACH SIDE)

STORMWATER
DETENTION
AREA

PARCEL NO. 12.00
JOHN DOUGLAS MILES ETAL

PARCEL NO. 13.00
ANN K. CONNER

NASHVILLE HWY (US 31)

PARCEL NO. 2.00
RAGSDALE CORRINE
ETVIR RICKY
(ZONED PUD)

PARCEL NO. 3.00
JONES RANDY T
ETUX BRANDY T
(ZONED PUD)

PARCEL NO. 4.00
KING SUSAN C
(ZONED PUD)

PARCEL NO. 5.00
MATTHEWS W C
ETUX MARTHA ANN
(ZONED PUD)

BAKER ROAD (80' PUBLIC ROW)

LANGLEY LANE (50' PUBLIC ROW)

PARCEL NO. 6.00
WILLIAMS NANCY
ETVIR WILLIAM
(ZONED PUD)

PARCEL NO. 7.00
MITCHELL VALERIE

PARCEL NO. 8.00
MITCHELL VALERIE
(ZONED PUD)

PARCEL NO. 11.00
MAHON ROAD HOLDINGS, LLC
(ZONED PUD)

5-MIN. WALK ~ ¼ MILE
FROM MAIN CIVIC SPACE
(PEDESTRIAN SHED)

R1760.0'

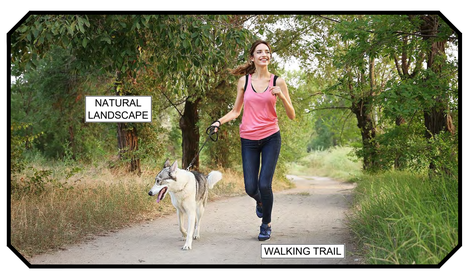


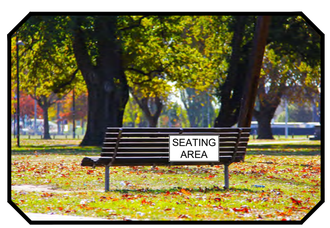


PLAYGROUND



GREEN AREA







NOT FOR CONSTRUCTION

GRAPHIC SCALE
(IN FEET)
0 100 200
SCALE: 1" = 100'

LEGEND

- PROPERTY LINE
- 775 CONTOUR
- CD-2 BOUNDS (30.61 AC)
- CD-3L BOUNDS (26.82 AC)
- DISTANCE FROM PLAYGROUND
- DISTANCE FROM CIVIC SPACE

Total Site Data	
	PROVIDED
TOTAL PROPERTY ACREAGE	57.43 +/- AC
EXISTING ZONING	PUD
PROPOSED ZONING	REZONE TO CD-3L (26.82 AC) & CD-2 (30.61 AC)
LOT WIDTH	CD-3L: 100 FT. (MIN.) CD-2: 125 FT. (MIN.)
TREE SAVE AREA	10.07 AC > 8.38 AC (REQUIRED)
SINGLE-FAMILY	24.3 AC
TOTAL OPEN SPACE	21.42 AC
TOTAL CIVIC SPACE	2.87 AC (5.0% OF GROSS ACREAGE
RIGHT OF WAY	8.7 AC
TOTAL LOTS	65
CD-3L DENSITY	1.45 UNITS / AC
CD-2 DENSITY	0.85 UNITS / AC

NOTES:

1. SEE SHEET C-2.1 FOR THE TYPICAL SECTION.
2. OS-5 TO BE 10.07 ACRES OF TREE SAVE AREA WHICH IS GREATER THAN THE 8.38 ACRES REQUIRED SEE SHEET C-2.2.
3. CIVIC SPACE 1 TO BE PLAYGROUND, GREEN AREA (CIVIC SPACE)
4. CIVIC SPACE 2 TO BE GREEN AREA (MAIN CIVIC SPACE)
5. OS-9 TO BE MAIL KIOSK AREA
6. LOTS 1 - 26 - CD-2 ZONING (MIN. 125 FT WIDTH)
7. LOTS 27 - 65 - CD-3L ZONING (MIN. 100 FT WIDTH)

CIVIC SPACE SUMMARY
SITE AREA: 57.43 AC
CIVIC SPACE REQUIRED: 2.87 AC (5% MIN.)
CIVIC SPACE PROVIDED: 2.87 AC (5%)
CS 1 (1.06 AC) + CS 2 (1.81 AC) = 2.87 AC (TOTAL)

Parcel Area Table		
PARCEL	SQ. FT.	ACRES
CIVIC SPACE 1	46319.71	1.06
CIVIC SPACE 2	78855.74	1.81

TKC
ARCHITECTURE
INTERIORS
CIVIL SITE
808 S. MAIN STREET, COLUMBIA, TN 38401 | 615.837.7477 | WWW.TKC-AE.COM

CONSULTANTS:

PROJECT TITLE:
BAKER ROAD DEVELOPMENT
Columbia, Maury County
Parcel 11.07, Tax Map 75

PRELIMINARY DRAWINGS

Revision		
No.	Date	Description

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SHEET TITLE:
PRELIMINARY CIVIC SPACE & PEDESTRIAN SHED PLAN

PRELIMINARY
DATE: 12/04/2023
DRAWN BY: TS
PROJECT NO.: 2353

SHEET NO.:
C - 2.3

CITY OF COLUMBIA
TENNESSEE

DEVELOPMENT REVEW COMMITTEE MEETING
Tuesday, March 12, 2024

ITEM NO.
24-0033

DESCRIPTION: Property Owners are proposing to rezone the property to CD-3L. The property is approximately 57.4 ac +/- and is currently zoned for a PUD. This proposal proposes to straight zone the project per the zoning code to 2 units per acre with 100' frontage min.

RECOMMENDATION: For final recommendation please see staff report.

COMMENTS:

Fire

1. No comments

Wastewater

2. Columbia Wastewater has stated its concerns in the availability letter.

Engineering

3. No comments on rezoning.

Planning

4. An updated water availability letter will be required before the review process is complete. A current water availability letter is required throughout the entitlement process. The current letter will expire on May 14, 2024. Presuming a timely resubmittal to technical comments and a favorable recommendation from the planning Commission in April, the second consideration for this item will occur on June 13th. 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.
5. 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.

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. The portions of the development at an elevation greater than 775 feet have a future land use classification of Hillsides and Natural Spaces (HNS). The requested CD-3L character district is not consistent with the HNS future land use classification. Please revise the application appropriately (i.e. modify request to CD-2 for portions of the site above 775' or request to amend the future land use map).
8. Advisory: If the request for rezoning is successful, future development plans will need to include a tree canopy preservation plan with recent aerial image conforming to 4.3.16.L of the zoning ordinance. Civic Spaces will need to be shown conforming to standards of Article 5 with sufficient detail for Planning Commission review.
9. Advisory: If the request for rezoning is successful, please note the information in the Wastewater Availability Letter indicating that subsequent development plans may require developer-provided off-site improvements to extend sewerage to the site and connect to the existing wastewater treatment capacity.

Maury County Highway Dept.

10. Because both sides of Baker Road are shown as being annexed into the City of Columbia at the connections of Langley Lane and Blaise Road on the City of Columbia GIS mapping, our understanding is that this portion of Baker Road is City of Columbia owned / maintained ROW and roadway. With this consideration, we have no comment on behalf of the Maury County Highway Department (MCHD).

Building

11. No comment.

Police

12. No comment.

ATT

13. PLAN TO SERVE

Maury County E911

14. Contact Maury County 911 at Maury911.org to submit street name request.

Maury County Schools

15. No Comment

Columbia Power

16. 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

17. No comments.

Atmos Energy

18. No comment.

Columbia Water

19. "A water availability letter was issued on 2-16-24 and is 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."

Duck River Electric Membership Corp

20. No comments.

CPWS BB

21. 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.

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	Open Seats
322	94.7%	18
636	90.9%	64
369	91.1%	36
314	82.6%	66
594	84.9%	106
575	91.3%	55
401	80.2%	99
449	83.1%	91
563	93.8%	37
599	80.9%	141
4822	***87.1%***	**713**
727	80.8%	173
64	7.1%	836
416	75.6%	134
527	55.5%	423
973	92.7%	77
2707	***62.2%***	**1643**
1382	81.3%	318
370	61.7%	230
1198	99.8%	2
2950	***84.3%***	**550**
874	85.7%	146
412	82.4%	88
512	78.8%	138
1798	***82.9%***	**372**
173		
12450		3105

DocuSign Envelope ID: D32034F2-460B-4E27-9884-D2E4F859F5F2

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	Baker Road, Columbia, TN		
	TAX MAP: 75	GROUP:	PARCEL: 11.17
SUMMARY OF NATURE OF REQUEST AND WORK	Requesting to Annex and Rezone the property. We are proposing zoning of CD-3L.		

DATE OF PRE-APPLICATION CONFERENCE	12/10/23	*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	TKC Architecture and Engineering LLC	PHONE	615.617.7477
ADDRESS	818 S Main St, Columbia TN 38401	EMAIL	cole@tkc-ae.com

PROPERTY OWNER NAME	Abhishek Yerra	PHONE	517.599.1641
ADDRESS	125 Circuit Road, Franklin TN 37064	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.

Cole Newton (TKC A&E)	Cole Newton	1/22/24
APPLICANT NAME	APPLICANT SIGNATURE	DATE
Abhishek Yerra	DocuSigned by: Abhishek Yerra 49B2329C5DED41E...	1/22/2024
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	

TKC ARCHITECTURE
INTERIORS
CIVIL SITE

818 South Main Street
COLUMBIA, TN 38401
TKC-AE.COM
615.617.7477

January 16th, 2024

Planning Staff
City of Columbia
700 N Garden Street
Columbia, TN 38401

Project: Baker Road Development

Subject: Baker Road Development Annexation / Rezone

Staff,

We are requesting the acceptance of our Annexation / Rezone of the property located on Baker Road. We are proposing to annex into the City of Columbia and proposed zoning of CD-3L. This submittal follows the City's zoning ordinance and subdivision regulations. The existing conditions consist of woods and grass area. The current City's Connect Columbia Comprehensive Plan shows the property as Suburban Neighborhood and our the proposed rezoning follows that guide.

The total site is +/- 57.43 acres.

With Annexation and Rezone approval we would submit for Preliminary Plat.

If you have any comments or questions please contact Cole Newton at TKC Architecture and Engineering at cole@tkc-ae.com or at 615.617.7477.

Thank you,

Cole Newton, PE, LEED AP
TKC Architecture and Engineering LLC
615.617.7477 (o)
931.797.3323 (c)
cole@tkc-ae.com

REZONE / ANNEXATION PLAN
FOR
BAKER ROAD DEVELOPMENT

Property Information:

Columbia / Maury County, Tennessee
Total Acres: 57.43 ACRES +/-

Owner / Developer:

XX

Civil Engineer:

TKC ARCHITECTURE AND ENGINEERING LLC
Cole Newton
cole@tkc-ae.com
615.617.7477
www.tkc-ae.com

Surveyor:

ALLEN B. O'LEARY

Topographic Boundary Survey, including property lines, legal description, existing utilities, site topography with spot elevations, outstanding physical features and existing structure locations was provided by the ALLEN B. O'LEARY. TKC ARCHITECTURE AND ENGINEERING and its associates will not be held responsible for its accuracy or for design errors or emissions resulting from potential survey inaccuracies.

Contractor to contact civil engineer with any discrepancies with these drawings and actual field conditions.

Utility Providers:

Water - Columbia Power & Water Systems (CPWS)
Wastewater - Columbia Power & Water Systems (CPWS)
Electric - Columbia Power & Water Systems (CPWS)



N.T.S.

LOCATION MAP

Total Site Data	
	PROVIDED
TOTAL PROPERTY ACREAGE	57.43 +/- AC
ZONING	REZONE TO CD-3L (2 UNITS / AC)
LOT WIDTH	100 FT. (MIN.)
LOT AREA	BASED ON 2 UNITS PER AC
SINGLE-FAMILY	24.3 AC
TOTAL OPEN SPACE	24.5 AC
TOTAL CIVIC SPACE	2.9 AC (5.0% OF GROSS ACREAGE
RIGHT OF WAY	8.7 AC
TOTAL LOTS	68 (1.2 UNITS / AC)

Sheet Schedule

C - 0.0 Cover Sheet
C - 1.0 Existing Conditions
C - 2.0 Preliminary Concept Plan
C - 2.1 Preliminary Development Plan
C - 2.2 Preliminary Tree Preservation Plan
C - 2.3 Preliminary Civic Space & Pedestrian Shed Plan

COLUMBIA / MAURY COUNTY, TN

MAP 75 PARCEL 11.17

NOT FOR CONSTRUCTION

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INTERIORS
CIVIL SITE
818 S. MAIN STREET, COLUMBIA, TN 38401 | 615.617.7477 | WWW.TKC-AE.COM

CONSULTANTS:

PROJECT TITLE:
BAKER ROAD DEVELOPMENT
Columbia, Maury County
Parcel 11.17, Tax Map 75

PRELIMINARY DRAWINGS

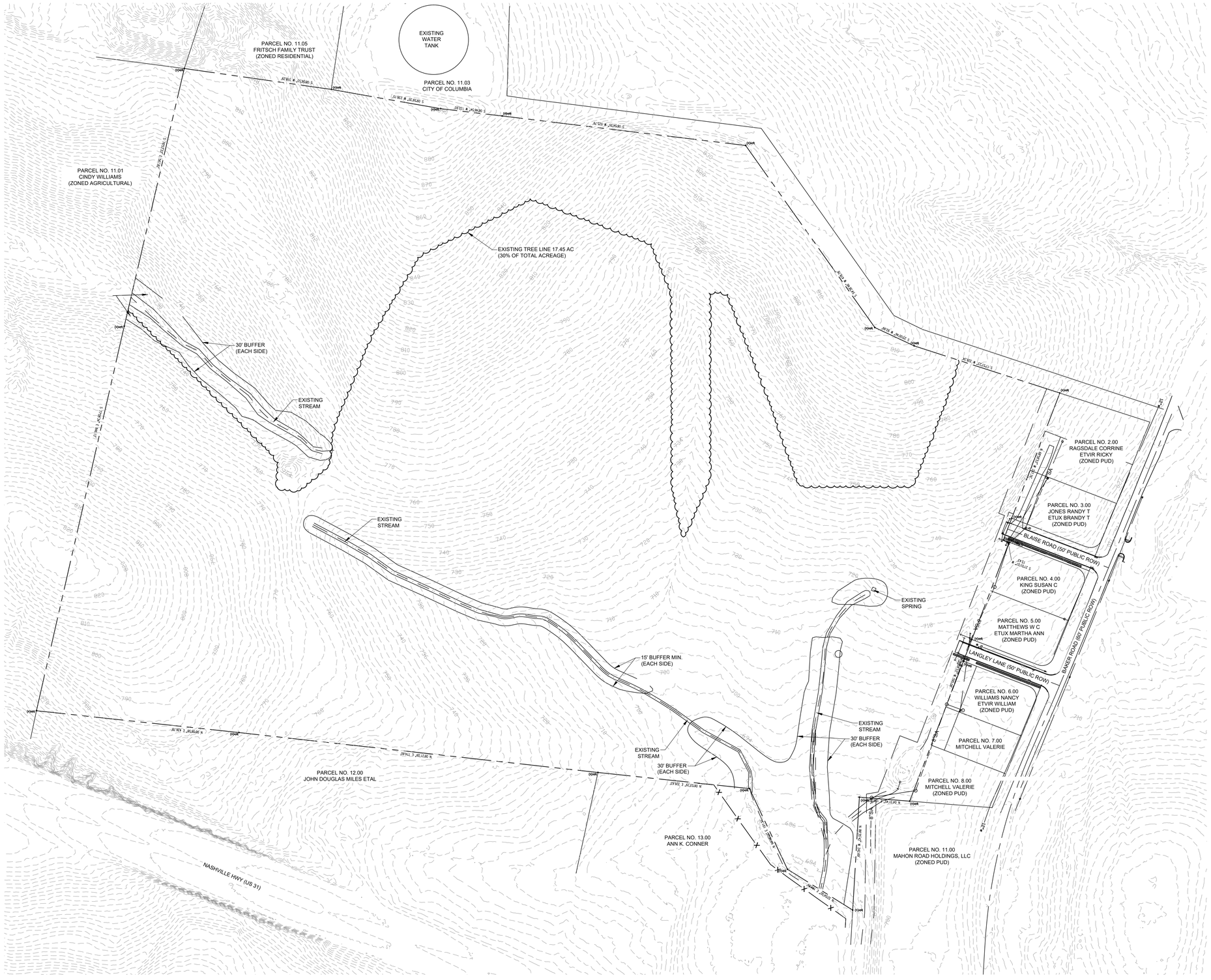
Revision		
No.	Date	Description

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SHEET TITLE:
COVER SHEET

PRELIMINARY
DATE: 12/04/2023
DRAWN BY: TS
PROJECT NO.: 2353

SHEET NO.:
C - 0.0



N

GRAPHIC SCALE
(IN FEET)
0 100 200

SCALE: 1" = 100'

LEGEND

PROPERTY LINE

EXISTING CONTOURS

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CONSULTANTS:

PROJECT TITLE:
BAKER ROAD DEVELOPMENT

Columbia, Maury County
Parcel 113.17, Tax Map 75

PRELIMINARY DRAWINGS

Revision		
No.	Date	Description

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SHEET TITLE:
EXISTING CONDITIONS

PRELIMINARY

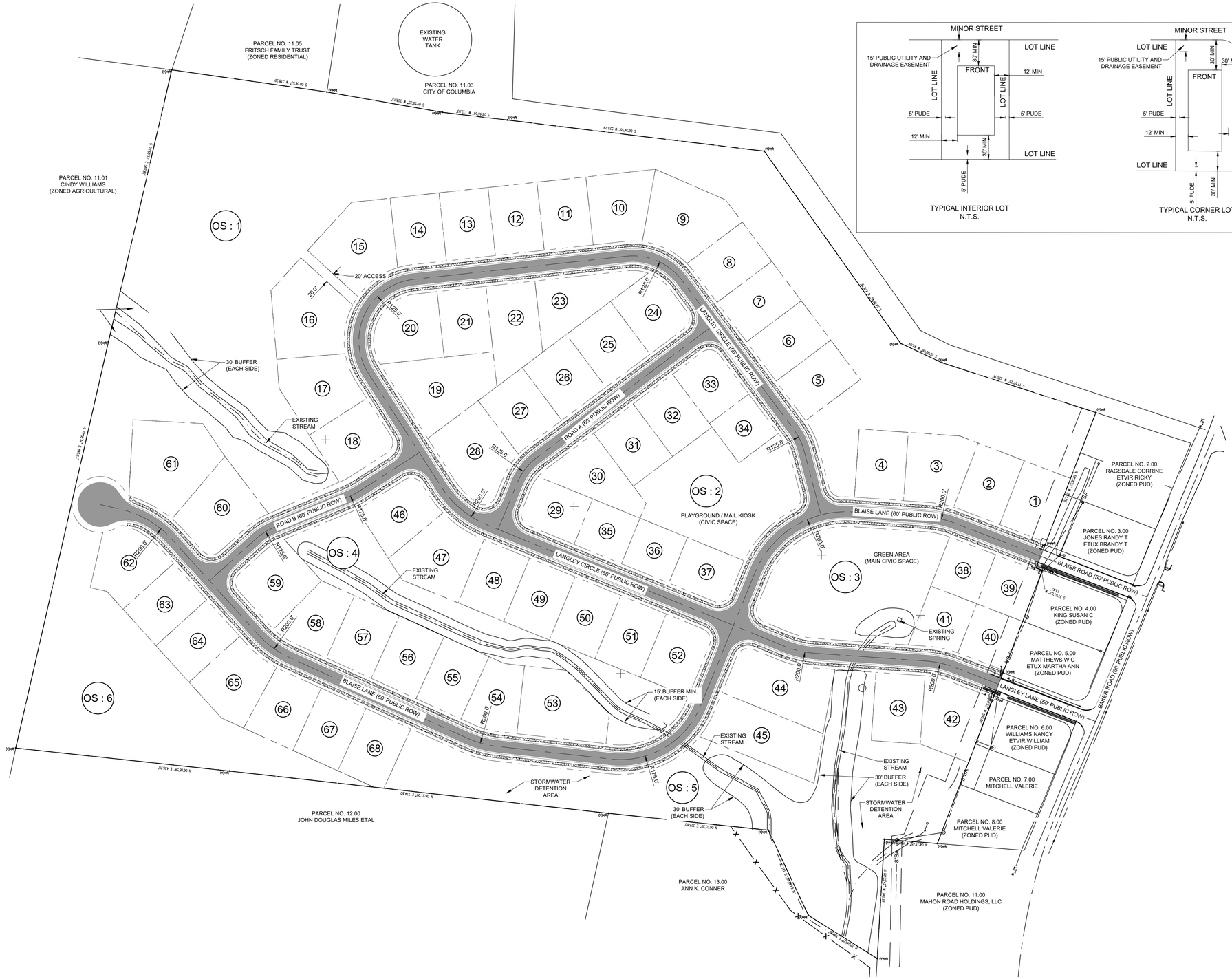
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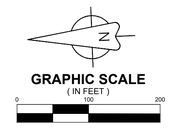
DRAWN BY: TS

PROJECT NO.: 2353

SHEET NO.:

C - 1.0





LEGEND

PROPERTY LINE

Total Site Data	
	PROVIDED
TOTAL PROPERTY ACREAGE	57.43 +/- AC
ZONING	REZONE TO CD-3L (2 UNITS / AC)
LOT WIDTH	100 FT. (MIN.)
LOT AREA	BASED ON 2 UNITS PER AC
SINGLE-FAMILY	24.3 AC
TOTAL OPEN SPACE	24.5 AC
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RIGHT OF WAY	8.7 AC
TOTAL LOTS	68 (1.2 UNITS / AC)

NOTES:

1. SEE SHEET C-2.1 FOR THE TYPICAL SECTION.
2. OS-1 TO BE 10.16 ACRES OF TREE SAVE AREA WHICH IS GREATER THAN THE 8.38 ACRES REQUIRED SEE SHEET C-2.2.
3. OS-2 TO BE PLAYGROUND, GREEN AREA (CIVIC SPACE) & MAIL KIOSK
4. OS-3 TO BE GREEN AREA (MAIN CIVIC SPACE)

Parcel Area Table		
PARCEL	SQ. FT.	ACRES
1	14010.97	0.32
2	13902.64	0.32
3	17326.28	0.40
4	13900.00	0.32
5	13900.00	0.32
6	13900.00	0.32
7	13900.00	0.32
8	13910.97	0.32
9	22308.18	0.51
10	16941.31	0.39
11	13900.78	0.32
12	13900.78	0.32
13	13900.78	0.32
14	13935.64	0.32
15	22337.39	0.51
16	24110.07	0.55
17	19258.95	0.44
18	15916.79	0.37
19	23896.02	0.55
20	16637.86	0.38
21	13400.00	0.31
22	17532.00	0.40
23	17735.37	0.41
24	14597.13	0.34
25	15008.00	0.34
26	15008.00	0.34
27	15028.33	0.35
28	21267.98	0.49
29	12241.64	0.28
30	16521.16	0.38
31	13400.00	0.31
32	13400.00	0.31
33	12365.87	0.28
34	10000.00	0.23
35	10400.00	0.24
36	10400.00	0.24
37	12268.23	0.28
38	10670.67	0.24
39	10692.37	0.25
40	10669.76	0.24

Parcel Area Table		
PARCEL	SQ. FT.	ACRES
41	11496.04	0.26
42	17596.85	0.40
43	13900.00	0.32
44	23108.48	0.53
45	23373.47	0.54
46	14966.11	0.34
47	19877.70	0.46
48	13900.00	0.32
49	13900.00	0.32
50	13900.00	0.32
51	13900.00	0.32
52	14460.87	0.33
53	21540.87	0.49
54	13474.56	0.31
55	13900.20	0.32
56	13900.00	0.32
57	13900.00	0.32
58	13625.70	0.31
59	17313.69	0.40
60	19714.33	0.45
61	27018.37	0.62
62	16921.94	0.39
63	13900.00	0.32
64	13900.00	0.32
65	17338.77	0.40
66	14608.53	0.34
67	13900.00	0.32
68	13839.92	0.32

Parcel Area Table		
PARCEL	SQ. FT.	ACRES
1	539190.44	12.38
2	55165.07	1.27
3	70885.11	1.63
4	75541.32	1.73
5	196439.15	4.51
6	127846.31	2.93

NOT FOR CONSTRUCTION

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INTERIORS
CIVIL SITE
818 S. MAIN STREET, COLUMBIA, TN 38401 | 615.837.7477 | WWW.TKC-AE.COM

CONSULTANTS:

PROJECT TITLE:
BAKER ROAD DEVELOPMENT
Columbia, Maury County
Parcel 113.Tax Map 75

PRELIMINARY DRAWINGS

Revision		
No.	Date	Description

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SHEET TITLE:
PRELIMINARY CONCEPT PLAN

PRELIMINARY

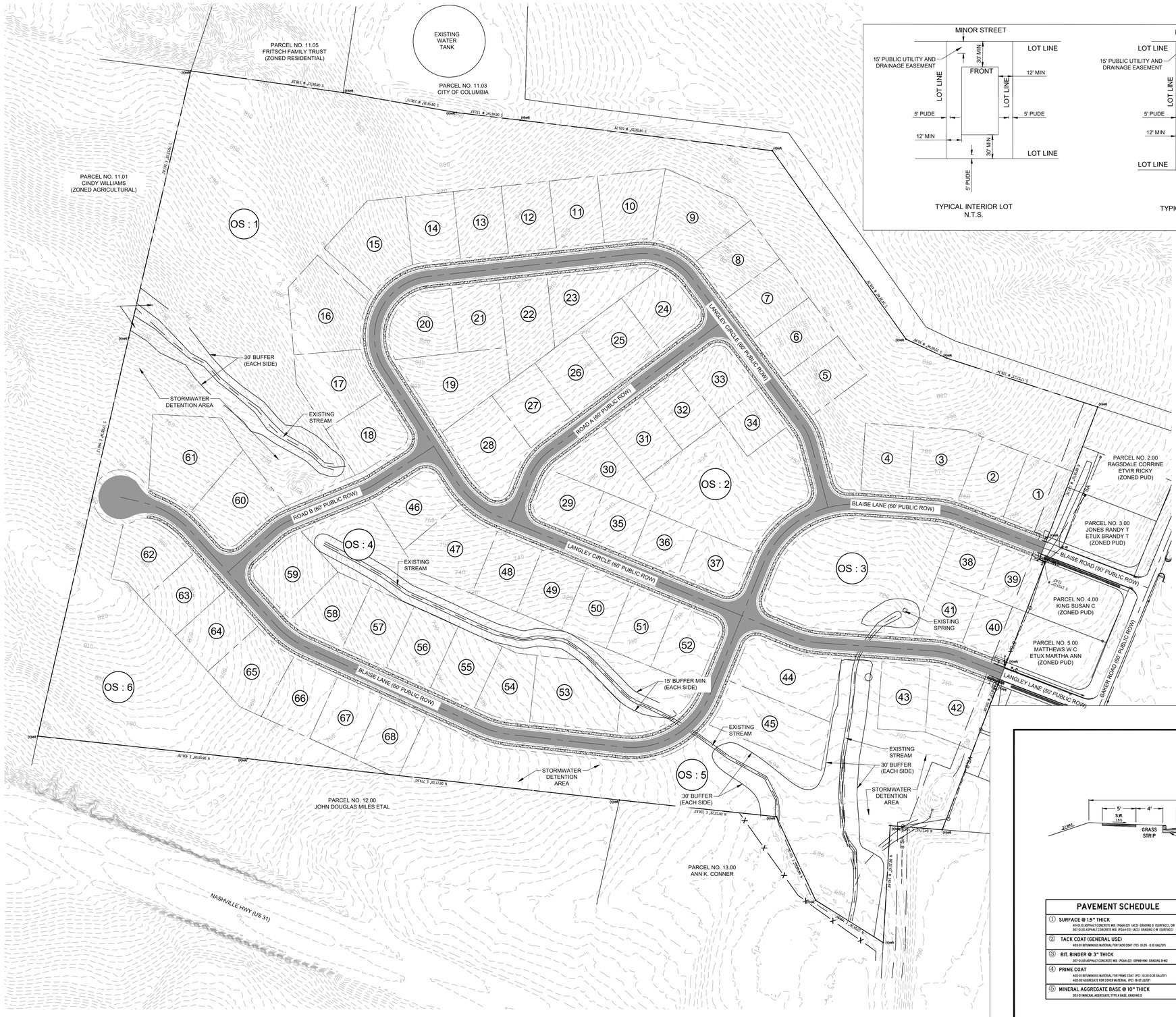
DATE: 12/04/2023

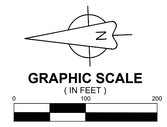
DRAWN BY: TS

PROJECT NO.: 2353

SHEET NO.:

C - 2.0





LEGEND

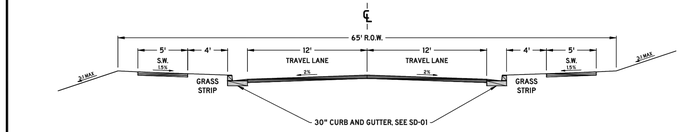
PROPERTY LINE

EXISTING CONTOURS

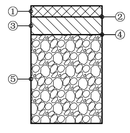
Total Site Data	
	PROVIDED
TOTAL PROPERTY ACREAGE	57.43 +/- AC
ZONING	REZONE TO CD-3L (2 UNITS / AC)
LOT WIDTH	100 FT. (MIN.)
LOT AREA	BASED ON 2 UNITS PER AC
SINGLE-FAMILY	24.3 AC
TOTAL OPEN SPACE	24.5 AC
TOTAL CIVIC SPACE	2.9 AC (5.0% OF GROSS ACREAGE
RIGHT OF WAY	8.7 AC
TOTAL LOTS	68 (1.2 UNITS / AC)

NOTES:

1. SEE SHEET C-2.1 FOR THE TYPICAL SECTION.
2. OS-1 TO BE 10.16 ACRES OF TREE SAVE AREA WHICH IS GREATER THAN THE 8.38 ACRES REQUIRED SEE SHEET C-2.2.
3. OS-2 TO BE PLAYGROUND, GREEN AREA (CIVIC SPACE) & MAIL KIOSK
4. OS-3 TO BE GREEN AREA (MAIN CIVIC SPACE)



PAVEMENT SCHEDULE
① SURFACE @ 1.5" THICK 411-0110 ASPHALT CONCRETE MIX (PG64-22) (ACS) GRADING D (SURFACE), OR 307-0110 ASPHALT CONCRETE MIX (PG64-22) (ACS) GRADING C-M (SURFACE)
② TACK COAT (GENERAL USE) 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC) (0.05 - 0.10 GAL/SY)
③ BIT. BINDER @ 3" THICK 307-0120 ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING B-M2
④ PRIME COAT 402-01 BITUMINOUS MATERIAL FOR PRIME COAT (PC) (0.30-0.35 GAL/SY) 402-02 AGGREGATE FOR COVER MATERIAL (PC) (8-12 LBS/SY)
⑤ MINERAL AGGREGATE BASE @ 10" THICK 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D



NOTES:

1. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED
2. MAY INCLUDE A THIRD TRAVEL LANE 12 FEET IN WIDTH
3. DIMENSIONS REFLECT A MINIMUM STANDARD
4. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

STANDARD DETAILS

MAJOR LOCAL / INDUSTRIAL ROADWAY

(NTS)

DATE
6/9/2022

RD-04

NOT FOR CONSTRUCTION

TKC
ARCHITECTURE
INTERIORS
CIVIL SITE
88 S. MAIN STREET, COLUMBIA, TN 38401 | 615.837.7477 | WWW.TKC-AE.COM

CONSULTANTS:

PROJECT TITLE:
BAKER ROAD DEVELOPMENT
Columbia, Maury County
Parcel 113.7, Tax Map 75

PRELIMINARY DRAWINGS

Revision		
No.	Date	Description

THIS DRAWING IS THE PROPERTY OF TKC ARCHITECTURE & ENGINEERING (TKC A&E). ANY UNAUTHORIZED REPRODUCTION OR USAGE WITHOUT THE PRIOR WRITTEN CONSENT OF TKC A&E IS PROHIBITED.

SHEET TITLE:
PRELIMINARY DEVELOPMENT PLAN

PRELIMINARY

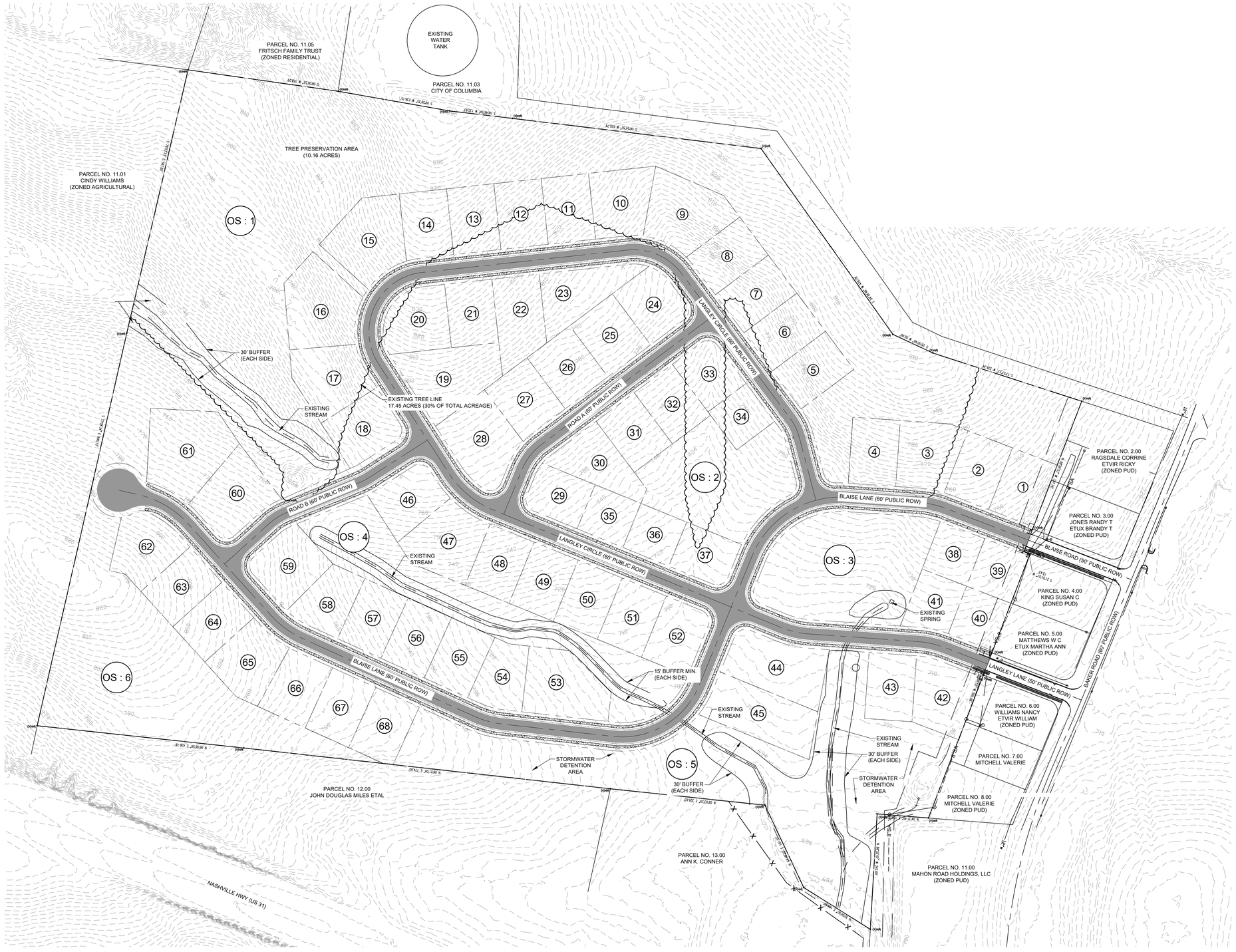
DATE: 12/04/2023

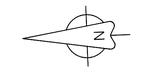
DRAWN BY: TS

PROJECT NO.: 2353

SHEET NO.:

C - 2.1





GRAPHIC SCALE
(IN FEET)

0 100 200

SCALE: 1" = 100'

LEGEND

PROPERTY LINE

EXISTING CONTOURS

TREE SAVE AREA

Total Site Data	
	PROVIDED
TOTAL PROPERTY ACREAGE	57.43 +/- AC
ZONING	REZONE TO CD-3L (2 UNITS / AC)
LOT WIDTH	100 FT. (MIN.)
LOT AREA	BASED ON 2 UNITS PER AC
SINGLE-FAMILY	24.3 AC
TOTAL OPEN SPACE	24.5 AC
TOTAL CIVIC SPACE	2.9 AC (5.0% OF GROSS ACREAGE
RIGHT OF WAY	8.7 AC
TOTAL LOTS	68 (1.2 UNITS / AC)

NOTES:

1. SEE SHEET C-2.1 FOR THE TYPICAL SECTION.
2. OS-1 TO BE 10.16 ACRES OF TREE SAVE AREA WHICH IS GREATER THAN THE 8.38 ACRES REQUIRED SEE SHEET C-2.2.
3. OS-2 TO BE PLAYGROUND, GREEN AREA (CIVIC SPACE) & MAIL KIOSK
4. OS-3 TO BE GREEN AREA (MAIN CIVIC SPACE)

NOT FOR CONSTRUCTION

TKC
ARCHITECTURE
INTERIORS
CIVIL SITE
808 S. MAIN STREET, COLUMBIA, TN 38401 | 615.837.7477 | WWW.TKC-AE.COM

CONSULTANTS:

PROJECT TITLE:
BAKER ROAD DEVELOPMENT
Columbia, Maury County
Parcel 113.7, Tax Map 75

PRELIMINARY DRAWINGS

Revision		
No.	Date	Description

THIS DRAWING IS THE PROPERTY OF TKC ARCHITECTURE & ENGINEERING (TKC A&E). ANY UNAUTHORIZED REPRODUCTION OR USAGE WITHOUT THE PRIOR WRITTEN CONSENT OF TKC A&E IS PROHIBITED.

SHEET TITLE:
PRELIMINARY TREE PRESERVATION PLAN

PRELIMINARY

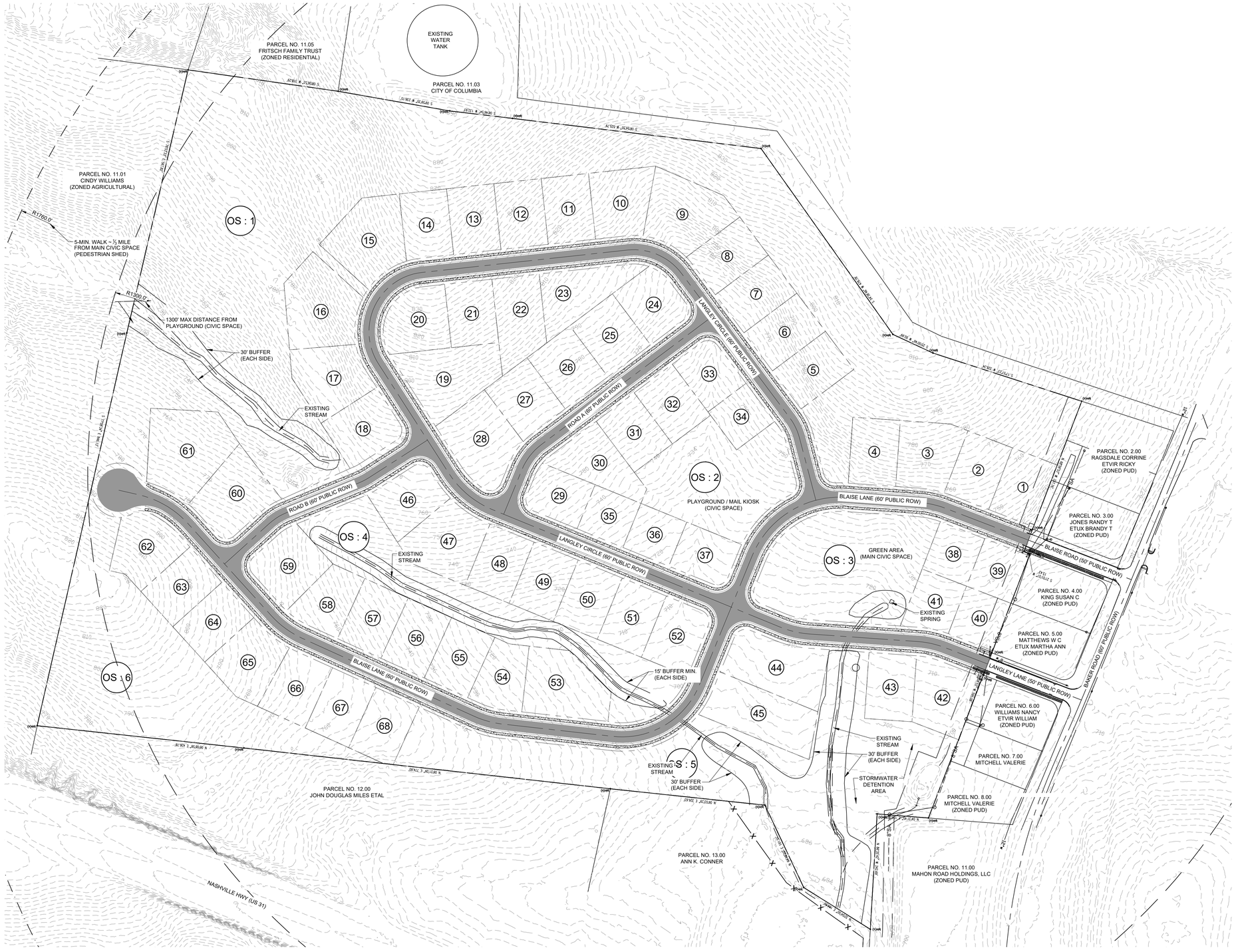
DATE: 12/04/2023

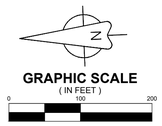
DRAWN BY: TS

PROJECT NO.: 2353

SHEET NO.:

C - 2.2





LEGEND

- PROPERTY LINE
- EXISTING CONTOURS
- DISTANCE FROM PLAYGROUND
- DISTANCE FROM MAIN CIVIC SPACE

Total Site Data	
	PROVIDED
TOTAL PROPERTY ACREAGE	57.43 +/- AC
ZONING	REZONE TO CD-3L (2 UNITS / AC)
LOT WIDTH	100 FT. (MIN.)
LOT AREA	BASED ON 2 UNITS PER AC
SINGLE-FAMILY	24.3 AC
TOTAL OPEN SPACE	24.5 AC
TOTAL CIVIC SPACE	2.9 AC (5.0% OF GROSS ACREAGE
RIGHT OF WAY	8.7 AC
TOTAL LOTS	68 (1.2 UNITS / AC)

NOTES:

1. TOTAL CIVIC SPACE REQUIRED: 2.5 ACRES (MIN. 5% OF GROSS ACREAGE)
   - 1.1. TOTAL CIVIC SPACE PROVIDED: 2.9 ACRES (5.0% OF GROSS ACREAGE
2. 1,300 FT FROM NEAREST PLAYGROUND REQUIRED
   - 2.1. SEE CIRCLE OF RADIUS OF 1,300 FT TO SHOW IF ALL LOTS ARE WITHIN 1,300 FT OF PLAYGROUND
3. PEDESTRIAN SHED OF 5-MINUTE WALK FROM MAIN CIVIC SPACE APPROXIMATELY 1,700 FT
   - 3.1. SEE CIRCLE OF RADIUS OF 1,700 FT TO SHOW IF ALL LOTS ARE WITHIN 1,700 FT (5-MIN. WALK) FROM MAIN CIVIC SPACE

NOT FOR CONSTRUCTION

TKC
ARCHITECTURE
INTERIORS
CIVIL SITE
808 S. MAIN STREET, COLUMBIA, TN 38401 | 615.837.7477 | WWW.TKC-AE.COM

CONSULTANTS:

PROJECT TITLE:
BAKER ROAD DEVELOPMENT
Columbia, Maury County
Parcel 113.7, Tax Map 75

PRELIMINARY DRAWINGS

Revision		
No.	Date	Description

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SHEET TITLE:
PRELIMINARY CIVIC SPACE & PEDESTRIAN SHED PLAN

PRELIMINARY

DATE: 12/04/2023

DRAWN BY: TS

PROJECT NO.: 2353

SHEET NO.:

C - 2.3

DocuSign Envelope ID: 614E8177-3DB5-45FF-A096-8055D9817DB6

TKC ARCHITECTURE INTERIORS CIVIL SITE

818 South Main Street
COLUMBIA, TN 38401
TKC-AE.COM
615.617.7477

January 22, 2024

Planning Staff
City of Columbia
700 N. Garden Street
Columbia TN 38401

Subject: Owner Consent Form –

Address: Map 75, Parcel 11.00

As the property owner of the property located on Baker Rd. in Columbia, TN (Map 75, Parcel 11.00), I hereby give consent for TKC Architecture and Engineering LLC to submit a rezoning / annexation application for approval on our property and represent that rezoning / annexation to the City at Boards and Commissions.

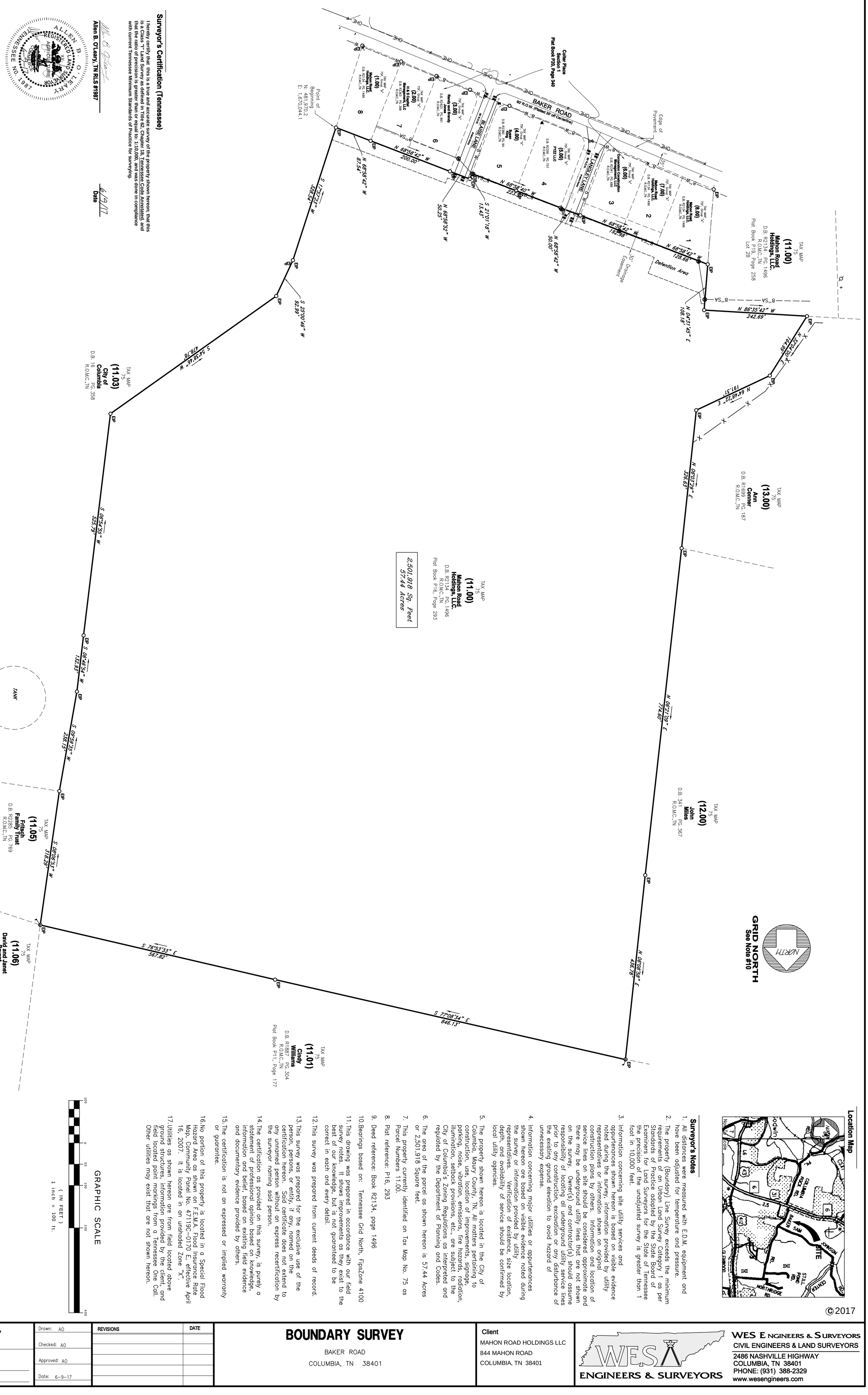
Sincerely,

DocuSigned by:
Abhishek Yerra
49B2329C5DED41E...

Owners Signature
Abhishek Yerra

Owners Printed Name

FILE: J:\WEBB ENGINEERING\13537 – Sterling Marlin – Colter Place\dwg\Survey\13537_Survey_REV1.dwg



Legend

IPS	Iron Rod Found	Bench Mark	Catch Basin
●	Iron Rod Set	Stake Found	Curb Inlet
I.P.F.	Iron Pipe Found	Fire Hydrant	Storm Pipe
AXLE	Axle Found	Water Meter	Cable Manhole
FCM	Fence Post	Water Valve	Electric Manhole
□	Concrete Monument Existing	Water Reducer	Telephone Manhole
P.K.F.	PK Nail Found	Clean Out	Water Manhole
P.K.S.	PK Nail Set	Sanitary Sewer Manhole	Electric Meter
R.R.S.F.	Railroad Spike Found	Storm Sewer Manhole	Cable Riser
R.R.S.S.	Railroad Spike Set		

	Electric Riser		Power Pole
	Telephone Riser		Flag Pole
	Telephone Booth		Guy Wire
	Gas Meter		Mailbox
	Gas Valve		Parking Block
	Light Pole		Satellite Dish
	Power Pole		Handicap Parking
	Telephone Pole		Water Spigot
	Guy Pole		Bollard

	Adjoining Property Line		Edge of Water
	Subject Property Line		Ditch / Creek
	Easement Line		Centerline
	Building Setback Line		Index Contour Line
	Centerline	G	Gas Line
	Edge of Pavement	SA	Sanitary Sewer Line
	Edge of Gravel	W	Water Line
X	Fence Line	ST	Storm Sewer Line
	Landscape	OH	Overhead Utility Line
	Woods / Tree line	OHC	Overhead Cable Line

	Evergreen Tree	OHE	Overhead Electric Line
	Deciduous Tree	OHT	Overhead Telephone Line
	Bush	UG	Underground Utility Line
	Sign	UGC	Underground Cable Line
		UGE	Underground Electric Line
		UGT	Underground Telephone Line
		FM	Forced Main Line

Surveyor's Certification (Tennessee)

I hereby certify that 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, and was done in compliance with current Tennessee Minimum Standards of Practice for surveying.

Allen B. O'Leary, TN RLS #1987

6/9/17
Date

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

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 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 others. 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 in 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 Regulations as interpreted and regulated by the Department of Planning and Codes.
6. The area of the parcel as shown hereon is 57.44 Acres or 2,501,918 Square feet.
7. This property currently identified on Tax Map No. 75 as Parcel Numbers 11.00.
8. Plat reference: P16, 293
9. Deed reference: Book R2134, page 1496
10. Bearings based on: Tennessee Grid North, FipsZone 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.
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 recertification 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. No portion of this property is located in a Special Flood Hazard Area as shown on F.E.M.A. Flood Insurance Rate Map, Community Panel No. 47119C-0170 E, effective April 16, 2007. It is located in an unshaded Zone "X".
17. Utilities as shown hereon are from field located above ground structures, information provided by the client, and field located paint markings from a Tennessee One Call. Other utilities may exist that are not shown hereon.

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

Location Map

©2017

IF YOU DIG TENNESSEE...
CALL US FIRST!
1-800-351-1111
1-615-366-1987
TENNESSEE ONE CALL
IT'S THE LAW

Job. no. 13-537	Drawn: AO	REVISIONS	DATE	**BOUNDARY SURVEY**	**Client**
Scale:	Checked: AO			BAKER ROAD	MAHON ROAD HOLDINGS LLC
Vertical:	Approved: AO			COLUMBIA, TN 38401	844 MAHON ROAD
Horizontal:	Date: 6-9-17				COLUMBIA, TN 38401

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

Surveyor's Description

Maury County
Property Map 75 | Parcel 11.17

Being a tract or parcel of land located in Columbia, Maury County, Tennessee, said tract being the property conveyed to Welling Corporation by deed as shown in Record Book 2442, Page 1419, R.O.M.C., and being more particularly described as follows;

Beginning at a point located in the westerly Right-of-Way line of Langley Lane, said point being the northeasterly corner of property conveyed to Nancy Williams by deed as shown in Record Book 2440, Page 1276, R.O.M.C., and being the Point of Beginning for the herein described tract,

Thence, with the northerly line of Nancy Williams (RB2440-1276) and the northerly line of Valerie Mitchell (R2767-1122) N 68deg 58min 42sec W, 192.98 feet to an existing pin,

Thence, continuing with the northerly line of Mitchell (RB2767-1122) N 68deg 58min 42sec W, 128.66 feet to an existing pin,

Thence, with the easterly line of Rogers Group property (RB2578-527) N 4deg 31min 45sec E, 108.18 feet to an existing pin,

Thence, continuing with the northerly line of Rogers Group (RB2578-527) N 86deg 35min 42sec W, 242.69 feet to an existing pin,

Thence, with the easterly line of Ann Conner (RB1699-187) N 32deg 04min 00sec E, 164.99 to an existing pin,

Thence, continuing with Conner (RB1699-187) N64deg 48min 22sec E, 191.31 feet to an existing pin,

Thence, continuing with Conner (RB1699-187) N 6deg 03min 29sec E, 326.63 feet to an existing pin,

Thence, with the easterly line of John Miles (RB2660-1324) N 6deg 21min 09sec E, 774.60 feet to an existing pin,

Thence, continuing with Miles (RB2660-1324) N 6deg 08min 58sec E, 436.78 feet to an existing pin,

Thence, with the southerly line of Cindy Williams (RB1887-304) S 77deg 08min 34sec E, 846.13 feet to an existing pin,

Thence, continuing with Williams (RB1887-304) S 76deg 53min 33sec E, 567.82 feet to an existing pin,

Thence, with the westerly line of the Fritsch Family Trust (RB2285-769) S 8deg 06min 53sec W, 318.29 feet to an existing pin,

Thence, with the westerly line of the City of Columbia property (Deed Book 16 – Page 358) S 9deg 59min 35sec W, 238.15 feet to an existing pin,

Thence, continuing with the City of Columbia property (DB16 – PG358) S 6deg 46min 54sec W, 132.93 feet to an existing pin,

Thence continuing with the City of Columbia property (DB16 – PG358) S 6deg 54min 55sec W, 525.79 feet to an existing pin,

Thence, continuing with the City of Columbia property (DB16 – PG358) S 54deg 38min 46sec W, 478.78 feet to an existing pin,

Thence, continuing with the City of Columbia property (DB16 – PG358) S 25deg 00min 46sec W, 92.99 feet to an existing pin,

Thence, continuing with the City of Columbia property (DB16 – PG358) S 17deg 57min 23sec W, 328.54 feet to an existing pin,

Thence, with the northerly line of Corrine Ragsdale (RB2678-513) N 68deg 58min 42 sec W, 87.54 feet to an existing pin,

Thence, continuing with the northerly line of Ragsdale (RB2678-513) and with the northerly line of Randy Jones (RB 2423-861) N 68deg 58min 42sec W, 200.00 feet to an existing pin,

Thence, with the northerly Right-of-Way terminus of Blaise Lane N68deg 58min 52sec W, 50.25 feet to an existing pin,

Thence, continuing with the westerly Right-of-Way line of Blaise Lane S 21deg 01min 18sec W, 13.43 feet to an existing pin,

Thence, with the northerly line of Susan King (RB2380-94) and the northerly line of W.C. Matthews (RB2488-1443) N 68deg 58min 40 sec W, 233.37 feet to an existing pin,

Thence, leaving said line with the northerly Right-of-Way terminus of the aforementioned Langley Lane N 68deg 58min 42sec W, 50.00 feet to an existing pin and the Point of Beginning.

Containing 2,501,918 square feet or 57.44 acres, being the same more or less.

Benny M. Cantrell
Tennessee RLS 1638
P.O. Box 293192
Nashville, Tn 37229

CPWS

January 15, 2024

Mr. Cole Newton
TKC Architecture and Engineering LLC
2004 Carmack Blvd Suite C
Columbia, TN 38401
Sent via email: cole@tkc-ae.com

RE: Water Availability Letter
Colter Place – 100 Units
Baker Road
Tax Map 75, Parcel 11
Columbia, Maury County, TN

Dear Mr. Newton:

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 100 single-family lots. 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:

- Domestic waterline connections will be made to the existing 8-inch water main stubs off of Baker Road. An additional connection may be required to the existing 30-inch water main located on the water tank access road East of the property to meet fireflow requirements for all lots.
- Minimum size 8-inch water mains will be required throughout the development.

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.

CPWS

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 (100 SFUs)	$38,500.00

- 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: $540 per 3/4" meter (100 meters)	$54,000.00
Impact Fee: $4,500 per 3/4" meter (100 meters)	$450,000.00
Total Meter and Impact Fees Due =	**$504,000.00**

- 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 22-091

CITY OF COLUMBIA
TENNESSEE

WASTEWATER DEPARTMENT

14 December 2023

Cole Newton
818 S Main St
Columbia, TN 38401

RE: Colter Place Rezone

Cole,

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. 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.

Offsite improvements may include the installation of a new pump station in place of the current Columbia Rock Rd Pump Station. Improvements may include a new station enclosure, newly upgraded pumps, new wet well, new force main, new Scada telemetry equipment, and other items required for new pump stations listed in the Columbia Standard Sewer Specifications.

Depending upon the situation with the Theta Pike Pump Station Sewershed, work may need to be performed to free up capacity that is taken up by inflow and infiltration (I&I). Pump Station upgrades may also be necessary, similar to what Columbia Rock Rd Pump Station may need.

A flow study is probably the best path forward to determine current conditions in both aforementioned areas.

Donnie Boshers, Director
City of Columbia, TN
Wastewater Department

Cole Newton

From: Trevor Gilmer <Trevor.Gilmer@cpws.com>
Sent: Monday, December 11, 2023 8:27 AM
To: Cole Newton
Cc: Ryan Turley
Subject: RE: Rezone - electric availability

You will receive a power availability letter when the rezone packet gets to the Development Review Committee of City Planning. It will be part of the comments returned to you after the committee meeting.
If you have any questions, let us know.

Trevor Gilmer
Power Engineering Manager
Columbia Power and Water Systems
931-375-7743 phone

From: Cole Newton <cole@tkc-ae.com>
Sent: Friday, December 8, 2023 11:15 AM
To: Michelle Colbaugh <michelle.colbaugh@cpws.com>
Cc: Ryan Turley <rturley@tkc-ae.com>
Subject: Rezone - electric availability

CAUTION: This email contains an attachment (or an image file) and the email was sent from someone external to our organization.
REMEMBER: Opening attachments (including images) can potentially install virus/malware/ransomware to our systems. Only open attachments which you are expecting from the sender and the attached file type, name, and size is logical.

Michelle,

We are working with a client on a possible project located off of Baker Road near address 1001 Langley Lane. We are needing to rezone the property per the new zoning code and we are trying for CD-3 (4 units / ac). There was a previous plan for this site and I have attached a letter from the Dept. the owner provided regarding electric availability. The client would like to get 100 lots but we are currently showing 79. We may be able to get to 100 lots but it would be with a plan showing alley access and tighter lots.

Can you provide an updated electric availability letter or email that we can include with our rezone packet?

If you want to meet on this one let me know and I'll come out one day next week.

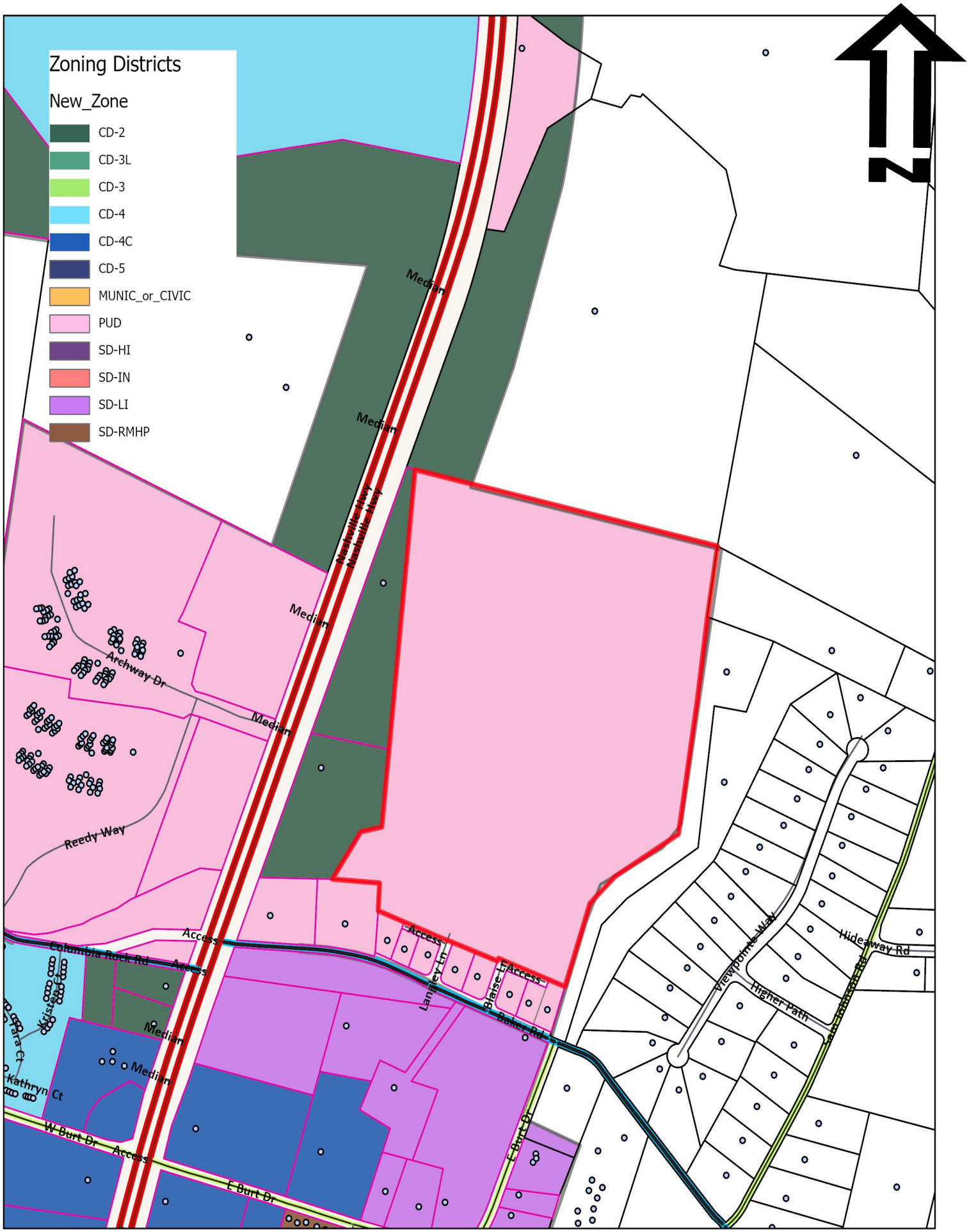
Thanks,
Cole

Cole O. Newton, PE
Co-Owner / Civil Engineer

TKC ARCHITECTURE INTERIORS CIVIL SITE

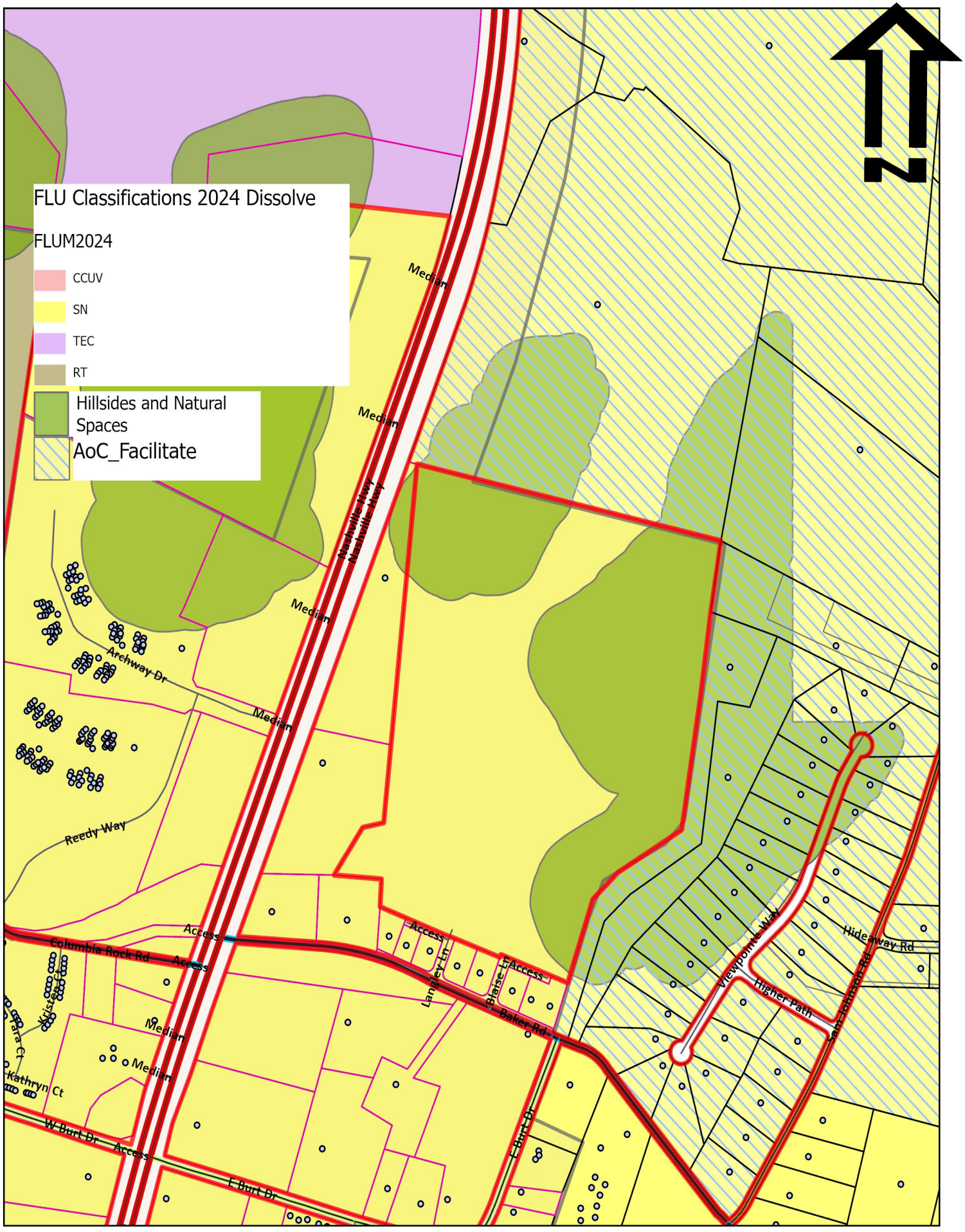
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Case #24-0033
Baker Road
Tax Map 75 Parcel 11.17

City of Columbia
Development Services
700 N. Garden Street
Columbia, TN 38401



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