



The Columbia Planning Commission Development Review Committee will meet on Tuesday, November 7, 2023 at 10:00 AM in Conference Room A, basement level, City Hall, to consider the following:

I. Items For Review

1. 23-0406 - Request from Allison Corolla for Exception to Access Management concerning property at [1400 Hampshire Pike, being Tax Map 88M Group B Parcels 7 and 7.01.](#)

Documents:

1. 23-0406_Affidavit
 2. 23-0406_Application
 3. 23-0406_Building Elevations
 4. 23-0406_Description of Proposed Project
 5. 23-0406_Floor Plans
 6. 23-0406_Site Plan
 7. 23-0406_Traffic Study
2. 23-0422 - Request from T-Square Engineering for final plat approval with surety of Summit at Carter's Station Phase 3 consisting of 44 lots off [Wellwind Drive.](#)

Documents:

1. 23-0422_Final Plat
2. SWMA LTMP
3. 23-0422_Development Agreement
4. 23-0422_Application

3. 23-0423 - Request from M2Group for Site Development Plan and Preliminary Plat approval of MacKenzie Place and consisting of 32 townhome units at [220 Theta Pike, being Tax Map 90B Group B Parcel 47.](#)

Documents:

1. Mackenzie Place Apartments - Site Plan
 2. Preliminary Plat
 3. MacKenzie Place Townhomes - Project Description
 4. MacKenzie Place Apartments - Landscape Plan - LP1.0
 5. MacKenzie Place Apartments - Landscape Plan - LP2.0
 6. Mackenzie Place Townhomes - Architecturals - Elevations
 7. Mackenzie Place Townhomes - Architecturals - Floor Plans
 8. Mackenzie Place Townhomes - Cul-de-sac Justification Letter
 9. Mackenzie Place Townhomes - Sidewalk location variance Letter
 10. Mackenzie Place Townhomes - TIS_Review Memo
 11. Mackenzie Place Townhomes - TIS
 12. Mackenzie Place Townhomes - Power Availability Letter
 13. Mackenzie Place Townhomes - Sewer Availability Letter
 14. Mackenzie Place Townhomes - Water Availability Letter
 15. Mackenzie Place Townhomes - Survey
 16. Mackenzie Place Townhomes - Checklist
 17. Application
4. 23-0413 - Request from Allen O'Leary for Final Plat approval with surety of The Preserve at Drumwright Subdivision consisting of 112 lots off [Williams Ridge Drive.](#)

Documents:

1. Final Plat
 2. Development Agreement
 3. Columbia Letter Preserve at Drumwright
 4. Application
5. 23-0412 - Request from Allen O'Leary for Final Plat approval with surety of Drumwright PUD Phase 3 consisting of 24 lots off [Jacobs Valley Court.](#)

Documents:

1. 23-0412_Final Plat
2. 23-0412_Development Agreement

3. 23-0412_Submittal Letter
4. 23-0412_Application
6. 23-0414 / 23-0415 - 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](#).

Documents:

1. 23-0414_ALTA Survey
2. 23-0414_TIS
3. 23-0414_Building Elevations
4. 23-0414_Columbia Power Will Serve Letter
5. 23-0414_Active Adult HOA Draft
6. 23-0414_Primary Residential HOA Declaration Draft
7. 23-0414_Preliminary Master Civic Space Sheets (L1.1-L1.6)
8. 23-0414_Preliminary Master Dev Plan- first half
9. 23-0414_Sewer Will Serve Letter
10. 23-0414_Water Availability Letter_Oct 13
11. 23-0414_Description of Proposed Project
12. 23-0414_Floor Plans
13. 23-0414_PUD-R Checklist
14. 23-0414_Site Plan
15. 23-0414_Application
16. 23-0415_Preliminary Master Dev Plan-C2.0
17. 23-0415_Comp Plan Compliance Statement
18. 23-0415_Concept Plan
19. 23-0415_Description of Requested Zone
20. 23-0415_Legal Description
21. 23-0415_Property Owner Permission Form
22. 23-0415_REMAINING ANNEXATION AREA P-PUD
23. 23-0415_application (1)
24. 23-0415_Application

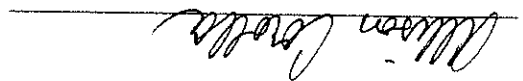
General Affidavit

I, Allison Corolla, personally appeared before the Undersigned Notary Public, and under affirmation make the following statement(s):

Regarding my letter, dated September 28, 2023 to the City of Columbia 1400 Hampshire Pike Access Management Exception Request:

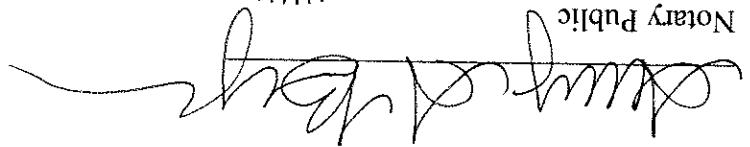
This affidavit is to affirm that the information provided in the Access Management Request is true and correct.

Dated this 3rd day of October, 2023

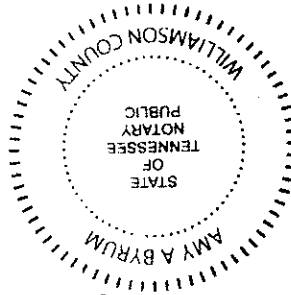


Allison Corolla

Subscribed and Sworn before me, this 3rd day of October, 2023



Notary Public





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	1400 Hampshire Pike		
	TAX MAP: 88	GROUP:	PARCEL: 7.00
SUMMARY OF NATURE OF REQUEST AND WORK	We are requesting an appeal of the City Engineer access determination. This appeal would allow for two entrances to the site, one off of Hampshire Pike and one off of Williamsport Pike.		

DATE OF PRE-APPLICATION CONFERENCE	8/23/23	Pre-application meetings are scheduled for Wednesdays.
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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: This is an appeal of the City Engineer's decision on access management. <i>*File naming nomenclature examples:</i> <i>Freedom Point Site Plan</i> <i>Freedom Point Master Plan</i> <i>Freedom Point Final Plat</i>	<u>Annexations/Rezoning/PUD's:</u> ☐ 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 <u>Plats/PUDs:</u> ☐ Project Name (include Sections & Phases) _____ ☐ Total Number of Lots _____ ☐ Total acreage _____

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

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

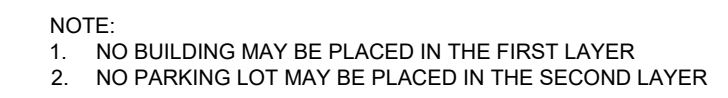
All communications go to the Applicant's email that is provided.

NAME	Allison Corolla	PHONE	615.678.8212
ADDRESS	1329 West Main Street, Franklin, TN	EMAIL	Allison.Corolla@T2 Eng.com
PROPERTY OWNER NAME	Malak Salama	PHONE	615.918.8099
ADDRESS	680 Lawler Lane, Nolensville, TN	EMAIL	malaksalama34@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.

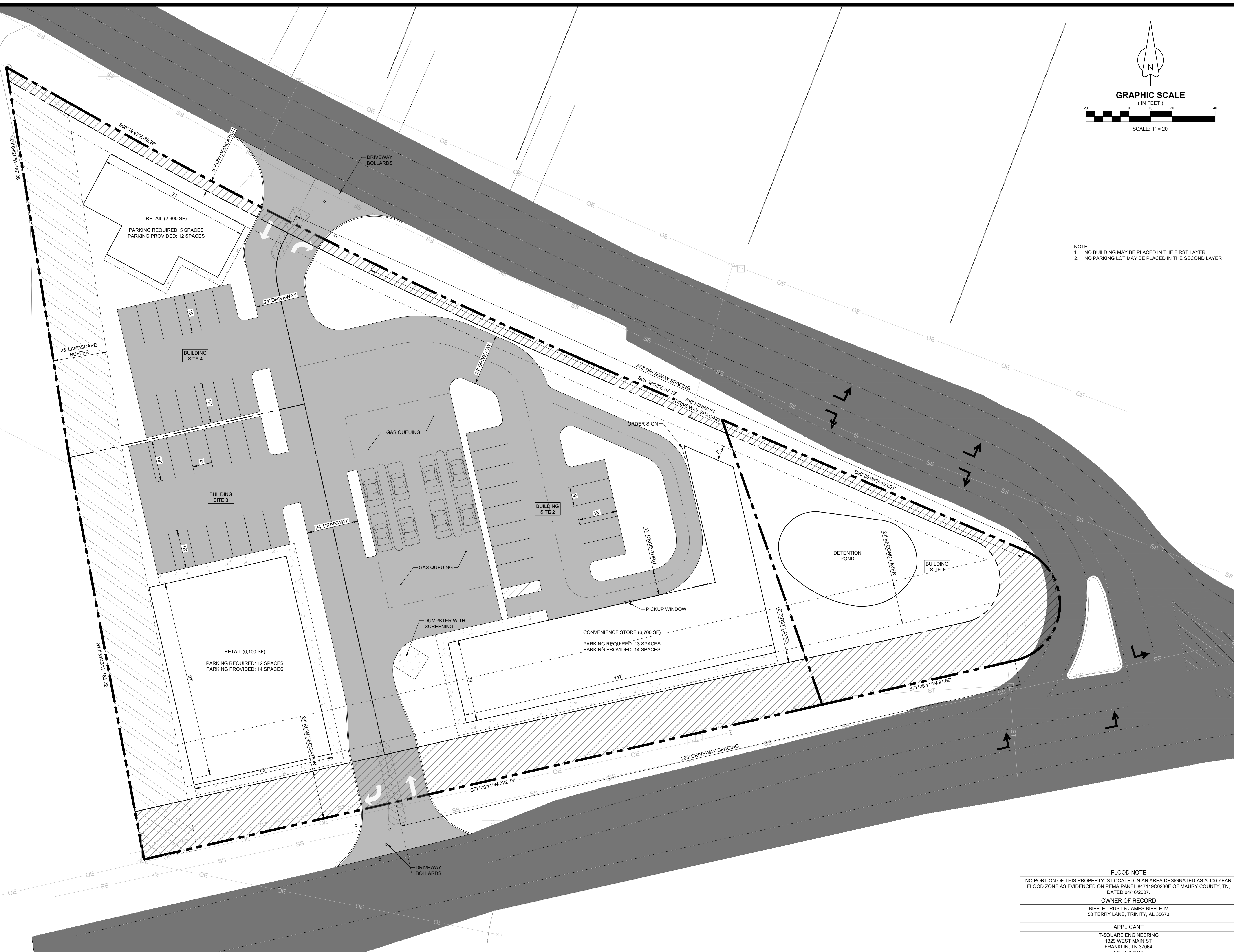
Allison Corolla	Allison B. Corolla	10/4/2023
APPLICANT NAME	APPLICANT SIGNATURE	DATE
Malak salama	MALAK	10/4/2023
PROPERTY OWNER NAME	PROPERTY OWNER SIGNATURE	DATE

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			



NOTE:

1. NO BUILDING MAY BE PLACED IN THE FIRST LAYER
2. NO PARKING LOT MAY BE PLACED IN THE SECOND LAYER



DATE:	NO.	DATE	REVISIONS
7/24/23			
SCALE:			
AS SHOWN			
UNIT:			
SQUARE			
REVIEWER:			
U.S.			

CONCEPT PLAN

MAP 88M, GROUP B, PARCEL 7.00
COLUMBIA, TENNESSEE

1400 HAMPSHIRE PIKE

	SHEET C-2	PROJECT 23-0		CONCEPT PLAN MAP 88M, GROUP B, PARCEL 7.00 COLUMBIA, TENNESSEE
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FLOOD NOTE

NO PORTION OF THIS PROPERTY IS LOCATED IN AN AREA DESIGNATED AS A 100 YEAR FLOOD ZONE AS EVIDENCED ON PEMA PANEL #471 RC00280E OF MAURY COUNTY, TN.

DATED 04/16/2009

OWNER OF RECORD

BIFFLE TRUST & JAMES BIFFLE IV
50 TERRY LANE, TRINITY, AL. 35673

APPLICANT

T-SQUARE ENGINEERING
1329 WEST MAIN ST
FRANKLIN, TN 37064
615-678-8212





WASTEWATER

TRAFFIC

SITE DEVELOPMENT

SURVEYING



T-SQUARE ENGINEERING

CIVIL-SITE | TRAFFIC | WASTEWATER

1329 WEST MAIN STREET
FRANKLIN, TN 37064
615.678.8212

WWW.T2-ENG.COM

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

September 28, 2023

RE: Map 088, Parcel 7.00 & Map 088, Parcel 7.01

To whom it may concern:

We are formally requesting approval for the use of two access locations from existing public ROW onto the property at Map 088, Parcel 7.00 and Map 088, Parcel 7.01. The development of this parcel will ultimately include multiple commercial buildings, located throughout the site, as well as all required utility and stormwater infrastructure.

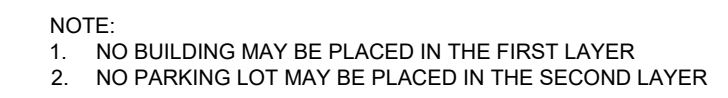
Access 1 is located along Hampshire Pike approximately 295' west of the intersection of Hampshire Pike and Williamsport Pike. This access location is opposite the access to the Tennessee Department of Environment and Conservation across the street. According to TDOT's functional classification map, Hampshire Pike is designated as a Principle Arterial. Because of this designation, the required driveway spacing is 440'. The front of our property along Hampshire Pike is approximately 414'. This access requirement is impossible to meet. In light of this understanding, our design proposes a right-in, right-out access from/to Hampshire Pike. This prevents left-turn movements from the site onto Hampshire Pike and left-turn movements from Hampshire Pike onto the site. In accordance with the attached exhibit, bollards will be provided along the entrance to the site.

Access 2 is located along Williamsport Pike. According to TDOT's functional classification map, it is a Minor Arterial Roadway. Thus, the access spacing required is 330'. The access as proposed is located approximately 372' from Williamsport Pike's intersection with Hampshire Pike.

In reviewing the challenges this site presents, we request an access exception to the regulations as written. Please contact me with any questions or concerns.

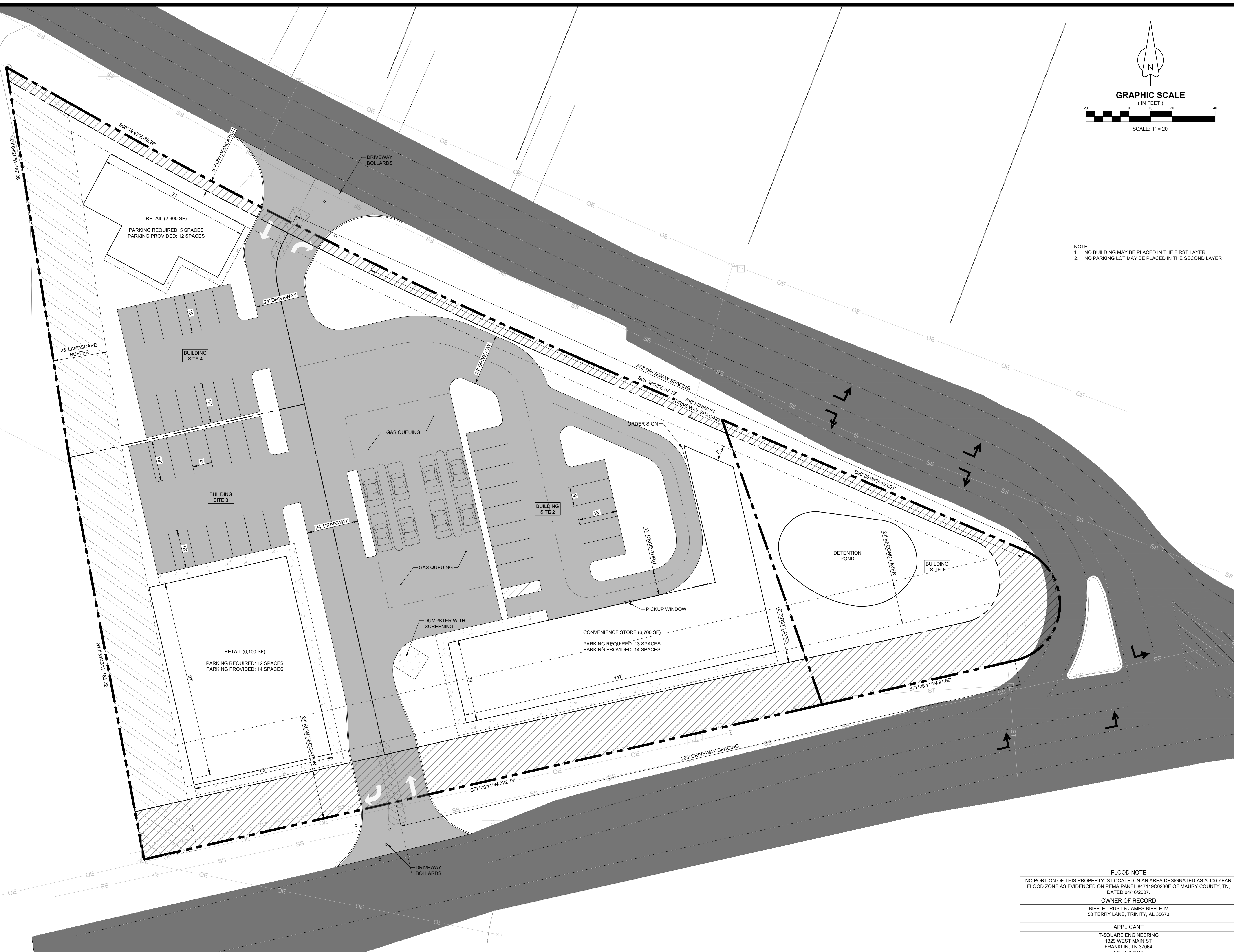
Thank you,

Allison Corolla, EI Engineer Intern
T-Square Engineering, Inc.
OFFICE: 615.678.8212, ext.148
EMAIL: Allison.Corolla@T2-Eng.com



NOTE:

1. NO BUILDING MAY BE PLACED IN THE FIRST LAYER
2. NO PARKING LOT MAY BE PLACED IN THE SECOND LAYER



DATE:	NO.	DATE	REVISIONS
7/7/24/23			
SCALE:			
AS SHOWN			
UNIT:			
SQUARE			
REVIEWER:			
U.S.			

CONCEPT PLAN

MAP 88M, GROUP B, PARCEL 7.00
COLUMBIA, TENNESSEE

1400 HAMPSHIRE PIKE

SHEET	C-2	PROJECT 23-00		CONCEPT PLAN MAP 88M, GROUP B, PARCEL 7.00 COLUMBIA, TENNESSEE
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FLOOD NOTE

NO PORTION OF THIS PROPERTY IS LOCATED IN AN AREA DESIGNATED AS A 100 YEAR FLOOD ZONE AS EVIDENCED ON PEMA PANEL #471 RC00280E OF MAURY COUNTY, TN.

DATED 04/16/2020

OWNER OF RECORD

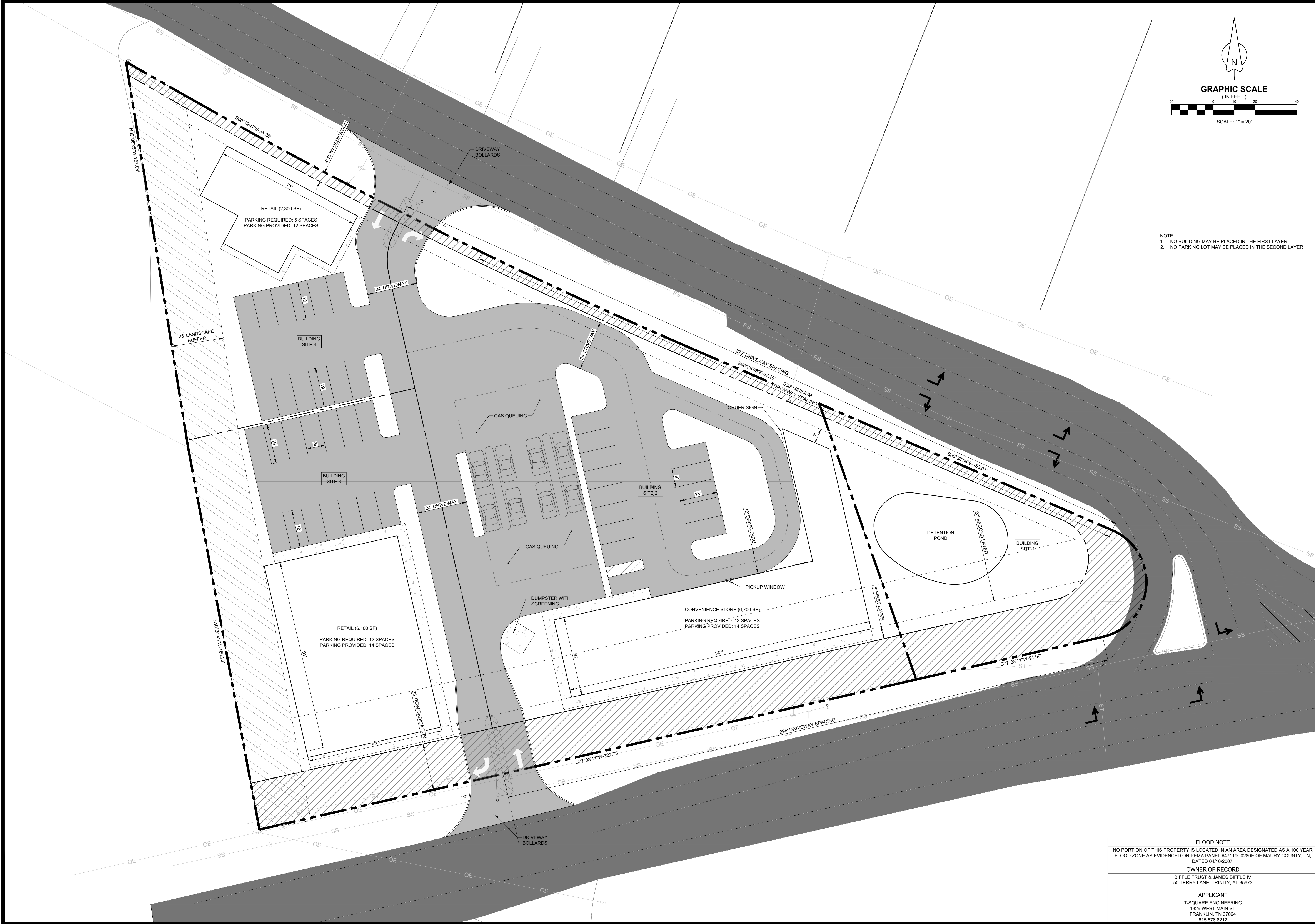
BIFFLE TRUST & JAMES BIFFLE IV
50 TERRY LANE, TRINITY, AL 35673

APPLICANT

T-SQUARE ENGINEERING
1329 WEST MAIN ST
FRANKLIN, TN 37064
615-678-8212



P:\Projects\2023\0333\1400 Hampshire Pike - Roy Dale\Production\23-0333 Concept Plan.dwg, 9/28/2023 8:16:50 AM



FLOOD NOTE	
NO PORTION OF THIS PROPERTY IS LOCATED IN AN AREA DESIGNATED AS A 100 YEAR FLOOD ZONE AS EVIDENCED ON PEMA PANEL #47119C0280E OF MAURY COUNTY, TN, DATED 04/16/2007.	
OWNER OF RECORD	
BIFBLE TRUST & JAMES BIFBLE IV 50 TERRY LANE, TRINITY, AL 35673	
APPLICANT	
T-SQUARE ENGINEERING 1329 WEST MAIN ST FRANKLIN, TN 37064 615.678.8212	



REVISIONS	
NO.	DATE

DATE:	7/24/23
SCALE:	AS SHOWN
DRAWN BY:	T-SQUARE
REVIEWER:	LTS

CONCEPT PLAN
MAP 88M, GROUP B, PARCEL 7.00
COLUMBIA, TENNESSEE

PROJECT
23-0333

SHEET
C-2.0

1400 HAMPSHIRE PIKE

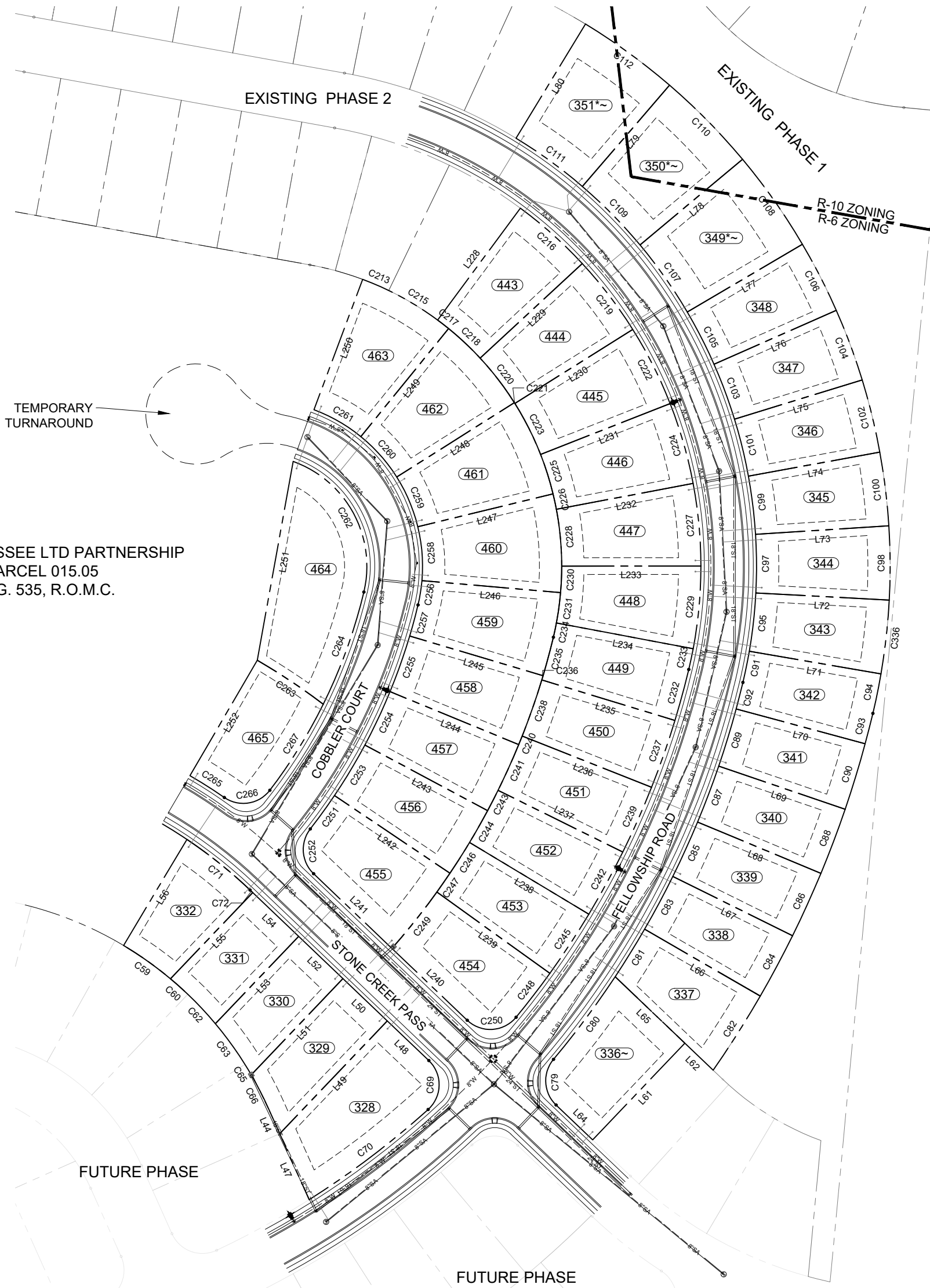


VICINITY MAP - NOT TO SCALE

Parcel Area Table			Parcel Area Table		
PARCEL	SQ. FT.	ACRES	PARCEL	SQ. FT.	ACRES
328	11322.55	0.26	452	7313.16	0.17
329	7098.72	0.16	453	7313.16	0.17
330	6215.93	0.14	454	8954.36	0.21
331	6089.60	0.14	455	9186.24	0.21
332	6958.24	0.16	456	7414.27	0.17
336~	9281.66	0.21	457	7414.27	0.17
337	7748.78	0.18	458	7414.27	0.17
338	6913.65	0.16	459	7963.91	0.18
339	6913.65	0.16	460	8631.68	0.20
340	6913.65	0.16	461	8631.68	0.20
341	6913.65	0.16	462	8631.68	0.20
342	7050.34	0.16	463	8631.68	0.20
343	7165.79	0.16	464	13761.24	0.32
344	7165.79	0.16	465	8265.20	0.19
345	7165.79	0.16			
346	7165.79	0.16			
347	7165.79	0.16			
348	7165.79	0.16			
349~	10037.63	0.23			
350~	10037.63	0.23			
351~	10037.63	0.23			
443	7876.90	0.18			
444	7876.90	0.18			
445	7876.90	0.18			
446	7876.90	0.18			
447	7876.90	0.18			
448	7876.90	0.18			
449	7455.75	0.17			
450	7313.16	0.17			
451	7313.16	0.17			

PULTE HOMES TENNESSEE LTD PARTNERSHIP
MAP 041, PARCEL 015.05
D.B. R2806, PG. 535, R.O.M.C.

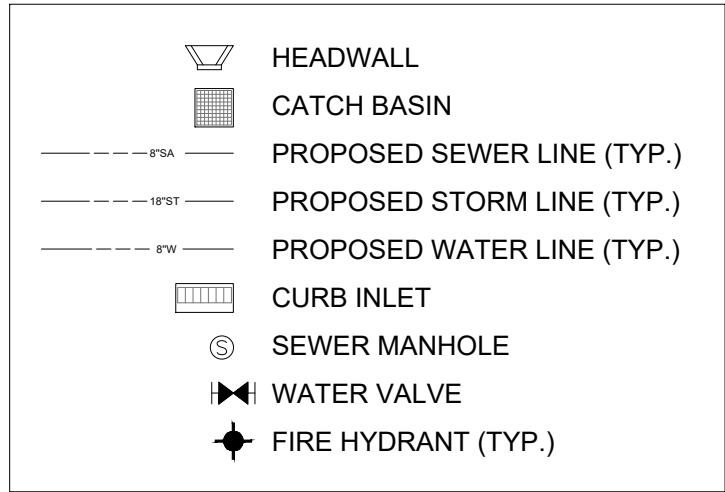
Parcel Line Table			Parcel Line Table		
Line #	Length	Direction	Line #	Length	Direction
L44	24.48	S24° 02' 17.98"E	L80	120.00	S31° 19' 27.78"W
L47	64.90	S24° 02' 17.98"E	L228	125.00	N36° 29' 33.93"E
L48	51.56	N46° 21' 19.74"W	L229	125.00	S47° 11' 26.00"W
L49	139.97	S43° 38' 40.26"W	L230	125.00	N57° 53' 18.06"E
L50	55.00	N46° 21' 19.74"W	L231	125.00	S68° 35' 10.13"W
L51	119.35	N43° 38' 40.26"E	L232	125.00	N79° 17' 02.20"E
L52	55.00	N46° 21' 19.74"W	L233	125.00	S89° 58' 54.27"W
L53	108.34	N43° 38' 40.26"E	L234	125.00	S79° 19' 13.67"E
L54	57.00	N46° 21' 19.74"W	L235	125.00	S73° 06' 17.87"E
L55	107.01	N43° 38' 40.26"E	L236	125.00	N68° 23' 00.93"W
L56	110.96	S30° 50' 05.06"W	L237	125.00	S63° 40' 43.99"E
L61	120.00	S43° 38' 40.26"W	L238	125.00	N56° 56' 27.04"W
L62	121.65	N46° 21' 19.74"W	L239	125.00	N54° 16' 10.10"W
L64	45.41	N46° 21' 19.74"W	L240	93.45	N46° 21' 19.74"W
L65	121.65	N46° 21' 19.74"W	L241	97.25	S46° 21' 19.74"E
L66	120.00	N59° 57' 58.23"W	L242	125.00	N56° 05' 07.67"W
L67	120.00	S63° 41' 46.12"E	L243	125.00	S81° 52' 12.22"E
L68	120.00	N67° 25' 34.01"W	L244	125.00	S67° 39' 16.78"E
L69	120.00	S71° 09' 21.90"E	L245	125.00	S73° 26' 13.34"E
L70	120.00	N74° 53' 09.79"W	L246	125.00	S85° 03' 10.32"E
L71	120.00	N80° 13' 54.56"W	L247	125.00	S76° 19' 42.43"W
L72	120.00	S86° 56' 25.73"E	L248	125.00	S57° 42' 35.18"W
L73	120.00	S88° 21' 03.11"W	L249	125.00	S39° 05' 27.92"W
L74	120.00	N79° 38' 31.90"E	L250	125.00	N20° 28' 20.67"E
L75	120.00	S72° 56' 00.78"W	L251	181.42	N10° 13' 29.49"E
L76	120.00	N65° 13' 29.62"E	L252	120.00	N30° 15' 36.06"E
L77	120.00	S59° 30' 58.45"W			
L78	120.00	N50° 07' 08.23"E			
L79	120.00	S40° 43' 18.00"W			



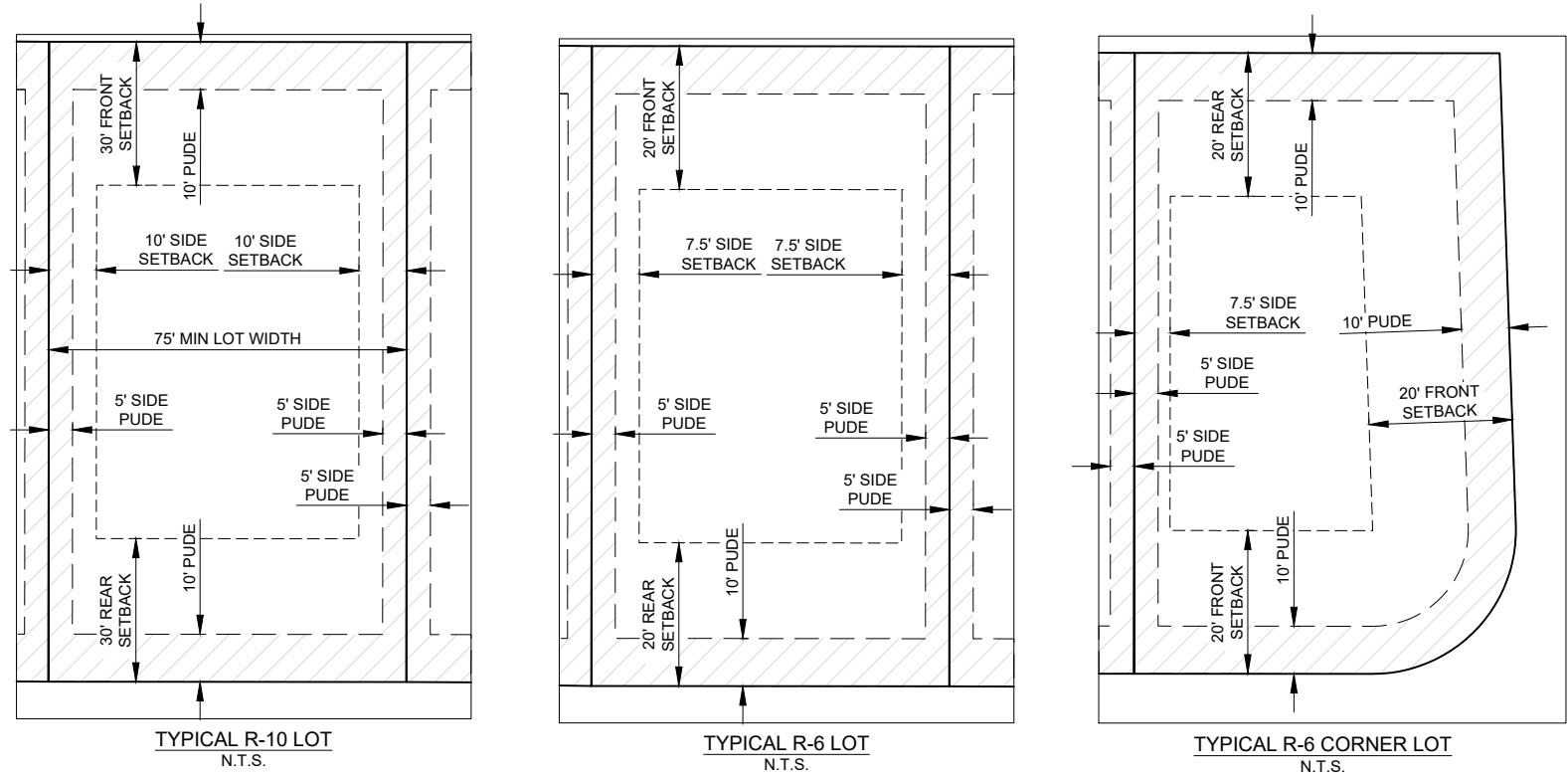
Curve Table				
Curve #	Length	Radius	Delta	Chord Direction
C59	51.71	325.00	9.12	S54° 36' 27"E
C60	20.91	325.00	3.69	S48° 12' 24"E
C62	36.18	325.00	6.38	S43° 10' 28"E
C63	45.28	325.00	7.98	S35° 59' 37"E
C65	10.88	325.00	1.92	S31° 02' 36"E
C66	34.30	325.00	6.05	S27° 03' 41"E
C69	49.34	30.00	94.23	N0° 45' 41"E
C70	134.29	775.00	9.93	N52° 50' 32"E
C71	76.07	426.58	10.22	N51° 02' 54"W
C72	76.07	426.58	10.22	N51° 02' 54"W
C79	45.19	30.00	86.31	N3° 11' 59"W
C80	92.65	825.00	6.43	N36° 44' 20"E
C81	50.22	825.00	3.49	N31° 46' 40"E
C82	78.91	945.00	4.78	S32° 25' 34"W
C83	53.71	825.00	3.73	N28° 10' 08"E
C84	61.52	945.00	3.73	S28° 10' 08"W
C85	53.71	825.00	3.73	S24° 26' 20"W
C86	61.52	945.00	3.73	N24° 26' 20"E
C87	53.71	825.00	3.73	N20° 42' 32"E
C88	61.52	945.00	3.73	S20° 42' 32"W
C89	53.71	825.00	3.73	S16° 58' 44"W
C90	61.52	945.00	3.73	S16° 58' 44"E
C91	28.58	945.00	3.64	N11° 35' 16"E
C92	24.57	825.00	1.71	N14° 15' 38"E
C93	28.15	945.00	1.71	S14° 15' 38"W
C94	36.20	570.00	3.64	S11° 35' 16"W
C95	52.69	450.00	6.71	N6° 24' 50"E
C97	52.69	450.00	6.71	S0° 17' 41"E
C98	66.74	570.00	6.71	N0° 17' 41"W
C99	52.69	450.00	6.71	N7° 00' 12"W
C100	66.74	570.00	6.71	S7° 00' 12"E
C101	52.69	450.00	6.71	S13° 42' 44"E
C102	66.74	570.00	6.71	N13° 42' 44"W
C103	52.69	450.00	6.71	N20° 25' 15"W
C104	66.74	570.00	6.71	S20° 25' 15"E

Curve Table				
Curve #	Length	Radius	Delta	Chord Direction
C105	52.69	450.00	6.71	S27° 07' 46"E
C106	66.74	570.00	6.71	N27° 07' 46"W
C107	73.81	450.00	9.40	N35° 10' 57"W
C108	93.49	570.00	9.40	S35° 10' 57"E
C109	73.81	450.00	9.40	S44° 34' 47"E
C110	93.49	570.00	9.40	N44° 34' 47"W
C111	73.81	450.00	9.40	N53° 58' 37"W
C112	93.49	570.00	9.40	S53° 58' 37"E
C213	25.55	275.00	5.32	N66° 51' 59"W
C215	51.35	275.00	10.70	S58° 51' 22"E
C216	74.68	400.00	10.70	S48° 09' 30"E
C217	12.47	275.00	2.60	N52° 12' 29"W
C218	38.87	275.00	8.10	N46° 51' 33"W
C219	74.68	400.00	10.70	N37° 27' 38"W
C220	50.49	275.00	10.52	S37° 32' 59"E
C221	0.86	275.00	0.18	S32° 12' 03"E
C222	74.68	400.00	10.70	S26° 45' 46"E
C223	51.35	275.00	10.70	N26° 45' 46"W
C224	74.68	400.00	10.70	N16° 03' 54"W
C225	37.16	275.00	7.74	S17° 32' 34"E
C226	14.19	275.00	2.96	S12° 11' 38"E
C227	74.68	400.00	10.70	S5° 22' 02"E
C228	51.35	275.00	10.70	N5° 22' 02"W
C229	74.68	400.00	10.70	N5° 19' 50"E
C230	23.83	275.00	4.97	S2° 27' 52"W
C231	27.51	275.00	5.73	S7° 48' 48"W
C232	47.40	775.00	3.50	N15° 09' 34"E
C233	19.04	400.00	2.73	N12° 02' 37"E
C234	13.09	275.00	2.73	S12° 02' 37"W
C235	35.77	650.00	3.15	S14° 59' 03"W
C236	3.98	650.00	0.35	S16° 44' 10"W
C237	63.64	775.00	4.70	S19° 15' 51"W
C238	53.37	650.00	4.70	N19° 15' 51"E
C239	63.64	775.00	4.70	N23° 58' 08"E
C240	8.27	650.00	0.73	S21° 58' 51"W

Curve Table				
Curve #	Length	Radius	Delta	Chord Direction
C241	45.10	650.00	3.98	S24° 20' 00"W
C242	63.64	775.00	4.70	S28° 40' 24"W
C243	20.52	650.00	1.81	N27° 13' 32"E
C244	32.85	650.00	2.90	N29° 34' 40"E
C245	63.64	775.00	4.70	S33° 22' 41"W
C246	32.77	650.00	2.89	N32° 26' 13"E
C247	20.60	650.00	1.82	N34° 49' 21"E
C248	49.78	775.00	3.68	S37° 34' 14"W
C249	64.78	650.00	5.71	N38° 35' 07"E
C250	49.34	30.00	94.23	S86° 31' 40"W
C251	37.04	525.00	4.04	S35° 56' 09"W
C252	44.15	30.00	84.31	S4° 11' 57"E
C253	53.00	525.00	5.78	N31° 01' 20"E
C254	53.00	525.00	5.78	N25° 14' 15"E
C255	53.00	525.00	5.78	N19° 27' 11"E
C256	22.15	150.00	8.46	N9° 10' 38"E
C257	28.89	525.00	3.15	N14° 59' 03"E
C258	48.74	150.00	18.62	N4° 21' 44"W
C259	48.74	150.00	18.62	N22° 58' 51"W
C260	48.74	150.00	18.62	N41° 58' 58"W
C261	48.74	150.00	18.62	N80° 13' 06"W
C262	146.03	100.00	83.67	S28° 25' 38"E
C263	71.28	595.00	6.86	S56° 16' 29"E
C264	107.36	475.00	12.95	S19° 52' 57"W
C265	36.54	475.00	4.41	N57° 32' 10"W
C266	45.72	400.00	87.32	S81° 00' 26"W
C267	91.10	475.00	10.99	S31° 51' 07"W
C336	66.74	570.00	6.71	S6° 24' 50"W



SITE DATA	
CURRENT ZONING:	R-10 & R6
MINIMUM BUILDING SETBACKS:	R-10: 30' R6: 20'
FRONT:	30'
REAR:	30'
SIDE:	10'
TOTAL PHASE AREA:	
NEW ROW:	
7.01 ACRES	
1.41 ACRES	



* DENOTES R-10 LOT
DENOTES A CRITICAL LOT
THAT WILL REQUIRE A LOT
GRADING PLAN

GENERAL NOTES

1. THE PURPOSE OF THIS PLAT IS TO CREATE 44 LOTS AND DEDICATE RIGHT-OF-WAY.
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 35.00 AS SHOWN ON MAURY COUNTY TAX MAP 42.
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.

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.

DATE _____, 20____
DIRECTOR OF COLUMBIA WASTEWATER DEPARTMENT

CERTIFICATE OF APPROVAL OF STREETS, DRAINAGE AND UTILITIES

I HEREBY CERTIFY THAT THE STREETS, DRAINAGE AND UTILITIES DESIGNATED IN SUMMIT AT CARTER'S STATION, PHASE 3 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.

DATE _____, 20____
CITY ENGINEER

CERTIFICATE OF APPROVAL FOR RECORDING

DOCUMENT PREPARED BY:

Name: Allison Corolla

Company T-Square Engineering

Address:

1329 West Main Street

Franklin, TN

After recording return copy to City of Columbia, Development Services

**INSPECTION AND MAINTENANCE AGREEMENT OF
PRIVATE STORMWATER MANAGEMENT FACILITIES**

Map & Parcel Number: Map 42, Parcel 35.00

Project Name: Summit at Carter's Station, Phase 3

Recorded by deed in the Register of Deeds Office of Maury County in Deed Book R2828, Page(s) 296.

THIS AGREEMENT, made this 12 day of October, 2023, by and between Tamarack Land-Carter's Station LLC 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 OWNER(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

Jeff Leone

Owner

Tamarack Land - Carters Station, LLC

Title

Authorized Representative

Address

715 Vista Blvd Ste 303

Signature

[Signature]

City, State ZIP

Wesley, MN 55387

STATE OF NEW JERSEY

COUNTY OF ESSEX

Before me, Yoandri Alvarado

of the state and county mentioned, personally appeared

Jeff Leone

, with whom I am personally acquainted and who acknowledged that he/she executed the foregoing instrument of the purposes therein contained.

Witness my hand this the 12 day of October, 2023.

[Signature]
Notary Public

YOANDRI ALVARADO
Commission # 50209012
Notary Public, State of New Jersey
My Commission Expires
April 12, 2028

My Commission Expires: April 12, 2028

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: _____



10/12/2023

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

POST CONSTRUCTION LONG TERM MAINTENANCE PLAN
PROJECT NAME: THE SUMMIT AT CARTER'S STATION, PHASE 3

SYSTEM DESCRIPTION:

The site consists of stormwater conveyances through piped channel and detention ponds. This phase consists of:

- 2,060 LF of round concrete pipe and 29 storms 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. 2,060 LF OF RCP AND 27 STORM DRAINS
 - These structures will be inspected and cleaned quarterly to ensure pipes and drain inlets do not fill with sediment or trash.

CONSTRUCTION PLANS
FOR
SUMMIT AT CARTER'S STATION
PHASE 1
3040 CLEBURNE ROAD
COLUMBIA, TN 37174
CITY OF COLUMBIA, WARD #5

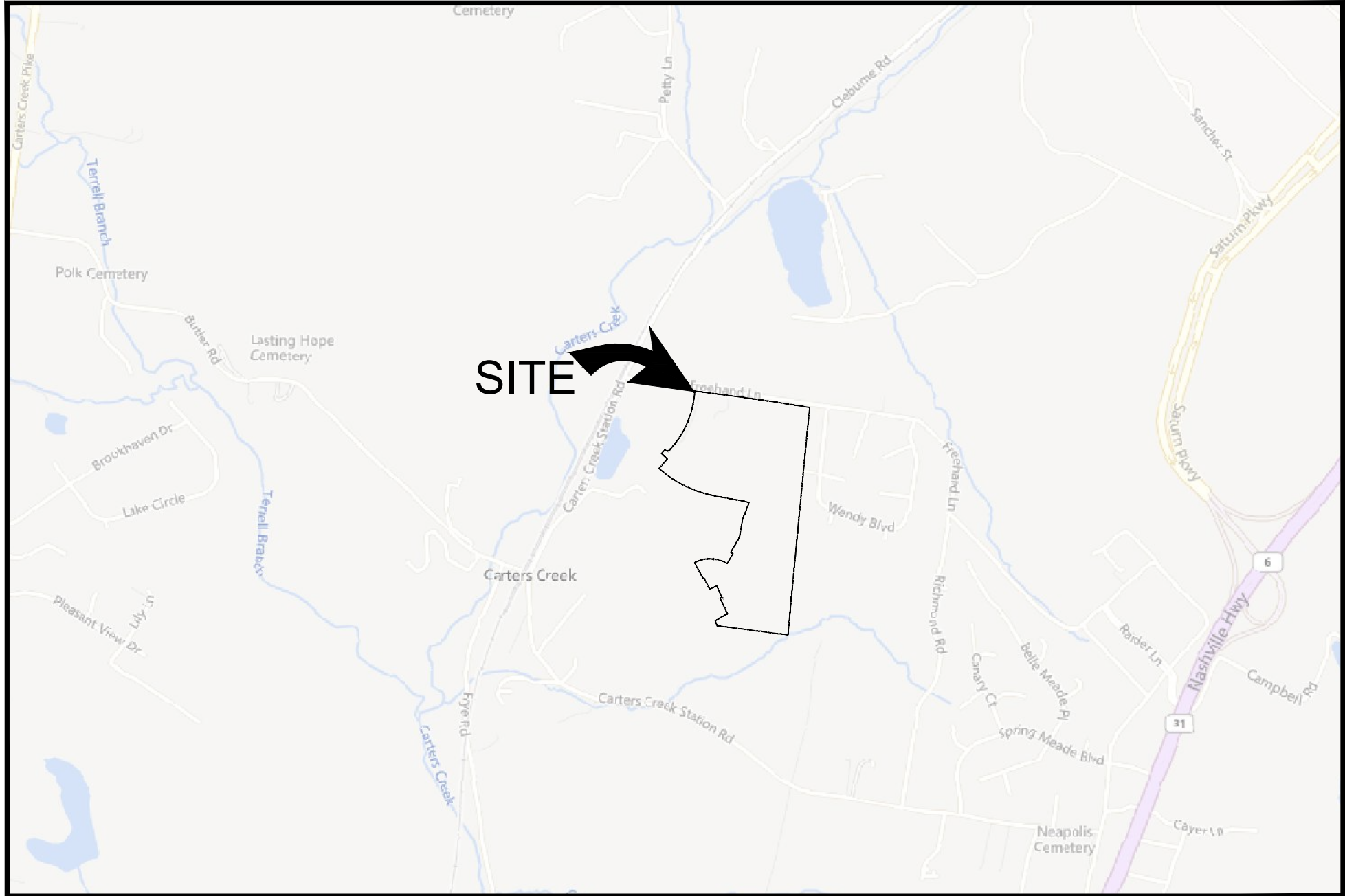
DEVELOPER: RICHMOND AMERICAN HOMES
12220 SUNRISE VALLEY DRIVE SUITE 400
RESTON, VA 20191
703-390-0900

ENGINEER: T-SQUARE ENGINEERING
1329 WEST MAIN STREET
FRANKLIN, TN 37064
615-678-8212

SURVEYOR: T-SQUARE ENGINEERING
1329 WEST MAIN STREET
FRANKLIN, TN 37064
615-678-8212

WATER UTILITY: CPWS Shane Andrews
CPWS
201 Pickens Lane
PO Box 379
Columbia, TN 38402
931-388-4833

POWER UTILITY: CPWS Doug Burgess
CPWS
201 Pickens Lane
PO Box 379
Columbia, TN 38402
931-388-4833



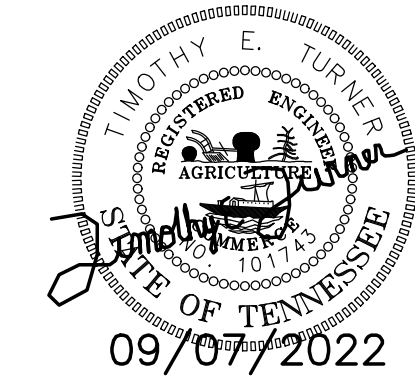
SITE VICINITY MAP
N.T.S.

Sheet Schedule	
C-0.0	Cover Sheet
C-1.0	Preliminary Plat
C-1.1	Existing Conditions
C-2.0	Site Plan
C-2.1	Parcel Site Plan
C-2.2	Parcel Data Tables
C-3.0	Initial Erosion Control
C-3.1	Temporary Erosion Control
C-3.2	Final Erosion Control
C-4.0	Predevelopment Stormwater Plan
C-4.1	Postdevelopment Stormwater Plan
C-5.0	Grading Plan
C-5.1	Drainage Plan
C-5.2	Drainage Plan Tables
C-5.3	Inlet Area Plan
C-6.0	Roadway Plan and Profile Wellwind Road
C-6.1	Roadway Plan and Profile Sellerback Way
C-6.2	Roadway Plan and Profile Youngfellow Drive
C-6.3	Fellowship Road
C-6.4	Fellowship Road & Haplander Court
C-6.5	Cobler Court & Candler Road
C-6.6	Pippin Street
C-7.0	Utility Plan
C-7.1	Sanitary Plan and Profile
C-7.2	Sanitary Plan and Profile
C-7.3	Sanitary Plan and Profile
C-7.4	Sanitary Plan and Profile
C-7.5	Sanitary Plan and Profile
C-7.6	Sanitary Plan and Profile
C-8.0	Detail Sheet
C-8.1	Detail Sheet
C-8.2	Detail Sheet
C-8.3	Detail Sheet
C-8.4	Detail Sheet
C-8.5	Detail Sheet
C-8.6	Detail Sheet
C-8.7	Detail Sheet

FLOOD NOTE A PORTION OF THIS PROPERTY LIES WITHIN AN AREA DESIGNATED AS AE, AS EVIDENCED ON FEMA PANEL #4711900180E OF MAURY COUNTY, TN, DATED 04/16/2007.	
OWNER OF RECORD	
FP TCI CCS LLC MAP 41, P/O PARCEL 15.00	
APPLICANT	
T-SQUARE ENGINEERING 1329 WEST MAIN ST FRANKLIN, TN 37064 615-678-8212	

COVER SHEET

MAP 41, P/O PARCEL 15.00
COLUMBIA, TENNESSEE 37174



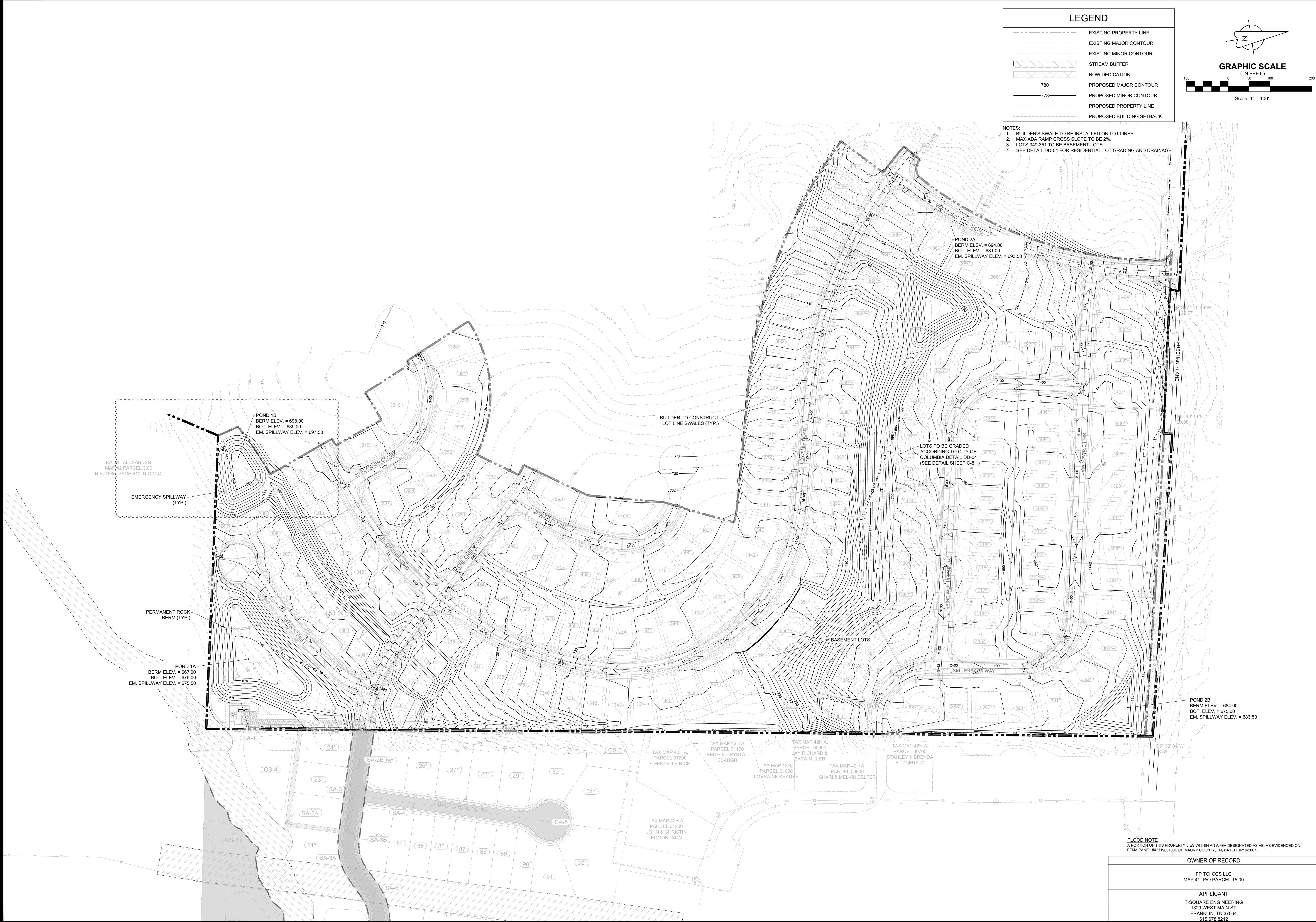
PROJECT
21-0515

SHEET
C-0.0

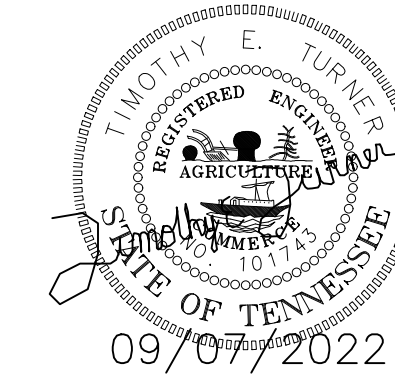


SUMMIT AT CARTER'S STATION

NO.		DATE	REVISIONS
1	10/13/21	03/02/22	SANITARY SEWER MAIN REVISION
2	SCALE: AS SHOWN	03/16/22	REVISIONS PER TDEC COMMENTS
3	DRAWN BY: T-SQUARE	04/14/22	REVISIONS PER CITY COMMENTS
4	REVIEWER: TET	08/03/22	REVISIONS PER TDEC COMMENTS
5		09/07/22	REVISIONS PER PULTE COMMENTS



GRADING PLAN
MAP 41, P/O PARCEL 15.00
COLUMBIA, TENNESSEE 37174



PROJECT
21-0515

SHEET
C-5.0

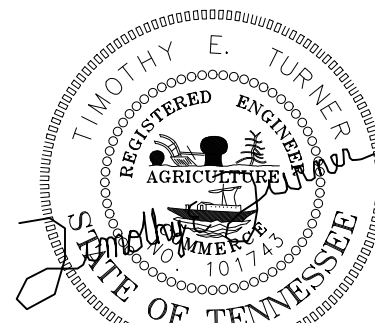
DATE:		NO.		DATE		REVISIONS	
10/13/21		1		03/02/22		SANITARY SEWER MAIN REVISION	
SCALE:		2		03/16/22		REVISIONS PER TDEC COMMENTS	
AS SHOWN		3		04/14/22		REVISIONS PER CITY COMMENTS	
DRAWN BY:		4		08/03/22		REVISIONS PER TDEC COMMENTS	
T-SQUARE		5		09/07/22		REVISIONS PER PULTE COMMENTS	
TET							

SUMMIT AT CARTER'S STATION



DATE:	NO.	DATE	REVISIONS
10/13/21	1	03/02/22	SANITARY SEWER MAIN REVISION
SCALE:	2	03/16/22	REVISIONS PER DEC COMMENTS
AS SHOWN	3	04/06/22	REVISIONS PER DEC COMMENTS
DRAWN BY:	4	08/03/22	REVISIONS PER DEC COMMENTS
T-SQUARE	5	09/07/22	REVISIONS PER PULTE COMMENTS
REVIEWER:			
TET			

SUMMIT AT CARTER'S STATION



PROJECT
21-0515

STRUCTURE TABLE				
STRUCTURE NAME	DETAILS	PIPES IN	PIPES OUT	STRUCTURE
HW-1A	RIM = 669.10 TOP = 666.87	INV. IN = 666.39		HEADWALL
HW-2A	RIM = 681.12 TOP = ???	INV. IN = 678.41		HEADWALL
HW-2C	RIM = 675.77 TOP = 674.33	INV. IN = 673.06		HEADWALL
RISER-1A	RIM = 675.00 TOP = 668.00		INV. OUT =667.00	RISER
RISER-2A	RIM = 692.00 TOP = 682.00		INV. OUT =681.00	RISER
RISER-2C	RIM = 682.00 TOP = 676.00		INV. OUT =675.00	RISER

STRUCTURE TABLE				
STRUCTURE NAME	DETAILS	PIPES IN	PIPES OUT	STRUCTURE
HW-B1	RIM = 678.48 TOP = 674.73	INV. IN = 674.18		HEADWALL
HW-B2	RIM = 671.95 TOP = 670.00	INV. IN = 669.25		HEADWALL
RISER-1B	RIM = 690.71 TOP = 690.00		INV. OUT =689.00	RISER
ST-B1	RIM = 730.92 TOP = 730.92	INV. IN = 726.65	INV. OUT =726.65	SINGLE INLET
ST-B1A	RIM = 730.92 TOP = 730.92	INV. IN = 723.18	INV. OUT =726.90	SINGLE INLET
ST-B2	RIM = 727.43 TOP = 727.43	INV. IN = 723.18	INV. OUT =723.18	SINGLE INLET
ST-B2A	RIM = 727.43 TOP = 727.43		INV. OUT =723.43	SINGLE INLET
ST-B3	RIM = 724.82 TOP = 724.82	INV. IN = 720.82	INV. OUT =720.82	SINGLE INLET
ST-B3A	RIM = 724.81 TOP = 724.81	INV. IN = 720.57	INV. OUT =720.57	SINGLE INLET
ST-B4	RIM = 723.98 TOP = 723.98	INV. IN = 719.73	INV. OUT =719.73	SINGLE INLET
ST-B4A	RIM = 723.98 TOP = 723.98		INV. OUT =719.98	SINGLE INLET
ST-B4B	RIM = 721.88 TOP = 717.38	INV. IN = 717.38	INV. OUT =717.38	SINGLE INLET
ST-B4C	RIM = 722.00 TOP = 722.00		INV. OUT =718.00	AREA DRAIN
ST-B5	RIM = 717.88 TOP = 717.88	INV. IN = 713.38	INV. OUT =713.38	SINGLE INLET
ST-B5A	RIM = 717.88 TOP = 717.88		INV. OUT =713.88	SINGLE INLET
ST-B6	RIM = 710.18 TOP = 710.18	INV. IN = 705.68	INV. OUT =705.68	SINGLE INLET
ST-B6A	RIM = 710.18 TOP = 710.18	INV. IN = 705.68	INV. OUT =706.18	SINGLE INLET
ST-B7	RIM = 698.78 TOP = 698.78	INV. IN = 694.28	INV. OUT =694.28	SINGLE INLET
ST-B7A	RIM = 698.78 TOP = 698.78		INV. OUT =694.78	SINGLE INLET
ST-B8	RIM = 687.62 TOP = 687.62	INV. IN = 678.49	INV. OUT =678.49	SINGLE INLET
ST-B9	RIM = 684.10 TOP = 684.10	INV. IN = 679.10	INV. OUT =679.10	SINGLE INLET
ST-B9A	RIM = 683.49 TOP = 683.49		INV. OUT =679.99	SINGLE INLET
ST-B9B	RIM = 704.00 TOP = 704.00		INV. OUT =700.00	AREA DRAIN
ST-B10	RIM = 687.69 TOP = 687.69	INV. IN = 677.70	INV. OUT =677.70	SINGLE INLET
ST-B10A	RIM = 687.70 TOP = 687.70	INV. IN = 677.95	INV. OUT =677.95	SINGLE INLET
ST-B11	RIM = 685.71 TOP = 685.71	INV. IN = 676.68	INV. OUT =676.68	SINGLE INLET
ST-B11A	RIM = 685.71 TOP = 685.71		INV. OUT =682.26	SINGLE INLET
ST-B11B	RIM = 686.35 TOP = 686.35	INV. IN = 676.31	INV. OUT =676.31	SINGLE INLET
ST-B12	RIM = 686.49 TOP = 686.49	INV. IN = 674.92	INV. OUT =674.92	SINGLE INLET
ST-B12A	RIM = 686.49 TOP = 686.49	INV. IN = 674.67	INV. OUT =674.67	SINGLE INLET
ST-B13	RIM = 736.85 TOP = 736.85	INV. IN = 732.60	INV. OUT =732.60	SINGLE INLET
ST-B13A	RIM = 736.85 TOP = 736.85		INV. OUT =732.85	SINGLE INLET
ST-B14	RIM = 735.24 TOP = 735.24	INV. IN = 730.96	INV. OUT =730.96	SINGLE INLET
ST-B14A	RIM = 735.24 TOP = 735.24		INV. OUT =731.24	SINGLE INLET
ST-B15	RIM = 733.28 TOP = 733.28	INV. IN = 729.03	INV. OUT =729.03	SINGLE INLET
ST-B15A	RIM = 733.28 TOP = 733.28		INV. OUT =729.28	SINGLE INLET
ST-B16	RIM = 722.71 TOP = 722.71	INV. IN = 718.46	INV. OUT =718.46	SINGLE INLET
ST-B16A	RIM = 722.71 TOP = 722.71		INV. OUT =718.71	SINGLE INLET
ST-B17	RIM = 714.47 TOP = 714.47	INV. IN = 710.22	INV. OUT =710.22	SINGLE INLET
ST-B17A	RIM = 714.47 TOP = 714.47		INV. OUT =710.47	SINGLE INLET
ST-B18	RIM = 682.00 TOP = 682.00	INV. IN = 675.17	INV. OUT =675.17	SINGLE INLET

STRUCTURE TABLE				
STRUCTURE NAME	DETAILS	PIPES IN	PIPES OUT	STRUCTURE
ST-B18A	RIM = 680.89 TOP = 688.87	INV. IN = 688.89	OUT =679.42	SINGLE INLET
ST-C1	RIM = 733.69 TOP = 733.69	INV. IN = 729.44	INV. OUT =729.44	SINGLE INLET
ST-C1A	RIM = 733.69 TOP = 733.69		INV. OUT =729.69	SINGLE INLET
ST-C2	RIM = 727.10 TOP = 727.10	INV. IN = 723.10	INV. OUT =723.10	SINGLE INLET
ST-C3	RIM = 721.90 TOP = 721.90	INV. IN = 717.65	INV. OUT =717.65	SINGLE INLET
ST-C3A	RIM = 721.90 TOP = 721.90		INV. OUT =717.90	SINGLE INLET
ST-C4	RIM = 716.91 TOP = 716.91	INV. IN = 712.91	INV. OUT =712.91	SINGLE INLET
ST-C5	RIM = 711.28 TOP = 711.28	INV. IN = 707.03	INV. OUT =707.03	SINGLE INLET
ST-C5A	RIM = 711.28 TOP = 711.28		INV. OUT =707.28	SINGLE INLET
ST-C6	RIM = 700.85 TOP = 700.85	INV. IN = 691.14	INV. OUT =691.14	SINGLE INLET
ST-C6A	RIM = 696.00 TOP = 696.00		INV. OUT =692.50	AREA DRAIN
ST-C7	RIM = 693.96 TOP = 693.96	INV. IN = 689.96	INV. OUT =689.96	SINGLE INLET
ST-C7A	RIM = 693.96 TOP = 693.96	INV. IN = 689.71	INV. OUT =689.71	SINGLE INLET

STRUCTURE TABLE				
STRUCTURE NAME	DETAILS	PIPES IN	PIPES OUT	STRUCTURE
HW-D1	RIM = 681.45 TOP = 680.00	INV. IN = 676.20		HEADWALL
ST-D1	RIM = 696.28 TOP = 696.28	INV. IN = 692.03	INV. OUT =692.03	SINGLE INLET
ST-D1A	RIM = 696.28 TOP = 696.28		INV. OUT =692.28	SINGLE INLET
ST-D1B	RIM = 707.88 TOP = 707.88		INV. OUT =703.00	AREA DRAIN
ST-D2	RIM = 683.67 TOP = 683.67	INV. IN = 689.67	INV. OUT =689.67	SINGLE INLET
ST-D2A	RIM = 701.67 TOP = 701.67		INV. OUT =697.67	AREA DRAIN
ST-D3	RIM = 693.15 TOP = 693.15	INV. IN = 688.65	INV. OUT =688.65	SINGLE INLET
ST-D3A	RIM = 693.76 TOP = 693.76	INV. IN = 688.38	INV. OUT =688.38	SINGLE INLET
ST-D4	RIM = 689.15 TOP = 689.15	INV. IN = 684.54	INV. OUT =684.54	SINGLE INLET
ST-D5	RIM = 684.64 TOP = 684.64	INV. IN = 679.78	INV. OUT =679.78	SINGLE INLET
ST-D5A	RIM = 684.64 TOP = 684.64		INV. OUT =680.28	SINGLE INLET

STRUCTURE TABLE				
STRUCTURE NAME	DETAILS	PIPES IN	PIPES OUT	STRUCTURE
HW-E1	RIM = 653.77 TOP = ???	INV. IN = 650.52		HEADWALL
HW-E2	RIM = 676.10 TOP = 674.48	INV. IN = 673.39		HEADWALL
HW-E3	RIM = 675.62 TOP = ???	INV. IN = 672.91		HEADWALL
HW-E4	RIM = 655.45 TOP = 654.00		INV. OUT =652.74	HEADWALL
HW-E5	RIM = 675.71 TOP = 672.75	INV. IN = 671.92		HEADWALL
ST-E1	RIM = 694.11 TOP = 694.11		INV. OUT =690.11	SINGLE INLET
ST-E1A	RIM = 692.82 TOP = 692.82	INV. IN = 688.82	INV. OUT =688.82	SINGLE INLET
ST-E2A	RIM = 692.82 TOP = 692.82	INV. IN = 688.57	INV. OUT =688.57	SINGLE INLET
ST-E2B	RIM = 692.26 TOP = 692.26	INV. IN = 688.09	INV. OUT =688.09	SINGLE INLET
ST-E2C	RIM = 691.12 TOP = 691.12	INV. IN = 687.04	INV. OUT =687.04	SINGLE INLET
ST-E3	RIM = 689.67 TOP = 689.67	INV. IN = 685.23	INV. OUT =685.23	AREA DRAIN
ST-E4	RIM = 685.67 TOP = 685.67	INV. IN = 681.94	INV. OUT =681.94	AREA DRAIN
ST-E5	RIM = 684.70 TOP = 684.70	INV. IN = 679.20	INV. OUT =679.20	AREA DRAIN
ST-E6	RIM = 679.87 TOP = 679.87	INV. IN = 675.37	INV. OUT =675.37	SINGLE INLET
ST-E6A	RIM = 679.87 TOP = 679.87	INV. IN = 675.87	INV. OUT =675.87	SINGLE INLET
ST-E7	RIM = 678.75 TOP = 678.75	INV. IN = 674.25	INV. OUT =674.25	SINGLE INLET
ST-E7A	RIM = 678.75 TOP = 678.75		INV. OUT =674.75	SINGLE INLET
ST-E8	RIM = 675.91 TOP = 675.91	INV. IN = 671.91	INV. OUT =671.91	SINGLE INLET
ST-E9	RIM = 669.62 TOP = 669.62	INV. IN = 665.82	INV. OUT =665.82	SINGLE INLET
ST-E10	RIM = 667.61 TOP = 667.61	INV. IN = 663.61	INV. OUT =663.61	SINGLE INLET
ST-E10A	RIM = 667.61 TOP = 667.61	INV. IN = 663.36	INV. OUT =663.36	SINGLE INLET
ST-E11	RIM = 664.57 TOP = 664.57	INV. IN = 660.32	INV. OUT =660.32	SINGLE INLET
ST-E11A	RIM = 664.57 TOP = 664.57	INV. IN = 660.57	INV. OUT =660.57	SINGLE INLET
ST-E12	RIM = 656.61 TOP = 656.61	INV. IN = 652.11	INV. OUT =652.11	SINGLE INLET
ST-E12A	RIM = 656.62 TOP = 656.62	INV. IN = 652.62	INV. OUT =652.62	SINGLE INLET
ST-E13	RIM = 680.87 TOP = 680.87	INV. IN = 673.82	INV. OUT =673.82	SINGLE INLET

STRUCTURE TABLE				
STRUCTURE NAME	DETAILS	PIPES IN	PIPES OUT	STRUCTURE
ST-E13A	RIM = 680.87 TOP = 680.87	INV. IN = 673.57	INV. OUT =673.57	SINGLE INLET
ST-E14	RIM = 670.59 TOP = 670.59	INV. IN = 666.59	INV. OUT =666.59	SINGLE INLET
ST-E15	RIM = 680.21 TOP = 680.21	INV. IN = 675.96	INV. OUT =675.96	SINGLE INLET
ST-E15A	RIM = 680.21 TOP = 680.21		INV. OUT =676.21	SINGLE INLET
ST-E16	RIM = 681.44 TOP = 681.44		INV. OUT =677.44	SINGLE INLET
ST-E17	RIM = 680.34 TOP = 680.34	INV. IN = 676.09	INV. OUT =676.09	SINGLE INLET
ST-E17A	RIM = 680.34 TOP = 680.34		INV. OUT =676.34	SINGLE INLET
ST-E18	RIM = 680.15 TOP = 680.15	INV. IN = 675.11	INV. OUT =675.11	DOUBLE INLET
ST-E18A	RIM = 679.54 TOP = 679.54	INV. IN = 674.86	INV. OUT =674.86	SINGLE INLET
ST-E18B	RIM = 680.54 TOP = 680.54		INV. OUT =676.19	SINGLE INLET
ST-E19	RIM = 682.14 TOP = 682.14		INV. OUT =678.14	SINGLE INLET
ST-E20	RIM = 681.32 TOP = 681.32	INV. IN = 676.18	INV. OUT =676.18	SINGLE INLET
ST-E20A	RIM = 680.14 TOP = 680.14	INV. IN = 676.53	INV. OUT =676.53	SINGLE INLET
ST-E20B	RIM = 682.00 TOP = 682.00		INV. OUT =678.00	AREA DRAIN
ST-E21	RIM = 679.35 TOP = 679.35	INV. IN = 675.35	INV. OUT =675.35	SINGLE INLET
ST-E21A	RIM = 679.35 TOP = 679.35	INV. IN = 675.10	INV. OUT =675.10	SINGLE INLET
ST-E22	RIM = 677.48 TOP = 677.48	INV. IN = 673.23	INV. OUT =673.23	SINGLE INLET
ST-E22A	RIM = 677.48 TOP = 677.48		INV. OUT =673.48	SINGLE INLET
ST-E23	RIM = 694.16 TOP = 694.16	INV. IN = 689.91	INV. OUT =689.91	SINGLE INLET
ST-E23A	RIM = 694.16 TOP = 694.16		INV. OUT =690.16	SINGLE INLET
ST-E24	RIM = 680.09 TOP = 680.09	INV. IN = 686.09	INV. OUT =686.09	SINGLE INLET
ST-E25	RIM = 687.61 TOP = 687.61	INV. IN = 683.36	INV. OUT =683.36	SINGLE INLET
ST-E25A	RIM = 687.61 TOP = 687.61	INV. IN = 680.57	INV. OUT =680.57	SINGLE INLET
ST-E26	RIM = 683.63 TOP = 683.63	INV. IN = 679.63	INV. OUT =679.63	SINGLE INLET
ST-E27	RIM = 680.57 TOP = 680.57	INV. IN = 676.57	INV. OUT =676.57	SINGLE INLET

PIPE TABLE			
NAME	SIZE	LENGTH	SLOPE
RISER-1A TO HW-1A	18" Reinforced Concrete Pipe	56.80	1.00%
RISER-2A TO HW-2A	18" Reinforced Concrete Pipe	258.10	1.00%
RISER-2C TO HW-2C	18" Reinforced Concrete Pipe	189.97	1.00%

PIPE TABLE			
NAME	SIZE	LENGTH	SLOPE
ST-A1 TO ST-A2B	18" Reinforced Concrete Pipe	76.87	1.00%
ST-A1A TO ST-A1	18" Reinforced Concrete Pipe	24.17	1.00%
ST-A2 TO ST-A3	18" Reinforced Concrete Pipe	99.35	1.68%
ST-A2A TO ST-A2	18" Reinforced Concrete Pipe	24.20	1.38%
ST-A2B TO ST-A2	18" Reinforced Concrete Pipe	80.91	1.00%
ST-A3 TO ST-A4	18" Reinforced Concrete Pipe	96.12	2.95%
ST-A4 TO ST-A5	18" Reinforced Concrete Pipe	53.55	1.00%
ST-A4A TO ST-A4	18" Reinforced Concrete Pipe	24.17	1.00%
ST-A5 TO ST-A5A	18" Reinforced Concrete Pipe	24.17	1.00%
ST-A5A TO ST-A5B	18" Reinforced Concrete Pipe	131.76	9.08%
ST-A5B TO ST-A5C	24" Reinforced Concrete Pipe	119.07	1.00%
ST-A5C TO HW-A1	24" Reinforced Concrete Pipe	57.78	1.90%
ST-A5D TO ST-A5B	24" Reinforced Concrete Pipe	183.04	1.00%
ST-A6 TO ST-A4A	18" Reinforced Concrete Pipe	44.19	1.00%
ST-A7 TO ST-A8	18" Reinforced Concrete Pipe	150.04	2.14%
ST-A7A TO ST-A7	18" Reinforced Concrete Pipe	24.23	1.00%
ST-A8 TO ST-A5	18" Reinforced Concrete Pipe	94.63	1.46%

PIPE TABLE			
NAME	SIZE	LENGTH	SLOPE
RISER-1B TO ST-B18	18" Reinforced Concrete Pipe	170.11	8.08%
ST-B1 TO ST-B2	18" Reinforced Concrete Pipe	130.82	2.63%
ST-B1A TO ST-B1	18" Reinforced Concrete Pipe	24.16	1.00%
ST-B2 TO ST-B3	18" Reinforced Concrete Pipe	97.62	2.39%
ST-B2A TO ST-B2	18" Reinforced Concrete Pipe	24.17	1.00%
ST-B3 TO ST-B3A	18" Reinforced Concrete Pipe	24.23	1.00%
ST-B3A TO ST-B4	18" Reinforced Concrete Pipe	39.30	2.04%
ST-B4 TO ST-B4B	18" Reinforced Concrete Pipe	105.73	2.20%
ST-B4A TO ST-B4	18" Reinforced Concrete Pipe	24.15	1.00%
ST-B4B TO ST-B5	24" Reinforced Concrete Pipe	104.90	3.77%
ST-B4C TO ST-B4B	24" Reinforced Concrete Pipe	13.24	4.31%
ST-B5 TO ST-B6	24" Reinforced Concrete Pipe	88.31	8.65%
ST-B5A TO ST-B5	18" Reinforced Concrete Pipe	24.18	1.97%
ST-B6 TO ST-B7	24" Reinforced Concrete Pipe	113.19	10.03%
ST-B6A TO ST-B6	18" Reinforced Concrete Pipe	24.19	1.97%
ST-B7 TO ST-B8	24" Reinforced Concrete Pipe	119.65	13.21%
ST-B7A TO ST-B7	18" Reinforced Concrete Pipe	24.19	1.97%
ST-B8 TO ST-B10A	30" Reinforced Concrete Pipe	53.00	1.00%
ST-B9 TO ST-B8	24" Reinforced Concrete Pipe	59.53	1.00%
ST-B9A TO ST-B9	18" Reinforced Concrete Pipe	25.33	3.36%

PIPE TABLE			
NAME	SIZE	LENGTH	SLOPE
ST-B9B TO ST-B9	18" Reinforced Concrete Pipe	134.49	15.61%
ST-B10 TO ST-B11	30" Reinforced Concrete Pipe	100.64	1.00%
ST-B10A TO ST-B10	30" Reinforced Concrete Pipe	24.22	1.00%
ST-B11 TO ST-B11B	30" Reinforced Concrete Pipe	36.13	1.00%
ST-B11A TO ST-B11	18" Reinforced Concrete Pipe	25.15	21.97%
ST-B11B TO ST-B12	30" Reinforced Concrete Pipe	137.99	1.00%
ST-B12 TO ST-B12A	30" Reinforced Concrete Pipe	24.17	1.00%

LOCATION MAP (NOT TO SCALE)



LEGEND	
●	IRON PIN SET (IPS)
○	IRON PIN FOUND (IPF)
△	CALCULATED POINT
▲	MAGNETIC SET
—	FENCE POST
○	UTILITY POLE
⊗	SEWER MANHOLE
—	DRIVEWAY
—	EDGE OF ROAD
---	ZONING LINE
---o---	OVERHEAD UTILITY LINES
---	UNDERGROUND SANITARY SEWER
—	WATER LINE
---	PROPERTY BOUNDARY
---	CONTOUR LINE
---	FLOODPLAIN

COMMITMENT NOS. 21000050245 (TAMARACK) & 21000050246 (PULTE) EXCEPTIONS:

1. ANY DEFECT, LIEN, ENCUMBRANCE, ADVERSE CLAIM, OR OTHER MATTER THAT APPEARS FOR THE FIRST TIME IN THE PUBLIC RECORDS OR IS CREATED, ATTACHED, OR IS DISCLOSED BETWEEN THE COMMITMENT DATE AND THE DATE ON WHICH ALL OF THE SCHEDULE B, PART I - REQUIREMENTS ARE MET (NOT A SURVEY MATTER).

2. STANDARD EXCEPTIONS (NOT A SURVEY MATTER):

- RIGHTS OR CLAIMS OF PARTIES IN POSSESSION NOT SHOWN BY THE PUBLIC RECORDS.
- ENCROACHMENTS, OVERLAPS, BOUNDARY LINE DISPUTES OR OTHER MATTERS WHICH WOULD BE DISCLOSED BY AN ACCURATE SURVEY AND INSPECTION OF THE PREMISES.
- EASEMENTS, OR CLAIMS OF EASEMENTS, NOT SHOWN BY THE PUBLIC RECORDS. ANY LIEN, OR RIGHT TO A LIEN, FOR SERVICES, LABOR, OR MATERIAL HERETO OR HEREFTER FURNISHED, IMPOSED BY LAW AND NOT SHOWN BY THE PUBLIC RECORDS.
- ANY TITLES OR RIGHTS ASSERTED BY ANYONE INCLUDING BUT NOT LIMITED TO, PERSONS, CORPORATIONS, GOVERNMENTS OR OTHER ENTITIES, TO TIDE LANDS, OR LANDS COMPRISING THE SHORES OR BOTTOMS OF NAVIGABLE RIVERS, LAKES, BAYS, OCEANS OR GULF, OR LANDS BEYOND THE LINE OF THE HARBOR OR BULKHEAD LINES AS ESTABLISHED OR CHANGED BY THE UNITED STATES GOVERNMENT OR WATER RIGHTS, IF ANY.
- TAXES OR SPECIAL ASSESSMENTS WHICH ARE NOT SHOWN AS EXISTING LIENS BY THE PUBLIC RECORDS.

SPECIAL EXCEPTIONS:

3. TAXES FOR THE YEAR 2021, A LIEN NOW DUE AND PAYABLE BUT NOT YET DELINQUENT, AND SUBSEQUENT YEARS, WHICH ARE A LIEN NOT YET DUE AND PAYABLE (NOT A SURVEY MATTER).

4. TAXES RESULTING FROM SUPPLEMENTAL, REVISED OR CORRECTED ASSESSMENTS UNDER TENNESSEE CODE ANNOTATED SECTION 67-5-603, ET SEQ., AND SECTION 67-1-1001, ET SEQ (NOT A SURVEY MATTER).

5. RIGHTS OF TENANTS IN POSSESSION UNDER UNRECORDED LEASES (NOT A SURVEY MATTER).

6. ANY INACCURACY IN THE AREA, SQUARE FOOTAGE OR ACREAGE OF THE LAND OR ATTACHED PLAT, IF ANY, THE COMPANY DOES NOT INSURE THE AREA, SQUARE FOOTAGE OR ACREAGE OF THE LAND (NOT A SURVEY MATTER).

7. RIGHTS OF THE PUBLIC, COUNTY, STATE OR MUNICIPALITY IN AND TO THAT PORTION OF THE LAND TAKEN OR USED FOR ROAD PURPOSES (PUBLIC ROAD RIGHTS-OF-WAY AS SHOWN HEREON).

8. ANY TRUST, RIGHT, INTEREST OR CLAIM THAT MAY EXIST, ARISE OR BE ASSERTED AGAINST THE TITLE UNDER OR PURSUANT TO THE PERISHABLE AGRICULTURAL COMMODITIES ACT OF 1930, AS AMENDED, 7 U.S.C. §499a, ET SEQ., OR ANY SIMILAR STATE OR FEDERAL LAW (NOT A SURVEY MATTER).

9. ANY TRUST, RIGHT, INTEREST OR CLAIM THAT MAY EXIST, ARISE, OR BE ASSERTED AGAINST THE TITLE UNDER OR PURSUANT TO THE PACKERS AND STOCKYARD ACT OF 1921, AS AMENDED, 7 U.S.C. §181, ET SEQ., OR ANY SIMILAR STATE OR FEDERAL LAW (NOT A SURVEY MATTER).

10. MINERALS OF WHATSOEVER KIND, SUBSURFACE AND SURFACE SUBSTANCES, INCLUDING BUT NOT LIMITED TO COAL, LIGNITE, OIL, GAS, URANIUM, CLAY, ROCK, SAND AND GRAVEL IN, ON UNDER AND THAT MAY BE PRODUCED FROM THE LAND, TOGETHER WITH ALL RIGHTS, PRIVILEGES AND IMMUNITIES RELATING THERETO, WHETHER OR NOT APPEARING IN THE PUBLIC RECORDS OR LISTED IN SCHEDULE B, THE COMPANY MAKES NO REPRESENTATION AS TO THE PRESENT OWNERSHIP OF ANY SUCH INTERESTS. THERE MAY BE LEASES, GRANTS, EXCEPTIONS OR RESERVATION OF INTEREST THAT ARE NOT LISTED (NOT A SURVEY MATTER).

11. ALL MATTERS SHOWN ON PLATS OF RECORD IN PLAT BOOK 6, PAGE 443B (AFFECTS COMMITMENT NOS. 21000050245 & 21000050246; OVERALL BOUNDARY OF PROPERTY, NO EASEMENTS); PLAT BOOK 7, PAGE 28B (AFFECTS COMMITMENT NO. 21000050246; 24.02' SUBDIVISION ALONG CARTERS CREEK STATION ROAD, NO EASEMENTS); AND PLAT BOOK 10, PAGE 280 (RESUBDIVISION OF LOT ALONG CARTERS CREEK STATION ROAD, EASEMENTS AFFECT COMMITMENT NO. 21000050246 AS SHOWN HEREON), ALL IN THE REGISTERS' OFFICE OF MAURY COUNTY, TENNESSEE.

Property Description: 64.03 Acres, Pulte Homes Tennessee LP

Beginning at a Fence Post at the northeast corner of James Mills, as recorded in Deed Book 411, Page 286, Register's Office Maury County (R.O.M.C.), said Point being on the eastern right of way of Cleburne Road, thence, leaving the right of way and with Mills, S 50°46'49" E, 2.40' to an Iron Pin Set (IPS) on the proposed east right of way of Cleburne Road, said point being the Point of Beginning, thence, leaving Mills and with said right of way, the following calls: N 47°05'45" E, a distance of 127.80' to an IPS; thence, leaving the right of way, the following calls: N 1°17'00" E, a distance of 342.88', and a chord bearing of 284.88' to an IPS; thence, leaving the right of way, the following calls: N 28°42'25" E, 340.60' feet to an IPS; with a curve to the left having a radius of 8547.08', an arc length of 177.22', and a chord bearing and distance of N 16°37'41" E, 177.21' to an IPS; with a curve to the right, having a radius of 2043.12', an arc length of 219.39', and a chord bearing and distance of N 18°10'07" E, 219.33' to an IPS; with a curve to the right, having a radius of 7505.09', an arc length of 289.61' feet, and a chord bearing and distance of N 21°25'30" E, 289.60' to an IPS; thence, leaving Cleburne Road, the following calls: N 1°17'00" E, a distance of 342.88', and a chord bearing of 284.88' to an IPS; thence, leaving the right of way, the following calls: N 28°42'25" E, 340.60' feet to an IPS; with a curve to the left having a radius of 30.00' feet, an arc length of 47.21', and a chord bearing and distance of S 22°33'17" E, 42.49' to an IPS; S 67°38'24" E, a distance of 72.91' to an IPS; with a curve to the right having a radius of 1025.00', an arc length of 140.87', and a chord bearing and distance of S 63°02'29" E, 147.74' to an IPS; S 70°32'27" E, a distance of 444.06', and a chord bearing and distance of S 67°38'24" E, 42.49' to an IPS; with a curve to the right having a radius of 121.94', a radius of 925.00', and a chord bearing and distance of S 38°50'57" E, 121.85' to a Point; S 47°37'12" E, a distance of 5.44' to a Point; with a curve to the right having a radius of 30.00', an arc length of 47.95', and a chord bearing and distance of S 88°25'09" W, 43.01' to a Point; N 45°47'32" E, a distance of 3.47' to a Point; S 44°12'27" W, a distance of 50.00' to a Point; S 45°47'32" E, a distance of 32.40' to a Point; with a curve to the left with an arc length of 47.36', a radius of 1025.00', and a chord bearing and distance of S 47°06'57" E, 47.35' to a Point; S 41°33'38" W, a distance of 125.00' to a Point; with a curve to the left with an arc length of 628.95', a radius of 150.00', and a chord bearing and distance of S 64°06'26" E, 621.14' to a Point; S 79°43'17" E, a distance of 283.47' to a Point; with a curve to the right with an arc length of 46.18', a radius of 276.00', and a chord bearing and distance of S 74°39'05" E, of 49.12' to a Point; S 20°28'21" W, a distance of 125.00' to a Point; with a curve to the left with an arc length of 1.92', a radius of 150.00', and a chord bearing and distance of N 69°54'50" W, 621.14' to a Point; S 19°47'18" W, a distance of 50.00' to a Point; S 10°13'29" W, a distance of 181.42' to a Point; S 30°15'36" W, a distance of 120.00' to a Point; S 30°15'36" W, a distance of 120.00' to a Point; with a curve to the right with an arc length of 26.51', a radius of 425.00', and a chord bearing and distance of S 57°57'12" E, 26.50' to a Point; S 30°50'05" W, a distance of 110.96' to a Point; with a curve to the left with an arc length of 333.64', a radius of 325.00', and a chord bearing and distance of N 88°14'28" W, 319.18' to a Point; S 65°02'05" E, a distance of 125.00' to a Point; S 28°00'48" E, a distance of 50.00' to a Point; with a curve to the right with an arc length of 0.68', a radius of 1325.03', and a chord bearing and distance of N 62°00'04" W, 0.68' to a Point; N 28°00'48" W, a distance of 50.00' to a Point; N 28°00'48" W, a distance of 125.00' to a Point; N 28°00'48" W, a distance of 125.00' to a Point; with a curve to the right with an arc length of 3.47', a radius of 425.00', and a chord bearing and distance of N 57°57'12" E, 3.47' to a Point; S 41°33'38" W, a distance of 125.00' to a Point; with a curve to the left with an arc length of 628.95', a radius of 150.00', and a chord bearing and distance of S 64°06'26" E, 621.14' to a Point; S 79°43'17" E, a distance of 283.47' to a Point; with a curve to the right with an arc length of 46.18', a radius of 276.00', and a chord bearing and distance of S 74°39'05" E, of 49.12' to a Point; S 20°28'21" W, a distance of 125.00' to a Point; with a curve to the left with an arc length of 1.92', a radius of 150.00', and a chord bearing and distance of N 69°54'50" W, 621.14' to a Point; S 19°47'18" W, a distance of 50.00' to a Point; S 10°13'29" W, a distance of 181.42' to a Point; S 30°15'36" W, a distance of 120.00' to a Point; S 30°15'36" W, a distance of 120.00' to a Point; with a curve to the right with an arc length of 26.51', a radius of 425.00', and a chord bearing and distance of S 57°57'12" E, 26.50' to a Point; S 30°50'05" W, a distance of 110.96' to a Point; with a curve to the left with an arc length of 333.64', a radius of 325.00', and a chord bearing and distance of N 88°14'28" W, 319.18' to a Point; S 65°02'05" E, a distance of 125.00' to a Point; S 28°00'48" E, a distance of 50.00' to a Point; with a curve to the right with an arc length of 0.68', a radius of 1325.03', and a chord bearing and distance of N 62°00'04" W, 0.68' to a Point; N 28°00'48" W, a distance of 50.00' to a Point; N 28°00'48" W, a distance of 125.00' to a Point; N 28°00'48" W, a distance of 125.00' to a Point; with a curve to the right with an arc length of 3.47', a radius of 425.00', and a chord bearing and distance of N 57°57'12" E, 3.47' to a Point; S 41°33'38" W, a distance of 125.00' to a Point; with a curve to the left with an arc length of 628.95', a radius of 150.00', and a chord bearing and distance of S 64°06'26" E, 621.14' to a Point; S 79°43'17" E, a distance of 283.47' to a Point; with a curve to the right with an arc length of 46.18', a radius of 276.00', and a chord bearing and distance of S 74°39'05" E, of 49.12' to a Point; S 20°28'21" W, a distance of 125.00' to a Point; with a curve to the left with an arc length of 1.92', a radius of 150.00', and a chord bearing and distance of N 69°54'50" W, 621.14' to a Point; 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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

Tamarack Land, Carter's Station 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 DEVELOPER'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.

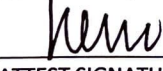
B4.3 Acceptance of Facilities

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.

<u>Summit at Carter's Station, Phase 3</u>	
PROJECT	
<i>Completed by the Developer</i>	<i>Completed by the City</i>
<u>Tamarack Land - Carter's Station LLC</u>	
DEVELOPER NAME	
<u>Jeff Leone</u>	
AUTHORIZED AGENT NAME	CITY ENGINEER
	
SIGNATURE	SIGNATURE
<u>10/16/23</u>	
DATE	DATE
<u>712 Vista Blvd Ste 303</u>	
STREET	
<u>Waconia, MN 55387</u>	
CITY, STATE, ZIP	
<u>201-463-7866</u>	
PHONE	
<u>Jeff@TamarackLand.com</u>	
EMAIL	
<i>Attest</i>	<i>Attest</i>
<u>Jamie Heim</u>	
ATTEST NAME	ATTEST NAME
	
ATTEST SIGNATURE	ATTEST SIGNATURE
<u>10/16/23</u>	
DATE	DATE



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	Wellwind Road, Columbia, TN		
	TAX MAP: 42	GROUP:	PARCEL: 35.00
SUMMARY OF NATURE OF REQUEST AND WORK	This application is to approve the final plat for the third phase of Summit at Carter's Station.		

DATE OF PRE-APPLICATION CONFERENCE		Pre-application meetings are scheduled for Wednesdays.
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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: <i>*File naming nomenclature examples:</i> <i>Freedom Point Site Plan</i> <i>Freedom Point Master Plan</i> <i>Freedom Point Final Plat</i>	<u>Annexations/Rezoning/PUD's:</u> ☐ 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 <u>Plats/PUDs:</u> ☒ Project Name (include Sections & Phases) Summit at Carter's Station, Phase 3 ☒ 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	T-Square Engineering	PHONE	615.678.8212
ADDRESS	1329 West Main St., Franklin, TN 37064	EMAIL	Allison.Corolla@T2-Eng.com

PROPERTY OWNER NAME	Tamarack Land - Carters' Station, LLC	PHONE	201.463.7866
ADDRESS	712 Vista Blvd. #303, Waconia, MN 55387	EMAIL	Jeff@TamarackLand.com

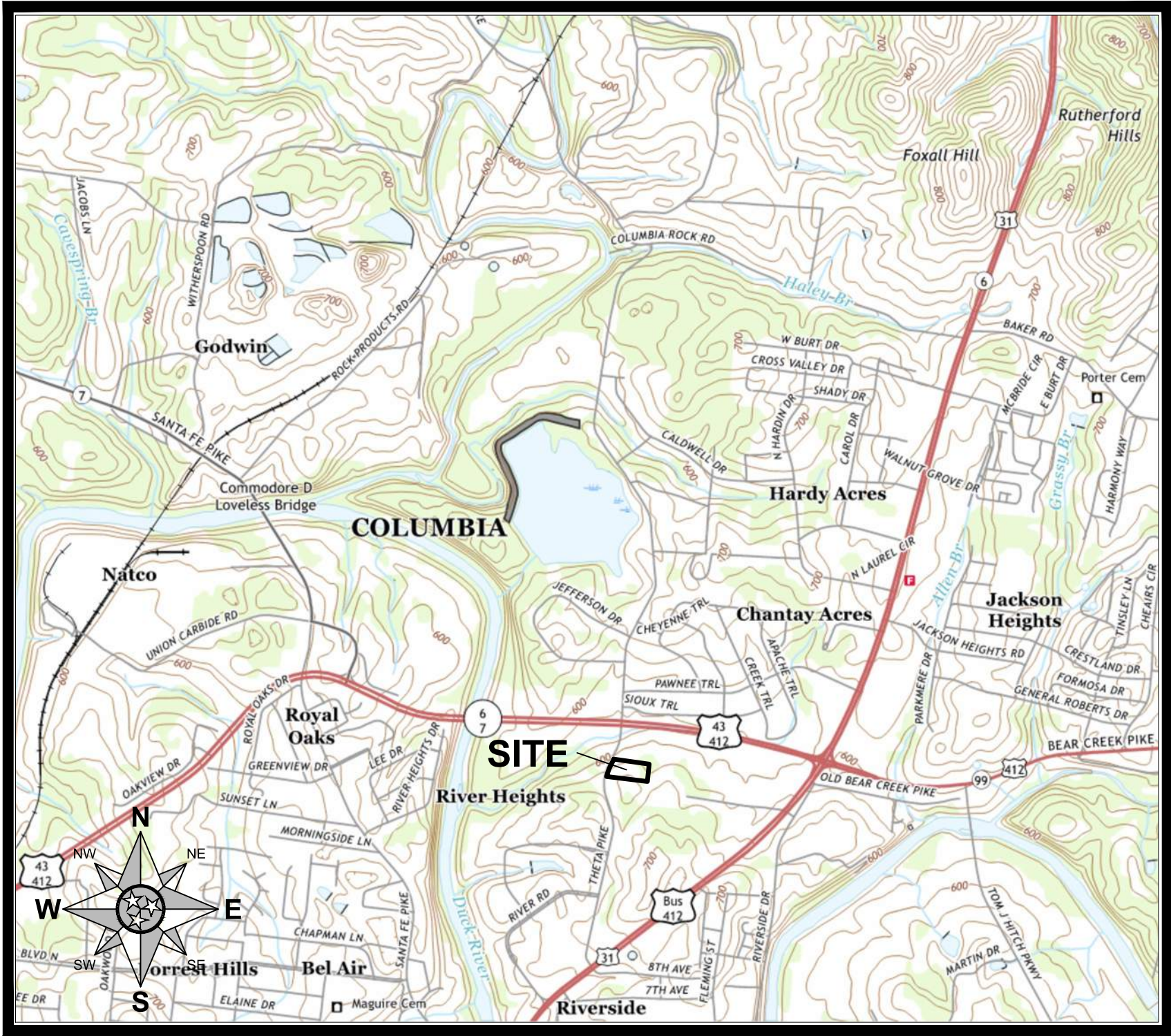
In filling out this application, I attest that (1) I am familiar with the rules, regulations, and procedures of the City of Columbia & (2) all information contained herein is accurate & true to the best of my knowledge.

<u>Allison Corolla</u> APPLICANT NAME	<u><i>Allison Corolla</i></u> APPLICANT SIGNATURE	<u>10/10/2023</u> DATE
<u>Jeff Leone</u> PROPERTY OWNER NAME	<u><i>Jeff Leone</i></u> PROPERTY OWNER SIGNATURE	<u>10/12/2023</u> 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			

SITE PLAN FOR:
MACKENZIE PLACE
TAX MAP 90B, GROUP B, PARCEL 47.00
220 THETA PIKE
MAURY COUNTY, TENNESSEE
OCTOBER 16, 2023



VICINITY MAP
SCALE: 1" = 2,000'
SOURCE: USGS

SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
C000	COVER SHEET
C001	GENERAL NOTES
C100	EXISTING CONDITIONS & DEMOLITION PLAN
C200	SITE LAYOUT PLAN
C201	INTERSECTION SIGHT DISTANCE PLAN
C300	OVERALL GRADING & DRAINAGE PLAN
C304	GRADING DETAILS
C305	STORM SEWER DETAILS
C401	INITIAL EPSC PLAN
C402	INTERMEDIATE EPSC PLAN
C403	FINAL EPSC PLAN
C404	EPSC DETAILS
C500	UTILITY PLAN
C501	OFFSITE SANITARY SEWER PLAN & PROFILE
C502	SANITARY SEWER PLAN & PROFILE
C600	SITE DETAILS
C601	UTILITY DETAILS
C602	UTILITY DETAILS
LP1.0	TREE PRESERVATION PLAN
LP2.0	LANDSCAPE PLAN
A0.0	ARCHITECTURAL ELEVATIONS
A0.1	ARCHITECTURAL ELEVATIONS
A1.0	ARCHITECTURAL FIRST FLOOR PLAN
A2.0	ARCHITECTURAL SECOND FLOOR PLAN
A3.0	ARCHITECTURAL RENDERING
A3.1	ARCHITECTURAL RENDERING
A3.2	ARCHITECTURAL RENDERING
A3.3	ARCHITECTURAL RENDERING
A3.4	ARCHITECTURAL RENDERING

PROJECT NOTES:

1. WATER FOR THIS DEVELOPMENT IS TO BE PROVIDED BY COLUMBIA POWER & WATER SYSTEMS.
2. SANITARY SEWER PROVIDER FOR THIS DEVELOPMENT IS TO BE COLUMBIA POWER & WATER SYSTEMS.
3. TOPOGRAPHIC AND BOUNDARY SURVEY PREPARED BY M2 GROUP, LLC DATED MAY, 2022.
4. ELECTRIC SERVICE TO BE PROVIDED BY COLUMBIA POWER & WATER SYSTEMS.
5. GAS SERVICE TO BE PROVIDED BY ATMOS ENERGY.

FLOODPLAIN NOTE:

THE PROPERTY SHOWN HEREON IS LOCATED IN A FLOOD HAZARD ZONE "X" (AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN) ACCORDING TO F.I.R.M. MAP "MAURY COUNTY, TENNESSEE" PANEL 170 OF 440, MAP NUMBER 47119C0170E, EFFECTIVE DATE APRIL 16, 2007.

CONTACT LIST

OWNER/DEVELOPER

WAITS DEVELOPMENT GROUP, LLC
ADDRESS: PO BOX 111285
NASHVILLE, TENNESSEE 37222
PHONE NO.: 615-498-4190
CONTACT NAME: JOHN WAITS

CIVIL ENGINEER

M2 GROUP, LLC
P.O. BOX 848
FRANKLIN, TN 37065
PHONE: (615) 406-3415
CONTACT: MATT W. BRYANT, P.E.
E-MAIL: matt@m2groupllc.com

UTILITY CONTACTS:

WATER SUPPLY:
COLUMBIA POWER & WATER SYSTEMS
201 PICKENS LANE
COLUMBIA, TN 38401
(931) 388-4833

SANITARY SEWER
COLUMBIA WASTEWATER DEPARTMENT
1244 Treatment Plant Road
COLUMBIA, TN 38401
(931) 560-1001

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

GAS SERVICE
ATMOS ENERGY CORPORATION
810 NASHVILLE HWY
COLUMBIA, TN 38401
(931) 388-9136



Know what's below.
Call before you dig.

DESCRIPTION

DATE

REVISION #

10/16/23

MATTHEW W. BRYANT
REGISTERED PROFESSIONAL ENGINEER
No. 10000
STATE OF TENNESSEE

SITE PLANS FOR:
MACKENZIE PLACE
TAX MAP 90B, GROUP B, PARCEL 47.00
220 THETA PIKE
CITY OF COLUMBIA
MAURY COUNTY, TENNESSEE

M2 GROUP
P.O. BOX 848
FRANKLIN, TN 37065
WWW.M2GROUPLLC.COM

COVER SHEET

DATE: OCTOBER 16, 2023
PROJECT NO.: 22-085

DRAWN BY: M2G
CHECKED BY: MWB

SHEET NUMBER:

C000

GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO THE BEGINNING OF CONSTRUCTION OR EARTH MOVING OPERATIONS. INFORM ENGINEER OF ANY CONFLICTS DETRIMENTAL TO THE DESIGN INTENT.
2. 72 HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTOR SHALL NOTIFY THE FOLLOWING AGENCIES: TENNESSEE 811 AND ALL OTHER AGENCIES THAT MAY HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NON-MEMBERS OF TENNESSEE 811.
3. THE CONTRACTOR AND SUBCONTRACTORS SHALL BE RESPONSIBLE FOR COMPLYING WITH APPLICABLE FEDERAL, STATE AND LOCAL REQUIREMENTS, TOGETHER WITH EXERCISING PRECAUTIONS AT ALL TIMES FOR THE PROTECTION OF PERSONS (INCLUDING EMPLOYEES) AND PROPERTY. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND SUBCONTRACTORS TO INITIATE, MAINTAIN AND SUPERVISE ALL SAFETY REQUIREMENTS, PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK.
4. THE CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE OWNER AND OWNER'S REPRESENTATIVE FOR ANY AND ALL INJURIES AND/OR DAMAGES TO PERSONNEL, EQUIPMENT AND/OR EXISTING FACILITIES OCCURRING IN THE COURSE OF THE DEMOLITION AND CONSTRUCTION DESCRIBED IN THE PLANS AND SPECIFICATIONS.
5. CONTRACTOR SHALL OBTAIN A PERMIT FOR ALL CONSTRUCTION ACTIVITIES AND PERFORM SAID ACTIVITIES IN ACCORDANCE WITH ALL LOCAL, STATE, FEDERAL & OSHA REGULATIONS.
6. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL CODES, OBTAIN ALL APPLICABLE PERMITS, PAY ALL REQUIRED FEES AND ATTEND REQUIRED PRE-CONSTRUCTION MEETINGS WITH CITY AND UTILITY COMPANIES PRIOR TO BEGINNING WORK.
7. ANY WORK PERFORMED IN THE LOCAL RIGHT OF WAYS SHALL BE IN ACCORDANCE WITH THE APPLICABLE LOCAL REQUIREMENTS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THE NECESSARY PERMITS FOR THE WORK, SCHEDULE NECESSARY INSPECTIONS, AND PROVIDE THE NECESSARY TRAFFIC CONTROL MEASURES AND DEVICES, ETC., FOR WORK PERFORMED IN THE RIGHT OF WAYS.
8. THE CONTRACTOR IS TO PERFORM ALL INSPECTIONS AS REQUIRED BY THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC) FOR THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND FURNISH OWNERS REPRESENTATIVE WITH WRITTEN REPORTS. OWNER WILL SUBMIT THE NOTICE OF INTENT (NOI) AND STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN ORDER TO OBTAIN A NOTICE OF COVERAGE (NOC) UNDER THE STATE OF TENNESSEE NPDES PERMIT. THE CONTRACTOR WILL BE REQUIRED TO SIGN THE NOI AND SUBMIT UPDATED NOI TO THE STATE OF TENNESSEE UPON SELECTION TO COMPLETE THE CONSTRUCTION AND BE A PERMITTEE LISTED ON THE NOC.
9. CONTRACTOR SHALL IMPLEMENT ALL SOIL AND EROSION CONTROL, PRACTICES REQUIRED BY CITY OF COLUMBIA AND TDEC.
10. ALL GROUND SURFACE AREAS THAT HAVE BEEN EXPOSED OR LEFT BARE AS A RESULT OF CONSTRUCTION AND ARE TO FINAL GRADE AND ARE TO REMAIN SO, SHALL BE SEEDED AND MULCHED AS SOON AS PRACTICAL IN ACCORDANCE WITH SPECIFICATIONS.
11. ALL WORK SHALL COMPLY WITH THE TENNESSEE DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS, AND ALL CONSTRUCTION WORK SHALL BE DONE ACCORDING TO SAID SPECIFICATIONS AND IN ACCORDANCE WITH APPLICABLE STANDARDS OF CITY OF COLUMBIA SUBDIVISION REGULATIONS.
12. ALL WORK PERFORMED BY THE CONTRACTOR SHALL CONFORM TO THE LATEST REGULATIONS OF THE AMERICANS WITH DISABILITIES ACT.
13. CONTRACTOR SHALL REFER TO OTHER PLAN SHEETS WITHIN THIS CONSTRUCTION SET FOR OTHER PERTINENT INFORMATION. IT IS NOT THE ENGINEER'S INTENT THAT ANY SINGLE PLAN SHEET IN THIS SET OF DOCUMENTS FULLY DEPICT ALL WORK ASSOCIATED WITH THE PROJECT.
14. BEFORE INSTALLATION OF STORM OR SANITARY SEWER, OR OTHER UTILITY THE CONTRACTOR SHALL VERIFY ALL CROSSINGS, BY EXCAVATION WHERE NECESSARY, AND INFORM THE OWNER AND THE ENGINEER OF ANY CONFLICTS. THE ENGINEER WILL BE HELD HARMLESS IN THE EVENT THEY ARE NOT NOTIFIED OF DESIGN CONFLICTS PRIOR TO CONSTRUCTION.
15. WHERE CURB IS PRESENT, DIMENSIONS ARE SHOWN TO THE FACE OF CURB, OTHERWISE DIMENSIONS ARE SHOWN TO THE EDGE OF PAVEMENT OR AS NOTED.
16. SITE SIGNAGE AND STRIPING SHALL BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.).
17. CONCRETE WALKS SHALL BE 4" THICK OVER 4" COMPACTED GRAVEL WITH CONTROL JOINTS EQUALLY SPACED AT IN ACCORDANCE WITH ACI 308R-01 AND ACI 325R 9-91, ISOLATION JOINTS AT ALL FIXED STRUCTURES (MANHOLES, INLETS, WALLS, BUILDING, ETC.). ALL SIDEWALKS ARE TO BE ABOUT FINISHED.
18. CONSTRUCTION OF ALL ROADWAYS AND SIDEWALKS SHALL MEET THE REQUIREMENTS OF CITY OF COLUMBIA ROADWAY CONSTRUCTION CRITERIA AND STANDARD DETAILS.
19. CONTRACTOR SHALL PROVIDE AND MAINTAIN TRAFFIC CONTROL MEASURES IN ACCORDANCE WITH STATE DEPARTMENT OF TRANSPORTATION REGULATIONS AND AS REQUIRED BY LOCAL AGENCIES WHEN WORKING IN AND/OR ALONG STREETS, ROADS, HIGHWAYS, ETC. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN APPROVAL AND COORDINATE WITH LOCAL AND/OR STATE AGENCIES REGARDING THE NEED, EXTENT AND LIMITATIONS ASSOCIATED WITH INSTALLING AND MAINTAINING TRAFFIC CONTROL MEASURES.
20. ALL TRENCHING, PIPE LAYING AND BACKFILLING SHALL BE IN ACCORDANCE WITH ALL FEDERAL OSHA REGULATIONS. CONTRACTOR TO PAY PARTICULAR ATTENTION TO 29 CFR PART 1926, SUBPARTS M AND P.

DEMOLITION NOTES

1. CLEARING LIMITS SHALL BE PHYSICALLY MARKED IN THE FIELD BY THE CONTRACTOR.
2. NO TREES SHALL BE REMOVED, NOR VEGETATION DISTURBED BEYOND THE LIMITS OF CONSTRUCTION WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.
3. TREE PROTECTION FENCING SHALL BE IN ACCORDANCE WITH CITY OF COLUMBIA STANDARDS AND DETAILED DRAWINGS. DO NOT OPERATE OR STORE EQUIPMENT, NOR HANDLE OR STORE MATERIALS WITHIN THE DRIP LINES OF THE TREES SHOWN TO REMAIN.
4. PROTECTION OF EXISTING TREES AND VEGETATION: PROTECT EXISTING TREES AND OTHER VEGETATION INDICATED TO REMAIN IN PLACE AGAINST UNNECESSARY CUTTING, BREAKING OR SKINNING OF ROOTS, SKINNING OR BRUISING OF BARK, SMOTHERING OF TREES BY STOCKPILING CONSTRUCTION MATERIALS OR EXCAVATED MATERIALS WITHIN DRIP LINE, EXCESS FOOT OR VEHICULAR TRAFFIC, OR PARKING OF VEHICLES WITHIN DRIP LINE. PROVIDE TEMPORARY GUARDS TO PROTECT TREES AND VEGETATION TO BE LEFT STANDING.
5. ALL DEMOLITION WASTE AND CONSTRUCTION DEBRIS, OTHER THAN TOPSOIL, SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE DESIGNATED AND SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OFFSITE IN A STATE APPROVED WASTE SITE AND IN ACCORDANCE WITH ALL LOCAL AND STATE CODES AND PERMIT REQUIREMENTS. TAKE CARE TO PROTECT UTILITIES THAT ARE TO REMAIN. REPAIR DAMAGE ACCORDING TO THE APPROPRIATE UTILITY COMPANY STANDARDS AND AT THE CONTRACTOR'S EXPENSE.
6. ALL UTILITY DISCONNECTION, REMOVAL, RELOCATION, CUTTING, CAPPING AND/OR ABANDONMENT SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY COMPANY / AGENCY. UTILITY COMPANIES ARE LISTED ON THE COVER SHEET.
7. THE BURNING OF CLEARED MATERIAL AND DEBRIS SHALL NOT BE ALLOWED UNLESS CONTRACTOR OBTAINS PRIOR WRITTEN AUTHORIZATION FROM THE LOCAL AUTHORITIES.
8. EROSION & SEDIMENT CONTROL MEASURES AROUND AREAS OF DEMOLITION SHALL BE PROPERLY INSTALLED AND FUNCTION PROPERLY PRIOR TO INITIALIZATION OF DEMOLITION ACTIVITIES.
9. HAZARDOUS MATERIALS ARE NOT EXPECTED, IF FOUND ON SITE, SUCH MATERIALS SHALL BE REMOVED BY A LICENSED HAZARDOUS MATERIALS CONTRACTOR. CONTRACTOR SHALL NOTIFY OWNER IMMEDIATELY IF HAZARDOUS MATERIALS ARE ENCOUNTERED.
10. CONTRACTOR SHALL ADHERE TO ALL LOCAL, STATE, FEDERAL AND OSHA REGULATIONS DURING ALL DEMOLITION ACTIVITIES.
11. CONTRACTOR SHALL PROTECT ALL CORNER PINS, MONUMENTS, PROPERTY CORNERS AND BENCHMARKS DURING DEMOLITION ACTIVITIES. IF DISTURBED, CONTRACTOR SHALL HAVE DISTURBED ITEMS RESET BY A LICENSED SURVEYOR AT NO ADDITIONAL COST TO THE OWNER.
12. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES, STRUCTURES, AND FEATURES TO REMAIN. ANY ITEMS TO REMAIN THAT HAVE BEEN DISTURBED OR DAMAGED AS A RESULT OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT CONTRACTOR'S EXPENSE.
13. THE CONTRACTOR SHALL USE SUITABLE METHODS TO CONTROL DUST AND DIRT CAUSED BY THE DEMOLITION ACTIVITIES.
14. ANY UTILITY AND STRUCTURE REMOVAL, RELOCATION, CUTTING, CAPPING AND/OR ABANDONMENT SHALL BE COORDINATED AND PROPERLY DOCUMENTED BY A CERTIFIED PROFESSIONAL, WHEN APPLICABLE, WITH THE APPROPRIATE UTILITY COMPANY, MUNICIPALITY AND/OR AGENCY. DEMOLITION OF REGULATED ITEMS MAY INCLUDE, BUT ARE NOT LIMITED TO WELLS, ASBESTOS, UNDER GROUND STORAGE TANKS, SEPTIC TANKS AND ELECTRIC TRANSFORMERS. DEMOLITION CONTRACTOR SHALL REFER TO ANY ENVIRONMENTAL STUDIES FOR DEMOLITION RECOMMENDATIONS AND GUIDANCE. AVAILABLE ENVIRONMENTAL STUDIES MAY INCLUDE, BUT ARE NOT LIMITED TO PHASE I ESA, PHASE I ESA, WETLAND AND STREAM DELINEATION AND ASBESTOS SURVEY. ALL APPLICABLE ENVIRONMENTAL STUDIES SHALL BE MADE AVAILABLE UPON REQUEST.

LAYOUT NOTES

1. THE CONTRACTOR SHALL CHECK EXISTING GRADES, DIMENSIONS, AND INVERTS IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE OWNERS REPRESENTATIVE PRIOR TO BEGINNING WORK.
2. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL EXISTING UTILITIES. TAKE CARE TO PROTECT UTILITIES THAT ARE TO REMAIN. RELOCATE EXISTING UTILITIES AS INDICATED, OR AS NECESSARY FOR CONSTRUCTION.
3. PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING PAVEMENT AND NEW PAVEMENT. FIELD ADJUSTMENT OF FINAL GRADES MAY BE NECESSARY. CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ALL UTILITIES, INCLUDING, BUT NOT LIMITED TO, ALL UTILITIES AND CROSSINGS PRIOR TO PAVEMENT INSTALLATION.
4. ALL DAMAGE TO EXISTING PAVEMENT TO REMAIN, WHICH RESULTS FROM THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED WITH LIKE MATERIALS AT THE CONTRACTOR'S EXPENSE.
5. SITE DIMENSIONS SHOWN ARE TO THE FACE OF CURB, OR EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
6. CONTRACTOR SHALL MAINTAIN ONE SET OF AS-BUILT/RECORD DRAWINGS ON-SITE DURING CONSTRUCTION FOR DISTRIBUTION TO THE OWNER AND/OR OWNERS REPRESENTATIVE UPON COMPLETION.
7. THIS SITE LAYOUT IS SPECIFIC TO THE APPROVALS NECESSARY FOR THE CONSTRUCTION IN ACCORDANCE WITH CITY OF COLUMBIA REQUIREMENTS. NO CHANGES TO THE SITE LAYOUT ARE ALLOWED WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER. CHANGES MADE TO THE SITE LAYOUT WITHOUT APPROVAL IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR. CHANGES INCLUDE BUT ARE NOT LIMITED TO, INCREASED IMPERVIOUS PAVEMENT, ADDITION / DELETION OF PARKING SPACES, MOVEMENT OF CURB LINES, CHANGES TO DRAINAGE STRUCTURES AND PATTERNS, LANDSCAPING, ETC.

8. CONTRACTOR SHALL PERFORM A PROOF ROLL PER CITY OF COLUMBIA REQUIREMENTS PRIOR TO STONE AND PAVEMENT INSTALLATION.
9. ALL PAVEMENT MARKINGS SHALL BE INSTALLED USING WHITE OR YELLOW, REFLECTIVE TRAFFIC MATERIALS (SEE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.).
10. THE CITY WILL MEASURE THE CROSS SLOPE OF FINAL CONSTRUCTED ROADWAYS WITHIN THE SUBDIVISION. THE CROSS SLOPE OF THE FINAL CONSTRUCTED ROADWAYS SHALL BE PER THE ROADWAY SECTION SHOWN ON THE CONSTRUCTION PLANS OR IT SHALL BE REPAIRED AT NO COST TO THE CITY OR OWNER.
11. OWNER SHALL PROVIDE STAKING OF THE FRONT PROPERTY LINES OF EACH LOT AND WILL SET FINAL PROPERTY CORNERS. ALL OTHER STAKING/SURVEYING THAT IS REQUIRED TO CONSTRUCT THE IMPROVEMENTS SHOWN IN THESE CONSTRUCTION PLANS IS THE RESPONSIBILITY OF THE CONTRACTOR.
12. THE ENGINEER SHALL PROVIDE FILES IN COMPUTER-AIDED-DRAFTING (CAD) FORMAT TO THE CONTRACTOR. THE CONTRACTOR WILL BE BOUND BY THE TERMS IN THE ENGINEER'S "CAD FILES DISCLAIMER, WAIVER AND LIMITATION OF LIABILITY" AGREEMENT.

GRADING NOTES

1. THE CONTRACTOR SHALL CHECK ALL EXISTING AND FINISHED GRADES, DIMENSIONS, ETC. PRIOR TO BEGINNING NOTIFY THE OWNERS REPRESENTATIVE OF ANY DISCREPANCIES AND/OR ERRORS IN THE PLANS PRIOR TO COMMENCING WORK.
2. ALL PROPOSED GRADES SHOWN ARE FINAL GRADES, TOP OF GROUND LEVEL, OR TOP OF PAVEMENT, OR GRATE ELEVATION AT THE DRAWDOWN POINT, UNLESS INDICATED OTHERWISE.
3. ALL ELEVATIONS SHOWN ARE FINISHED GRADE ELEVATIONS.
4. CONTRACTOR SHALL ADHERE TO THE EROSION & SEDIMENT CONTROL PLAN PREPARED FOR THIS PROJECT.
5. EARTHWORK SHALL INCLUDE CLEARING AND GRUBBING, STRIPPING AND STOCKPILING TOPSOIL, MASS GRADING, EXCAVATION, FILLING, UNDER CUT AND REPLACEMENT, IF REQUIRED, AND COMPACTATION.
6. CONTRACTOR TO REFILL UNDERCUT AREAS (IF REQUIRED) WITH SUITABLE MATERIAL AND COMPACT AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
7. EXCAVATED SUBGRADES AND EACH LAYER OF FILL SHALL BE OF A QUALITY ACCEPTABLE TO THE OWNERS REPRESENTATIVE AND SHALL NOT INCLUDE ORGANIC MATERIAL, BOULDERS, DEBRIS, WET MATERIAL, ETC. CUT OR STRIPPED AREAS SHALL BE PROOF ROLLED PRIOR TO ANY FILLING. AS GRADING ACTIVITY AND PLACEMENT OF MATERIALS ARE MONITORED BY A QUALIFIED GEOTECHNICAL ENGINEER (OR THEIR REPRESENTATIVE), OR AS DIRECTED BY THE OWNERS REPRESENTATIVE, MATERIAL SHALL MEET OR EXCEED COMPACTION REQUIREMENTS SPECIFIED IN THE SPECIFICATIONS PUBLISHED BY CITY OF COLUMBIA.
8. PLACE TOPSOIL OVER THE SUBGRADE OF UNPAVED, DISTURBED AREAS TO A MINIMUM DEPTH OF 6". TOPSOIL SHALL BE FREE OF ROCK AND DEBRIS.
9. ALL SLOPES IN NON-PAVED AREAS SHALL BE 3:1 (HORIZONTAL-VERTICAL) MAXIMUM UNLESS NOTED OTHERWISE.
10. ALL AREAS NOT PAVED SHALL BE STABILIZED IN ACCORDANCE WITH THE EROSION & SEDIMENT CONTROL PLAN, UNLESS NOTED OTHERWISE.
11. ALL FILLS SHALL BE CONTROLLED, COMPACTED, AND INSPECTED BY AN APPROVED TESTING LABORATORY OR AN INSPECTOR FROM THE APPROPRIATE GOVERNMENTAL AGENCY.
12. ALL EXCESS SOIL MATERIALS, OTHER THAN TOPSOIL, SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE DESIGNATED AND SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OFFSITE (INCLUDING ALL CHARTER COMMERCIAL, LLC PROPERTY OR FUTURE PHASES OF HIGH PARK HILL SUBDIVISION) AT NO ADDITIONAL COST TO THE OWNER IN ACCORDANCE WITH ALL LOCAL AND STATE CODES AND PERMIT REQUIREMENTS.
13. THE CONTRACTOR IS RESPONSIBLE FOR THE SITE EARTHWORK BY IMPORTING OR EXPORTING AS NECESSARY TO ACHIEVE DESIGN GRADES AND SPECIFICATIONS.
14. THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO ADJACENT PROPERTIES DURING CONSTRUCTION. THE CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR ANY DAMAGES TO ADJACENT PROPERTIES OCCURRING DURING CONSTRUCTION OF THIS PROJECT. NO WORK SHALL BE PERFORMED OUTSIDE THE PROJECT BOUNDARY WITHOUT PROPER AGREEMENTS WITH THE AFFECTED PROPERTY OWNERS.
15. THE LOCATION AND/OR ELEVATION OF THE EXISTING UTILITIES SHOWN HEREON ARE BASED ON UTILITY COMPANY RECORDS, AND WHERE POSSIBLE, FIELD MEASUREMENTS. THE CONTRACTOR SHALL NOT RELY UPON THIS INFORMATION AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 3 DAYS BUT NOT MORE THAN 10 DAYS PRIOR TO ANY EXCAVATION AND REQUEST FIELD VERIFICATION OF UTILITY LOCATIONS. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES TO REMAIN. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY DAMAGED UTILITIES ACCORDING TO LOCAL CODES AT THE CONTRACTORS EXPENSE.
16. THE GENERAL CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR JOB SITE CONDITIONS, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY DURING CONSTRUCTION. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND IS NOT LIMITED TO NORMAL WORKING HOURS.
17. MATERIALS NOT SUITABLE FOR FILL OR REUSE SHALL BE DISPOSED OFFSITE IN ACCORDANCE WITH THE REQUIREMENTS OF CITY OF COLUMBIA AND AS DIRECTED BY THE OWNER OR THEIR REPRESENTATIVE.
18. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT T.O.S.H.A. PROVISIONS AND THE MANUAL OF ACCIDENT PREVENTION AND CONSTRUCTION, ISSUED BY THE AGC OF AMERICA, INCORPORATED, AND THE SAFETY AND HEALTH REGULATIONS OF CONSTRUCTION ISSUED BY THE U.S. DEPARTMENT OF LABOR.
19. THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE THROUGH THE SITE DURING ALL PHASES OF CONSTRUCTION.
20. CONTRACTOR SHALL REMOVE FROM THE LIMITS OF DISTURBANCE ALL UNSUITABLE MATERIAL, DEBRIS, LARGER BOULDERS, DELETTERIOUS MATERIAL, ETC. STOCKPILING OF ANY MATERIAL IN FUTURE PHASES OF THIS SUBDIVISION IS PROHIBITED WITHOUT THE EXPRESS WRITTEN CONSENT OF THE DEVELOPER AND THE ENGINEER OF RECORD. CONSENT TO PLACE ANY MATERIAL IN FUTURE PHASES OF THIS SUBDIVISION SHALL ONLY BE GRANTED UNDER THE FOLLOWING PROVISIONS:
- IF THE AREA IS CLEARED, MAINTAINED AND PROPER EROSION CONTROL MEASURES INSTALLED TO PREVENT EROSION OR SEDIMENT DEPOSITION

• MATERIAL IS PLACED AND GRADED IN A PERMANENT LOCATION THAT WILL NOT BE REQUIRED TO BE MOVED IN A FUTURE PHASE OF THIS SUBDIVISION DEVELOPMENT AND PERMANENTLY STABILIZED IN ACCORDANCE WITH TDEC AND CITY REGULATIONS.
21. ALL SOILS, REGARDLESS OF THE CHARACTER OF SURFACE AND SUBSURFACE CONDITIONS ENCOUNTERED, ARE CONSIDERED TO BE UNCLASSIFIED BY THE CONTRACTOR RECOGNIZES THAT THIS PROJECT IS LOCATED IN AN AREA WHERE ROCK ENCOUNTER IS LIKELY. THE CONTRACTOR IS RESPONSIBLE TO VISIT THE SITE, MAKE ANY TESTS, BORES, TEST PITS, SURVEYS, ETC. NECESSARY TO FAMILIARIZE HIMSELF WITH ALL SPECIFIC SITE CONDITIONS RELATED TO THIS PROJECT. NO CHANGES IN THE CONTRACT SUM OR THE CONTRACT TIME WILL BE AUTHORIZED FOR ANY ROCK ENCOUNTER, THE EXCAVATION/REMOVAL THEREOF, OR DISPOSAL OF ROCK/SOIL MIX AND/OR UNSUITABLE SOIL

STORM DRAINAGE NOTES

1. DISTANCES SHOWN ON PIPING ARE HORIZONTAL DISTANCES FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE, UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE INSTALLATION, INSPECTION, TESTING AND FINAL ACCEPTANCE OF ALL NEW STORMWATER MANAGEMENT FACILITIES CONSTRUCTION. CONTRACTOR SHALL COORDINATE WITH ALL APPLICABLE REGULATING AGENCIES CONCERNING INSTALLATION, INSPECTION AND APPROVAL OF THE STORM DRAINAGE SYSTEM CONSTRUCTION.
3. ALL STORMWATER MANAGEMENT FACILITIES, INCLUDING COLLECTION AND CONVEYANCE STRUCTURES, SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE LOCAL AND STATE CODES AND REGULATIONS.
4. THE CONTRACTOR IS TO CONSTRUCT CURBS, CATCH BASINS, PIPING, ETC. AS REQUIRED TO CONVEY THE LANDSCAPED & PAVED SURFACE DRAINAGE THROUGH THE SITE.
5. STORM SEWER PIPE LABELED "RCP" SHALL BE REINFORCED CONCRETE PIPE. ALL STORM IS TO BE INSTALLED PER CITY OF COLUMBIA REQUIREMENTS AND SPECIFICATIONS.
6. STORM SEWER IS TO BE BEDDED WITH CLEAN GRANULAR MATERIAL (AGGREGATE) CONSISTING OF AASHTO #57 OR #67 STONE. BEDDING TO BE MINIMUM OF 6" BELOW & 12" ABOVE AND ON THE SIDES OF THE PIPE OR AS REQUIRED BY CITY OF COLUMBIA INSPECTOR.
7. ALL TRENCH SPOILS SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE DESIGNATED AND SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OF OFFSITE AT NO ADDITIONAL COST TO THE OWNER IN ACCORDANCE WITH ALL LOCAL AND STATE CODES AND PERMIT REQUIREMENTS.
8. CONTRACTOR SHALL INCLUDE A LINE ITEM IN THEIR CONTRACT TO THE OWNER FOR REMOVAL OF ALL EROSION AND SEDIMENT CONTROL MEASURES AT THE END OF THE BOND PERIOD WITH CITY OF COLUMBIA.

EROSION AND SEDIMENT CONTROL NOTES

1. THE ISSUED NOTICE OF COVERAGE (NOC) OF THE PERMIT TO DISCHARGE CONSTRUCTION ACTIVITY STORMWATER SHALL BE POSTED NEAR THE SITE CONSTRUCTION ENTRANCE. THE CONTRACTOR SHALL HAVE THE SWPPP AND A SET OF APPROVED EPSC PLANS ON SITE AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR WILL BE REQUIRED TO SIGN THE NOTICE OF INTENT (NOI) AND SUBMIT UPDATED NOI TO THE STATE OF TENNESSEE UPON SELECTION TO COMPLETE THE CONSTRUCTION AND BE A PERMITTEE LISTED ON THE NOC.
2. PRIOR TO INSTALLATION OF EROSION CONTROL MEASURES OR INITIATION OF EARTH DISTURBING ACTIVITIES, THE CONTRACTOR SHALL CLEARLY DELINEATE THE PROPOSED LIMITS OF DISTURBANCE IN THE FIELD UTILIZING FLAGGING, STAKES, AND/OR CONSTRUCTION FENCE. NO DISTURBANCE BEYOND THESE LIMITS SHALL BE PERMITTED WITHOUT FIRST OBTAINING WRITTEN PERMISSION FROM THE ENGINEER, THE AFFECTED PROPERTY OWNER AND ANY APPLICABLE REGULATORY AGENCIES.
3. THE CONSTRUCTION ACTIVITIES ANTICIPATED FOR THIS PROJECT INCLUDES GRADING, PAVING, AND UTILITY INSTALLATION.
4. ANY INCREASE IN THE APPROXIMATE TOTAL DISTURBED AREA SHALL BE APPROVED BY TDEC PRIOR TO ADDITIONAL DISTURBANCE.
5. CONSTRUCTION SHALL BE SEQUENCED BY THE CONTRACTOR AS TO MINIMIZE EXPOSURE TIME OF CLEARED SURFACE AREAS. PERIMETER EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE AND FUNCTIONAL PRIOR TO EARTH MOVING OPERATIONS.
6. THE CONTRACTOR SHALL DESIGNATE IN WRITING THE NAME AND PHONE NUMBER OF THE PERSON(S) RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL ROLS AT THE SITE. THIS INFORMATION SHALL BE POSTED AT THE JOB SITE TRAILER, OR AT THE SITE CONSTRUCTION SIGN.
7. PRE-CONSTRUCTION VEGETATIVE GROUNDCOVER SHALL NOT BE REMOVED MORE THAN 14 DAYS PRIOR TO COMMENCEMENT OF GRADING OR CONSTRUCTION. IF THE CONTRACTOR IS REQUIRED TO REMOVE MORE THAN 14 DAYS SHALL BE COVERED WITH TEMPORARY GRASS, SOD, STRAW, MULCH, OR FABRIC MATTING. STEEP SLOPES (GREATER THAN 3%) SHALL BE TEMPORARILY STABILIZED NOT LATER THAN 7 DAYS AFTER CONSTRUCTION ACTIVITY ON THE SLOPE HAS TEMPORARILY OR PERMANENTLY CEASED. PERMANENT SOIL STABILIZATION SHALL BE INSTALLED WITHIN 15 DAYS OF THE ESTABLISHMENT OF FINAL GRADES.

8. THE CONTRACTOR SHALL MAINTAIN RECORDS OF EROSION AND SEDIMENT CONTROL FOR A PERIOD OF THREE YEARS AFTER COMPLETION OF CONSTRUCTION OR AS REQUIRED BY GOVERNING AUTHORITIES.
9. TEMPORARY SEEDING FOR THIS PROJECT SHALL UTILIZE TODD, TDEC OR LOCAL STANDARDS UNLESS OTHERWISE INDICATED HEREON.
10. MULCHING SHALL CONSIST OF LOOSE HAY OR STRAW APPLIED AT A RATE OF 2 TONS PER ACRE. MULCH MUST BE CRIMPED INTO THE SOIL BY MECHANICAL MEANS. BROADCAST SPREADING OF MULCH IS NOT ACCEPTABLE.
11. SOIL STOCKPILES SHALL BE STABILIZED AND PROTECTED FROM EROSION. ALL STOCKPILES SHALL BE COVERED WITH TEMPORARY SEEDING AND PROTECTED WITH SILT FENCING.
12. FOR PERMANENT STABILIZATION OF ALL SLOPES 3:1 OR STEEPER, INSTALL TEMPORARY EROSION CONTROL BLANKET (TENSAR NORTH AMERICAN GREEN TOP-10 OR APPROVED EQUAL) INSTALLED PER MANUFACTURERS' RECOMMENDATIONS SHALL BE USED IN PLACE OF STRAW MULCH.
13. FOR PERMANENT STABILIZATION OF DRAINAGE SWALES, INSTALL TURF REINFORCEMENT MATTING (TENSAR NORTH AMERICAN GREEN SC260 OR APPROVED EQUAL) PER MANUFACTURERS' RECOMMENDATIONS.
14. FOR PERMANENT STABILIZATION OF PERMANENT DETENTION POND, INSTALL SOD PER MANUFACTURERS' RECOMMENDATIONS. SOD SHALL BE AS FOLLOWS: SOD SHALL BE HIGH-QUALITY TURF TYPE TALL FESCUE OF KNOWN GENETIC ORIGIN. FREE OF NOXIOUS WEEDS, DISEASE, AND INSECT PROBLEMS. SOD SHALL APPEAR HEALTHY AND VIGOROUS, AND CONFORM TO ALL SPECIFICATIONS IN THE TDEC SEDIMENT AND EROSION CONTROL HANDBOOK, LATEST EDITION.
15. THE LOCATION OF SOME OF THE EROSION CONTROL MEASURES MAY NEED TO BE ALTERED DUE TO CHANGING SITE CONDITIONS COMMENSURATE WITH PROGRESS OF THE WORK. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCOMPLISH EROSION AND SEDIMENT CONTROL FOR ALL DRAINAGE PATTERNS CREATED AT VARIOUS STAGES OF CONSTRUCTION. ANY DIFFICULTY IN CONTROLLING EROSION DURING ANY PHASE OF CONSTRUCTION SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
16. EROSION CONTROL DEVICES SHALL BE MAINTAINED UNTIL A PERMANENT GROUND COVER IS ESTABLISHED. SEEDDED AREAS MUST HAVE A MINIMUM 70% COVERAGE (ENGINEER WILL DETERMINE APPROXIMATE PERCENTAGE OF COVER) PRIOR TO REMOVAL OF THE TEMPORARY EROSION CONTROL DEVICES. FINAL SEEDING AND ESTABLISHMENT OF GROUNDCOVER SHALL BE APPLIED TO ANY AREA DISTURBED AS A RESULT OF THE REMOVAL OF THE EROSION CONTROL MEASURES.
17. CONTRACTOR SHALL PREPARE, IMPLEMENT, AND MAINTAIN A SPILL PREVENTION, CONTROL, AND COUNTERMEASURES (SPCC) PLAN, AS A SEPARATE DOCUMENT OR AS A COMPONENT OF THE SWPPP, FOR ALL TANKS/CONTAINERS STORING ONSITE FUEL, CHEMICALS, OR OTHER POLLUTANTS CONSISTENT WITH THE REQUIREMENTS OF STATE NPDES RULES. EFFECTIVE MEASURES NECESSARY TO PREVENT SPILLS AND TO CLEAN UP SPILLS OF ANY TOXIC POLLUTANT, AS DOCUMENTED IN THE FACTORY'S SPCC PLAN, SHALL BE FULLY IMPLEMENTED. SOIL, FUEL, AND OTHER HAZARDOUS SUBSTANCES, PAINTS, FUEL, OR CHEMICAL SPILLS, SHALL BE IMMEDIATELY CLEANED UP, MANAGED, AND DISPOSED OF IN AN APPROVED MANNER, WHERE POTENTIAL SPILLS CAN OCCUR. MATERIALS HANDLING PROCEDURES SHALL BE SPECIFIED AND PROCEDURES FOR IMMEDIATE CLEANUP/PREDEATION OF SPILLS SHALL BE DESCRIBED IN THE SPCC PLAN OR EMPLOYEE TRAINING PLANS. THE EQUIPMENT NECESSARY TO IMPLEMENT A CLEANUP SHALL BE MADE AVAILABLE TO FACILITY PERSONNEL. THE OPERATOR SHALL IMMEDIATELY NOTIFY THE DESIGNATED STATE AND LOCAL GOVERNMENT AGENCIES AFTER BECOMING AWARE OF A VISIBLE OIL SHEEN IN STORMWATER RUNOFF FROM ITS FACILITY OR IN A WATER OF THE STATE IN THE PROJECT VICINITY AS A RESULT OF ACTIVE OR POTENTIAL SPILL. THE CALLER SHOULD BE PREPARED TO REPORT THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE PERSON REPORTING SPILL, THE EXACT LOCATION OF THE SPILL, COMPANY NAME AND LOCATION, THE MATERIAL SPILLED, THE ESTIMATED QUANTITY, THE SOURCE OF THE SPILL, THE CAUSE OF THE SPILL, THE NEAREST DOWNSTREAM WATER WITH THE POTENTIAL TO RECEIVE THE SPILL, AND THE ACTIONS BEING TAKEN FOR CONTAINMENT AND CLEANUP.
18. ALL EROSION AND SEDIMENT CONTROL DEVICES TO BE SELECTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH TDEC SEDIMENT AND EROSION CONTROL HANDBOOK, LATEST EDITION.

SANITARY SEWER NOTES

1. ALL SANITARY SEWER (GRAVITY AND FORCE MAIN) CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CURRENT STANDARDS, SPECIFICATIONS, DETAILS AND REQUIREMENTS OF COLUMBIA POWER & WATER SYSTEMS AND TDEC.
2. THE CONTRACTOR SHALL NOTIFY TDEC AND COLUMBIA POWER & WATER SYSTEMS A MINIMUM OF 48 HOURS PRIOR TO COMMENCEMENT OF ANY PART OF THE SANITARY SEWER CONSTRUCTION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY REQUIRED LICENSES, PERMITS AND FEES ASSOCIATED WITH THE SANITARY SEWER CONSTRUCTION. ANY RELATED COSTS ARE TO BE PAID BY THE CONTRACTOR.
4. SANITARY SEWER CONSTRUCTION PLANS SHALL BE APPROVED BY COLUMBIA POWER & WATER SYSTEMS AND TDEC PRIOR TO COMMENCEMENT OF ANY PART OF THE SANITARY SEWER CONSTRUCTION. A SET OF THE STAMPED APPROVED PLANS SHALL BE KEPT ON SITE AT ALL TIMES DURING CONSTRUCTION.
5. MAINTAIN 10 FEET HORIZONTAL SEPARATION (EDGE-TO-EDGE) AND 18 INCHES OF VERTICAL SEPARATION (WATER OVER SEWER) BETWEEN SANITARY SEWERS AND WATER LINES WHERE POSSIBLE. CONTRACTOR MAY NEED TO MAKE FIELD ADJUSTMENTS TO MAINTAIN SEPARATION.
6. CONTRACTOR SHALL NOT CONNECT ANY PART OF THE PROPOSED SANITARY SEWER SYSTEM TO THE EXISTING SANITARY SEWER SYSTEM PRIOR TO INSPECTION AND APPROVAL BY COLUMBIA POWER & WATER SYSTEMS INSPECTOR.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING, IN THE FIELD, ALL EXISTING UTILITIES BEFORE THE START OF CONSTRUCTION. ANY DAMAGE TO THE EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND REPAIRED AT HIS EXPENSE.
8. CONTRACTOR SHALL COORDINATE ALL UTILITY CONSTRUCTION TO ELIMINATE CONFLICTS.
9. SEWER SERVICE LINES SHALL BE SDR 35 P.V.C. (SERVICE LINE MATERIAL SHALL MATCH CORRESPONDING SEWER MAIN MATERIAL) AT A MINIMUM SLOPE OF 1/8"=12". LINES SHALL BE EXTENDED 1 FOOT BEYOND THE EASEMENT, PROPERTY LINE OR SIDEWALK AS SHOWN ON PLANS AND PLUGGED & MARKED AS REQUESTED BY COLUMBIA POWER & WATER SYSTEMS. SERVICE CONNECTIONS TO THE MAIN WILL BE TEE OR WYE CONNECTED.
10. ALL MANHOLES IN ROADWAY SHALL BE BACKFILLED WITH STONE. ALL SEWER LINES SHALL HAVE A CRUSHED STONE ENVELOPE WHICH CONSISTS OF AASHTO #57 OR #67 STONE.
11. A SET OF AS-BUILT DRAWINGS SHALL BE REQUIRED SHOWING THE UTILITY IMPROVEMENTS. CONTRACTOR SHALL MAINTAIN A RECORD OF ALL INSTALLED SEWER SERVICES LABELING DISTANCE TO DOWNSTREAM MANHOLE, LENGTH OF SERVICE AND DEPTH OF SERVICE. THE AS-BUILT DRAWING SHALL BE PROVIDED TO THE ENGINEER UPON COMPLETION.
11. ANY CHANGE TO THE PLANS SHALL BE APPROVED IN WRITING BY COLUMBIA POWER & WATER SYSTEMS PRIOR TO CONSTRUCTION.
13. SHOP DRAWINGS OF THE MATERIALS USED TO CONSTRUCT THIS PROJECT SHALL BE APPROVED BY COLUMBIA POWER & WATER SYSTEMS PRIOR TO CONSTRUCTION.
14. IN CASE OF CONFLICT BETWEEN THE DRAWINGS AND SPECIFICATIONS, THE SPECIFICATIONS SHALL GOVERN. FIGURE DIMENSIONS ON DRAWINGS SHALL GOVERN OVER SCALE DIMENSIONS, AND DETAILED DRAWINGS SHALL GOVERN OVER GENERAL DRAWINGS.
15. ANY DISCREPANCIES FOUND BETWEEN THE DRAWINGS AND SPECIFICATIONS AND SITE CONDITIONS OR ANY INCONSISTENCIES OR AMBIGUITIES IN THE DRAWINGS AND SPECIFICATIONS SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER. IN WRITING, WHO SHALL PROMPTLY CORRECT SUCH INCONSISTENCIES OR AMBIGUITIES IN WRITING. WORK DONE BY THE CONTRACTOR AFTER HIS DISCOVERY OF SUCH DISCREPANCIES, INCONSISTENCIES OR AMBIGUITIES SHALL BE DONE AT THE CONTRACTOR'S RISK.
16. CONTRACTOR SHALL NOTIFY COLUMBIA POWER & WATER SYSTEMS TO SCHEDULE A PRE-CONSTRUCTION CONFERENCE PRIOR TO BEGINNING ANY CONSTRUCTION.
17. THE CONTRACTOR SHALL SUBMIT CUT SHEETS TO COLUMBIA POWER & WATER SYSTEMS FOR PROPOSED SEWER LINES PRIOR TO BEGINNING CONSTRUCTION.
18. CONTRACTOR MUST PROVIDE GRAVEL FILL TO SUBGRADE WHEN SANITARY SEWER IS WITHIN THE ROADWAY.
19. GRAVITY SEWER LINES TO BE SDR 26 PVC UNLESS OTHERWISE NOTED.
20. FORCE MAIN SEWER LINES SHALL BE MADE FROM CLEAN, VIRGIN, NSF APPROVED, TYPE I, GRADE I POLYVINYL CHLORIDE (PVC), CONFORMING TO ASTM RESIN SPECIFICATION D-1784. ALL PIPE SHALL MEET OR EXCEED MINIMUM REQUIREMENTS OF ASTM D-2241 FOR TYPE 1120 MATERIAL. MINIMUM SDR26 WALL THICKNESS UNLESS OTHERWISE NOTED.
21. SANITARY SEWER GRAVITY MAINS, FORCE MAINS, SERVICE LINES AND MANHOLES SHALL BE TESTED IN ACCORDANCE WITH COLUMBIA POWER & WATER SYSTEMS REQUIREMENTS.
22. FORCE MAIN IS TO BE CONSTRUCTED WITH AN UP-SLOPE GRADE FROM BEGINNING TO END, LAYING UP-SLOPE TO A POINT, TURNING DOWN, AND RISING AGAIN IS NOT ALLOWED WITHOUT INSTALLING AN AIR-VACUUM RELEASE VALVE.
23. CONTRACTOR SHALL INSTALL THRUST BLOCKS WHEREVER THE FORCE MAIN CHANGES DIRECTION, (E.G. TEES AND BENDS), AT DEAD ENDS, OR AT ANY OTHER POINT WHERE THE MANUFACTURER RECOMMENDS AND/OR THE UTILITY PROVIDER INDICATES THRUST BLOCKS ARE TO BE USED.
24. FOR DETECTION PURPOSES OF FORCE MAIN, METALLIC TAPE OR SIMILAR DEVICE SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. THE METALLIC TAPE SHALL BE TERRA TAPE OR EQUAL AND SHALL BE COMPATIBLE WITH THE UTILITY PROVIDERS LOCATION EQUIPMENT.
25. ALL FORCE MAIN TRENCHES SHALL BE BACKFILLED AND STABILIZED DAILY PRIOR TO CONTRACTOR LEAVING THE SITE.
26. FORCE MAIN TRENCHES SHALL BE EXCAVATED TO SUFFICIENT DEPTH TO PERMIT A MINIMUM OF 30" OF COVER TO BE MAINTAINED OVER THE TOP OF THE SEWER FORCE MAINS UNLESS OTHERWISE NOTED.

UTILITY NOTES

1. ALL GAS, ELECTRIC, TELEPHONE, AND CABLE SERVICE LINES AND EXTENSIONS ARE TO BE CONSTRUCTED TO THE RESPECTIVE UTILITY COMPANY SPECIFICATIONS. UTILITY DISCONNECTIONS TO BE COORDINATED WITH THE APPROPRIATE UTILITY COMPANY.
2. ALL WATER LINE AND APPURTENANCE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CURRENT STANDARDS, SPECIFICATIONS, DETAILS AND REQUIREMENTS OF MLCROFTON UTILITY DISTRICT.
3. THE GENERAL CONTRACTOR IS PARTICULARLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF THE EXISTING UTILITIES SHOWN HEREON IS BASED ON UTILITY COMPANY RECORDS, AND WHERE POSSIBLE, FIELD MEASUREMENTS. THE CONTRACTOR SHALL NOT RELY UPON THIS INFORMATION AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION AND REQUEST FIELD VERIFICATION OF UTILITY LOCATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE TO RELOCATE EXISTING UTILITIES COMPY WITH IMPROVEMENTS SHOWN HEREON IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS GOVERNING SUCH OPERATIONS.
4. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE SEQUENCING OF CONSTRUCTION FOR ALL UTILITY LINES SO THAT WATER LINES, GAS LINES, AND UNDERGROUND ELECTRIC DO NOT CONFLICT WITH SANITARY SEWERS OR STORM SEWERS. INSTALL UTILITIES PRIOR TO PAVEMENT CONSTRUCTION.
6. ALL TRENCH SPOILS SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE DESIGNATED AND SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OF OFFSITE (INCLUDING ALL CHARTER COMMERCIAL, LLC PROPERTY OR FUTURE PHASES OF HIGH PARK HILL SUBDIVISION) AT NO ADDITIONAL COST TO THE OWNER IN ACCORDANCE WITH ALL LOCAL AND STATE CODES AND PERMIT REQUIREMENTS.
7. ROOF DRAINS, FOUNDATION DRAINS AND ALL OTHER CLEAR WATER CONNECTIONS TO THE SANITARY SEWER SYSTEMS ARE PROHIBITED.
8. THE CONTRACTOR SHALL PROVIDE RECORD DRAWINGS OF ALL IMPROVEMENTS. INCLUDE AT LEAST TWO DIMENSIONS TO EACH VALVE AND MANHOLE FROM KNOWN SITE FEATURES. DRAWINGS SHALL INCLUDE HORIZONTAL AND VERTICAL INFORMATION ON ALL NEW UTILITIES AS WELL AS EXISTING UTILITIES ENCOUNTERED.
9. CONTRACTOR TO INSTALL CONDUIT SYSTEMS FOR UNDERGROUND ELECTRIC, TELEPHONE AND CABLE SERVICES IN ACCORDANCE WITH UTILITY COMPANIES' REQUIREMENTS, INCLUDING PULL CORDS INSIDE CONDUITS AND HIGHWAY LOAD-BEARING PULL BOXES AND MANHOLES.
10. CONTRACTOR SHALL INSTALL PAD(S) FOR TRANSFORMER(S) AND CONDUITS FOR UNDERGROUND ELECTRIC SERVICE IN ACCORDANCE WITH ELECTRIC COMPANY'S REQUIREMENTS.
11. LOCATION OF PROPOSED CONDUITS SHALL BE COORDINATED AND APPROVED BY THE LOCAL PROVIDER PRIOR TO INSTALLATION.
12. THE CONTRACTOR SHALL PAY ANY APPLICABLE WATER AND SEWERAGE SERVICES INSPECTION FEES.
13. ANY, AND ALL FEES, LICENSES, AND PERMITS NECESSARY FOR THIS CONSTRUCTION ARE TO BE OBTAINED PRIOR TO INITIATION OF CONSTRUCTION AND THE COST OF SAME TO BE BORNE BY THE CONTRACTOR.
14. CONTRACTOR SHALL EXERCISE EXTREME CAUTION IN THE USE OF EQUIPMENT IN AND AROUND OVERHEAD AND UNDERGROUND ELECTRICAL WIRES AND SERVICES. IF AT ANY TIME IN THE PURSUIT OF THIS WORK, THE CONTRACTOR MUST WORK IN THE CLOSE PROXIMITY OF THE ABOVE-NOTED ELECTRICAL WIRES, THE ELECTRIC COMPANY SHALL BE CONTACTED PRIOR TO SUCH WORK AND THE PROPER SAFETY MEASURES TAKEN. A THOROUGH EXAMINATION OF THE OVERHEAD AND UNDERGROUND WIRES IN THE PROJECT AREA SHOULD BE MADE BY THE CONTRACTOR PRIOR TO THE INITIATION OF CONSTRUCTION.
15. THE LOCATIONS OF UTILITIES SHOWN WITHIN THESE PLANS ARE APPROXIMATE ONLY. EXACT LOCATIONS SHALL BE DETERMINED IN THE FIELD BY CONTACTING THE UTILITY COMPANIES INVOLVED. NOTIFICATION BY CALLING THE TENNESSEE ONE CALL SYSTEM, INC., AT 1-800-351-1111 AS REQUIRED BY TCA 65-1-106 WILL BE REQUIRED. IN ADDITION ALL OTHER AGENCIES THAT MAY HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NON-MEMBERS OF TENNESSEE 811 SHALL BE NOTIFIED.
16. ADJUST ALL EXISTING UTILITY SURFACE FEATURES TO REMAIN INCLUDING BUT NOT LIMITED TO CASTINGS, VALVE BOXES, PEDESTALS, CLEANOUTS, ETC. AS NEEDED TO MATCH PROPOSED FINISHED GRADES, UNLESS OTHERWISE INDICATED.
17. CONTRACTOR SHALL INSTALL A 4" SCHEDULE 40 PVC CONDUIT FOR UNITED COMMUNICATIONS THAT FOLLOWS THE ITEMTC MAIN RUNS AND IS INSTALLED IN THE SAME TRENCH AS THE ITEMTC MAIN RUN CONDUIT. UNITED COMMUNICATIONS CONDUIT SHALL ONLY BE INSTALLED AFTER INSTALLATION OF ITEMTC CONDUIT AND APPROVAL OF BACKFILL COVERING ITEMTC CONDUIT. FOR ITEMTC CONDUIT RUNS THAT CROSS STREETS OR BACK FEED, CONTRACTOR SHALL INSTALL A 2" SCHEDULE 40 PVC CONDUITS FOR UNITED COMMUNICATIONS. ALL MATERIALS SHALL BE FURNISHED BY THE CONTRACTOR.

ABBREVIATIONS

TYP	TYPICAL
ELEV	ELEVATION
REF	REFERENCE
DIA	DIAMETER
NTS	NOT TO SCALE
UG	UNDERGROUND
SAN	SANITARY SEWER
WTR	WATER
PVC	POLYVINYL CHLORIDE
EP	EDGE OF PAVEMENT
FC	FACE OF CURB
FOG	FACE OF GUTTER
OC	ON CENTER
LP	LOW POINT
EX	EXISTING
CONT	CONTINUOUS
MBSL	MINIMUM BUILDING SETBACK LINE
PUDE	PUBLIC UTILITY AND DRAINAGE EASEMENT
PUDAE	PUBLIC UTILITY, DRAINAGE, AND ACCESS EASEMENT
TDOT	TENNESSEE DEPARTMENT OF TRANSPORTATION
CPWS	COLUMBIA POWER & WATER SYSTEMS
MUDEE	MLCROFTON UTILITY DISTRICT EXCLUSIVE EASEMENT
EPSC	EROSION PREVENTION AND SEDIMENT CONTROL
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
SPCC	SPILL PREVENTION, CONTROL AND COUNTERMEASURES

DESCRIPTION

DATE

REVISION #

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10/16/23

ATTHEW W. BRUNTT
REGISTERED PROFESSIONAL ENGINEER
No. 0000000000
STATE OF TENNESSEE

SITE PLANS FOR
MACKENZIE PLACE
TAX MAP 908, GROUP B, PARCEL 47-00
220 THETA PIKE
CITY OF COLUMBIA
MAURY COUNTY, TENNESSEE

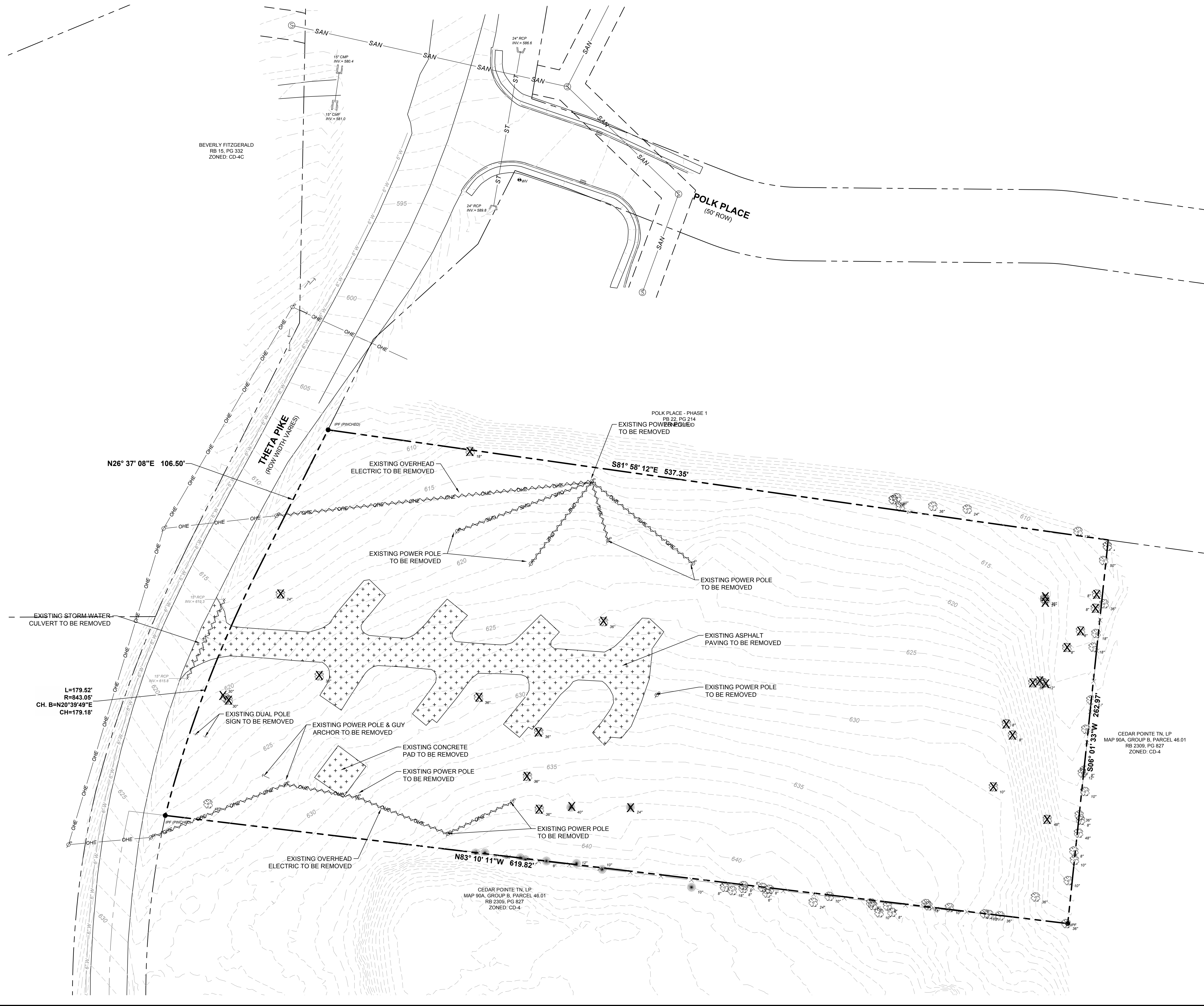
MPA GROUP

P.O. BOX 848
FRANKLIN, TN 37065
WWW.M2GROUPLLC.COM

GENERAL NOTES

DATE: OCTOBER 16, 2023
DRAWN BY: M2G
CHECKED BY: MWB
PROJECT NO.: 22-085

SHEET NUMBER:
C001



LEGEND

- ASPHALT REMOVAL
- UTILITY REMOVAL
- TREE REMOVAL
- EXISTING PROPERTY LINE
- EXISTING ADJACENT PROPE
- EXISTING INDEX CONTOUR
- EXISTING OVERHEAD ELECT
- EXISTING SANITARY SEWER I
- EXISTING TREELINE
- EXISTING SPOT ELEVATION
- EXISTING STORM SEWER LIN
- FIRE HYDRANT
- WATER METER
- TREE, DECIDUOUS
- TREE, CONIFER
- IRON PIPE FOUND (IPF)
- SANITARY MANHOLE
- WATER BOX (WATER VALVE)
- POWER POLE
- CURB INLET

SURVEYOR'S NOTES

- BEARINGS ARE BASED ON THE TENNESSEE STATE PLANE COORDINATE SYSTEM (NAD83, 2011).
- THE FIELD SURVEY WAS COMPLETED ON MAY, 2022.
- THIS SURVEY WAS PREPARED USING THE CURRENT DEEDS AND PLATS OF RECORD.
- ALL DEED BOOK AND PLAT REFERENCES PERTAIN TO THE REGISTERS OFFICE FOR MAURY COUNTY, TENNESSEE.
- ADJOINING PROPERTY LINES SHOWN WERE PLOTTED FROM INFORMATION TAKEN FROM EITHER DEED DESCRIPTION, RECORD PLATS, OR TAX MAPS.
- PROPERTY CORNERS SET THIS SURVEY ARE 18" #4 REBAR WITH ORANGE PLASTIC CAP STAMPED "M2 GROUP", 18" #6 REBAR WITH YELLOW PLASTIC CAP STAMPED "M2 GROUP, LLC", OR PK NAIL WITH STAINLESS STEEL WASHER STAMPED "M2 GROUP, LLC", UNLESS NOTED OTHERWISE.
- UTILITIES SHOWN HEREON WERE COMPILED FROM VISIBLE STRUCTURES AT THE SITE, INFORMATION FROM PLANS, AND PHYSICAL MARKINGS AND COMBINED TO DEVELOP A VIEW OF THE UNDERGROUND UTILITIES. HOWEVER, LACKING EXCAVATION, THE EXACT LOCATION OF UNDERGROUND FEATURES CANNOT BE ACCURATELY, COMPLETELY, AND RELIABLY DEPICTED. IN ADDITION, IN SOME JURISDICTIONS, 811 OR OTHER SIMILAR UTILITY LOCATE REQUESTS FROM SURVEYORS MAY BE IGNORED OR RESULT IN AN INCOMPLETE RESPONSE. THIS SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THIS SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. VERIFICATION OF EXISTENCE, LOCATIONS, AND DEPTH SHOULD BE MADE BEFORE CONDUCTING ANY EXCAVATION IN THE VICINITY OF THE UTILITY.
- THE PROPERTY SHOWN HEREON IS LOCATED IN A FLOOD HAZARD ZONE "X" (AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN) ACCORDING TO F.I.R.M. MAP "MAURY COUNTY, TENNESSEE" PANEL 170 OF 440, MAP NUMBER 47119C0170E, EFFECTIVE DATE APRIL 16, 2007.
- NO TITLE REPORT WAS PROVIDED TO THIS SURVEYOR REGARDING THE SUBJECT PROPERTIES. THEREFORE, THIS SURVEY IS SUBJECT TO THE FINDINGS OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH AND REPORT MAY DISCLOSE.

REFERENCE

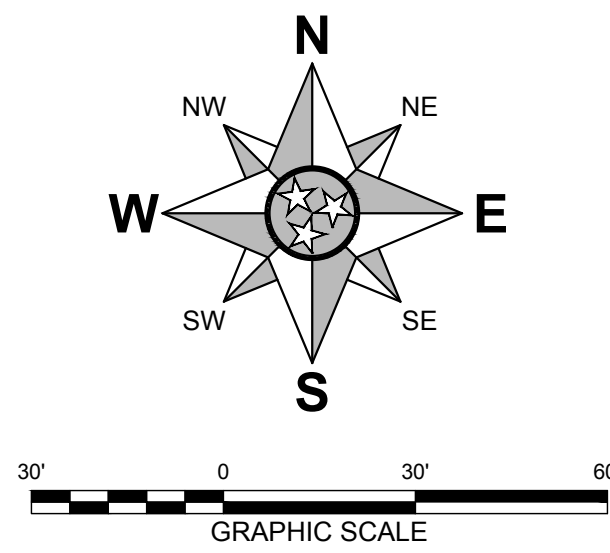
SEE SEE C001 FOR GENERAL AND DEMOLITION NOTES.

FLOODPLAIN NOTE:

THE PROPERTY SHOWN HEREON IS LOCATED IN A FLOOD HAZARD ZONE "X" (AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN) ACCORDING TO F.I.R.M. MAP "MAURY COUNTY, TENNESSEE" PANEL 170 OF 440, MAP NUMBER 47119C0170E, EFFECTIVE DATE APRIL 16, 2007.



DESCRIPTION	
DATE	
REVISION #	
SITE PLANS FOR: MACKENZIE PLACE TAX MAP 90B, GROUP B, PARCEL 47.00 220 THETA PIKE CITY OF COLUMBIA MAURY COUNTY, TENNESSEE	
EXISTING CONDITIONS & DEMOLITION PLAN	
DATE:	OCTOBER 16, 2023
DRAWN BY:	M2G
CHECKED BY:	MWB
PROJECT NO.:	22-085
SHEET NUMBER: C100	



BEVERLY FITZGERALD
RB 15, PG 332
ZONED: CD-4C

ZONING: GCS

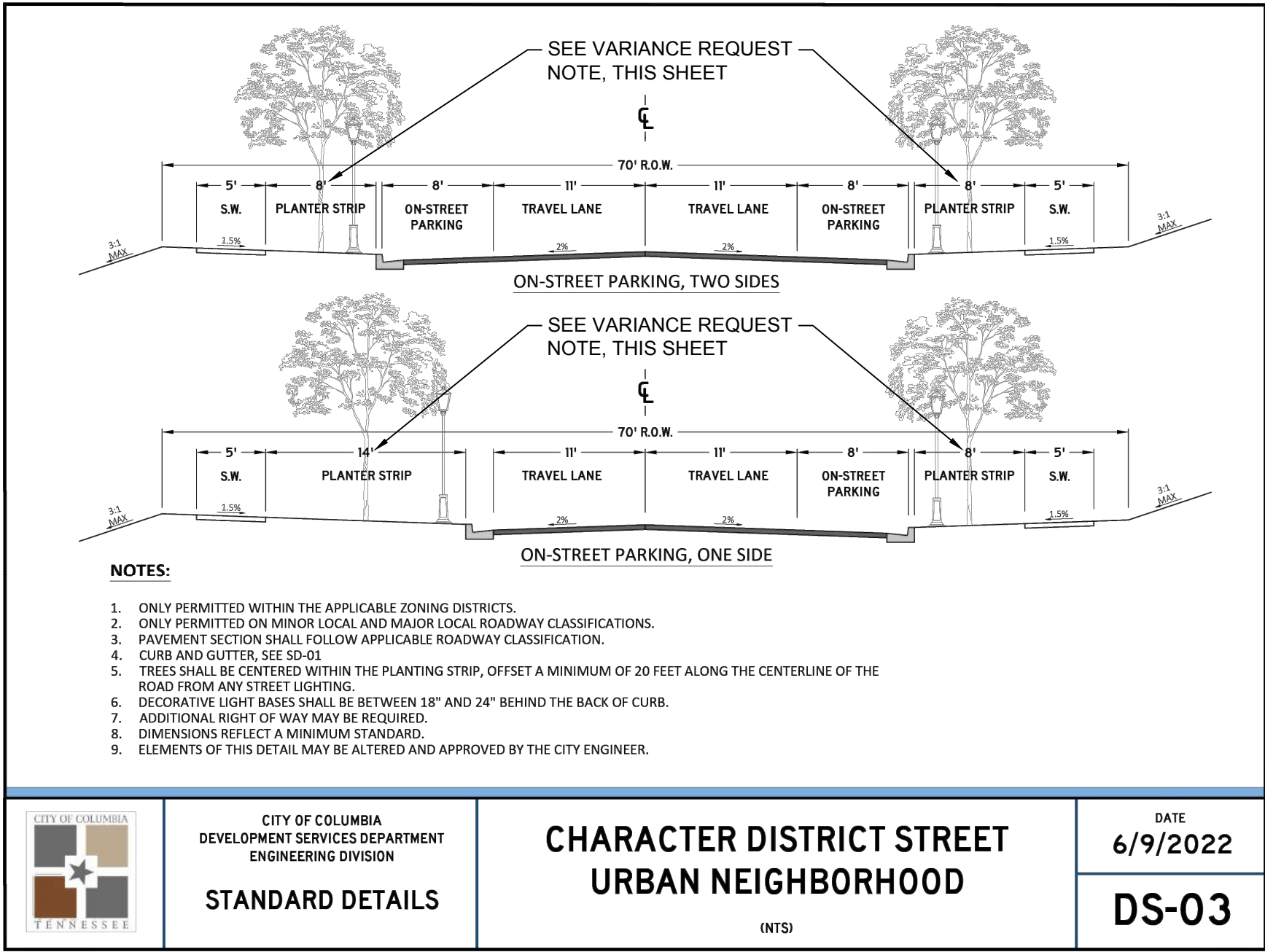
N26° 37' 08"E 106.50'

L=179.52'
R=843.05'
CH. B=N20°39'49"E
CH=179.18'

CEDAR POINTE TN, LP
MAP 90A, GROUP B, PARCEL 46.01
RB 2309, PG 827
ZONED: CD-4

POLK PLACE - PHASE 1
PB 22, PG 214
ZONED: PUD

CEDAR POINTE TN, LP
MAP 90A, GROUP B, PARCEL 46.01
RB 2309, PG 827
ZONED: CD-4



SITE PLAN KEY NOTES

1. 2' WIDE x 18' LONG THERMOPLASTIC STOP BAR
2. STOP / STREET SIGN (REF. SHEET C600)
3. PROPOSED LIGHT POLE/FIXTURE, SEE SITE PHOTOMETRICS PLAN
4. 5' CONCRETE SIDEWALK (REF SHEET C600)
5. CURB AND GUTTER (TYP.) (REF. SHEET C600)
6. CURB TAPER (REF. SHEET C6.0)
7. ADA RAMP (REF. SHEET C6.0)
8. 2' WIDE CURB CUT
9. UNIT PARKING (2 SPACES PER UNIT)
10. NO PARKING SIGN

LOCAL NOTE:

1. PROJECT IS INTENDED TO BE PLATTED AND RECORDED UNDER THE HORIZONTAL PROPERTY REGIME STANDARDS OF THE STATE OF TENNESSEE. THEREFORE A PRELIMINARY PLAT AND FINAL PLAT ARE NOT REQUIRED.
2. DURING FINAL ARCHITECTURAL / BUILDING PERMIT PHASE, PLAN WILL DEMONSTRATE MINIMUM INTERIOR DIMENSION TO MEET CITY STANDARDS.

SITE DATA TABLE

ZONING	CD-4
TOTAL LOT AREA	3.59 AC.
TOTAL NUMBER OF UNITS	32 EA.
DENSITY	8.91 UNITS / AC.
PARKING SPACES REQUIRED	64 EA.
PARKING SPACES PROVIDED	77 EA.
FRONT YARD SETBACK	6' - 20' L.F.
SIDE YARD SETBACK	0 L.F.
REAR YARD SETBACK	6 L.F.

VARIANCE REQUEST:

THIS PLAN DEPICTS THE ALLOWANCE OF A REQUESTED VARIANCE OF THE 14' PLANTER STRIP TO A 5' PLANTER STRIP.

REVISION #

DATE

DESCRIPTION

DATE:

OCTOBER 16, 2023

DRAWN BY:

M2G

PROJECT NO.:

22-085

CHECKED BY:

MWB

SITE LAYOUT PLAN

SHEET NUMBER:

C200

SITE PLANS FOR:

MACKENZIE PLACE

TAX MAP 90B, GROUP B, PARCEL 47.00

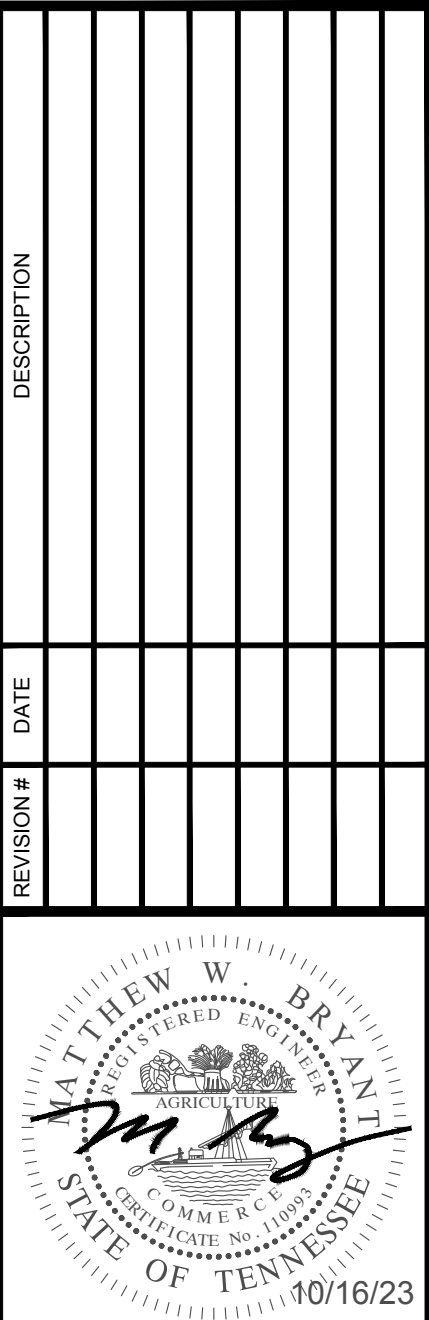
220 THETA PIKE

CITY OF COLUMBIA

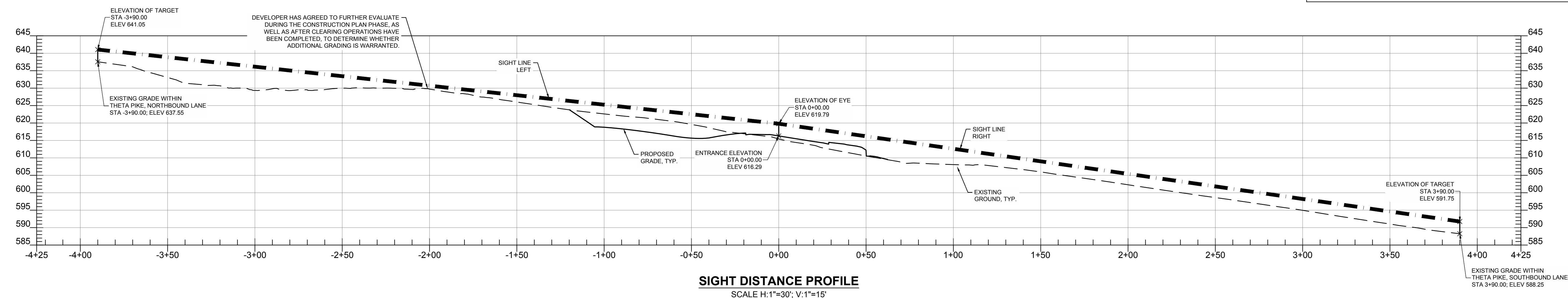
MAURY COUNTY, TENNESSEE

811

Know what's below.
Call before you dig.

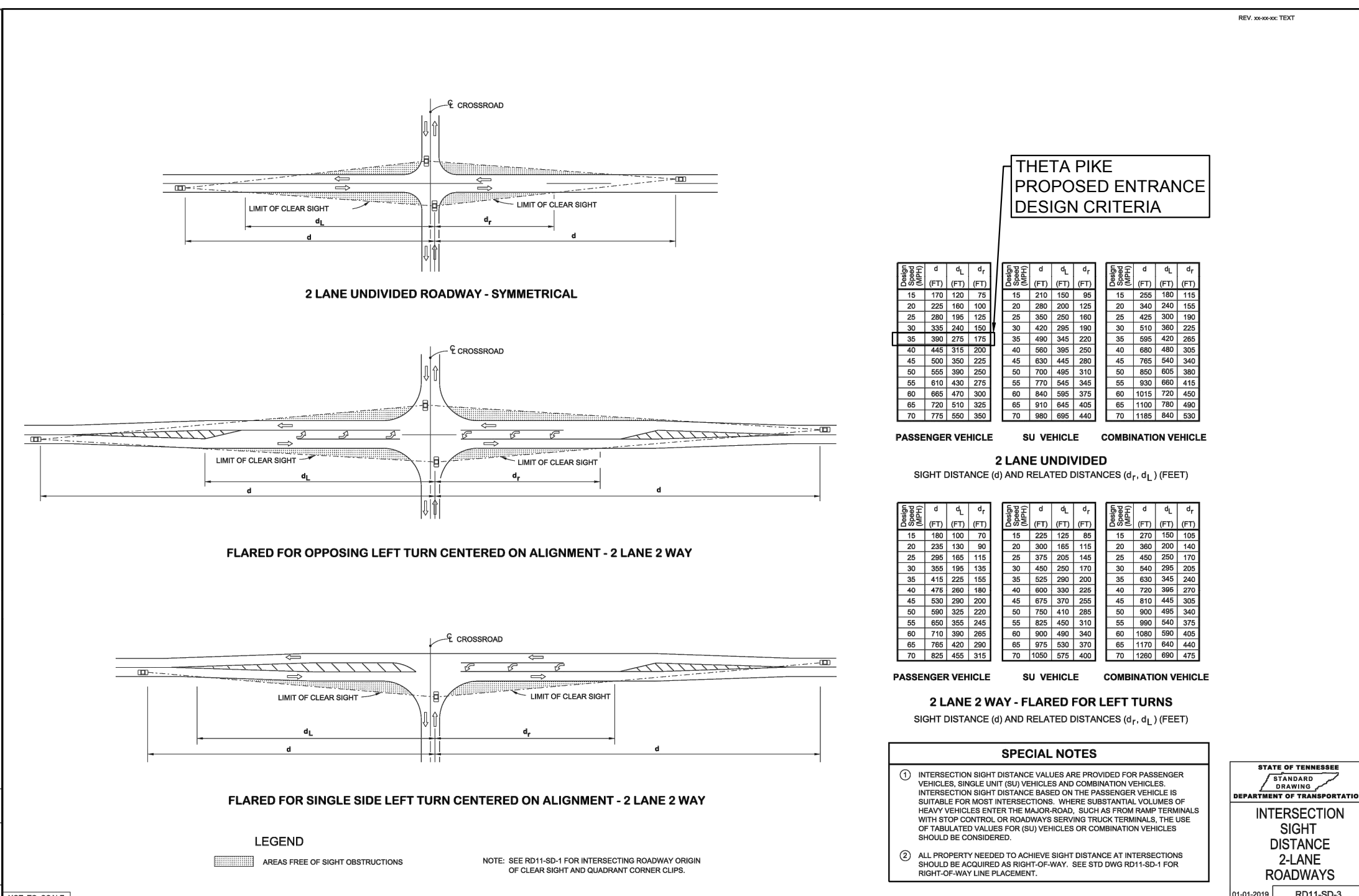
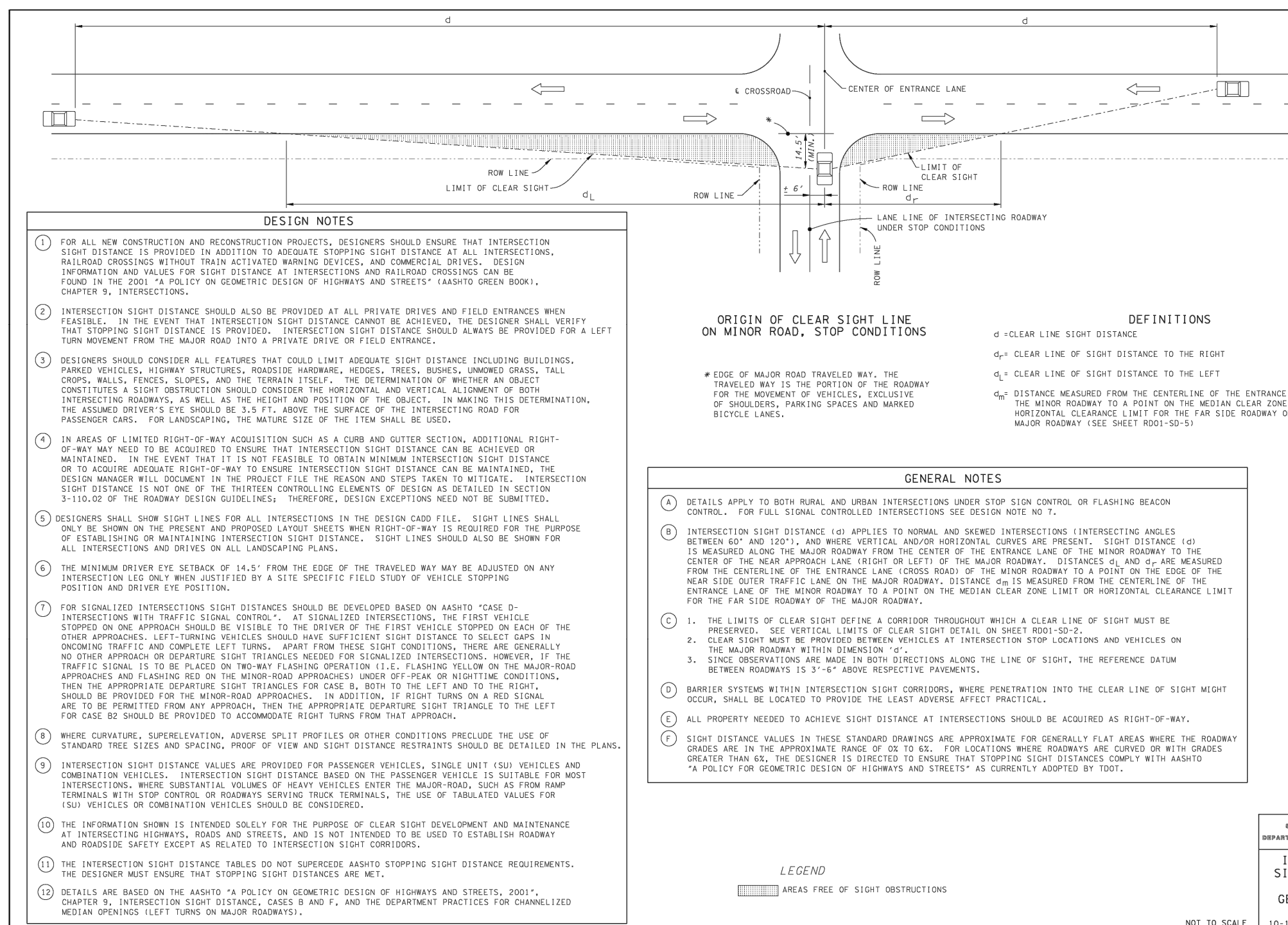


SITE PLANS FOR:
MACKENZIE PLACE
TAX MAP 90B, GROUP B, PARCEL 47.00
220 THETA PIKE
CITY OF COLUMBIA
MAURY COUNTY, TENNESSEE



SIGHT DISTANCE PROFILE

SCALE H:1"=30'; V:1"=15'



NORTHBOUND STOPPING SIGHT DISTANCE ANALYSIS:

DESIGN SPEED, V: 35 MPH
GRADE, G: -6% (AVERAGE)

STOPPING SIGHT DISTANCE, S: $S = 1.47 * V * 2.5 + [V^2 / (30 * (0.347826 \pm (G / 100)))]$
 $S = 1.47 * 40 * 2.5 + [35^2 / (30 * (0.347826 + (-6 / 100)))]$
 $S = 270.49 \text{ FT.} = 271 \text{ FT.}$

SOUTHBOUND STOPPING SIGHT DISTANCE ANALYSIS:

DESIGN SPEED, V: 35 MPH
GRADE, G: +7% (AVERAGE)

STOPPING SIGHT DISTANCE, S: $S = 1.47 * V * 2.5 + [V^2 / (30 * (0.347826 \pm (G / 100)))]$
 $S = 1.47 * 35 * 2.5 + [35^2 / (30 * (0.347826 + (7 / 100)))]$
 $S = 226.35 \text{ FT.} = 227.00 \text{ FT.}$



Know what's below.
Call before you dig.

INTERSECTION SIGHT DISTANCE PLAN

DATE :	OCTOBER 16, 2023	DRAWN BY :
PROJECT NO. :	22-085	CHECKED BY :

SHEET NUMBER

C201



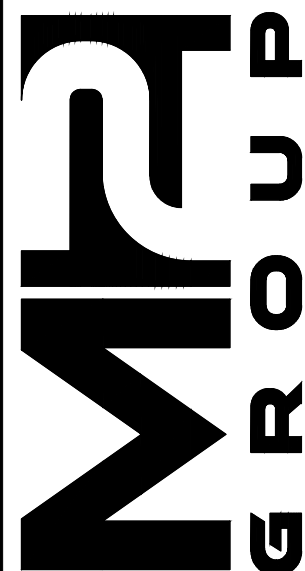
THE PROPERTY SHOWN HEREON IS LOCATED IN A FLOOD HAZARD ZONE "X" (AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN) ACCORDING TO F.I.R.M. MAP "MAURY COUNTY, TENNESSEE" PANEL 170 OF 440, MAP NUMBER 47119C0170E, EFFECTIVE DATE APRIL 16 2007.

RETAINING WALL NOTE:

SPOT ELEVATIONS AT BOTTOM OF RETAINING WALLS REPRESENTS GROUND LEVEL ELEVATION, NOT THE TOP OF FOOTER. RETAINING WALLS ARE TO BE DESIGNED BY OTHERS.

STORM SEWER NOTE:

STORM SEWER STRUCTURES ARE SHOWN FOR GRAPHICAL PURPOSES ON THIS SHEET. SEE PIPE AND STRUCTURE TABLES ON SHEET C305 FOR ACTUAL STORM STRUCTURE SIZING AND DETAILS.



OVERALL GRADING & DRAINAGE PLAN

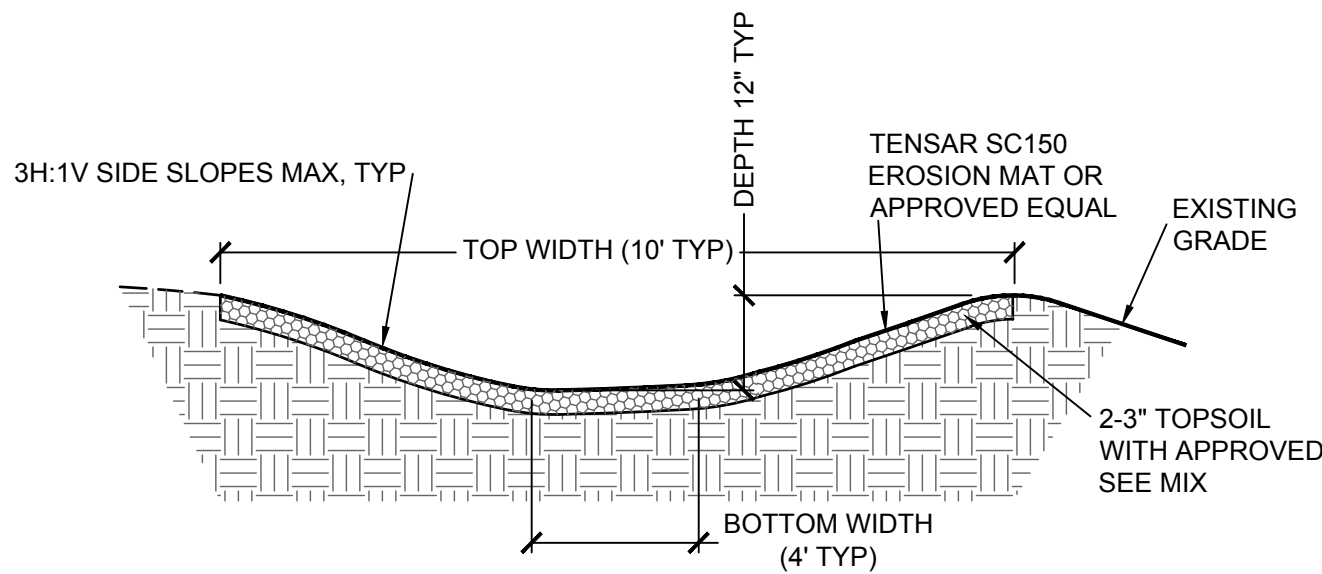
DATE :	OCTOBER 16, 2023	DRAWN BY :	M2G
PROJECT NO. :	22-085	CHECKED BY :	MWB

SHEET NUMBER

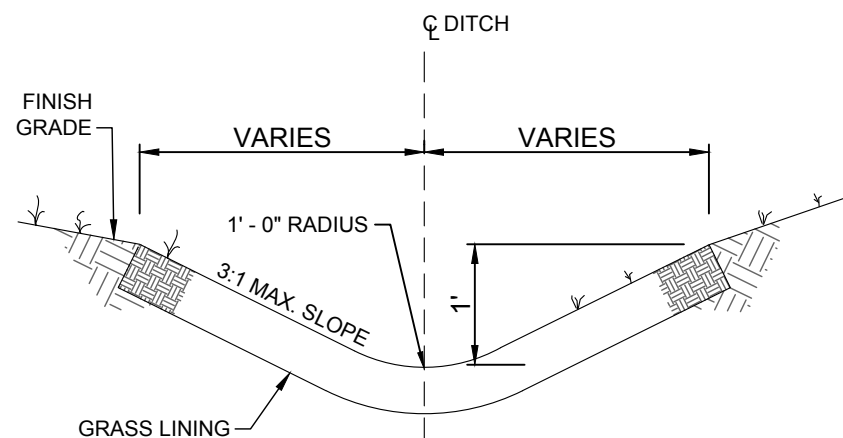
C300



Know what's below.
Call before you dig.



NORTH GRASS SWALE SECTION
N.T.S.



SOUTH GRASS SWALE SECTION
N.T.S.

TYPE	TDOT STANDARD DRAWING OR CASTING MODEL
CURB INLET CATCH BASINS	TDOT CB SERIES NOS. 10, 11, 12, 13, 14, 16, 17
CURB AND GUTTER INLET CASTINGS	JB&S 3080
EXTRUDED CURB INLET CASTINGS	JB&S 3103
AREA DRAIN CATCH BASINS	TDOT CB SERIES NOS. 38, 39, 40, 42, 43
AREA DRAIN CASTINGS	TDOT CBB-42
JUNCTION BOXES	TDOT JBS SERIES NOS. 1, 2, 3, 4, AND 5
MANHOLES	TDOT MH SERIES NOS. 2, 3, 4, 5, 6, 7 AND TDOT RF-1
TRENCH DRAINS	TDOT TD-1
CONCRETE PIPE INSTALLATION	TDOT PB-1
FLEXIBLE PIPE INSTALLATION	TDOT PB-2
OVAL AND ARCH PIPES	TDOT PD-1
SAFETY CROSS DRAIN ENDWALLS	TDOT PE SERIES
SAFETY SIDE DRAIN ENDWALLS	TDOT SEN SERIES AND TDOT MSE-1
PROTECTED ENDWALLS	TDOT PE, PEW SERIES
FLUMES	TDOT FLU-1

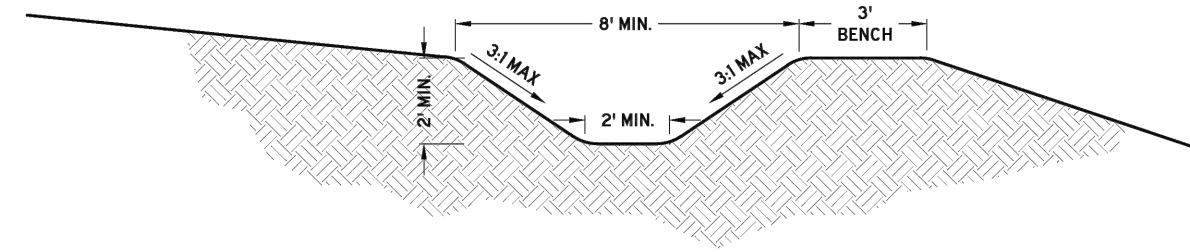


CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

INLETS, CASTINGS,
STRUCTURES, AND PIPES

(NTS)

DATE
6/9/2022
DD-01



NOTES:

- DITCHES SHALL BE STABILIZED WITH APPROPRIATELY DESIGNED SOFT ARMORING.
- RIP-RAP OR OTHER HARD ARMORING TECHNIQUES ARE DISCOURAGED AND SHALL ONLY BE APPROVED WHEN ALL OTHER MEANS OF STABILIZATION ARE EXHAUSTED.
- FLOW LINE GRADE SHALL NOT BE LESS THAN 1.0%.
- FLOW LINE GRADE SHALL NOT BE MORE THAN 7.5%.
- WHERE PLACED ON A SLOPE, A BENCH OF MINIMUM WIDTH OF 3 FEET SHALL BE PROVIDED.
- A MINIMUM OF 6 INCHES OF FREEBOARD ABOVE THE DESIGN FLOW DEPTH SHALL BE PROVIDED.
- ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER.

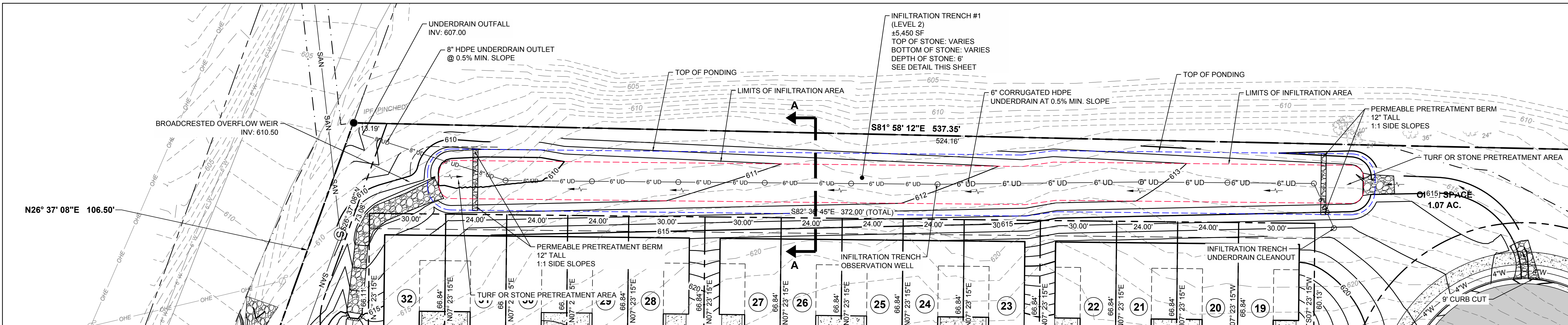


CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

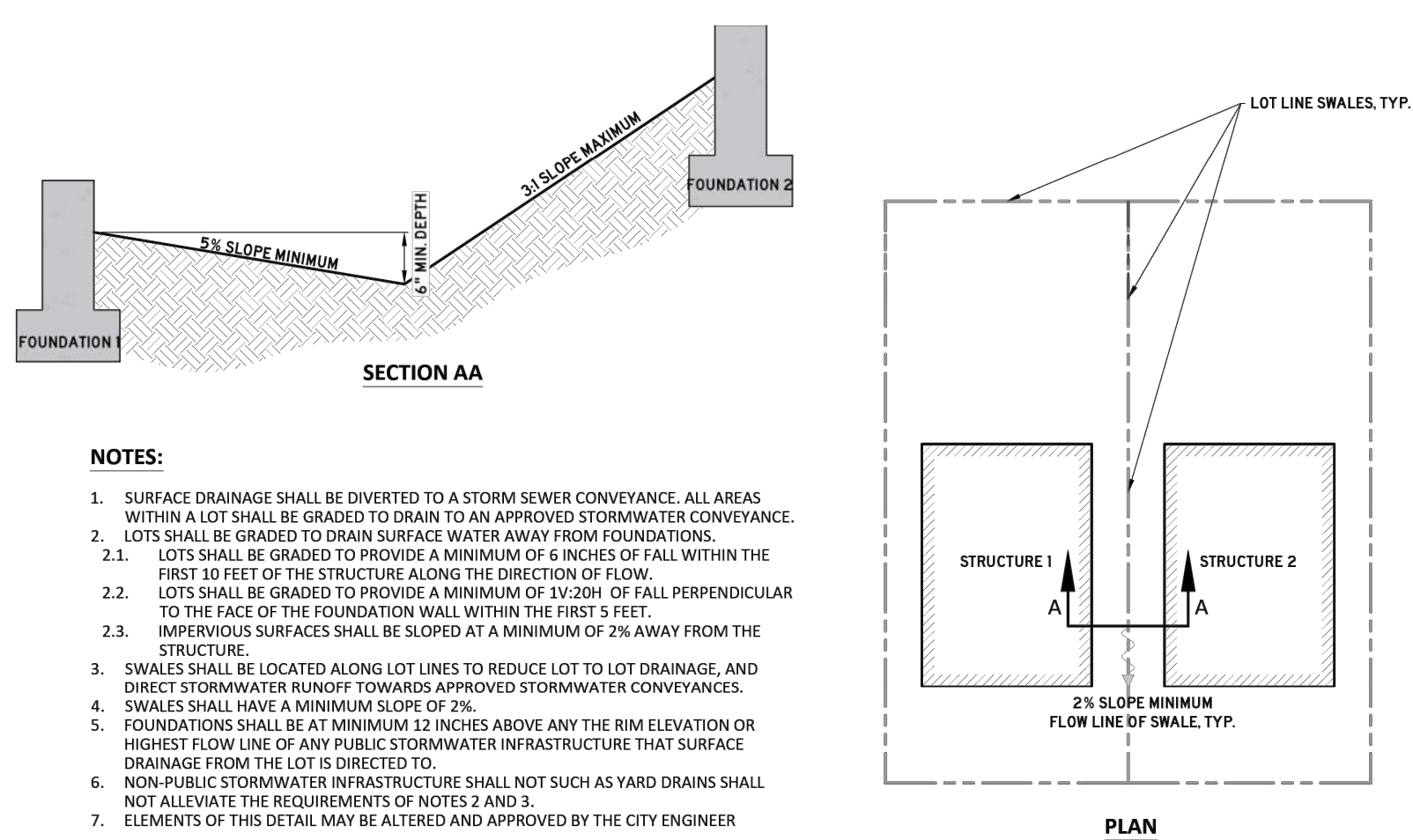
TRAPEZOIDAL DITCH

(NTS)

DATE
6/9/2022
DD-03



INFILTRATION TRENCH #1
SCALE: 1"=20'



- NOTES:
- SURFACE DRAINAGE SHALL BE DIVERTED TO A STORM SEWER CONVEYANCE. ALL AREAS WITHIN A LOT SHALL BE GRADED TO DRAIN TO AN APPROVED STORMWATER CONVEYANCE.
 - LOTS SHALL BE GRADED TO DRAIN SURFACE WATER AWAY FROM FOUNDATIONS.
 - LOTS SHALL BE GRADED TO PROVIDE A MINIMUM OF 6 INCHES OF FALL WITHIN THE FIRST 30 FEET OF THE STRUCTURE ALONG THE DIRECTION OF FLOW.
 - LOTS SHALL BE GRADED TO PROVIDE A MINIMUM OF 1/4" PER FOOT OF FALL PERPENDICULAR TO THE FACE OF THE FOUNDATION WALL WITHIN THE FIRST 5 FEET.
 - IMPERVIOUS SURFACES SHALL BE SLOPED AT A MINIMUM OF 2% AWAY FROM THE STRUCTURE.
 - SWALES SHALL BE LOCATED ALONG LOT LINES TO REDUCE LOT TO LOT DRAINAGE, AND DIRECT STORMWATER RUNOFF TOWARDS APPROVED STORMWATER CONVEYANCES.
 - SWALES SHALL HAVE A MINIMUM SLOPE OF 2%.
 - FOUNDATIONS SHALL BE AT MINIMUM 12 INCHES ABOVE ANY THE RIM ELEVATION OR HIGHEST FLOW LINE OF ANY PUBLIC STORMWATER INFRASTRUCTURE THAT SURFACE DRAINAGE FROM THE LOT IS DIRECTED TO.
 - NON-PUBLIC STORMWATER INFRASTRUCTURE SHALL NOT SUCH AS YARD DRAINS SHALL NOT ALLEVIATE THE REQUIREMENTS OF NOTES 2 AND 3.
 - ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

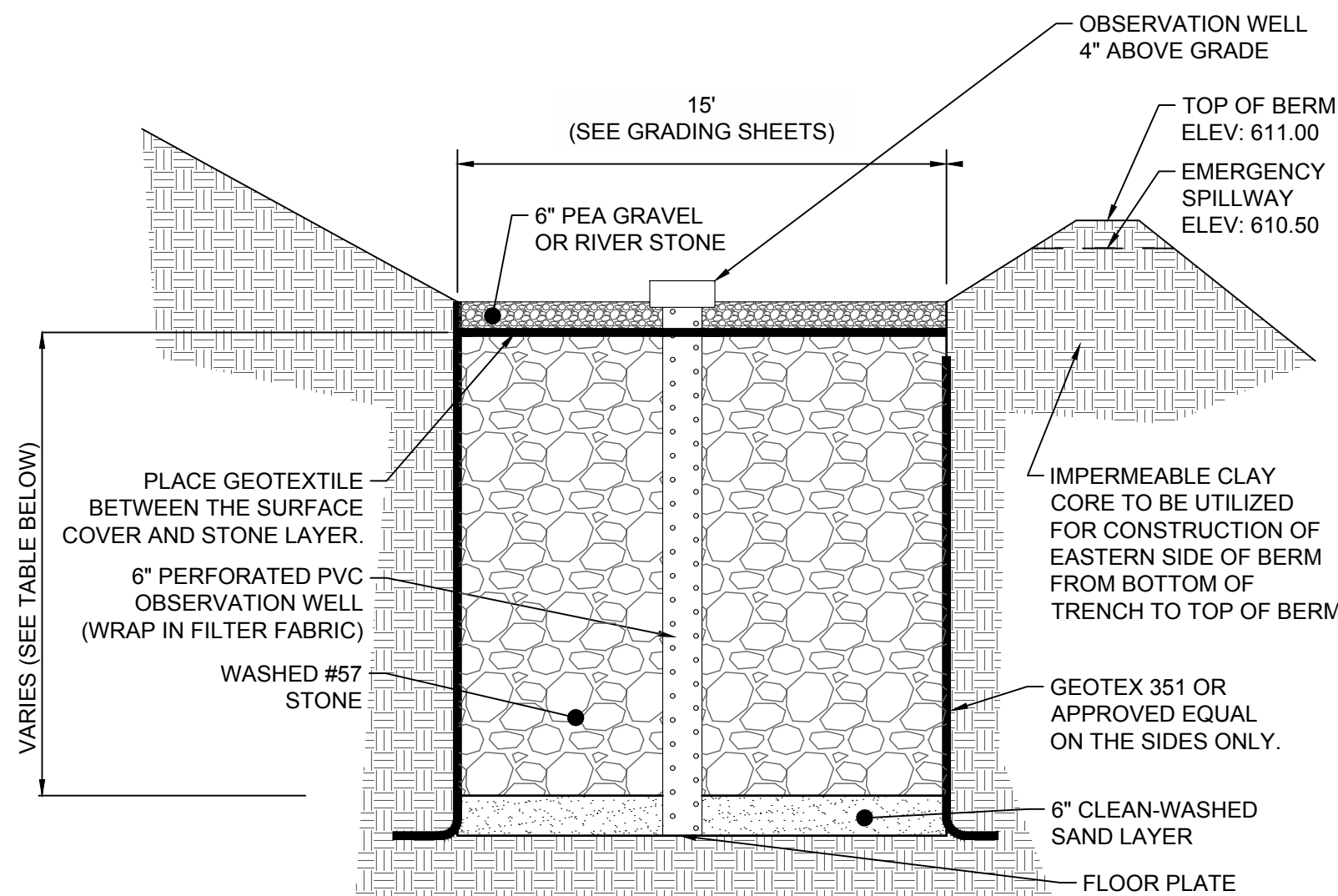


CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

RESIDENTIAL LOT
GRADING AND DRAINAGE

(NTS)

DATE
6/9/2022
DD-04

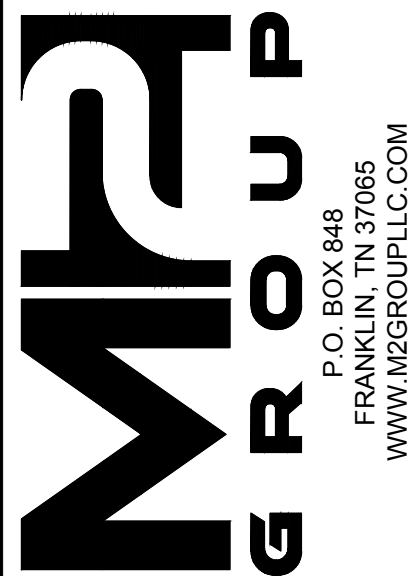


INFILTRATION TRENCH SUMMARY				
INFILTRATION TRENCH	INFILTRATION AREA (SF)	TOP OF STONE	STONE DEPTH (FT)	BOTTOM OF STONE
IT#1	5,450	609.5 (VARIES)	6	603.5 (VARIES)

INFILTRATION TRENCH
SECTION A - A
N.T.S.



SITE PLANS FOR:
MACKENZIE PLACE
TAX MAP 908, GROUP B, PARCEL 47.00
220 THETA PIKE
CITY OF COLUMBIA
MAURY COUNTY, TENNESSEE



GRADING DETAILS

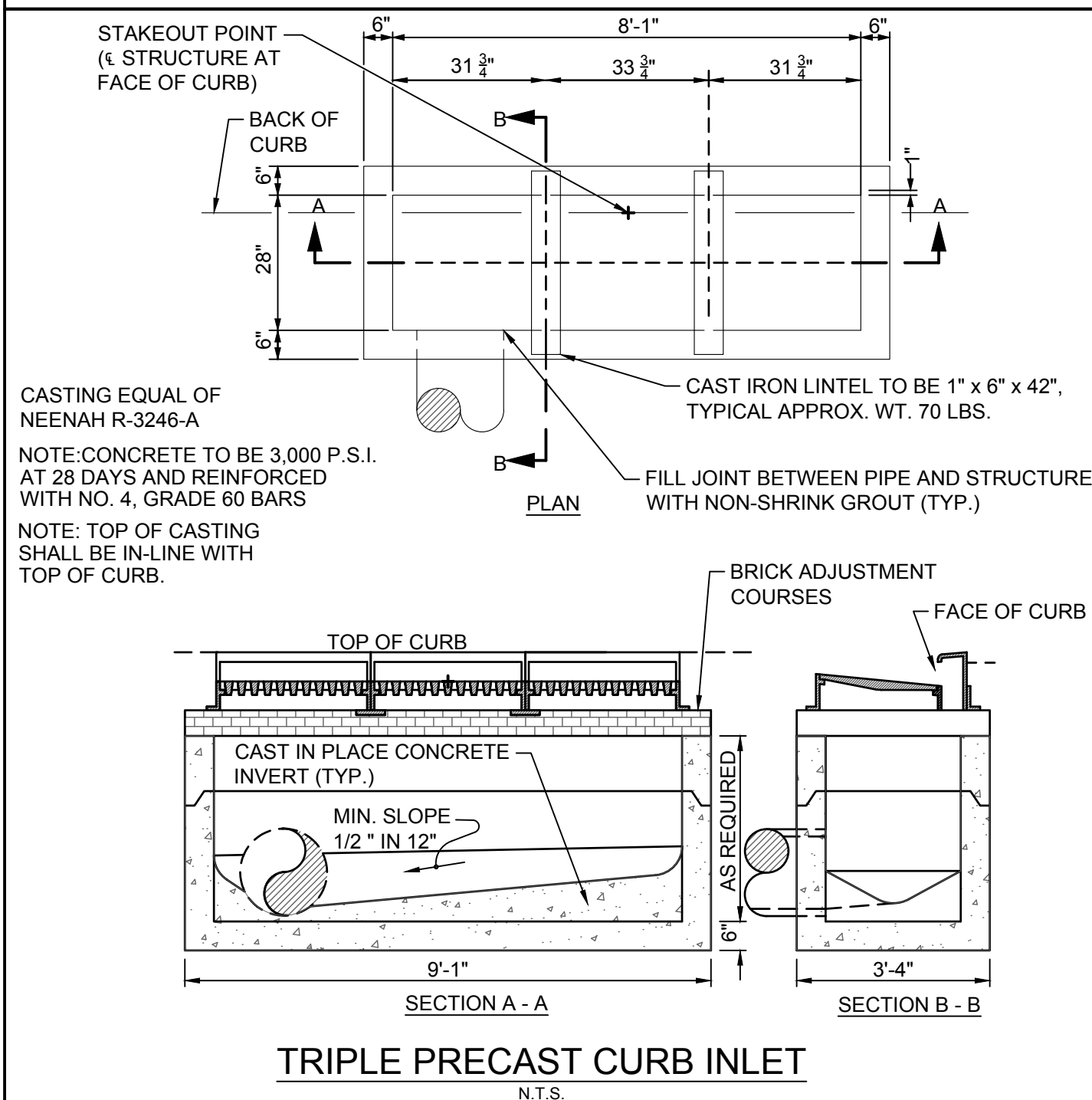
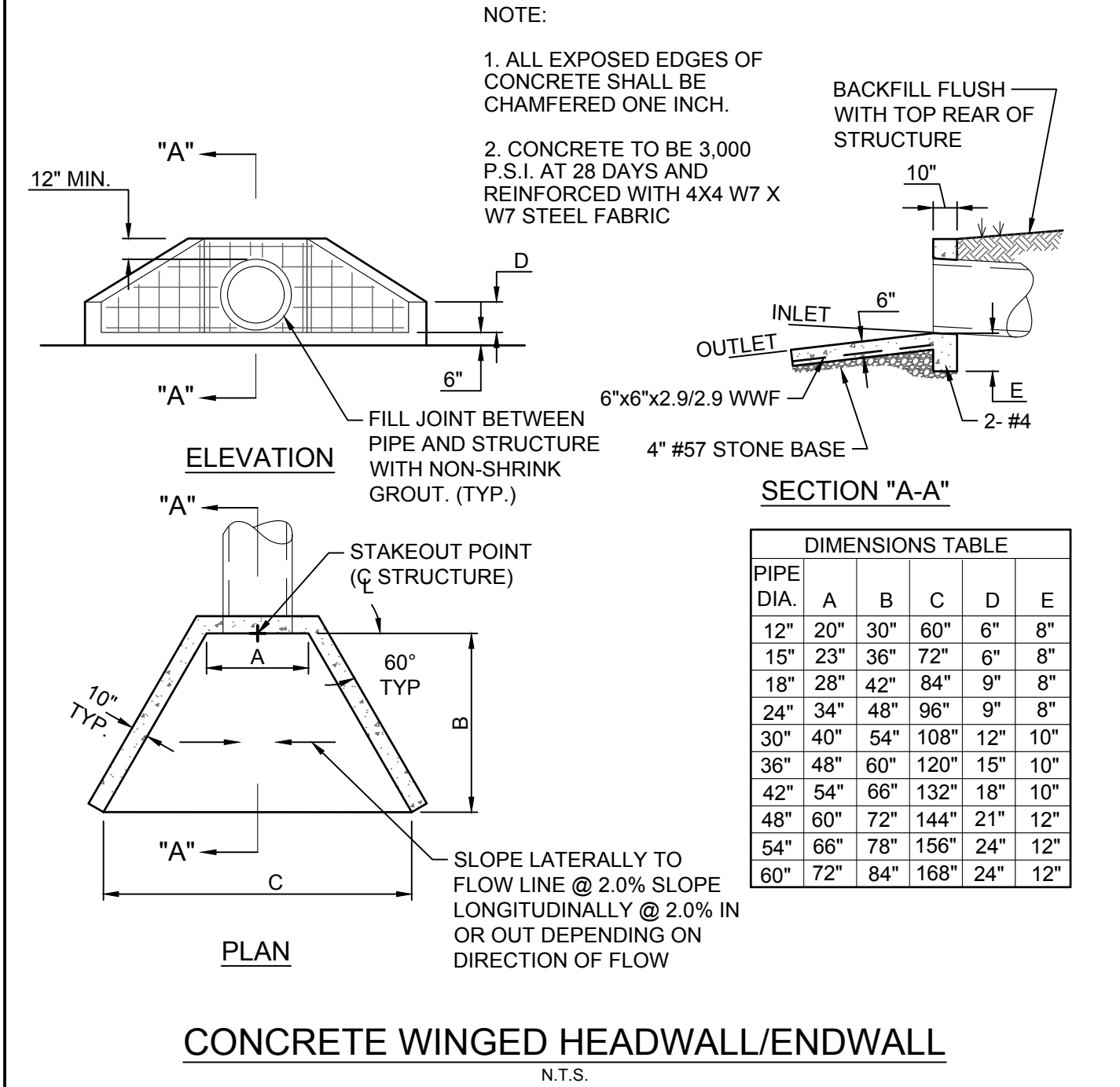
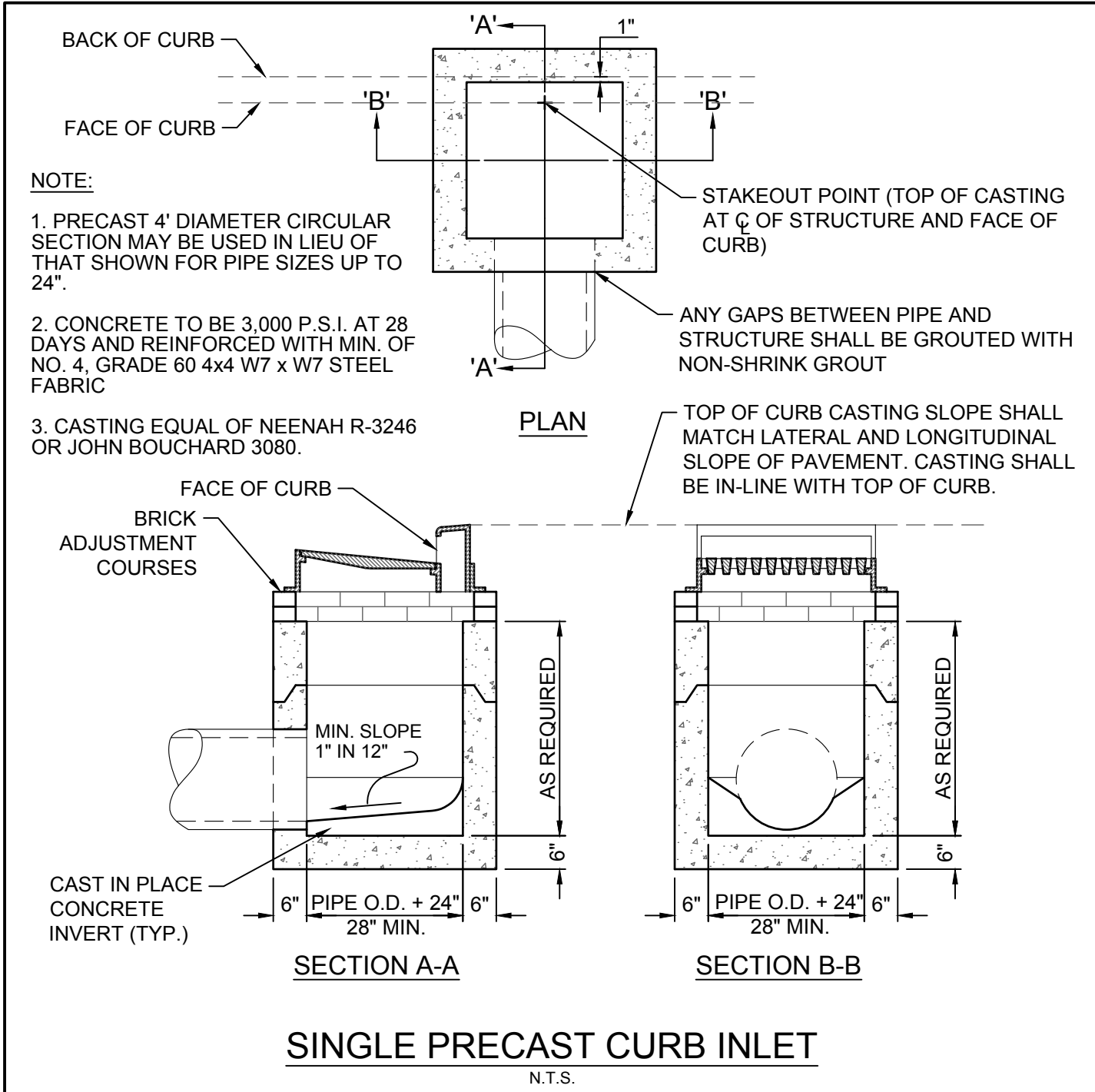
DATE: OCTOBER 16, 2023 DRAWN BY: M2G CHECKED BY: MWB
PROJECT NO.: 22-085

SHEET NUMBER:

C304

STRUCTURE TABLE		
NAME	INLET TYPE	DETAILS
R1	Headwall	INV IN = 613.965
R2	Single Curb Inlet	RIM = 617.470 INV IN = 614.210 INV IN = 614.208 INV OUT = 614.210
R3	Single Curb Inlet	RIM = 620.140 INV IN = 617.000 INV IN = 617.000 INV OUT = 617.000
R4	Single Curb Inlet	RIM = 620.139 INV OUT = 617.000
R5	Single Curb Inlet	RIM = 617.238 INV OUT = 614.330
R8	Single Curb Inlet	RIM = 621.359 INV IN = 619.235 INV OUT = 619.280
R9	Single Curb Inlet	RIM = 623.942 INV IN = 618.500 INV IN = 618.000 INV OUT = 618.000
R9A	Single Curb Inlet	RIM = 621.575 INV OUT = 619.557
R10	Single Curb Inlet	RIM = 623.941 INV OUT = 620.200
R11	Headwall	INV IN = 610.500
R12	Headwall	INV OUT = 613.050

PIPE TABLE				
NAME	MATERIAL	DIA.	APPROX. LENGTH	SLOPE
R1-R2	RCP	24"	49'	0.50%
R2-R3	RCP	18"	109'	2.57%
R2-R5	RCP	18"	25'	0.48%
R3-R4	RCP	18"	25'	0.00%
R3-R9	RCP	18"	155'	0.65%
R8-R9A	RCP	15"	31'	1.04%
R9-R8	RCP	18"	124'	1.04%
R9-R10	RCP	18"	25'	6.94%
R12-R11	RCP	18"	96'	2.66%

[illegible]

SITE PLANS FOR:
MACKENZIE PLACE
TAX MAP 90B, GROUP B, PARCEL 47.00
220 THETA PIKE
CITY OF COLUMBIA
MAURY COUNTY, TENNESSEE

M2 GROUP
P.O. BOX 848
FRANKLIN, TN 37065
WWW.M2GROUPLLC.COM

STORM SEWER DETAILS

DATE :	OCTOBER 16, 2023	DRAWN BY :
PROJECT NO. :	22-085	CHECKED BY :

SHEET NUMBER

C305

SEDIMENT TRAP DESIGN		ST-1	ST-2
DRAINAGE AREA (AC.)	2.80	2.50	
TOTAL VOL. REQUIRED (CF)	10,130.00	9,045.00	
WET VOL. REQUIRED (CF)	5,065.00	4,522.50	
DRY VOL. REQUIRED (CF)	5,065.00	4,522.50	
WET STORAGE VOL. PROVIDED (CF)	5,261.00	4,754.50	
TRAP BOTTOM ELEV. (FT)	607.00	607.00	
TOP WET STORAGE ELEV. (FT)	608.50	608.50	
SPILLWAY CREST ELEV. (FT)**	610.00	610.00	
TOP EMBANKMENT ELEV. (FT)	610.00	610.00	
SPILLWAY CREST LENGTH (FT)	15.00	15.00	
SPILLWAY CREST WIDTH (FT)	5.00	5.00	
EMBANKMENT TOP WIDTH (FT)	5.00	5.00	
DRY STORAGE VOL. PROVIDED (CF)	5,261.00	4,754.50	
TOTAL VOL. PROVIDED (CF)	10,522.00	9,509.00	

TDEC - NPDES NOC NOTE:

THE PROJECT ASSOCIATED WITH THESE PLANS IS REQUIRED TO BE COVERED UNDER TENNESSEE GENERAL STORM WATER PERMIT TNR100000 BECAUSE THE LIMITS OF DISTURBANCE IS OVER 1 ACRE. THE LIMITS OF DISTURBANCE IS APPROXIMATELY 3.8 AC±.

EPSC GENERAL NOTES

1. SEDIMENT SHALL BE REMOVED FROM SILT FENCE WHEN IT REACHES 1/3 THE HEIGHT OF THE FENCE; SEDIMENT SHALL BE REMOVED FROM ALL OTHER EPSDC MEASURES AND CONTROL AS RECOMMENDED IN THE TNEPSC HANDBOOK, AND MUST BE REMOVED WHEN DESIGN CAPACITY HAS BEEN REDUCED BY 50%.
2. EPSDC SHALL BE IMPLEMENTED BEFORE EARTH MOVING BEGINS.
3. AREAS WHERE CONSTRUCTION HAS TEMPORARILY/PERMANENTLY CEASED SHALL BE STABILIZED NO LATER THAN 14 DAYS (7 DAYS FOR 25%+ SLOPES).
4. INSPECTION AND MAINTENANCE OF ALL FALLS/EPSDC MEASURES SHALL BE CONDUCTED AT LEAST TWICE WEEKLY AND AT LEAST 72 HOURS APART.
5. VEGETATION, EPSDCS & OTHER PROTECTIVE MEASURES SHALL BE REPAIRED, REPLACED, OR MODIFIED AFTER BEING NOTIFIED OF AN ISSUE WITHIN 7 DAYS OR BY THE NEXT SIGNIFICANT RAIN CHANCE OF 50% OR GREATER. ISSUES WITHIN 7 DAYS OF A SIGNIFICANT RAIN CHANCE SHALL BE REPAIRED IMMEDIATELY AS PER FMC 23-109(2)(g).
6. CONSTRUCTION SHALL BE PHASED FOR ACTIVITIES THAT WILL DISTURB >50 ACRES.
7. EPSDCS SHALL BE DESIGNED TO CONTROL THE RAINFALL AND RUNOFF FROM A 5-YEAR, 24-HOUR RETURN INTERVAL STORM.
8. ADDITIONAL SEDIMENT BASIN(S) SHALL BE PROVIDED FOR ON-SITE OUTFALLS THAT RECEIVE DRAINAGE FROM ≥10 ACRES, ≥5 ACRES FOR SITES THAT DISCHARGE TO IMPAIRED OR EXCEPTIONAL TN WATERS.
9. GREEN INFRASTRUCTURE BMP(S) SHALL BE PROTECTED DURING SITE WORK, WITH SILT FENCE, TO PREVENT SEDIMENTATION AND COMPACTION.
10. IF DEEMED NECESSARY BY THE TNEPSC, THE TNEPSC MAY REQUIRE THE ADDITION, REMOVAL OR MODIFICATION OF EPSDC MEASURES AND/OR EPSDC LOCATIONS AT ANY TIME DURING THE CONSTRUCTION PROCESS TO ENSURE PROPER EPSDC PERFORMANCE.

EROSION AND SEDIMENT CONTROL PLAN NOTES

1. PRIOR TO INSTALLATION OF EROSION CONTROL MEASURES OR INITIATION OF EARTH DISTURBING ACTIVITIES, THE CONTRACTOR SHALL CLEARLY DELINEATE THE PROPOSED LIMITS OF DISTURBANCE IN THE FIELD UTILIZING FLAGGING, SURVEYING TAPES AND/OR COLOR CODED AND/OR NUMBERED PILES. THE CONTRACTOR SHALL OBTAIN WITHOUT FIRST OBTAINING WRITTEN PERMISSION FROM THE ENGINEER, THE AFFECTED PROPERTY OWNER AND ANY APPLICABLE REGULATORY AGENCIES.
2. THE EROSION CONTROL ACTIVITIES ANTICIPATED FOR THIS PROJECT INCLUDES GRADING, PAVING, AND UTILITY INSTALLATION.
3. THE APPROXIMATE TOTAL DISTURBED AREA OF THIS SITE IS 6.60 ACRES, ANY INCREASE IN THE APPROXIMATE TOTAL DISTURBED AREA SHALL BE APPROVED BY THE CITY OF COLUMBIA PRIOR TO ADDITIONAL DISTURBANCE.
4. EROSION CONTROL MEASURES SHALL BE INSTALLED ON ALL EXPOSED EROSION PRONE AREAS, INCLUDING EXPOSED SURFACE AREAS, PERIMETER EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE AND FUNCTIONAL PRIOR TO EARTH MOVING OPERATIONS.
5. THE CONTRACTOR SHALL DESIGNATE IN WRITING THE NAME AND PHONE NUMBER OF THE PERSON(S) RESPONSIBLE FOR EROSION AND SEDIMENT CONTROLS AT THE SITE. THIS INFORMATION SHALL BE POSTED AT THE JOB SITE TRAILER, OR AT THE SITE CONSTRUCTION SIGN.
6. THE CONTRACTOR SHALL MAINTAIN RECORDS OF EROSION AND SEDIMENT CONTROL MEASURES FROM COMMENCEMENT OF GRADINGS ACTIVITIES. ALL GRADED AREAS EXPECTED TO REMAIN UNFINISHED FOR MORE THAN 14 DAYS SHALL BE COVERED WITH TEMPORARY GRASS, SOIL, STRAW, MULCH, OR FABRIC MATTING. STEEP SLOPES (GREATER THAN 35%) SHALL BE TEMPORARILY STABILIZED NOT LATER THAN 7 DAYS AFTER CONSTRUCTION ACTIVITY COMPLETION. MULCHING SHALL BE USED TO STABILIZE EROSION PRONE AREAS. PERMANENT SOIL STABILIZATION SHALL BE INSTALLED WITHIN 15 DAYS OF THE ESTABLISHMENT OF FINAL GRADES.
7. THE CONTRACTOR SHALL MAINTAIN RECORDS OF EROSION AND SEDIMENT CONTROL FOR A PERIOD OF THREE YEARS AFTER COMPLETION OF THE PROJECT.
8. TEMPORARY SEEDING FOR THIS PROJECT SHALL UTILIZE TUD, TDEC OR LOCAL STANDARDS UNLESS OTHERWISE INDICATED HEREON.
9. MULCHING SHALL CONSIST OF LOOSE HEAVY STRAW APPLIED AT A RATE OF 2 TONS PER ACRE. MULCH MUST BE CRIMPED INTO THE SOIL BY MECHANICAL MEANS. BROADCAST SPREADING OF MULCH IS NOT ACCEPTABLE. SOIL STOCKPILES SHALL BE STABILIZED AND PROTECTED FROM EROSION. ALL STOCKPILES SHALL BE COVERED WITH TEMPORARY SEEDING AND PROTECTED WITH SILL FENCING.
10. SECTIONS 11.1 AND 11.2 OF THE CITY OF COLUMBIA SDCS TO BE REPEALED, INSTALL TEMPORARY EROSION CONTROL, BLANK (TENSAR NORTH AMERICAN GREEN S150 OR APPROVED EQUIV) INSTALLED PER MANUFACTURERS' RECOMMENDATIONS SHALL BE USED IN PLACE OF STRAW MULCH.
11. THE LOCATION OF SOME OF THE EROSION CONTROL MEASURES MAY NEED TO BE ALTERED DUE TO CHANGING SITE CONDITIONS AND/OR UNEXPECTED OBSTACLES OF THE WORK. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ADJUST EROSION AND SEDIMENT CONTROL FOR ALL DRAINAGE PATTERNS CREATED AT VARIOUS STAGES OF CONSTRUCTION. ANY DIFFICULTY IN CONTROLLING EROSION DURING ANY PHASE OF CONSTRUCTION SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
12. EROSION CONTROL DEVICES SHALL BE MAINTAINED UNTIL A PERMANENT GROUND COVER IS ESTABLISHED. SEEDED AREAS MUST HAVE A MINIMUM 70% COVERAGE (ENGINEER WILL DETERMINE APPROXIMATE PERCENTAGE OF COVER) PRIOR TO REMOVAL OF THE TEMPORARY EROSION CONTROL DEVICES. FINAL SEEDING AND ESTABLISHMENT OF PERMANENT COVER SHALL BE APPLIED TO ANY AREA DISTURBED AS A RESULT OF THE REMOVAL OF THE EROSION CONTROL MEASURES.
13. CONTRACTOR SHALL PREPARE, IMPLEMENT, AND MAINTAIN A SPILL PREVENTION, CONTROL, AND COUNTERMEASURES PLAN. THE PLAN SHALL BE REVIEWED AND APPROVED BY THE CITY OF COLUMBIA. THE PLAN SHALL INCLUDE, BUT NOT BE LIMITED TO, ON-SITE FUEL, CHEMICALS, OR OTHER POLLUTANTS CONSISTENT WITH THE REQUIREMENTS OF STATE NPDES RULES. EFFECTIVE MEASURES NECESSARY TO PREVENT SPILLS AND TO CLEAN UP SPILLS OF ANY TOXIC POLLUTANT, AS WELL AS NON-TOXIC POLLUTANTS, SHALL BE FULLY CONSIDERED AND INCLUDED IN THE PLAN. SPILLS OF OIL, GREASE, AND OTHER SUBSTANCES, PAINTS, FUELS, OR CHEMICAL SPILLS SHALL BE IMMEDIATELY CLEANED AND DISPOSED OF IN AN APPROVED MANNER. WHERE POTENTIAL SPILLS CAN OCCUR, MATERIALS HANDLING PROCEDURES SHALL BE SPECIFIED AND PROCEDURES FOR IMMEDIATE CLEANUP/REMEDIATION OF SPILLS SHALL BE DESCRIBED IN THE SPCC OR SPILL RESPONSE PLAN. THE PLAN SHALL INCLUDE, BUT NOT BE LIMITED TO, THE MATERIAL, THE MATERIAL SPILLED, THE ESTIMATED QUANTITY, THE SOURCE OF THE SPILL, THE CAUSE OF THE SPILL, THE NEAREST DOWNSTREAM WATER WITH THE POTENTIAL TO RECEIVE THE SPILL, AND THE ACTIONS BEING TAKEN FOR THE SPILL.
14. EROSION AND SEDIMENT CONTROL DEVICES TO BE SELECTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH TDEC SEDIMENT AND EROSION CONTROL HANDBOOK, LATEST EDITION.
15. WATER QUALITY BMPs SHALL NOT BE INSTALLED UNTIL BUILDS IS NEAR COMPLETION TO PREVENT CONSTRUCTION FROM DISTURBING THE BUILT AREAS. WATER QUALITY BMPs SHALL NOT BE USED AS SEDIMENT BASINS DURING CONSTRUCTION. INSTALLERS OF WATER QUALITY BMPs SHOULD FOLLOW ALL INSTALLATION GUIDELINES SET FORTH IN THE CITY OF COLUMBIA BMP MANUAL LOCATED ON THE CITY'S WEBSITE.
16. THE CONTRACTOR SHALL MAINTAIN THE WATER QUALITY AREAS, ALL SIGNS, MATERIALS, AND LABOR TO BE INSTALLED WILL BE PROVIDED BY THE CITY STAFF.

CONSTRUCTION SEQUENCE

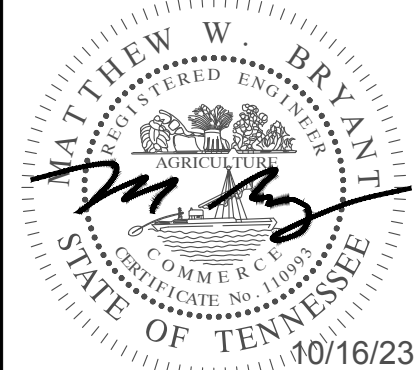
1. INSTALL CONSTRUCTION ENTRANCE
2. INSTALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES
3. INSTALL SEDIMENT BASIN, IF REQUIRED
4. INSTALL WATER QUALITY BUFFER SIGNS, IF REQUIRED
5. INSTALL TREE PROTECTION FENCING
6. CONTACT CITY OF COLUMBIA FOR INSPECTION OF EROSION PREVENTION AND SEDIMENT CONTROL DEVICES AND TO OBTAIN A FULL GRADING PERMIT.
7. CLEAR GRUBS AND GRADE THE SITE
8. CONSTRUCT REMAINDER OF SITE PER APPROVED PLANS INCLUDING INSTALLATION OF ALL ADDITIONAL EPSC MEASURES SHOWN ON THE PLANS OR AS DIRECTED BY THE EPSC INSPECTOR
9. IMMEDIATELY AFTER STABILIZATION OF THE SITE, REMOVE ALL TEMPORARY EROSION CONTROL DEVICES (SEE FINAL EPSC PLAN FOR POST CONSTRUCTION CLOSEOUT PROCESS).

EPSC DATA CHART:
BMP DESIGN RAIN EVENT: 5 YEAR, 24 HR STORM

DESCRIPTION

31

REVISION



SITE PLANS FOR:
CKENZIE PLACE

MAP 90B, GROUP B, PARCEL 47.00
220 THETA PIKE
 CITY OF COLUMBIA
 MAURY COUNTY, TENNESSEE



MTP
GROUP

INITIAL EPSC PLAN

M2G

111

DRAWN BY:

OCTOBER 16, 2023

QUESTIONS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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SHEET NUMBER

C401



MPA, INTERMEDIATE EPSC PLAN.DWG / Monday, October 16, 2023 3:36:58 PM

ZONED: CD-4C

THETA PIKE
(ROW WIDTH VARIES)

INFILTRATION TRENCH WILL BE UTILIZED AS
SEDIMENT TRAP DURING CONSTRUCTION.
CONVERT AFTER STABILIZATION OF SITE.
*DO NOT ADD FINAL CLEAN WASHED
INFILTRATION STONE UNTIL CONTRIBUTING
AREAS ARE STABILIZED.

UTILIZE AS SEDIMENT TRAP UNTIL
INFILTRATION TRENCH IS INSTALLED AND STABILIZED.
FILL AND CONVERT TO FINAL CONDITION
AFTER STABILIZATION OF SITE.

TDEC - NPDES NOC NOTE:

THE PROJECT ASSOCIATED WITH THESE PLANS IS REQUIRED TO BE COVERED UNDER TENNESSEE GENERAL
STORM WATER PERMIT TNR100000 BECAUSE THE LIMITS OF DISTURBANCE IS OVER 1 ACRE. THE LIMITS OF
DISTURBANCE IS APPROXIMATELY 3.8 AC.

EPSC GENERAL NOTES

1. SEDIMENT SHALL BE REMOVED FROM SILT FENCE WHEN IT REACHES 1/3 THE HEIGHT OF THE FENCE; SEDIMENT SHALL BE REMOVED FROM ALL OTHER EPSC MEASURES AND CONTROL AS RECOMMENDED IN THE TNEPSC HANDBOOK, AND MUST BE REMOVED WHEN DESIGN CAPACITY HAS BEEN REDUCED BY 50%.
2. EPSC SHALL BE IMPLEMENTED BEFORE EARTH-MOVING BEGINS.
3. AREAS WHERE CONSTRUCTION HAS TEMPORARILY/PERMANENTLY CEASED SHALL BE STABILIZED NO LATER THAN 14 DAYS (7 DAYS FOR >35% SLOPES).
4. INSPECTIONS OF OUTFALLS/EPSC MEASURES SHALL BE CONDUCTED AT LEAST TWICE WEEKLY AND AT LEAST 72 HOURS APART.
5. VEGETATION, EPSCS & OTHER PROTECTIVE MEASURES SHALL BE REPAIRED, REPLACED, OR MODIFIED AFTER BEING NOTIFIED OF AN ISSUE WITHIN 7 DAYS OR BY THE NEXT SIGNIFICANT RAIN CHANCE OF 50% OR GREATER. ISSUES WITH IMMEDIATE THREATS TO WATER QUALITY SHALL BE REPAIRED IMMEDIATELY AS PER FMC 23-106(i)(g).
6. CONSTRUCTION SHALL BE PHASED FOR ACTIVITIES THAT WILL DISTURB >50 ACRES.
7. EPSCS SHALL BE DESIGNED TO CONTROL THE RAINFALL AND RUNOFF FROM A 5-YEAR, 24-HOUR RETURN INTERVAL STORM.
8. TEMPORARY SEDIMENT BASIN(S) SHALL BE PROVIDED FOR ON-SITE OUTFALLS THAT RECEIVE DRAINAGE FROM ≥10 ACRES; ≥5 ACRES FOR SITES THAT DISCHARGE TO IMPAIRED OR EXCEPTIONAL TN WATERS.
9. GREEN INFRASTRUCTURE BMPs SHALL BE PROTECTED DURING SITE WORK, WITH SILT FENCE, TO PREVENT SEDIMENTATION AND COMPACTION.
10. IF DEEMED APPROPRIATE, THE CITY MAY REQUIRE THE ADDITION, REMOVAL OR MODIFICATION OF EPSC MEASURES AND/OR EPSC LOCATIONS AT ANY TIME DURING THE CONSTRUCTION PROCESS TO ENSURE PROPER EPSC PERFORMANCE.

EROSION AND SEDIMENT CONTROL PLAN NOTES

1. PRIOR TO INSTALLATION OF EROSION CONTROL MEASURES OR INITIATION OF EARTH DISTURBING ACTIVITIES, THE CONTRACTOR SHALL CLEARLY DELINEATE THE PROPOSED LIMITS OF DISTURBANCE IN THE FIELD UTILIZING FLAGGING, STAKES, AND/OR CONSTRUCTION FENCE. NO DISTURBANCE BEYOND THESE LIMITS SHALL BE PERMITTED WITHOUT FIRST OBTAINING WRITTEN PERMISSION FROM THE ENGINEER. THE AFFECTED PROPERTY OWNER AND ANY APPLICABLE REGULATORY AGENCIES.
2. THE CONSTRUCTION ACTIVITIES ANTICIPATED FOR THIS PROJECT INCLUDES GRADING, PAVING, AND UTILITY INSTALLATION.
3. THE APPROXIMATE TOTAL DISTURBED AREA OF THIS SITE IS 6.60 ACRES. ANY INCREASE IN THE APPROXIMATE TOTAL DISTURBED AREA SHALL BE APPROVED BY THE CITY OF COLUMBIA PRIOR TO ADDITIONAL DISTURBANCE.
4. CONSTRUCTION SHALL BE SEQUENCED BY THE CONTRACTOR AS TO MINIMIZE EXPOSURE TIME OF CLEARED SURFACE AREAS. PERIMETER EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE AND FUNCTIONAL PRIOR TO EARTH MOVING OPERATIONS.
5. THE CONTRACTOR SHALL DESIGNATE IN WRITING THE NAME AND PHONE NUMBER OF THE PERSON(S) RESPONSIBLE FOR EROSION AND SEDIMENT CONTROLS AT THE SITE. THIS INFORMATION SHALL BE POSTED AT THE JOB SITE TRAILER, OR AT THE SITE CONSTRUCTION SIGN.
6. PRE-CONSTRUCTION VEGETATIVE GROUND COVER SHALL NOT BE REMOVED MORE THAN 14 DAYS PRIOR TO COMMENCEMENT OF GRADING ACTIVITIES. ALL GRADED AREAS EXPECTED TO REMAIN UNFINISHED FOR MORE THAN 14 DAYS SHALL BE COVERED WITH TEMPORARY GRASS, SO, STRAW, MULCH, OR FABRIC MATTING. STEEP SLOPES (GREATER THAN 35%) SHALL BE TEMPORARILY STABILIZED NOT LATER THAN 7 DAYS AFTER CONSTRUCTION ACTIVITY ON THE SLOPE HAS TEMPORARILY OR PERMANENTLY CEASED. PERMANENT SOIL STABILIZATION SHALL BE INSTALLED WITHIN 15 DAYS OF THE ESTABLISHMENT OF FINAL GRADES.
7. THE CONTRACTOR SHALL MAINTAIN RECORDS OF EROSION AND SEDIMENT CONTROL FOR A PERIOD OF THREE YEARS AFTER COMPLETION OF CONSTRUCTION OR AS REQUIRED BY GOVERNING AUTHORITIES.
8. TEMPORARY SEEDING FOR THIS PROJECT SHALL UTILIZE TDOT, TDEC OR LOCAL STANDARDS UNLESS OTHERWISE INDICATED HEREON.
9. MULCHING SHALL CONSIST OF LOOSE HAY OR STRAW APPLIED AT A RATE OF 2 TONS PER ACRE. MULCH MUST BE CRIMPED INTO THE SOIL BY MECHANICAL MEANS. BROADCAST SPREADING OF MULCH IS NOT ACCEPTABLE.
10. SOIL STOCKPILES SHALL BE STABILIZED AND PROTECTED FROM EROSION. ALL STOCKPILES SHALL BE COVERED WITH TEMPORARY SEEDING AND PROTECTED WITH SILT FENCING.
11. FOR PERMANENT STABILIZATION OF ALL SLOPES ≥1:1 OR STEEPER, INSTALL TEMPORARY EROSION CONTROL BLANKET (TENSAR NORTH AMERICAN GREEN S150 OR APPROVED EQUAL) INSTALLED PER MANUFACTURERS' RECOMMENDATIONS SHALL BE USED IN PLACE OF STRAW MULCH.
12. THE LOCATION OF SOME OF THE EROSION CONTROL MEASURES MAY NEED TO BE ALTERED DUE TO CHANGING SITE CONDITIONS COMMENSURATE WITH PROGRESS OF THE WORK. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCOMPLISH EROSION AND SEDIMENT CONTROL FOR ALL DRAINAGE PATTERNS CREATED AT VARIOUS STAGES OF CONSTRUCTION. ANY DIFFICULTY IN CONTROLLING EROSION DURING ANY PHASE OF CONSTRUCTION SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
13. EROSION CONTROL DEVICES SHALL BE MAINTAINED UNTIL A PERMANENT GROUND COVER IS ESTABLISHED. SEEDING AREAS MUST HAVE A MINIMUM 70% COVERAGE (ENGINEER WILL DETERMINE APPROXIMATE PERCENTAGE OF COVER) PRIOR TO REMOVAL OF THE TEMPORARY EROSION CONTROL DEVICES. FINAL SEEDING AND ESTABLISHMENT OF GROUND COVER SHALL BE APPLIED TO ANY AREA DISTURBED AS A RESULT OF THE REMOVAL OF THE EROSION CONTROL MEASURES.
14. CONTRACTOR SHALL PREPARE, IMPLEMENT, AND MAINTAIN A SPILL PREVENTION, CONTROL, AND COUNTERMEASURES (SPCC) PLAN, AS A SEPARATE DOCUMENT OR AS A COMPONENT OF THE SWPPP, FOR ALL TANKS/CONTAINERS STORING ON-SITE FUEL, CHEMICALS, OR OTHER POLLUTANTS CONSISTENT WITH THE REQUIREMENTS OF STATE NPDES RULES. EFFECTIVE MEASURES NECESSARY TO PREVENT SPILLS AND TO CLEAN UP SPILLS OF ANY TOXIC POLLUTANTS AS DOCUMENTED IN THE FACILITY'S SPCC PLAN, SHALL BE FULLY IMPLEMENTED. SOIL CONTAMINATED BY HAZARDOUS SUBSTANCES, PAINTS, FUEL, OR CHEMICAL SPILLS, SHALL BE IMMEDIATELY CLEANED UP, MANAGED, AND DISPOSED OF IN AN APPROVED MANNER. WHERE POTENTIAL SPILLS CAN OCCUR, MATERIALS HANDLING PROCEDURES SHALL BE SPECIFIED AND PROCEDURES FOR IMMEDIATE CLEANUP/MEDIATION OF SPILLS SHALL BE DESCRIBED IN THE SPCC PLAN OR EMPLOYEE TRAINING EXACT LOCATION OF THE SPILL, COMPANY NAME AND LOCATION, THE MATERIAL SPILLED, THE ESTIMATED QUANTITY, THE SOURCE OF THE SPILL, THE CAUSE OF THE SPILL, THE NEAREST DOWNSTREAM WATER WITH THE POTENTIAL TO RECEIVE THE SPILL, AND THE ACTIONS BEING TAKEN FOR CONTAINMENT AND CLEANUP.
15. ALL EROSION AND SEDIMENT CONTROL DEVICES TO BE SELECTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH TDEC SEDIMENT AND EROSION CONTROL HANDBOOK, LATEST EDITION.
16. WATER QUALITY BMPs SHALL NOT BE INSTALLED UNTIL BUILD IS NEAR COMPLETION TO PREVENT CONSTRUCTION SEDIMENT FROM ENTERING WATER QUALITY BMPs. WATER QUALITY AREAS SHALL NOT BE USED AS SEDIMENT BASINS DURING CONSTRUCTION. INSTALLERS OF WATER QUALITY BMPs SHOULD FOLLOW ALL INSTALLATION GUIDELINES SET FORTH IN THE CITY OF COLUMBIA WEBSITE.
17. WATER QUALITY SIGNS SHALL BE PLACED WITHIN THE WATER QUALITY AREAS. THE SIGNS, MATERIALS, AND LABOR TO INSTALL WILL BE PROVIDED BY THE CITY STAFF.

CONSTRUCTION SEQUENCE

1. INSTALL CONSTRUCTION ENTRANCE
2. INSTALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES
3. INSTALL SEDIMENT TRAPS, IF REQUIRED
4. INSTALL TREE PROTECTION FENCING
5. CONTACT CITY OF COLUMBIA FOR INSPECTION OF EROSION PREVENTION AND SEDIMENT CONTROL DEVICES AND TO OBTAIN A FULL GRADING PERMIT.
6. CLEAR, GRUB, AND GRADE THE SITE
7. CONSTRUCT REMAINDER OF SITE PER APPROVED PLANS INCLUDING INSTALLATION OF ALL ADDITIONAL EPSC MEASURES SHOWN ON THE PLANS OR AS DIRECTED BY THE EPSC INSPECTOR
8. UPON PERMANENT STABILIZATION OF THE SITE, REMOVE ALL TEMPORARY EROSION CONTROL DEVICES (SEE FINAL EPSC PLAN FOR POST CONSTRUCTION CLOSEOUT PROCESS).

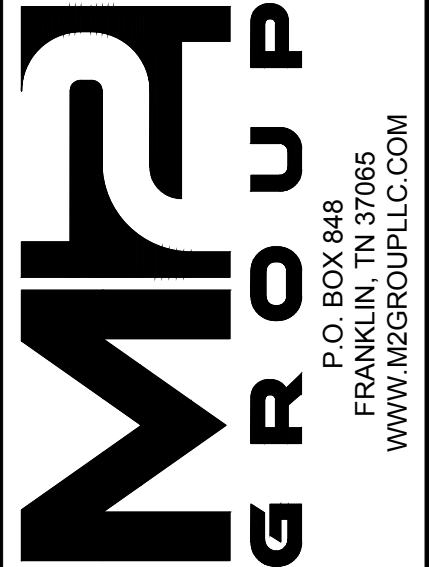
EPSC DATA CHART:

BMP DESIGN RAIN EVENT: 5 YEAR, 24 HR STORM

REVISION #	DATE	DESCRIPTION



SITE PLANS FOR:
MACKENZIE PLACE
TAX MAP 90A, GROUP B, PARCEL 47.00
220 THETA PIKE
CITY OF COLUMBIA
MAURY COUNTY, TENNESSEE



P.O. BOX 848
FRANKLIN, TN 37065
WWW.M2GROUPLLC.COM

INTERMEDIATE EPSC PLAN

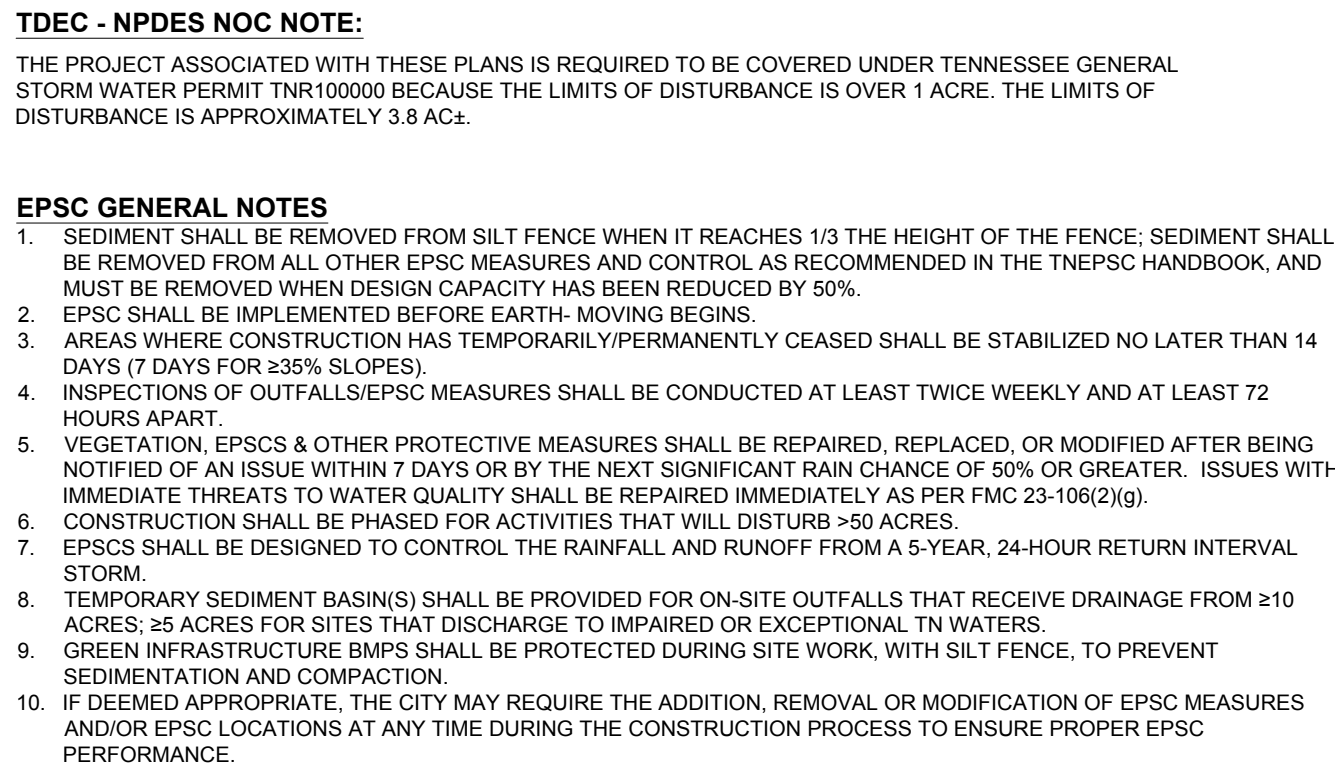
DATE: OCTOBER 16, 2023 DRAWN BY: M2G
PROJECT NO.: 22-085 CHECKED BY: MWB

SHEET NUMBER:

C402



Know what's below.
Call before you dig.



EROSION AND SEDIMENT CONTROL PLAN NOTES

1. PRIOR TO INSTALLATION OF EROSION CONTROL MEASURES OR INITIATION OF EARTH DISTURBING ACTIVITIES, THE CONTRACTOR SHALL CLEARLY DELINEATE THE PROPOSED LIMITS OF DISTURBANCE IN THE FIELD UTILIZING FLAGGING, STAKES, AND/OR CONSTRUCTION LAYOUT. ANY AREAS OF DISTURBANCE NOT TO BE DISTURBED SHALL BE IDENTIFIED WITHOUT FIRST OBTAINING WRITTEN PERMISSION FROM THE ENGINEER, THE AFFECTED PROPERTY OWNER AND ANY APPLICABLE REGULATORY AGENCIES.
2. THE CONSTRUCTION ACTIVITIES ANTICIPATED FOR THIS PROJECT INCLUDES GRADING, PAVING, AND UTILITY INSTALLATION.
3. THE APPROXIMATE TOTAL DISTURBED AREA OF THIS SITE IS 6.00 ACRES. ANY INCREASE IN THE APPROXIMATE TOTAL DISTURBED AREA SHALL BE APPROVED BY THE CITY OF COLUMBIA PRIOR TO ADDITIONAL DISTURBANCE.
4. STABILIZATION AND EROSION CONTROL MEASURES SHALL BE INSTALLED ON ALL EXPOSED EROSION-PRONE SURFACE AREAS. PERIMETER EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE AND FUNCTIONAL PRIOR TO EARTH MOVING OPERATIONS.
5. THE CONTRACTOR SHALL DESIGNATE IN WRITING THE NAME AND PHONE NUMBER OF THE PERSON(S) RESPONSIBLE FOR EROSION AND SEDIMENT CONTROLS AT THE SITE. THIS INFORMATION SHALL BE POSTED AT THE JOB SITE TRAILER, OR AT THE SITE CONSTRUCTION SIGN.
6. PRE-CONSTRUCTION VEGETATIVE GROUND/COVER SHALL NOT BE REMOVED MORE THAN 14 DAYS PRIOR TO START OF CONSTRUCTION. VEGETATION MUST BE MAINTAINED UNTIL 11:45 AM OF THE 14TH DAY AFTER CONSTRUCTION DAYS SHALL BE COVERED WITH TEMPORARY GRASS, SOD, STRAW, MULCH OR FABRIC MATTING. STEEP SLOPES (GREATER THAN 35%) SHALL BE TEMPORARILY STABILIZED NOT LATER THAN 7 DAYS AFTER CONSTRUCTION ACTIVITY ON THE SLOPE HAS TEMPORARILY OR PERMANENTLY CEASED. PERMANENT SOIL STABILIZATION SHALL BE INSTALLED WITHIN 60 DAYS OF THE END OF CONSTRUCTION.
7. THE CONTRACTOR SHALL MAINTAIN RECORDS OF EROSION AND SEDIMENT CONTROL, FOR A PERIOD OF THREE YEARS AFTER COMPLETION OF CONSTRUCTION OR AS REQUIRED BY GOVERNING AUTHORITIES.
8. TEMPORARY SEEDING FOR THIS PROJECT SHALL UTILIZE TUD, TDEC OR LOCAL STANDARDS UNLESS OTHERWISE INDICATED.
9. MULCHING SHALL CONSIST OF LOOSE YAW OR STRAW APPLIED AT A RATE OF 2 TONS PER ACRE. MULCH MUST BE CRIMPED INTO THE SOIL BY MECHANICAL MEANS. BROADCAST SPREADING OF MULCH IS NOT ACCEPTABLE.
10. AFTER 45 DAYS OF CONSTRUCTION, MULCH SHALL BE REPLACED TO PREVENT EROSION. ALL STOCKPILES SHALL BE COVERED WITH TEMPORARY SEEDING AND PROTECTED WITH SILT FENCING.
11. FOR PERMANENT STABILIZATION OF ALL SLOPES 3:1 OR STEEPER, INSTALL TEMPORARY EROSION CONTROL, BLANKET (TENSAR NORTH AMERICAN GREEN S150 OR APPROVED EQUIV) INSTALLED PER MANUFACTURERS' INSTRUCTIONS.
12. THE LOCATION OF SOME OF THE EROSION CONTROL MEASURES MAY NEED TO BE ALTERED DUE TO CHANGING SITE CONDITIONS COMMENSURATE WITH PROGRESS OF THE WORK. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCOMPLISH EROSION AND SEDIMENT CONTROL FOR ALL DRAINAGE PATTERNS CREATED AT VARIOUS STAGES OF CONSTRUCTION, AND TO MAINTAIN SLOTTED EROSION DURING ANY PHASE OF CONSTRUCTION SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
13. EROSION CONTROL DEVICES SHALL BE MAINTAINED UNTIL A PERMANENT GROUND COVER IS ESTABLISHED. SEEDING SHALL BE INSTALLED AND COVERED WITH MULCH OR STRAW IMMEDIATELY AFTER EROSION CONTROL DEVICES ARE REMOVED. PRIOR TO REMOVAL OF THE TEMPORARY EROSION CONTROL DEVICES, FINAL SEEDING AND ESTABLISHMENT OF GROUND/COVER SHALL BE APPLIED TO ANY AREA DISTURBED AS A RESULT OF THE REMOVAL OF THE EROSION CONTROL DEVICES.
14. THE CONTRACTOR SHALL PREPARE, IMPLEMENT, AND MAINTAIN A SILT PREVENTION, CONTROL, AND COUNTERMEASURES (SPCC) PLAN AS A SEPARATE DOCUMENT OR AS A COMPONENT OF THE SWPPP. FOR ALL TANKS/CONTAINERS STORING ONSITE FUEL, CHEMICALS, OR OTHER POLLUTANTS CONSISTENT WITH THE REQUIREMENTS OF STATE NPDES RULES. EFFECTIVE MEASURES NECESSARY TO PREVENT SPILLS AND TO CLEAN UP SPILLS OF ANY TOXIC POLLUTANT, AS WELL AS SPILLS OF FUEL, OIL, GREASE, AND OTHER POLLUTANTS. ALL SPILLS OF FUEL, OIL, GREASE, AND OTHER POLLUTANTS, PAINTS, FUEL, OR CHEMICAL SPILLS, SHALL BE IMMEDIATELY CLEANED UP, MANAGED, AND DISPOSED OF IN AN APPROVED MANNER. WHERE POTENTIAL SPILLS CAN OCCUR, MATERIALS HANDLING PROCEDURES SHALL BE DEVELOPED PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CLEAN UP AND DISPOSE OF ALL SPILLS DESCRIBED IN THE SPCC PLAN OR EMPLOYEE TRAINING EXCEPT LOCATION OF THE SPILL, COMPANY NAME AND LOCATION, THE MATERIAL SPILLED, THE ESTIMATED QUANTITY, THE SOURCE OF THE SPILL, THE CAUSE OF THE SPILL, THE NEAREST DOWNSTREAM WATER WITH THE POTENTIAL TO RECEIVE THE SPILL, AND THE ACTIONS BEING TAKEN FOR CONTAINMENT AND CLEANUP.
15. ALL EROSION AND SEDIMENT CONTROL DEVICES TO BE SELECTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH TDEC SEDIMENT AND EROSION CONTROL HANDBOOK, LATEST EDITION.
16. WATER QUALITY SHALL NOT BE INSTALLED UNTIL BUILD'S NEAR COMPLETION TO PREVENT CONSTRUCTION DRAINAGE FROM ENTERING ANY OF THE WATER QUALITY AREAS SHALL NOT BE USED AS SEDIMENT BASINS DURING CONSTRUCTION. INSTALLERS OF WATER QUALITY BMP'S SHOULD FOLLOW ALL INSTALLATION GUIDELINES SET FORTH IN THE CITY OF COLUMBIA BMP MANUAL, LOCATED ON THE CITY'S WEBSITE.
17. MATERIALS AND SUPPLIES TO BE STORED IN THE WATER QUALITY AREAS, THE SIGNS, MATERIALS, AND LABOR TO INSTALL WILL BE PROVIDED BY THE CITY STAFF.

CONSTRUCTION SEQUENCE

1. INSTALL CONSTRUCTION ENTRANCE
2. INSTALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES
3. INSTALL SEDIMENT TRAPS
4. INSTALL TREE PROTECTION FENCING
5. OBTAIN CITY OF COLUMBIA FOR INSPECTION OF EROSION PREVENTION AND SEDIMENT CONTROL DEVICES AND TO OBTAIN A FULL GRADING PERMIT.
6. CLEAR, GRUB, AND GRADE THE SITE
7. CONTACT REMAINING OF SITE FOR APPROVED PLANS INCLUDING INSTALLATION OF ALL ADDITIONAL EPSC MEASURES SHOWN ON THE PLANS OR AS DIRECTED BY THE EPSC INSPECTOR
8. REFINISH EXISTING CONCRETE SURFACES OF THE SITE, REMOVE ALL TEMPORARY EROSION CONTROL DEVICES (SEE FINAL EPSC PLAN FOR POST CONSTRUCTION CLOSEOUT PROCESS).

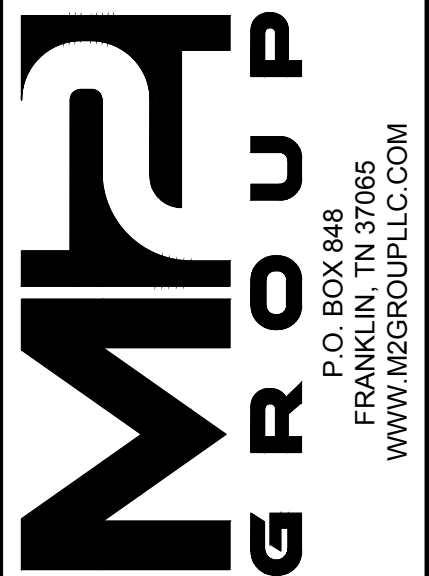
EPSC DATA CHART:
BMP DESIGN RAIN EVENT: 5 YEAR, 24 HR STORM



Know what's below.
Call before you dig

[illegible]

SITE PLANS FOR:
MACKENZIE PLACE
TAX MAP 90B, GROUP B, PARCEL 47.00
220 THETA PIKE
CITY OF COLUMBIA
MAURY COUNTY, TENNESSEE



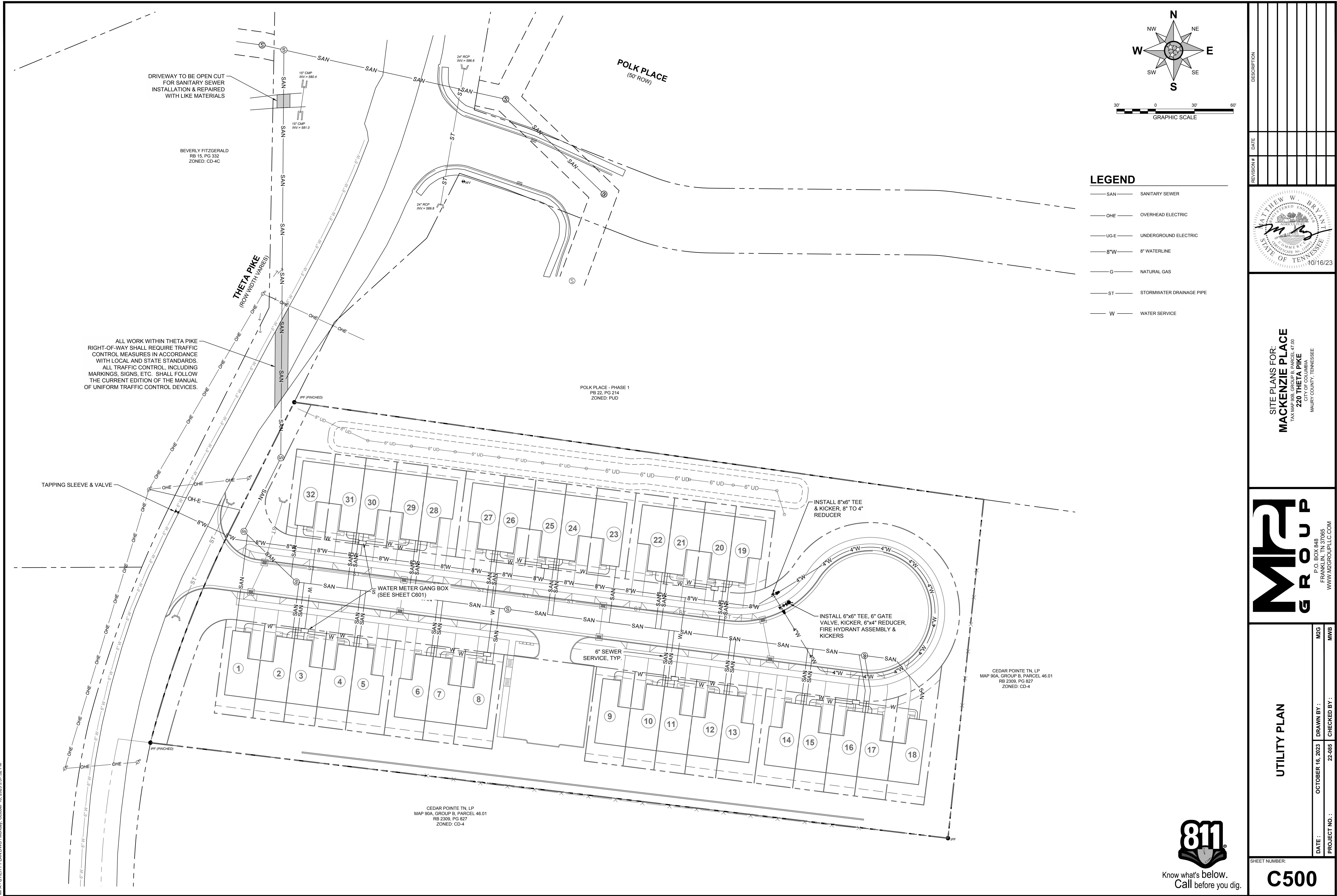
P.O. BOX 848
FRANKLIN, TN 37065
WWW.M2GROUPLLC.COM

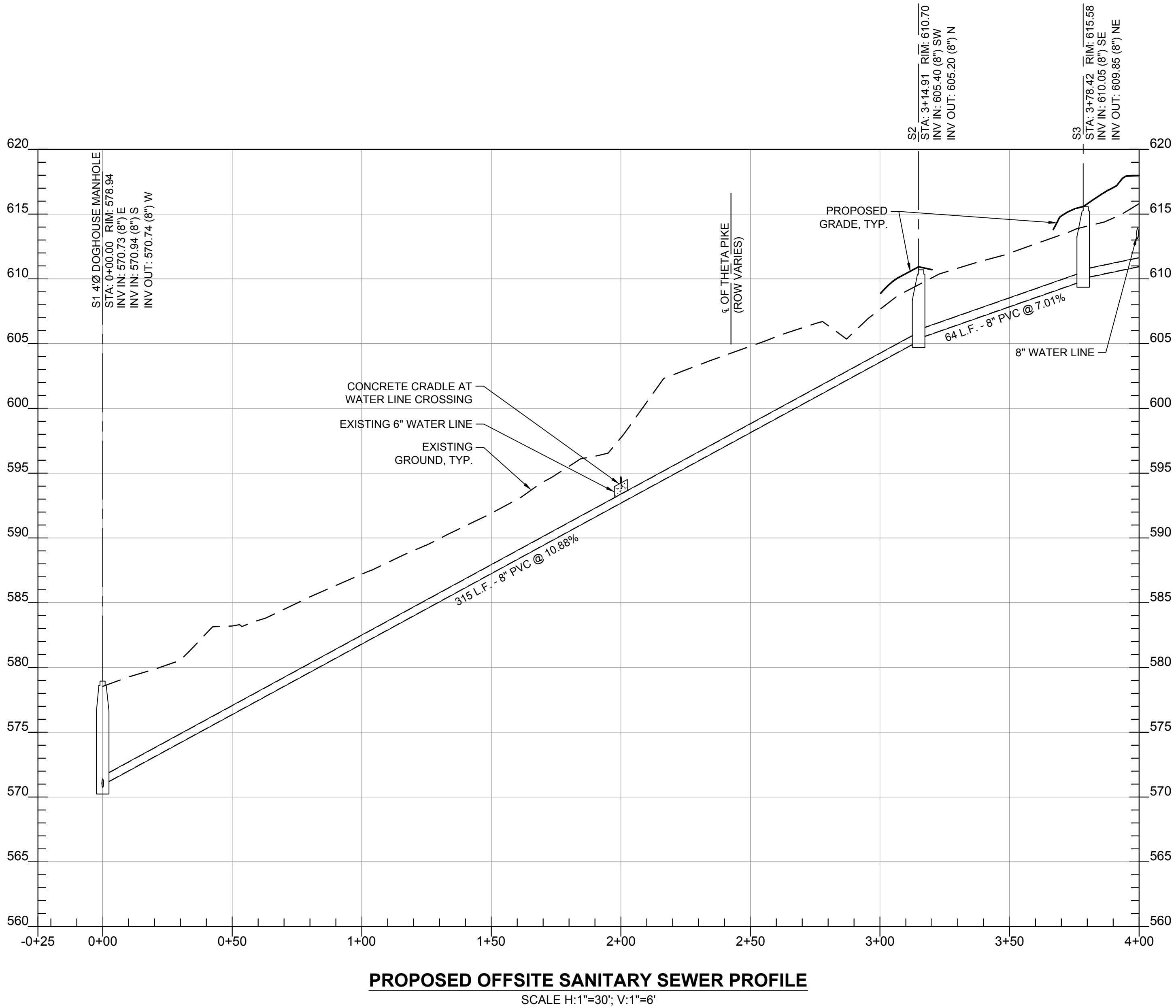
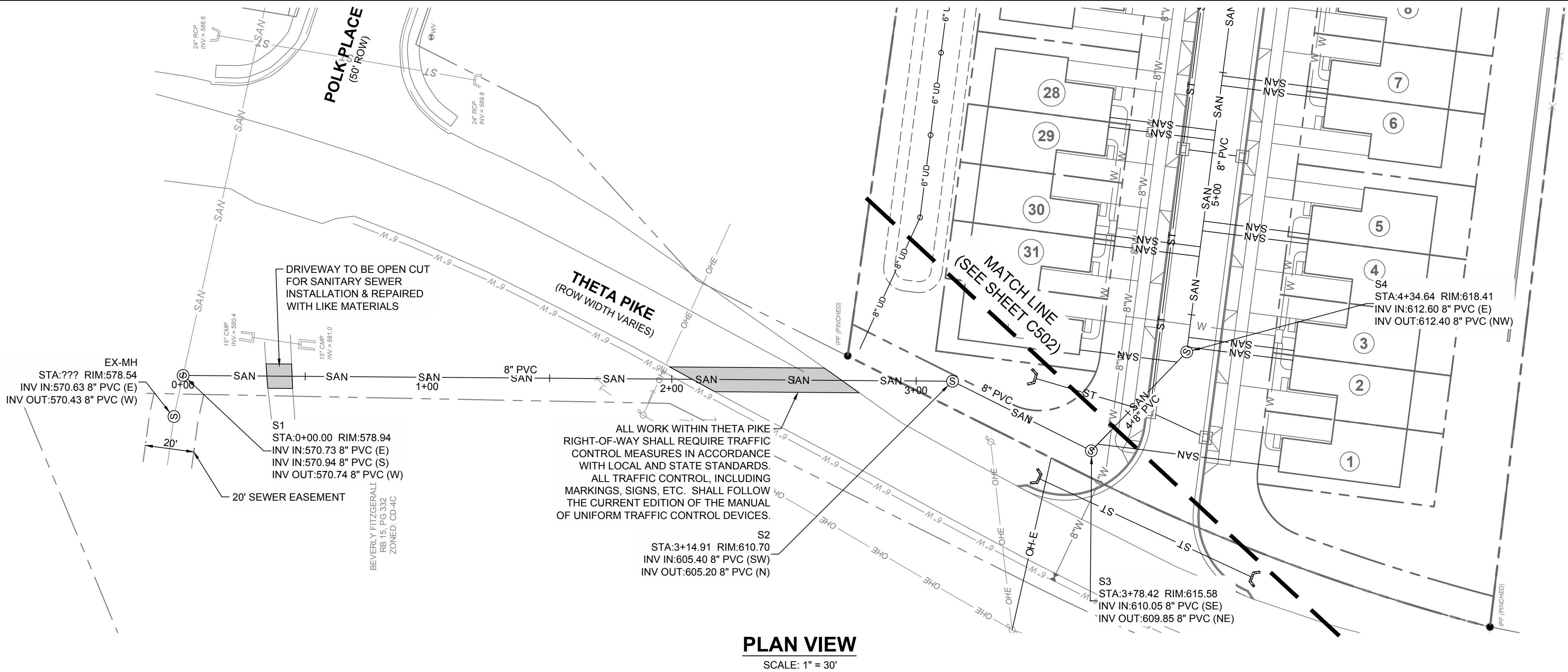
FINAL EPSC PLAN

DATE:	OCTOBER 16, 2023	DRAWN BY:	M2G
PROJECT NO.:	22-085	CHECKED BY:	MWB

SHEET NUMBER

C403





Know what's below.
Call before you dig.

OFFSITE SANITARY SEWER
PLAN & PROFILE

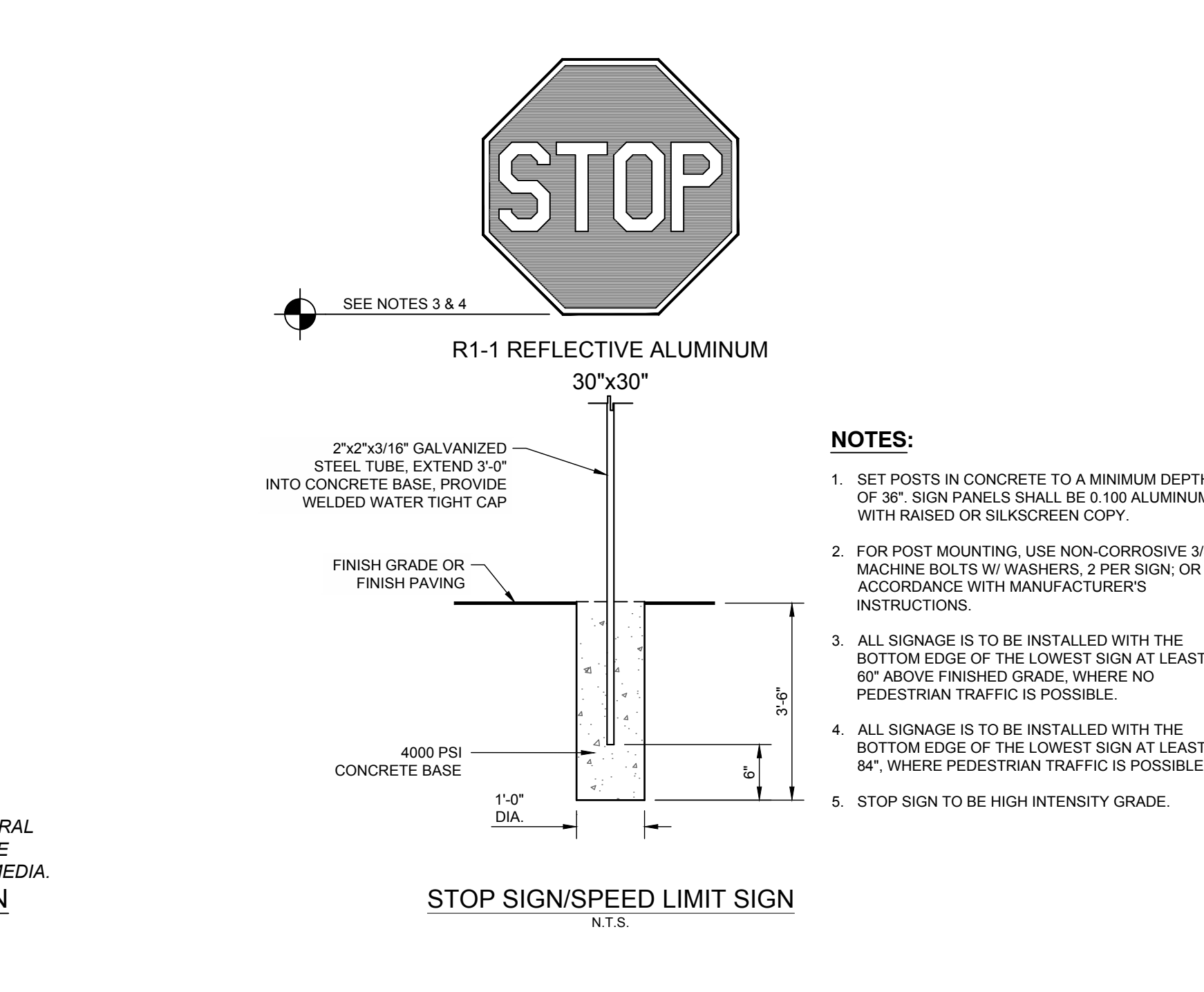
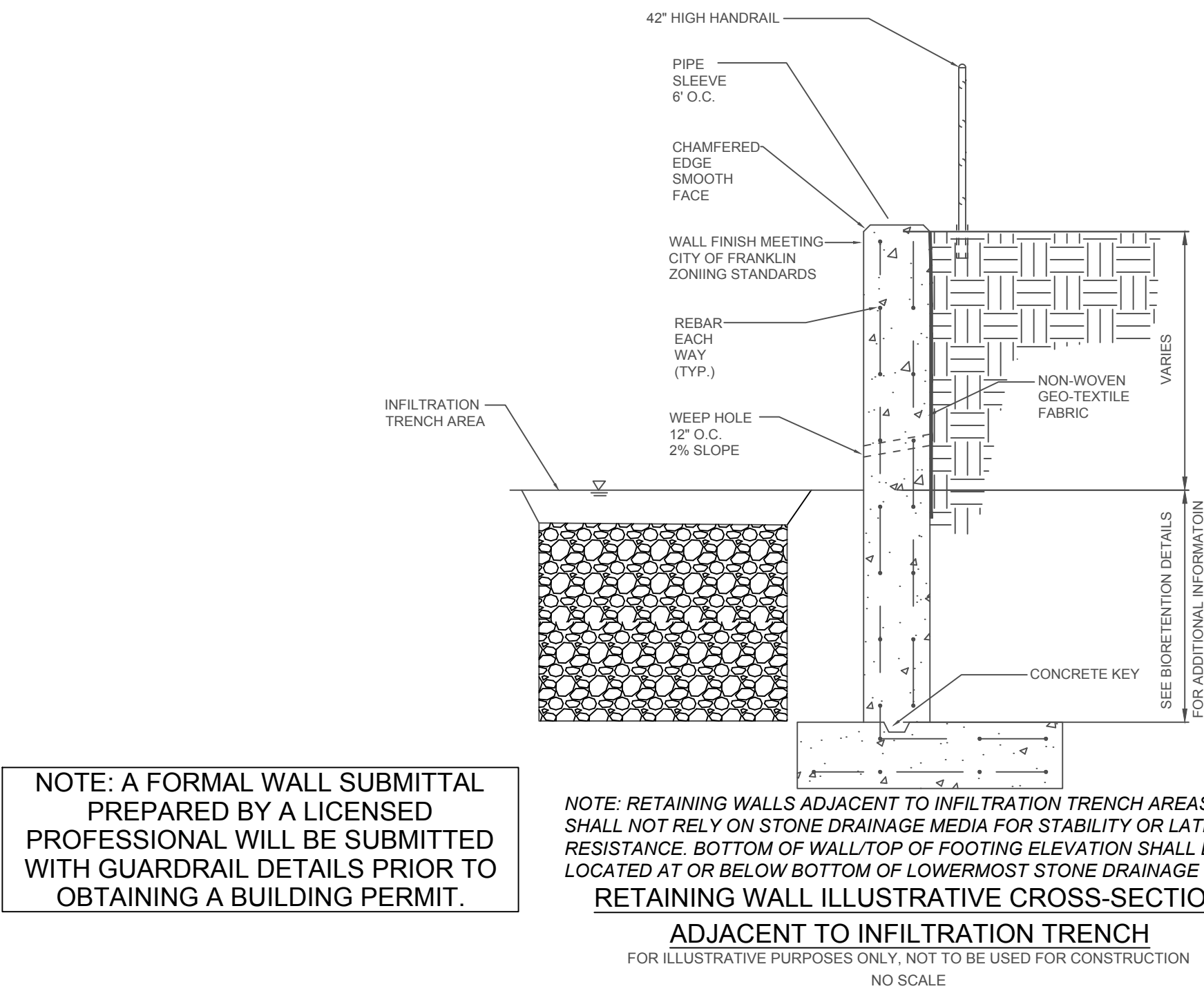
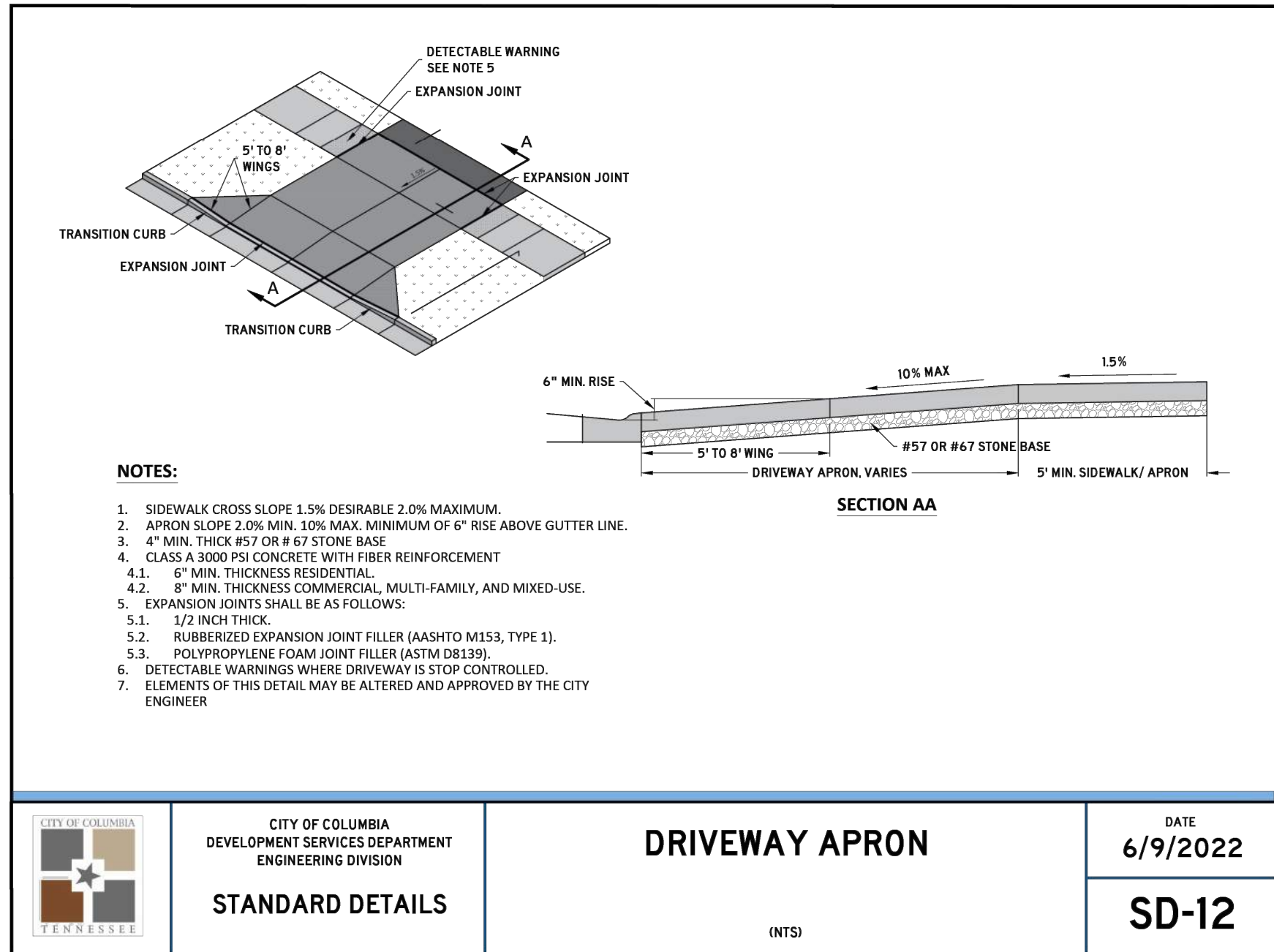
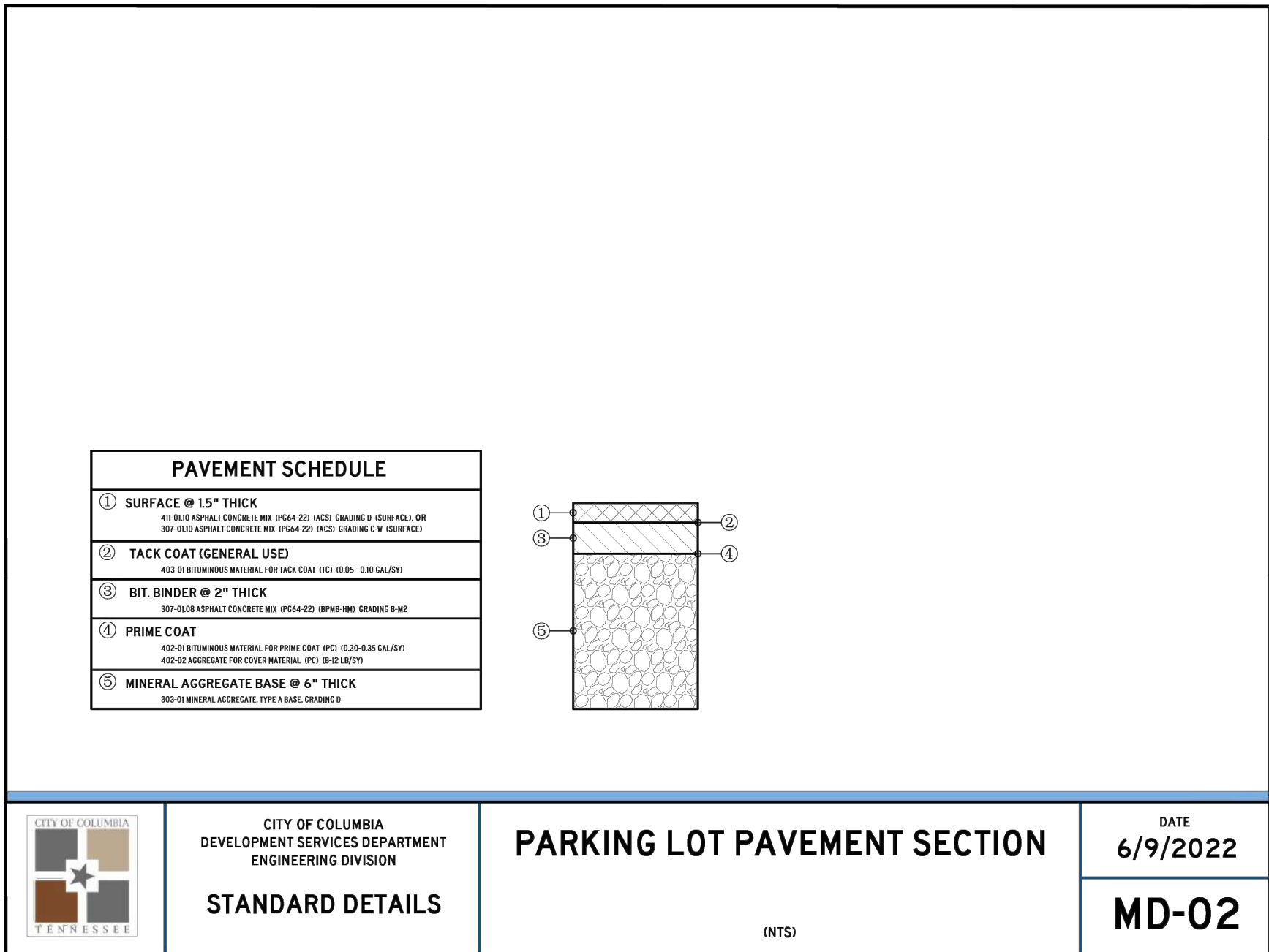
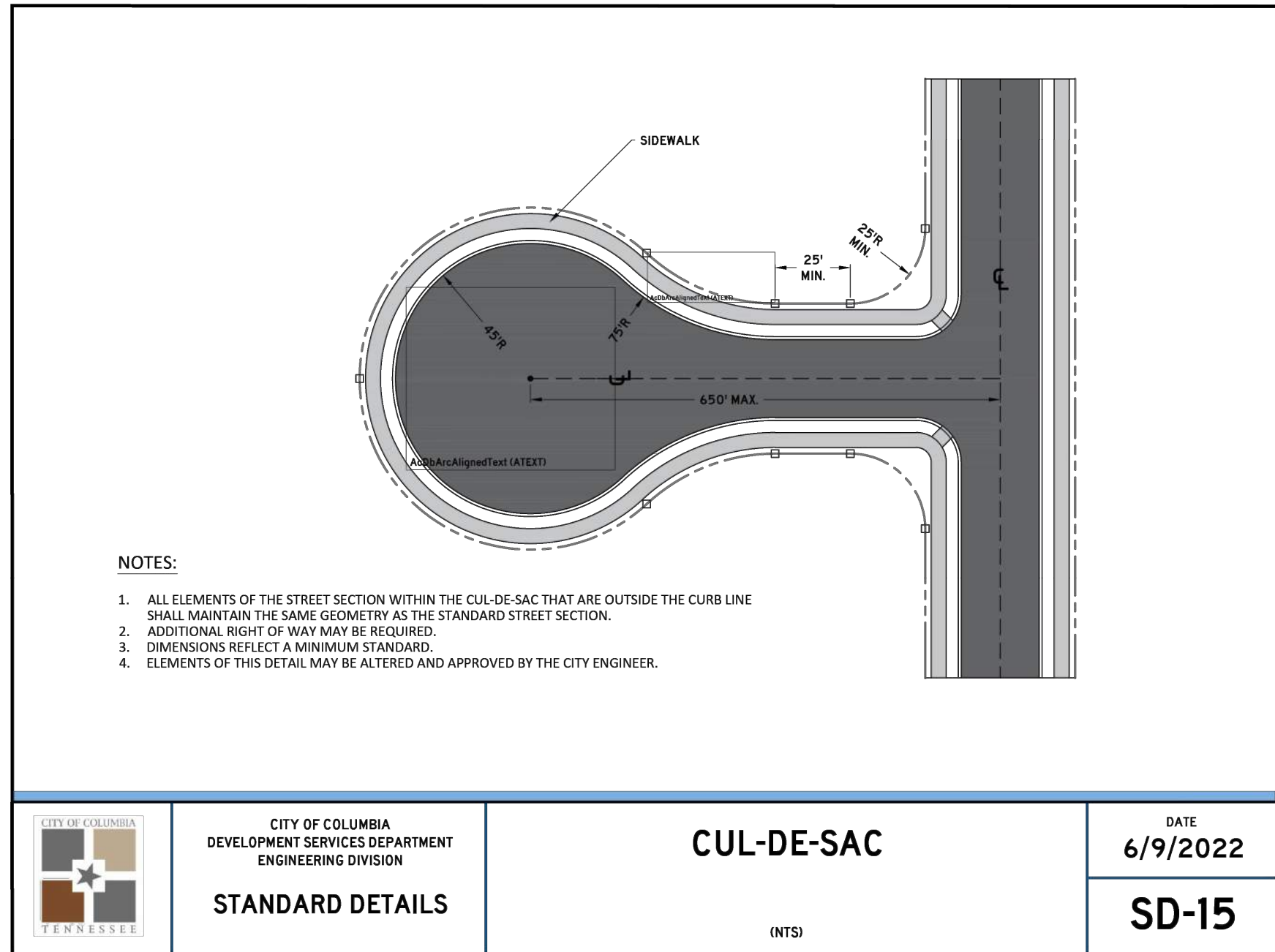
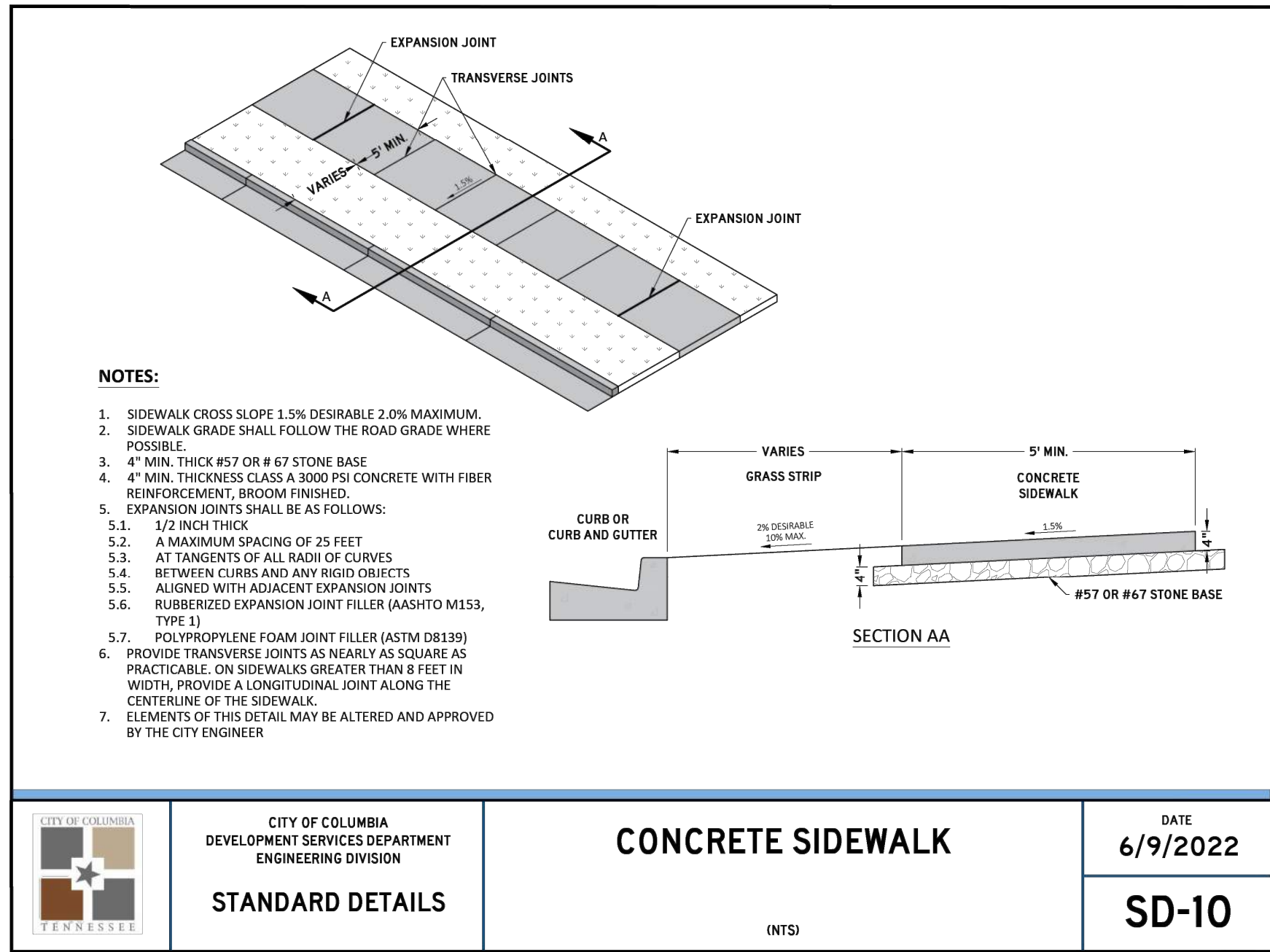
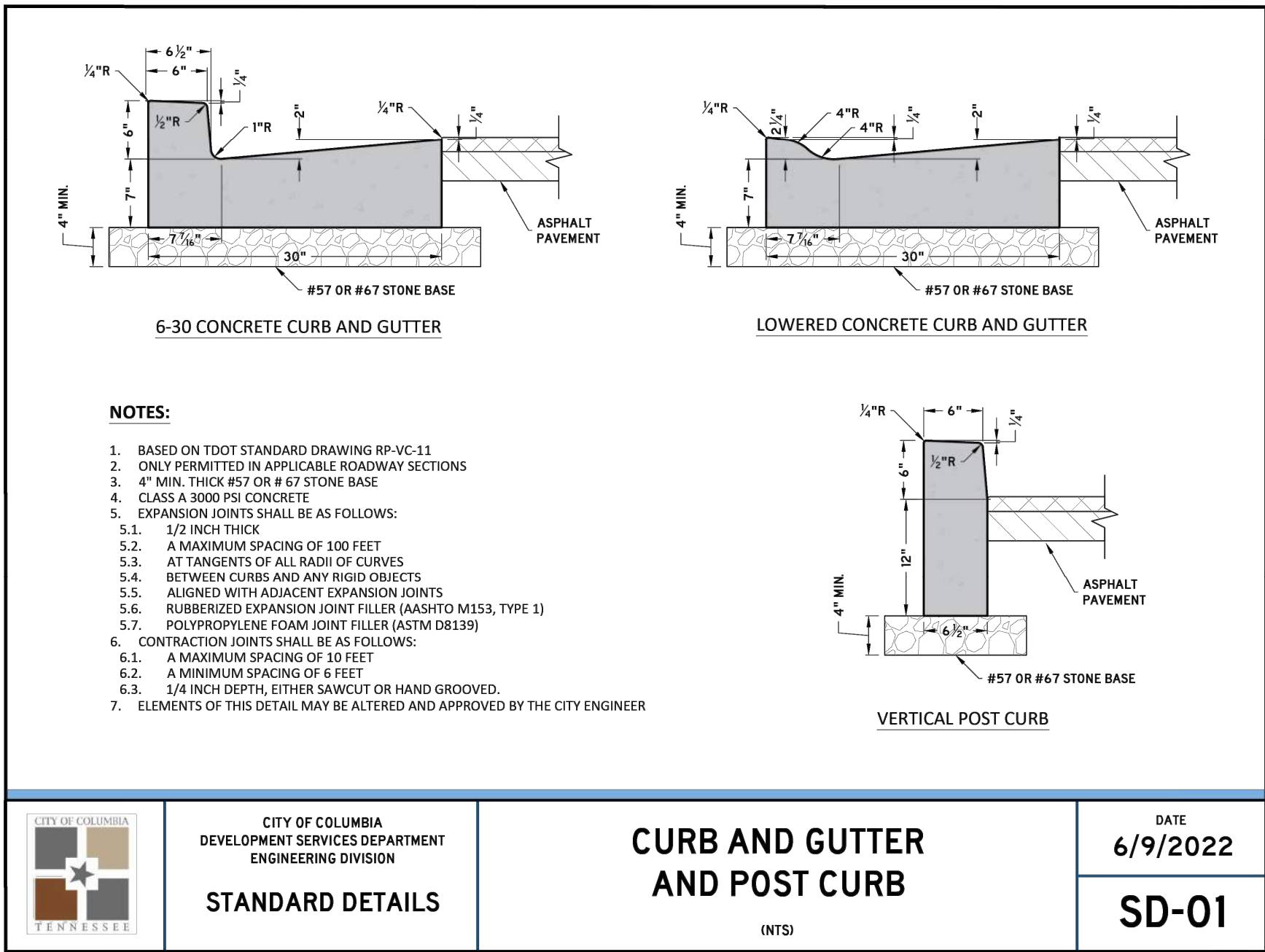
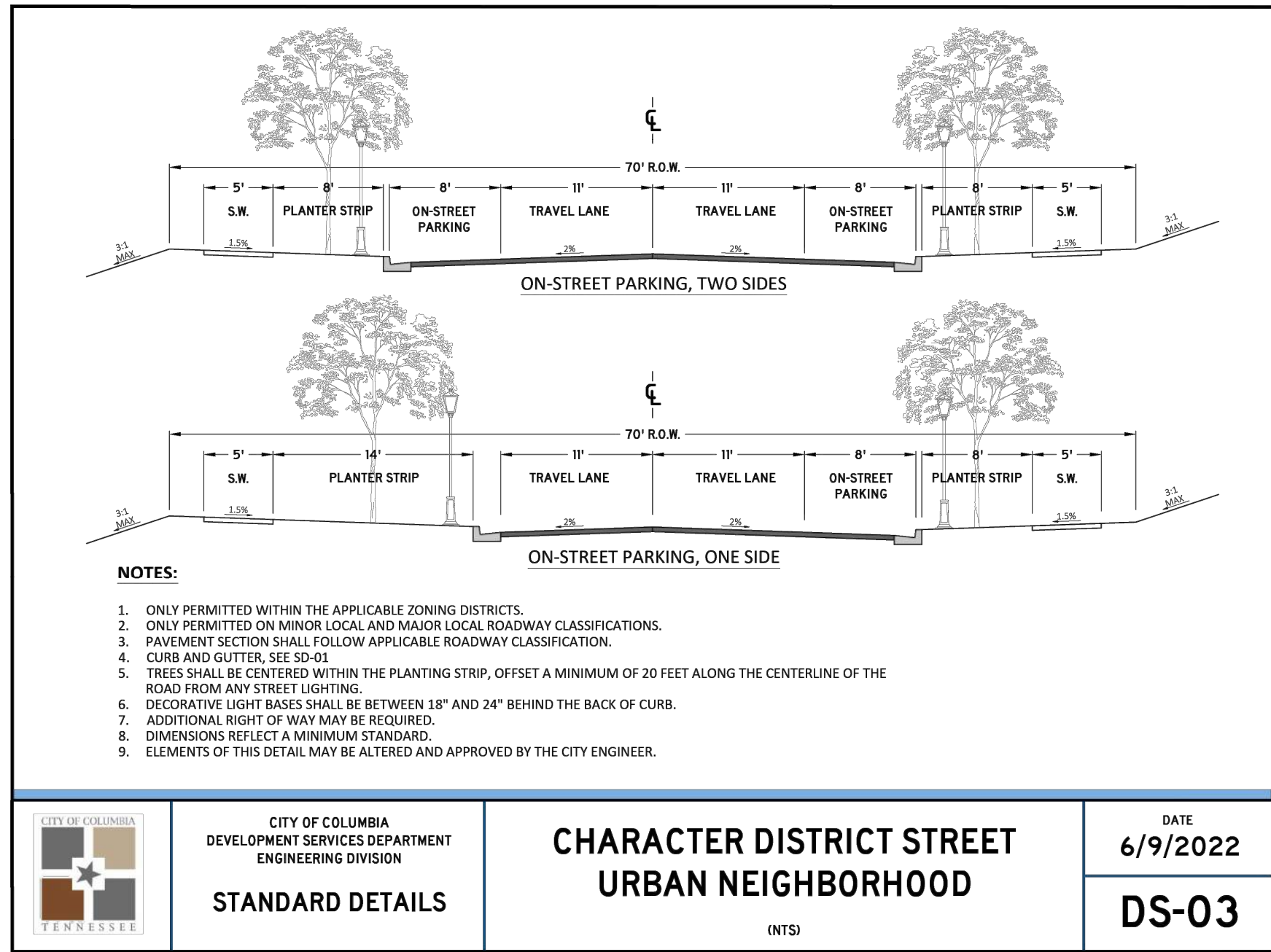
DATE:	OCTOBER 16, 2023	DRAWN BY:	M2G
PROJECT NO.:	22-085	CHECKED BY:	MWB

M2G GROUP
P.O. BOX 848
FRANKLIN, TN 37065
WWW.M2GROUP,LLC.COM

SITE PLANS FOR:
MACKENZIE PLACE
TAX MAP 90B, GROUP B, PARCEL 47.00
220 THETA PIKE
CITY OF COLUMBIA
MAURY COUNTY, TENNESSEE



REVISION #	DATE	DESCRIPTION

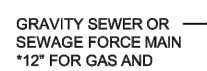
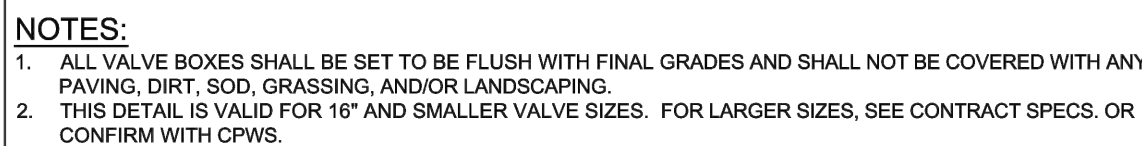


SITE PLANS FOR:
MACKENZIE PLACE
TAX MAP 90B, GROUP B, PARCEL 47.00
220 THETA PIKE
CITY OF COLUMBIA
MAURY COUNTY, TENNESSEE

M2G GROUP
P.O. BOX 848
FRANKLIN, TN 37065
WWW.M2GROUP,LLC.COM

SITE DETAILS

C600

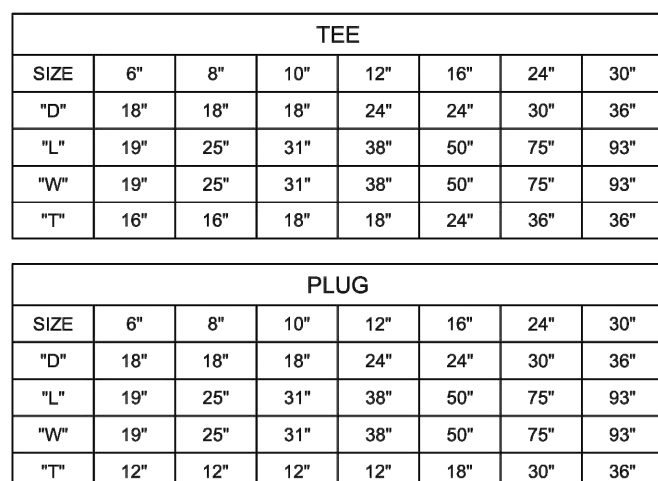


TEES		
RUN	BRANCH	L
4"	4"	F.O.
4"	6"	10"
	<6"	F.O.
8"	8"	29"
	<8"	F.O.
10"	10"	45"
	8"	13"
	<8"	F.O.
12"	12"	62"
	10"	32"
	<8"	F.O.
16"	16"	94"
	12"	39"
	10"	5"
	<10"	F.O.
20"	20"	125"
	16"	76"
	12"	14"
	<12"	F.O.
24"	24"	124"
	20"	84"
	16"	36"
	<16"	F.O.

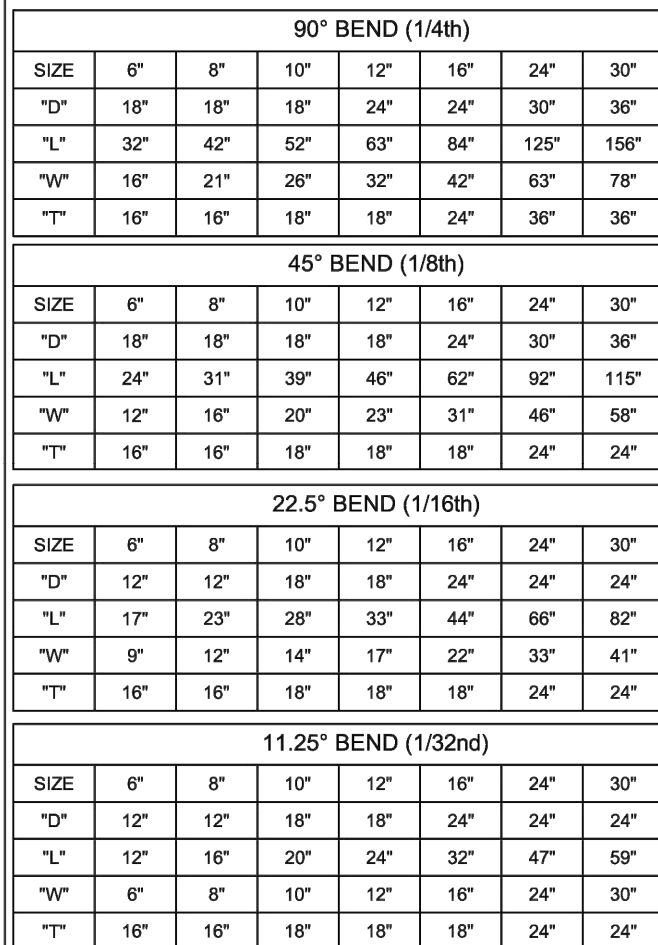
REDUCERS	
SIZE	L
6x4	34"
8x6	36"
8x4	62"
10x8	35"
10x6	63"
12x10	36"
12x8	64"
16x12	66"
16x10	92"
20x18	35"
20x16	66"
20x12	117"
24x20	56"
24x18	80"
24x16	101"

- NOTES:**
1. PIPE TO BE INSTALLED IN TRENCH AS PER LINE LAYING CONDITION DETAIL.
 2. ALL BURIED PIPES SPECIFIED TO BE PRESSURE TESTED AND SHALL BE PROVIDED WITH MECHANICAL JOINT THREAT RESISTANTS AT ALL DIRECTION CHANGES, SIZE CHANGES, AND DEAD ENDS, ALL CONNECTIONS TO EXISTING PIPE SHALL BE MADE WITH RETAINER GASKETS.
 3. MECHANICAL JOINT SHALL BE BUILT TO BE DUCTILE IRON IN ACCORDANCE WITH ASTM A536 - STANDARD SPECIFICATION FOR DUCTILE IRON CASTINGS.
 4. CONTRACTOR SHALL FURNISH AND INSTALL MECHANICAL JOINTS AND ALL HARDWARE AND ACCESSORIES AS REQUIRED BY THE MANUFACTURER FOR PROPER INSTALLATION.
 5. CONTRACTOR SHALL PROVIDE THE SERIES/MODEL OF JOINT RESTRAINT AS REQUIRED FOR THE PIPE SIZE, MATERIAL, AND THE FITTING SHOWN ON THE PLANS.
 6. RESTRAINT LENGTH CALCULATIONS WERE PERFORMED UNDER THE FOLLOWING CONDITIONS: PVC PIPE MATERIAL, GM SOIL, 15' SPAN FACTOR, TYPE 3 CONC RETAINMENT, 2.5 FT BURY DEPTH, 15 PSI TEST PRESSURE.

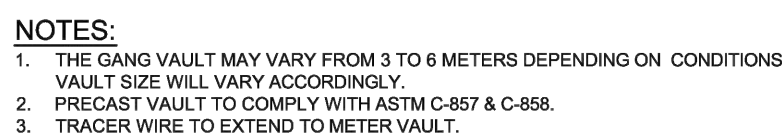
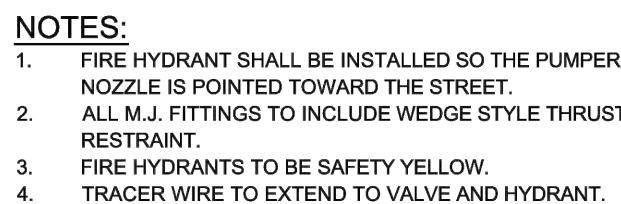
STANDARD WATER DETAIL	FIGURE NO.:
PIPE JOINT RESTRAINT SCHEDULE	CWS-4



- ## NOTES:
1. DEPTH "D" MAY BE GREATER THAN SPECIFIED TO ALLOW WORKING SPACE AGAINST UNDISTURBED EARTH.
 2. ALL BOLTS AND FITTINGS MUST BE WRAPPED IN MINIMUM 12" (305 MM) PLASTIC.
 3. LEAVE APPROXIMATELY 12" SEPARATION BETWEEN CONCRETE AND FITTING BELLS.
 4. THRUST BLOCK DIMENSIONS BASED ON 150 PSI OPERATING PRESSURE AND 50% ADDITIONAL SURGE PRESSURE.
 5. SOIL BEARING PRESSURE USED FOR THRUST BLOCK DIMENSIONS SHOWN IS 4,000 PSF. IF SOIL SURROUNDING THRUST BLOCK DOES NOT HAVE THIS CAPACITY, ADDITIONAL THRUST BLOCKS WILL BE REQUIRED.
 6. CONCRETE TO BE USED FOR THRUST BLOCKS TO BE 3,500 PSI CONCRETE.
 7. LENGTH (L) AND WIDTH (W) DIMENSIONS CAN BE MODIFIED SUFFICIENTLY AS LONG AS TOTAL AREA DOES NOT CHANGE, BY WRITING DIRECTION OF CPWS ONLY TO MEET SITE SPECIFIC CONCERNS.
 8. BOTTOM OF GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF THRUST BLOCK.

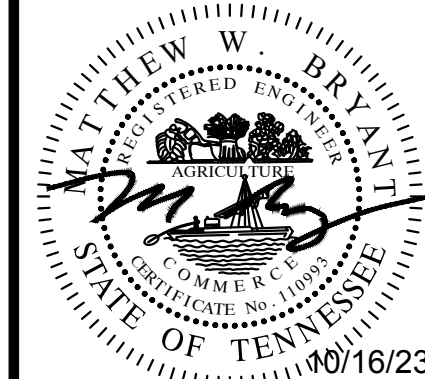


- ## NOTES:
1. DEPTH "D" MAY BE GREATER THAN SPECIFIED TO ALLOW WORKING SPACE AGAINST UNDISTURBED EARTH.
 2. ALL BOLTS AND FITTINGS MUST BE WRAPPED IN MINIMUM THREE (3) PL. PLASTIC.
 3. LEAVE APPROXIMATELY 12" CLEARANCE BETWEEN CONCRETE AND FITTING BOLTS.
 4. THRUST BLOCK DIMENSIONS BASED ON 150 PSI OPERATING STRESS AND 50% ADDITIONAL SURFACE PRESSURE.
 5. SOIL BEARING PRESSURE USED FOR THRUST BLOCK DIMENSIONS SHOWN IS 4,000 PSF. IF SOIL SURROUNDING THRUST BLOCK DOES NOT HAVE THIS CAPACITY, ADDITIONAL STRENGTH OF THRUST BLOCK VOLUME MUST BE PROVIDED.
 6. CONCRETE TO BE USED FOR THRUST BLOCKS TO BE 3,500PSI CONCRETE.
 7. LENGTH (L) AND WIDTH (W) DIMENSIONS CAN BE MODIFIED Slightly AS LONG AS TOTAL AREA DOES NOT CHANGE, BY WRITTEN DIRECTION OF CPWS ONLY TO MEET SITE SPECIFIC CONCERNS.
 8. ELEVATION OF GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF THRUST BLOCK.

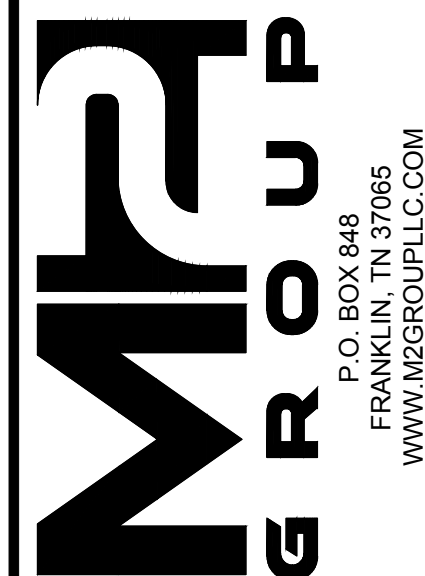


- NOTES:**
1. THE GANG VAULT MAY VARY FROM 3 TO 6 METERS DEPENDING ON CONDITIONS. VAULT SIZE WILL VARY ACCORDINGLY.
 2. PRECAST VAULT TO COMPLY WITH ASTM C-857 & C-858.
 3. TRACER WIRE TO EXTEND TO METER VAULT.

STANDARD WATER DETAIL	FIGURE NO.:
GANG METER VAULT	CWS-2

[illegible]

SITE PLANS FOR:
MACKENZIE PLACE
TAX MAP 90B, GROUP B, PARCEL 47.00
220 THETA PIKE
CITY OF COLUMBIA
MAURY COUNTY, TENNESSEE



P.O. BOX 848
FRANKLIN, TN 37065
WWW.M2GROUPLLC.COM

UTILITY DETAILS

DATE :	OCTOBER 16, 2023	DRAWN BY :	M2G
PROJECT NO. :	22-085	CHECKED BY :	MWB

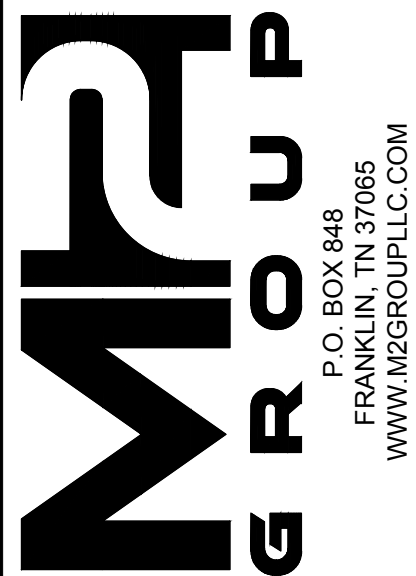
SHEET NUMBER:

C601

Sheet List Table	
SHEET NUMBER	SHEET TITLE
PP-01	COVER SHEET
PP-02	EXISTING CONDITIONS
PP-03	PRELIMINARY PLAT
PP-04	PRELIMINARY PLAT

[illegible]

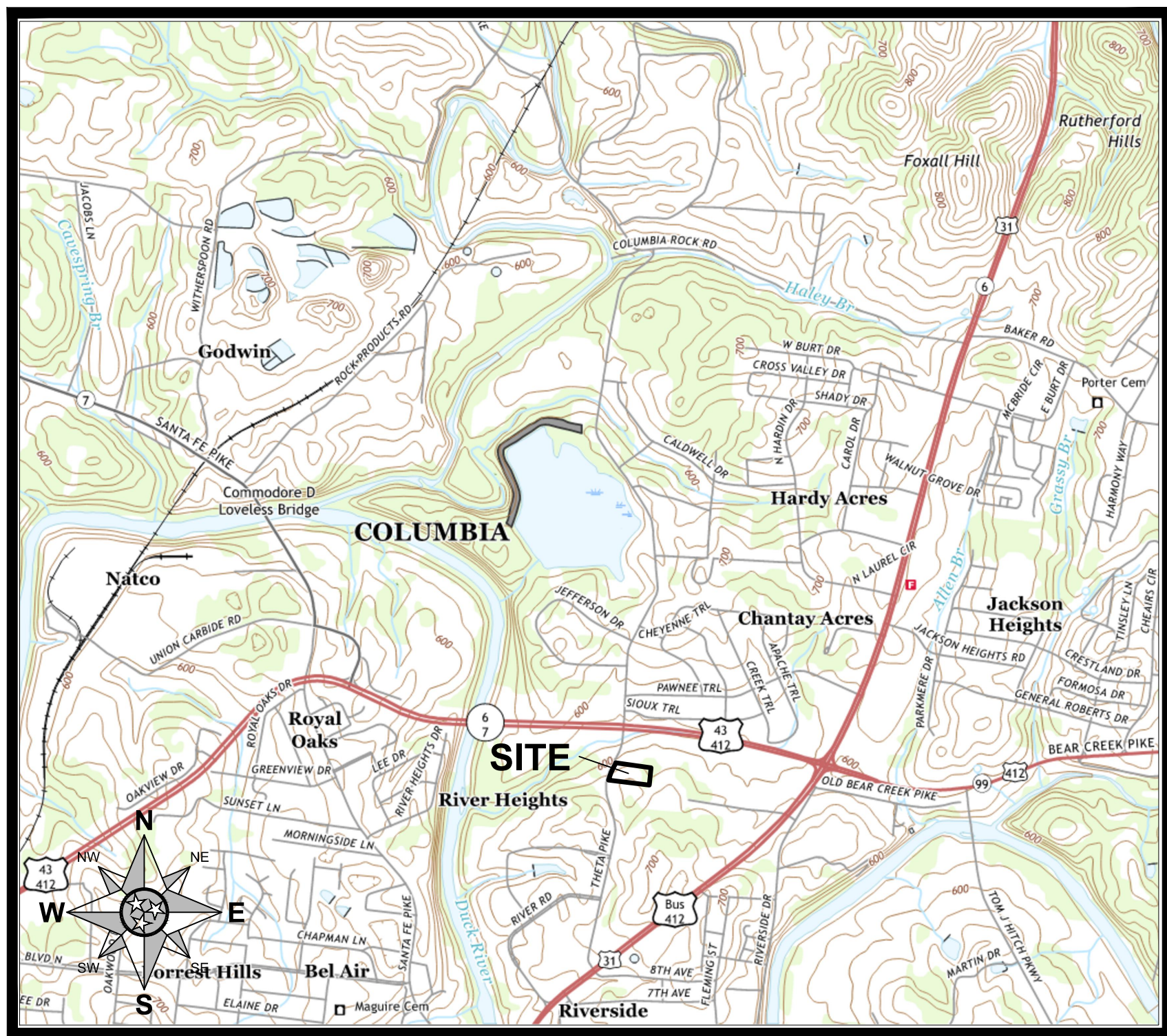
PRELIMINARY PLAT FOR:
MACKENZIE PLACE
TAX MAP 90B, GROUP B, PARCEL 47.00
220 THETA PIKE
CITY OF COLUMBIA
MAURY COUNTY, TENNESSEE



COVER SHEET	DATE :	OCTOBER 16, 2023	DRAWN BY :	M2G
	PROJECT NO. :	22-085	CHECKED BY :	MWB

SHEET NUMBER

PP-01



SCALE: 1" = 2,000'
SOURCE: USGS

1. BEARINGS ARE BASED ON THE TENNESSEE STATE PLANE COORDINATE SYSTEM (NAD83, 2011).
2. ALL DEED BOOK AND PLAT REFERENCES PERTAIN TO THE REGISTER'S OFFICE FOR MAURY COUNTY, TENNESSEE.
3. WATER FOR THIS DEVELOPMENT IS TO BE PROVIDED BY COLUMBIA POWER & WATER SYSTEMS.
4. SANITARY SEWER PROVIDER FOR THIS DEVELOPMENT IS TO BE COLUMBIA POWER & WATER SYSTEMS.
5. TOPOGRAPHIC AND BOUNDARY SURVEY PREPARED BY M2 GROUP, LLC DATED MAY, 2022.
6. ELECTRIC SERVICE TO BE PROVIDED BY COLUMBIA POWER & WATER SYSTEMS.
7. GAS SERVICE TO BE PROVIDED BY ATMOS ENERGY.

THE PROPERTY SHOWN HEREON IS LOCATED IN A FLOOD HAZARD ZONE "X"
(AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE
FLOODPLAIN) ACCORDING TO F.I.R.M. MAP "MAURY COUNTY, TENNESSEE"
PANEL 170 OF 440, MAP NUMBER 47119C0170E, EFFECTIVE DATE APRIL 16, 2007.

OWNER/DEVELOPER

WAITS DEVELOPMENT GROUP, LLC
ADDRESS: PO BOX 111285
NASHVILLE, TENNESSEE 37222
PHONE NO.:615-498-4190
CONTACT NAME: JOHN WAITS

CIVIL ENGINEER

M2 GROUP, LLC
P.O. BOX 848
FRANKLIN, TN 37065
PHONE: (615) 406-3415
CONTACT: MATT W. BRYANT, P.E.
E-MAIL: matt@m2groupllc.com

WATER SUPPLY:
COLUMBIA POWER & WATER SYSTEMS
201 PICKENS LANE
COLUMBIA, TN 38401
(931) 388-4833

SANITARY SEWER
COLUMBIA WASTEWATER DEPARTMENT
1244 Treatment Plant Road
COLUMBIA, TN 38401
(931) 560-1001

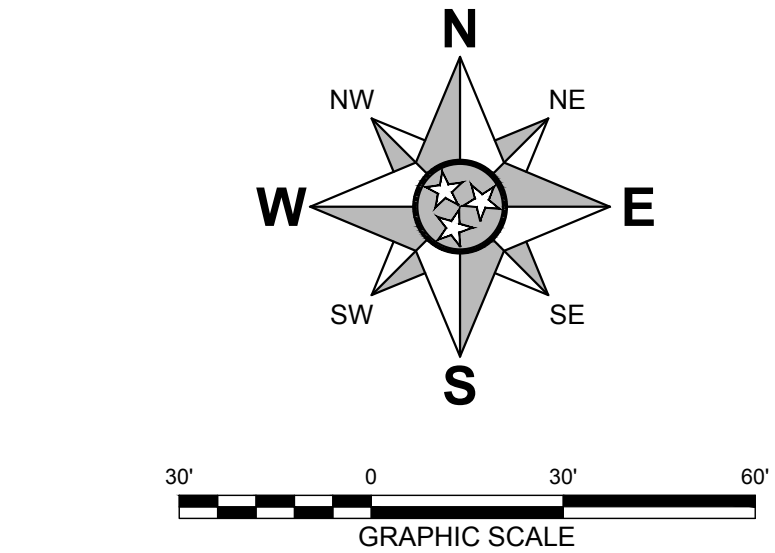
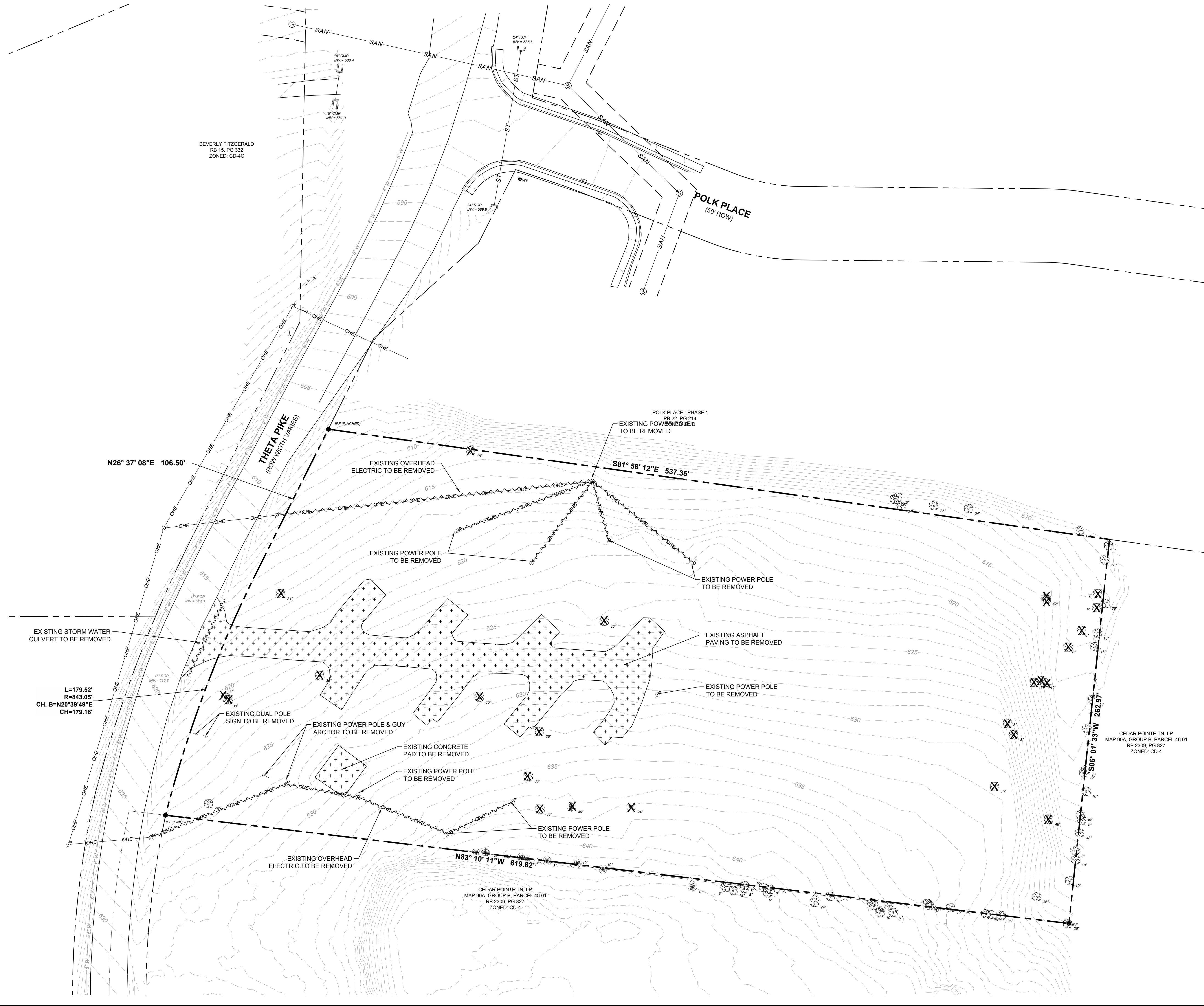
ELECTRIC SERVICE
COLUMBIA POWER & WATER SYSTEMS
201 PICKENS LANE
COLUMBIA, TN 38401
(931) 388-4833

GAS SERVICE
ATMOS ENERGY CORPORATION
810 NASHVILLE HWY
COLUMBIA, TN 38401
(931) 388-9136



Know what's below.
Call before you dig.

MPA, PP - EXISTING CONDITIONS DWG / Monday, October 16, 2023 2:23:04 PM



LEGEND

- ASPHALT REMOVAL
- UTILITY REMOVAL
- TREE REMOVAL
- EXISTING PROPERTY LINE
- EXISTING ADJACENT PROPE
- EXISTING INDEX CONTOUR
- EXISTING OVERHEAD ELECT
- EXISTING SANITARY SEWER I
- EXISTING TREELINE
- EXISTING SPOT ELEVATION
- EXISTING STORM SEWER LIN
- FIRE HYDRANT
- WATER METER
- TREE, DECIDUOUS
- TREE, CONIFER
- IRON PIPE FOUND (IPF)
- SANITARY MANHOLE
- WATER BOX (WATER VALVE)
- POWER POLE
- CURB INLET

SURVEYOR'S NOTES

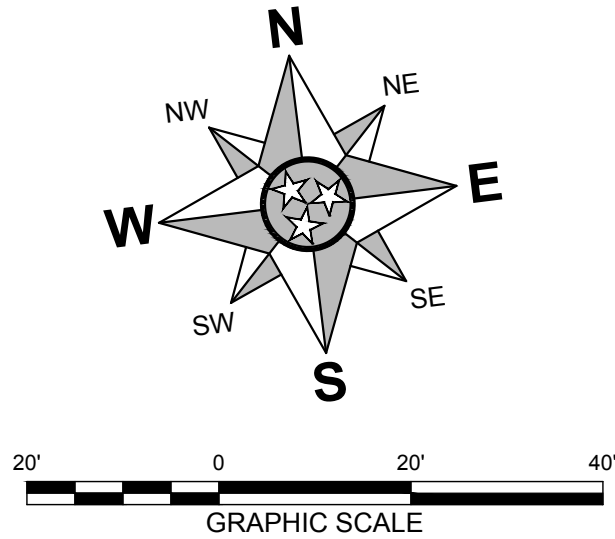
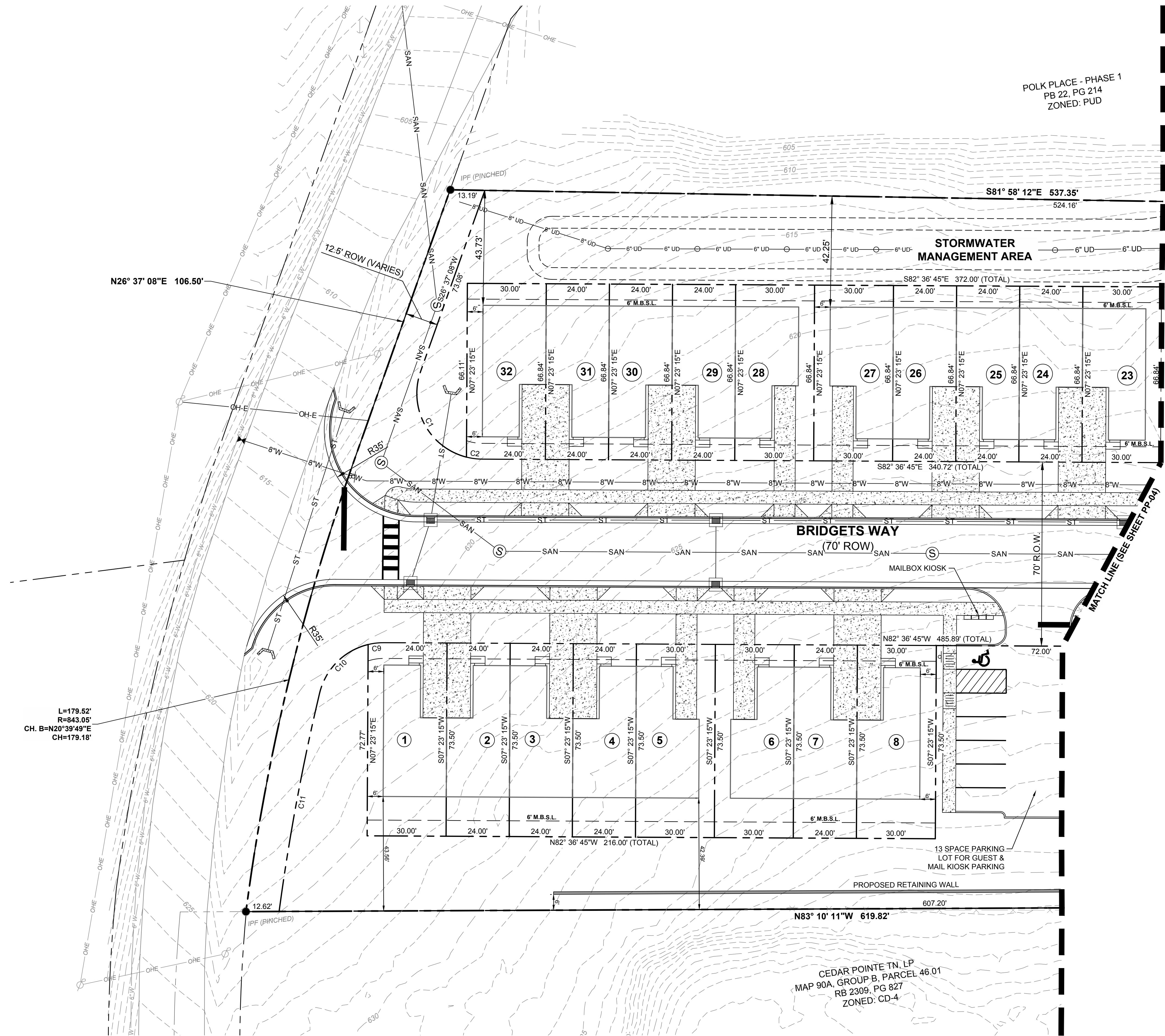
- BEARINGS ARE BASED ON THE TENNESSEE STATE PLANE COORDINATE SYSTEM (NAD83, 2011).
- THE FIELD SURVEY WAS COMPLETED ON MAY, 2022.
- THIS SURVEY WAS PREPARED USING THE CURRENT DEEDS AND PLATS OF RECORD.
- ALL DEED BOOK AND PLAT REFERENCES PERTAIN TO THE REGISTERS OFFICE FOR MAURY COUNTY, TENNESSEE.
- ADJOINING PROPERTY LINES SHOWN WERE PLOTTED FROM INFORMATION TAKEN FROM EITHER DEED DESCRIPTION, RECORD PLATS, OR TAX MAPS.
- PROPERTY CORNERS SET THIS SURVEY ARE 18" #4 REBAR WITH ORANGE PLASTIC CAP STAMPED "M2 GROUP", 18" #6 REBAR WITH YELLOW PLASTIC CAP STAMPED "M2 GROUP, LLC", OR PK NAIL WITH STAINLESS STEEL WASHER STAMPED "M2 GROUP, LLC", UNLESS NOTED OTHERWISE.
- UTILITIES SHOWN HEREON WERE COMPILED FROM VISIBLE STRUCTURES AT THE SITE, INFORMATION FROM PLANS, AND PHYSICAL MARKINGS AND COMBINED TO DEVELOP A VIEW OF THE UNDERGROUND UTILITIES. HOWEVER, LACKING EXCAVATION, THE EXACT LOCATION OF UNDERGROUND FEATURES CANNOT BE ACCURATELY, COMPLETELY, AND RELIABLY DEPICTED. IN ADDITION, IN SOME JURISDICTIONS, 811 OR OTHER SIMILAR UTILITY LOCATE REQUESTS FROM SURVEYORS MAY BE IGNORED OR RESULT IN AN INCOMPLETE RESPONSE. THIS SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THIS SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. VERIFICATION OF EXISTENCE, LOCATIONS, AND DEPTH SHOULD BE MADE BEFORE CONDUCTING ANY EXCAVATION IN THE VICINITY OF THE UTILITY.
- THE PROPERTY SHOWN HEREON IS LOCATED IN A FLOOD HAZARD ZONE "X" (AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN) ACCORDING TO F.I.R.M. MAP "MAURY COUNTY, TENNESSEE" PANEL 170 OF 440, MAP NUMBER 47119C0170E, EFFECTIVE DATE APRIL 16, 2007.
- NO TITLE REPORT WAS PROVIDED TO THIS SURVEYOR REGARDING THE SUBJECT PROPERTIES. THEREFORE, THIS SURVEY IS SUBJECT TO THE FINDINGS OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH AND REPORT MAY DISCLOSE.

FLOODPLAIN NOTE:

THE PROPERTY SHOWN HEREON IS LOCATED IN A FLOOD HAZARD ZONE "X" (AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN) ACCORDING TO F.I.R.M. MAP "MAURY COUNTY, TENNESSEE" PANEL 170 OF 440, MAP NUMBER 47119C0170E, EFFECTIVE DATE APRIL 16, 2007.



DESCRIPTION	
DATE	
REVISION #	
PRELIMINARY PLAT FOR: MACKENZIE PLACE TAX MAP 90A, GROUP B, PARCEL 47.00 220 THETA PIKE CITY OF COLUMBIA MAURY COUNTY, TENNESSEE	
EXISTING CONDITIONS	
DATE:	OCTOBER 16, 2023
DRAWN BY:	M2G
CHECKED BY:	MWB
PROJECT NO.:	22-085
SHEET NUMBER:	
PP-02	



PROJECT NOTES:

1. BEARINGS ARE BASED ON THE TENNESSEE STATE PLANE COORDINATE SYSTEM (NAD83, 2011).
2. ALL DEED BOOK AND PLAT REFERENCES PERTAIN TO THE REGISTER'S OFFICE FOR MAURY COUNTY, TENNESSEE.
3. WATER FOR THIS DEVELOPMENT IS TO BE PROVIDED BY COLUMBIA POWER & WATER SYSTEMS.
4. SANITARY SEWER PROVIDER FOR THIS DEVELOPMENT IS TO BE COLUMBIA POWER & WATER SYSTEMS.
5. TOPOGRAPHIC AND BOUNDARY SURVEY PREPARED BY M2 GROUP, LLC DATED MAY, 2022.
6. ELECTRIC SERVICE TO BE PROVIDED BY COLUMBIA POWER & WATER SYSTEMS.
7. GAS SERVICE TO BE PROVIDED BY ATMOS ENERGY.

FLOODPLAIN NOTE:

THE PROPERTY SHOWN HEREON IS LOCATED IN A FLOOD HAZARD ZONE "X" (AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN) ACCORDING TO F.I.R.M. MAP "MAURY COUNTY, TENNESSEE" PANEL 170 OF 440, MAP NUMBER 47119C0170E, EFFECTIVE DATE APRIL 16, 2007.

LOT AREA TABLE		
LOT #	AREA (S.F.)	AREA (AC.)
1	2,204	0.05
2	1,764	0.04
3	1,764	0.04
4	1,764	0.04
5	2,205	0.05
6	2,205	0.05
7	1,764	0.04
8	2,205	0.05
9	2,205	0.05
10	1,764	0.04
11	1,764	0.04
12	1,764	0.04
13	2,205	0.05
14	2,205	0.05
15	1,764	0.04
16	1,765	0.04
17	1,831	0.04

LOT AREA TABLE		
LOT #	AREA (S.F.)	AREA (AC.)
18	2,749	0.06
19	1,950	0.04
20	1,604	0.04
21	1,604	0.04
22	2,005	0.05
23	2,005	0.05
24	1,604	0.04
25	1,604	0.04
26	1,604	0.04
27	2,005	0.05
28	2,005	0.05
29	1,604	0.04
30	1,604	0.04
31	1,604	0.04
32	2,004	0.05

CURVE TABLE				
CURVE #	LENGTH	RADIUS	CHORD BRNG	CHORD LENGTH
C1	41.60	25.00	S21° 03' 13"E	36.97
C2	6.06	25.00	S75° 40' 09"E	6.04
C3	26.45	51.00	S82° 31' 43"W	26.16
C4	30.80	51.00	N50° 22' 05"E	30.33
C5	221.25	69.00	S55° 04' 25"E	137.93
C6	41.82	69.00	N54° 08' 53"E	41.18
C7	25.04	69.00	N81° 54' 24"E	24.90
C8	6.12	69.00	S85° 09' 17"E	6.12
C9	6.06	25.00	S89° 33' 21"E	6.04

DESCRIPTION

DATE

REVISION #

PRELIMINARY PLAT FOR:
MACKENZIE PLACE
TAX MAP 90B, GROUP B, PARCEL 46.00
220 THETA PIKE
CITY OF COLUMBIA
MAURY COUNTY, TENNESSEE
10/16/23

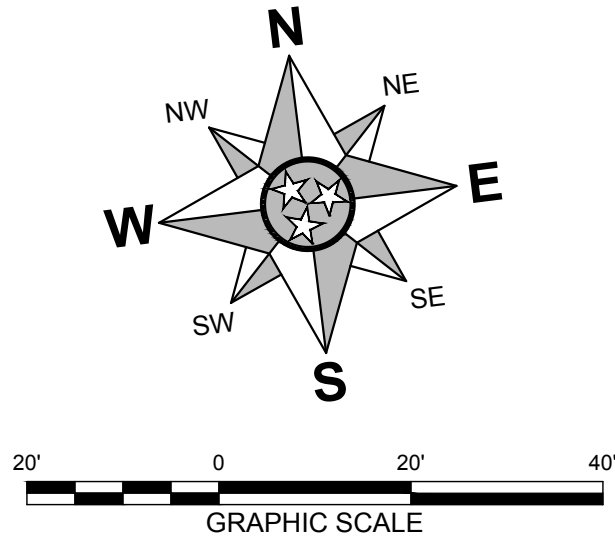
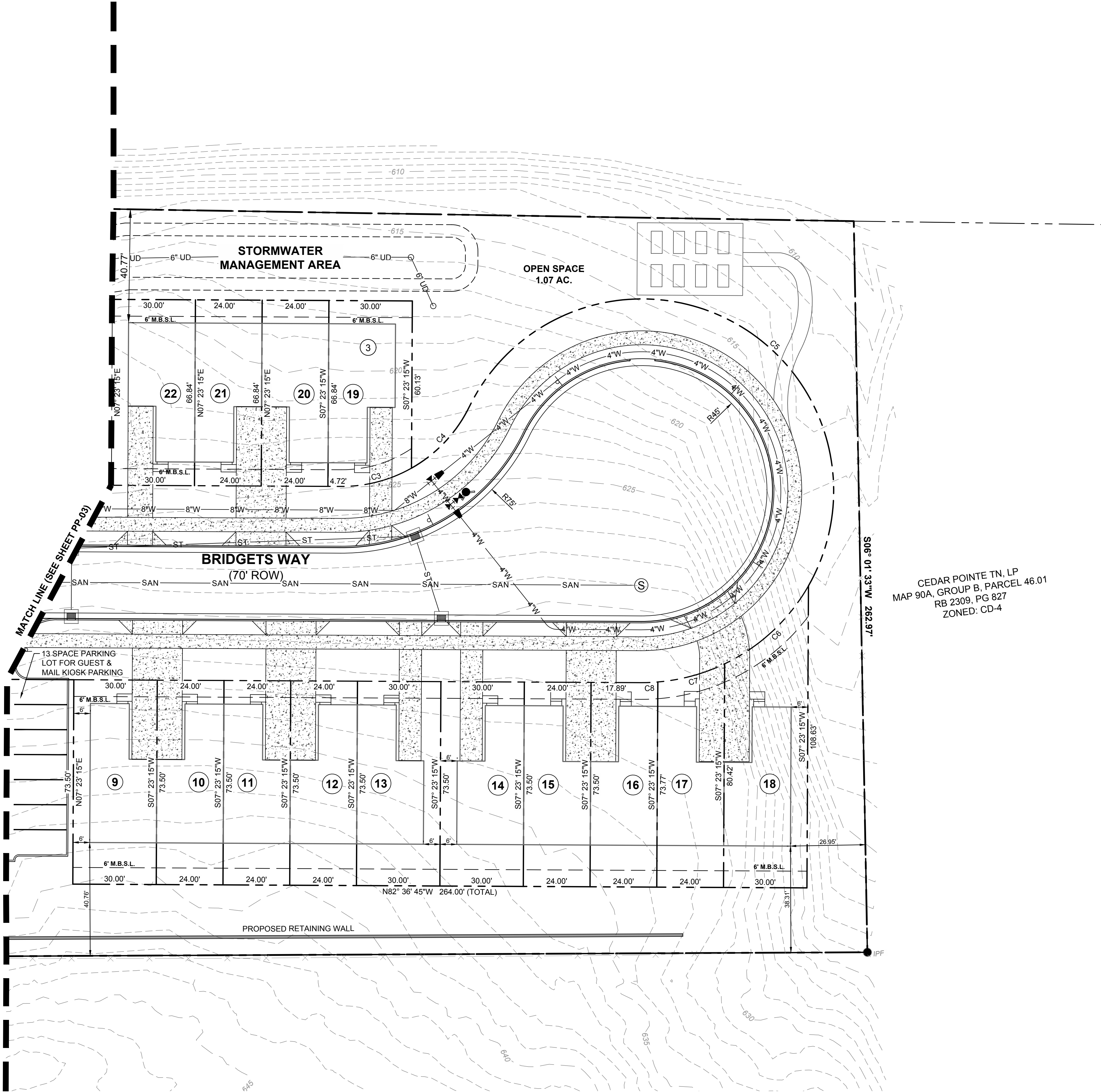
PRELIMINARY PLAT

DATE: OCTOBER 16, 2023
PROJECT NO.: 22-085

DRAWN BY: M2G
CHECKED BY: MWB

SHEET NUMBER:
PP-03

Page 52 of 637



PROJECT NOTES:

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DESCRIPTION

DATE

REVISION #

PRELIMINARY PLAT FOR:
MACKENZIE PLACE
TAX MAP 90A, GROUP B, PARCEL 46.00
220 THETA PIKE
CITY OF COLUMBIA
MAURY COUNTY, TENNESSEE

10/16/23

PRELIMINARY PLAT

DATE: OCTOBER 16, 2023
PROJECT NO.: 22-085

DRAWN BY: M2G
CHECKED BY: MWB

SHEET NUMBER:

PP-04

October 16, 2023

City of Columbia, Tennessee
700 North Garden Street
Columbia, Tennessee 38401

Re: **Mackenzie Place Townhomes**
220 Theta Pike
Description of Proposed Project

To Whom it May Concern:

The Mackenzie Place Townhome project consists of 32 townhome units that will be constructed along a 560+/- LF roadway terminating with a cul-de-sac. Each unit will have two parking spaces: one within the garage itself and the other space located in the driveway. There will be a third parking space in each driveway between the sidewalk and the front of the unit as overflow parking, as well as a parking lot that was added to the plan in the middle of the site for 13 guest parking spots. This will help to alleviate the concern of people parking in the cul-de-sac. The total parking count exceeds the City minimum code requirement for parking.

Due to topography, a 436+/- LF retaining wall with varying heights (7.5' at its maximum) will be required along the south property line.

Storm water will be managed via an (level 2) infiltration trench which will satisfy the 80% target runoff reduction requirement. The infiltration trench has been oversized in order to reduce the post-development Curve Number (CN) to meet the stormwater requirements and ensure that post developed flows do not exceed the pre-developed flows.

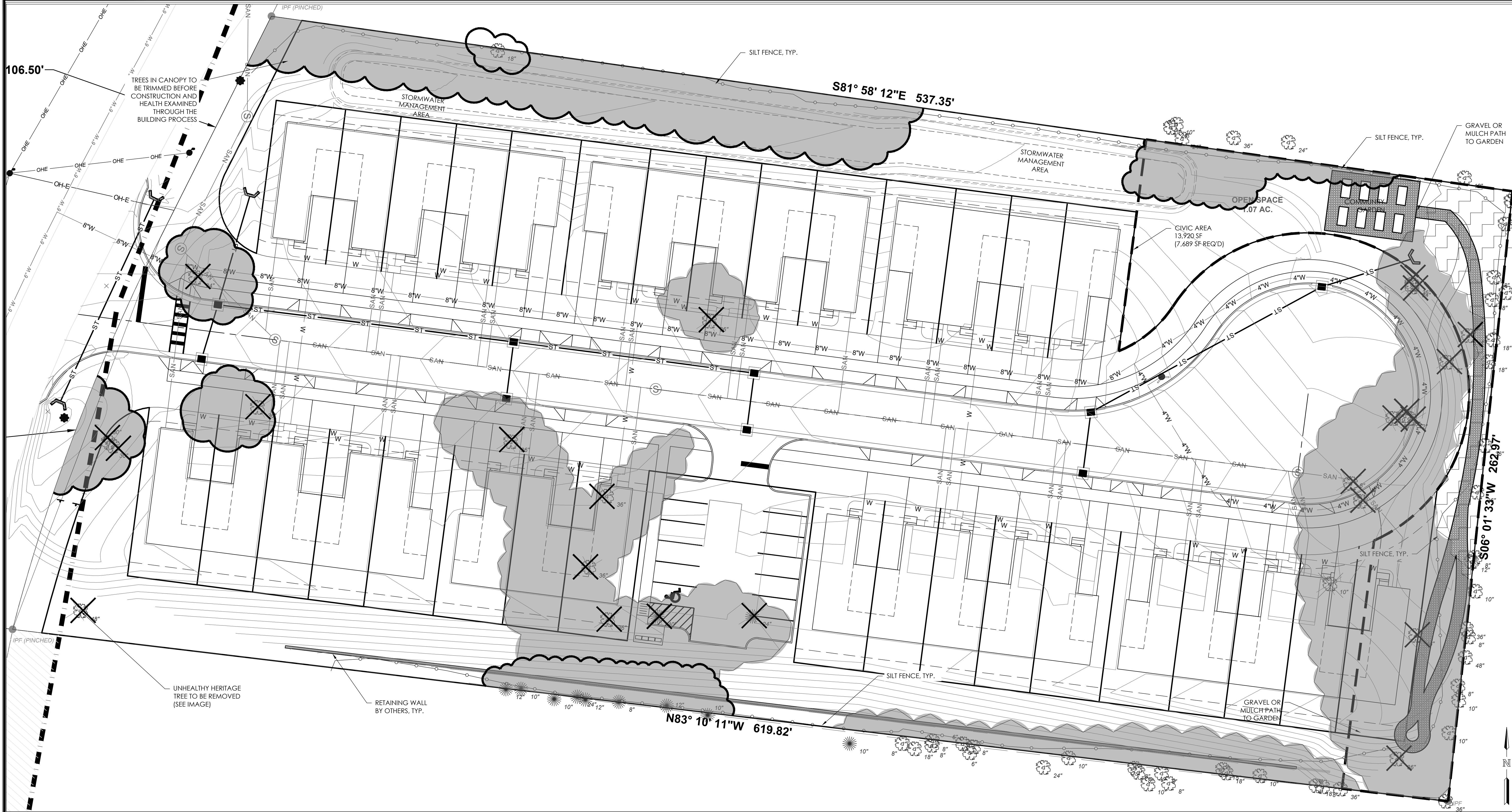
Sanitary Sewer will be provided with a proposed extension of the existing network connecting at a manhole adjacent to the intersection of Theta Pike and Polk Place.

Water will be provided with the construction of a new 8" main that will connect to an existing main along Theta Pike.

Thank you for your consideration of this site plan submittal and please do not hesitate to reach out to us if have any questions or need any further information.

Sincerely,

Brian Holcombe



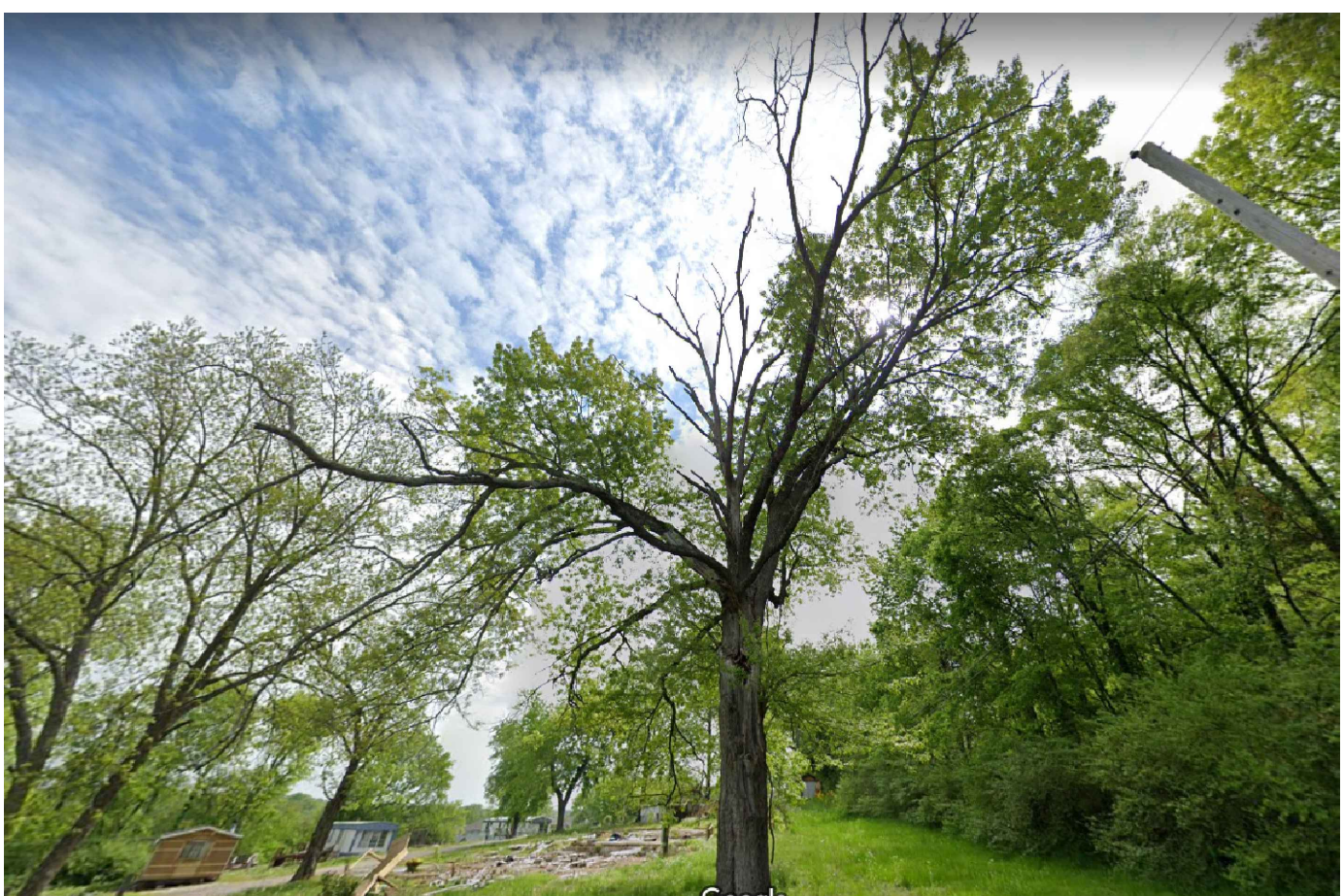
TREE PRESERVATION PLAN

TREE CANOPY CALCULATIONS:

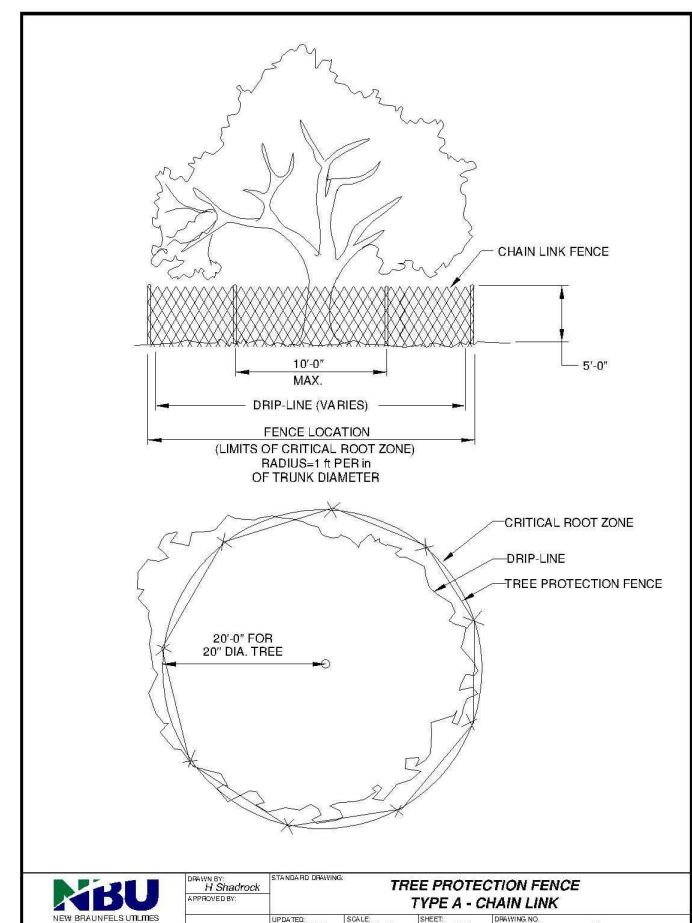
LOT SIZE:	141,429 SF
EX TREE CANOPY:	33,202 SF (23.4% OF LOT)
EX TREE CANOPY TO BE PRESERVED:	4,401 SF (13.25%)
REQUIRED TREE CANOPY RETENTION:	48%
TREES PROVIDED TO COMPENSATE (SEE L2.O)	52

TABLE 4.3.16.L TREE CANOPY COVER RETENTION

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 SD-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%



UNHEALTHY HERITAGE TREE TO BE REMOVED

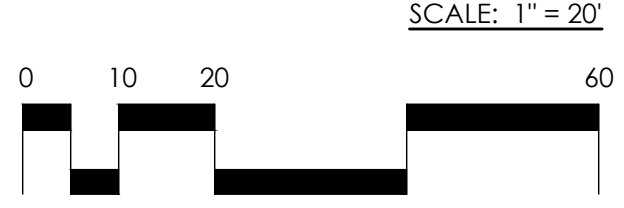


KEY

TREE CANOPY OUTLINE

TREE CANOPY TO BE PRESERVED

ON SITE TREE CANOPY TO BE REMOVED



theadisongroup
LANDSCAPE ARCHITECT

http://addison-group.com/
7123 Crossroads Blvd Ste. E | Brentwood, TN 37027

TREE PRESERVATION PLAN

Prepared For:
Mackenzie Place Townhomes

MACKENZIE PLACE TOWNHOMES

220 THETA PIKE
COLUMBIA, TENNESSEE

2023 The Addison Group LLC Drawings, written material, and design concepts shall not be used or reproduced in whole or part in any form or format without prior written consent of The Addison Group, LLC

DATE: 01.17.23

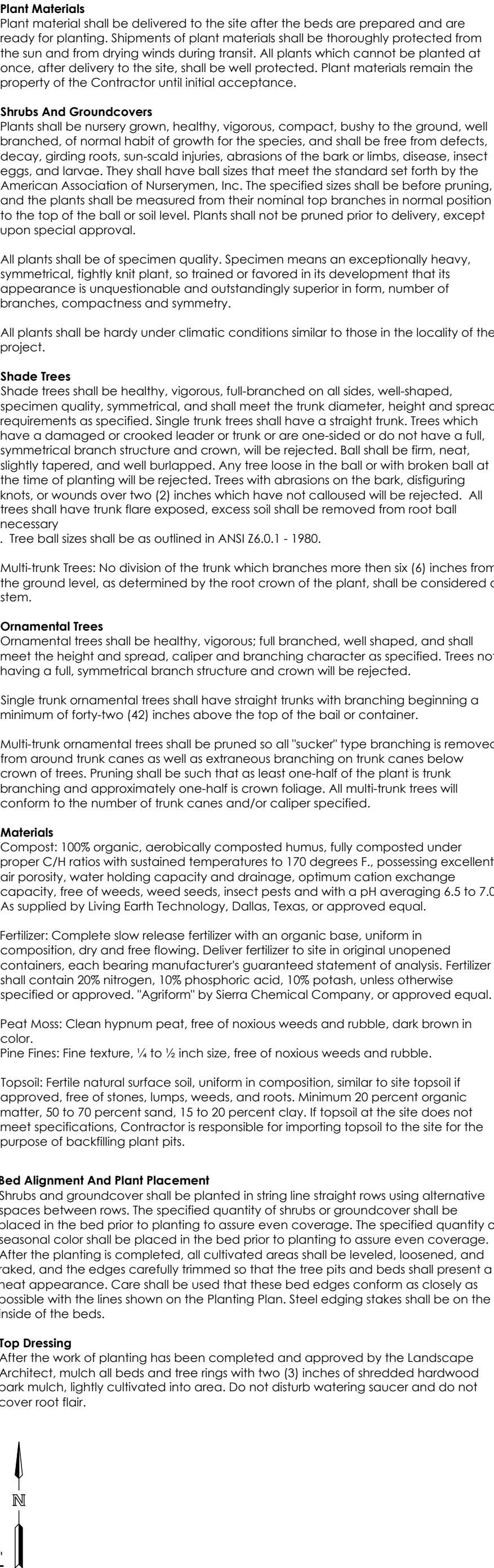
REVISIONS:

03.20.23
04.13.23
05.19.23
10.16.23

SHEET NO.
LP1.0

The Addison Group, LLC 2023

Page 55 of 637



PLANT SCHEDULE				
TREES	QTY	BOTANICAL / COMMON NAME	SIZE	REMARKS
ACAR	32	Acer rubrum 'Armstrong' / Armstrong Red Maple	3' Cal.	
QUFH	11	Quercus phellos / Willow Oak	2.5" Cal.	
THGG	6	Thuja x 'Green Giant' / Green Giant Arborvitae	12-14' Ht. Min.	
SHRUBS	QTY	BOTANICAL / COMMON NAME	SIZE	SPACING
ILFL	96	Illicium floridanum / Florida Anise	3' Ht.	42" o.c.

MULCH NOTE: ALL PLANTS SHALL BE MULCHED A MINIMUM OF THREE INCHES DEEP WITH A HARDWOOD MULCH.

Trees Pits and Planting

The Contractor shall obtain approval of plant locations by the Landscape Architect. The Landscape Architect reserves the right to relocate plant material as deemed necessary.

Ornamental Trees: Plant ornamental trees in pits twelve (12) inches larger than the tree ball. After setting the tree, the pit shall be backfilled with parts of topsoil to one [1] part of compost and covered temporarily by watering to prevent air pockets. From a three (3) foot diameter hole, excavate a four (4) foot square hole. Place wire mesh to secure burial on three ball shall be cut from top of ball and around trunk. Place a two (2) inch layer of compost inside the watering ring.

Shade Trees: Shade trees are in a tree pit two (2) feet greater in diameter than the tree ball. The crown of the tree ball should be approximately one (1) inch higher than the existing grade. After setting the tree, the pit shall be backfilled with four (4) parts of topsoil and one (1) part of compost. One (1) part compost and compost shall be placed over the root system. A four (4) inch high watering ring around the tree. All cord or wire used to secure burial on tree ball shall be cut from top of three (3) foot ball and around trunk after setting. Place two (2) inch layer of compost or bark mulch inside the watering ring.

Percolation Test Pits: The Contractor shall excavate at least four (4) test pits on the site to determine soil conditions. Percolation tests shall be performed on all areas to be planted. Fill each test pit with water to test for percolation. Size of pits shall be comparable to largest tree to be installed. Location can be in conjunction with proposed shade tree installation. Monitor pit for forty-eight (48) hours. If, at the end of that time, water has not significantly percolated, a Stand-Pipe Underdrain system should be installed for trees in that area.

Stand Pipe Installation: Should it be determined that tree pits will not percolate, or do so very slowly, shade trees shall have sump pumps installed in specially excavated tree pits.

Beds Preparation

Grass beds: Loosen all groundcover below a depth of six (6) inches. Two (2) inches of peat moss or compost shall be applied and worked into the upper six (6) inches of bed. Beds shall be thoroughly filled and pulverized to a depth of six (6) inches and raked smooth. Work fertilizer into soil at the rate of twelve (12) pounds per 1000 square feet. Various receipts of soil amendments may be requested.

Shrub beds: Lay down grass below a depth of six (6) inches. Four (4) inches of peat moss or compost shall be applied and worked into the upper six (6) inches of the bed. Beds shall be thoroughly filled and pulverized to a depth of six (6) inches and raked smooth. Work fertilizer into soil at the rate of twelve (12) pounds per 1000 square feet. Broadcast fertilizer and work lightly into the soil around the shrubs at the rate of (12) twelve pounds per 1000 square feet. Bed shall be left high to prevent poor drainage or ponding of water within the bed.

Shrub Bed Draining: All shrub beds to a depth of six (6) inches. Four (4) inches of peat moss or compost shall be applied and worked into the upper six (6) inches of the bed. Beds shall be thoroughly filled and pulverized to a depth of six (6) inches and raked smooth. Work fertilizer into soil at the rate of twelve (12) pounds per 1000 square feet. Broadcast fertilizer for proper drainage. Broadcast fertilizer and work lightly into the soil around the shrubs at the rate of (12) twelve pounds per 1000 square feet. Bed shall be left high to prevent poor drainage or ponding of water within the bed.

A pre-drill shall be taken to prevent planting drains from blocking drainage against building or impeding site drainage in any way.

Gruy Geyng And Slaking

Submit unit cost bid for slaking all trees four (4) inch caliper and under, with three (3) inch diameter stakes and three (3) Adj-A-Tree traps. Model 5100. Stakes should be located equidistant around the tree, and outside of tree pit. Stakes to be embedded a minimum of ten (10) two (2) feet into stable soil.

Stakes and guys shall be removed following the one (1) year warranty period.

Grass And Weed Removal

Existing grass and weeds in areas of proposed beds shall be removed either mechanically or chemically. Sod is to be removed by hand. Sod shall be removed either chemically or by excavation, including root system. Existing weeds shall be removed either chemically or by excavation, including root system, from all proposed lawn areas prior to installation of grass. Contractor shall re-fill excavated areas with topsoil to finish grade before bed preparation or grass installation.

Soil Mesh Protection

Install mesh erosion protection approved in planting bed with slopes greater than three to one prior to planting. Mesh shall have a minimum overlap of twelve (12) inches where sections join. Materials shall be installed in lengthwise sections running parallel with the slope, providing the length of slope in x excess of ten (10) linear feet from top to bottom. Mesh shall be secured with staples or pins every five (5) linear feet. Mesh shall be installed across the slope and double pinned at the twelve (12) linear feet overlap. Pins shall be installed so close that no gaps or spots are visible in mesh.

Lawns

Loosen and rake smooth all soils to be graded. Remove all weeds, debris and any stones, cobbles, clods, etc., larger than three quarter (3/4) inch diameter. Ensure lawn areas and swales are graded for proper drainage. Areas next to sidewalks and curbs shall be graded down to one (1) inch below finished grade to allow for thickness of grass build-up.

Sod: Areas will be planted with sod as indicated on the plan. All sod shall be dark, rich green, free of weeds and nut grass and placed so joints are flush between sods. Sod is to be laid in such a manner that it will support its own weight without tearing, when suspended vertically by holding the upper two corners. Sodded areas shall be rolled with a 200 pound roller immediately after laying, watering thoroughly and fertilized. All soddod grass rollers shall be fertilized at the rate of twenty-five (25) pounds per 1000 square feet, prior to laying sod. Dead patches of sod shall be removed and replaced immediately.

Lawn Establishment

It is the responsibility of the Contractor to establish a dense lawn of permanent grasses, free from weeds, lumps and depressions. Any part of the area that fails to show a uniform germination shall be reseeded or resodded, and such reseeding or resodding shall continue until a dense lawn is established, regardless of amount of rain.

Water, mow and edge the lawn until initial acceptance. Mow each time after the lawn has reached a height of three (3) and half (3 ½) inches. Mow to a height of two (2) inches. Seed and fertilizer shall be applied according to manufacturer's directions resulting from erosion shall be repaired by the Contractor. Scattered bare spots will not be allowed over one (1) foot square in the lawn area. Never mow off more than one-third of the grass leaves.

Clean-Up

During the work, the premises are to be kept neat and orderly at all times. Storage areas for plant and other materials shall be so organized that they, too, are neat and orderly. All trash, including debris resulting from removing weeds or rocks from landscaping area, preparing beds, or planting plants, shall be removed from the site daily by the Contractor. All walks and drives shall be kept clean by sweeping and hosing. Excavated soil may be distributed on the site or hauled off site as directed by Owner.

Maintenance

The Contractor shall maintain all trees, shrubs, and groundcover under this Contract until initial acceptance, by adequate watering, cultivating the top two (2) inches, weeding every two (2) weeks, spraying, and replacing as necessary to keep plants in healthy, vigorous condition. Bed areas shall be raked as may be required to keep them neat.

The Contractor shall maintain all grass areas under this Contract until initial acceptance by watering, mowing, spraying, fertilizing, etc..

One Year Maintenance

The Contractor shall submit a separate price for maintenance of the landscape and irrigation installation for a period of one (1) year after initial acceptance.

The Contractor shall be based on the Maintenance Specifications listed above.

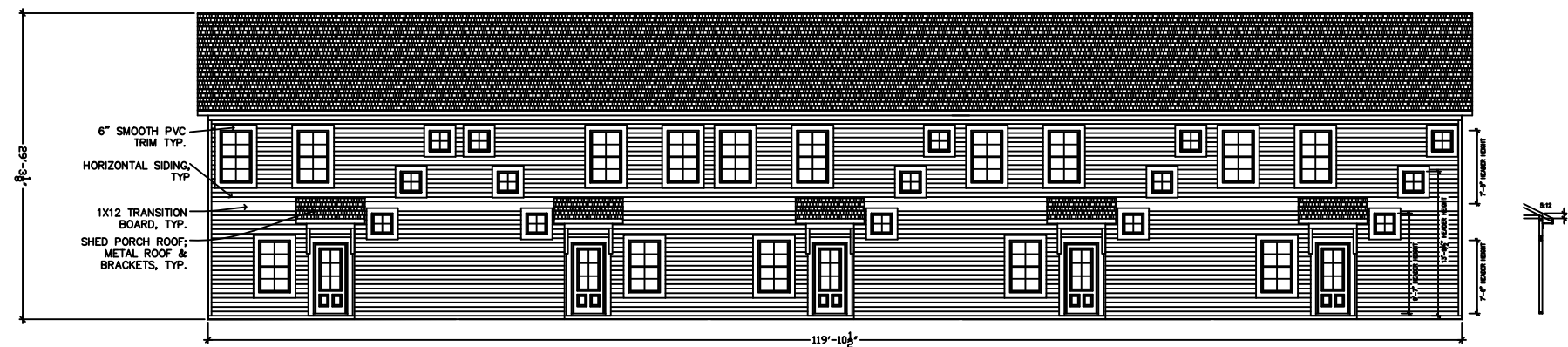
Project	
TOWNHOME	
Spec. Revision Date:	
Lot #	Market Home or Home Owner
#	Name:
Plan Name:	
PROPOSED	
Sheet Name:	
STANDARD FLOORPLANS	



FRONT ELEVATIONS

A0.0

NOTE: ALL BUILDING ELEMENTS MUST MEET THE REQUIREMENTS OF ARTICLE 4 BUILDING, LOT & BUILDING SITE STANDARDS, TABLE 4.3.1-D OF THE CD-4 ZONING DISTRICT.



REAR ELEVATION

1/16"=1'-0"



LEFT ELEVATION

$$1/16''=1'-0''$$


RIGHT ELEVATION

$$1/16''=1'-0''$$
[illegible]

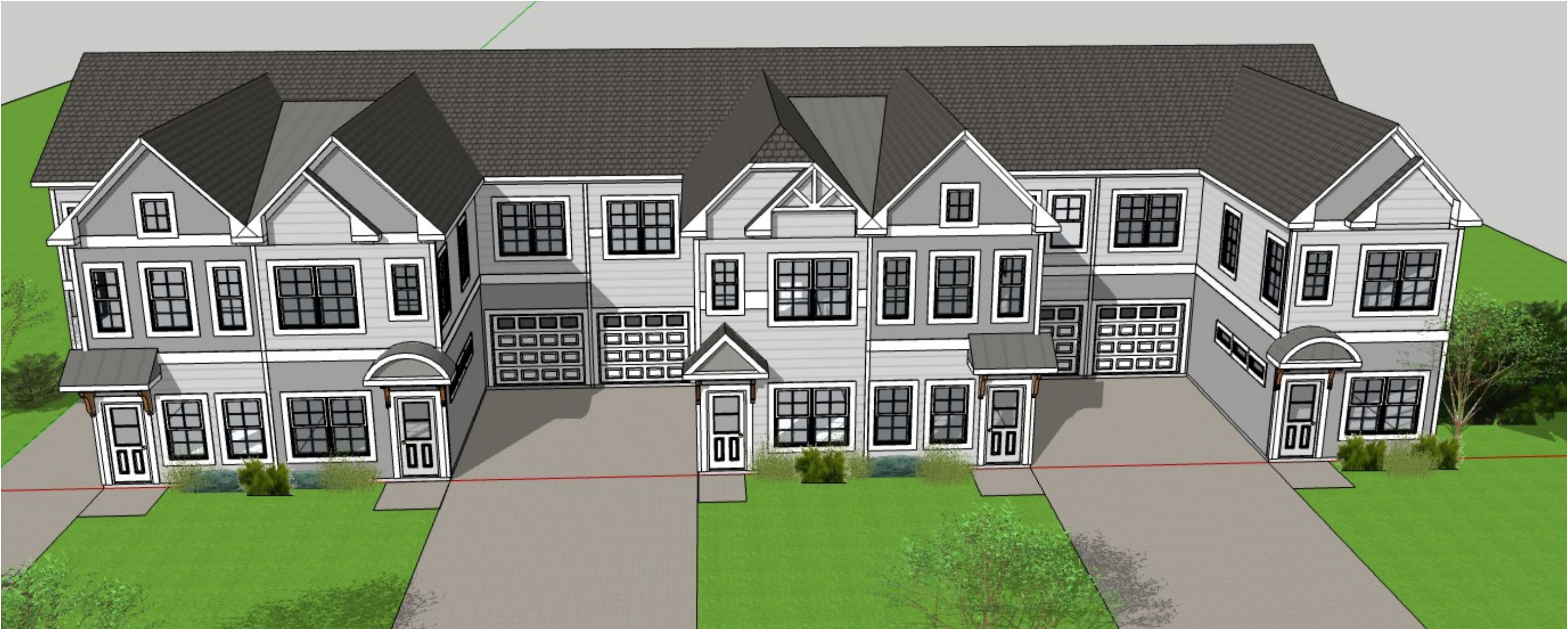
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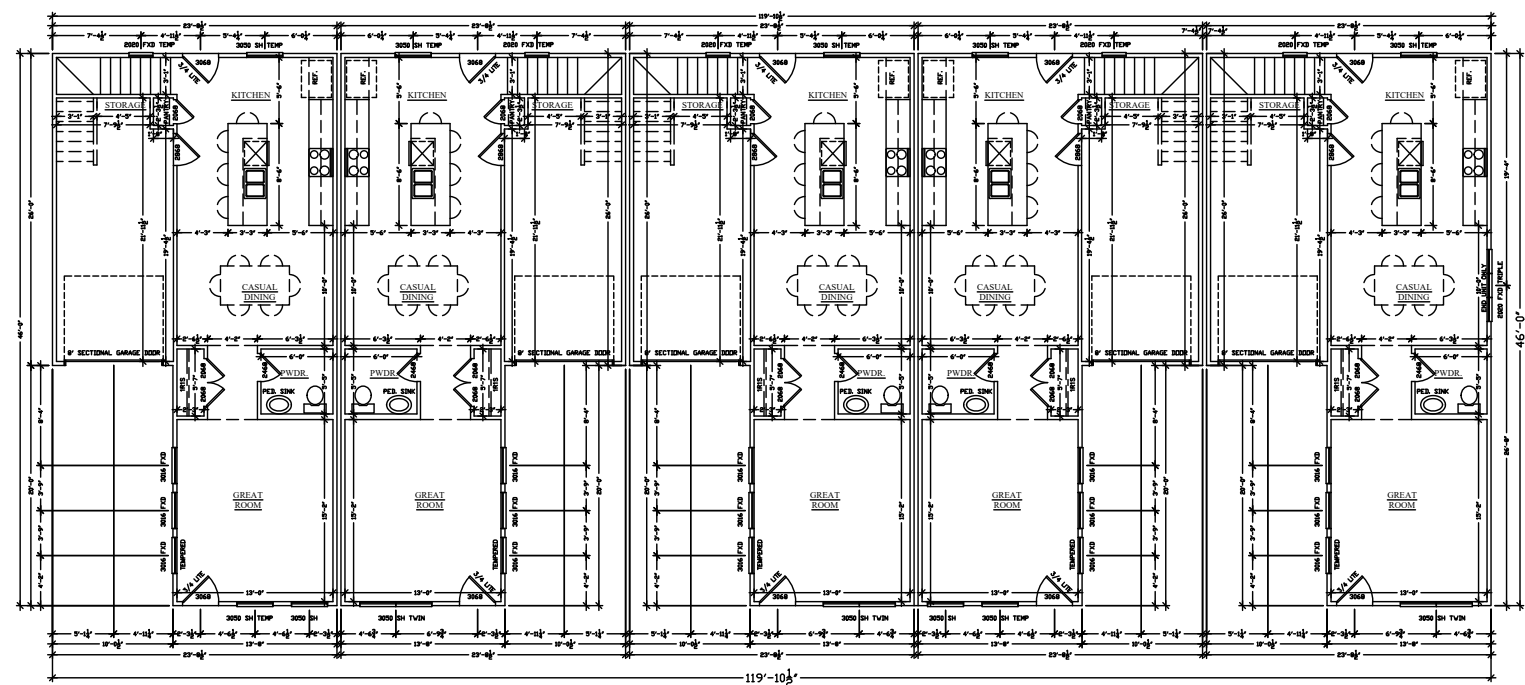


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DURING FINAL ARCHITECTURAL / BUILDING PERMIT PHASE, PLAN WILL DEMONSTRATE MINIMUM INTERIOR DIMENSION TO MEET CITY STANDARDS.

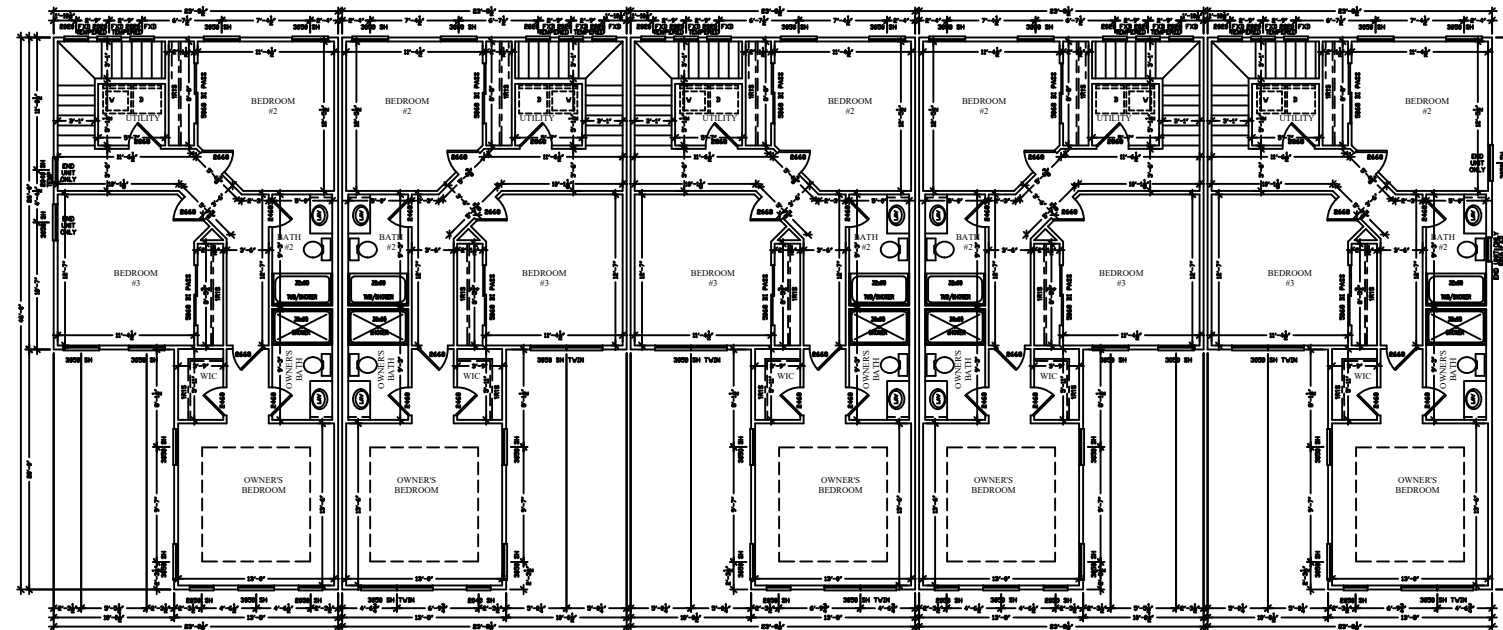


STANDARD FIRST FLOORPLAN

1/16"=1'-0"

Project	
TOWNHOME	
Spec. Revision Date:	
Lot #	Market Home or Home Owner
#	Name:
Plan Name:	
PROPOSED	
Sheet Name:	
STANDARD FLOORPLANS	
THE JONES COMPANY of Tennessee, LLC LIVE LARGER >> LIVEJONES.COM	
Drawn By: BSR	
Scale: 1/16"=1'-0"	
Date: XX/XX/XX	
Revision Dates:	
A1.0	

DURING FINAL ARCHITECTURAL / BUILDING PERMIT
PHASE, PLAN WILL DEMONSTRATE MINIMUM
INTERIOR DIMENSION TO MEET CITY STANDARDS.


$$1/16''=1'-0''$$
[illegible]



October 16, 2023

City of Columbia, Tennessee
700 North Garden Street
Columbia, Tennessee 38401

Re: Mackenzie Place Townhomes – 220 Theta Pike
Cul-de-sac Justification Letter

To whom it may concern,

The following items are listed below to provide justification for a cul-de-sac on the aforementioned project:

1. Storm water management area directly to the east of the project site.
2. Lack of viable roadway connection to the east due to topography.
3. Lack of viable roadway connection to the north due to no easements or rights of way stubbed to property line from adjacent site.
4. Lack of viable roadway connection to the south due to no easements or rights of way stubbed to property line from adjacent site.
5. Guest parking lot consisting of 13 parking spaces has been added and signage prohibiting parking in the cul de sac.

Sincerely,

Brian Holcombe



October 16, 2023

City of Columbia, Tennessee
Attn: Glenn Harper, P.E.
700 North Garden Street
Columbia, Tennessee 38401

Re: Mackenzie Place Townhomes – 220 Theta Pike
Sidewalk Location Variance Justification Letter

Dear Mr. Harper:

This project is requesting a variance for the location of the sidewalk from the back of curb in the City standard cross section. Currently the standard for this 70' wide right of way shows the sidewalk fourteen (14') feet from back of curb, and we are proposing the sidewalk to be five (5') from back of curb. The request is based on the following reasoning:

1. The horizontal location of the sidewalk closer to the street will allow one (1) additional overflow parking space in each townhome unit driveway for guest parking without blocking the sidewalk for pedestrian movements.
2. Street trees can still be planted in the five (5') feet green space strip behind the sidewalk, but also allowing more room for front yard space for the residents of the neighborhood.
3. The site has some extreme topographic challenges which prevent back yard space from remaining usable, therefore having a larger front yard space creates a more active space for residents of the neighborhood to utilize.

Sincerely,

Brian Holcombe

June 10, 2022

Glenn Harper, PE
City Engineer
City of Columbia
700 N Garden Street
Columbia, TN 38401

**Re: Mackenzie Place Apartments
Traffic Impact Study
Review Comments**

Dear Glenn:

This memorandum provides the findings of the independent review of the Mackenzie Place Apartments Traffic Impact Study (TIS) Update. Our review includes the traffic projections and the operational analyses; evaluation of the proposed roadway network; review and evaluation of the recommended infrastructure improvements; and identification of any recommended modifications or additions to the recommended infrastructure improvements identified in the TIS.

General Project Information

The Mackenzie Place Apartments TIS, dated May 2022, was completed by the Corradino Group, Inc. for Waits Development Group, LLC. Mackenzie Place Apartments development in Columbia, TN is proposed to be located east of Theta Pike and south of Highway 412/13, bound to the south and north by a multi-family residential development, to the west by a single-family residential, and to the east by multi-family housing and light industrial facilities. The Mackenzie Place Apartments development will consist of 80 multifamily units with one access point along Theta Pike. The site access is located approximately 650 feet south of the intersection of Theta Pike and Highway 412/13 and 475 feet north of Timber Trail. The development is expected to be complete in two years, which is a year 2024 horizon. Traffic counts were conducted by the Corradino Group, Inc. on a typical weekday in February 2022 while schools were in session for the intersections of Theta Pike and Highway 412/13, Theta Pike and Timber Trail, and Theta Pike/8th Avenue and Nashville Highway. In addition, 24-hour bi-directional volume and speed tube counts were conducted along Theta Pike in the vicinity of the proposed development access. To develop the growth rate to be applied to the existing traffic volumes, historical daily traffic volumes were obtained from the TDOT count stations located on Highway 412/43, Theta Pike, and Nashville Highway in the vicinity of the project site. The growth rate found from the count stations was 4% but a growth rate of 3.5% was selected through coordination with the City's traffic consultant. These counts were grown by an annual 3.5% to obtain the background 2024 traffic volumes. Additionally, there are two proposed developments, Theta Pike Cove & Taylor Landing, near the study area that are expected to

affect the traffic volumes at the study intersections. Traffic for both developments were added to the background 2024 traffic volumes.

Trip Generation and Trip Distribution

Future trips generated by Mackenzie Place Apartments were calculated using ITE's *Trip Generation*, 11th Edition based on the future land use. The land use used to determine the project-generated trips was 80 dwelling units of low-rise multifamily homes. The total development is expected to produce 588 trips per day with 48 new trips in the AM peak hour and 55 new trips in the PM peak hour. The new trips are detailed below.

	Total Entering Trips	Total Exiting Trips
AM	12	36
PM	35	20

These trips were distributed throughout the study area based on commuter patterns in the area and the proximity and routes to major transportation facilities. The directional distribution assumes approximately 40% of the project-generated traffic will be oriented from the southwest along Nashville Highway, 20% to the northwest along, Highway 412, 15% to the north along Theta Pike, 15% to the northeast along Highway 412, and 10% to the southeast along Nashville Highway.

Capacity/Level of Service Analyses

The operational analyses for the intersections within the study area was completed utilizing Synchro 11 software, which uses the methods from *Highway Capacity Manual 2010*. The intersections were evaluated for the weekday AM and PM existing, background, and projected traffic conditions. Additionally, turn lane and sight distance analysis was completed.

Intersection Capacity Analysis

In the projected 2024 conditions, the analyses indicate that all of the critical turning movements are expected to operate at LOS D or better during both peak hours.

Turn Lane Warrant Analysis

The intersection of Theta Pike at the Site Access was evaluated for the need for left turn lanes on Theta Pike based on methodology outlined in *M.D. Harmelink's Volume Warrants for Left-Turn Storage Lanes at Unsignalized Intersections*. Based on the total projected peak hour traffic volumes presented in the TIS, a left turn deceleration lane on Theta Pike at the Site Access is not warranted. The intersection of Theta Pike at the Site Access was also evaluated for the need for right turn lanes on Theta Pike based on methodology in *Intersection Channelization Design Guide (NCHRP 279)*. Similarly, a right turn deceleration lane is not warranted by the total projected peak hour volumes. Therefore, separate turn lanes on Theta Pike are not needed.

Intersection Sight Distance Evaluation

The available intersection sight distance along Theta Pike was evaluated where traffic will enter and exit the site. The criteria for intersection sight distance are provided in the AASHTO *Policy on Geometric Design of Highways and Streets*, commonly known as the Green Book. The sight distance at the proposed access location does not exceed the required sight distances per AASHTO. The available sight distance to the south is blocked by a “Theta Pike Residential” sign and vegetation. Construction of the site access should be completed with the minimum 390 feet of intersection sight distance provided to the north for a left turn from the site access to Theta Pike. In addition, a minimum of 335 feet of intersection sight distance provided to the south for a right turn from the site access onto Theta Pike.

Recommendations Identified in the TIS

The following conclusion and recommendations are included in the study and our response.

- The traffic operations in the study area for the Future Traffic Analysis are expected to continue to operate at the level currently being experienced or at the level of operation expected with the background traffic. To conclude, proposed development will have minimal impact on the nearby intersections thus requiring no improvements in terms of traffic signal and intersection geometry.

Staff Response: *We agree that the proposed development will have minimal impact on the nearby intersections and that no improvements are required.*

- The proposed site access should be designed such that the departure sight triangles, as specified by AASHTO and detailed in this study, will be clear of all sight obstructions, including landscaping, existing vegetation, monument signs/walls, fences, etc.

Staff Responses: *We agree that the site access should be constructed such that sufficient sight distance is provided.*

- The proposed site access on Theta Pike should be designed to include sufficient width for one entering lane and two exiting lanes as shown in the proposed site plan. This access should be stop controlled on the westbound approach for traffic exiting the site. STOP sign installation should be done based on TDOT sign guidelines.

Staff Responses: *We agree that the proposed access should include one entering lane and two exiting lanes. This access should be constructed according to MUTCD, AASHTO, TDOT, and City of Columbia Standards, including providing sufficient sight distance.*

- All intersection and roadway signing and pavement markings should be completed according to the Manual on Uniform Traffic Control Devices (MUTCD).

Staff Responses: *We agree that all signing and pavement marking should be completed according to the MUTCD, AASHTO, TDOT, and City of Columbia Standards.*

Additional Staff Response:

- *Based on the site plan included in the TIS, the mail kiosk is proposed to be located very close to the access on Theta Pike. All design aspects should ensure a mail delivery vehicle and/or residents' vehicles will not impede incoming traffic that could block traffic onto Theta Pike.*

Conclusion

The Mackenzie Place Apartments Traffic Impact Study submitted May 2022 covers the typical required traffic impact study components and identifies several feasible and beneficial infrastructure improvements. It is recommended The Corradino Group, Inc. make a note of the comments identified above; however, we require no additional evaluation or analysis.

Should you have any questions or need additional information, please contact me.

Sincerely,



Dyan C. Damron, PE, PTP
Director of Traffic, Planning & ROW
Volkert, Inc.

TRAFFIC IMPACT STUDY

MACKENZIE PLACE APARTMENTS COLUMBIA, TN

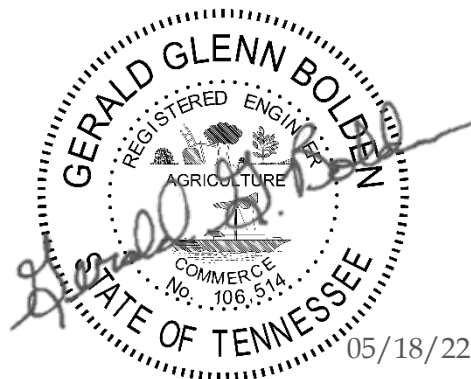
Prepared For: Waits Development Group, LLC

Prepared By: The Corradino Group, Inc.

May 2022

**Traffic Impact Study
MacKenzie Place Apartment
Columbia, Tennessee**

Prepared For:
Waits Development Group, LLC.



Prepared By:
The Corradino Group, Inc.
Franklin, TN

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Executive Summary

Project Description

This study will evaluate the traffic impacts of the proposed Mackenzie Place Apartment, a multifamily residential development located at 220 Theta Pike in Columbia, Tennessee. The site plan proposes 80 dwelling units accommodated in four two-story buildings. Access to the development is planned to be provided by a single access drive on Theta Pike. Surface parking is planned to accommodate the residential development. The purpose of this study is to analyze the access plan and the traffic impacts associated with this proposed development. For this study, it is assumed the development will be completed by 2024.

Existing Traffic Volumes

In order to analyze the roadway operations in the vicinity of the proposed development, typical weekday intersection turning movement counts were conducted at the following locations:

- Theta Pike and Highway 412/43
- Theta Pike and Timber Trail
- Theta Pike/8th Avenue and Nashville Highway

In addition, 24-hour bi-directional volume and speed tube counts were conducted along Theta Pike in the vicinity of the proposed development access.

Projection of Future Traffic Volumes

It is assumed that the traffic will continue to grow before the project is completed. Therefore, a historic growth rate was calculated and applied to the existing traffic counts. Additionally, traffic from two other approved developments were included in the background traffic volumes. Trips expected from the proposed multifamily residential development were added to background traffic in order to obtain the total projected traffic volumes for the study area. Finally, these trips were analyzed to determine the recommendations required for adequate roadway operations in the study.

Conclusions and Recommendations

The proposed Mackenzie Place development is located to the south of Hwy 412/43 and on the east side of Theta Pike in Columbia, Tennessee. According to the site engineer, the proposed development consists of approximately 80 multi-family dwelling units. The analyses presented in this study indicate that the impacts of the proposed project on the existing street network will be manageable by providing the recommendations below. These specific recommendations will provide safe and efficient traffic operations within the study area following the completion of the proposed project.

- The traffic operations in the study area for the Future Traffic Analysis are expected to continue to operate at the level currently being experienced or at the level of operation expected with the background traffic. To conclude, proposed development will have minimal impact on the nearby intersections thus requiring no improvement in terms of traffic signal and intersection geometry.

- The proposed site access should be designed such that the departure sight triangles, as specified by AASHTO and detailed in this study, will be clear of all sight obstructions, including landscaping, existing vegetation, monument signs/walls, fences, etc.
- The proposed site access on Theta Pike should be designed to include sufficient width for one entering lane and two exiting lanes as shown in the proposed site plan. This access should be stop controlled on the westbound approach for traffic exiting the site. STOP sign installation should be done based on TDOT sign guidelines.
- All intersection and roadway signing and pavement markings should be completed according to the Manual on Uniform Traffic Control Devices (MUTCD).

Introduction

This study aims to evaluate the traffic impacts of a proposed residential development located east of Theta Pike and south of Highway 412/43 in Columbia, Tennessee. The proposed development is within an area that is characterized by a mix of low to high density land uses, with multi-family residential developments immediately adjacent to the south, east and north of the project site. The site plan proposes 80 multi-family dwelling units. Access to the proposed development will create an intersection with Theta Pike. Access is located approximately 650 feet south of the intersection of Theta Pike and Highway 412/43 and 475 feet north of the Timber Trail.

In this study existing operating conditions of the roadway network near the proposed development will be evaluated using traffic counts conducted along the study area roadways and intersections. The expected annual traffic growth will be determined based on historical traffic data. Using the estimated growth rate and trips generated by two other approved yet unbuild residential developments in the area, the background traffic volumes will be calculated. Trips generated by the proposed development will be determined and distributed to the roadway network to get the total projected traffic that will be present when the proposed development is completed.

Using the anticipated build-out final traffic, adjacent roadways and intersections will then be reevaluated to determine the anticipated traffic impacts of the proposed project. The project team will also conduct turn lane warrant analysis for the proposed access location. Industry standards will be used to analyze the traffic volumes and identify any necessary mitigation strategies to offset the decline (if any) in roadway operations resulting from the proposed development.

Project Description

The proposed residential development is located at 220 Theta Pike in Columbia, Tennessee. As shown on **Figure 1**, the development is located just east of Theta Pike, north of Timber Trail and south of Highway 412/43. The property is generally bounded on the south and north by multi-family housing, to the west by large lot single-family residential and on the east by multi-family housing and light industrial facilities. According to the site plan the property is intended to be zoned to RM-1 (High Density Residential).

As shown on the site plan provided in **Appendix A**, the development consists of 80 dwelling units accommodated in four two-story buildings. The proposed vehicular access point for the planned surface parking will be provided by an access drive on Theta Pike on the west side of the site. Access is located approximately in the mid-point between Timber Trail and Bancroft MI (Clifford Heights). The project is anticipated to be completed in 2024.



[Source: Google Earth]

Figure 1 Study Area

Existing Conditions

Existing Roadway Network

The existing roadway network, in the vicinity of the project site, includes Theta Pike, Highway 412/43 and Timber Trail. A description of this roadways and study intersections within the project vicinity is as follows:

Roadways

Theta Pike near the project site is a two-lane two-way undivided roadway with a posted speed limit of 35 mph. In the study area, this roadway runs in a north-south direction and provides a connection between Nashville Highway to the south and more rural areas of the county to the north. Based on Columbia's Transportation Master Plan, this roadway is classified as collector road. This road has 12-foot lane width in both directions along with open ditches and no shoulder. No on-street parking, sidewalk, transit, or bicycle facilities are provided on Theta Pike.



Northbound Theta Pike – Near Proposed Access



Southbound Theta Pike - Near Proposed Access

Timber Trail is a two-lane local road mainly serving as an access to the Cedar Pointe residential establishment (located southeast of the proposed development). The roadway is approximately 24 feet wide with mountable curb along each side. There is no sidewalk facilities on this section of road. There is no posted speed limit.

Highway 412/43, near the project site, is a four-lane median divided roadway with paved shoulders and a posted speed limit of 45 mph. This segment of roadway runs in an east-west direction and provides a bypass around the north side of Columbia. As a



Westbound Timber Trail

whole, Highway 412/43 provides a connection to I-65. To the east of Nashville Highway, this roadway has partial access control. There is no on-street parking, sidewalk, transit, or bicycle facilities are provided on Highway 412/43.

Intersections

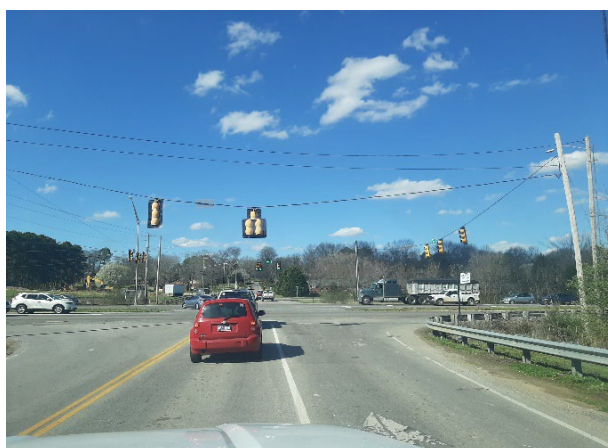
Theta Pike and Highway 412/43 form a four-legged, signalized intersection. On both southbound and northbound approaches of Theta Pike, there is a shared through/right-turn lane and exclusive left-turn lane. The northbound left-turn lane has approximately 90 feet of available storage while the southbound left has approximately 150 feet. These approaches include protected-permissive left turn signal phasing. Highway 412/43 has one through lane, one shared through/right-turn lane and one exclusive left-turn lane on both the eastbound and westbound approaches. The westbound left-turn lane has approximately 185 feet of available storage while the eastbound left has approximately 140 feet. The eastbound and westbound approaches on Highway 412/43 have protected only left turn signal phasing. No pedestrian facilities are provided at the intersection.



Eastbound Highway 412/43 @ Theta Pike



Westbound Highway 412/43 @ Theta Pike



Northbound Theta Pike @ Highway 412/43



Southbound Theta Pike @ Highway 412/43

Theta Pike and Timber Trail form a three-leg stop controlled intersection with Timber Trail having the stop condition. Timber Trail has one shared left-turn/right-turn lane. Northbound Theta Pike has one shared through/right-turn lane while southbound Theta Pike has one shared through/left-turn lane.



Westbound Timber Trail @ Theta Pike

Theta Pike/8th Avenue and Nashville Highway forms a four-legged signalized intersection. Southbound Theta Pike has an exclusive left-turn lane with approximately 75 feet of storage and a shared through/right-turn lane. Northbound 8th Avenue has one shared through/left-turn lane and one exclusive right turn lane with approximately 90 feet of storage. Both eastbound and westbound approaches of Nashville Highway have one through lane, one shared through/right-turn lane and one exclusive left-turn lane. The westbound left-turn lane has approximately 85 feet of storage and the eastbound left-turn lane has approximately 300 feet of storage. The northbound and southbound approaches of Theta Pike and 8th Avenue operate as permissive phasing. Protected-permissive left turn signal phasing is utilized for the eastbound and westbound approaches of Nashville Highway.



Southbound Theta Pike/8th Avenue @ Nashville Highway



Northbound Theta Pike/8th Avenue @ Nashville Highway



Eastbound Nashville Highway @ Theta Pike/8th Avenue



Westbound Nashville Highway @ Theta Pike/8th Avenue

Existing Traffic Volumes

In order to analyze the roadway operations in the vicinity of the proposed development, typical weekday intersection turning movement counts were conducted at the following locations:

- Theta Pike and Highway 412/43
- Theta Pike and Timber Trail
- Theta Pike/8th Avenue and Nashville Highway

The turning movement counts were collected on Tuesday, February 22, 2022, during the AM and PM peak periods while school was in full session. The AM count period was from 6:00 – 9:00 AM and the PM count period was from 3:00 – 6:00 PM, to be inclusive of the school arrival and dismissal periods. In addition, 24-hour bi-directional volume and speed tube counts were conducted along Theta Pike in the vicinity of the proposed development access. The raw turning movement counts and 24-hour bi-directional counts are included in **Appendix B**.

Existing Traffic Analysis

To determine the effects of the proposed development on the existing roadway network, analysis of the roadway network in the study area was conducted. The existing traffic volumes used are shown in **Figure 2**. The operational analysis results in a Level of Service (LOS) for each intersection during the AM and PM peak hours. The LOS is based on the industry standard outlined in the *Highway Capacity Manual 2010*. The LOS results range from an A to a F with A being the best and F the worst. For intersections, the LOS is based on the volume-to-capacity ratio and amount of delay experienced by each movement. For unsignalized intersections, the LOS is reported for critical turning movements based on delay and volume-to-capacity (v/c) ratio and for signalized intersections the LOS is reported for each approach and for the overall intersection based on delay, as shown in **Table 1**. The LOS for the existing traffic volumes at the study intersections is shown in **Table 2** and **Appendix C** contains the LOS reports.

TABLE 1
LEVEL OF SERVICE THRESHOLDS

LOS	CONTROL DELAY/VEHICLE (s/veh)	
	UNSIGNALIZED	SIGNALIZED
A	0 – 10	≤ 10
B	> 10 – 15	> 10 – 20
C	> 15 – 25	> 20 – 35
D	> 25 – 35	> 35 – 55
E	> 35 – 50	> 55 – 80
F	> 50	> 80

TABLE 2
EXISTING LEVEL OF SERVICE

Intersection	Movement	AM Peak		PM Peak	
		LOS	Delay	LOS	Delay
Theta Pike and Highway 412/43	Eastbound Approach	B	19.2	C	21.6
	Westbound Approach	B	18.3	C	26.1
	Northbound Approach	D	46.1	D	39.5
	Southbound Approach	D	53.0	D	54.1
	Overall Intersection	C	22.5	C	28.0
Theta Pike and Nashville Highway	Eastbound Approach	A	7.3	A	8.2
	Westbound Approach	A	9.8	B	10.3
	Northbound Approach	C	33.1	C	32.8
	Southbound Approach	D	38.6	D	40.2
	Overall Intersection	B	10.4	B	11.4
Theta Pike and Timber Trail	Westbound Approach	A	9.8	B	11.6
	Southbound Left	A	7.4	A	7.9

The results show that overall, all intersections operate at acceptable levels of service (LOS D or better) during AM and PM peak hour. The LOS analysis reports are included in **Appendix C**.

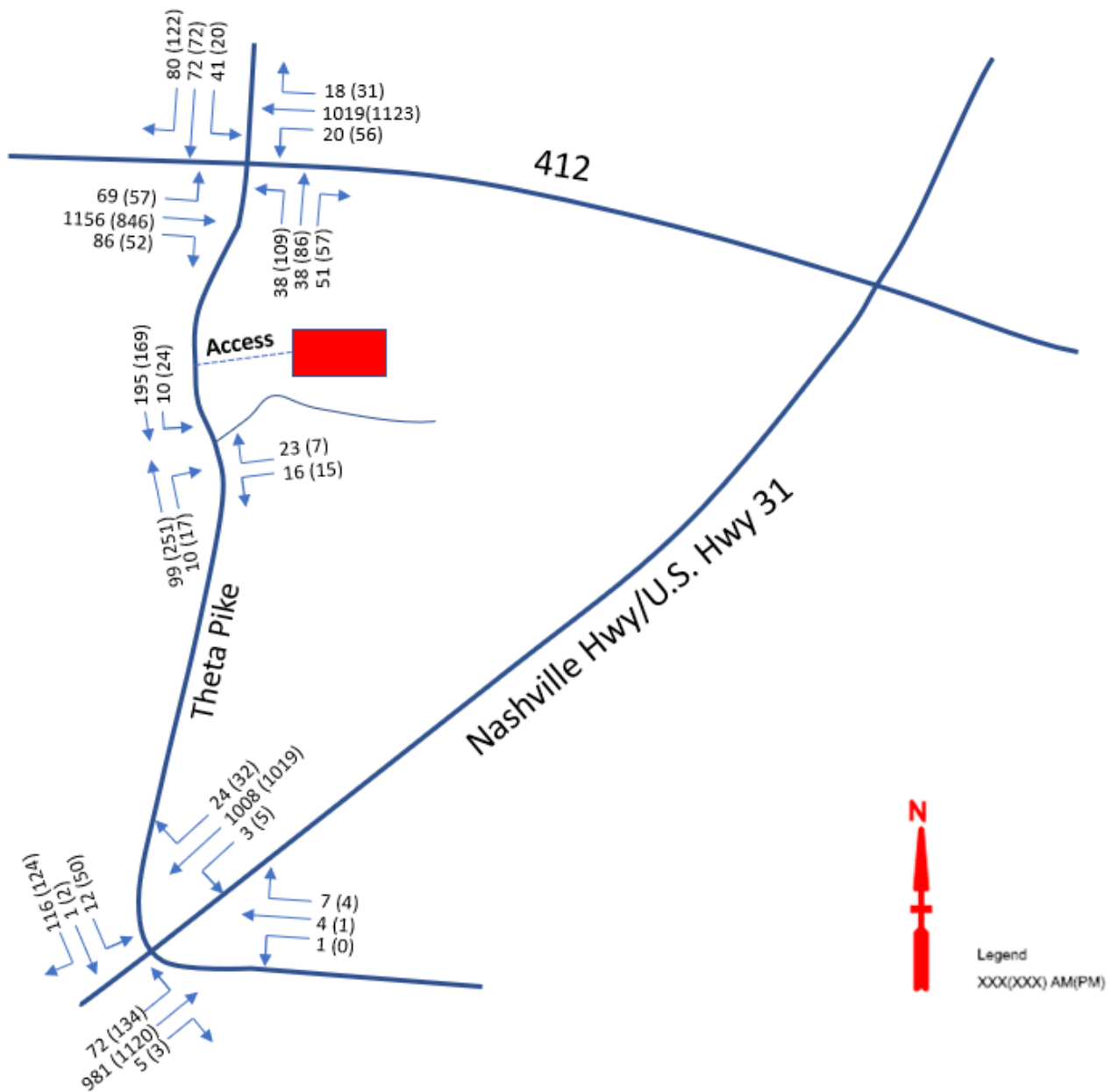


Figure 2 Existing Traffic Volumes

Background Traffic Volumes

Developing Historic Growth Rates

In order to account for the traffic growth prior to the completion of the proposed project, background traffic volumes were established. To develop the growth rate to be applied to the existing traffic volumes, historical daily traffic volumes were obtained from the TDOT count stations located on Highway 412/43, Theta Pike, and Nashville Highway in the vicinity of the project site. **Table 3** below shows the AADT for TDOT count Station. For these three-count station average linear growth rate from 2016 to 2021 is 4%. Through coordination with the City's traffic consultant and based on the historical count data, a 3.5% annual growth rate was used. Anticipated project build-out is 2024, so, percentage growth is calculated for 2-year period to represent the 2024 background traffic growth.

TABLE 3
TDOT COUNT STATION

TDOT Count Sta.60000043 Theta Pike		TDOT Count Sta. 60000202 New Lawrenceburg		TDOT Count Sta. 60000046 Nashville Hwy	
Year	AADT	Year	AADT	Year	AADT
2021	4,164	2021	32,654	2021	30,239
2020	3,809	2020	24,408	2020	27,741
2019	3,510	2019	24,166	2019	27,466
2018	3,060	2018	19,450	2018	26,893
2017	3,374	2017	28,345	2017	25,904
2016	3,440	2016	23,564	2016	26,101

There are two proposed developments, Theta Pike Cove & Taylor Landing, near the study area that is expected to affect the traffic volumes at the study intersections. Theta Pike Cove is a residential development of 162 townhome units. Taylor Landing, on the other hand, is a development consisting of 140 single family homes and 148 townhome units. For Taylor Landing, the traffic information provided by the city did not have trip distribution and assignment. The project team utilized the old distribution and assignment pattern to develop traffic for the updated trip generation. Traffic for both of these developments were included in the background growth. **Figure 3** shows the total background traffic volume for the study area which includes the 7% total ambient growth to account for the 2 years to buildout. The trip distribution and assignment figure for the approved developments are included in **Appendix D** for reference.

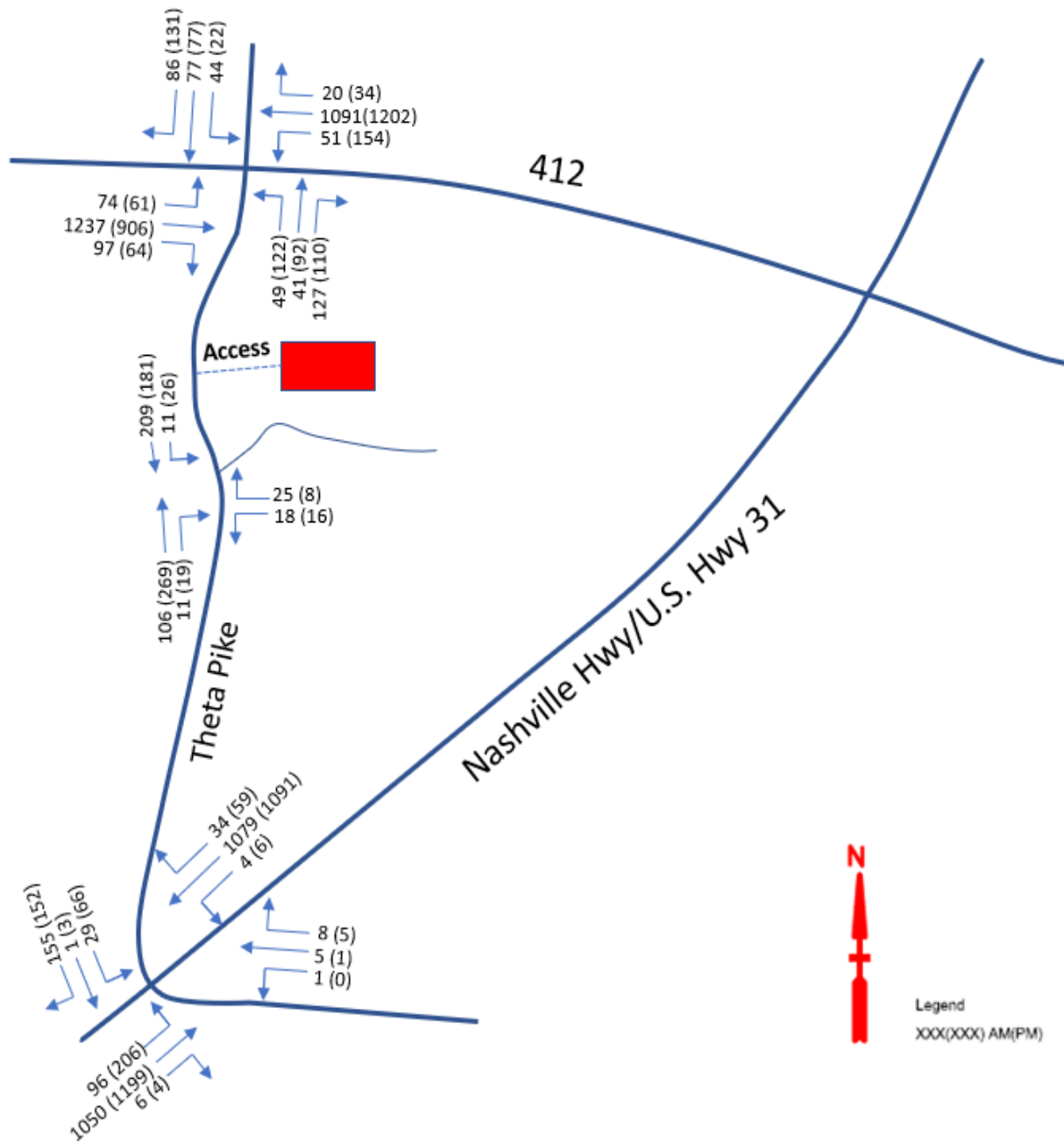


Figure 3 Background Traffic Volumes

Background Traffic Analysis

Using the background traffic volumes and the methodology outlined in the existing conditions, **Table 4** shows the results of the background traffic analysis. As shown, overall, all intersections in the study area are expected to operate at acceptable levels of service under background conditions similar to the existing condition. The LOS analysis reports are included in **Appendix C**.

TABLE 4
BACKGROUND LEVEL OF SERVICE

Intersection	Movement	AM Peak		PM Peak	
		LOS	Delay	LOS	Delay
Theta Pike and Highway 412/43	Eastbound Approach	C	22.6	C	27.4
	Westbound Approach	C	21.0	D	45.0
	Northbound Approach	D	54.1	D	41.1
	Southbound Approach	D	51.7	D	54.2
	Overall Intersection	C	26.2	D	39.2
Theta Pike and Nashville Highway	Eastbound Approach	A	9.8	B	10.8
	Westbound Approach	B	13.3	B	13.8
	Northbound Approach	C	30.1	C	31.2
	Southbound Approach	D	40.9	D	44.5
	Overall Intersection	B	13.9	B	14.8
Theta Pike and Timber Trail	Westbound Approach	A	9.9	B	11.9
	<i>Southbound Left</i>	A	7.5	A	7.9

Proposed Development Impacts

Development Trip Generation

The proposed new development is expected to generate vehicular trips that will use the roadway network in the study area. To determine the expected amount of traffic to be generated from the residential development, *ITE Trip Generation Manual*, 11th Edition was used to calculate the daily trips, AM Peak hour trips, and PM peak hour trips. **Table 5** lists the calculated trips for the proposed development. **Appendix E** includes the trip generation calculations.

TABLE 5
TRIP GENERATION FOR PROPOSED DEVELOPMENT

Trip Generation Table							
Land Use	LUC	Size	Daily Trips	AM Peak Hour Trips		PM Peak Hour Trips	
				Enter	Exit	Enter	Exit
Multifamily Housing (Low-Rise)	220	80 units	588	12	36	35	20

Trip Distribution and Traffic Assignment

The trips generated by the proposed development will be distributed and assigned to the roadway network within the study area. The trip distribution is based on the existing traffic flow and attractors in the area and regionally. It is assumed the new traffic created by the Mackenzie Place development will travel in the same pattern through the study area roadway network to and from the proposed development as the existing traffic, given it is the same general land use. **Figures 4 and 5** show the trip distribution and traffic assignment for the proposed residential uses.

To determine the total amount of traffic traveling through the study area in 2024 when the development is complete, the trip assignment was added to the total background traffic volumes. The resulting total proposed traffic volumes are shown in **Figure 6**.

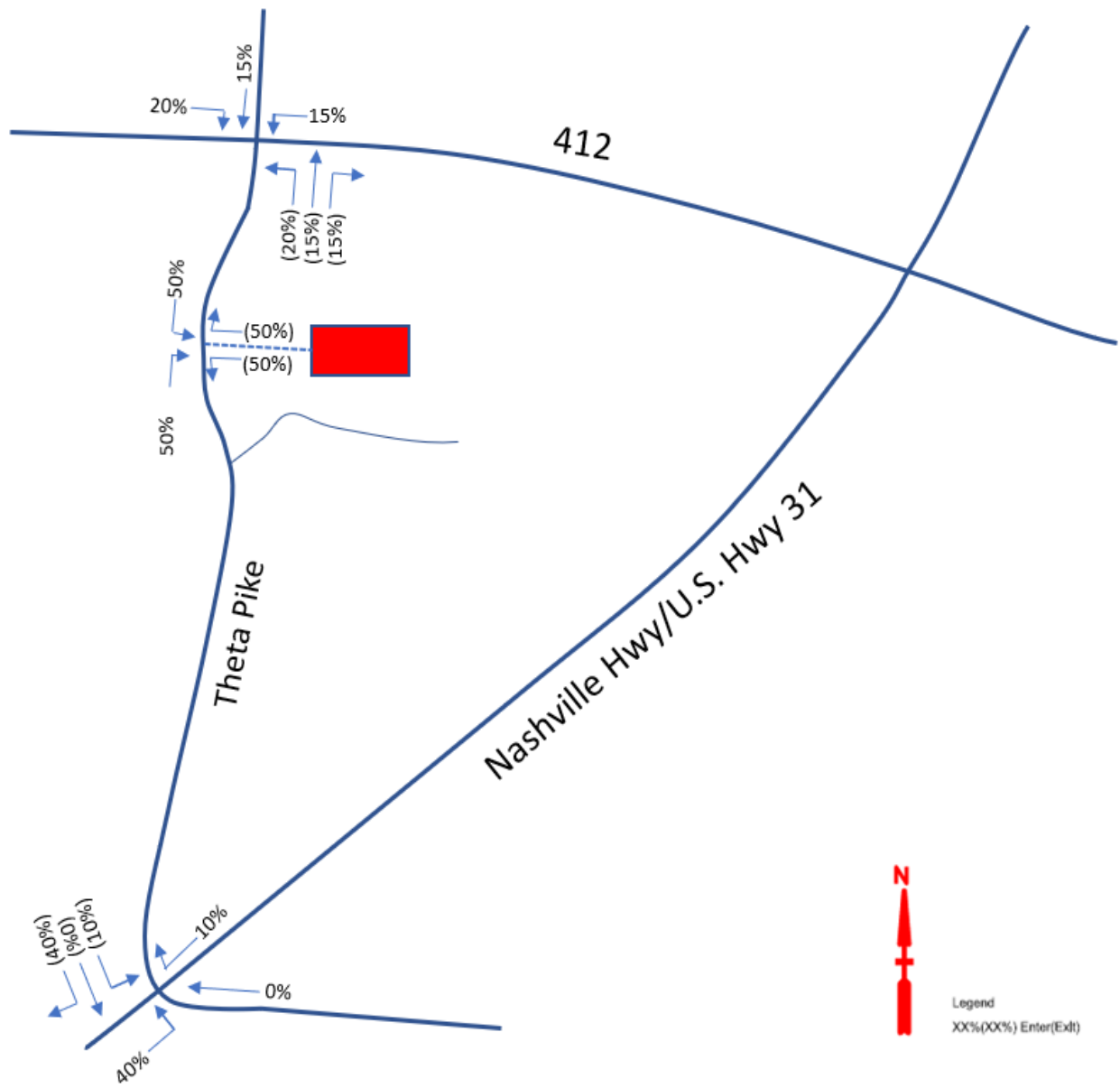


Figure 4 Peak Hour Traffic Distribution

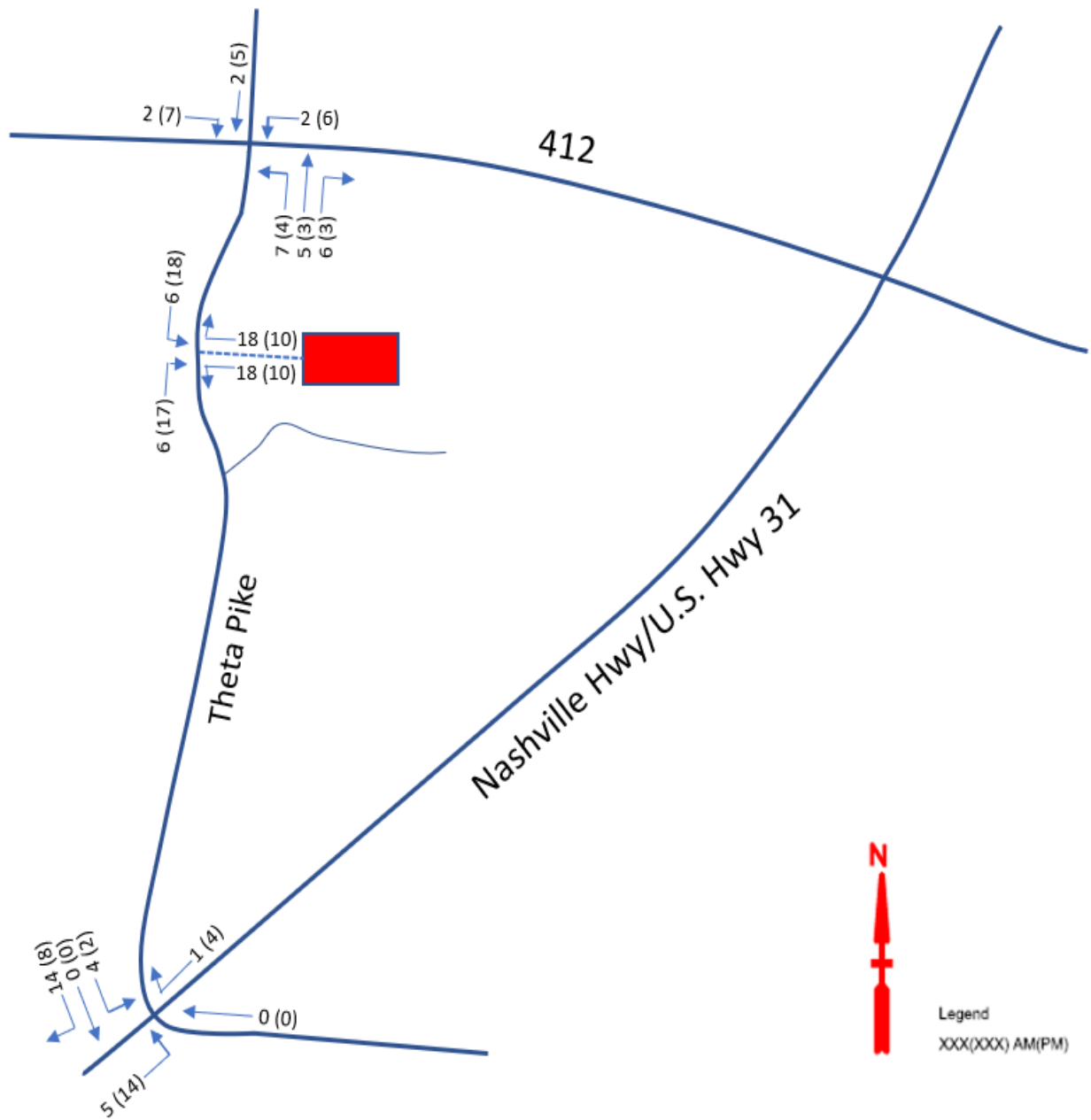


Figure 5 Peak Hour Traffic Assignment

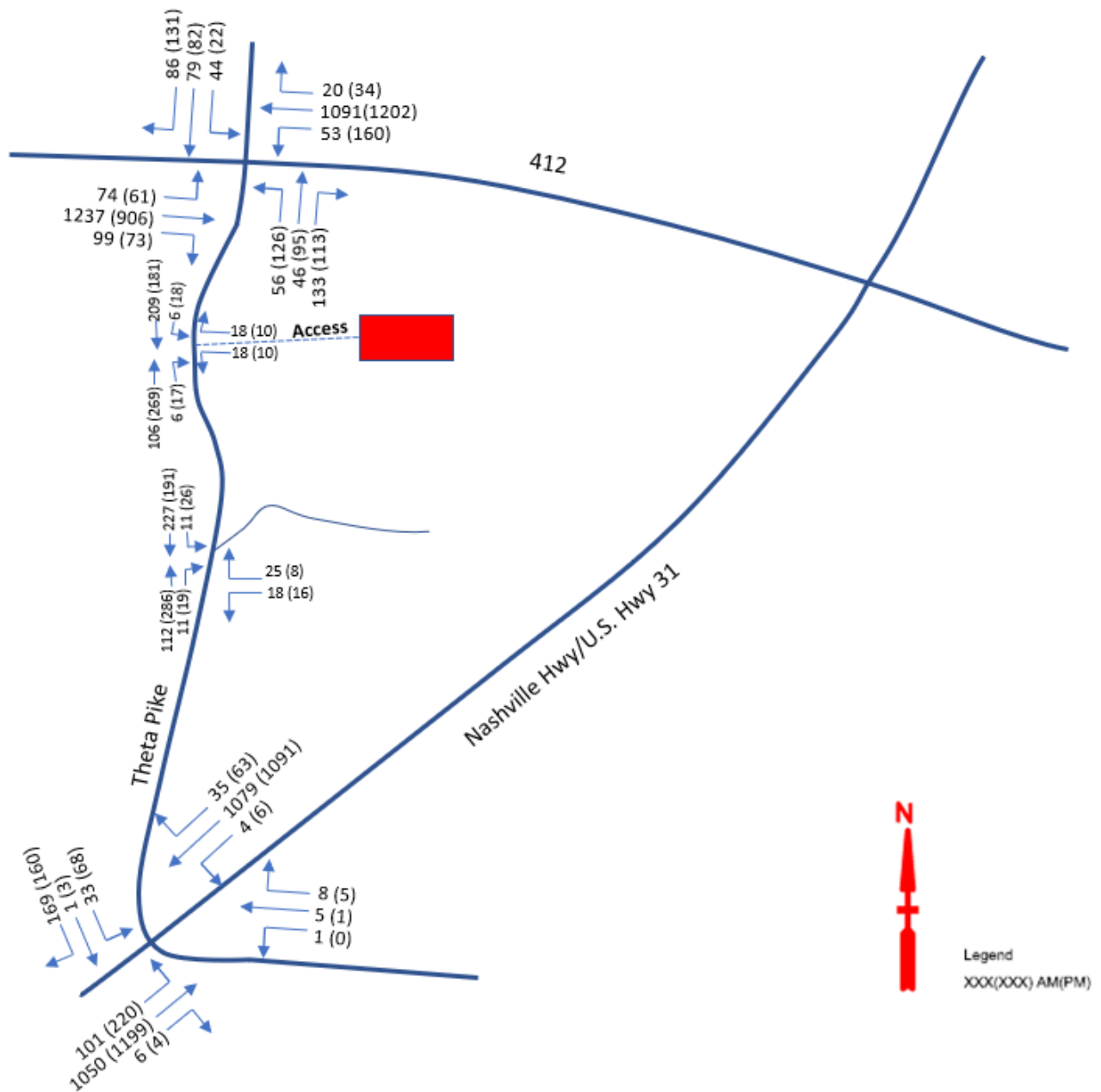


Figure 6 Total Projected Traffic Volumes Expected in Buildout Year

Future Traffic Analysis

Future traffic volumes were developed from the background traffic and proposed residential development. Capacity analyses were performed in order to determine the impact of the project on the study intersections. These capacity analyses were also used to evaluate the need for roadway and traffic control improvements at the intersections studied. For the analyses, the intersection configurations and signal timings were the same as the existing and background conditions. It was assumed the site access on Theta Pike will include one lane for entering traffic and two lanes for exiting traffic as shown in the site plan included in **Appendix A**.

Table 6 shows the resulting LOS for the intersections in the study area. According to the analysis under the projected conditions the capacity analyses indicate that the study intersections are expected to continue to operate at the same levels of service as under the background conditions with only slight increases in vehicular delay. All intersections are expected to continue to operate at acceptable levels of service. The LOS analysis reports are included in **Appendix C**.

TABLE 6
TOTAL PROJECTED LEVEL OF SERVICE

Intersection	Movement	AM Peak		PM Peak	
		LOS	Delay	LOS	Delay
Theta Pike and Highway 412/43	Eastbound Approach	C	23.5	C	27.9
	Westbound Approach	C	21.7	D	47.9
	Northbound Approach	D	54.8	D	41.3
	Southbound Approach	D	51.2	D	54.6
	Overall Intersection	C	27.2	D	40.8
Theta Pike and Nashville Highway	Eastbound Approach	B	10.6	B	11.6
	Westbound Approach	B	14.3	B	14.6
	Northbound Approach	C	29.1	C	30.8
	Southbound Approach	D	41.6	D	45.7
	Overall Intersection	B	14.9	B	15.6
Theta Pike and Timber Trail	Westbound Approach	B	10.1	B	12.2
	Southbound Left	A	7.5	A	8.0
Theta Pike and Project Access	Westbound Left	B	11.1	B	12.8
	Westbound Right	A	9.1	B	10.0
	Southbound Left	A	7.5	A	7.9

Analysis of Site Plan

Turn Lane Analysis

The site access point on Theta Pike was evaluated for the need to provide a left turn lane based on the projected traffic volumes. This analysis was based on the procedures outlined in M.D. Harmelink's *Volume Warrants for Left-Turn Storage Lanes at Unsignalized Intersections*. The result of this analysis indicates that a left turn lane is not warranted by the projected traffic volumes at the study intersection. Details of the Harmelink analyses are included in **Appendix F**.

The site access point on Theta Pike was also evaluated for the need to provide a right turn lane based on the projected traffic volumes. According to the Intersection Channelization Design Guide (NCHRP 279), a full width right turn lane is not warranted at the site access point based on the projected peak hour traffic volumes. The right turn lane analysis is included in **Appendix F**.

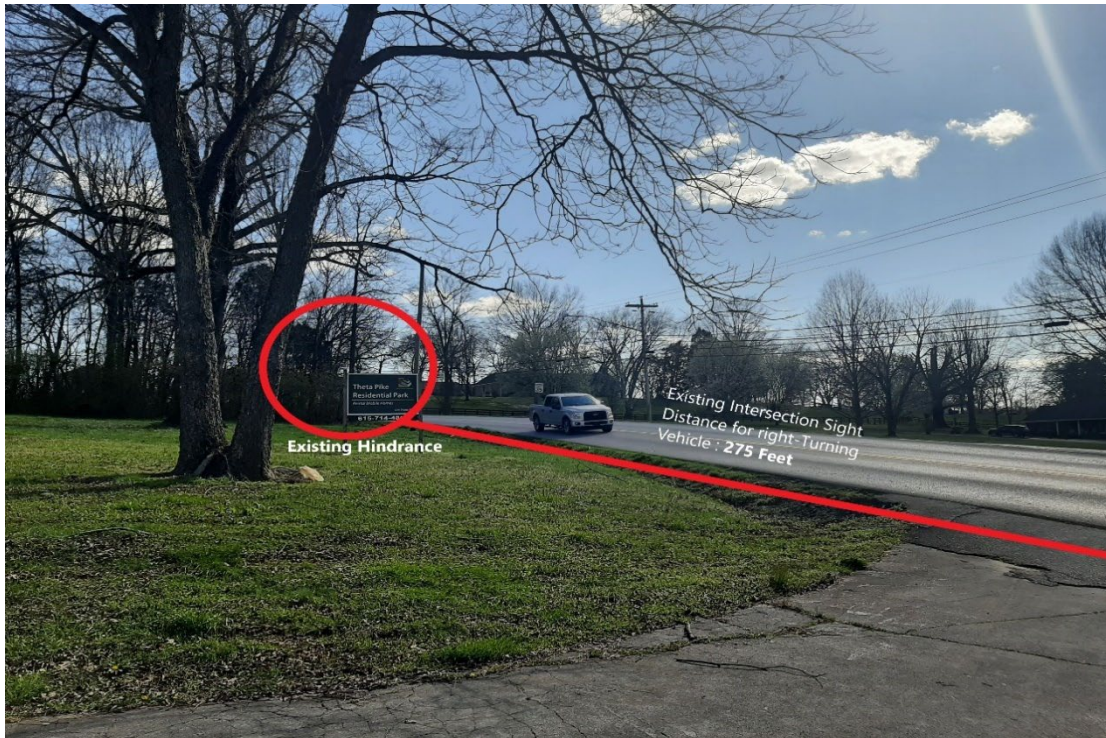
Access Sight Distance

As previously mentioned, access to the proposed development will be provided by a single driveway on Theta Pike. Field investigations and sight distance measurements were conducted to determine if adequate sight distance would be available for motorists exiting the project site onto Theta Pike from the site access based on the current site plan. For a 35-mph speed, as posted on Theta Pike, the guidelines from *A Policy on Geometric Design of Highways and Streets*, by the American Association of State Highway and Transportation Officials (AASHTO), call for a minimum stopping sight distance of 250 feet as a design value. This is the distance required for a motorist to detect an object in the roadway necessitating a stop and be able to stop before reaching the object.

Subsequently, AASHTO also provides minimum design values for intersection sight distance. The intersection sight distance allows enough time gap for a motorist to turn from the site access onto Theta Pike without requiring a motorist on Theta Pike to significantly reduce speed. For a speed of 35 mph, the design value for intersection sight distance for a motorist turning left from a stop (Case B1) onto a two-lane roadway such as Theta Pike is 390 feet and for a motorist turning right from a stop (Case B2) is 335 feet.

The field investigations indicate that the sight distance available at the proposed intersection of the site access and Theta Pike will be more than adequate to the north of the access. However, intersection sight distance to the south of the access, for right turning vehicle, was measured at approximately 275 feet which falls below the required intersection sight distance. Currently, a "Theta Pike Residential" sign and trees are a hindrance for right-turning movement and limiting the available sight distance.

Construction of the site access should be completed such that a minimum of 390 feet of intersection sight distance is provided to the north for a left turn from the site access onto Theta Pike. In addition, a minimum of 335 feet of intersection sight distance should be provided to the south for a right turn from the site access onto Theta Pike.



Intersection Sight Distance for Right-Turning Vehicle: Existing Condition

Conclusions and Recommendations

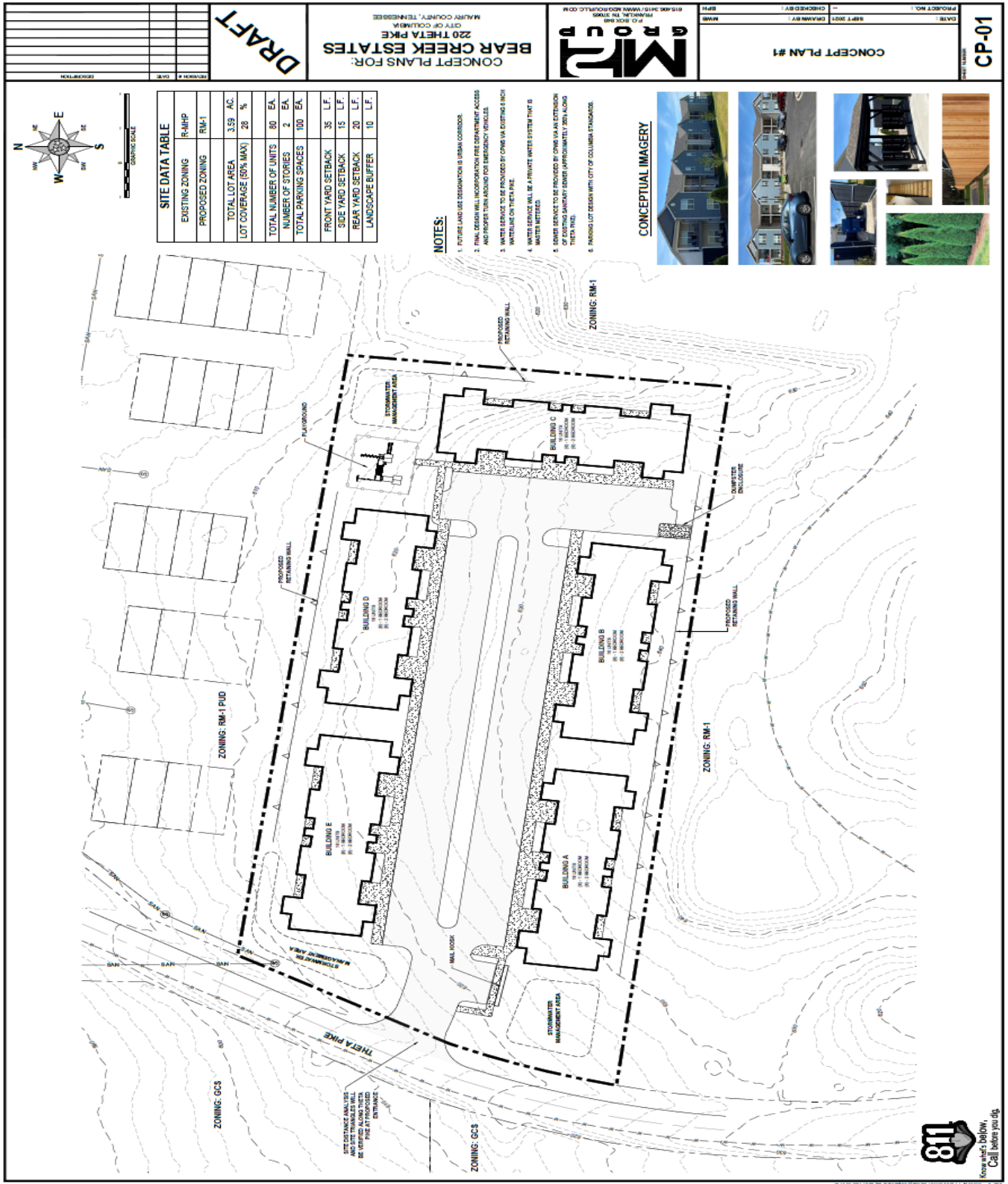
The proposed Mackenzie Place development is located to the south of Hwy 412/43 and on the east side of Theta Pike in Columbia, Tennessee. According to the site engineer, the proposed development consists of approximately 80 multi-family dwelling units. The analyses presented in this study indicate that the impacts of the proposed project on the existing street network will be manageable by providing the recommendations below. These specific recommendations will provide safe and efficient traffic operations within the study area following the completion of the proposed project.

- The traffic operations in the study area for the Future Traffic Analysis are expected to continue to operate at the level currently being experienced or at the level of operation expected with the background traffic. To conclude, proposed development will have minimal impact on the nearby intersections thus requiring no improvement in terms of traffic signal and intersection geometry.
- The proposed site access should be designed such that the departure sight triangles, as specified by AASHTO and detailed in this study, will be clear of all sight obstructions, including landscaping, existing vegetation, monument signs/walls, fences, etc.
- The proposed site access on Theta Pike should be designed to include sufficient width for one entering lane and two exiting lanes as shown in the proposed site plan. This access should be stop controlled on the westbound approach for traffic exiting the site. STOP sign installation should be done based on TDOT sign guidelines.
- All intersection and roadway signing and pavement markings should be completed according to the Manual on Uniform Traffic Control Devices (MUTCD).

Appendix

- A. Site Plan
- B. Traffic Counts
- C. Level of Service (LOS) Reports –
 - Existing
 - Background
 - Projected
- D. Background Traffic Data
- E. Trip Generation
- F. Turn Lane Analysis

A. Site Plan



B. Traffic Counts



[Click here for Map](#)

Peak Hour Turning Movement Count

Bear Creek Estates



www.marrtraffic.com

Tuesday, February 22, 2022	
Period	0600 - 0900
Peak Hour	0715 - 0815

* the Peak Hour Diagram does not include Bikes

Session Parameters

(Drop Down Menu)

Peak Hour

Volume



All vehicles

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App Total	
0715 - 0730	10	8	5	0	23	12	13	24	0	49	17	321	17	0	355	6	235	1	0	242	669
0730 - 0745	16	8	15	0	39	10	22	17	0	49	25	301	20	0	346	10	295	5	0	310	744
0745 - 0800	6	13	14	0	33	13	27	29	0	69	19	304	35	0	358	11	232	7	0	250	710
0800 - 0815	6	9	17	0	32	6	10	10	0	26	8	230	14	1	253	20	257	5	0	282	593
Total	38	38	51	0	127	41	72	80	0	193	69	1156	86	1	1312	47	1019	18	0	1084	2716
Approach %	29.92	29.92	40.16	0.00	-	21.24	37.31	41.45	0.00	-	5.26	88.11	6.55	0.08	-	4.34	94.00	1.66	0.00	-	-
PHF	0.59	0.73	0.75	0.00	0.81	0.79	0.67	0.69	0.00	0.70	0.69	0.90	0.61	0.25	0.92	0.59	0.86	0.64	0.00	0.87	0.91

Passenger Vehicles (1-3)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App Total	
0715 - 0730	10	7	4	0	21	12	13	23	0	48	17	306	16	0	339	6	215	1	0	222	630
0730 - 0745	16	8	15	0	39	8	22	17	0	47	25	280	20	0	325	10	265	5	0	280	691
0745 - 0800	6	13	14	0	33	12	27	28	0	67	19	287	34	0	340	11	209	7	0	227	667
0800 - 0815	5	9	17	0	31	6	10	10	0	26	7	213	13	1	234	20	222	4	0	246	537
Total	37	37	50	0	124	38	72	78	0	188	68	1086	83	1	1238	47	911	17	0	975	2525
Approach %	29.84	29.84	40.32	0.00	-	20.21	38.30	41.49	0.00	-	5.49	87.72	6.70	0.08	-	4.82	93.44	1.74	0.00	-	-
PHF	0.58	0.71	0.74	0.00	0.79	0.79	0.67	0.70	0.00	0.70	0.68	0.89	0.61	0.25	0.91	0.59	0.86	0.61	0.00	0.87	0.91

Single Unit Trucks (4-7)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App. Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App. Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App. Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App. Total	
0715 - 0730	0	1	1	0	2	0	0	1	0	1	0	4	0	0	4	0	10	0	0	10	17
0730 - 0745	0	0	0	0	0	2	0	0	0	2	0	14	0	0	14	0	16	0	0	16	32
0745 - 0800	0	0	0	0	0	1	0	1	0	2	0	8	1	0	9	0	14	0	0	14	25
0800 - 0815	1	0	0	0	1	0	0	0	0	0	1	11	1	0	13	0	24	1	0	25	39
Total	1	1	1	0	3	3	0	2	0	5	1	37	2	0	40	0	64	1	0	65	113
Approach %	33.33	33.33	33.33	0.00	-	60.00	0.00	40.00	0.00	-	2.50	92.50	5.00	0.00	-	0.00	98.46	1.54	0.00	-	-
PHF	0.25	0.25	0.25	0.00	0.38	0.38	0.00	0.50	0.00	0.63	0.25	0.66	0.50	0.00	0.71	0.00	0.67	0.25	0.00	0.65	0.72

Combination Trucks (8-13)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App Total	
0715 - 0730	0	0	0	0	0	0	0	0	0	0	0	11	1	0	12	0	10	0	0	10	22
0730 - 0745	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7	0	14	0	0	14	21
0745 - 0800	0	0	0	0	0	0	0	0	0	0	0	9	0	0	9	0	9	0	0	9	18
0800 - 0815	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	0	11	0	0	11	17
Total	0	0	0	0	0	0	0	0	0	0	0	33	1	0	34	0	44	0	0	44	78
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	97.06	2.94	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	0.25	0.00	0.71	0.00	0.79	0.00	0.00	0.79	0.89

Bikes

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App Total	
0715 - 0730	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	
0745 - 0800	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	
Total	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	

Pedestrians

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)				Theta Pike (North)				TN-6 (West)				TN-6 (East)								
	EB 1a	WB 1b		App Total	EB 1c	WB 1d		App Total	NB 1e	SB 1f		App Total	NB 1g	SB 1h		App 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

Bear Creek Estates



www.marrtraffic.com

Tuesday, February 22, 2022	
Period	1500 - 1800
Peak Hour	1615 - 1715

* the Peak Hour Diagram does not include Bikes

Session Parameters

(Drop Down Menu)

Peak Hour

Volume



All vehicles

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App Total	
1615 - 1630	34	23	22	0	79	5	25	44	0	74	14	203	10	0	227	11	267	5	0	283	663
1630 - 1645	33	16	12	0	61	2	15	27	0	44	10	242	16	0	268	15	320	6	0	341	714
1645 - 1700	20	17	10	0	47	6	19	32	0	57	15	205	13	1	234	15	268	8	0	291	629
1700 - 1715	22	30	13	0	65	7	13	19	0	39	18	196	13	0	227	15	268	12	0	295	626
Total	109	86	57	0	252	20	72	122	0	214	57	846	52	1	956	56	1123	31	0	1210	2632
Approach %	43.25	34.13	22.62	0.00	-	9.35	33.64	57.01	0.00	-	5.96	88.49	5.44	0.10	-	4.63	92.81	2.56	0.00	-	-
PHF	0.80	0.72	0.65	0.00	0.80	0.71	0.72	0.69	0.00	0.72	0.79	0.87	0.81	0.25	0.89	0.93	0.88	0.65	0.00	0.89	0.92

Passenger Vehicles (1-3)

Time	Northbound					Southbound					Eastbound					Westbound					Int total
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App Total	
1615 - 1630	33	23	22	0	78	5	25	44	0	74	14	195	10	0	219	10	255	5	0	270	641
1630 - 1645	33	16	12	0	61	2	14	27	0	43	10	233	16	0	259	14	309	6	0	329	692
1645 - 1700	20	17	10	0	47	6	19	32	0	57	15	187	13	1	216	15	265	8	0	288	608
1700 - 1715	22	30	13	0	65	7	12	19	0	38	18	185	13	0	216	15	260	12	0	287	606
Total	108	86	57	0	251	20	70	122	0	212	57	800	52	1	910	54	1089	31	0	1174	2547
Approach %	43.03	34.26	22.71	0.00	-	9.43	33.02	57.55	0.00	-	6.26	87.91	5.71	0.11	-	4.60	92.76	2.64	0.00	-	-
PHF	0.82	0.72	0.65	0.00	0.80	0.71	0.70	0.69	0.00	0.72	0.79	0.86	0.81	0.25	0.88	0.90	0.88	0.65	0.00	0.89	0.92

Single Unit Trucks (4-7)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App Total	
1615 - 1630	1	0	0	0	1	0	0	0	0	0	0	2	0	0	2	1	7	0	0	8	11
1630 - 1645	0	0	0	0	0	0	1	0	0	1	0	3	0	0	3	1	6	0	0	7	11
1645 - 1700	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	3	0	0	3	7
1700 - 1715	0	0	0	0	0	0	1	0	0	1	0	5	0	0	5	0	4	0	0	4	10
Total	1	0	0	0	1	0	2	0	0	2	0	14	0	0	14	2	20	0	0	22	39
Approach %	100.00	0.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	9.09	90.91	0.00	0.00	-	-
PHF	0.25	0.00	0.00	0.00	0.25	0.00	0.50	0.00	0.00	0.50	0.00	0.70	0.00	0.00	0.70	0.50	0.71	0.00	0.00	0.69	0.89

Combination Trucks (8-13)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App Total	
1615 - 1630	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	0	5	0	0	5	
1630 - 1645	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	0	5	0	0	5	
1645 - 1700	0	0	0	0	0	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	
1700 - 1715	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	0	4	0	0	4	
Total	0	0	0	0	0	0	0	0	0	0	0	32	0	0	32	0	14	0	0	14	
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	0.70	0.00	0.00	0.70	

Bikes

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App Total	
1615 - 1630	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	
1645 - 1700	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	
Total	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	

Pedestrians

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	EB 1a	WB 1b			App Total	EB 1c	WB 1d			App Total	NB 1e	SB 1f			App Total	NB 1g	SB 1h			App 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

Classified Turn Movement Count || All vehicles

Bear Creek Estates

Site 1 of 3

Theta Pike (South)
Theta Pike (North)
TN-6 (West)
TN-6 (East)

Date

Tuesday, February 22, 2022

Weather

Cloudy
65°F

Lat/Long

35.637331°, -87.027785°

0600 - 0900 (Weekday 3h Session) (02-22-2022)

All vehicles

TIME	Northbound					Southbound					Eastbound					Westbound					Int
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App Total	
0600 - 0615	3	3	5	0	11	3	4	3	0	10	7	248	3	0	258	3	98	2	0	103	382
0615 - 0630	3	2	9	0	14	3	5	6	0	14	7	322	3	0	332	1	162	2	0	165	525
0630 - 0645	5	4	12	0	21	4	7	9	0	20	10	291	7	0	308	0	171	3	1	175	524
0645 - 0700	9	3	11	0	23	2	12	14	0	28	9	281	8	0	298	3	179	4	0	186	535
Hourly Total	20	12	37	0	69	12	28	32	0	72	33	1142	21	0	1196	7	610	11	1	629	1966
0700 - 0715	11	6	7	0	24	9	11	14	0	34	12	258	10	0	280	5	220	7	0	232	570
0715 - 0730	10	8	5	0	23	12	13	24	0	49	17	321	17	0	355	6	235	1	0	242	669
0730 - 0745	16	8	15	0	39	10	22	17	0	49	25	301	20	0	346	10	295	5	0	310	744
0745 - 0800	6	13	14	0	33	13	27	29	0	69	19	304	35	0	358	11	232	7	0	250	710
Hourly Total	43	35	41	0	119	44	73	84	0	201	73	1184	82	0	1339	32	982	20	0	1034	2693
0800 - 0815	6	9	17	0	32	6	10	10	0	26	8	230	14	1	253	20	257	5	0	282	593
0815 - 0830	6	9	13	0	28	3	12	15	0	30	8	253	17	0	278	13	178	4	0	195	531
0830 - 0845	11	10	17	0	38	3	11	7	0	21	9	196	15	0	220	11	178	0	0	189	468
0845 - 0900	7	5	8	0	20	5	19	10	0	34	7	202	21	0	230	10	174	7	1	192	476
Hourly Total	30	33	55	0	118	17	52	42	0	111	32	881	67	1	981	54	787	16	1	858	2068
Grand Total	93	80	133	0	306	73	153	158	0	384	138	3207	170	1	3516	93	2379	47	2	2521	6727
Approach %	30.39	26.14	43.46	0.00	-	19.01	39.84	41.15	0.00	-	3.92	91.21	4.84	0.03	-	3.69	94.37	1.86	0.08	-	-
Intersection %	1.38	1.19	1.98	0.00	4.55	1.09	2.27	2.35	0.00	5.71	2.05	47.67	2.53	0.01	52.27	1.38	35.36	0.70	0.03	37.48	-
PHF	0.59	0.73	0.75	0.00	0.81	0.79	0.67	0.69	0.00	0.70	0.69	0.90	0.61	0.25	0.92	0.59	0.86	0.64	0.00	0.87	0.91

1500 - 1800 (Weekday 3h Session) (02-22-2022)

All vehicles

	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
TIME	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App Total	
1500 - 1515	21	23	11	0	55	12	15	23	0	50	31	275	21	0	327	17	224	9	0	250	
1515 - 1530	26	29	13	0	68	13	23	22	0	58	42	258	22	1	323	13	223	16	0	252	
1530 - 1545	20	32	19	0	71	4	11	15	0	30	33	243	20	0	296	19	244	7	0	270	
1545 - 1600	29	26	13	0	68	3	12	21	0	36	10	177	15	1	203	6	236	3	2	247	
Hourly Total	96	110	56	0	262	32	61	81	0	174	116	953	78	2	1149	55	927	35	2	1019	
1600 - 1615	26	21	12	0	59	8	25	31	0	64	14	167	9	0	190	13	286	7	1	307	
1615 - 1630	34	23	22	0	79	5	25	44	0	74	14	203	10	0	227	11	267	5	0	283	
1630 - 1645	33	16	12	0	61	2	15	27	0	44	10	242	16	0	268	15	320	6	0	341	
1645 - 1700	20	17	10	0	47	6	19	32	0	57	15	205	13	1	234	15	268	8	0	291	
Hourly Total	113	77	56	0	246	21	84	134	0	239	53	817	48	1	919	54	1141	26	1	1222	
1700 - 1715	22	30	13	0	65	7	13	19	0	39	18	196	13	0	227	15	268	12	0	295	
1715 - 1730	22	20	10	0	52	5	24	25	0	54	9	195	14	0	218	7	256	5	0	268	
1730 - 1745	13	27	7	0	47	9	13	18	0	40	17	148	11	0	176	12	238	8	0	258	
1745 - 1800	16	22	5	0	43	5	10	14	0	29	9	140	14	0	163	11	179	13	0	203	
Hourly Total	73	99	35	0	207	26	60	76	0	162	53	679	52	0	784	45	941	38	0	1024	
Grand Total	282	286	147	0	715	79	205	291	0	575	222	2449	178	3	2852	154	3009	99	3	3265	
Approach %	39.44	40.00	20.56	0.00	-	13.74	35.65	50.61	0.00	-	7.78	85.87	6.24	0.11	-	4.72	92.16	3.03	0.09	-	
Intersection %	3.81	3.86	1.98	0.00	9.65	1.07	2.77	3.93	0.00	7.76	3.00	33.06	2.40	0.04	38.50	2.08	40.62	1.34	0.04	44.08	
PHF	0.80	0.72	0.65	0.00	0.80	0.71	0.72	0.69	0.00	0.72	0.79	0.87	0.81	0.25	0.89	0.93	0.88	0.65	0.00	0.89	



[Click here for Map](#)

Peak Hour Turning Movement Count

Bear Creek Estates



www.marrtraffic.com

Tuesday, February 22, 2022	
Period	0600 - 0900
Peak Hour	0715 - 0815

* the Peak Hour Diagram does not include Bikes

Session Parameters

(Drop Down Menu)

Peak Hour

Volume



All vehicles

Time	Northbound					Southbound					Eastbound					Westbound					Int. total
	8th Ave					Theta Pike					TN-99 Nashville Hwy (West)					TN-99 Nashville Hwy (East)					
	Left 2.1	Thru 2.2	Right 2.3		App. Total	Left 2.4	Thru 2.5	Right 2.6	U-Turn 2.7	App. Total	Left 2.8	Thru 2.9	Right 2.10	U-Turn 2.11	App. Total	Left 2.12	Thru 2.13	Right 2.14	U-Turn 2.15	App. Total	
0715 - 0730	0	1	2	-	3	3	0	28	0	31	9	242	3	0	254	1	213	6	0	220	508
0730 - 0745	0	2	3	-	5	0	0	31	0	31	16	239	1	0	256	1	268	6	0	275	567
0745 - 0800	1	0	0	-	1	5	1	36	0	42	27	293	1	0	321	0	285	11	0	296	660
0800 - 0815	0	1	2	-	3	4	0	21	0	25	20	207	0	0	227	1	242	1	0	244	499
Total	1	4	7	0	12	12	1	116	0	129	72	981	5	0	1058	3	1008	24	0	1035	2234
Approach %	8.33	33.33	58.33	0.00	-	9.30	0.78	89.92	0.00	-	6.81	92.72	0.47	0.00	-	0.29	97.39	2.32	0.00	-	-
PHF	0.25	0.50	0.58	0.00	0.60	0.60	0.25	0.81	0.00	0.77	0.67	0.84	0.42	0.00	0.82	0.75	0.88	0.55	0.00	0.87	0.85

Passenger Vehicles (1-3)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	8th Ave					Theta Pike					TN-99 Nashville Hwy (West)					TN-99 Nashville Hwy (East)					
	Left 2.1	Thru 2.2	Right 2.3		App Total	Left 2.4	Thru 2.5	Right 2.6	U-Turn 2.7	App Total	Left 2.8	Thru 2.9	Right 2.10	U-Turn 2.11	App Total	Left 2.12	Thru 2.13	Right 2.14	U-Turn 2.15	App Total	
0715 - 0730	0	1	2	-	3	2	0	28	0	30	8	232	3	0	243	1	207	5	0	213	489
0730 - 0745	0	2	3	-	5	0	0	30	0	30	16	231	1	0	248	1	262	6	0	269	552
0745 - 0800	1	0	0	-	1	5	1	36	0	42	27	281	1	0	309	0	278	11	0	289	641
0800 - 0815	0	1	2	-	3	4	0	21	0	25	19	198	0	0	217	1	229	1	0	231	476
Total	1	4	7	0	12	11	1	115	0	127	70	942	5	0	1017	3	976	23	0	1002	2158
Approach %	8.33	33.33	58.33	0.00	-	8.66	0.79	90.55	0.00	-	6.88	92.63	0.49	0.00	-	0.30	97.41	2.30	0.00	-	-
PHF	0.25	0.50	0.58	0.00	0.60	0.55	0.25	0.80	0.00	0.76	0.65	0.84	0.42	0.00	0.82	0.75	0.88	0.52	0.00	0.87	0.84

Single Unit Trucks (4-7)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	8th Ave					Theta Pike					TN-99 Nashville Hwy (West)					TN-99 Nashville Hwy (East)					
	Left 2.1	Thru 2.2	Right 2.3		App Total	Left 2.4	Thru 2.5	Right 2.6	U-Turn 2.7	App Total	Left 2.8	Thru 2.9	Right 2.10	U-Turn 2.11	App Total	Left 2.12	Thru 2.13	Right 2.14	U-Turn 2.15	App Total	
0715 - 0730	0	0	0	-	0	0	0	0	0	0	1	8	0	0	9	0	5	1	0	6	15
0730 - 0745	0	0	0	-	0	0	0	1	0	1	0	5	0	0	5	0	5	0	0	5	11
0745 - 0800	0	0	0	-	0	0	0	0	0	0	0	11	0	0	11	0	5	0	0	5	16
0800 - 0815	0	0	0	-	0	0	0	0	0	0	1	8	0	0	9	0	8	0	0	8	17
Total	0	0	0	0	0	0	0	1	0	1	2	32	0	0	34	0	23	1	0	24	59
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	100.00	0.00	-	5.88	94.12	0.00	0.00	-	0.00	95.83	4.17	0.00	-	-
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.25	0.50	0.73	0.00	0.00	0.77	0.00	0.72	0.25	0.00	0.75	0.87

Combination Trucks (8-13)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total	
	8th Ave					Theta Pike					TN-99 Nashville Hwy (West)					TN-99 Nashville Hwy (East)						
	Left 2.1	Thru 2.2	Right 2.3		App Total	Left 2.4	Thru 2.5	Right 2.6	U-Turn 2.7	App Total	Left 2.8	Thru 2.9	Right 2.10	U-Turn 2.11	App Total	Left 2.12	Thru 2.13	Right 2.14	U-Turn 2.15	App Total		
0715 - 0730	0	0	0	-	0	0	1	0	0	0	1	0	2	0	0	2	0	1	0	0	1	4
0730 - 0745	0	0	0	-	0	0	0	0	0	0	0	3	0	0	0	3	0	1	0	0	1	4
0745 - 0800	0	0	0	-	0	0	0	0	0	0	0	1	1	0	0	1	0	2	0	0	2	3
0800 - 0815	0	0	0	-	0	0	0	0	0	0	0	1	0	0	0	1	0	5	0	0	5	6
Total	0	0	0	0	0	0	1	0	0	0	1	0	7	0	0	7	0	9	0	0	9	17
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	0.58	0.00	0.00	0.58	0.00	0.45	0.00	0.00	0.45	0.71	

Bikes

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	8th Ave					Theta Pike					TN-99 Nashville Hwy (West)					TN-99 Nashville Hwy (East)					
	Left 2.1	Thru 2.2	Right 2.3		App Total	Left 2.4	Thru 2.5	Right 2.6	U-Turn 2.7	App Total	Left 2.8	Thru 2.9	Right 2.10	U-Turn 2.11	App Total	Left 2.12	Thru 2.13	Right 2.14	U-Turn 2.15	App Total	
0715 - 0730	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	
0745 - 0800	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	
Total	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	

Pedestrians

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	8th Ave					Theta Pike					TN-99 Nashville Hwy (West)					TN-99 Nashville Hwy (East)					
	EB 2a	WB 2b			App Total	EB 2c	WB 2d			App Total	NB 2e	SB 2f			App Total	NB 2g	SB 2h			App 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

Bear Creek Estates



www.marrtraffic.com

Tuesday, February 22, 2022	
Period	1500 - 1800
Peak Hour	1500 - 1600

* the Peak Hour Diagram does not include Bikes

Session Parameters

(Drop Down Menu)

Peak Hour

Volume



All vehicles

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	8th Ave					Theta Pike					TN-99 Nashville Hwy (West)					TN-99 Nashville Hwy (East)					
	Left 2.1	Thru 2.2	Right 2.3		App Total	Left 2.4	Thru 2.5	Right 2.6	U-Turn 2.7	App Total	Left 2.8	Thru 2.9	Right 2.10	U-Turn 2.11	App Total	Left 2.12	Thru 2.13	Right 2.14	U-Turn 2.15	App Total	
1500 - 1515	0	1	1	-	2	9	0	40	0	49	33	307	1	1	342	0	282	10	2	294	687
1515 - 1530	0	0	3	-	3	13	0	34	0	47	38	305	2	1	346	3	264	7	1	275	671
1530 - 1545	0	0	0	-	0	12	1	23	0	36	31	262	0	0	293	1	248	8	2	259	588
1545 - 1600	0	0	0	-	0	16	1	27	0	44	32	246	0	1	279	1	225	7	1	234	557
Total	0	1	4	0	5	50	2	124	0	176	134	1120	3	3	1260	5	1019	32	6	1062	2503
Approach %	0.00	20.00	80.00	0.00	-	28.41	1.14	70.45	0.00	-	10.63	88.89	0.24	0.24	-	0.47	95.95	3.01	0.56	-	-
PHF	0.00	0.25	0.33	0.00	0.42	0.78	0.50	0.78	0.00	0.90	0.88	0.91	0.38	0.75	0.91	0.42	0.90	0.80	0.75	0.90	0.91

Passenger Vehicles (1-3)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	8th Ave					Theta Pike					TN-99 Nashville Hwy (West)					TN-99 Nashville Hwy (East)					
	Left 2.1	Thru 2.2	Right 2.3		App Total	Left 2.4	Thru 2.5	Right 2.6	U-Turn 2.7	App Total	Left 2.8	Thru 2.9	Right 2.10	U-Turn 2.11	App Total	Left 2.12	Thru 2.13	Right 2.14	U-Turn 2.15	App Total	
1500 - 1515	0	1	1	-	2	9	0	39	0	48	33	301	1	1	336	0	277	10	2	289	675
1515 - 1530	0	0	3	-	3	13	0	34	0	47	38	297	2	1	338	3	257	7	1	268	656
1530 - 1545	0	0	0	-	0	12	1	23	0	36	31	260	0	0	291	1	239	8	2	250	577
1545 - 1600	0	0	0	-	0	16	1	27	0	44	32	244	0	1	277	1	224	7	1	233	554
Total	0	1	4	0	5	50	2	123	0	175	134	1102	3	3	1242	5	997	32	6	1040	2462
Approach %	0.00	20.00	80.00	0.00	-	28.57	1.14	70.29	0.00	-	10.79	88.73	0.24	0.24	-	0.48	95.87	3.08	0.58	-	-
PHF	0.00	0.25	0.33	0.00	0.42	0.78	0.50	0.79	0.00	0.91	0.88	0.92	0.38	0.75	0.92	0.42	0.90	0.80	0.75	0.90	0.91

Single Unit Trucks (4-7)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	8th Ave					Theta Pike					TN-99 Nashville Hwy (West)					TN-99 Nashville Hwy (East)					
	Left 2.1	Thru 2.2	Right 2.3		App Total	Left 2.4	Thru 2.5	Right 2.6	U-Turn 2.7	App Total	Left 2.8	Thru 2.9	Right 2.10	U-Turn 2.11	App Total	Left 2.12	Thru 2.13	Right 2.14	U-Turn 2.15	App Total	
1500 - 1515	0	0	0	-	0	0	0	1	0	1	0	3	0	0	3	0	4	0	0	4	8
1515 - 1530	0	0	0	-	0	0	0	0	0	0	0	7	0	0	7	0	6	0	0	6	13
1530 - 1545	0	0	0	-	0	0	0	0	0	0	0	2	0	0	2	0	9	0	0	9	11
1545 - 1600	0	0	0	-	0	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	3
Total	0	0	0	0	0	0	0	1	0	1	0	14	0	0	14	0	20	0	0	20	35
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	100.00	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	0.25	0.00	0.25	0.00	0.50	0.00	0.00	0.50	0.00	0.56	0.00	0.00	0.56	0.67

Combination Trucks (8-13)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	8th Ave					Theta Pike					TN-99 Nashville Hwy (West)					TN-99 Nashville Hwy (East)					
	Left 2.1	Thru 2.2	Right 2.3		App Total	Left 2.4	Thru 2.5	Right 2.6	U-Turn 2.7	App Total	Left 2.8	Thru 2.9	Right 2.10	U-Turn 2.11	App Total	Left 2.12	Thru 2.13	Right 2.14	U-Turn 2.15	App Total	
1500 - 1515	0	0	0	-	0	0	0	0	0	0	0	3	0	0	3	0	1	0	0	1	4
1515 - 1530	0	0	0	-	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2
1530 - 1545	0	0	0	-	0	0	0	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	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	2	0	0	2	6
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	0.33	0.00	0.00	0.33	0.00	0.50	0.00	0.00	0.50	0.38

Bikes

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	8th Ave					Theta Pike					TN-99 Nashville Hwy (West)					TN-99 Nashville Hwy (East)					
	Left 2.1	Thru 2.2	Right 2.3		App Total	Left 2.4	Thru 2.5	Right 2.6	U-Turn 2.7	App Total	Left 2.8	Thru 2.9	Right 2.10	U-Turn 2.11	App Total	Left 2.12	Thru 2.13	Right 2.14	U-Turn 2.15	App Total	
1500 - 1515	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1515 - 1530	0	0	0	-	0	0	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	0	0	0	0	0	
1545 - 1600	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	
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	

Pedestrians

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	8th Ave					Theta Pike					TN-99 Nashville Hwy (West)					TN-99 Nashville Hwy (East)					
	EB 2a	WB 2b			App Total	EB 2c	WB 2d			App Total	NB 2e	SB 2f			App Total	NB 2g	SB 2h			App Total	
1500 - 1515	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1515 - 1530	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
1545 - 1600	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

Bear Creek Estates

Site 2 of 3

8th Ave
Theta Pike
TN-99 Nashville Hwy (West)
TN-99 Nashville Hwy (East)

Date

Tuesday, February 22, 2022

Weather

Cloudy
65°F

Lat/Long

35.627192°, -87.029283°

0600 - 0900 (Weekday 3h Session) (02-22-2022)

All vehicles

TIME	Northbound				Southbound					Eastbound					Westbound						Int		
	8th Ave				App Total	Theta Pike				App Total	TN-99 Nashville Hwy (West)					App Total	TN-99 Nashville Hwy (East)					App Total	
	Left 2.1	Thru 2.2	Right 2.3	Left 2.4		Thru 2.5	Right 2.6	U-Turn 2.7	Left 2.8		Thru 2.9	Right 2.10	U-Turn 2.11	Left 2.12	Thru 2.13		Right 2.14	U-Turn 2.15					
0600 - 0615	0	1	3	4	0	0	5	1	6	2	141	0	0	143	0	69	0	0	69	222			
0615 - 0630	0	0	0	0	0	0	6	0	6	2	156	0	0	158	1	105	0	0	106	270			
0630 - 0645	0	0	0	4	4	0	0	9	0	10	193	1	0	204	0	114	2	0	116	333			
0645 - 0700	3	0	1	4	3	0	13	0	16	3	195	0	0	198	1	134	0	0	135	353			
Hourly Total	3	1	8	12	3	0	33	1	37	17	685	1	0	703	2	422	2	0	426	1178			
0700 - 0715	0	0	4	4	2	0	14	0	16	14	195	1	0	210	1	154	0	0	155	385			
0715 - 0730	0	1	2	3	3	0	28	0	31	9	242	3	0	254	1	213	6	0	220	508			
0730 - 0745	0	2	3	5	0	0	31	0	31	16	239	1	0	256	1	268	6	0	275	567			
0745 - 0800	1	0	0	1	5	1	36	0	42	27	293	1	0	321	0	285	11	0	296	660			
Hourly Total	1	3	9	13	10	1	109	0	120	66	969	6	0	1041	3	920	23	0	946	2120			
0800 - 0815	0	1	2	3	4	0	21	0	25	20	207	0	0	227	1	242	1	0	244	499			
0815 - 0830	2	0	0	2	4	0	20	0	24	22	182	0	0	204	1	188	19	1	209	439			
0830 - 0845	0	0	2	2	14	0	31	0	45	13	210	1	0	224	0	231	10	0	241	512			
0845 - 0900	0	0	1	1	8	0	30	0	38	13	200	1	0	214	0	224	6	2	232	485			
Hourly Total	2	1	5	8	30	0	102	0	132	68	799	2	0	869	2	885	36	3	926	1935			
Grand Total	6	5	22	33	43	1	244	1	289	151	2453	9	0	2613	7	2227	61	3	2298	5233			
Approach %	18.18	15.15	66.67	-	14.88	0.35	84.43	0.35	-	5.78	93.88	0.34	0.00	-	0.30	96.91	2.65	0.13	-				
Intersection %	0.11	0.10	0.42	0.63	0.82	0.02	4.66	0.02	5.52	2.89	46.88	0.17	0.00	49.93	0.13	42.56	1.17	0.06	43.91				
PHF	0.25	0.50	0.58	0.60	0.60	0.25	0.81	0.00	0.77	0.67	0.84	0.42	0.00	0.82	0.75	0.88	0.55	0.00	0.87	0.85			

1500 - 1800 (Weekday 3h Session) (02-22-2022)

All vehicles

TIME	Northbound				Southbound						Eastbound					Westbound						Int	
	8th Ave				App Total	Theta Pike				App Total	TN-99 Nashville Hwy (West)					App Total	TN-99 Nashville Hwy (East)						App Total
	Left 2.1	Thru 2.2	Right 2.3			Left 2.4	Thru 2.5	Right 2.6	U-Turn 2.7		Left 2.8	Thru 2.9	Right 2.10	U-Turn 2.11	Left 2.12		Thru 2.13	Right 2.14	U-Turn 2.15				
1500 - 1515	0	1	1		2	9	0	40	0	49	33	307	1	1	342	0	282	10	2	294	687		
1515 - 1530	0	0	3		3	13	0	34	0	47	38	305	2	1	346	3	264	7	1	275	671		
1530 - 1545	0	0	0		0	12	1	23	0	36	31	262	0	0	293	1	248	8	2	259	588		
1545 - 1600	0	0	0		0	16	1	27	0	44	32	246	0	1	279	1	225	7	1	234	557		
Hourly Total	0	1	4		5	50	2	124	0	176	134	1120	3	3	1260	5	1019	32	6	1062	2503		
1600 - 1615	0	0	0		0	11	1	20	0	32	23	255	1	2	281	4	322	10	2	338	651		
1615 - 1630	0	1	0		1	5	0	31	0	36	25	217	2	0	244	4	264	17	2	287	568		
1630 - 1645	0	0	0		0	6	1	40	0	47	19	252	0	0	271	4	219	0	2	225	543		
1645 - 1700	1	0	2		3	4	1	27	0	32	28	243	0	1	272	5	365	5	0	375	682		
Hourly Total	1	1	2		4	26	3	118	0	147	95	967	3	3	1068	17	1170	32	6	1225	2444		
1700 - 1715	2	1	1		4	3	2	20	0	25	33	300	1	2	336	2	273	4	0	279	644		
1715 - 1730	0	0	1		1	3	1	20	0	24	30	227	4	3	264	4	250	8	1	263	552		
1730 - 1745	0	0	1		1	5	0	28	0	33	25	209	1	2	237	0	276	6	3	285	556		
1745 - 1800	2	1	2		5	4	1	21	0	26	14	169	2	0	185	1	232	6	0	239	455		
Hourly Total	4	2	5		11	15	4	89	0	108	102	905	8	7	1022	7	1031	24	4	1066	2207		
Grand Total	5	4	11		20	91	9	331	0	431	331	2992	14	13	3350	29	3220	88	16	3353	7154		
Approach %	25.00	20.00	55.00		-	21.11	2.09	76.80	0.00	-	9.88	89.31	0.42	0.39	-	0.86	96.03	2.62	0.48	-			
Intersection %	0.07	0.06	0.15		0.28	1.27	0.13	4.63	0.00	6.02	4.63	41.82	0.20	0.18	46.83	0.41	45.01	1.23	0.22	46.87			
PHF	0.00	0.25	0.33		0.42	0.78	0.50	0.78	0.00	0.90	0.88	0.91	0.38	0.75	0.91	0.42	0.90	0.80	0.75	0.90	0.91		



[Click here for Map](#)

Peak Hour Turning Movement Count

Bear Creek Estates



www.marrtraffic.com

Tuesday, February 22, 2022	
Period	0600 - 0900
Peak Hour	0715 - 0815

* the Peak Hour Diagram does not include Bikes

Session Parameters

(Drop Down Menu)

Peak Hour

Volume



All vehicles

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					Driveway					Timber Trail					
	Left 3.1	Thru 3.2	Right 3.3	U-Turn 3.4	App Total	Left 3.5	Thru 3.6	Right 3.7	U-Turn 3.8	App Total	Left 3.9	Thru 3.10	Right 3.11	U-Turn 3.12	App Total	Left 3.13	Thru 3.14	Right 3.15	U-Turn 3.16	App Total	
0715 - 0730	0	19	1	0	20	0	38	0	0	38	0	0	0	0	0	3	0	7	0	10	68
0730 - 0745	0	27	2	0	29	0	51	0	0	51	0	0	0	0	0	2	0	10	0	12	92
0745 - 0800	0	29	2	0	31	5	67	1	0	73	0	0	0	0	0	4	0	1	0	5	109
0800 - 0815	0	24	5	0	29	5	39	0	0	44	1	0	0	0	1	7	0	5	0	12	86
Total	0	99	10	0	109	10	195	1	0	206	1	0	0	0	1	16	0	23	0	39	355
Approach %	0.00	90.83	9.17	0.00	-	4.85	94.66	0.49	0.00	-	100.00	0.00	0.00	0.00	-	41.03	0.00	58.97	0.00	-	
PHF	0.00	0.85	0.50	0.00	0.88	0.50	0.73	0.25	0.00	0.71	0.25	0.00	0.00	0.00	0.25	0.57	0.00	0.58	0.00	0.81	0.81

Passenger Vehicles (1-3)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					Driveway					Timber Trail					
	Left 3.1	Thru 3.2	Right 3.3	U-Turn 3.4	App Total	Left 3.5	Thru 3.6	Right 3.7	U-Turn 3.8	App Total	Left 3.9	Thru 3.10	Right 3.11	U-Turn 3.12	App Total	Left 3.13	Thru 3.14	Right 3.15	U-Turn 3.16	App Total	
0715 - 0730	0	17	1	0	18	0	37	0	0	37	0	0	0	0	0	3	0	7	0	10	65
0730 - 0745	0	27	2	0	29	0	51	0	0	51	0	0	0	0	0	2	0	10	0	12	92
0745 - 0800	0	29	2	0	31	5	66	1	0	72	0	0	0	0	0	4	0	1	0	5	108
0800 - 0815	0	23	5	0	28	5	39	0	0	44	1	0	0	0	1	7	0	5	0	12	85
Total	0	96	10	0	106	10	193	1	0	204	1	0	0	0	1	16	0	23	0	39	350
Approach %	0.00	90.57	9.43	0.00	-	4.90	94.61	0.49	0.00	-	100.00	0.00	0.00	0.00	-	41.03	0.00	58.97	0.00	-	
PHF	0.00	0.83	0.50	0.00	0.85	0.50	0.73	0.25	0.00	0.71	0.25	0.00	0.00	0.00	0.25	0.57	0.00	0.58	0.00	0.81	0.81

Single Unit Trucks (4-7)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					Driveway					Timber Trail					
	Left 3.1	Thru 3.2	Right 3.3	U-Turn 3.4	App. Total	Left 3.5	Thru 3.6	Right 3.7	U-Turn 3.8	App. Total	Left 3.9	Thru 3.10	Right 3.11	U-Turn 3.12	App. Total	Left 3.13	Thru 3.14	Right 3.15	U-Turn 3.16	App. Total	
0715 - 0730	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
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	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
0800 - 0815	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	3	0	0	3	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	4
Approach %	0.00	100.00	0.00	0.00	-	0.00	100.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.38	0.00	0.00	0.38	0.00	0.25	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50

Combination Trucks (8-13)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					Driveway					Timber Trail					
	Left 3.1	Thru 3.2	Right 3.3	U-Turn 3.4	App. Total	Left 3.5	Thru 3.6	Right 3.7	U-Turn 3.8	App. Total	Left 3.9	Thru 3.10	Right 3.11	U-Turn 3.12	App. Total	Left 3.13	Thru 3.14	Right 3.15	U-Turn 3.16	App. Total	
0715 - 0730	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	
0745 - 0800	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	
Total	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	100.00	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	0.25	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	

Bikes

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					Driveway					Timber Trail					
	Left 3.1	Thru 3.2	Right 3.3	U-Turn 3.4	App Total	Left 3.5	Thru 3.6	Right 3.7	U-Turn 3.8	App Total	Left 3.9	Thru 3.10	Right 3.11	U-Turn 3.12	App Total	Left 3.13	Thru 3.14	Right 3.15	U-Turn 3.16	App Total	
0715 - 0730	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	
0745 - 0800	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	
Total	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	

Pedestrians

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)				App Total	Theta Pike (North)				App Total	Driveway				App Total	Timber Trail				App Total	
	EB 3a	WB 3b				EB 3c	WB 3d				NB 3e	SB 3f				NB 3g	SB 3h				
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
	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

Bear Creek Estates



www.marrtraffic.com

Tuesday, February 22, 2022	
Period	1500 - 1800
Peak Hour	1500 - 1600

* the Peak Hour Diagram does not include Bikes

Session Parameters

(Drop Down Menu)

Peak Hour

Volume



All vehicles

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					Driveway					Timber Trail					
	Left 3.1	Thru 3.2	Right 3.3	U-Turn 3.4	App Total	Left 3.5	Thru 3.6	Right 3.7	U-Turn 3.8	App Total	Left 3.9	Thru 3.10	Right 3.11	U-Turn 3.12	App Total	Left 3.13	Thru 3.14	Right 3.15	U-Turn 3.16	App Total	
1500 - 1515	0	52	4	0	56	8	46	0	0	54	0	0	0	0	0	3	0	3	0	6	116
1515 - 1530	0	65	3	0	68	8	46	0	0	54	0	0	0	0	0	7	0	2	0	9	131
1530 - 1545	0	68	5	0	73	4	42	0	0	46	0	0	0	0	0	3	0	1	1	5	124
1545 - 1600	0	66	5	0	71	4	35	0	0	39	0	0	0	0	0	2	0	1	0	3	113
Total	0	251	17	0	268	24	169	0	0	193	0	0	0	0	0	15	0	7	1	23	484
Approach %	0.00	93.66	6.34	0.00	-	12.44	87.56	0.00	0.00	-	0.00	0.00	0.00	0.00	-	65.22	0.00	30.43	4.35	-	-
PHF	0.00	0.92	0.85	0.00	0.92	0.75	0.92	0.00	0.00	0.89	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.58	0.25	0.64	0.92

Passenger Vehicles (1-3)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					Driveway					Timber Trail					
	Left 3.1	Thru 3.2	Right 3.3	U-Turn 3.4	App Total	Left 3.5	Thru 3.6	Right 3.7	U-Turn 3.8	App Total	Left 3.9	Thru 3.10	Right 3.11	U-Turn 3.12	App Total	Left 3.13	Thru 3.14	Right 3.15	U-Turn 3.16	App Total	
1500 - 1515	0	50	4	0	54	6	46	0	0	52	0	0	0	0	0	2	0	2	0	4	110
1515 - 1530	0	65	3	0	68	7	46	0	0	53	0	0	0	0	0	7	0	2	0	9	130
1530 - 1545	0	68	5	0	73	4	42	0	0	46	0	0	0	0	0	3	0	1	1	5	124
1545 - 1600	0	66	5	0	71	4	35	0	0	39	0	0	0	0	0	2	0	1	0	3	113
Total	0	249	17	0	266	21	169	0	0	190	0	0	0	0	0	14	0	6	1	21	477
Approach %	0.00	93.61	6.39	0.00	-	11.05	88.95	0.00	0.00	-	0.00	0.00	0.00	0.00	-	66.67	0.00	28.57	4.76	-	-
PHF	0.00	0.92	0.85	0.00	0.91	0.75	0.92	0.00	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.75	0.25	0.58	0.92

Single Unit Trucks (4-7)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					Driveway					Timber Trail					
	Left 3.1	Thru 3.2	Right 3.3	U-Turn 3.4	App Total	Left 3.5	Thru 3.6	Right 3.7	U-Turn 3.8	App Total	Left 3.9	Thru 3.10	Right 3.11	U-Turn 3.12	App Total	Left 3.13	Thru 3.14	Right 3.15	U-Turn 3.16	App Total	
1500 - 1515	0	2	0	0	2	2	0	0	0	2	0	0	0	0	0	1	0	1	0	2	6
1515 - 1530	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
1530 - 1545	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0
Total	0	2	0	0	2	3	0	0	0	3	0	0	0	0	0	1	0	1	0	2	7
Approach %	0.00	100.00	0.00	0.00	-	100.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	50.00	0.00	50.00	0.00	-	-
PHF	0.00	0.25	0.00	0.00	0.25	0.38	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.25	0.00	0.25	0.29

Combination Trucks (8-13)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					Driveway					Timber Trail					
	Left 3.1	Thru 3.2	Right 3.3	U-Turn 3.4	App. Total	Left 3.5	Thru 3.6	Right 3.7	U-Turn 3.8	App. Total	Left 3.9	Thru 3.10	Right 3.11	U-Turn 3.12	App. Total	Left 3.13	Thru 3.14	Right 3.15	U-Turn 3.16	App. Total	
1500 - 1515	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1515 - 1530	0	0	0	0	0	0	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	0	0	0	0	0	0	
1545 - 1600	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	
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	

Bikes

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					Driveway					Timber Trail					
	Left 3.1	Thru 3.2	Right 3.3	U-Turn 3.4	App Total	Left 3.5	Thru 3.6	Right 3.7	U-Turn 3.8	App Total	Left 3.9	Thru 3.10	Right 3.11	U-Turn 3.12	App Total	Left 3.13	Thru 3.14	Right 3.15	U-Turn 3.16	App Total	
1500 - 1515	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1515 - 1530	0	0	0	0	0	0	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	0	0	0	0	0	0	
1545 - 1600	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	
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	

Pedestrians

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)				Theta Pike (North)				Driveway				Timber Trail								
	EB 3a	WB 3b		App Total	EB 3c	WB 3d		App Total	NB 3e	SB 3f		App Total	NB 3g	SB 3h		App Total					
1500 - 1515	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1515 - 1530	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
1545 - 1600	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

Bear Creek Estates

Site 3 of 3

Theta Pike (South)
Theta Pike (North)
Driveway
Timber Trail

Date

Tuesday, February 22, 2022

Weather

Cloudy
65°F

Lat/Long

35.624217°, -87.028542°

0600 - 0900 (Weekday 3h Session) (02-22-2022)

All vehicles

TIME	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					Driveway					Timber Trail					
	Left 3.1	Thru 3.2	Right 3.3	U-Turn 3.4	App Total	Left 3.5	Thru 3.6	Right 3.7	U-Turn 3.8	App Total	Left 3.9	Thru 3.10	Right 3.11	U-Turn 3.12	App Total	Left 3.13	Thru 3.14	Right 3.15	U-Turn 3.16	App Total	
0600 - 0615	0	13	0	0	13	0	8	0	0	8	0	0	0	0	0	1	0	0	0	1	22
0615 - 0630	0	8	1	0	9	1	8	0	0	9	0	0	0	0	0	3	0	3	0	6	24
0630 - 0645	0	15	2	0	17	2	12	0	0	14	0	0	0	0	0	1	0	2	0	3	34
0645 - 0700	0	14	0	0	14	1	20	0	0	21	0	0	0	0	0	2	0	5	0	7	42
Hourly Total	0	50	3	0	53	4	48	0	0	52	0	0	0	0	0	7	0	10	0	17	122
0700 - 0715	0	14	2	0	16	3	21	0	0	24	0	0	0	0	0	0	0	6	0	6	46
0715 - 0730	0	19	1	0	20	0	38	0	0	38	0	0	0	0	0	3	0	7	0	10	68
0730 - 0745	0	27	2	0	29	0	51	0	0	51	0	0	0	0	0	2	0	10	0	12	92
0745 - 0800	0	29	2	0	31	5	67	1	0	73	0	0	0	0	0	4	0	1	0	5	109
Hourly Total	0	89	7	0	96	8	177	1	0	186	0	0	0	0	0	9	0	24	0	33	315
0800 - 0815	0	24	5	0	29	5	39	0	0	44	1	0	0	0	1	7	0	5	0	12	86
0815 - 0830	0	21	2	0	23	3	36	0	0	39	0	0	0	0	0	0	0	1	0	1	63
0830 - 0845	0	29	2	0	31	1	38	0	0	39	0	0	0	0	0	4	0	7	0	11	81
0845 - 0900	0	18	4	0	22	1	46	0	0	47	0	0	0	0	0	2	0	2	0	4	73
Hourly Total	0	92	13	0	105	10	159	0	0	169	1	0	0	0	1	13	0	15	0	28	303
Grand Total	0	231	23	0	254	22	384	1	0	407	1	0	0	0	1	29	0	49	0	78	740
Approach %	0.00	90.94	9.06	0.00	-	5.41	94.35	0.25	0.00	-	100.00	0.00	0.00	0.00	-	37.18	0.00	62.82	0.00	-	
Intersection %	0.00	31.22	3.11	0.00	34.32	2.97	51.89	0.14	0.00	55.00	0.14	0.00	0.00	0.00	0.14	3.92	0.00	6.62	0.00	10.54	
PHF	0.00	0.85	0.50	0.00	0.88	0.50	0.73	0.25	0.00	0.71	0.25	0.00	0.00	0.00	0.25	0.57	0.00	0.58	0.00	0.81	0.81

1500 - 1800 (Weekday 3h Session) (02-22-2022)

All vehicles

	Northbound					Southbound					Eastbound					Westbound					Int Total
	Theta Pike (South)					Theta Pike (North)					Driveway					Timber Trail					
TIME	Left 3.1	Thru 3.2	Right 3.3	U-Turn 3.4	App Total	Left 3.5	Thru 3.6	Right 3.7	U-Turn 3.8	App Total	Left 3.9	Thru 3.10	Right 3.11	U-Turn 3.12	App Total	Left 3.13	Thru 3.14	Right 3.15	U-Turn 3.16	App Total	
1500 - 1515	0	52	4	0	56	8	46	0	0	54	0	0	0	0	0	3	0	3	0	6	
1515 - 1530	0	65	3	0	68	8	46	0	0	54	0	0	0	0	0	7	0	2	0	9	
1530 - 1545	0	68	5	0	73	4	42	0	0	46	0	0	0	0	0	3	0	1	1	5	
1545 - 1600	0	66	5	0	71	4	35	0	0	39	0	0	0	0	0	2	0	1	0	3	
Hourly Total	0	251	17	0	268	24	169	0	0	193	0	0	0	0	0	15	0	7	1	23	
1600 - 1615	0	53	1	0	54	3	37	0	0	40	0	0	0	0	0	2	0	4	0	6	
1615 - 1630	0	71	7	0	78	2	44	0	0	46	0	0	0	0	0	3	0	4	0	7	
1630 - 1645	0	59	1	0	60	2	44	0	0	46	0	0	0	0	0	2	0	1	0	3	
1645 - 1700	0	44	7	0	51	2	38	0	0	40	0	0	0	0	0	1	0	2	0	3	
Hourly Total	0	227	16	0	243	9	163	0	0	172	0	0	0	0	0	8	0	11	0	19	
1700 - 1715	0	61	6	0	67	1	35	0	0	36	0	0	0	0	0	1	0	4	0	5	
1715 - 1730	0	46	2	0	48	0	48	0	0	48	0	0	0	0	0	3	0	4	0	7	
1730 - 1745	0	54	2	0	56	1	35	0	0	36	0	0	0	0	0	3	0	0	0	3	
1745 - 1800	0	38	0	0	38	4	26	0	0	30	0	0	0	0	0	2	0	0	0	2	
Hourly Total	0	199	10	0	209	6	144	0	0	150	0	0	0	0	0	9	0	8	0	17	
Grand Total	0	677	43	0	720	39	476	0	0	515	0	0	0	0	0	32	0	26	1	59	
Approach %	0.00	94.03	5.97	0.00	-	7.57	92.43	0.00	0.00	-	0.00	0.00	0.00	0.00	-	54.24	0.00	44.07	1.69	-	
Intersection %	0.00	52.32	3.32	0.00	55.64	3.01	36.79	0.00	0.00	39.80	0.00	0.00	0.00	0.00	0.00	2.47	0.00	2.01	0.08	4.56	
PHF	0.00	0.92	0.85	0.00	0.92	0.75	0.92	0.00	0.00	0.89	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.58	0.25	0.64	

Bi-Directional Speed & Class Count || Graphical Analysis NB EB

Bear Creek Estates

Site 1

Theta Pike,
south of Bancroft MI

Lat/Long

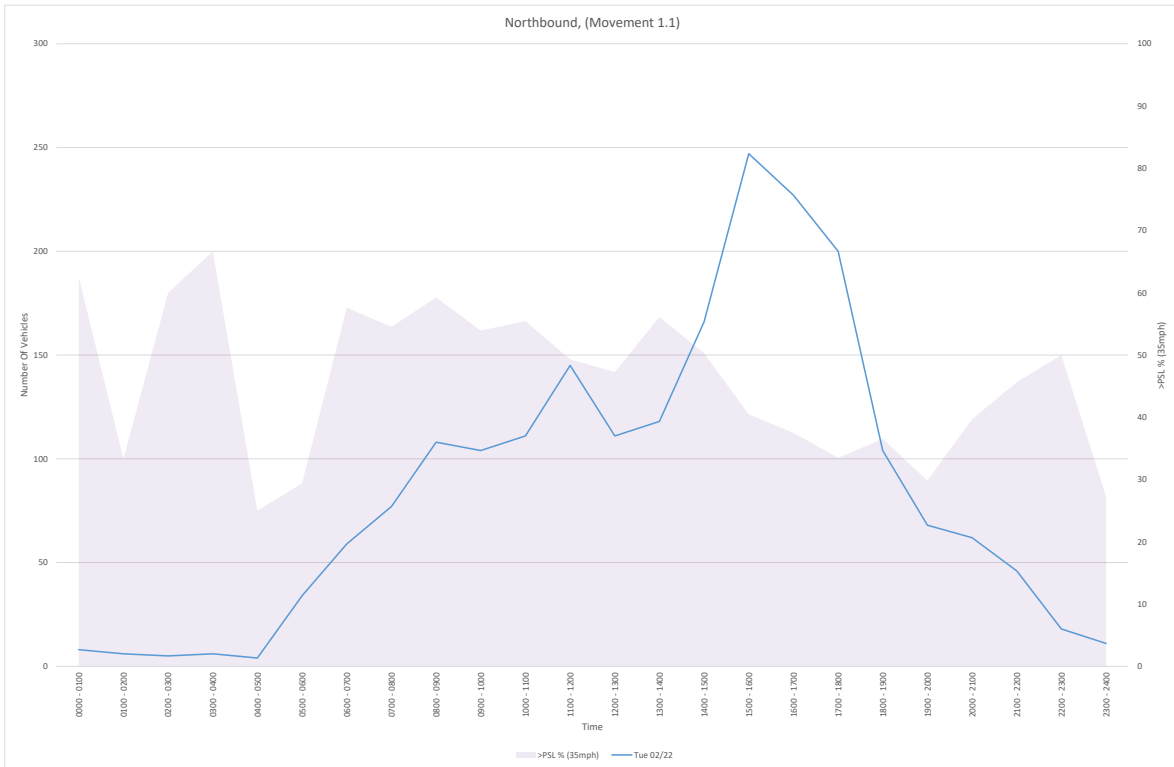
35.635555°, -87.028507°



[Click here for Map](#)

0000 - 2400 (Weekday 24h Session)

Graphical Analysis NB EB



Bi-Directional Speed & Class Count || Graphical Analysis SB WB

Bear Creek Estates

Site 1

Theta Pike,
south of Bancroft MI

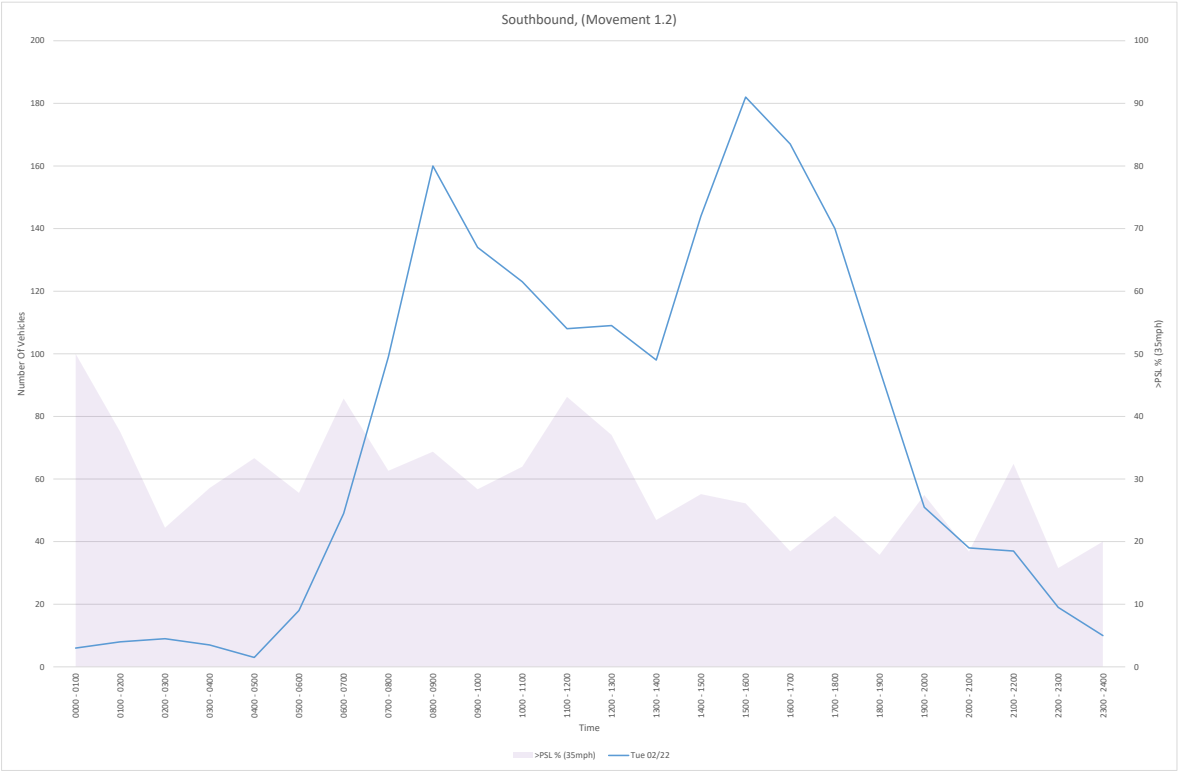
Lat/Long
35.635555°, -87.028507°



[Click here for Map](#)

0000 - 2400 (Weekday 24h Session)

Graphical Analysis SB WB



C. Level of Service

Existing

HCM 2010 Signalized Intersection Summary

Theta Pike & Highway 412/43

Mackenzie PI TIS
Existing AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	1156	86	47	1019	18	38	38	51	41	72	80
Future Volume (veh/h)	69	1156	86	47	1019	18	38	38	51	41	72	80
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1795	1900	1900	1729	1900	1863	1863	1900	1776	1870	1900
Adj Flow Rate, veh/h	76	1270	95	52	1120	20	42	42	56	45	79	88
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	6	4	0	10	5	2	2	2	7	0	3
Cap, veh/h	97	1960	146	67	1955	35	151	85	113	199	96	107
Arrive On Green	0.05	0.61	0.61	0.04	0.59	0.59	0.03	0.12	0.12	0.03	0.12	0.12
Sat Flow, veh/h	1792	3217	240	1810	3302	59	1774	725	967	1691	810	902
Grp Volume(v), veh/h	76	672	693	52	557	583	42	0	98	45	0	167
Grp Sat Flow(s),veh/h/ln	1792	1705	1752	1810	1642	1718	1774	0	1692	1691	0	1711
Q Serve(g_s), s	4.7	28.2	28.4	3.2	23.2	23.3	2.3	0.0	6.0	2.6	0.0	10.6
Cycle Q Clear(g_c), s	4.7	28.2	28.4	3.2	23.2	23.3	2.3	0.0	6.0	2.6	0.0	10.6
Prop In Lane	1.00		0.14	1.00		0.03	1.00		0.57	1.00		0.53
Lane Grp Cap(c), veh/h	97	1039	1067	67	972	1017	151	0	198	199	0	202
V/C Ratio(X)	0.78	0.65	0.65	0.77	0.57	0.57	0.28	0.00	0.49	0.23	0.00	0.83
Avail Cap(c_a), veh/h	210	1039	1067	212	972	1017	229	0	305	302	0	339
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	0.00	1.00
Uniform Delay (d), s/veh	51.8	14.0	14.0	53.0	14.0	14.0	41.5	0.0	45.9	41.3	0.0	47.8
Incr Delay (d2), s/veh	5.0	3.1	3.1	6.8	2.5	2.3	0.7	0.0	1.9	0.4	0.0	8.2
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(50%),veh/ln	2.4	14.0	14.6	1.7	11.2	11.7	1.1	0.0	2.9	1.2	0.0	5.5
LnGrp Delay(d),s/veh	56.9	17.1	17.1	59.7	16.4	16.3	42.2	0.0	47.8	41.7	0.0	56.0
LnGrp LOS	E	B	B	E	B	B	D		D	D		E
Approach Vol, veh/h		1441			1192			140			212	
Approach Delay, s/veh		19.2			18.3			46.1			53.0	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	74.6	8.1	19.1	11.0	72.7	8.3	19.0				
Change Period (Y+Rc), s	5.0	7.0	4.5	6.0	5.0	7.0	4.5	6.0				
Max Green Setting (Gmax), s	13.0	45.0	8.5	22.0	13.0	45.0	10.5	20.0				
Max Q Clear Time (g_c+I1), s	5.2	30.4	4.3	12.6	6.7	25.3	4.6	8.0				
Green Ext Time (p_c), s	0.0	11.1	0.0	0.5	0.0	12.0	0.0	0.3				
Intersection Summary												
HCM 2010 Ctrl Delay				22.5								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary

3: Theta Pike (South)/Theta Pike (North) & Highway 412/42 (West)/Highway 412/42 (East) 05/18/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	846	52	56	1123	31	109	86	57	20	72	122
Future Volume (veh/h)	57	846	52	56	1123	31	109	86	57	20	72	122
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1794	1900	1900	1729	1900	1863	1863	1900	1776	1865	1900
Adj Flow Rate, veh/h	63	930	57	62	1234	34	120	95	63	22	79	134
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	6	4	0	10	5	2	2	2	7	0	3
Cap, veh/h	81	1734	106	80	1732	48	223	209	138	242	93	157
Arrive On Green	0.05	0.53	0.53	0.04	0.53	0.53	0.07	0.20	0.20	0.02	0.15	0.15
Sat Flow, veh/h	1792	3264	200	1810	3266	90	1774	1046	694	1691	623	1056
Grp Volume(v), veh/h	63	486	501	62	620	648	120	0	158	22	0	213
Grp Sat Flow(s),veh/h/ln	1792	1705	1759	1810	1643	1714	1774	0	1740	1691	0	1678
Q Serve(g_s), s	3.9	20.7	20.7	3.8	31.6	31.7	6.3	0.0	8.9	1.1	0.0	13.7
Cycle Q Clear(g_c), s	3.9	20.7	20.7	3.8	31.6	31.7	6.3	0.0	8.9	1.1	0.0	13.7
Prop In Lane	1.00		0.11	1.00		0.05	1.00		0.40	1.00		0.63
Lane Grp Cap(c), veh/h	81	906	935	80	871	909	223	0	347	242	0	250
V/C Ratio(X)	0.78	0.54	0.54	0.77	0.71	0.71	0.54	0.00	0.46	0.09	0.00	0.85
Avail Cap(c_a), veh/h	129	906	935	147	871	909	230	0	408	334	0	393
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	0.00	1.00
Uniform Delay (d), s/veh	52.4	17.0	17.0	52.5	19.7	19.7	37.0	0.0	39.1	34.4	0.0	46.0
Incr Delay (d2), s/veh	5.8	2.3	2.2	5.8	4.9	4.7	1.8	0.0	0.9	0.1	0.0	10.1
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(50%),veh/ln	2.0	10.3	10.6	2.0	15.5	16.1	3.2	0.0	4.3	0.5	0.0	7.1
LnGrp Delay(d),s/veh	58.3	19.3	19.3	58.3	24.6	24.4	38.8	0.0	40.1	34.5	0.0	56.2
LnGrp LOS	E	B	B	E	C	C	D		D	C		E
Approach Vol, veh/h	1050				1330				278		235	
Approach Delay, s/veh	21.6				26.1				39.5		54.1	
Approach LOS	C				C				D		D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	66.0	12.6	22.5	10.0	65.9	7.0	28.1				
Change Period (Y+Rc), s	5.0	7.0	4.5	6.0	5.0	7.0	4.5	6.0				
Max Green Setting (Gmax), s	9.0	45.0	8.5	26.0	8.0	46.0	8.5	26.0				
Max Q Clear Time (g_c+I1), s	5.8	22.7	8.3	15.7	5.9	33.7	3.1	10.9				
Green Ext Time (p_c), s	0.0	11.1	0.0	0.8	0.0	9.2	0.0	0.7				
Intersection Summary												
HCM 2010 Ctrl Delay	28.0											
HCM 2010 LOS	C											

HCM 2010 Signalized Intersection Summary

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05/18/2022

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	12	1	116	1	4	7	72	981	5	3	1008	24
Future Volume (veh/h)	12	1	116	1	4	7	72	981	5	3	1008	24
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1759	1881	1900	1900	1900	1900	1863	1827	1900	1900	1844	1900
Adj Flow Rate, veh/h	14	1	136	1	5	8	85	1154	6	4	1186	28
Adj No. of Lanes	1	1	0	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	0	1	0	0	0	2	4	0	0	3	4
Cap, veh/h	129	1	185	59	182	197	387	2444	13	360	2255	53
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.05	0.69	0.69	0.01	0.64	0.64
Sat Flow, veh/h	1318	12	1589	85	1566	1615	1774	3542	18	1810	3499	83
Grp Volume(v), veh/h	14	0	137	6	0	8	85	566	594	4	594	620
Grp Sat Flow(s),veh/h/ln	1318	0	1601	1651	0	1615	1774	1736	1824	1810	1752	1830
Q Serve(g_s), s	0.9	0.0	7.0	0.0	0.0	0.4	1.2	12.7	12.7	0.1	15.5	15.5
Cycle Q Clear(g_c), s	7.9	0.0	7.0	7.0	0.0	0.4	1.2	12.7	12.7	0.1	15.5	15.5
Prop In Lane	1.00		0.99	0.17		1.00	1.00		0.01	1.00		0.05
Lane Grp Cap(c), veh/h	129	0	186	242	0	197	387	1198	1259	360	1129	1179
V/C Ratio(X)	0.11	0.00	0.73	0.02	0.00	0.04	0.22	0.47	0.47	0.01	0.53	0.53
Avail Cap(c_a), veh/h	201	0	273	337	0	284	515	1198	1259	574	1129	1179
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	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	0.0	36.3	33.3	0.0	32.9	5.8	6.1	6.1	5.7	8.1	8.1
Incr Delay (d2), s/veh	0.1	0.0	2.2	0.0	0.0	0.0	0.3	1.3	1.3	0.0	1.8	1.7
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(50%),veh/ln	0.3	0.0	3.2	0.1	0.0	0.2	0.6	6.4	6.7	0.0	8.0	8.3
LnGrp Delay(d),s/veh	40.2	0.0	38.5	33.3	0.0	33.0	6.1	7.4	7.3	5.7	9.9	9.8
LnGrp LOS	D		D	C		C	A	A	A	A	A	A
Approach Vol, veh/h		151			14			1245			1218	
Approach Delay, s/veh		38.6			33.1			7.3			9.8	
Approach LOS		D			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	64.7		15.4	8.8	60.8		15.4				
Change Period (Y+Rc), s	4.5	6.0		5.5	4.5	6.0		5.5				
Max Green Setting (Gmax), s	10.5	44.0		14.5	10.5	44.0		14.5				
Max Q Clear Time (g_c+I1), s	2.1	14.7		9.0	3.2	17.5		9.9				
Green Ext Time (p_c), s	0.0	15.6		0.0	0.1	15.5		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			10.4									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

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05/18/2022

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	50	2	124	0	1	4	134	1120	3	5	1019	32
Future Volume (veh/h)	50	2	124	0	1	4	134	1120	3	5	1019	32
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1759	1881	1900	1900	1900	1900	1863	1827	1900	1900	1844	1900
Adj Flow Rate, veh/h	59	2	146	0	1	5	158	1318	4	6	1199	38
Adj No. of Lanes	1	1	0	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	0	1	0	0	0	2	4	0	0	3	4
Cap, veh/h	238	3	183	0	220	200	387	2443	7	311	2214	70
Arrive On Green	0.12	0.12	0.12	0.00	0.12	0.12	0.06	0.69	0.69	0.01	0.64	0.64
Sat Flow, veh/h	1326	22	1581	0	1900	1615	1774	3550	11	1810	3467	110
Grp Volume(v), veh/h	59	0	148	0	1	5	158	644	678	6	606	631
Grp Sat Flow(s),veh/h/ln	1326	0	1602	0	1900	1615	1774	1736	1825	1810	1752	1825
Q Serve(g_s), s	3.5	0.0	7.6	0.0	0.0	0.2	2.4	15.6	15.7	0.1	16.2	16.3
Cycle Q Clear(g_c), s	3.5	0.0	7.6	0.0	0.0	0.2	2.4	15.6	15.7	0.1	16.2	16.3
Prop In Lane	1.00		0.99	0.00		1.00	1.00		0.01	1.00		0.06
Lane Grp Cap(c), veh/h	238	0	186	0	220	200	387	1195	1256	311	1119	1165
V/C Ratio(X)	0.25	0.00	0.80	0.00	0.00	0.03	0.41	0.54	0.54	0.02	0.54	0.54
Avail Cap(c_a), veh/h	310	0	273	0	324	288	504	1195	1256	521	1119	1165
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.8	0.0	36.6	0.0	33.2	32.7	6.7	6.6	6.6	6.1	8.5	8.5
Incr Delay (d2), s/veh	0.2	0.0	5.6	0.0	0.0	0.0	0.7	1.8	1.7	0.0	1.9	1.8
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(50%),veh/ln	1.3	0.0	3.7	0.0	0.0	0.1	1.3	7.9	8.3	0.1	8.3	8.7
LnGrp Delay(d),s/veh	35.0	0.0	42.2	0.0	33.2	32.8	7.4	8.3	8.2	6.1	10.4	10.3
LnGrp LOS	D		D		C	C	A	A	A	A	B	B
Approach Vol, veh/h		207			6			1480			1243	
Approach Delay, s/veh		40.2			32.8			8.2			10.3	
Approach LOS		D			C			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	64.5		15.3	9.4	60.3		15.3				
Change Period (Y+Rc), s	4.5	6.0		5.5	4.5	6.0		5.5				
Max Green Setting (Gmax), s	10.5	44.0		14.5	10.5	44.0		14.5				
Max Q Clear Time (g_c+I1), s	2.1	17.7		2.2	4.4	18.3		9.6				
Green Ext Time (p_c), s	0.0	16.9		0.0	0.2	15.5		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			11.4									
HCM 2010 LOS			B									

Intersection						
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	23	99	10	10	195
Future Vol, veh/h	16	23	99	10	10	195
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	17	25	108	11	11	212
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	348	114	0	0	119	0
Stage 1	114	-	-	-	-	-
Stage 2	234	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	653	944	-	-	1482	-
Stage 1	916	-	-	-	-	-
Stage 2	810	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	648	944	-	-	1482	-
Mov Cap-2 Maneuver	648	-	-	-	-	-
Stage 1	916	-	-	-	-	-
Stage 2	804	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.8	0	0.4			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	795	1482	-	
HCM Lane V/C Ratio	-	-	0.053	0.007	-	
HCM Control Delay (s)	-	-	9.8	7.4	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	7	251	17	24	169
Future Vol, veh/h	15	7	251	17	24	169
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	16	8	273	18	26	184
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	518	282	0	0	291	0
Stage 1	282	-	-	-	-	-
Stage 2	236	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	521	762	-	-	1282	-
Stage 1	770	-	-	-	-	-
Stage 2	808	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	509	762	-	-	1282	-
Mov Cap-2 Maneuver	509	-	-	-	-	-
Stage 1	770	-	-	-	-	-
Stage 2	789	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.6	0		1		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		569	1282	
HCM Lane V/C Ratio	-	-		0.042	0.02	
HCM Control Delay (s)	-	-		11.6	7.9	
HCM Lane LOS	-	-		B	A	
HCM 95th %tile Q(veh)	-	-		0.1	0.1	

Background

HCM 2010 Signalized Intersection Summary

3: Theta Pike (South)/Theta Pike (North) & Highway 412/42 (West)/Highway 412/42 (East) 05/18/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	1237	97	51	1091	20	49	41	127	44	77	86
Future Volume (veh/h)	74	1237	97	51	1091	20	49	41	127	44	77	86
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1795	1900	1900	1729	1900	1863	1863	1900	1776	1870	1900
Adj Flow Rate, veh/h	81	1359	107	56	1199	22	54	45	140	48	85	95
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	6	4	0	10	5	2	2	2	7	0	3
Cap, veh/h	103	1887	148	73	1885	35	165	53	166	150	106	119
Arrive On Green	0.06	0.59	0.59	0.04	0.57	0.57	0.04	0.13	0.13	0.03	0.13	0.13
Sat Flow, veh/h	1792	3204	251	1810	3300	61	1774	400	1244	1691	808	903
Grp Volume(v), veh/h	81	721	745	56	597	624	54	0	185	48	0	180
Grp Sat Flow(s),veh/h/ln	1792	1705	1751	1810	1642	1718	1774	0	1643	1691	0	1711
Q Serve(g_s), s	5.0	33.4	33.8	3.4	27.1	27.2	2.9	0.0	12.2	2.7	0.0	11.3
Cycle Q Clear(g_c), s	5.0	33.4	33.8	3.4	27.1	27.2	2.9	0.0	12.2	2.7	0.0	11.3
Prop In Lane	1.00		0.14	1.00		0.04	1.00		0.76	1.00		0.53
Lane Grp Cap(c), veh/h	103	1004	1031	73	938	982	165	0	219	150	0	225
V/C Ratio(X)	0.78	0.72	0.72	0.77	0.64	0.64	0.33	0.00	0.84	0.32	0.00	0.80
Avail Cap(c_a), veh/h	210	1004	1031	212	938	982	236	0	341	206	0	339
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	0.00	1.00
Uniform Delay (d), s/veh	51.6	16.2	16.3	52.8	16.0	16.0	40.2	0.0	47.0	40.2	0.0	46.8
Incr Delay (d2), s/veh	4.8	4.4	4.4	6.3	3.3	3.1	0.8	0.0	10.9	0.9	0.0	7.7
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(50%),veh/ln	2.6	16.9	17.4	1.8	13.1	13.7	1.4	0.0	6.2	1.3	0.0	5.8
LnGrp Delay(d),s/veh	56.4	20.7	20.7	59.1	19.3	19.2	41.1	0.0	57.8	41.1	0.0	54.5
LnGrp LOS	E	C	C	E	B	B	D		E	D		D
Approach Vol, veh/h	1547			1277				239		228		
Approach Delay, s/veh	22.6			21.0				54.1		51.7		
Approach LOS	C			C				D		D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	72.4	8.6	20.6	11.4	70.4	8.4	20.8				
Change Period (Y+Rc), s	5.0	7.0	4.5	6.0	5.0	7.0	4.5	6.0				
Max Green Setting (Gmax), s	13.0	45.0	8.5	22.0	13.0	45.0	7.5	23.0				
Max Q Clear Time (g_c+I1), s	5.4	35.8	4.9	13.3	7.0	29.2	4.7	14.2				
Green Ext Time (p_c), s	0.0	7.8	0.0	0.6	0.0	10.9	0.0	0.6				
Intersection Summary												
HCM 2010 Ctrl Delay	26.2											
HCM 2010 LOS	C											

HCM 2010 Signalized Intersection Summary

3: Theta Pike (South)/Theta Pike (North) & Highway 412/42 (West)/Highway 412/42 (East) 05/18/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	906	64	154	1202	34	122	92	110	22	77	131
Future Volume (veh/h)	61	906	64	154	1202	34	122	92	110	22	77	131
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1795	1900	1900	1729	1900	1863	1863	1900	1776	1865	1900
Adj Flow Rate, veh/h	67	996	70	169	1321	37	134	101	121	24	85	144
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	6	4	0	10	5	2	2	2	7	0	3
Cap, veh/h	86	1554	109	147	1677	47	231	164	196	208	99	168
Arrive On Green	0.05	0.48	0.48	0.08	0.51	0.51	0.08	0.21	0.21	0.02	0.16	0.16
Sat Flow, veh/h	1792	3232	227	1810	3265	91	1774	773	926	1691	623	1056
Grp Volume(v), veh/h	67	525	541	169	664	694	134	0	222	24	0	229
Grp Sat Flow(s),veh/h/ln	1792	1705	1755	1810	1643	1713	1774	0	1699	1691	0	1679
Q Serve(g_s), s	4.1	25.7	25.7	9.0	36.6	36.7	6.9	0.0	13.1	1.2	0.0	14.8
Cycle Q Clear(g_c), s	4.1	25.7	25.7	9.0	36.6	36.7	6.9	0.0	13.1	1.2	0.0	14.8
Prop In Lane	1.00		0.13	1.00		0.05	1.00		0.55	1.00		0.63
Lane Grp Cap(c), veh/h	86	820	844	147	844	880	231	0	360	208	0	267
V/C Ratio(X)	0.78	0.64	0.64	1.15	0.79	0.79	0.58	0.00	0.62	0.12	0.00	0.86
Avail Cap(c_a), veh/h	129	820	844	147	844	880	231	0	398	312	0	408
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	0.00	1.00
Uniform Delay (d), s/veh	52.2	21.6	21.6	51.0	22.0	22.0	36.2	0.0	39.7	33.7	0.0	45.5
Incr Delay (d2), s/veh	7.8	3.8	3.7	120.9	7.3	7.1	3.2	0.0	2.4	0.2	0.0	10.9
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(50%),veh/ln	2.2	12.8	13.2	9.4	18.1	19.1	3.6	0.0	6.4	0.6	0.0	7.6
LnGrp Delay(d),s/veh	60.0	25.5	25.4	171.9	29.3	29.1	39.4	0.0	42.1	33.9	0.0	56.4
LnGrp LOS	E	C	C	F	C	C	D		D	C		E
Approach Vol, veh/h	1133			1527				356			253	
Approach Delay, s/veh	27.4			45.0				41.1			54.2	
Approach LOS	C			D				D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	60.4	13.0	23.6	10.3	64.0	7.1	29.5				
Change Period (Y+Rc), s	5.0	7.0	4.5	6.0	5.0	7.0	4.5	6.0				
Max Green Setting (Gmax), s	9.0	44.0	8.5	27.0	8.0	45.0	9.5	26.0				
Max Q Clear Time (g_c+I1), s	11.0	27.7	8.9	16.8	6.1	38.7	3.2	15.1				
Green Ext Time (p_c), s	0.0	9.8	0.0	0.9	0.0	5.3	0.0	0.9				
Intersection Summary												
HCM 2010 Ctrl Delay	39.2											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

8:

05/18/2022

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	29	1	155	1	5	8	96	1050	6	4	1079	34
Future Volume (veh/h)	29	1	155	1	5	8	96	1050	6	4	1079	34
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1759	1881	1900	1900	1900	1900	1863	1827	1900	1900	1844	1900
Adj Flow Rate, veh/h	34	1	182	1	6	9	113	1235	7	5	1269	40
Adj No. of Lanes	1	1	0	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	0	1	0	0	0	2	4	0	0	3	4
Cap, veh/h	149	1	251	61	247	265	336	2292	13	305	2078	65
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.05	0.65	0.65	0.01	0.60	0.60
Sat Flow, veh/h	1315	9	1592	78	1564	1615	1774	3540	20	1810	3468	109
Grp Volume(v), veh/h	34	0	183	7	0	9	113	606	636	5	641	668
Grp Sat Flow(s),veh/h/ln	1315	0	1600	1642	0	1615	1774	1736	1824	1810	1752	1825
Q Serve(g_s), s	2.1	0.0	9.2	0.0	0.0	0.4	1.9	16.0	16.1	0.1	19.6	19.7
Cycle Q Clear(g_c), s	11.4	0.0	9.2	9.2	0.0	0.4	1.9	16.0	16.1	0.1	19.6	19.7
Prop In Lane	1.00		0.99	0.14		1.00	1.00		0.01	1.00		0.06
Lane Grp Cap(c), veh/h	149	0	252	307	0	265	336	1124	1181	305	1050	1094
V/C Ratio(X)	0.23	0.00	0.73	0.02	0.00	0.03	0.34	0.54	0.54	0.02	0.61	0.61
Avail Cap(c_a), veh/h	166	0	273	330	0	286	458	1124	1181	517	1050	1094
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	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	0.0	34.1	30.3	0.0	29.9	8.5	8.1	8.1	7.5	10.8	10.8
Incr Delay (d2), s/veh	0.3	0.0	7.0	0.0	0.0	0.0	0.6	1.9	1.8	0.0	2.6	2.5
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(50%),veh/ln	0.8	0.0	4.6	0.1	0.0	0.2	1.0	8.1	8.5	0.0	10.2	10.6
LnGrp Delay(d),s/veh	39.7	0.0	41.1	30.3	0.0	29.9	9.1	10.0	9.9	7.5	13.4	13.3
LnGrp LOS	D		D	C		C	A	A	A	A	B	B
Approach Vol, veh/h		217			16			1355			1314	
Approach Delay, s/veh		40.9			30.1			9.8			13.3	
Approach LOS		D			C			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.1	61.0		18.9	9.2	56.9		18.9				
Change Period (Y+Rc), s	4.5	6.0		5.5	4.5	6.0		5.5				
Max Green Setting (Gmax), s	10.5	44.0		14.5	10.5	44.0		14.5				
Max Q Clear Time (g_c+I1), s	2.1	18.1		11.2	3.9	21.7		13.4				
Green Ext Time (p_c), s	0.0	15.7		0.0	0.1	14.9		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay			13.9									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

8:

05/18/2022

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	66	3	152	0	1	5	206	1199	4	6	1091	59
Future Volume (veh/h)	66	3	152	0	1	5	206	1199	4	6	1091	59
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1759	1882	1900	1900	1900	1900	1863	1827	1900	1900	1844	1900
Adj Flow Rate, veh/h	78	4	179	0	1	6	242	1411	5	7	1284	69
Adj No. of Lanes	1	1	0	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	0	1	0	0	0	2	4	0	0	3	4
Cap, veh/h	266	5	215	0	261	236	359	2362	8	272	2030	109
Arrive On Green	0.14	0.14	0.14	0.00	0.14	0.14	0.07	0.67	0.67	0.01	0.60	0.60
Sat Flow, veh/h	1325	35	1570	0	1900	1615	1774	3548	13	1810	3382	181
Grp Volume(v), veh/h	78	0	183	0	1	6	242	690	726	7	664	689
Grp Sat Flow(s),veh/h/ln	1325	0	1605	0	1900	1615	1774	1736	1825	1810	1752	1812
Q Serve(g_s), s	4.6	0.0	9.4	0.0	0.0	0.3	4.1	18.8	18.8	0.1	20.7	20.8
Cycle Q Clear(g_c), s	4.6	0.0	9.4	0.0	0.0	0.3	4.1	18.8	18.8	0.1	20.7	20.8
Prop In Lane	1.00		0.98	0.00		1.00	1.00		0.01	1.00		0.10
Lane Grp Cap(c), veh/h	266	0	220	0	261	236	359	1155	1215	272	1052	1088
V/C Ratio(X)	0.29	0.00	0.83	0.00	0.00	0.03	0.67	0.60	0.60	0.03	0.63	0.63
Avail Cap(c_a), veh/h	310	0	274	0	324	290	446	1155	1215	480	1052	1088
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	0.0	35.7	0.0	31.7	31.1	12.1	7.9	7.9	7.6	10.9	11.0
Incr Delay (d2), s/veh	0.2	0.0	13.3	0.0	0.0	0.0	2.9	2.3	2.2	0.0	2.9	2.8
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(50%),veh/ln	1.7	0.0	5.0	0.0	0.0	0.1	3.8	9.6	10.0	0.1	10.8	11.2
LnGrp Delay(d),s/veh	33.9	0.0	49.0	0.0	31.7	31.1	15.0	10.2	10.1	7.6	13.8	13.8
LnGrp LOS	C		D		C	C	B	B	B	A	B	B
Approach Vol, veh/h		261			7			1658			1360	
Approach Delay, s/veh		44.5			31.2			10.8			13.8	
Approach LOS		D			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	62.6		17.2	10.8	57.0		17.2				
Change Period (Y+Rc), s	4.5	6.0		5.5	4.5	6.0		5.5				
Max Green Setting (Gmax), s	10.5	44.0		14.5	10.5	44.0		14.5				
Max Q Clear Time (g_c+I1), s	2.1	20.8		2.3	6.1	22.8		11.4				
Green Ext Time (p_c), s	0.0	16.6		0.0	0.3	14.8		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			14.8									
HCM 2010 LOS			B									

Intersection						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	18	25	106	11	11	209
Future Vol, veh/h	18	25	106	11	11	209
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	20	27	115	12	12	227
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	372	121	0	0	127	0
Stage 1	121	-	-	-	-	-
Stage 2	251	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	633	936	-	-	1472	-
Stage 1	909	-	-	-	-	-
Stage 2	795	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	627	936	-	-	1472	-
Mov Cap-2 Maneuver	627	-	-	-	-	-
Stage 1	909	-	-	-	-	-
Stage 2	788	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.9	0	0.4			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	776	1472	-	
HCM Lane V/C Ratio	-	-	0.06	0.008	-	
HCM Control Delay (s)	-	-	9.9	7.5	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	8	269	19	26	181
Future Vol, veh/h	16	8	269	19	26	181
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	17	9	292	21	28	197
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	556	303	0	0	313	0
Stage 1	303	-	-	-	-	-
Stage 2	253	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	496	741	-	-	1259	-
Stage 1	754	-	-	-	-	-
Stage 2	794	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	484	741	-	-	1259	-
Mov Cap-2 Maneuver	484	-	-	-	-	-
Stage 1	754	-	-	-	-	-
Stage 2	774	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.9	0		1		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	547	1259	-	
HCM Lane V/C Ratio	-	-	0.048	0.022	-	
HCM Control Delay (s)	-	-	11.9	7.9	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-	

Projected

HCM 2010 Signalized Intersection Summary

3: Theta Pike (South)/Theta Pike (North) & Highway 412/42 (West)/Highway 412/42 (East) 05/18/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	1237	99	53	1091	20	56	46	133	44	79	86
Future Volume (veh/h)	74	1237	99	53	1091	20	56	46	133	44	79	86
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1795	1900	1900	1729	1900	1863	1863	1900	1776	1871	1900
Adj Flow Rate, veh/h	81	1359	109	58	1199	22	62	51	146	48	87	95
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	6	4	0	10	5	2	2	2	7	0	3
Cap, veh/h	103	1857	148	75	1863	34	175	60	171	150	110	120
Arrive On Green	0.06	0.58	0.58	0.04	0.56	0.56	0.04	0.14	0.14	0.03	0.13	0.13
Sat Flow, veh/h	1792	3199	256	1810	3300	61	1774	426	1221	1691	819	894
Grp Volume(v), veh/h	81	722	746	58	597	624	62	0	197	48	0	182
Grp Sat Flow(s),veh/h/ln	1792	1705	1750	1810	1642	1718	1774	0	1647	1691	0	1713
Q Serve(g_s), s	5.0	34.2	34.6	3.5	27.6	27.6	3.3	0.0	13.0	2.7	0.0	11.4
Cycle Q Clear(g_c), s	5.0	34.2	34.6	3.5	27.6	27.6	3.3	0.0	13.0	2.7	0.0	11.4
Prop In Lane	1.00		0.15	1.00		0.04	1.00		0.74	1.00		0.52
Lane Grp Cap(c), veh/h	103	990	1016	75	927	970	175	0	231	150	0	230
V/C Ratio(X)	0.78	0.73	0.73	0.77	0.64	0.64	0.35	0.00	0.85	0.32	0.00	0.79
Avail Cap(c_a), veh/h	210	990	1016	212	927	970	238	0	341	206	0	339
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	0.00	1.00
Uniform Delay (d), s/veh	51.6	16.9	17.0	52.7	16.5	16.5	39.7	0.0	46.6	39.7	0.0	46.5
Incr Delay (d2), s/veh	4.8	4.7	4.7	6.1	3.4	3.3	0.9	0.0	12.7	0.9	0.0	7.5
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(50%),veh/ln	2.6	17.3	17.9	1.9	13.3	13.9	1.7	0.0	6.7	1.3	0.0	5.9
LnGrp Delay(d),s/veh	56.4	21.7	21.7	58.8	20.0	19.8	40.6	0.0	59.2	40.5	0.0	54.0
LnGrp LOS	E	C	C	E	B	B	D		E	D		D
Approach Vol, veh/h		1549			1279			259			230	
Approach Delay, s/veh		23.5			21.7			54.8			51.2	
Approach LOS		C			C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	71.4	9.0	20.9	11.4	69.7	8.4	21.6				
Change Period (Y+Rc), s	5.0	7.0	4.5	6.0	5.0	7.0	4.5	6.0				
Max Green Setting (Gmax), s	13.0	45.0	8.5	22.0	13.0	45.0	7.5	23.0				
Max Q Clear Time (g_c+I1), s	5.5	36.6	5.3	13.4	7.0	29.6	4.7	15.0				
Green Ext Time (p_c), s	0.0	7.2	0.0	0.6	0.0	10.6	0.0	0.6				
Intersection Summary												
HCM 2010 Ctrl Delay				27.2								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary

3: Theta Pike (South)/Theta Pike (North) & Highway 412/42 (West)/Highway 412/42 (East) 05/18/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	906	73	160	1202	34	126	95	113	22	82	131
Future Volume (veh/h)	61	906	73	160	1202	34	126	95	113	22	82	131
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1795	1900	1900	1729	1900	1863	1863	1900	1776	1866	1900
Adj Flow Rate, veh/h	67	996	80	176	1321	37	138	104	124	24	90	144
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	6	4	0	10	5	2	2	2	7	0	3
Cap, veh/h	86	1529	123	147	1669	47	230	166	198	206	105	167
Arrive On Green	0.05	0.48	0.48	0.08	0.51	0.51	0.08	0.21	0.21	0.02	0.16	0.16
Sat Flow, veh/h	1792	3198	257	1810	3265	91	1774	775	924	1691	647	1036
Grp Volume(v), veh/h	67	531	545	176	664	694	138	0	228	24	0	234
Grp Sat Flow(s),veh/h/ln	1792	1705	1750	1810	1643	1713	1774	0	1700	1691	0	1683
Q Serve(g_s), s	4.1	26.2	26.2	9.0	36.8	36.9	7.1	0.0	13.5	1.2	0.0	15.0
Cycle Q Clear(g_c), s	4.1	26.2	26.2	9.0	36.8	36.9	7.1	0.0	13.5	1.2	0.0	15.0
Prop In Lane	1.00		0.15	1.00		0.05	1.00		0.54	1.00		0.62
Lane Grp Cap(c), veh/h	86	815	837	147	840	876	230	0	365	206	0	272
V/C Ratio(X)	0.78	0.65	0.65	1.20	0.79	0.79	0.60	0.00	0.63	0.12	0.00	0.86
Avail Cap(c_a), veh/h	129	815	837	147	840	876	230	0	398	311	0	409
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	0.00	1.00
Uniform Delay (d), s/veh	52.2	21.9	22.0	51.0	22.3	22.3	36.1	0.0	39.5	33.5	0.0	45.3
Incr Delay (d2), s/veh	7.8	4.0	3.9	137.9	7.5	7.3	3.7	0.0	2.7	0.2	0.0	11.4
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(50%),veh/ln	2.2	13.2	13.5	10.1	18.4	19.1	3.7	0.0	6.6	0.6	0.0	7.8
LnGrp Delay(d),s/veh	60.0	26.0	25.9	188.9	29.8	29.6	39.8	0.0	42.2	33.7	0.0	56.7
LnGrp LOS	E	C	C	F	C	C	D		D	C		E
Approach Vol, veh/h	1143			1534				366			258	
Approach Delay, s/veh	27.9			47.9				41.3			54.6	
Approach LOS	C			D				D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	60.1	13.0	23.9	10.3	63.7	7.1	29.8				
Change Period (Y+Rc), s	5.0	7.0	4.5	6.0	5.0	7.0	4.5	6.0				
Max Green Setting (Gmax), s	9.0	44.0	8.5	27.0	8.0	45.0	9.5	26.0				
Max Q Clear Time (g_c+I1), s	11.0	28.2	9.1	17.0	6.1	38.9	3.2	15.5				
Green Ext Time (p_c), s	0.0	9.7	0.0	0.9	0.0	5.1	0.0	0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			40.8									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary

8:

05/18/2022

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	33	1	169	1	5	8	101	1050	6	4	1079	35
Future Volume (veh/h)	33	1	169	1	5	8	101	1050	6	4	1079	35
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1759	1881	1900	1900	1900	1900	1863	1827	1900	1900	1844	1900
Adj Flow Rate, veh/h	39	1	199	1	6	9	119	1235	7	5	1269	41
Adj No. of Lanes	1	1	0	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	0	1	0	0	0	2	4	0	0	3	4
Cap, veh/h	153	1	272	61	259	286	328	2246	13	296	2030	66
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.06	0.63	0.63	0.01	0.59	0.59
Sat Flow, veh/h	1315	8	1592	77	1518	1615	1774	3540	20	1810	3464	112
Grp Volume(v), veh/h	39	0	200	7	0	9	119	606	636	5	641	669
Grp Sat Flow(s),veh/h/ln	1315	0	1600	1594	0	1615	1774	1736	1824	1810	1752	1824
Q Serve(g_s), s	2.5	0.0	10.1	0.0	0.0	0.4	2.1	16.6	16.6	0.1	20.3	20.4
Cycle Q Clear(g_c), s	12.5	0.0	10.1	10.1	0.0	0.4	2.1	16.6	16.6	0.1	20.3	20.4
Prop In Lane	1.00		1.00	0.14		1.00	1.00		0.01	1.00		0.06
Lane Grp Cap(c), veh/h	153	0	273	320	0	286	328	1102	1157	296	1026	1069
V/C Ratio(X)	0.25	0.00	0.73	0.02	0.00	0.03	0.36	0.55	0.55	0.02	0.62	0.63
Avail Cap(c_a), veh/h	153	0	273	320	0	286	449	1102	1157	508	1026	1069
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	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.4	0.0	33.4	29.4	0.0	28.9	9.2	8.7	8.7	8.0	11.5	11.5
Incr Delay (d2), s/veh	0.3	0.0	8.6	0.0	0.0	0.0	0.7	2.0	1.9	0.0	2.9	2.8
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(50%),veh/ln	0.9	0.0	5.1	0.1	0.0	0.2	1.1	8.5	8.9	0.0	10.4	10.9
LnGrp Delay(d),s/veh	39.7	0.0	42.0	29.4	0.0	29.0	9.9	10.7	10.6	8.0	14.4	14.3
LnGrp LOS	D		D	C		C	A	B	B	A	B	B
Approach Vol, veh/h	239					16		1361			1315	
Approach Delay, s/veh	41.6					29.1		10.6			14.3	
Approach LOS	D					C		B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	5.1	59.9	20.0		9.2	55.8	20.0					
Change Period (Y+Rc), s	4.5	6.0	5.5		4.5	6.0	5.5					
Max Green Setting (Gmax), s	10.5	44.0	14.5		10.5	44.0	14.5					
Max Q Clear Time (g_c+I1), s	2.1	18.6	12.1		4.1	22.4	14.5					
Green Ext Time (p_c), s	0.0	15.4	0.0		0.1	14.6	0.0					
Intersection Summary												
HCM 2010 Ctrl Delay	14.9											
HCM 2010 LOS	B											

HCM 2010 Signalized Intersection Summary

8:

05/18/2022

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	68	3	160	0	1	5	220	1199	4	6	1091	63
Future Volume (veh/h)	68	3	160	0	1	5	220	1199	4	6	1091	63
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1759	1882	1900	1900	1900	1900	1863	1827	1900	1900	1844	1900
Adj Flow Rate, veh/h	80	4	188	0	1	6	259	1411	5	7	1284	74
Adj No. of Lanes	1	1	0	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	8	0	1	0	0	0	2	4	0	0	3	4
Cap, veh/h	273	5	224	0	271	245	360	2343	8	269	1987	114
Arrive On Green	0.14	0.14	0.14	0.00	0.14	0.14	0.08	0.66	0.66	0.01	0.59	0.59
Sat Flow, veh/h	1325	33	1571	0	1900	1615	1774	3548	13	1810	3367	194
Grp Volume(v), veh/h	80	0	192	0	1	6	259	690	726	7	667	691
Grp Sat Flow(s),veh/h/ln	1325	0	1604	0	1900	1615	1774	1736	1825	1810	1752	1809
Q Serve(g_s), s	4.7	0.0	9.9	0.0	0.0	0.3	4.5	19.1	19.1	0.1	21.4	21.5
Cycle Q Clear(g_c), s	4.7	0.0	9.9	0.0	0.0	0.3	4.5	19.1	19.1	0.1	21.4	21.5
Prop In Lane	1.00		0.98	0.00		1.00	1.00		0.01	1.00		0.11
Lane Grp Cap(c), veh/h	273	0	229	0	271	245	360	1146	1205	269	1034	1068
V/C Ratio(X)	0.29	0.00	0.84	0.00	0.00	0.02	0.72	0.60	0.60	0.03	0.65	0.65
Avail Cap(c_a), veh/h	310	0	274	0	324	290	438	1146	1205	476	1034	1068
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.3	0.0	35.5	0.0	31.3	30.7	13.3	8.1	8.1	7.9	11.5	11.6
Incr Delay (d2), s/veh	0.2	0.0	15.3	0.0	0.0	0.0	4.5	2.3	2.2	0.0	3.1	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	5.3	0.0	0.0	0.1	4.2	9.8	10.2	0.1	11.1	11.5
LnGrp Delay(d),s/veh	33.5	0.0	50.8	0.0	31.3	30.7	17.7	10.5	10.4	7.9	14.6	14.6
LnGrp LOS	C		D		C	C	B	B	B	A	B	B
Approach Vol, veh/h		272			7			1675			1365	
Approach Delay, s/veh		45.7			30.8			11.6			14.6	
Approach LOS		D			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	62.1		17.6	11.2	56.2		17.6				
Change Period (Y+Rc), s	4.5	6.0		5.5	4.5	6.0		5.5				
Max Green Setting (Gmax), s	10.5	44.0		14.5	10.5	44.0		14.5				
Max Q Clear Time (g_c+I1), s	2.1	21.1		2.3	6.5	23.5		11.9				
Green Ext Time (p_c), s	0.0	16.4		0.0	0.3	14.5		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			15.6									
HCM 2010 LOS			B									

Intersection						
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	18	25	112	11	11	227
Future Vol, veh/h	18	25	112	11	11	227
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	20	27	122	12	12	247
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	399	128	0	0	134	0
Stage 1	128	-	-	-	-	-
Stage 2	271	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	611	927	-	-	1463	-
Stage 1	903	-	-	-	-	-
Stage 2	779	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	605	927	-	-	1463	-
Mov Cap-2 Maneuver	605	-	-	-	-	-
Stage 1	903	-	-	-	-	-
Stage 2	771	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.1	0		0.3		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 758		1463	-	
HCM Lane V/C Ratio	-	- 0.062		0.008	-	
HCM Control Delay (s)	-	- 10.1		7.5	0	
HCM Lane LOS	-	- B		A	A	
HCM 95th %tile Q(veh)	-	- 0.2		0	-	

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	8	286	19	26	191
Future Vol, veh/h	16	8	286	19	26	191
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	17	9	311	21	28	208

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	586	322	0	0	332	0
Stage 1	322	-	-	-	-	-
Stage 2	264	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	476	724	-	-	1239	-
Stage 1	739	-	-	-	-	-
Stage 2	785	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	464	724	-	-	1239	-
Mov Cap-2 Maneuver	464	-	-	-	-	-
Stage 1	739	-	-	-	-	-
Stage 2	765	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.2	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	527	1239
HCM Lane V/C Ratio	-	-	0.05	0.023
HCM Control Delay (s)	-	-	12.2	8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1

Intersection

Int Delay, s/veh 1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	18	18	131	6	6	220
Future Vol, veh/h	18	18	131	6	6	220
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	20	20	142	7	7	239

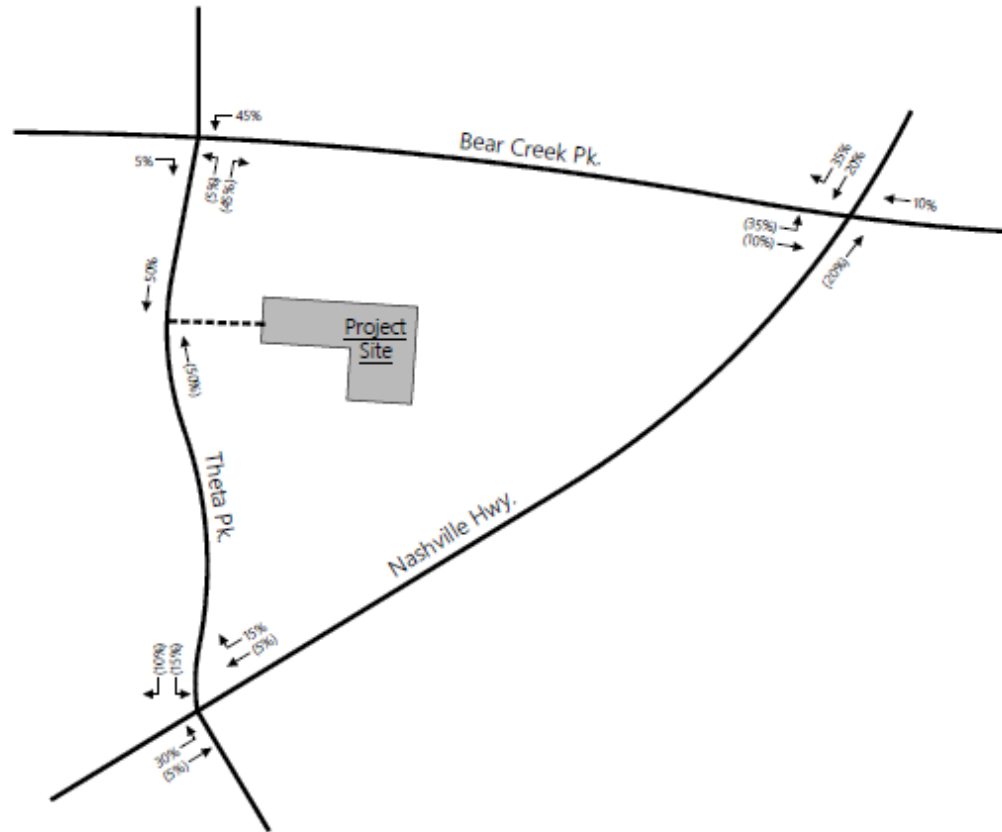
Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	399	146	0	0	149
Stage 1	146	-	-	-	-
Stage 2	253	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	611	906	-	-	1445
Stage 1	886	-	-	-	-
Stage 2	794	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	607	906	-	-	1445
Mov Cap-2 Maneuver	607	-	-	-	-
Stage 1	886	-	-	-	-
Stage 2	789	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 607 906 1445	-	-
HCM Lane V/C Ratio	-	- 0.032 0.022 0.005	-	-
HCM Control Delay (s)	-	- 11.1 9.1 7.5	0	
HCM Lane LOS	-	- B A A	A	
HCM 95th %tile Q(veh)	-	- 0.1 0.1 0	-	-

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	10	277	17	18	207
Future Vol, veh/h	10	10	277	17	18	207
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	11	11	301	18	20	225
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	575	310	0	0	319	0
Stage 1	310	-	-	-	-	-
Stage 2	265	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	483	735	-	-	1252	-
Stage 1	748	-	-	-	-	-
Stage 2	784	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	474	735	-	-	1252	-
Mov Cap-2 Maneuver	474	-	-	-	-	-
Stage 1	748	-	-	-	-	-
Stage 2	770	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	11.4	0	0.6			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 474 735 1252	-	-		
HCM Lane V/C Ratio	-	- 0.023 0.015 0.016	-	-		
HCM Control Delay (s)	-	- 12.8 10 7.9	0			
HCM Lane LOS	-	- B B A A				
HCM 95th %tile Q(veh)	-	- 0.1 0 0	-			

D. Background



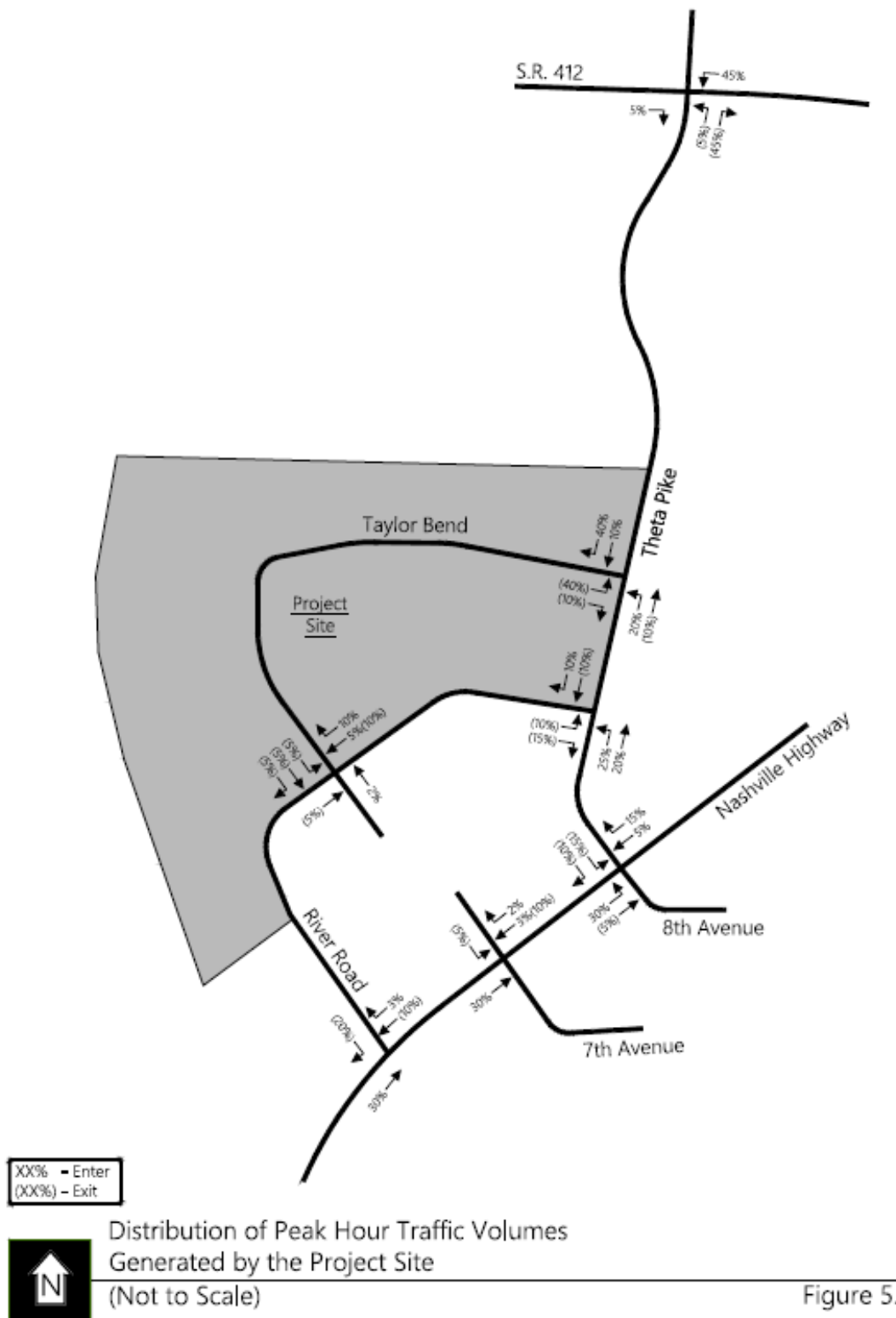
XX% - Enter
(XX%) - Exit



Distribution of Peak Hour Traffic Volumes
Generated by Theta Pike Residential
(Not to Scale)

Figure F1.





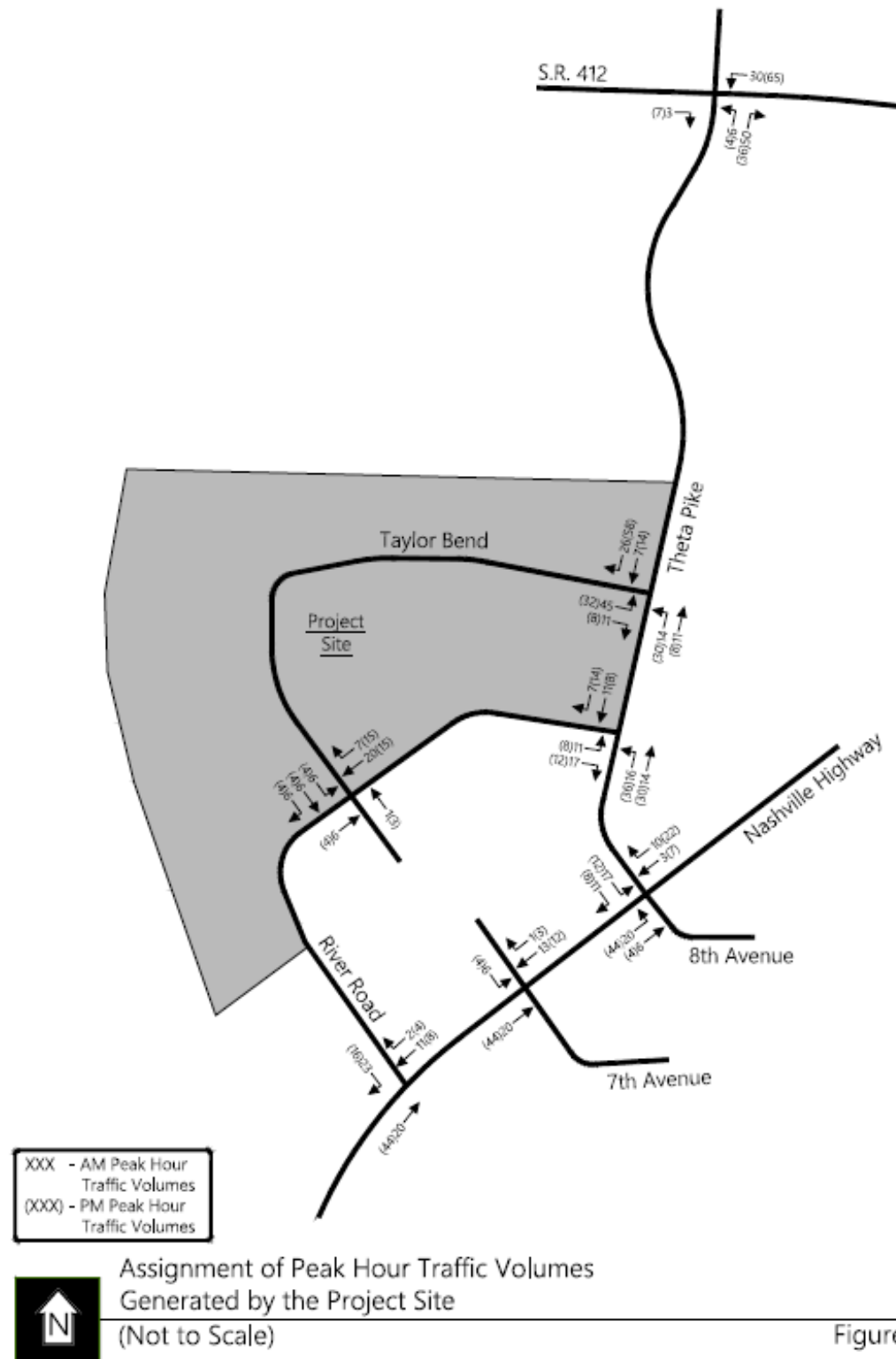


Figure 6.

E. Trip Generation

Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 22

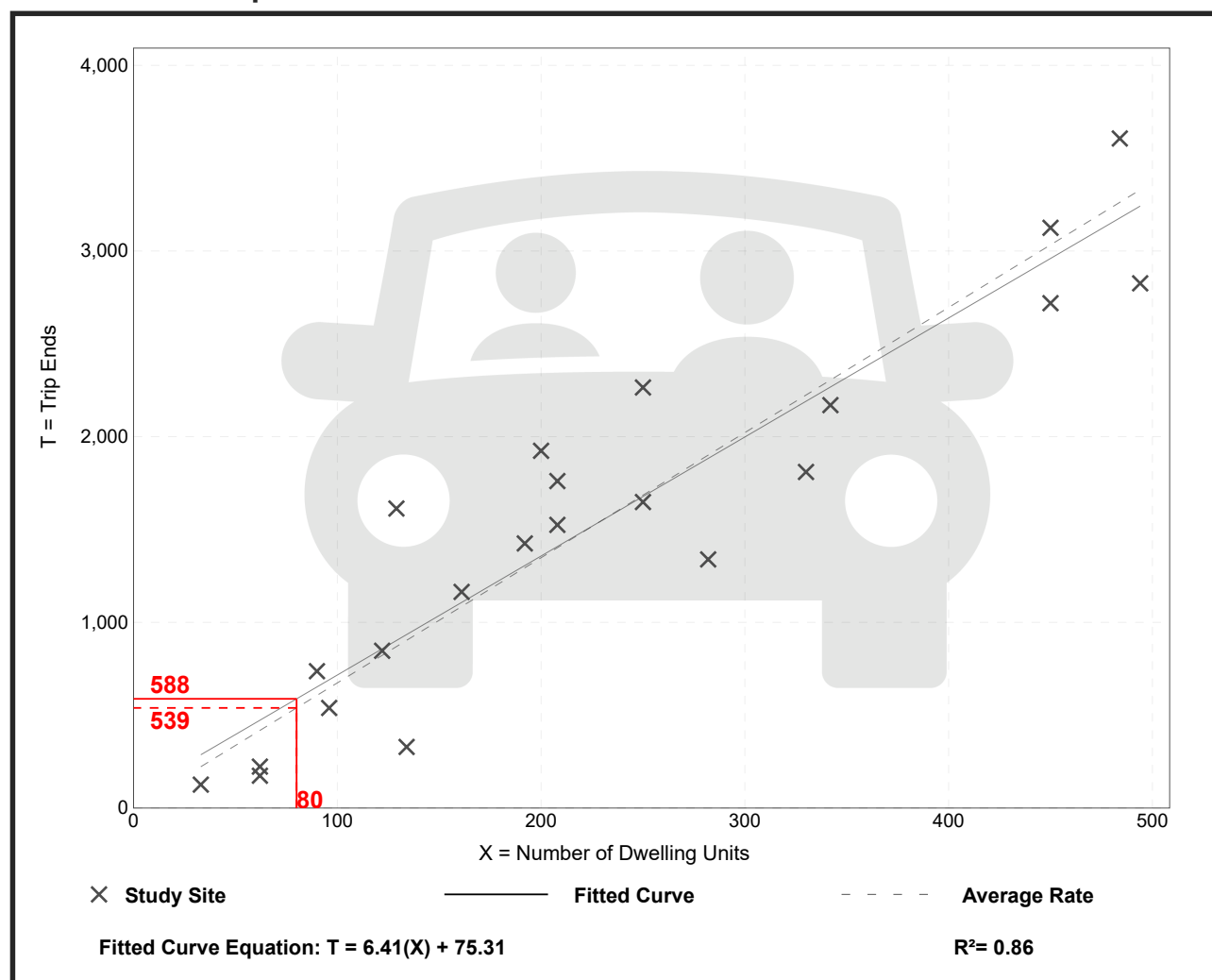
Avg. Num. of Dwelling Units: 229

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
6.74	2.46 - 12.50	1.79

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

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: 49

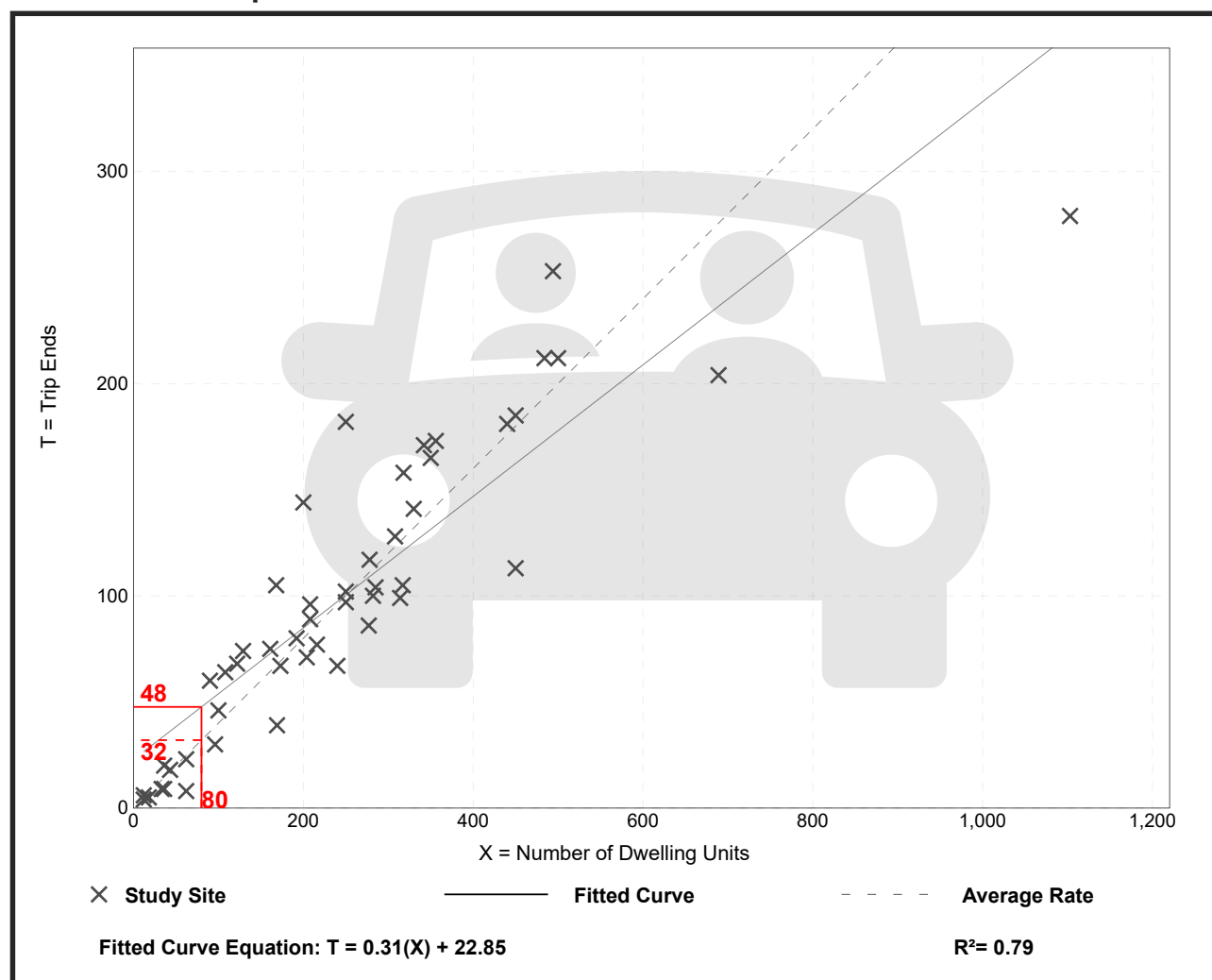
Avg. Num. of Dwelling Units: 249

Directional Distribution: 24% entering, 76% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.40	0.13 - 0.73	0.12

Data Plot and Equation



Multifamily Housing (Low-Rise)

Not Close to Rail Transit (220)

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:

59

Avg. Num. of Dwelling Units:

241

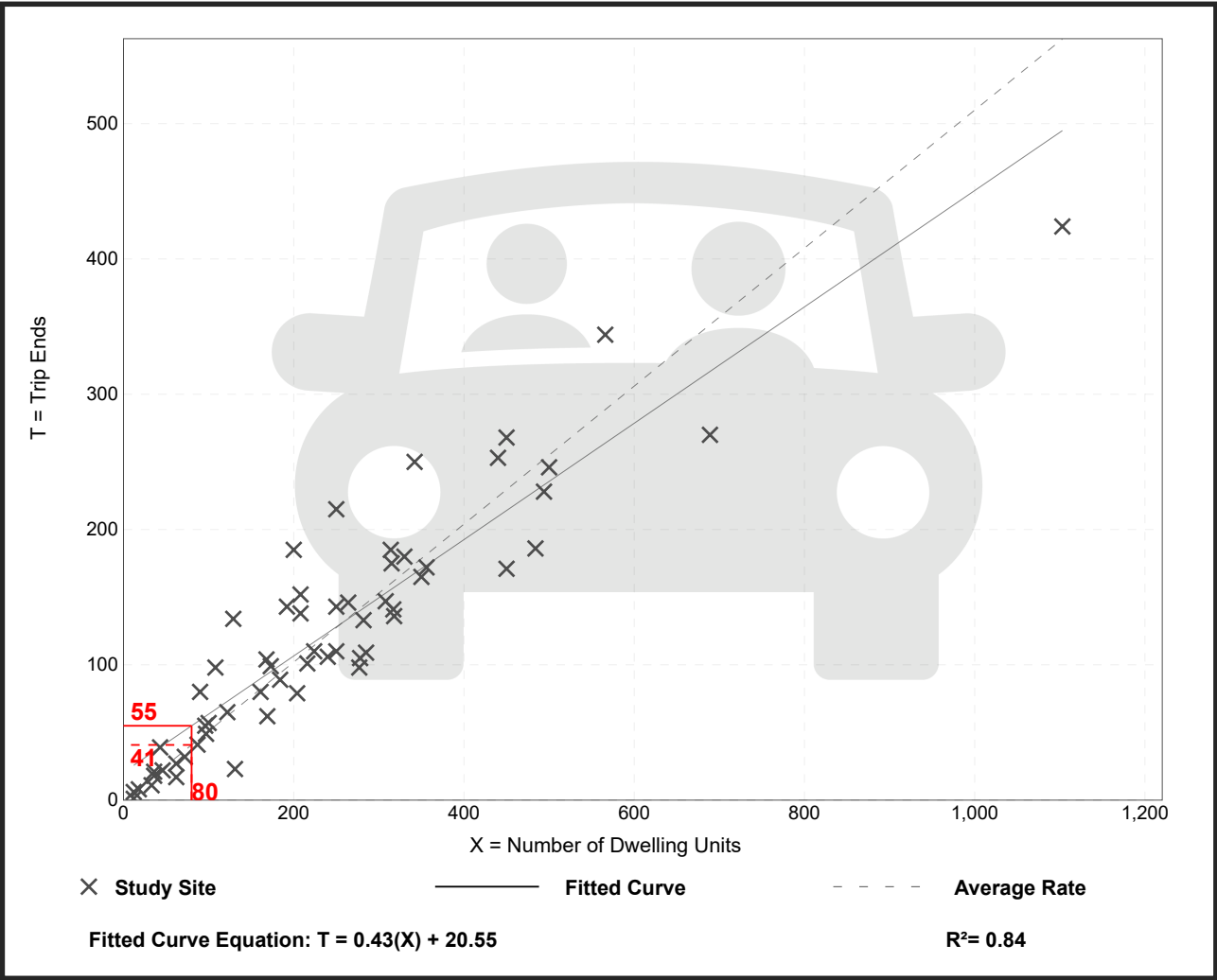
Directional Distribution:

63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.51	0.08 - 1.04	0.15

Data Plot and Equation

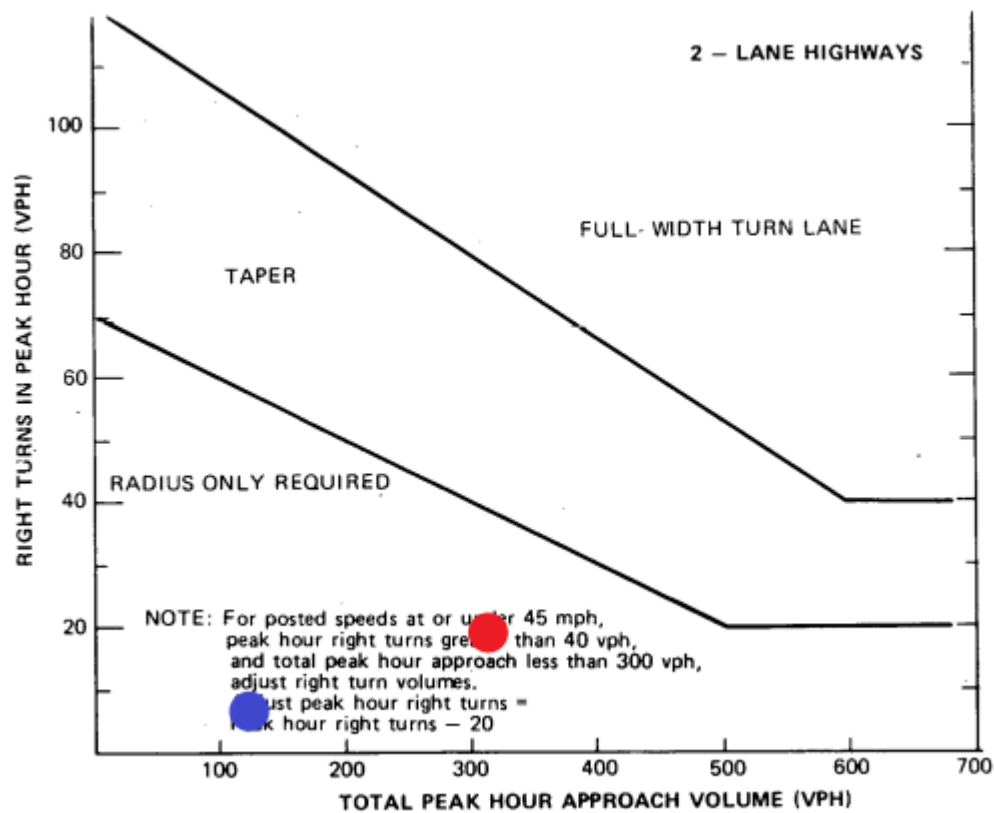


F. Turn Lane Analysis

RIGHT TURN LANE WARRANT ANALYSES (Based on Intersection Channelization Design Guide)

Intersection Approach	AM Peak ●			PM Peak ●		
	V_R^*	V_A^*	Warranted?	V_R^*	V_A^*	Warranted?
Northbound Theta Pike @ Site Access	6	118	No	17	303	No

* V_R = Right Turn Volumes, V_A = Advancing Volumes ** Adjusted right turn volumes



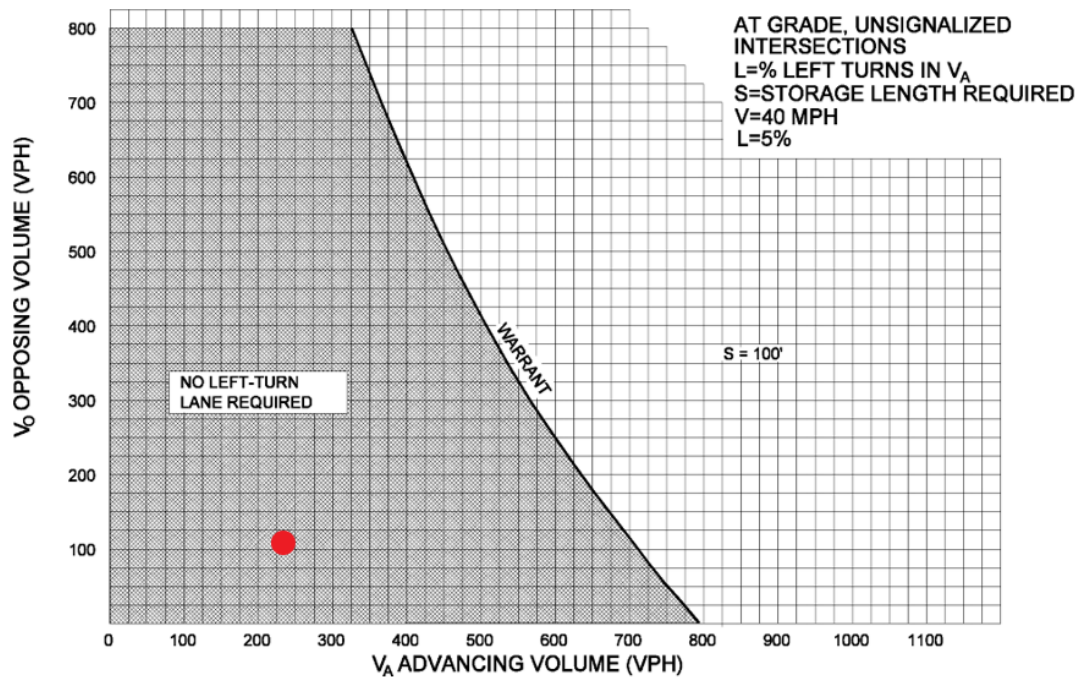
Under projected conditions, an exclusive right turn lane is not warranted on Theta Pike at the Site Access during either peak hour.

LEFT TURN LANE WARRANT ANALYSES
(Based on Harmelink Methodology)
Theta Pike and Site Access (AM Peak Hour)

2-lane roadway

Variable	Value
85th percentile speed, mph:	39
Percent of left turns in advancing volume (VA), %:	2.5%
Advancing volume (VA), veh/h:	233
Opposing volume (VO), veh/h:	118

HARMELINK CHARTS – 40 MPH



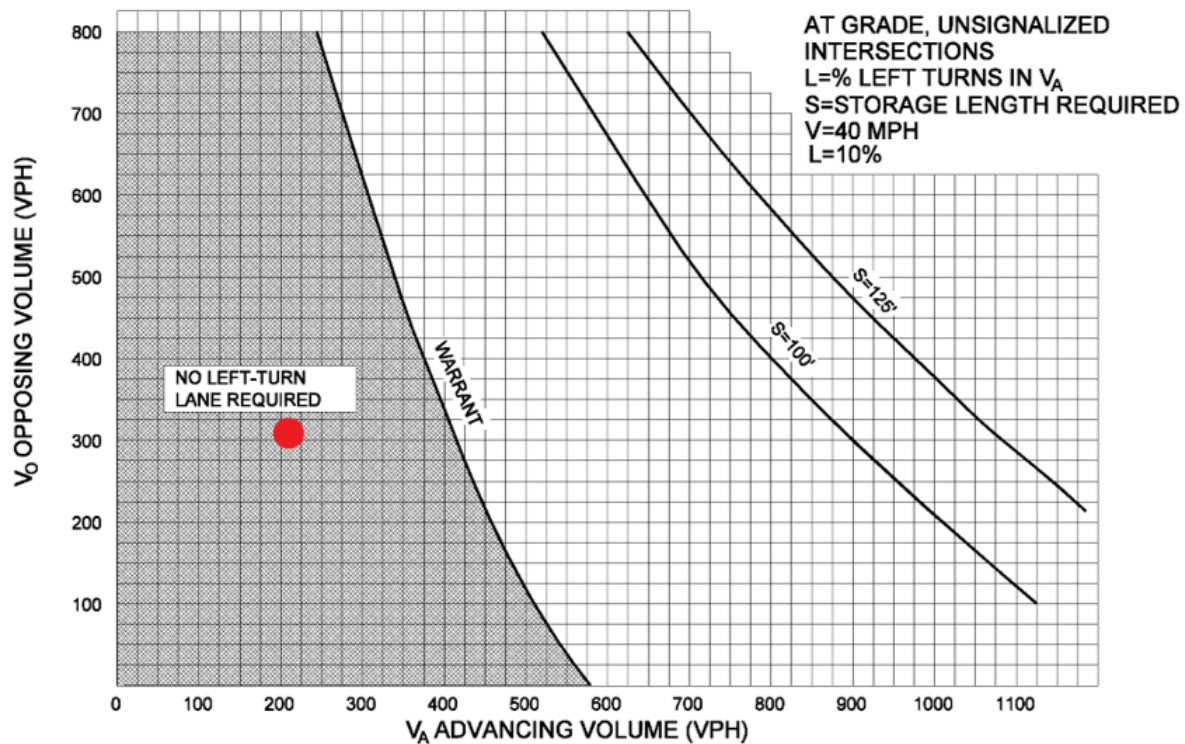
Warrant for 5% Left-Turn Storage Lanes at 40 mph

Under projected conditions, an exclusive **left turn lane is not warranted** on Theta Pike at the Site Access during **AM peak hour**.

LEFT TURN LANE WARRANT ANALYSES
(Based on Harmelink Methodology)
Theta Pike and Site Access (PM Peak Hour)

2-lane roadway

Variable	Value
85th percentile speed, mph:	39
Percent of left turns in advancing volume (V_A), %:	8.5%
Advancing volume (V_A), veh/h:	209
Opposing volume (V_O), veh/h:	303



Warrant for 10% Left-Turn Storage Lanes at 40 mph

Under projected conditions, an exclusive **left turn lane is not warranted** on Theta Pike at the Site Access during **PM peak hour**.



201 Pickens Lane
P.O. Box 379
Columbia, TN 38402

P 931.388.4833
F 931.388.5287
www.cpws.com

January 10, 2023

M2 Group, LLC
Matt Bryant, PE
matt@m2groupllc.com

Re: 220 Theta Pike
Mackenzie Place Apartments, 34 Townhome Units

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.

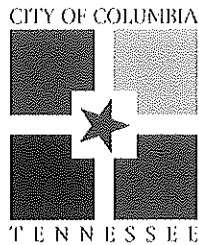
Yours truly,

COLUMBIA POWER & WATER SYSTEMS

A handwritten signature in black ink, appearing to be "Ryan Massey", is written over the company name.

Ryan Massey, P. E.
Vice President of Power Operations

kw



WASTEWATER DEPARTMENT

28 December 2022

Brian Holcombe
M2 Group, LLC
brian@m2groupllc.com

RE: 220 Theta Pike, Columbia, TN 38401

Brian,

This letter serves as confirmation that the City of Columbia Wastewater Department has the available capacity to service the above-referenced development. Any extension to the existing sewer infrastructure will be initiated by the owner/developer, reviewed by our department and approved by the State of Tennessee. The project must be advanced in accordance with local, state and federal rules, regulations and policies. Funding and construction of those improvements will remain the responsibility of the owner/developer. New customers will be required to pay all fees applicable at the time of connection. No detailed design plan for an extension of the sewer has been proposed at this time.

A handwritten signature in black ink, appearing to read "Donnie Boshers".

Donnie Boshers, Director
City of Columbia, TN
Wastewater Department



October 16, 2023

Mr. Brian Holcombe

M2 Group, LLC

P.O. Box 848

Franklin, TN 37065

Sent via email: brian@m2groupllc.com

RE: **Water Availability Letter**
 Mackenzie Place Townhomes – 32 Units
 220 Theta Pike
 Tax Map 90B, Parcel 47.00
 Columbia, Maury County, TN

Dear Mr. Holcombe:

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, provided the applicant complies with all rules and regulations of CPWS and conditions set out herein.

The proposed development consists of 32 townhome 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:

- Domestic waterline connection will be made to the existing 6-inch water main located on Theta Pike.
- Minimum size 8-inch water mains will be required throughout the development.



- Townhomes will be served via gang-meter vaults.

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

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

- Present the attached hydrant analysis report for coordination and approval of development from the Columbia Fire & Rescue Fire Marshall.
- Provide site base CAD files in DWG format, including roads, lot lines, existing and proposed contours, and other existing and proposed utilities, for use in development of water construction drawings.

- Remit to CPWS new water service fees:

New Water Service Fee: \$1,500 + \$370 per SFU (32 SFUs)	\$13,340.00
--	-------------

- 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 (32 meters)	\$17,280.00
Impact Fee: \$875 per 3/4" meter (32 meters)	\$28,000.00
Total Meter and Impact Fees Due =	\$45,280.00

- 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 Mr. Jonathan Hardin or myself 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,

A handwritten signature in blue ink that reads "Eric King". The signature is written in a cursive, flowing style.

Eric King, P.E.

Inflo Design Group, LLC

on behalf of Columbia Power and Water Systems

cc: Jonathan Hardin, CPWS

File 22-005

MPA - SURVEY DWG / Monday, June 19, 2023 2:48:02 PM



LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJACENT PROPEI
- EXISTING INDEX CONTOUR
- EXISTING OVERHEAD ELECTI
- EXISTING SANITARY SEWER I
- EXISTING TREELINE
- EXISTING SPOT ELEVATION
- EXISTING STORM SEWER LIN
- FIRE HYDRANT
- WATER METER
- TREE, DECIDUOUS
- TREE, CONIFER
- IRON PIPE FOUND (IPF)
- SANITARY MANHOLE
- WATER BOX (WATER VALVE)
- POWER POLE
- CURB INLET

GENERAL NOTES

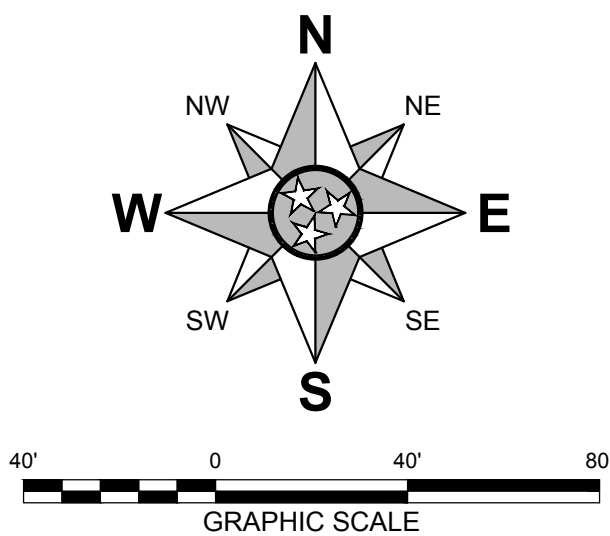
- BEARINGS ARE BASED ON THE TENNESSEE STATE PLANE COORDINATE SYSTEM (NAD83, 2011).
- ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, GEOID 18). CONTOURS ARE SHOWN AT 1-FOOT INTERVALS.
- THE FIELD SURVEY WAS COMPLETED ON MAY, 2022.
- THIS SURVEY WAS PREPARED USING THE CURRENT DEEDS AND PLATS OF RECORD.
- ALL DEED BOOK AND PLAT REFERENCES PERTAIN TO THE REGISTER'S OFFICE FOR MAURY COUNTY, TENNESSEE.
- ADJOINING PROPERTY LINES SHOWN WERE PLOTTED FROM INFORMATION TAKEN FROM EITHER DEED DESCRIPTION, RECORD PLATS, OR TAX MAPS.
- PROPERTY CORNERS SET THIS SURVEY ARE 18" #4 REBAR WITH ORANGE PLASTIC CAP STAMPED "M2 GROUP", 18" #5 REBAR WITH YELLOW PLASTIC CAP STAMPED "M2 GROUP, LLC", OR PK NAIL WITH STAINLESS STEEL WASHER STAMPED "M2 GROUP, LLC", UNLESS NOTED OTHERWISE.
- UTILITIES SHOWN HEREON WERE COMPILED FROM VISIBLE STRUCTURES AT THE SITE, INFORMATION FROM PLANS, AND PHYSICAL MARKINGS AND COMBINED TO DEVELOP A VIEW OF THE UNDERGROUND UTILITIES. HOWEVER, LACKING EXCAVATION, THE EXACT LOCATION OF UNDERGROUND FEATURES CANNOT BE ACCURATELY, COMPLETELY, AND RELIABLY DEPICTED. IN ADDITION, IN SOME JURISDICTIONS, 811 OR OTHER SIMILAR UTILITY LOCATE REQUESTS FROM SURVEYORS MAY BE IGNORED OR RESULT IN AN INCOMPLETE RESPONSE. THIS SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THIS SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. VERIFICATION OF EXISTENCE, LOCATIONS, AND DEPTH SHOULD BE MADE BEFORE CONDUCTING ANY EXCAVATION IN THE VICINITY OF THE UTILITY.
- THE PROPERTY SHOWN HEREON IS LOCATED IN A FLOOD HAZARD ZONE "X" (AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN) ACCORDING TO F.I.R.M. MAP "MAURY COUNTY, TENNESSEE" PANEL 170 OF 440, MAP NUMBER 47119C0170E, EFFECTIVE DATE APRIL 16, 2007.
- NO TITLE REPORT WAS PROVIDED TO THIS SURVEYOR REGARDING THE SUBJECT PROPERTIES. THEREFORE, THIS SURVEY IS SUBJECT TO THE FINDINGS OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH AND REPORT MAY DISCLOSE.

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE INFORMATION SHOWN HEREON IS TRUE AND ACCURATE TO THE BEST OF MY PROFESSIONAL KNOWLEDGE AND BELIEF. THE SURVEY SHOWN HEREON REPRESENTS A CATEGORY I SURVEY, HAVING A LINEAR ERROR OF CLOSURE WHICH IS EQUAL TO OR LESS THAN 1 FOOT PER 10,000 FEET OF LAND (1:10,000). THIS SURVEY WAS MADE IN COMPLIANCE WITH THE CURRENT TENNESSEE MINIMUM STANDARDS OF PRACTICE.

SUBJECT PROPERTY INFORMATION:

- OWNER: BLAIR PROPERTY MANAGEMENT INC
- TAX MAP 90B, GROUP B, PARCEL 47.00
- TOTAL AREA = 3.61 AC.



REVISION #	DATE	DESCRIPTION
BOUNDARY & TOPOGRAPHIC SURVEY 220 THETA PIKE CITY OF COLUMBIA MAURY COUNTY, TENNESSEE		
DATE :	MAY, 2022	DRAWN BY :
MADE FOR :	WAITS DEVELOPMENT GROUP, LLC	CHECKED BY :



P.O. BOX 848
FRANKLIN, TN 37065
WWW.M2GROUPLLC.COM

SHEET NUMBER:

SV-01



Preliminary Plat, Site Development Plan, and PUD Checklist

Development: MacKenzie Place

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.



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.



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

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:

Brian Holcombe

Print Name

Signature

05/22/23

Date



CITY OF
COLUMBIA
TENNESSEE

DEVELOPMENT SERVICES

700 NORTH GARDEN STREET

COLUMBIA, TN 38401

PHONE: (931) 560-1560

FAX: (931) 560-1541

PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy of submittal on USB thumb drive or CD
Fold hard copy submittals larger than 8½"x11"*

ADDRESS/LOCATION	220 Theta Pike		
	TAX MAP: 90B	GROUP: B	PARCEL: 47.00
SUMMARY OF NATURE OF REQUEST AND WORK	Preliminary Plat for 32 lots.		

REQUEST DATE FOR PRE-APPLICATION CONFERENCE	04/05/23	<i>Pre-application meetings are scheduled for Wednesdays.</i>
---	----------	---

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☐ Annexation ☐ Rezoning ☐ Sketch Plat – <i>Must be submitted at least two weeks prior to Preliminary Plat submittal</i> ☒ Preliminary Plat ☐ Final Plat ☐ PUD Preliminary Master Plan + Checklist ☐ PUD Final Site Plan + Checklist ☐ Multi-Family Site Plan ☐ Other: <i>*File naming nomenclature examples:</i> <i>Freedom Point Site Plan</i> <i>Freedom Point Master Plan</i> <i>Freedom Point Final Plat</i> <i>Freedom Point Elevations</i>	<u>Annexations/Rezoning:</u> ☐ Written Legal Description copy ☐ Requested Zone Listed ☐ Compliance with Comprehensive Plan ☐ Annexation Permission Form ☐ Plans and/or Plats conforming to City standards
	<u>Plats/PUDs:</u> - Project Name (include Sections & Phases) Mackenzie Place - Total Number of Lots 33 - Total acreage 3.59

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

APPLICANT

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

NAME	M2 Group, LLC	PHONE	(615) 925-0851
ADDRESS	P.O. Box 2543 - Brentwood, TN 37024	EMAIL	brian@m2groupllc.com

PROPERTY OWNER NAME	Blair Property Management, LLC	PHONE	(615) 498-4190
ADDRESS	8217 VICTORY TRAIL BRENTWOOD, TN 37027-7374	EMAIL	phillipsjohn1@mac.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.

Brian Holcombe

M2 Group, LLC

APPLICANT NAME

DocuSigned by:

Brian Holcombe

004D4D33BAE24E0...

APPLICANT SIGNATURE

08-21-2023 | 15:15:22 CDT

DATE

John Phillips

Blair Property Management, LLC

PROPERTY OWNER NAME

DocuSigned by:

John Phillips

6E3D27D98E42408...

PROPERTY OWNER SIGNATURE

08-21-2023 | 15:24:45 CDT

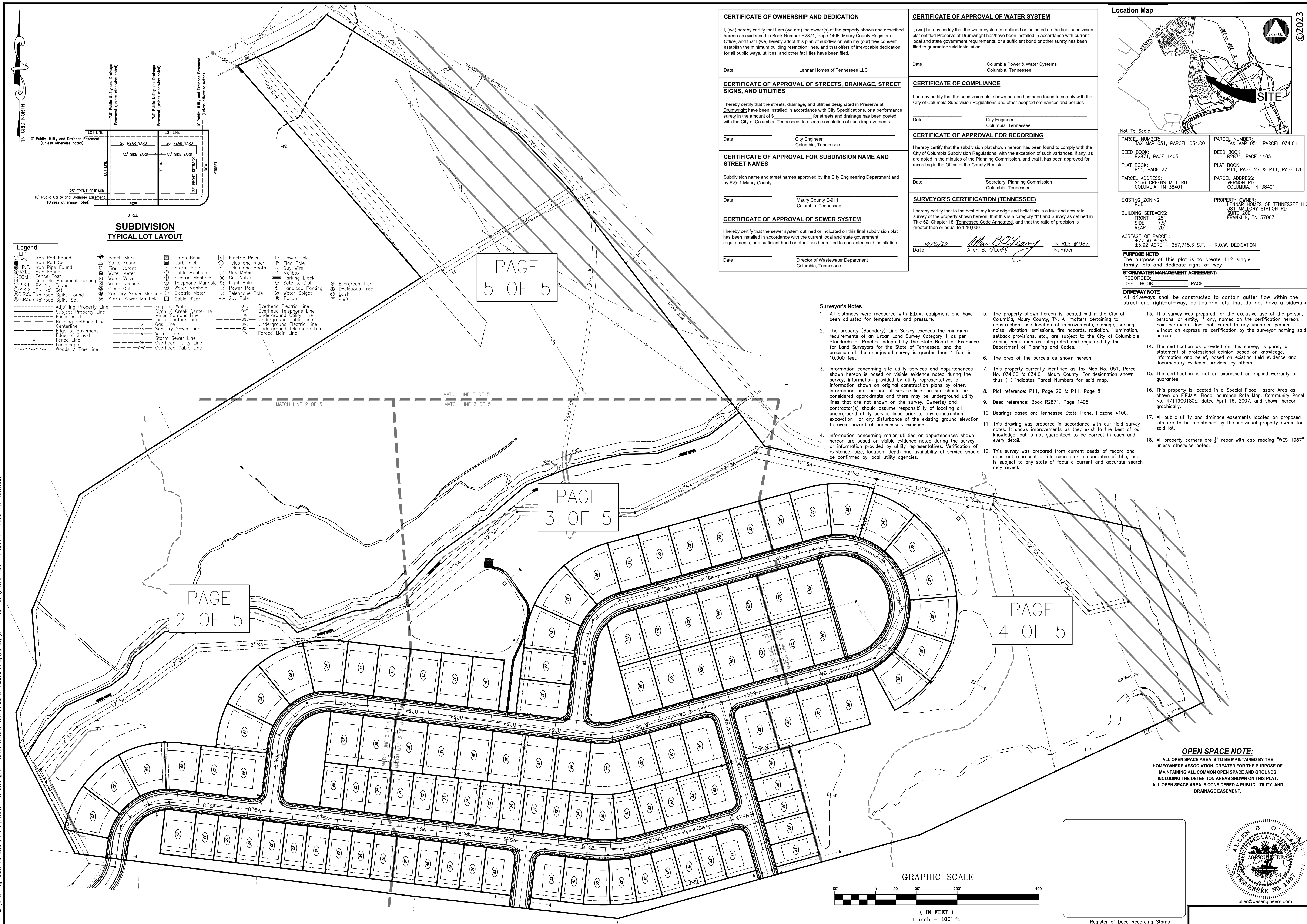
DATE

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	

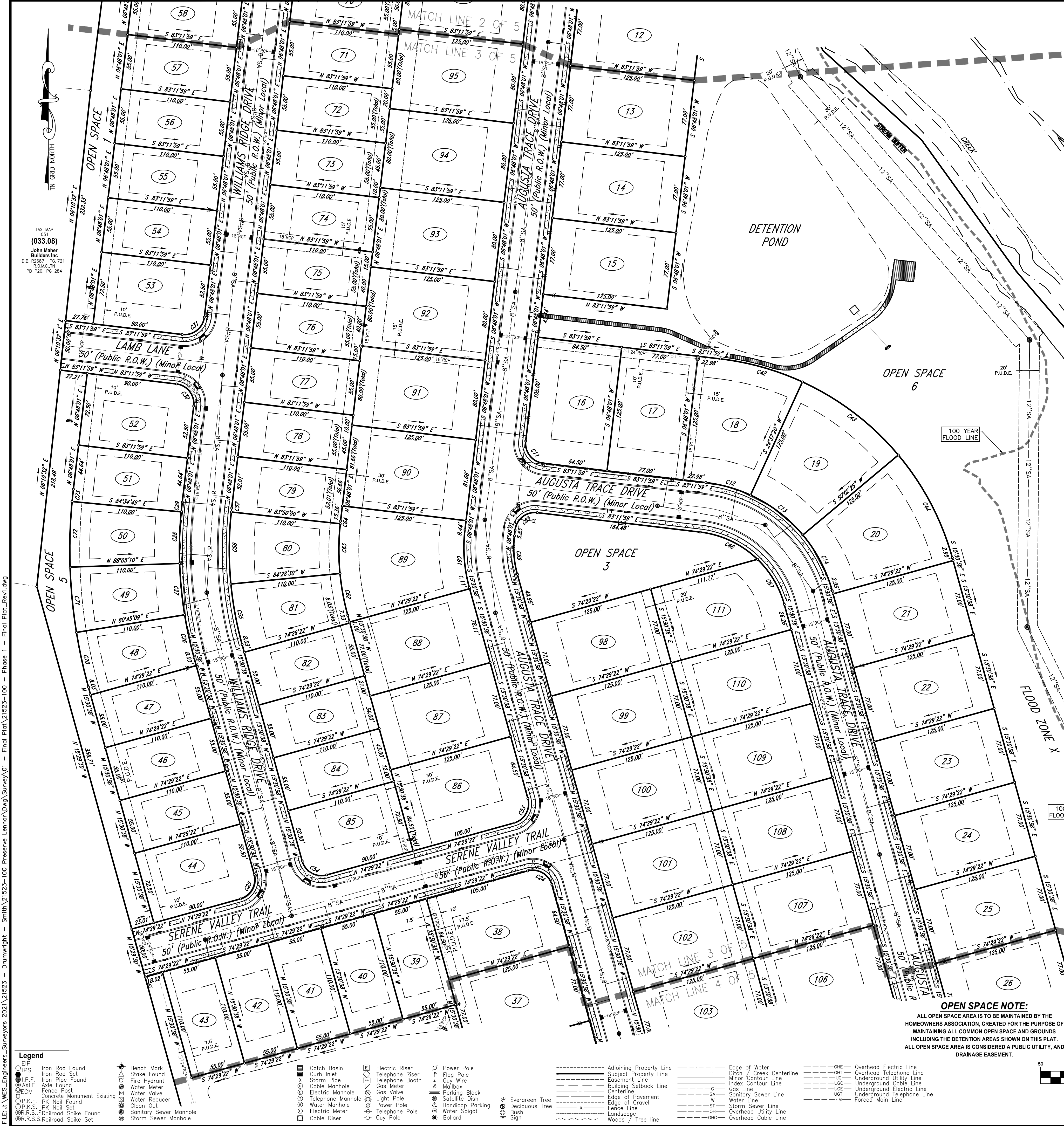
BOARD ACTION	
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FILE: J:\WES_Engineers_Surveyors_2021\21523 - Drumwright - Smith\21523-100 Preserve Lennar\Draw\Survey\01 - Final Plat\21523-100 - Phase 1 - Final Plat_Rev.dwg

Legend
EIP
IPS
Iron Rod Found
Iron Rod Set
Iron Pipe Found
Iron Pipe Set
A/C
ECCM
P.K.F.
P.K.S.
R.R.S.F.
R.R.S.F.
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
Building Setback
Electric Manhole
Power Pole
Electric Meter
Cable Riser
Electric Riser
Telephone Riser
Telephone Booth
Motor
Gas Valve
Light Pole
Water Manhole
Electric Meter
Cable Riser
Power Pole
Guy Wire
Parking Block
Satellite Dish
Handicap Parking
Water Spigot
Bollard
Evergreen Tree
Deciduous Tree
Sign
Adjoining Property Line
Subject Property Line
Easement 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
Sanitary Sewer Line
Water Line
Storm Sewer Line
Overhead Utility Line
Forced Main Line
OHE
OHT
UG
UG
UG
UG
FM

TAX MAP
(033.08)
John Maher
Buildings Inc.
D.B. R2687 PG. 721
R.O.A.C. TN
PB P20, PG. 284

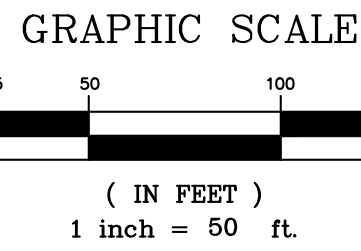


CURVE TABLE

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C11	20.00	31.42	28.28	S 38°11'59" E	90°00'00"
C12	150.00	46.66	46.47	S 74°29'22" W	17°49'19"
C13	150.00	66.54	66.00	S 52°40'07" E	25°25'05"
C14	150.00	64.01	63.52	S 27°44'06" E	24°26'57"
C24	20.00	31.42	28.28	N 62°30'38" W	90°00'00"
C25	20.00	31.42	28.28	N 29°29'22" E	90°00'00"
C26	405.00	44.27	44.25	N 12°22'45" W	6°15'47"
C27	405.00	51.84	51.80	N 05°34'17" E	7°20'01"
C28	405.00	51.84	51.80	N 01°45'10" E	7°20'01"
C29	405.00	9.76	9.76	N 06°06'36" E	1°22'50"
C30	20.00	31.42	28.28	N 38°11'59" W	90°00'00"
C31	20.00	31.42	28.28	N 51°48'01" E	90°00'00"
C42	275.00	85.54	85.20	S 74°17'19" E	17°49'19"
C43	275.00	117.35	116.48	S 52°40'07" E	25°25'05"
C44	275.00	117.35	116.48	S 27°44'06" E	24°26'57"
C53	20.00	31.42	28.28	S 29°29'22" W	90°00'00"
C54	20.00	31.42	28.28	N 62°30'38" W	90°00'00"
C55	355.00	61.87	61.79	N 10°31'04" W	9°59'08"
C56	355.00	72.44	72.31	N 00°19'15" E	11°41'30"
C57	355.00	33.93	33.93	N 08°29'00" E	0°38'01"
C61	150.00	58.41	58.04	S 04°21'19" W	22°18'39"
C62	245.00	42.70	42.65	N 10°31'04" W	9°59'08"
C63	245.00	49.99	49.91	N 00°19'15" E	11°41'30"
C64	245.00	2.71	2.71	N 06°29'00" E	0°38'01"
C65	20.00	31.42	28.28	N 51°48'01" E	90°00'00"
C66	100.00	64.93	63.79	S 64°35'27" E	37°12'04"
C67	100.00	51.21	50.59	S 50°45'17" E	37°09'17"
C69	100.00	38.94	38.69	N 04°21'19" W	22°18'39"
C70	515.00	56.30	56.27	N 12°22'45" W	6°15'47"
C71	515.00	65.92	65.87	N 05°34'17" W	7°20'01"
C72	515.00	65.92	65.87	N 01°45'10" E	7°20'01"
C73	515.00	12.41	12.41	N 06°06'36" E	1°22'50"

AREA TABLE

LOT	SQ. FT.	ACRES
13	9,625.0	0.22
14	9,625.0	0.22
15	9,625.0	0.22
16	10,476.7	0.24
17	9,625.0	0.22
18	11,134.8	0.26
19	11,783.9	0.27
20	11,704.0	0.27
21	9,625.0	0.22
22	9,625.0	0.22
23	9,625.0	0.22
24	10,476.7	0.24
25	9,625.0	0.22
26	10,476.7	0.24
27	9,625.0	0.22
28	11,783.9	0.27
29	6,050.0	0.14
30	6,050.0	0.14
31	6,050.0	0.14
32	6,050.0	0.14
33	6,050.0	0.14
34	6,050.0	0.14
35	6,050.0	0.14
36	6,050.0	0.14
37	6,050.0	0.14
38	6,050.0	0.14
39	6,050.0	0.14
40	6,050.0	0.14
41	6,050.0	0.14
42	6,050.0	0.14
43	6,050.0	0.14
44	7,889.2	0.18
45	6,050.0	0.14
46	6,050.0	0.14
47	6,050.0	0.14
48	6,414.4	0.15
49	6,476.5	0.15
50	6,476.5	0.15
51	6,129.6	0.14
52	7,889.2	0.18
53	7,889.2	0.18
54	6,050.0	0.14
55	6,050.0	0.14
56	6,050.0	0.14
57	6,050.0	0.14
58	6,050.0	0.14
59	6,050.0	0.14
60	6,050.0	0.14
61	6,050.0	0.14
62	6,050.0	0.14
63	6,050.0	0.14
64	6,050.0	0.14
65	6,050.0	0.14
66	6,050.0	0.14
67	6,050.0	0.14
68	6,050.0	0.14
69	6,050.0	0.14
70	6,050.0	0.14
71	6,050.0	0.14
72	6,050.0	0.14
73	6,050.0	0.14
74	6,050.0	0.14
75	6,050.0	0.14
76	6,050.0	0.14
77	6,050.0	0.14
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81	6,050.0	0.14
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83	6,050.0	0.14
84	6,050.0	0.14
85	6,050.0	0.14
86	6,050.0	0.14
87	6,050.0	0.14
88	6,050.0	0.14
89	6,050.0	0.14
90	6,050.0	0.14
91	6,050.0	0.14
92	6,050.0	0.14
93	6,050.0	0.14
94	6,050.0	0.14
95	6,050.0	0.14
96	6,050.0	0.14
97	6,050.0	0.14
98	6,050.0	0.14
99	6,050.0	0.14
100	6,050.0	0.14
101	6,050.0	0.14
102	6,050.0	0.14
103	6,050.0	0.14
104	6,050.0	0.14
105	6,050.0	0.14
106	6,050.0	0.14
107	6,050.0	0.14
108	6,050.0	0.14
109	6,050.0	0.14
110	6,050.0	0.14
111	6,050.0	0.14
112	6,050.0	0.14
113	6,050.0	0.14
114	6,050.0	0.14
115	6,050.0	0.14
116	6,050.0	0.14
117	6,050.0	0.14
118	6,050.0	0.14
119	6,050.0	0.14
120	6,050.0	0.14
121	6,050.0	0.14
122	6,050.0	0.14
123	6,050.0	0.14
124	6,050.0	0.14
125	6,050.0	0.14
126	6,050.0	0.14



Location Map

Not To Scale

PARCEL NUMBER: TAX MAP 051, PARCEL 034.00

DEED BOOK: R2687, PAGE 1405

PLAT BOOK: P11, PAGE 27

PARCEL ADDRESS: 2550 GREENS MILL RD COLUMBIA, TN 38401

PARCEL NUMBER: TAX MAP 051, PARCEL 034.01

DEED BOOK: R2687, PAGE 1405

PLAT BOOK: P11, PAGE 27 & P11, PAGE 81

PARCEL ADDRESS: VERNON RD COLUMBIA, TN 38401

EXISTING ZONING: PUD

PROPERTY OWNER: LENNAR HOMES OF TENNESSEE LLC

BUILDING SETBACKS: FRONT - 25' SIDE - 7.5' REAR - 20'

ACREAGE OF PARCEL: 277.50 ACRES

±5.92 ACRE - 257,715.3 S.F. - R.O.W. DEDICATION

PURPOSE NOTE: The purpose of this plat is to create 112 single family lots and dedicate right-of-way.

STORMWATER MANAGEMENT AGREEMENT: RECORDED: DEED BOOK: PAGE:

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.

CERTIFICATE OF OWNERSHIP AND DEDICATION

I, (we) hereby certify that I am (we are) the owner(s) of the property shown and described herein evidenced in Book Number R2687, Page 1405, 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 lines, and that of irrevocable dedication for all public ways, utilities, and other facilities have been filed.

Date: Lennar Homes of Tennessee LLC

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

I hereby certify that the streets, drainage, and utilities designated in Preserve at Drumwright 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 Preserve at Drumwright has 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 "1" 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.

Date: 10/16/22 Allen B. O'Leary TN RLS #1987 Number



WES E ENGINEERS & SURVEYORS

CIVIL ENGINEERS & LAND SURVEYORS

2486 NASHVILLE HIGHWAY

COLUMBIA, TN 38401

PHONE: (931) 388-2329

www.wesengineers.com

ENGINEERS & SURVEYORS

Client: LENNAR HOMES

381 MALLORY STATION RD

SUITE 200

FRANKLIN, TN 37067

FINAL PLAT

PRESERVE AT DRUMWRIGHT

COLUMBIA, TN

DATE: 10/16/22

Drawn: EP

Checked: AO

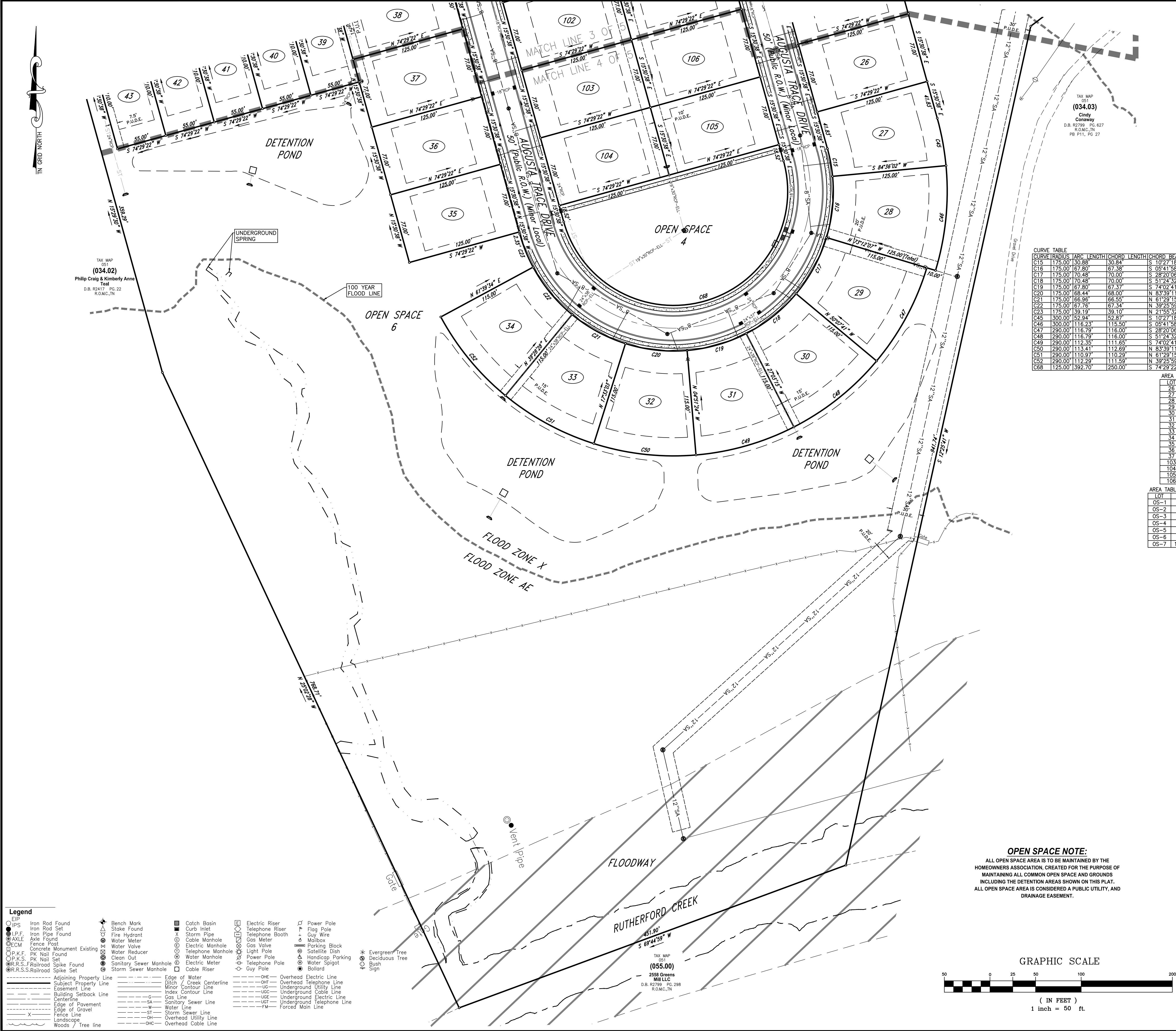
Approved: AO

Date: 10-16-2023

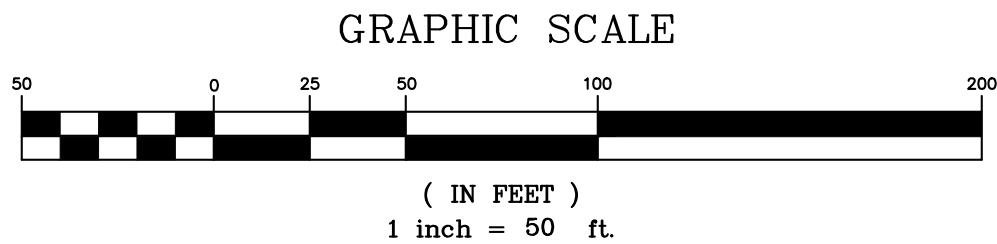
Scale: Vertical: 1"=50'

Horizontal:

3 of 5



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.



CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C15	175.00	30.88	30.84	S 10°27'18" E	10°06'40"
C16	175.00	67.80	67.38	S 05°41'58" W	22°11'51"
C17	175.00	70.48	70.00	S 28°20'06" W	23°04'26"
C18	175.00	70.48	70.00	S 51°24'32" W	23°04'26"
C19	175.00	67.80	67.37	S 74°02'41" W	22°11'51"
C20	175.00	68.44	68.00	N 83°39'11" W	22°24'27"
C21	175.00	66.96	66.53	N 61°29'15" W	21°55'25"
C22	175.00	67.76	67.34	N 39°25'59" W	22°11'07"
C23	175.00	39.19	39.10	N 21°55'32" W	12°49'48"
C45	100.00	52.94	52.87	S 10°27'18" E	10°06'40"
C46	300.00	116.23	115.50	S 05°41'58" W	22°11'51"
C47	290.00	116.79	116.00	S 28°20'06" W	23°04'26"
C48	290.00	116.79	116.00	S 51°24'32" W	23°04'26"
C49	290.00	112.35	111.65	S 74°02'41" W	22°11'51"
C50	290.00	113.41	112.69	N 83°39'11" W	22°24'27"
C51	290.00	110.97	110.29	N 61°29'15" W	21°55'25"
C52	290.00	112.29	111.59	N 39°25'59" W	22°11'07"
C68	125.00	392.70	250.00	S 74°29'22" W	180°00'00"

LOT	SQ. FT.	ACRES
26	9,625.0	0.22
27	10,447.3	0.24
28	11,501.5	0.26
29	10,767.6	0.25
30	10,767.6	0.25
31	10,358.6	0.24
32	10,456.6	0.24
33	10,230.8	0.23
34	10,352.9	0.24
35	9,625.0	0.22
36	9,625.0	0.22
37	9,625.0	0.22
103	9,625.0	0.22
104	9,625.0	0.22
105	9,625.0	0.22
106	9,625.0	0.22

LOT	SQ. FT.	ACRES
OS-1	33,203.0	0.76
OS-2	19,713.0	0.45
OS-3	15,795.4	0.36
OS-4	29,172.6	0.67
OS-5	14,425.4	0.33
OS-6	879,992.9	20.20
OS-7	1,183,045.2	27.16

Location Map

Not To Scale

PARCEL NUMBER: TAX MAP 051, PARCEL 034.00
DEED BOOK: R02811, PAGE 1405
PLAT BOOK: P11, PAGE 27
PARCEL ADDRESS: 2558 GREENS MILL RD COLUMBIA, TN 38401

PARCEL NUMBER: TAX MAP 051, PARCEL 034.01
DEED BOOK: R02811, PAGE 1405
PLAT BOOK: P11, PAGE 27 & P11, PAGE 81
PARCEL ADDRESS: VERNON RD COLUMBIA, TN 38401

EXISTING ZONING: P11
BUILDING SETBACKS: FRONT - 25', SIDE - 7.5', REAR - 20'

ACREAGE OF PARCEL: 177.50 ACRES
±5.92 ACRE - 257,715.3 S.F. - R.O.W. DEDICATION

PURPOSE NOTE:
The purpose of this plat is to create 112 single family lots and dedicate right-of-way.

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

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.

CERTIFICATE OF OWNERSHIP AND DEDICATION
I, (we) hereby certify that I am (we are) the owner(s) of the property shown and described herein as evidenced in Book Number R02811, Page 1405, 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 lines, and that offers of irrevocable dedication for all public ways, utilities, and other facilities have been filed.

Date: _____ Lennar Homes of Tennessee LLC

CERTIFICATE OF APPROVAL OF STREETS, DRAINAGE, STREET SIGNS, AND UTILITIES
I hereby certify that the streets, drainage, and utilities designated in Preserve at Drumwright 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 Preserve at Drumwright 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 "1" Land Survey as defined in Title 62, Chapter 18, Tennessee Code Annotated, and that the degree of precision is greater than or equal to 1:10,000.

Date: 10/16/23 Allen B. O'Leary TN RLS #1987
Number



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

ENGINEERS & SURVEYORS

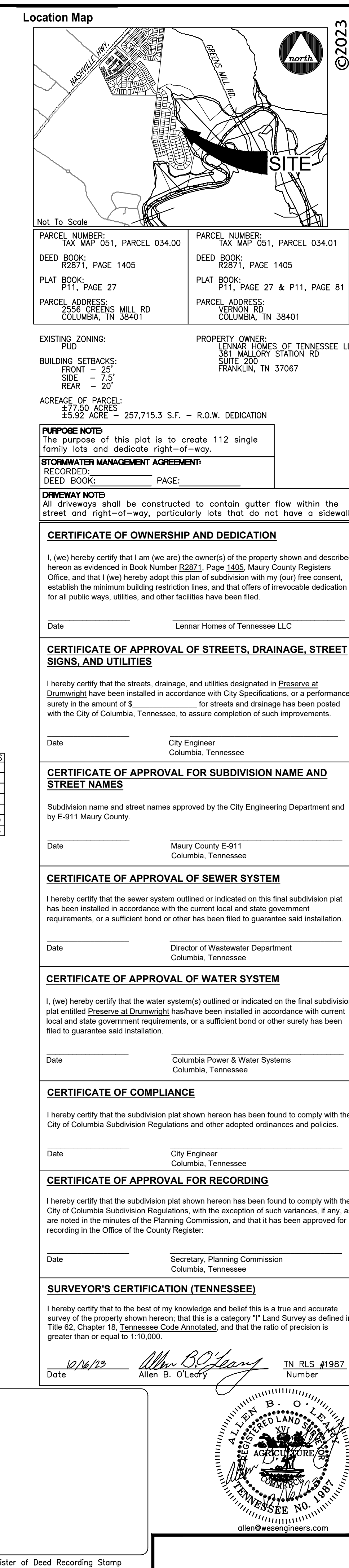
Client: LENNAR HOMES
381 MALLORY STATION ROAD
SUITE 200
FRANKLIN, TN 37067

FINAL PLAT
PRESERVE AT DRUMWRIGHT
COLUMBIA, TN

Date: 10-16-2023

Scale: Vertical: 1"=50'
Horizontal: 1"=50'

4 of 5



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

LENNAR HOMES OF TENNESSEE, 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 DEVELOPER'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.

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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.

<u>The Preserve @ Dramawright</u> PROJECT	
Completed by the Developer <u>Lennar Homes of Tennessee LLC</u> DEVELOPER NAME <u>Nick Branum</u> AUTHORIZED AGENT NAME <u>NB Branum</u> SIGNATURE <u>10-05-2023</u> DATE <u>381 Mallory Station Rd Suite #200</u> STREET <u>Franklin, TN 37067</u> CITY, STATE, ZIP <u>(615) 305-8321</u> PHONE <u>Nick.Branum@lennar.com</u> EMAIL Attest <u>Kenneth E. Zimmstein</u> ATTEST NAME <u>Kenneth E. Zimmstein</u> ATTEST SIGNATURE <u>10-5-2023</u> DATE	Completed by the City _____ CITY ENGINEER _____ SIGNATURE _____ DATE Attest _____ ATTEST NAME _____ ATTEST SIGNATURE _____ DATE



October 16, 2023

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

RE: Project Name: Preserve at Drumwright, Final Plat
City of Columbia Staff Review Submittal

On behalf of Lennar Homes of Tennessee LLC, the owner of these 112 proposed single family lots, **WES Engineers & Surveyors** would like to submit this Final Plat to the City of Columbia for Planning Commission approval.

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

Sincerely,
WES Engineers & Surveyors

A handwritten signature in black ink that reads 'Allen B. O'Leary'. The signature is written in a cursive style with a large, looping 'L' at the end.

Allen B. O'Leary, RLS
Principal



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	Nashville Hwy, Columbia, TN		
	TAX MAP: 051	GROUP:	PARCEL: 034.00/034.01
SUMMARY OF NATURE OF REQUEST AND WORK	Request Final Plat approval for 112 single family residential lots for Preserve at Drumwright.		

DATE OF PRE-APPLICATION CONFERENCE		<i>Pre-application meetings are scheduled for Wednesdays.</i>
------------------------------------	--	---

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:	<u>Annexations/Rezoning/PUD's:</u> ☐ 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 <u>Plats/PUDs:</u> ☒ Project Name (include Sections & Phases) Preserve at Drumwright ☒ Total Number of Lots 112 ☒ Total acreage ±77.50

**File naming nomenclature examples:*

*Freedom Point Site Plan
Freedom Point Master Plan
Freedom Point Final Plat*

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	Lennar Home at Tennessee LLC	PHONE	
ADDRESS	381 Mallory Station Rd, Suite 200 Franklin, TN 37067	EMAIL	

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

Allen B. O'Leary
APPLICANT NAME

Allen B. O'Leary
APPLICANT SIGNATURE

10/5/23
DATE

Nick Branum
PROPERTY OWNER NAME

Nick Branum
PROPERTY OWNER SIGNATURE

10-05-2023
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			

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

LENNAR HOMES OF TENNESSEE, 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.

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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.

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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.

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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.

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No third party shall obtain any benefits or rights under this agreement nor shall the rights or duties be assigned by either party.

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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.

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This agreement may not be orally amended and supersedes all prior negotiations, commitments, or understandings.

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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.

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This agreement shall be binding upon the DEVELOPER and the DEVELOPER's heirs, administrators, executors, assigns, and any other successors in interest.

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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.

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Construction of IMPROVEMENTS may not begin until the following events have occurred:

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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.

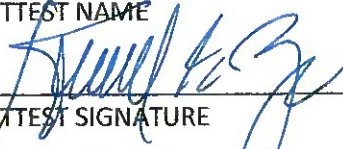
B4.3 Acceptance of Facilities

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.

DRUMWRIGHT PHASES 3A, 3B & 3C PROJECT	
Completed by the Developer Lennar Homes of Tennessee, LLC DEVELOPER NAME Nick Branum AUTHORIZED AGENT NAME  SIGNATURE 10-05-2023 DATE 381 Mallory Station Rd Suite #200 STREET Franklin, TN 37067 CITY, STATE, ZIP (615) 305-8321 PHONE Nick.Branum@lennar.com EMAIL Attest Kenneth E. Zumstein ATTEST NAME  ATTEST SIGNATURE 10-5-2023 DATE	Completed by the City CITY ENGINEER SIGNATURE DATE Attest ATTEST NAME ATTEST SIGNATURE DATE



October 16, 2023

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

RE: Project Name: Drumwright P.U.D., Phase 3C, Final Plat
City of Columbia Staff Review Submittal

On behalf of AG Essential Housing Multi State 2, LLC, the owner of these 24 proposed single family lots, **WES Engineers & Surveyors** would like to submit this Final Plat to the City of Columbia for Planning Commission approval.

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

Sincerely,
WES Engineers & Surveyors

A handwritten signature in black ink that reads 'Allen B. O'Leary'. The signature is written in a cursive style with a large, looping 'L' at the end.

Allen B. O'Leary, RLS
Principal



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	Nashville Hwy, Columbia, TN		
	TAX MAP: 051	GROUP:	PARCEL: 032.00
SUMMARY OF NATURE OF REQUEST AND WORK	Request Final Plat approval for 24 single family residential lots - Phase 3C of Drumwright.		

DATE OF PRE-APPLICATION CONFERENCE		<i>Pre-application meetings are scheduled for Wednesdays.</i>
------------------------------------	--	---

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:	<u>Annexations/Rezoning/PUD's:</u> ☐ 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 <u>Plats/PUDs:</u> ☒ Project Name (include Sections & Phases) Drumwright, Phase 3C ☒ Total Number of Lots 24 ☒ Total acreage ±6.42

**File naming nomenclature examples:*

*Freedom Point Site Plan
Freedom Point Master Plan
Freedom Point Final Plat*

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	AG Essential House Multi State 2, LLC	PHONE	
ADDRESS	2372 Nashville Highway Columbia, TN 38401	EMAIL	

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

Allen B. O'Leary
APPLICANT NAME

Allen B. O'Leary
APPLICANT SIGNATURE

10/5/23
DATE

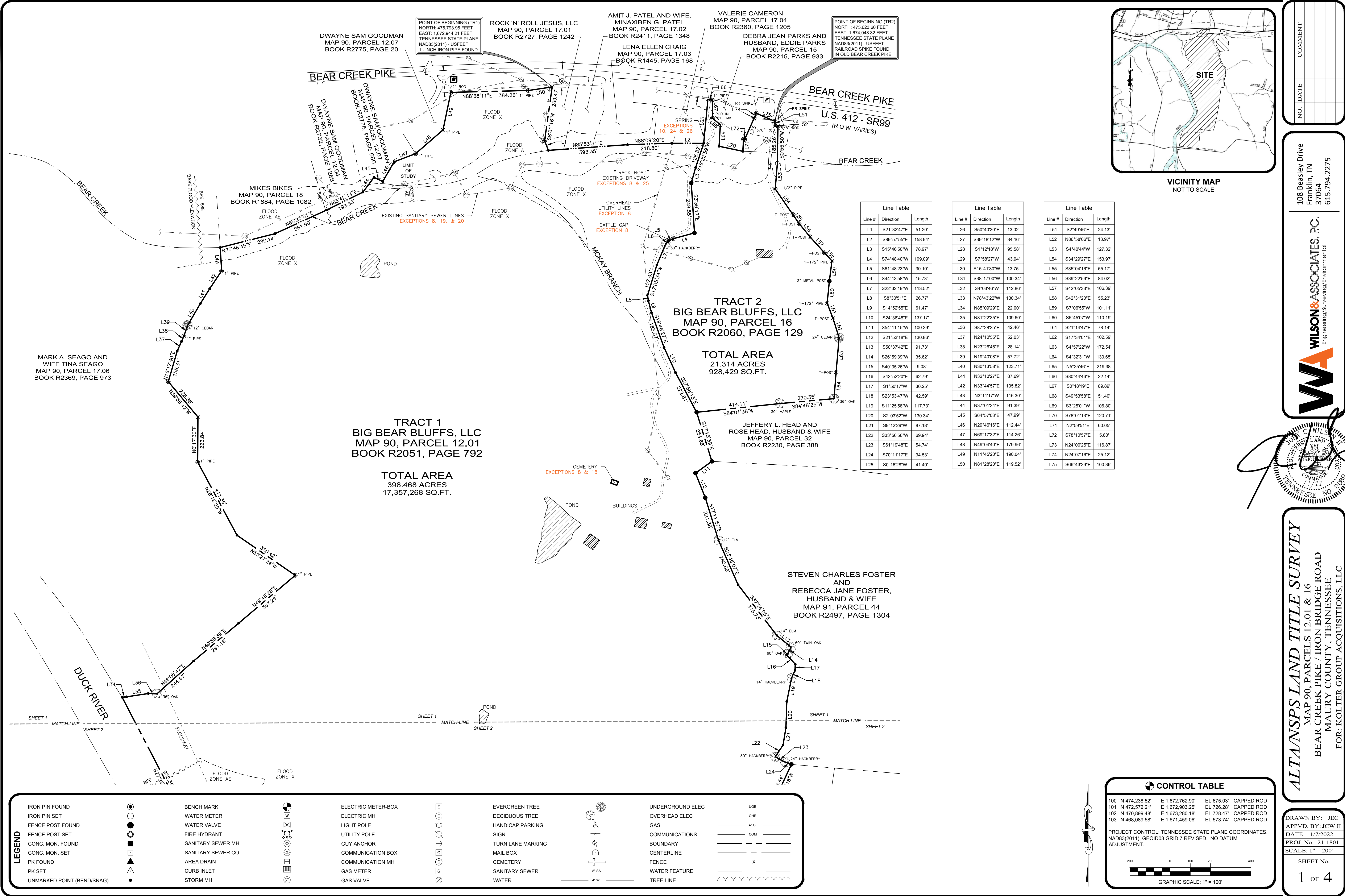
Nick Brannum
PROPERTY OWNER NAME

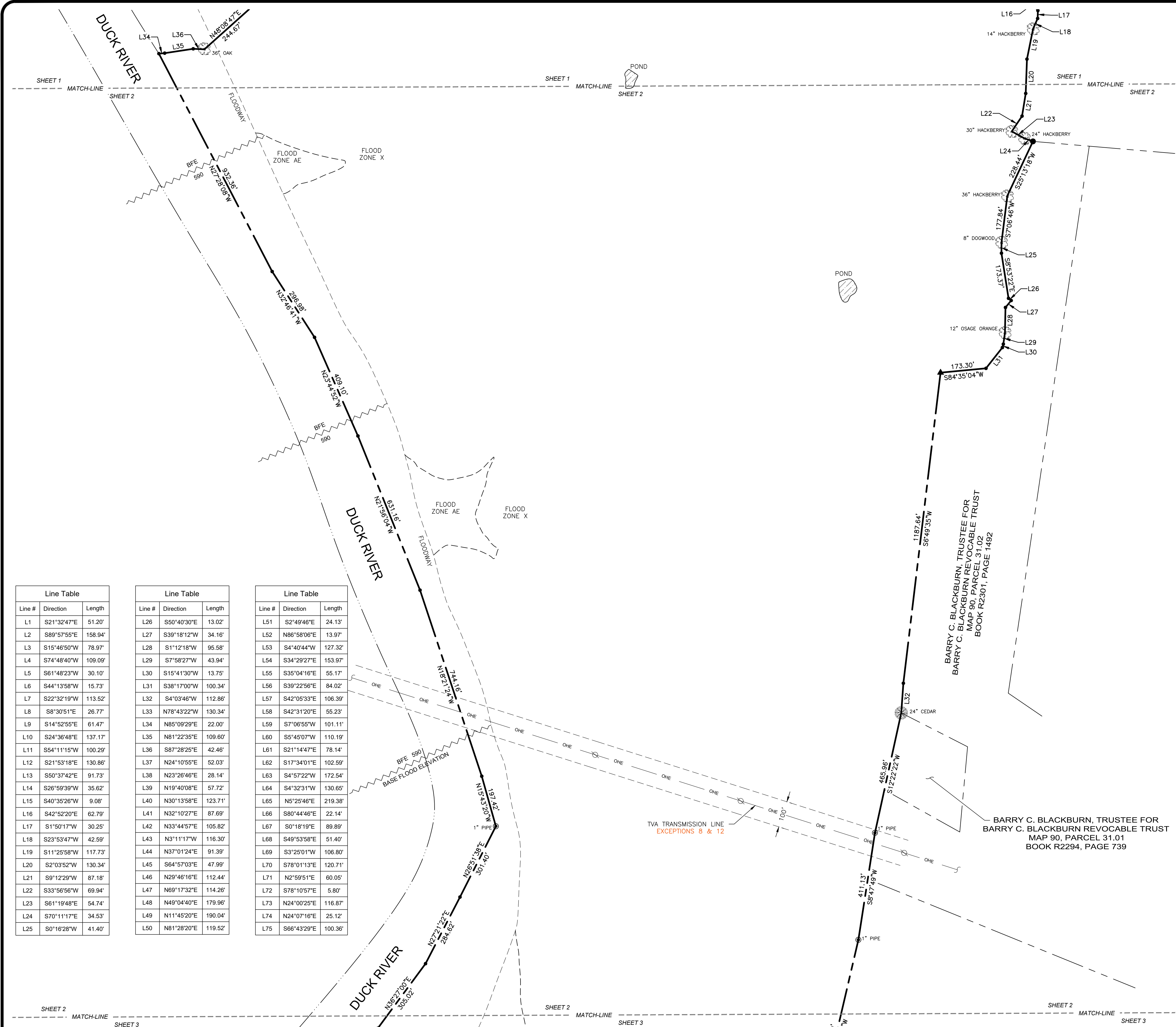
Nick Brannum
PROPERTY OWNER SIGNATURE

10-05-2023
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			





Line Table		
Line #	Direction	Length
L1	S21°32'47"E	51.20'
L2	S89°57'55"E	158.94'
L3	S15°46'50"W	78.97'
L4	S74°48'40"W	109.09'
L5	S61°48'23"W	30.10'
L6	S44°13'58"W	15.73'
L7	S22°32'19"W	113.52'
L8	S8°30'51"E	26.77'
L9	S14°52'55"E	61.47'
L10	S24°36'48"E	137.17'
L11	S54°11'15"W	100.29'
L12	S21°53'18"E	130.86'
L13	S50°37'42"E	91.73'
L14	S26°59'39"W	35.62'
L15	S40°35'26"W	9.08'
L16	S42°52'20"E	62.79'
L17	S1°50'17"W	30.25'
L18	S23°53'47"W	42.59'
L19	S11°25'58"W	117.73'
L20	S2°03'52"W	130.34'
L21	S9°12'29"W	87.18'
L22	S33°56'56"W	69.94'
L23	S61°19'48"E	54.74'
L24	S70°11'17"E	34.53'
L25	S0°16'28"W	41.40'

Line Table		
Line #	Direction	Length
L26	S50°40'30"E	13.02'
L27	S39°18'12"W	34.16'
L28	S1°12'18"W	95.58'
L29	S7°58'27"W	43.94'
L30	S15°41'30"W	13.75'
L31	S38°17'00"W	100.34'
L32	S4°03'46"W	112.86'
L33	N78°43'22"W	130.34'
L34	N85°09'29"E	22.00'
L35	N81°22'35"E	109.60'
L36	S87°28'25"E	42.46'
L37	N24°10'55"E	52.03'
L38	N23°26'46"E	28.14'
L39	N19°40'08"E	57.72'
L40	N30°13'58"E	123.71'
L41	N32°10'27"E	87.69'
L42	N33°44'57"E	105.82'
L43	N3°11'17"W	116.30'
L44	N37°01'24"E	91.39'
L45	S64°57'03"E	47.99'
L46	N29°46'16"E	112.44'
L47	N69°17'32"E	114.26'
L48	N49°04'00"E	179.96'
L49	N11°45'20"E	190.04'
L50	N81°28'20"E	119.52'

Line Table		
Line #	Direction	Length
L51	S2°49'46"E	24.13'
L52	N86°58'06"E	13.97'
L53	S4°40'44"W	127.32'
L54	S34°29'27"E	153.97'
L55	S35°04'16"E	55.17'
L56	S39°22'56"E	84.02'
L57	S42°05'33"E	106.39'
L58	S42°31'20"E	55.23'
L59	S7°06'55"W	101.11'
L60	S5°45'07"W	110.19'
L61	S21°14'47"E	78.14'
L62	S17°34'01"E	102.59'
L63	S4°57'22"W	172.54'
L64	S4°32'31"W	130.65'
L65	N5°25'46"E	219.38'
L66	S80°44'46"E	22.14'
L67	S0°18'19"E	89.89'
L68	S49°53'58"E	51.40'
L69	S3°25'01"W	106.80'
L70	S78°01'13"E	120.71'
L71	N2°59'51"E	60.05'
L72	S78°10'57"E	5.80'
L73	N24°00'25"E	116.87'
L74	N24°07'16"E	25.12'
L75	S66°43'29"E	100.36'

LEGEND	
IRON PIN FOUND	●
IRON PIN SET	○
FENCE POST FOUND	●
FENCE POST SET	○
CONC. MON. FOUND	■
CONC. MON. SET	□
PK FOUND	▲
PK SET	△
UNMARKED POINT (BEND/SNAG)	•

BENCH MARK	⊙
WATER METER	⊙
WATER VALVE	⊙
FIRE HYDRANT	⊙
SANITARY SEWER MH	⊙
SANITARY SEWER CO	⊙
AREA DRAIN	⊙
CURB INLET	⊙
STORM MH	⊙

ELECTRIC METER-BOX	⊙
ELECTRIC MH	⊙
LIGHT POLE	⊙
UTILITY POLE	⊙
GUY ANCHOR	⊙
COMMUNICATION BOX	⊙
COMMUNICATION MH	⊙
GAS METER	⊙
GAS VALVE	⊙

EVERGREEN TREE	⊙
DECIDUOUS TREE	⊙
HANDICAP PARKING	⊙
SIGN	⊙
TURN LANE MARKING	⊙
MAIL BOX	⊙
CEMETERY	⊙
SANITARY SEWER	⊙
WATER	⊙

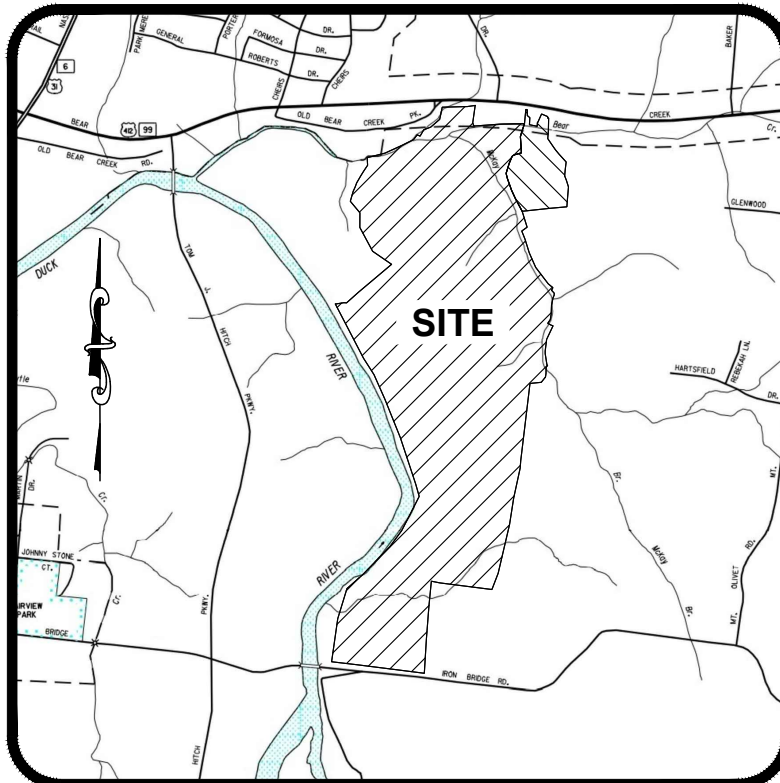
UNDERGROUND ELEC	⊙
OVERHEAD ELEC	⊙
GAS	⊙
COMMUNICATIONS	⊙
BOUNDARY	⊙
CENTERLINE	⊙
FENCE	⊙
WATER FEATURE	⊙
TREE LINE	⊙

UGE	⊙
OHE	⊙
4" G	⊙
COM	⊙
BOUNDARY	⊙
CENTERLINE	⊙
FENCE	⊙
WATER FEATURE	⊙
TREE LINE	⊙

CONTROL TABLE			
100 N 474,238.52'	E 1,672,762.90'	EL 675.03'	CAPPED ROD
101 N 472,572.21'	E 1,672,903.25'	EL 726.28'	CAPPED ROD
102 N 470,899.48'	E 1,673,280.18'	EL 728.47'	CAPPED ROD
103 N 468,089.58'	E 1,671,459.06'	EL 573.74'	CAPPED ROD
PROJECT CONTROL: TENNESSEE STATE PLANE COORDINATES. NAD83(2011), GEOID03 GRID 7 REVISED. NO DATUM ADJUSTMENT.			
GRAPHIC SCALE: 1" = 200'			

GENERAL NOTES:

- THE PURPOSE OF THIS SURVEY IS: ALTA/NSPS LAND TITLE (BOUNDARY)
- THE ADDRESS OF THIS PROPERTY IS: 400 & 420 BEAR CREEK PIKE - COLUMBIA, TN 37401
- SUBJECT PROPERTY IS PRESENTLY IDENTIFIED AS PARCELS 12.01 & 16, ON MAURY COUNTY TAX MAP 90. SAID PARCEL IS FURTHER IDENTIFIED AS ALL OF THE PROPERTY DESCRIBED IN DEED BOOK R2051, PAGE 792; AND BOOK R2060, PAGE 129, REGISTERS OFFICE OF MAURY COUNTY, TENNESSEE.
- SUBSURFACE AND ENVIRONMENTAL CONDITIONS WERE NOT EXAMINED OR CONSIDERED AS A PART OF THIS SURVEY.
- EVERY DOCUMENT OF RECORD REVIEWED AND CONSIDERED AS A PART OF THIS SURVEY IS NOTED HEREON. ONLY THE DOCUMENTS NOTED HEREON WERE SUPPLIED TO THE SURVEYOR. OTHER DOCUMENTS OF RECORD MAY EXIST THAT WOULD AFFECT THIS PARCEL.
- THE WORD "CERTIFY" IS AN EXPRESSION OF PROFESSIONAL OPINION REGARDING THE FACTS OF THE SURVEY AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EXPRESSED OR IMPLIED. DECLARATION IS MADE TO THE SPECIFICALLY NAMED PARTIES AND IS NOT TRANSFERABLE TO ADDITIONAL PERSONS, INSTITUTIONS OR SUBSEQUENT OWNERS OF THE SUBJECT PROPERTY.
- THIS SURVEY WAS CONDUCTED WITH THE BENEFIT OF A TITLE REPORT ISSUED BY FIDELITY NATIONAL TITLE INSURANCE COMPANY, COMMITMENT NO. 14203-21, DATED NOVEMBER 12, 2021 AT 8:00AM AND IS SUBJECT TO ITS FINDINGS. THERE MAY BE OTHER IMPROVEMENTS OR ENCUMBRANCES THAT AFFECT THE PROPERTY SINCE THE ISSUANCE OF THE REPORT.
- BEARINGS SHOWN HEREON ARE BASED ON THE TENNESSEE STATE PLANE COORDINATE SYSTEM (NAD83). ELEVATIONS SHOWN HEREON ARE BASED ON NAVD88.
- ALL CORNERS SHOWN ON THE FACE OF THE SURVEY ARE MARKED EITHER FOUND OR SET. ANY MISSING CORNERS ARE MARKED WITH AN IRON ROD AND CAP BEARING THIS SURVEYORS COMPANY NAME.
- UTILITIES SHOWN HEREON WERE COMPILED FROM VISIBLE STRUCTURES AT THE SITE, INFORMATION FROM PLANS, AND PHYSICAL MARKINGS AND COMBINED TO DEVELOP A VIEW OF THE UNDERGROUND UTILITIES. HOWEVER, LACKING EXCAVATION, THE EXACT LOCATION OF UNDERGROUND FEATURES CANNOT BE ACCURATELY, COMPLETELY, AND RELIABLY DEPICTED. IN ADDITION, IN SOME JURISDICTIONS, 811 OR OTHER SIMILAR UTILITY LOCATE REQUESTS FROM SURVEYORS MAY BE IGNORED OR RESULT IN AN INCOMPLETE RESPONSE. THIS SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THIS SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. VERIFICATION OF EXISTENCE, LOCATIONS, AND DEPTH SHOULD BE MADE BEFORE CONDUCTING ANY EXCAVATION IN THE VICINITY OF THE UTILITY.
- BY SCALED MAP LOCATION AND GRAPHIC PLOTTING ONLY, PORTIONS OF THIS PROPERTY ARE LYING WITHIN ZONE "AE" AS DESIGNATED ON CURRENT FEDERAL EMERGENCY MANAGEMENT AGENCY MAP NOS. 47119C0170E, 47119C0190E, 47119C0285E, 47119C0305E, WITH EFFECTIVE DATES OF APRIL 16, 2007, WHICH MAKES UP A PART OF THE NATIONAL FLOOD INSURANCE PROGRAM. BASE FLOOD ELEVATIONS FOR THIS PROPERTY ARE 590 ALONG THE DUCK RIVER AND 588 ALONG BEAR CREEK. ZONE "AE" IS AN AREA WHERE BASE FLOOD ELEVATIONS HAVE BEEN DETERMINED. ZONE "X" IS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.
- I HEREBY CERTIFY THAT THIS IS A CATEGORY IV SURVEY AND WAS CONDUCTED IN ACCORDANCE WITH RULE 0820-03-11 (GLOBAL POSITION SYSTEMS SURVEYS) ACCORDING TO THE CURRENT TENNESSEE MINIMUM STANDARDS OF PRACTICE AS PROMULGATED BY THE TENNESSEE STATE BOARD OF EXAMINERS FOR LAND SURVEYORS. THIS SURVEY WAS CONDUCTED WITH DUAL-FREQUENCY RTK GPS EQUIPMENT BASED ON THE TDOT C.O.R.S. NETWORK.
 - POSITIONAL ACCURACY: 0.08"
 - DATE OF SURVEY: 01/04/2022
 - HORIZONTAL ZONE/DATUM: TN-4100NAD83(2011) - TENNESSEE STATE PLANE COORDINATES.
 - OCCUPATIONS FOR CONTROL POINTS ARE 3 MINUTES EACH, SIDE SHOTS ARE 3 SECONDS.
 - VERTICAL DATUM: NAVD88 (GEOID03, GRID 7 REVISED)
 - NO COMBINED GRID FACTORS WERE USED.
- THERE WAS NO EVIDENCE OF RECENT EARTH MOVING AT THE TIME OF SURVEY.
- THERE ARE NO KNOWN CHANGES TO THE STREET ROW AT THE TIME OF SURVEY.
- THERE WAS NO EVIDENCE OF DELINEATED WETLANDS AT THE TIME OF SURVEY, HOWEVER, SHOWN ON THE SURVEY ARE CLASSIFIED FRESHWATER PONDS AND STREAMS. FURTHER DETAILS CAN BE FOUND ON WETLAND MAPPER WEBSITE. <https://www.fws.gov/wetlands/data/mapper.html>
- EXCEPT AS NOTED, THERE WAS NO EVIDENCE OF ENCROACHMENTS AT THE TIME OF SURVEY.
- THE LOCATIONS OF STRUCTURES ARE APPROXIMATE FROM SATELLITE IMAGERY.

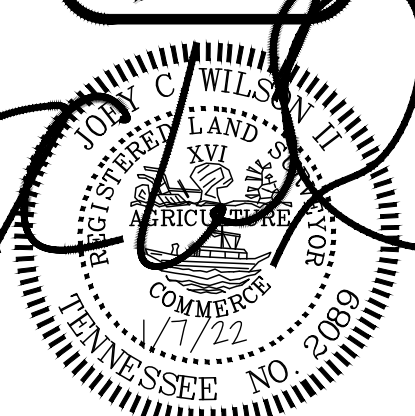


VICINITY MAP
NOT TO SCALE

COMMENT	
NO.	DATE

108 Beasley Drive
Franklin, TN
37064
615.794.2275

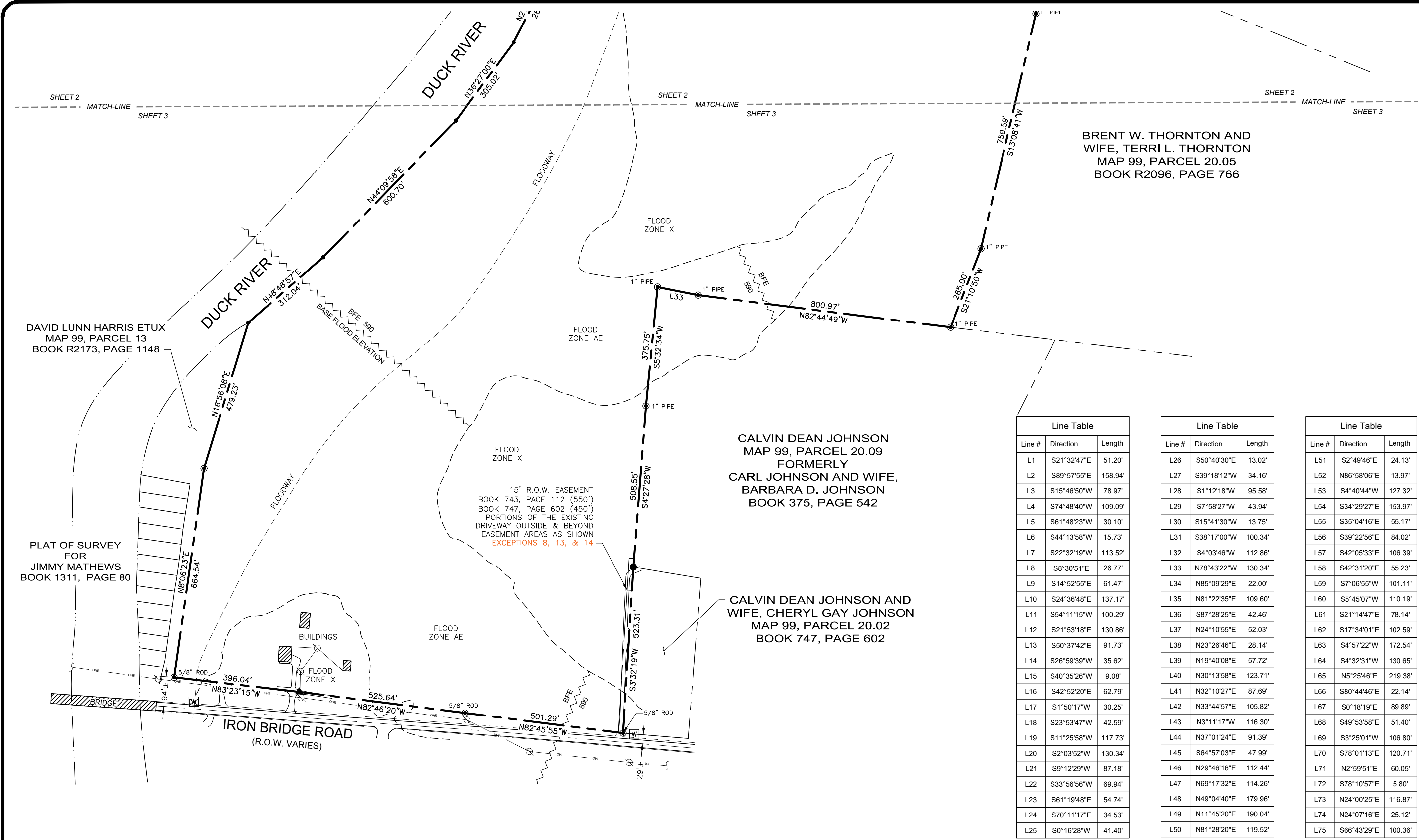
WILSON & ASSOCIATES, P.C.
Engineering/Surveying/Environmental



ALTA/NSPS LAND TITLE SURVEY
MAP 90, PARCELS 12.01 & 16
BEAR CREEK PIKE / IRON BRIDGE ROAD
MAURY COUNTY, TENNESSEE
FOR: KOLTER GROUP ACQUISITIONS, LLC

DRAWN BY: JEC
APPVD BY: JCW II
DATE: 1/7/2022
PROJ. No. 21-1801
SCALE: 1" = 200'

SHEET No.
2 OF 4



SCHEDULE B-II EXCEPTIONS:

- RIGHTS OR CLAIMS OF PARTIES IN POSSESSION NOT SHOWN BY THE PUBLIC RECORDS. **NONE OBSERVED DURING SURVEY.**
- ANY LIEN, OR RIGHT TO A LIEN, FOR SERVICES, LABOR, OR MATERIAL HERETOFORE OR HEREAFTER FURNISHED, IMPOSED BY LAW AND NOT SHOWN BY THE PUBLIC RECORDS. **NOT A SURVEY MATTER.**
- TAXES OR SPECIAL ASSESSMENTS WHICH ARE NOT SHOWN AS EXISTING LIENS BY THE PUBLIC RECORDS. **NOT A SURVEY MATTER.**
- ANY ENCROACHMENT, ENCUMBRANCE, VIOLATION, VARIATION, OR ADVERSE CIRCUMSTANCES AFFECTING THE TITLE THAT WOULD BE DISCLOSED BY AN ACCURATE AND COMPLETE LAND SURVEY OF THE LAND. **NO ENCROACHMENTS OBSERVED DURING SURVEY EXCEPT AS NOTED.**
- EASEMENTS OR CLAIMS OF EASEMENTS NOT SHOWN BY THE PUBLIC RECORDS. **DRIVEWAY USE EXTENDS OUTSIDE AND BEYOND EASEMENT AREA AS SHOWN - SEE ALSO ITEMS 13 & 14.**
- ANY DEFECT, LIEN, ENCUMBRANCE, ADVERSE CLAIM, OR OTHER MATTER THAT APPEARS FOR THE FIRST TIME IN THE PUBLIC RECORDS OR IS CREATED, ATTACHES, OR IS DISCLOSED BETWEEN THE COMMITMENT DATE AND THE DATE ON WHICH ALL OF THE SCHEDULE B, PART I-REQUIREMENTS ARE MET. **NOT A SURVEY MATTER.**
- 2022 AND SUBSEQUENT YEARS MAURY COUNTY, TENNESSEE AND CITY OF COLUMBIA REAL PROPERTY TAXES AND/OR ASSESSMENTS WHICH CONSTITUTE A LIEN UPON SAID REAL PROPERTY UNTIL PAID. IF IMPROVEMENTS ARE COMPLETED AFTER JANUARY 1 OF ANY YEAR, THE LAW REQUIRES SUPPLEMENTAL ASSESSMENT FOR THE YEAR IN WHICH IMPROVEMENTS ARE COMPLETED AS DEFINED BY STATUTE. WE ASSUME NO LIABILITY FOR TAXES ASSESSED BY CORRECTION PURSUANT TO THE PROVISIONS OF SECTION 67-5-603, ET SEQ., TENN. CODE ANN. **NOT A SURVEY MATTER.**
- SUBJECT TO ANY AND ALL MATTERS APPEARING IN MAP OF RECORD IN PLAT BOOK P16, PAGES 53-54 IN THE MAURY COUNTY, TENNESSEE REGISTER OF DEEDS OFFICE, INCLUDING BUT NOT LIMITED TO RIGHTS OF OTHERS, IF ANY, IN AND TO THE "TRACK ROAD" ALONG THE NORTHERN PORTION OF THE EASTERN BOUNDARY; CEMETERY; TVA TRANSMISSION LINE; JOHNSON RIGHT OF WAY; LOCAL SERVICE POWER AND TELEPHONE LINES; DUCK RIVER; BEAR CREEK; OLD BEAR CREEK PIKE AND, SEWER LINE WITH MANHOLES ALONG THE NORTHERN BOUNDARY. (TRACT 1) **SHOWN ON SURVEY.**
- TITLE TO ANY PORTION OF SAID LAND LYING WITHIN THE BOUNDS OF ANY ROAD OR RIGHT OF WAY. (TRACT 1) **RIGHT OF WAY MARGINS SHOWN ON SURVEY BASED ON FOUND MONUMENTS.**
- TERMS AND CONDITIONS OF THAT CERTAIN BENEFICIAL EASEMENT IN FAVOR OF N.W. DANIELLEY AND WIFE, RUTH A. DANIELLEY FOR THE PURPOSE OF RIGHT IN AND TO A SPRING OF RECORD IN BOOK 319 AT PAGE 295 IN THE MAURY COUNTY REGISTER OF DEEDS OFFICE. (TRACT 1). **SPRINGS SHOWN ON SURVEY.**
- EASEMENT IN FAVOR OF MAURY COUNTY, TENNESSEE FOR RIGHT OF WAY FOR ROAD PURPOSES (IRON BRIDGE ROAD) OF RECORD IN BOOK 387 AT PAGE 497 IN THE MAURY COUNTY REGISTER OF DEEDS OFFICE. (TRACT 1). **EXISTING IRON BRIDGE ROAD IS SHOWN ON SURVEY.**

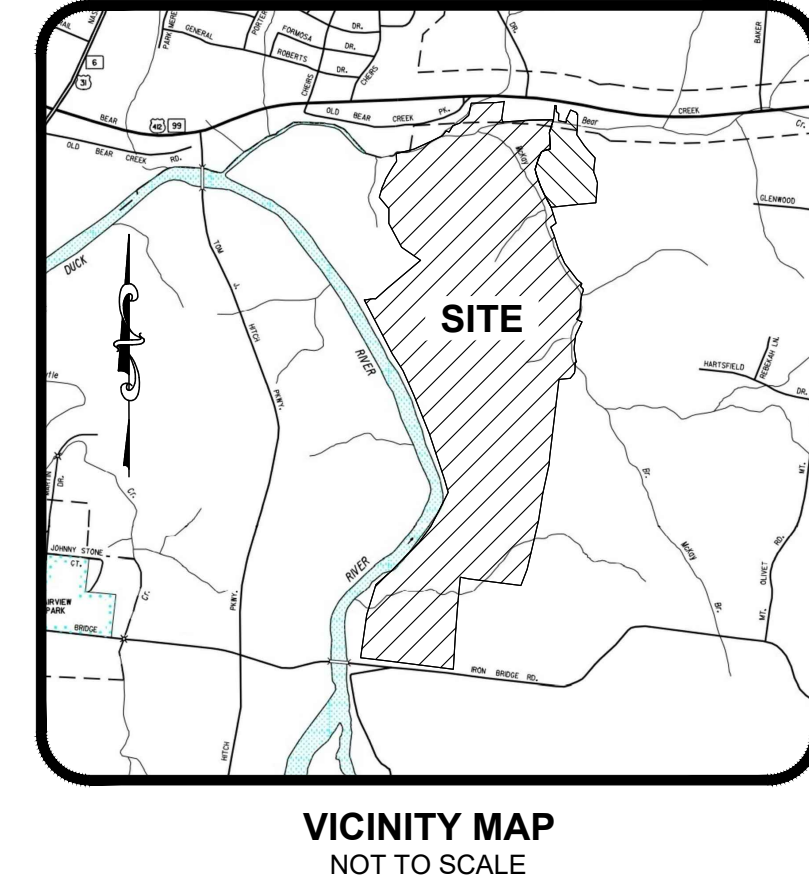
- EASEMENT IN FAVOR OF TVA FOR THE PURPOSE OF ELECTRIC TRANSMISSION LINES AS REFERENCED IN CURRENT VESTING DEED OF RECORD IN BOOK R401 AT PAGE 732 IN THE MAURY COUNTY, TENNESSEE REGISTER OF DEEDS OFFICE. (TRACT 1) **SHOWN ON SURVEY.**
- EASEMENT IN FAVOR OF CALVIN DEAN JOHNSON FOR THE PURPOSE OF RIGHT OF WAY OF RECORD IN BOOK 747 AT PAGE 602 IN THE MAURY COUNTY REGISTER OF DEEDS OFFICE. (TRACT 1). **SHOWN ON SURVEY.**
- EASEMENT IN FAVOR OF CARL JOHNSON ETUX BARBARA D. JOHNSON FOR THE PURPOSE OF RIGHT OF WAY OF RECORD IN BOOK 743 AT PAGE 112 IN THE MAURY COUNTY REGISTER OF DEEDS OFFICE. (TRACT 1). **SHOWN ON SURVEY.**
- TITLE TO ANY PORTION OF SAID LAND LYING IN THE BED OR BANKS OF THE MCKAY BRANCH CREEK, THE RIGHTS OF UPPER AND LOWER RIPARIAN OWNERS TO THE FREE AND UNOBSTRUCTED FLOW OF THE WATER OF SAID MCKAY BRANCH CREEK, WITHOUT DIMINUTION OR POLLUTION, AND THE CONSEQUENCE OF ANY PAST OR FUTURE CHANGE IN THE LOCATION OF SAID MCKAY BRANCH CREEK. (TRACT 1) **NOT A SURVEY MATTER.**
- TITLE TO ANY PORTION OF SAID LAND LYING IN THE BED OR BANKS OF THE DUCK RIVER, THE RIGHTS OF UPPER AND LOWER RIPARIAN OWNERS TO THE FREE AND UNOBSTRUCTED FLOW OF THE WATER OF SAID DUCK RIVER, WITHOUT DIMINUTION OR POLLUTION, AND THE CONSEQUENCE OF ANY PAST OR FUTURE CHANGE IN THE LOCATION OF SAID DUCK RIVER. (TRACT 1) **NOT A SURVEY MATTER.**
- TITLE TO ANY PORTION OF SAID LAND LYING IN THE BED OR BANKS OF THE BEAR CREEK, THE RIGHTS OF UPPER AND LOWER RIPARIAN OWNERS TO THE FREE AND UNOBSTRUCTED FLOW OF THE WATER OF SAID BEAR CREEK, WITHOUT DIMINUTION OR POLLUTION, AND THE CONSEQUENCE OF ANY PAST OR FUTURE CHANGE IN THE LOCATION OF SAID BEAR CREEK. (TRACT 1) **NOT A SURVEY MATTER.**
- RIGHTS OF OTHERS IN AND TO THE CEMETERY LOCATED ON SUBJECT PROPERTY AND THE RIGHTS OF INGRESS AND EGRESS THERETO. (TRACT 1). **CEMETERY SHOWN ON SURVEY.**
- EASEMENT IN FAVOR OF CITY OF COLUMBIA, TN FOR THE PURPOSE OF RIGHT OF WAY FOR SEWER/UTILITY EASEMENT OF RECORD IN BOOK R1801 AT PAGE 828 IN THE MAURY COUNTY REGISTER OF DEEDS OFFICE. (TRACT 1). **EXISTING SEWER LINES SHOWN ON SURVEY.**
- EASEMENT IN FAVOR OF CITY OF COLUMBIA, TN FOR THE PURPOSE OF RIGHT OF WAY FOR SEWER/UTILITY EASEMENT OF RECORD IN BOOK R1801 AT PAGE 831 IN THE MAURY COUNTY REGISTER OF DEEDS OFFICE. (TRACT 1). **EXISTING SEWER LINES SHOWN ON SURVEY.**
- SUBJECT TO ALL MATTERS SHOWN ON UNRECORDED SURVEY OF S. K. ADKINS DATED JULY 14, 2008. (TRACT 1) **DOCUMENT WAS NOT PROVIDED.**
- SPECIAL PROPERTY TAX ASSESSMENT (I.E. ROLL-BACK TAX), IF APPLICABLE, PURSUANT TO T.C.A. SECTION 67-5-1008 (D) (THE AGRICULTURAL, FOREST, AND OPEN SPACE LAND ACT OF 1976), AS MOST RECENTLY AMENDED. GREENBELT APPLICATION OF RECORD IN BOOK G5 AT PAGE 218 IN THE MAURY COUNTY, TENNESSEE REGISTER OF DEEDS OFFICE. (TRACT 1). **NOT A SURVEY MATTER.**
- ANY INACCURACY IN THE AREA, SQUARE FOOTAGE, OR ACREAGE OF LAND DESCRIBED IN PROPERTY DESCRIPTION OR ATTACHED PLAT, IF ANY, THE COMPANY DOES NOT INSURE THE AREA, SQUARE FOOTAGE, OR ACREAGE OF THE LAND. (TRACT 1) **AREAS NOTED ARE CORRECT.**
- EASEMENT FOR THE PURPOSE OF INGRESS/EGRESS RIGHT OF WAY OVER THE LANDS OF THOMPSON AND RIGHTS TO OBTAIN WATER FROM SPRING NOTED IN DEED OF RECORD IN BOOK 537 AT PAGE 671 IN THE MAURY COUNTY REGISTER OF DEEDS OFFICE. (TRACT 2) **SPRING SHOWN ON SURVEY.**
- EASEMENTS IN FAVOR OF JAMES A. HARDISON AND WIFE, MARJORIE J. HARDISON FOR THE PURPOSE OF INGRESS/EGRESS OF RECORD IN BOOK 513 AT PAGE 220 AND BOOK 483 AT PAGE 527 IN THE MAURY COUNTY, TENNESSEE REGISTER OF DEEDS OFFICE. (TRACT 2).
- EASEMENT IN FAVOR OF J. W. THOMPSON OR 'ANYONE ELSE' FOR THE PURPOSE OF OBTAINING SPRING WATER OF RECORD IN BOOK 441 AT PAGE 504 IN THE MAURY COUNTY, TENNESSEE REGISTER OF DEEDS OFFICE. (TRACT 2) **SPRING SHOWN ON SURVEY.**
- TITLE TO THAT PORTION OF THE PROPERTY WITHIN THE BOUNDS OF OLD BEAR CREEK PIKE. (TRACT 2) **RIGHT OF WAY MARGINS SHOWN ON SURVEY BASED ON FOUND MONUMENTS. RAILROAD SPIKES FOUND IN THE REMNANTS OF PAVEMENT - MAY BE SUBJECT TO RIGHT OF WAY - LEGAL QUESTION REGARDING ABANDONMENT - MINIMAL AREA IN QUESTION.**
- TITLE TO ANY PORTION OF SAID LAND LYING IN THE BED OR BANKS OF THE BEAR CREEK, THE RIGHTS OF UPPER AND LOWER RIPARIAN OWNERS TO THE FREE AND UNOBSTRUCTED FLOW OF THE WATER OF SAID BEAR CREEK, WITHOUT DIMINUTION OR POLLUTION, AND THE CONSEQUENCE OF ANY PAST OR FUTURE CHANGE IN THE LOCATION OF SAID BEAR CREEK. (TRACT2) **NOT A SURVEY MATTER.**
- ANY INACCURACY IN THE AREA, SQUARE FOOTAGE, OR ACREAGE OF LAND DESCRIBED IN PROPERTY DESCRIPTION OR ATTACHED PLAT, IF ANY, THE COMPANY DOES NOT INSURE THE AREA, SQUARE FOOTAGE, OR ACREAGE OF THE LAND. (TRACT 2) **AREAS NOTED ARE CORRECT.**
- SPECIAL PROPERTY TAX ASSESSMENT (I.E. ROLL-BACK TAX), IF APPLICABLE, PURSUANT TO T.C.A. SECTION 67-5-1008 (D) (THE AGRICULTURAL, FOREST, AND OPEN SPACE LAND ACT OF 1976), AS MOST RECENTLY AMENDED. GREENBELT APPLICATION OF RECORD IN BOOK G5 AT PAGE 275 IN THE MAURY COUNTY, TENNESSEE REGISTER OF DEEDS OFFICE. (TRACT 2) **NOT A SURVEY MATTER.**
- TITLE TO ANY PORTION OF SAID LAND LYING WITHIN THE BOUNDS OF ANY ROAD OR RIGHT OF WAY. (TRACT 2) **RIGHT OF WAY MARGINS SHOWN ON SURVEY BASED ON FOUND MONUMENTS.**

LEGEND	IRON PIN FOUND		BENCH MARK		ELECTRIC METER-BOX		EVERGREEN TREE		UNDERGROUND ELEC		UGE	
	IRON PIN SET		WATER METER		ELECTRIC MH		DECIDUOUS TREE		OVERHEAD ELEC		OHE	
	FENCE POST FOUND		WATER VALVE		LIGHT POLE		HANDICAP PARKING		GAS		4" G	
	FENCE POST SET		FIRE HYDRANT		UTILITY POLE		SIGN		COMMUNICATIONS		COM	
	CONC. MON. FOUND		SANITARY SEWER MH		GUY ANCHOR		TURN LANE MARKING		BOUNDARY			
	CONC. MON. SET		SANITARY SEWER CO		COMMUNICATION BOX		MAIL BOX		CENTERLINE			
	PK FOUND		AREA DRAIN		COMMUNICATION MH		CEMETERY		FENCE		X	
	PK SET		CURB INLET		GAS METER		SANITARY SEWER		WATER FEATURE			
	UNMARKED POINT (BEND/SNAG)		STORM MH		GAS VALVE		WATER		TREE LINE			

CONTROL TABLE			
100 N 474,238.52'	E 1,672,762.90'	EL 675.03'	CAPPED ROD
101 N 472,572.21'	E 1,672,903.25'	EL 726.28'	CAPPED ROD
102 N 470,899.48'	E 1,673,280.18'	EL 728.47'	CAPPED ROD
103 N 468,089.58'	E 1,671,459.06'	EL 573.74'	CAPPED ROD
PROJECT CONTROL: TENNESSEE STATE PLANE COORDINATES. NAD83(2011), GEOID03 GRID 7 REVISED. NO DATUM ADJUSTMENT.			
GRAPHIC SCALE: 1" = 200'			

DRAWN BY: JEC
APPVD BY: JCW II
DATE: 1/7/2022
PROJ. No. 21-1801
SCALE: 1" = 200'

SHEET No.
3 OF 4



VICINITY MAP
NOT TO SCALE

CERTIFICATION OF SURVEY FOR ALTA/NSPS LAND
TITLE SURVEYS

TO: (I) KOLTER GROUP ACQUISITIONS, LLC, AND (II) FIDELITY NATIONAL TITLE INSURANCE COMPANY/OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY.

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 2, 3, 4, 8, 11(OBSERVED), 13, 14, 16, 17, 18, AND 19, OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON 01/04/22.

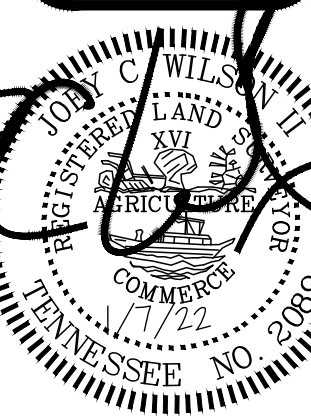
JOEY C. WILSON II, PE, RLS
TN PE No.: 106976
TN RLS No.: 2089
1/7/22

LEGAL DESCRIPTIONS BASED ON THIS SURVEY WILL BE PROVIDED ON SHEET NUMBER 4 AFTER TITLE COMMENTS AND QUESTIONS HAVE BEEN ADDRESSED.

ALTA/NSPS LAND TITLE SURVEY
MAP 90, PARCELS 12.01 & 16
BEAR CREEK PIKE / IRON BRIDGE ROAD
MAURY COUNTY, TENNESSEE
FOR: KOLTER GROUP ACQUISITIONS, LLC

NO.	DATE	COMMENT

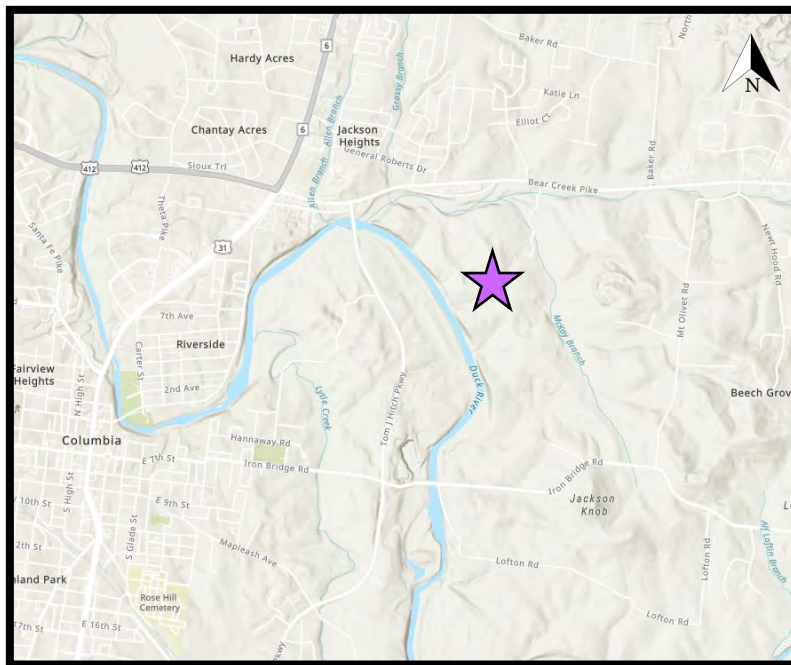
108 Beasley Drive
Franklin, TN
37064
615.794.2275



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

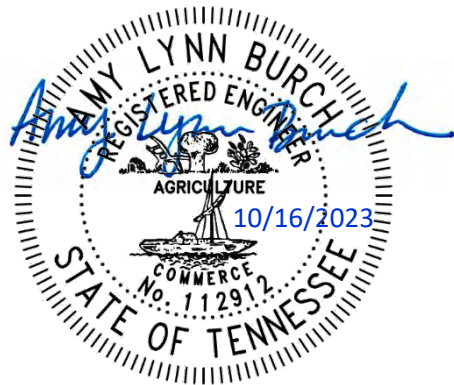


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1. Executive Summary

A TIS for the site (previously named "Big Bear Bluff Master Plan") was submitted 3/21/2022 and revised 4/18/2022. The previous development plan included a total of 810 single-family lots, 300 townhomes, and 300 multifamily units.

The Columbia Bluffs development is proposed to be located between Bear Creek Pike and Iron Bridge Road, east of the Duck River in Columbia, TN. A total of 860 dwelling units (472 single-family lots, 188 townhome units, and 200 active adult units) and a 14,000 square-foot day care center are proposed for the 412-acre property. The property is currently undeveloped farmland that is proposed to be annexed as a planned unit development (PUD). Primary vehicular site access will be located on Bear Creek Pike aligned with Patterson Drive. Secondary vehicular site access will be located on Iron Bridge Road. A development of this size will be constructed over several phases. For the purposes of this traffic study, two development scenarios were analyzed. Per the developer, Kolter Group Acquisitions LLC, Phases 1-3 are expected to be completed in approximately eight years, which corresponds to a 2031 horizon year. The Full Buildout (Phases 1-6) is expected to be completed in approximately eleven years, which corresponds to a 2034 horizon year. The new roadway connection to Iron Bridge Road to the south is not planned to be constructed until after Phase 3.

The analyses presented in this report indicate that the proposed development will generate new vehicular traffic to the study area. Following Full Buildout of the Columbia Bluffs development, the project is expected to generate approximately 7,324 daily trips, 658 AM peak hour trips, and 768 PM peak hour trips. Phases 1-3 of the development will include approximately 50% of the total number of dwelling units and will include the day care center. Phases 1-3 are expected to generate approximately 4,149 daily trips, 399 AM peak hour trips, and 475 PM peak hour trips.

Based on the analyses presented in this study and review of the study area and proposed development information, the following is recommended in order to accommodate the proposed development and provide for efficient traffic operations and safety:

Recommendations Associated with Phases 1-3 Scenario

The initial phases of development will require off-site improvements and as well as improvements to accommodate the primary access onto Bear Creek Pike. The following improvements should be coordinated with the City and could be phased in during construction of Phases 1, 2, and 3 of the development.

#1 Nashville Highway (US 31) and Bear Creek Pike/US 43

Laneage and traffic signal improvements are expected to be completed by the City/TDOT at the intersection of Nashville Highway (US 31) and Bear Creek Pike/US 43. These anticipated improvements were assumed to include the addition of a westbound left turn lane and a southbound left turn lane through restriping and modifying the existing median on Nashville Highway. The provision of dual left turn lanes requires protected only left turn signal phasing for the southbound approach. Additional signal timing adjustments and coordination may be needed for the intersection following the initial phases of development for Columbia Bluffs. Additionally, lead/lag protected only left turn signal phasing is recommended for the eastbound and westbound approaches of Bear Creek Pike.

No other improvements are recommended for the intersection.

#2 Bear Creek Pike and Tom J Hitch Parkway

- Construct a northbound right turn lane on Tom J Hitch Parkway with approximately 100 feet of storage and 60 feet of taper. The northbound right turn lane could be constructed using the existing shoulder and should not extend beyond the start of the bridge over Duck River.
- Restripe the northbound approach to provide one left turn lane and one through lane, plus the recommended right turn lane.
- Modify the traffic signal design to provide a northbound right turn overlap during the westbound left turn phase.
- Optimize and coordinate the signal timing along Bear Creek Pike.

#3 Bear Creek Pike and Patterson Drive/Site Access 1

- Site Access 1 should be constructed and aligned with Patterson Drive at Bear Creek Pike.
- Site Access 1 should be designed to include width for one entering lane and two exiting lanes, which should be a northbound left turn lane and a northbound shared through/right turn lane.
- An eastbound right turn deceleration lane should be constructed for Bear Creek Drive at Site Access 1 to accommodate the project traffic. The eastbound right turn lane should be designed so that the widening and taper does not begin until east of the guardrail over Bear Creek and includes approximately 180 feet of storage and 160 feet of bay taper, or as approved by the City and TDOT.
- A westbound right turn deceleration lane is recommended for Bear Creek Pike at Patterson Drive. The westbound right turn lane should be designed to include approximately 160 feet of storage and 180 feet of bay taper or as approved by the City and TDOT.
- A westbound left turn deceleration lane is recommended for Bear Creek Pike at Site Access 1 to accommodate the project traffic. The westbound left turn lane should be designed to include approximately 225 feet of storage, 180 feet of bay taper, and 270 feet of approach taper assuming the widening is centered on the roadway.
- Install a traffic signal at the intersection of Bear Creek Pike and Patterson Drive/Site Access 1. Signal warrant analyses indicate a traffic signal will be warranted by the traffic volumes generated by the project site prior to completion of Phase 2 (or comparable number of dwelling units) or prior to completion of Phase 1 if Phase 1 includes completion of the day care center. The signal design should include protected/permissive left turn signal phasing for the northbound and westbound approaches and permissive left turn signal phasing for the southbound and eastbound approaches.
- Optimize and coordinate the signal timing along Bear Creek Pike.
- Widen the north leg of Patterson Drive to provide a southbound left turn lane. The widening of Patterson Drive and the construction of Site Access 1 should be designed and constructed such that the northbound and southbound through movements are aligned and the left turn movements can operate concurrently. The southbound left turn lane should include approximately 75 feet of storage.

#4 Bear Creek Pike and Mt Olivet Road/School Access

- Restripe the southbound approach to a shared left turn/through lane and a right turn only lane.
- Modify the traffic signal design for the northbound approach to provide protected/permissive left turn signal phasing.
- Modify the traffic signal design for the southbound approach to provide a right turn overlap during the eastbound left turn phase.

- Optimize and coordinate the signal timing along Bear Creek Pike.

#5 Tom J Hitch Parkway and Iron Bridge Road

The signalized intersection of Tom J Hitch Parkway and Iron Bridge Road is expected to continue to operate acceptably under the future projected conditions.

No improvements are expected to be needed or recommended for the intersection of Tom J Hitch Parkway and Iron Bridge Road.

#6 Iron Bridge Road and Mt Olivet Road

The critical turning movements are expected to continue to operate acceptably at the one-way stop-controlled intersection of Iron Bridge Road and Mt Olivet Road under the future projected conditions.

No improvements are expected to be needed or recommended for the intersection of Iron Bridge Road and Mt Olivet Road.

#7 James Campbell Boulevard and Tom J Hitch Parkway

Tom J Hitch Parkway terminates to the south at James Campbell Boulevard. The T-intersection currently has stop-control for the southbound approach of Tom J Hitch Parkway. The intersection experiences heavy eastbound left turns and the reciprocal southbound right turns during peak hours. The southbound left turn movement currently operates at LOS F during the AM and PM peak hours and is expected to deteriorate with higher levels of delay under the 2031 Background and 2034 Future Projected Conditions with Phases 1-3. According to the City's *Connect Columbia Transportation Plan* adopted in 2018, the intersection is identified to be signalized in the near term (10-year horizon). Preliminary signal warrant analyses indicate the intersection's traffic volumes will meet signal warrants in the near future. The following intersection improvements are recommended to be constructed prior the completion of Phase 3, or comparable number of dwelling units:

- Install a traffic signal at the intersection of James Campbell Boulevard and Tom J Hitch Parkway.
- The traffic signal design should include protected/permissive left turn signal phasing for the eastbound approach and a southbound right turn overlap.

Recommendations Associated with Full Buildout (Phases 1-6) Scenario

As outlined above, the initial phases of development for the Columbia Bluffs project will require fairly significant improvements at many of the study intersections in order to accommodate the project's traffic plus the background traffic growth expected even without the development project's construction. In addition to the recommended improvements associated with Phases 1-3 of the development, the following is recommended for the Full Buildout Scenario:

#8 Iron Bridge Road and Site Access 2

- Site Access 2 should be constructed and connected to Iron Bridge Road prior to beginning construction for Phase 4, or comparable number of dwelling units.
- Site Access 2 should be aligned with the Maury County Yanahli Park Access on Iron Bridge Road.
- At a minimum, Site Access 2 should be designed to include width for one entering lane and one exiting lane.

- Stop-control should be provided for the southbound approach of Site Access 2 at Iron Bridge Road.
- The Site Access 2 should be designed and constructed to allow for sufficient intersection sight distance, clear of any obstructions such as vegetation, landscaping, hardscaping, signs, and fencing within the departure sight triangles.
- An eastbound left turn deceleration lane is recommended for Iron Bridge Road at Site Access 2 to accommodate the project traffic. The eastbound left turn lane should be designed to include approximately 160 feet of storage, 180 feet of bay taper, and 270 feet of approach taper assuming the widening is centered on the roadway, or as approved by the City.

Additional Planned Improvements

According to the City's *Connect Columbia Transportation Plan*, significant roadway improvements have been identified for some of the intersections and roadways in the study area. However, it is important to note that the improvements are not considered to be committed projects until funding has been allocated.

- In the near term, Bear Creek Pike between Nashville Highway and Tom J Hitch Parkway is planned to be widened from 3 lanes to 5 lanes and access management along the segment.
- In the midterm, Iron Bridge Road is planned to be reconstructed to improve the substandard roadway geometry between Fairview Drive and Tom J Hitch Parkway, which would include replacing the bridge/box culvert over Lytle Creek, which currently narrows the roadway to one lane at a sag vertical crest in the roadway.
- In the long-term, Bear Creek Pike is planned to be widened to four lanes between Tom J Hitch Parkway and east of Baker Road. It should be noted that the deceleration lanes recommended for Bear Creek Pike at Site Access 1/Patterson Drive as part of the initial phases of the Columbia Bluffs development will contribute towards this long-term improvement identified along Bear Creek Pike.

#2 Bear Creek Pike and Tom J Hitch Parkway

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.

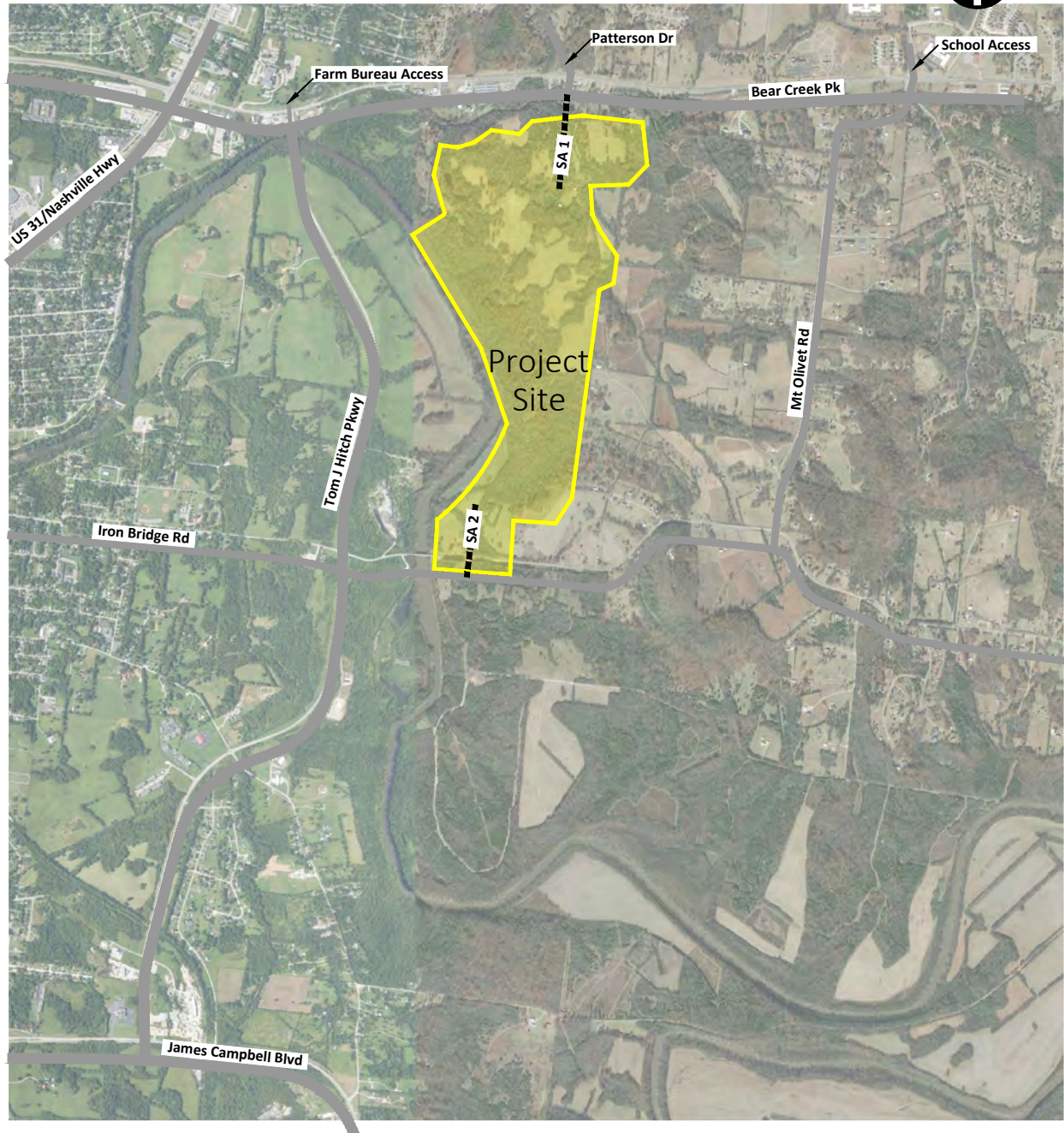
According to Kolter Group Acquisitions LLC, the construction and phasing will begin at the north end of the project site and work towards the south. The connection to Iron Bridge Road is not planned to be constructed until the beginning of Phase 4. Therefore, the following two (2) development scenarios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

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.



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.



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.



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.



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.



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.

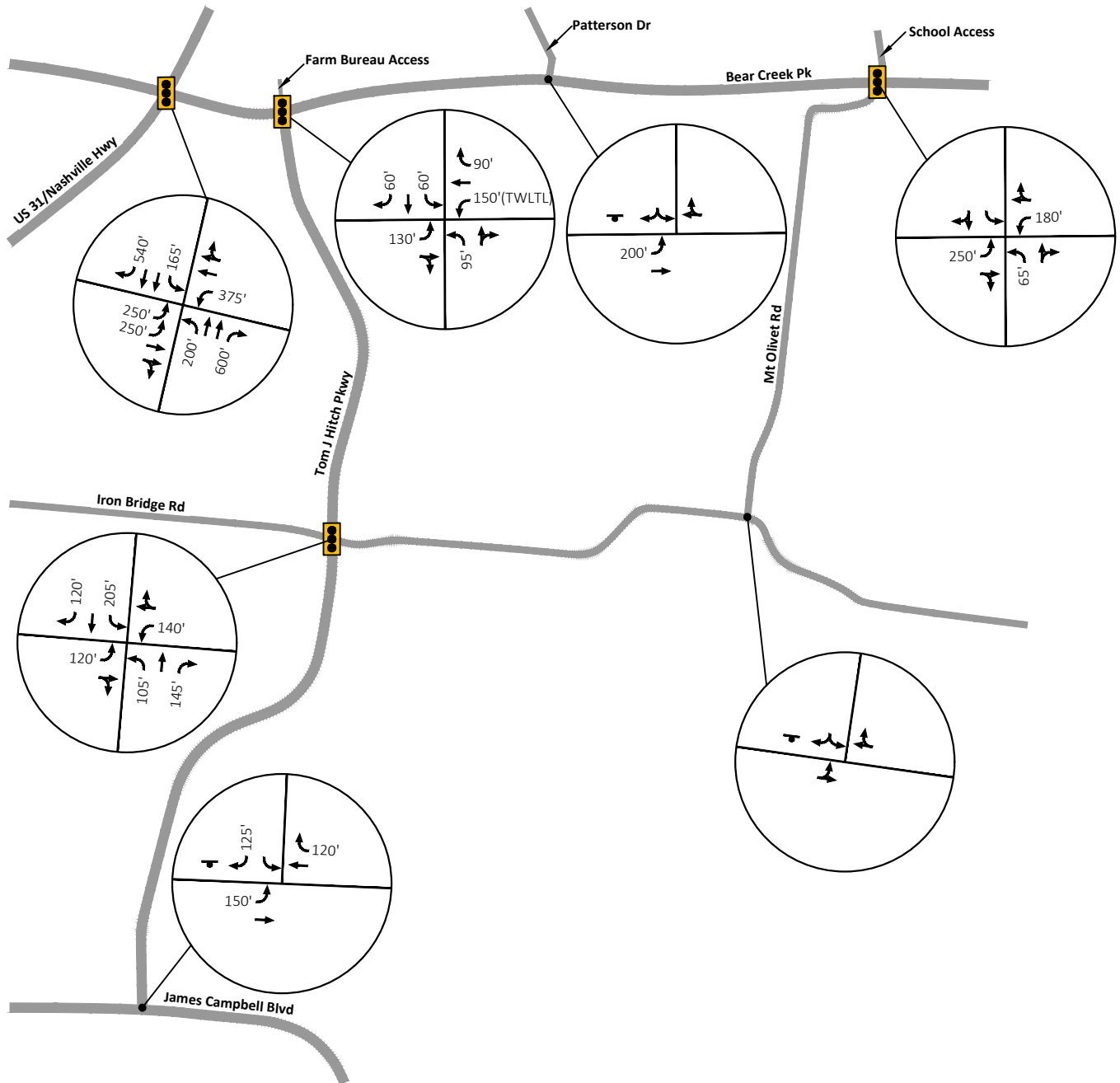
The intersection of **Iron Bridge Road and Mt Olivet Road** is unsignalized with three approaches. The eastbound approach of Iron Bridge Road includes one shared lane for left turn and through movements. The westbound approach of Iron Bridge Road includes one shared lane for through and right turn

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
- St. cotro
- rid

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.

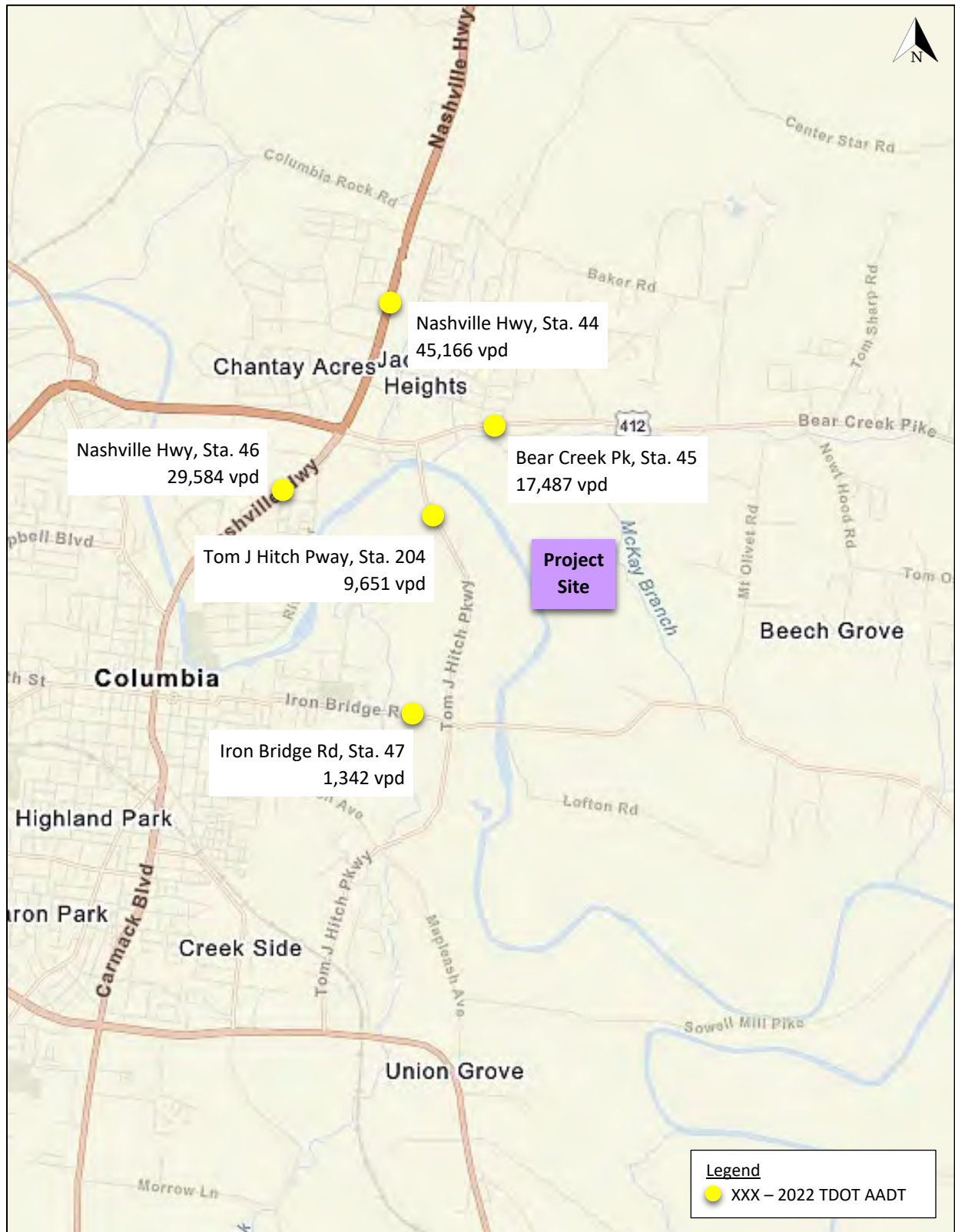
Turning movement count data conducted for the study intersections in May 2021 by Marr Traffic were obtained from a TIS prepared by Ragan-Smith for the same project site. Although the AADT comparison appears to show that traffic volumes in the study area have normalized, a peak hour comparison of the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

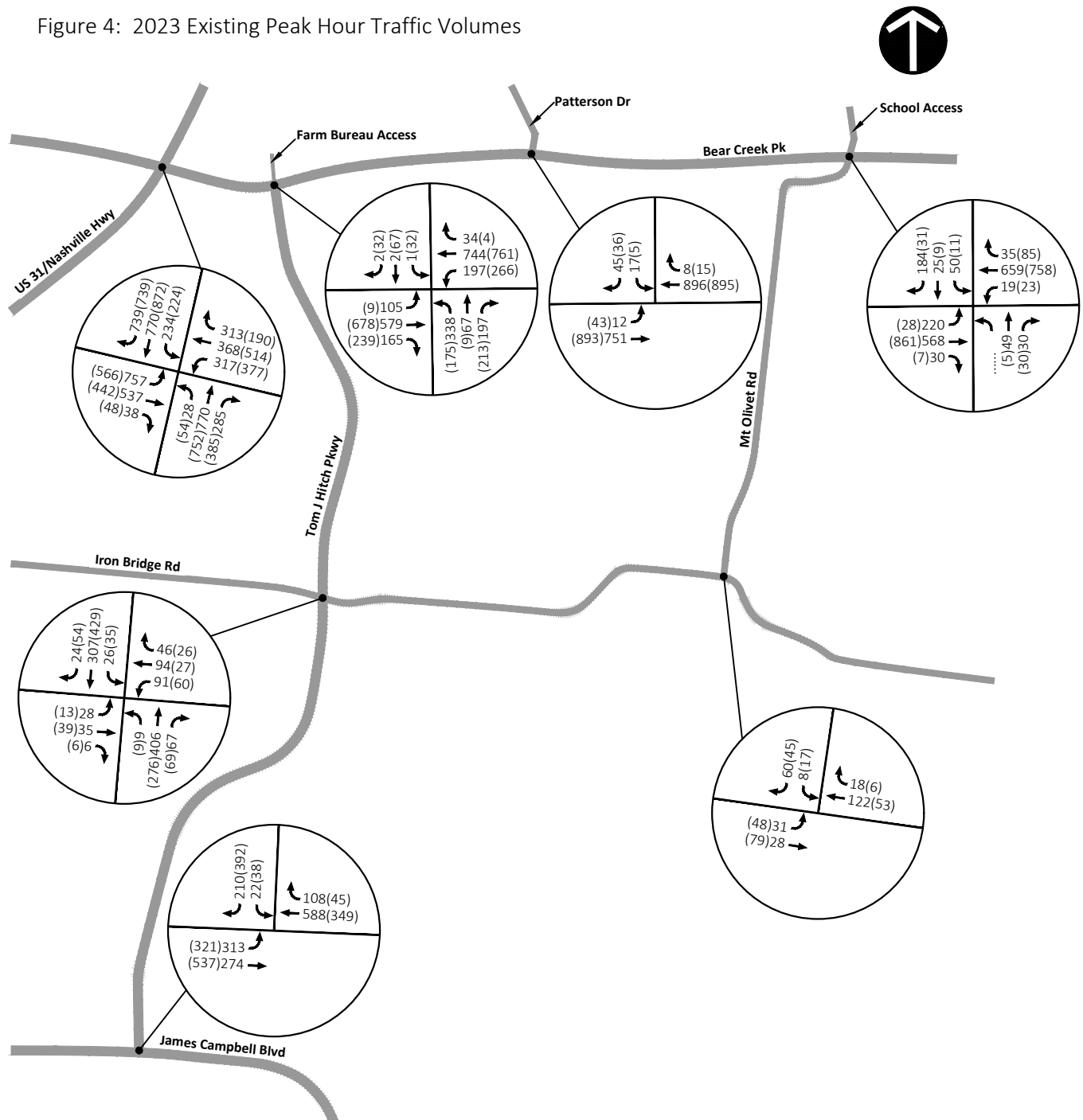
The 2023 Existing Conditions Peak Hour Traffic Volumes are presented in Figure 4. This represents the baseline conditions for the traffic analysis. The turning movement count data that was used to establish baseline conditions is included in Appendix D.

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)

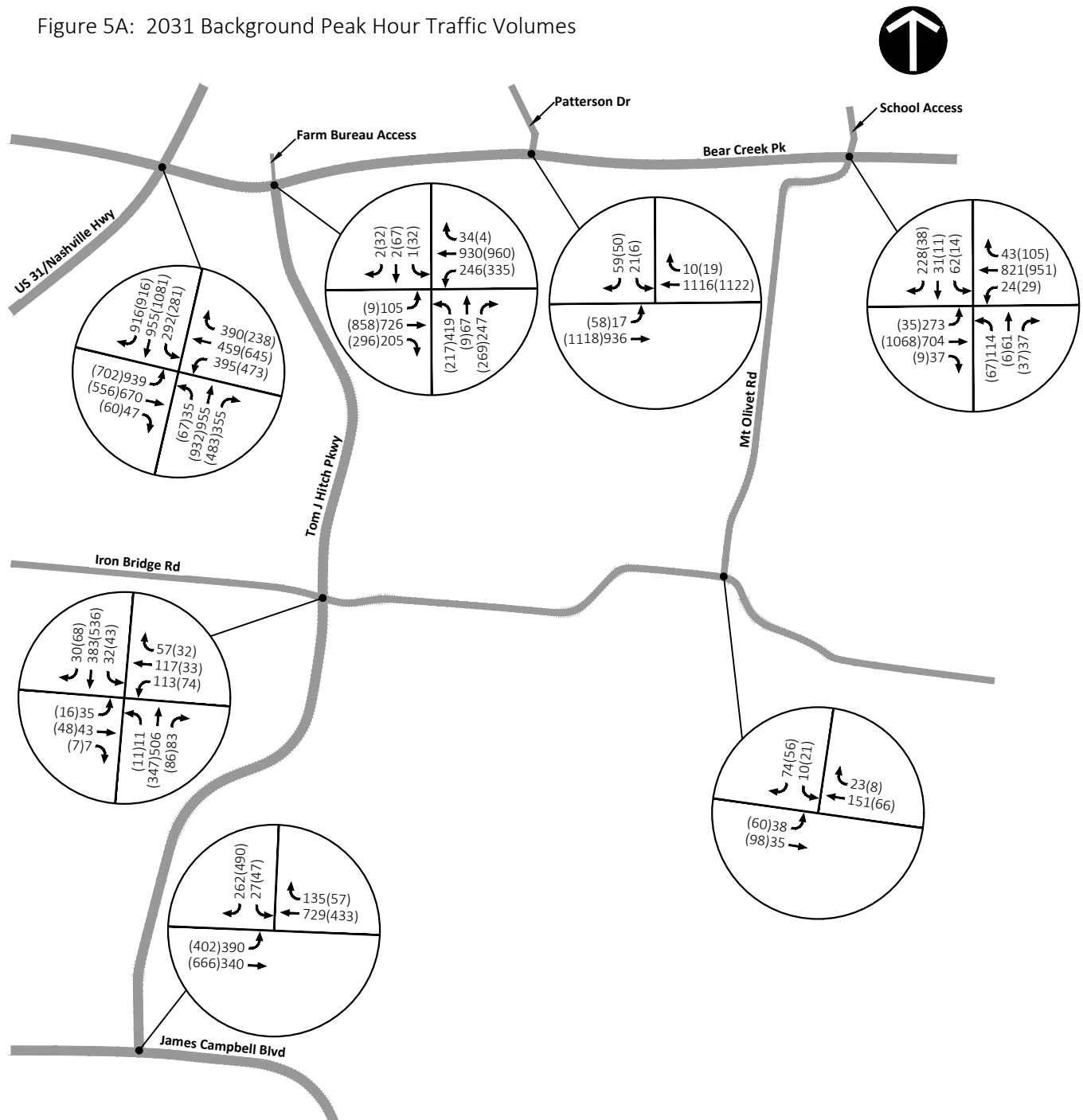
4. Background Conditions

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 2034. 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.

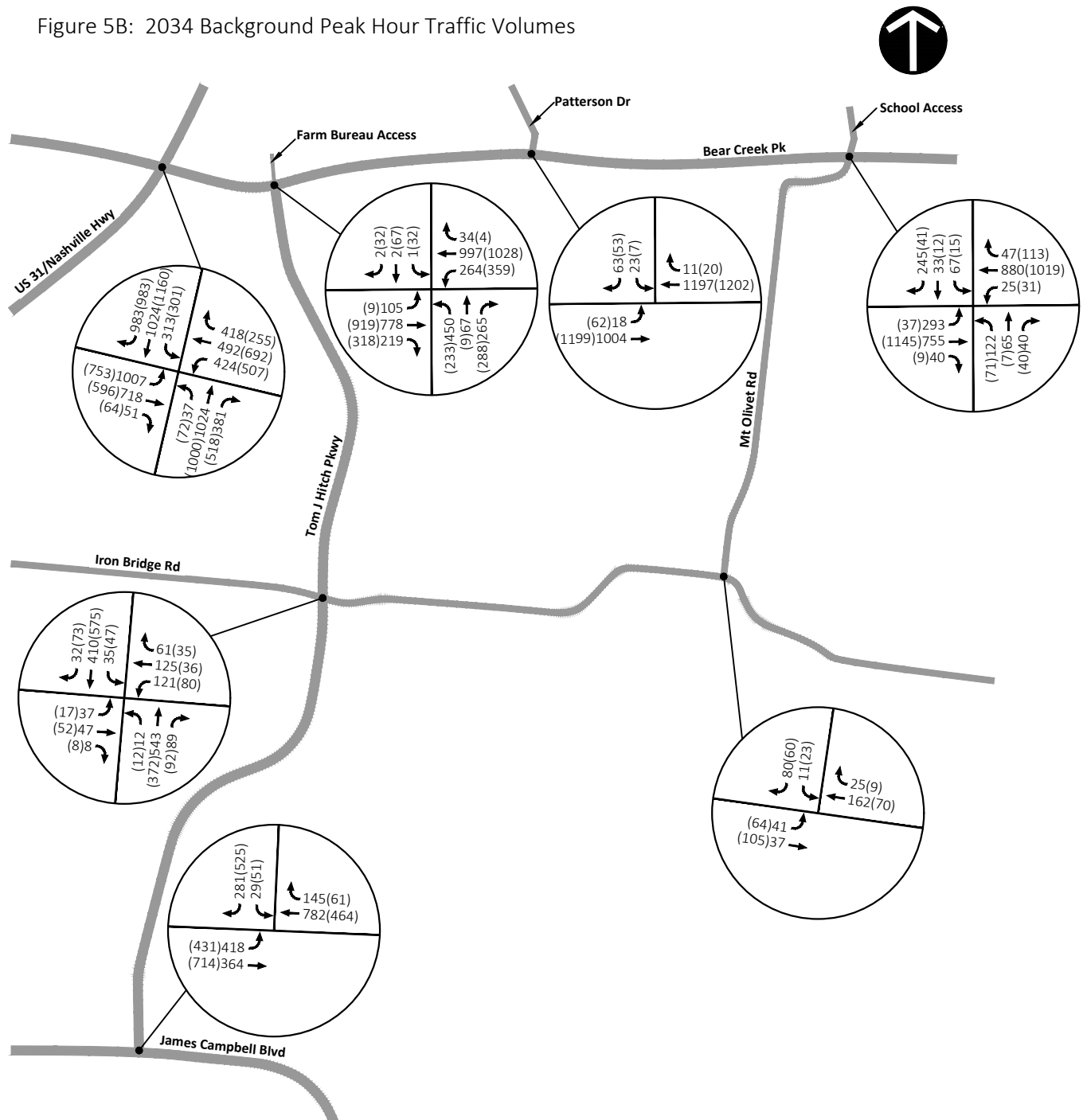
Figure 5A presents the 2031 Background Conditions Peak Hour Traffic Volumes, and Figure 5B presents the 2034 Background Conditions Peak Hour Traffic Volumes.

Figure 5A: 2031 Background Peak Hour Traffic Volumes



(Not to Scale)

Figure 5B: 2034 Background 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, 11 th Edition.								

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.

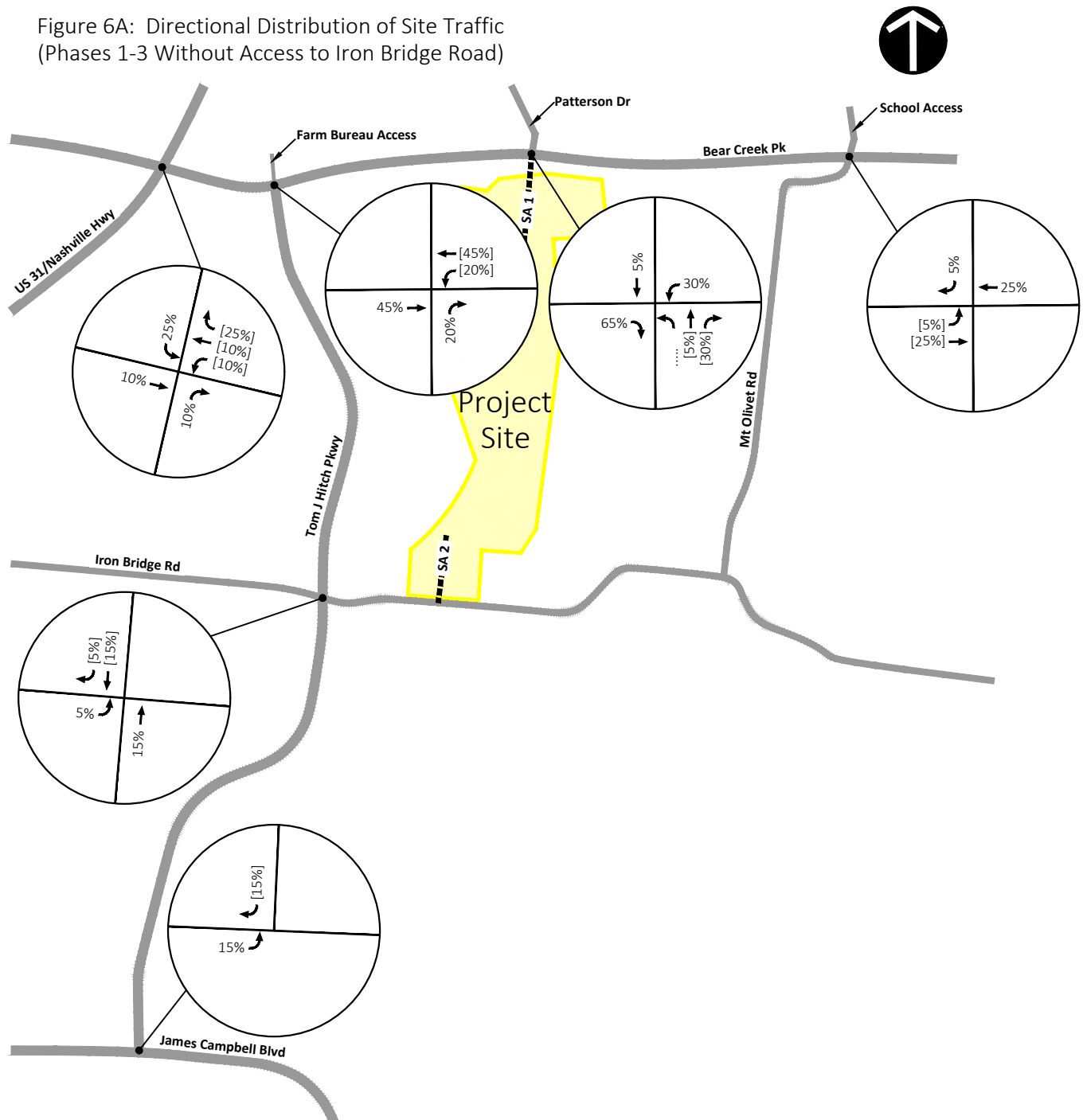
Table 3: Directional Distribution

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.

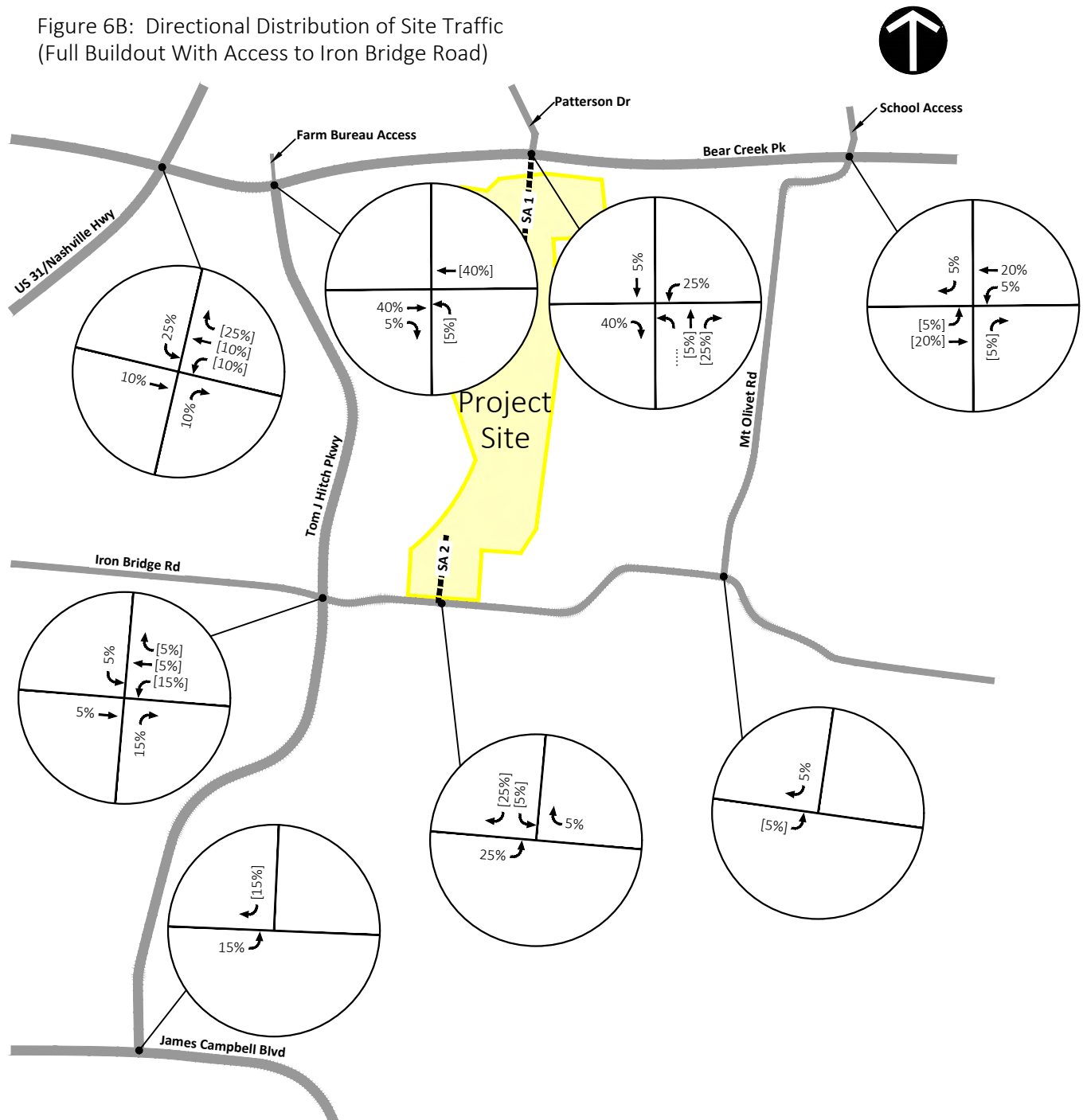
Figure 6A: Directional Distribution of Site Traffic
(Phases 1-3 Without Access to Iron Bridge Road)



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

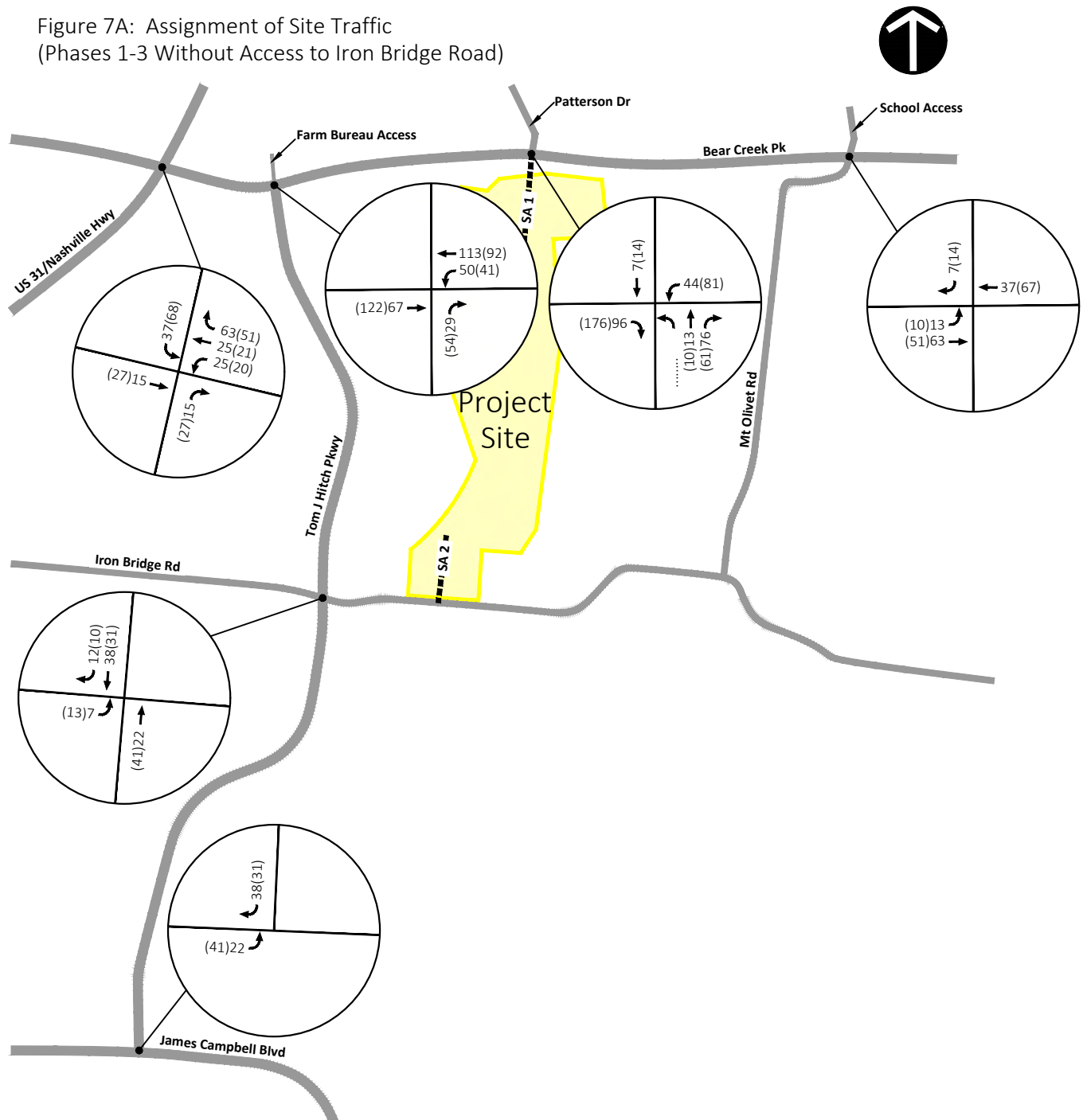
(Not to Scale)

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



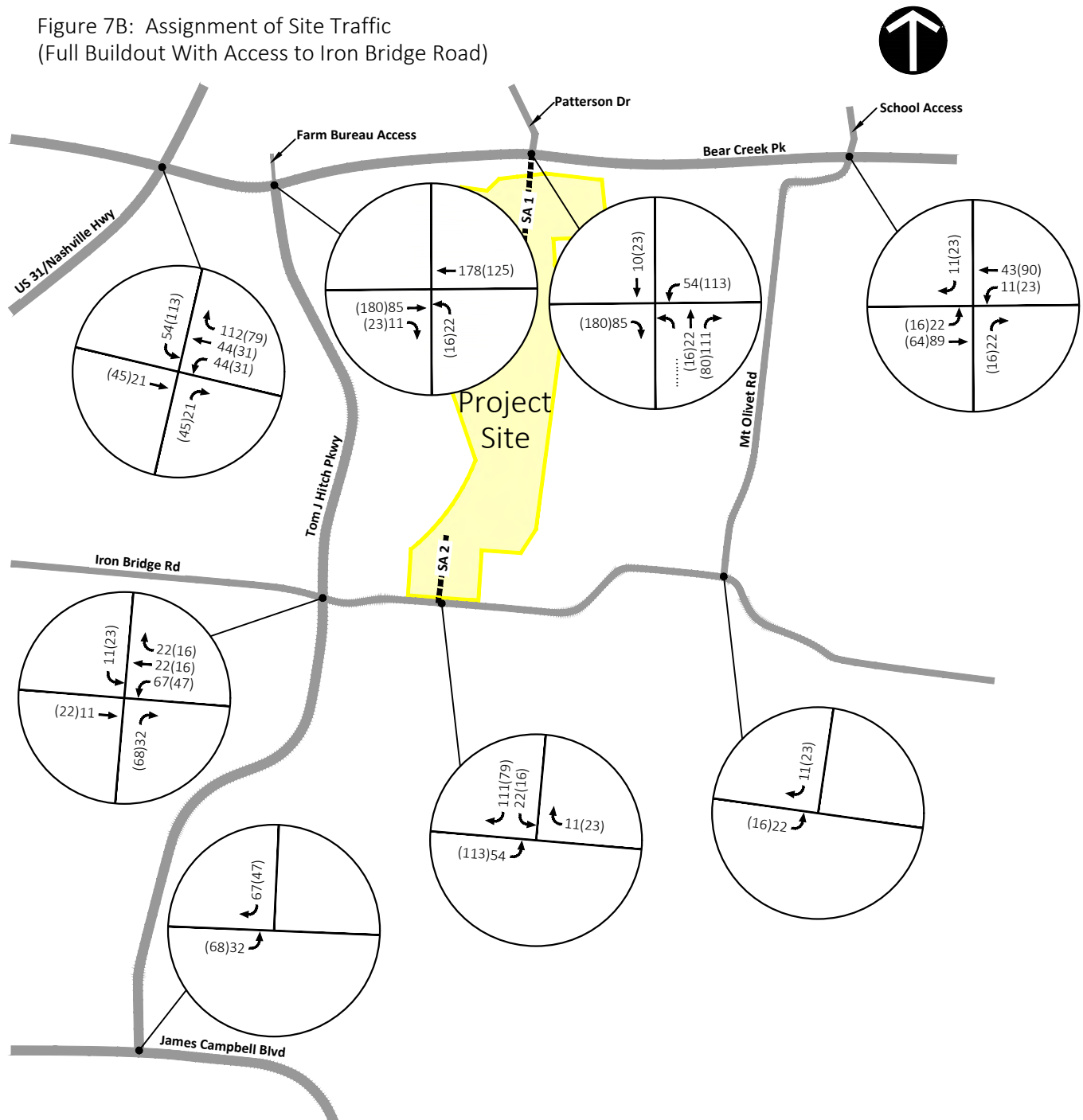
(Not to Scale)

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



(Not to Scale)

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



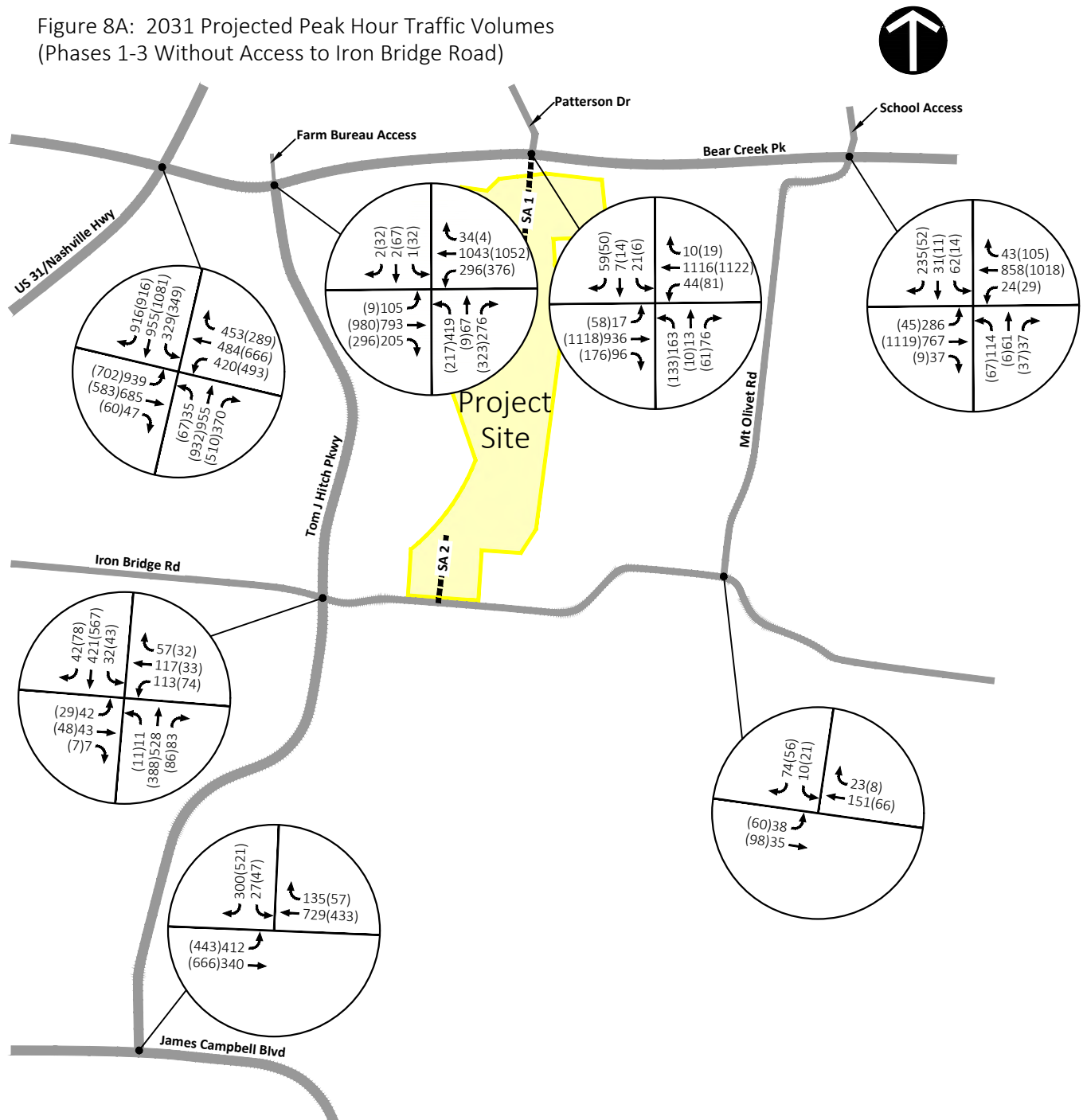
Legend:

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)



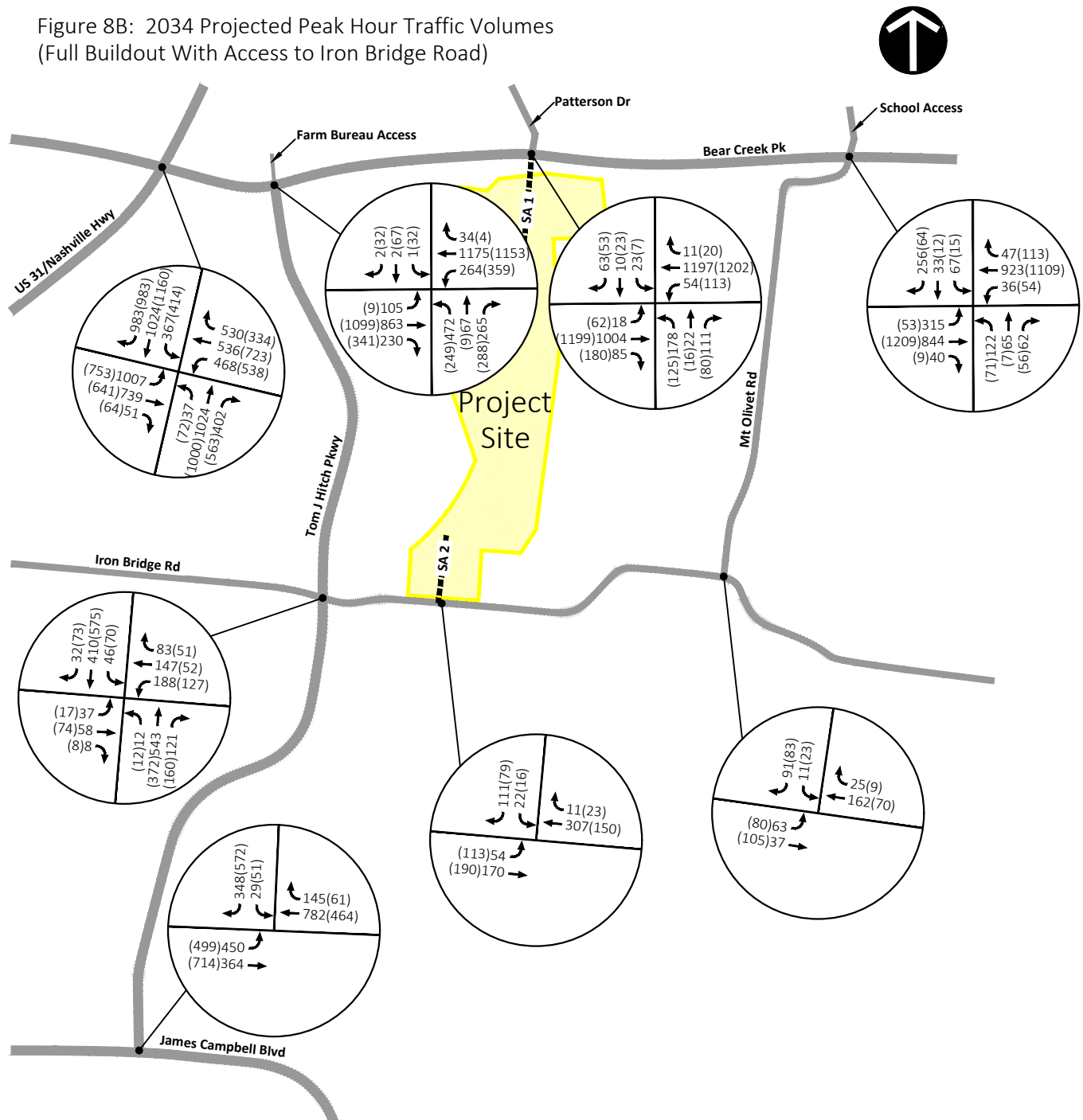
Legend:

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)



(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 $v/c \leq 1.0$	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 6 th 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.

#1 Nashville Highway (US 31) and Bear Creek Pike/US 43

Laneage and traffic signal improvements are expected to be completed by the City/TDOT at the intersection of Nashville Highway (US 31) and Bear Creek Pike/US 43. These anticipated improvements were assumed to include the addition of a westbound left turn lane and a southbound left turn lane through restriping and modifying the existing median on Nashville Highway. The provision of dual left turn lanes requires protected only left turn signal phasing for the southbound approach. Additional signal timing adjustments and coordination may be needed for the intersection following the initial phases of development for Columbia Bluffs. Additionally, lead/lag protected only left turn signal phasing is recommended for the eastbound and westbound approaches of Bear Creek Pike.

No other improvements are recommended for the intersection.

#2 Bear Creek Pike and Tom J Hitch Parkway

- Construct a northbound right turn lane on Tom J Hitch Parkway with approximately 100 feet of storage and 60 feet of taper. The northbound right turn lane could be constructed using the existing shoulder and should not extend beyond the start of the bridge over Duck River.
- Restripe the northbound approach to provide one left turn lane and one through lane, plus the recommended right turn lane.
- Modify the traffic signal design to provide a northbound right turn overlap during the westbound left turn phase.
- Optimize and coordinate the signal timing along Bear Creek Pike.

#3 Bear Creek Pike and Patterson Drive/Site Access 1

- Site Access 1 should be constructed and aligned with Patterson Drive at Bear Creek Pike.
- Site Access 1 should be designed to include width for one entering lane and two exiting lanes, which should be a northbound left turn lane and a northbound shared through/right turn lane.
- An eastbound right turn deceleration lane should be constructed for Bear Creek Drive at Site Access 1 to accommodate the project traffic. The eastbound right turn lane should be designed so that the widening and taper does not begin until east of the guardrail over Bear Creek and includes approximately 180 feet of storage and 160 feet of bay taper, or as approved by the City and TDOT.
- A westbound right turn deceleration lane is recommended for Bear Creek Pike at Patterson Drive. The westbound right turn lane should be designed to include approximately 160 feet of storage and 180 feet of bay taper or as approved by the City and TDOT.
- A westbound left turn deceleration lane is recommended for Bear Creek Pike at Site Access 1 to accommodate the project traffic. The westbound left turn lane should be designed to include approximately 225 feet of storage, 180 feet of bay taper, and 270 feet of approach taper assuming the widening is centered on the roadway.
- Install a traffic signal at the intersection of Bear Creek Pike and Patterson Drive/Site Access 1. Signal warrant analyses indicate a traffic signal will be warranted by the traffic volumes generated by the project site prior to completion of Phase 2 (or comparable number of dwelling units) or prior to completion of Phase 1 if Phase 1 includes completion of the day care center. The signal design should include protected/permissive left turn signal phasing for the northbound and westbound approaches and permissive left turn signal phasing for the southbound and eastbound approaches.
- Optimize and coordinate the signal timing along Bear Creek Pike.
- Widen the north leg of Patterson Drive to provide a southbound left turn lane. The widening of Patterson Drive and the construction of Site Access 1 should be designed and constructed such that the northbound and southbound through movements are aligned and the left turn movements can operate concurrently. The southbound left turn lane should include approximately 75 feet of storage.

#4 Bear Creek Pike and Mt Olivet Road/School Access

- Restripe the southbound approach to a shared left turn/through lane and a right turn only lane.
- Modify the traffic signal design for the northbound approach to provide protected/permissive left turn signal phasing.
- Modify the traffic signal design for the southbound approach to provide a right turn overlap during the eastbound left turn phase.
- Optimize and coordinate the signal timing along Bear Creek Pike.

#5 Tom J Hitch Parkway and Iron Bridge Road

The signalized intersection of Tom J Hitch Parkway and Iron Bridge Road is expected to continue to operate acceptably under the future projected conditions.

No improvements are expected to be needed or recommended for the intersection of Tom J Hitch Parkway and Iron Bridge Road.

#6 Iron Bridge Road and Mt Olivet Road

The critical turning movements are expected to continue to operate acceptably at the one-way stop-controlled intersection of Iron Bridge Road and Mt Olivet Road under the future projected conditions.

No improvements are expected to be needed or recommended for the intersection of Iron Bridge Road and Mt Olivet Road.

#7 James Campbell Boulevard and Tom J Hitch Parkway

Tom J Hitch Parkway terminates to the south at James Campbell Boulevard. The T-intersection currently has stop-control for the southbound approach of Tom J Hitch Parkway. The intersection experiences heavy eastbound left turns and the reciprocal southbound right turns during peak hours. The southbound left turn movement currently operates at LOS F during the AM and PM peak hours and is expected to deteriorate with higher levels of delay under the 2031 Background and 2034 Future Projected Conditions with Phases 1-3. According to the City's *Connect Columbia Transportation Plan* adopted in 2018, the intersection is identified to be signalized in the near term (10-year horizon). Preliminary signal warrant analyses indicate the intersection's traffic volumes will meet signal warrants in the near future. The following intersection improvements are recommended to be constructed prior the completion of Phase 3, or comparable number of dwelling units:

- Install a traffic signal at the intersection of James Campbell Boulevard and Tom J Hitch Parkway.
- The traffic signal design should include protected/permissive left turn signal phasing for the eastbound approach and a southbound right turn overlap.

Recommendations Associated with Full Buildout (Phases 1-6) Scenario

As outlined above, the initial phases of development for the Columbia Bluffs project will require fairly significant improvements at many of the study intersections in order to accommodate the project's traffic plus the background traffic growth expected even without the development project's construction. In addition to the recommended improvements associated with Phases 1-3 of the development, the following is recommended for the Full Buildout Scenario:

#8 Iron Bridge Road and Site Access 2

- Site Access 2 should be constructed and connected to Iron Bridge Road prior to beginning construction for Phase 4, or comparable number of dwelling units.
- Site Access 2 should be aligned with the Maury County Yanahli Park Access on Iron Bridge Road.
- At a minimum, Site Access 2 should be designed to include width for one entering lane and one exiting lane.
- Stop-control should be provided for the southbound approach of Site Access 2 at Iron Bridge Road.

- The Site Access 2 should be designed and constructed to allow for sufficient intersection sight distance, clear of any obstructions such as vegetation, landscaping, hardscaping, signs, and fencing within the departure sight triangles.
- An eastbound left turn deceleration lane is recommended for Iron Bridge Road at Site Access 2 to accommodate the project traffic. The eastbound left turn lane should be designed to include approximately 160 feet of storage, 180 feet of bay taper, and 270 feet of approach taper assuming the widening is centered on the roadway, or as approved by the City.

Additional Planned Improvements

According to the City's *Connect Columbia Transportation Plan*, significant roadway improvements have been identified for some of the intersections and roadways in the study area. However, it is important to note that the improvements are not considered to be committed projects until funding has been allocated.

- In the near term, Bear Creek Pike between Nashville Highway and Tom J Hitch Parkway is planned to be widened from 3 lanes to 5 lanes and access management along the segment.
- In the midterm, Iron Bridge Road is planned to be reconstructed to improve the substandard roadway geometry between Fairview Drive and Tom J Hitch Parkway, which would include replacing the bridge/box culvert over Lytle Creek, which currently narrows the roadway to one lane at a sag vertical crest in the roadway.
- In the long-term, Bear Creek Pike is planned to be widened to four lanes between Tom J Hitch Parkway and east of Baker Road. It should be noted that the deceleration lanes recommended for Bear Creek Pike at Site Access 1/Patterson Drive as part of the initial phases of the Columbia Bluffs development will contribute towards this long-term improvement identified along Bear Creek Pike.

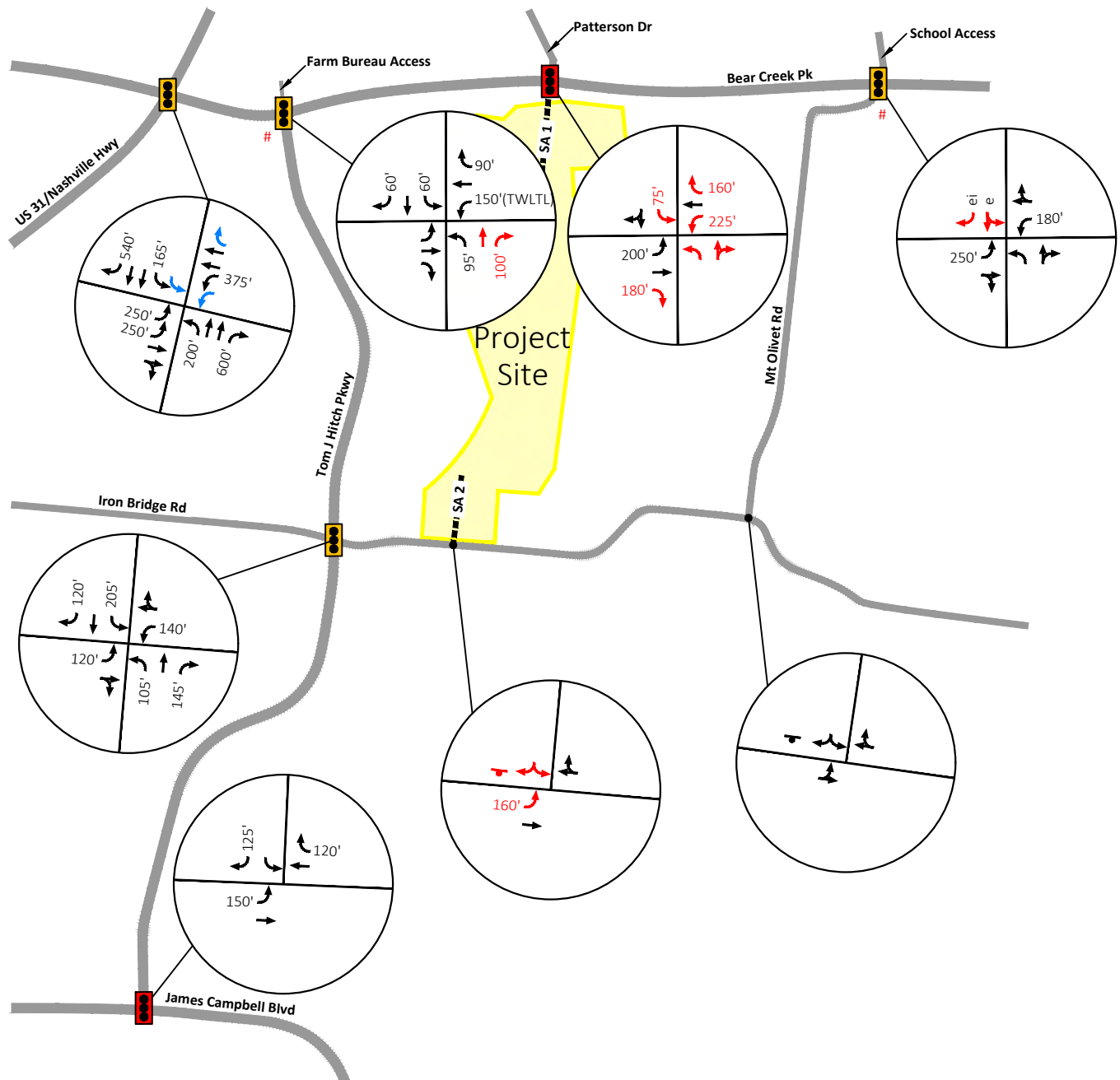
#2 Bear Creek Pike and Tom J Hitch Parkway

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.



Legend:

- Existing Laneage
- Future Laneage (Planned By Others)
- Future Laneage (Recommended)
- XXX' Storage Length (feet)

●●● Si
●●● cSiPeter
●●● trericSiecoee
#Siioictioecoe

(Not to Scale)

Figure 10A: Conceptual Layout of Recommended Improvements
at Bear Creek Pike and Tom J Hitch Parkway/Farm Bureau Access

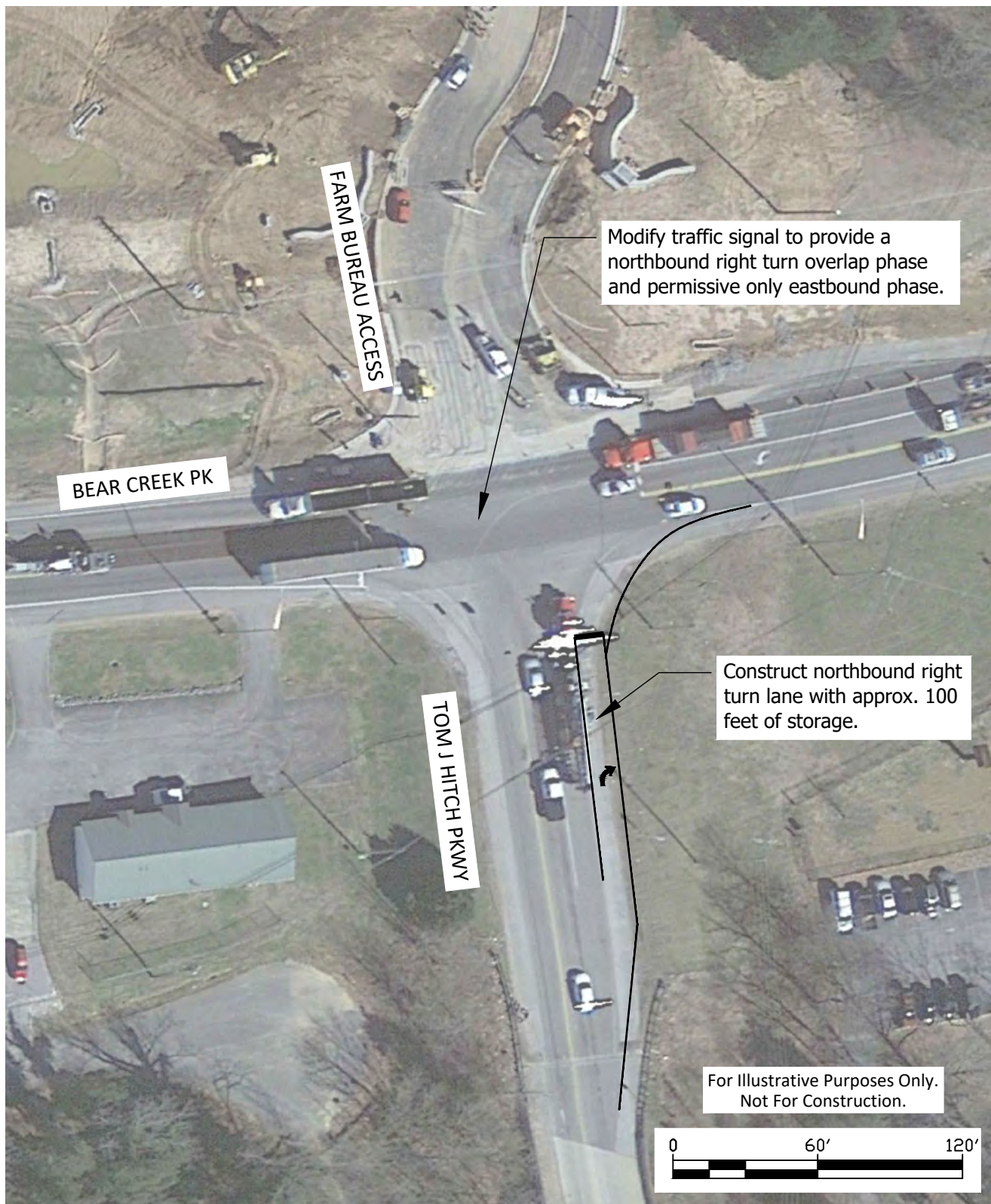


Figure 10B: Conceptual Layout of Recommended Improvements at Bear Creek Pike and Patterson Drive/Site Access 1

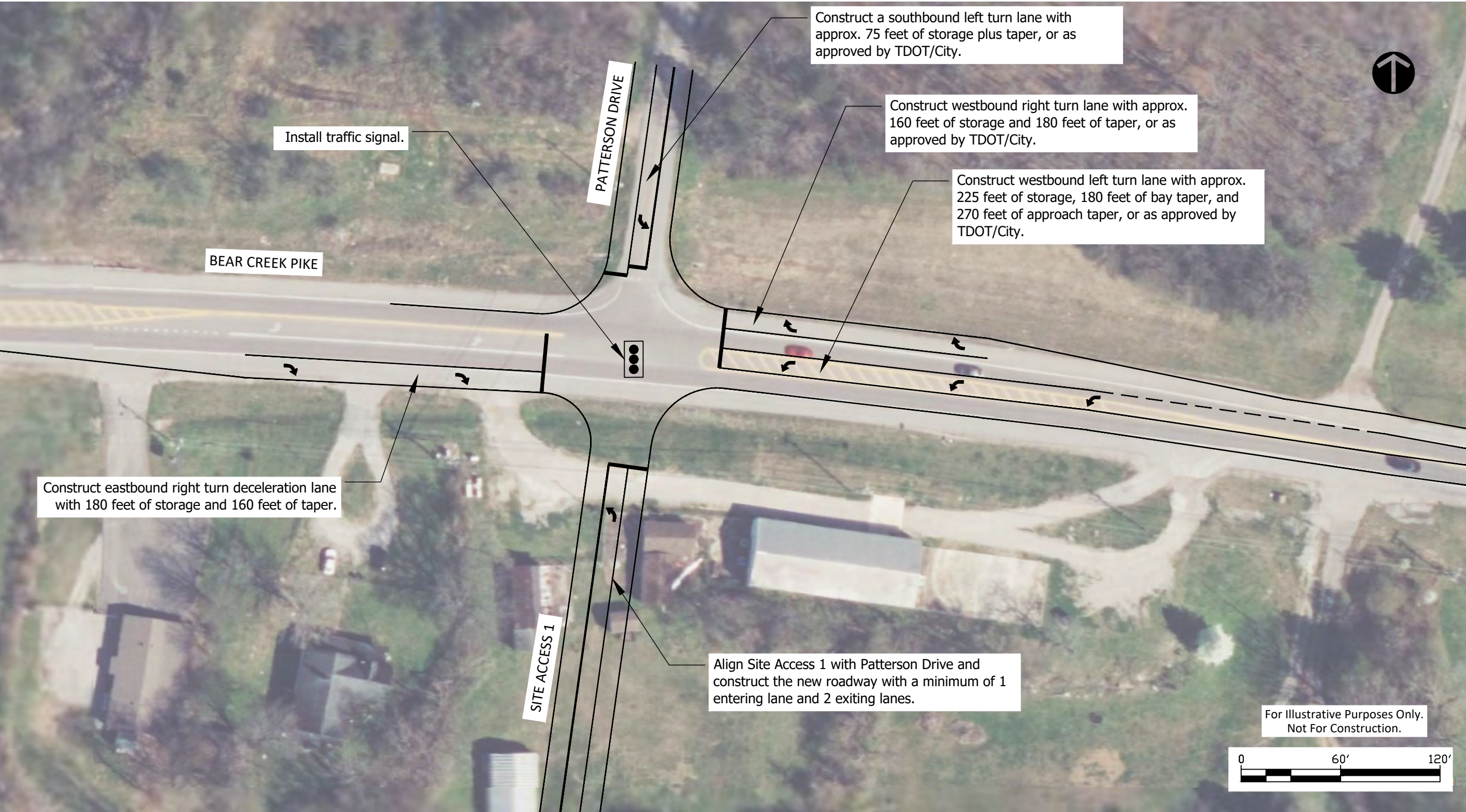


Figure 10C: Conceptual Layout of Recommended Improvements at Bear Creek Pike and Mt Olivet Road/School Access

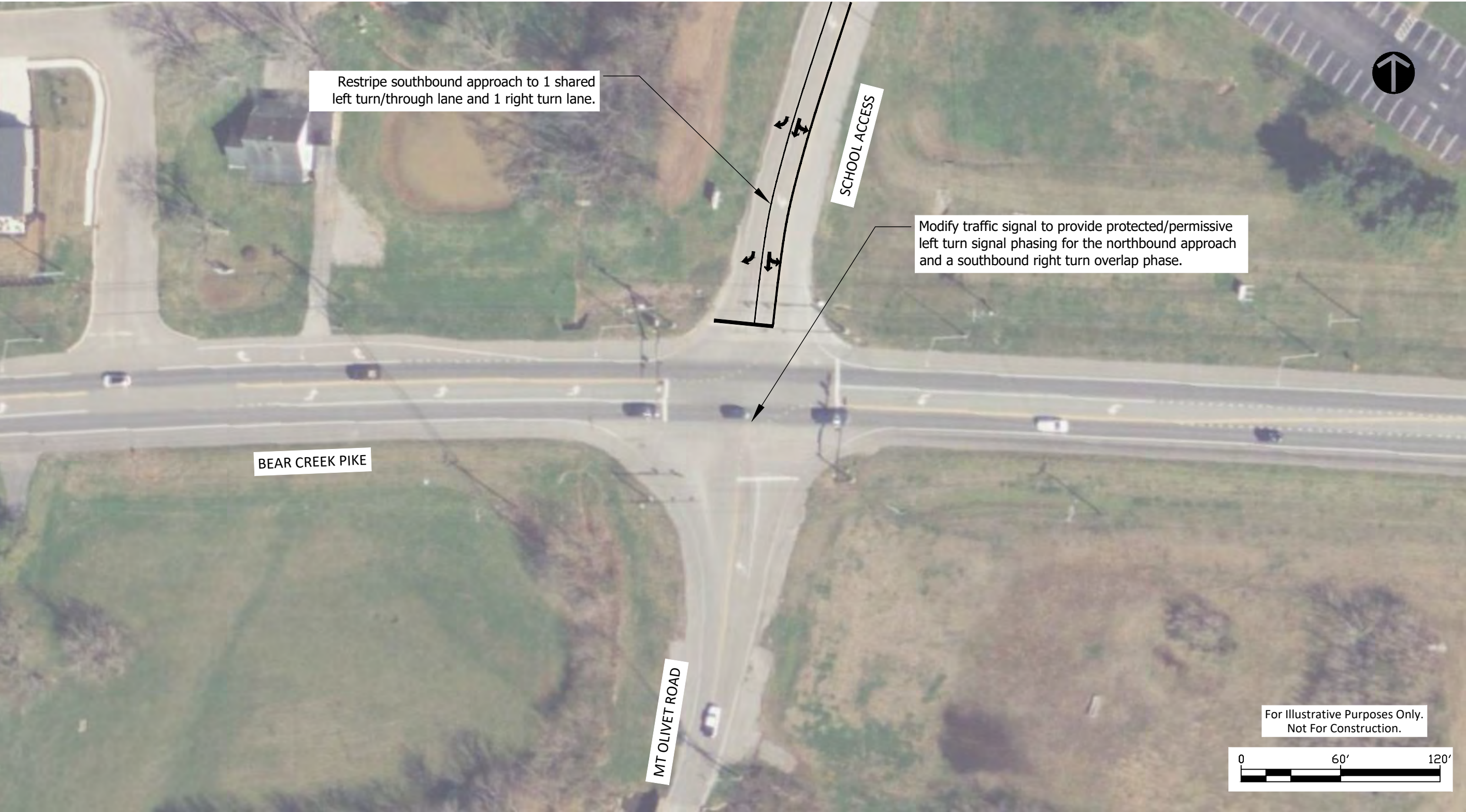


Figure 10D: Conceptual Layout of Recommended Improvements at Iron Bridge Road and Site Access 2



APPENDIX A

CURRENT SITE PLAN



COLUMBIA BLUFFS

PUD-R CONCEPT PLAN

August 22, 2023



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 ☒ 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@csdgt.com
Phone: 615-582-3253	Phone: 615-248-9999
DEVELOPERS TIS CONSULTANT CONTACT INFO: <i>complete if study was completed by Developer's consultant.</i>	
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)
 ☒ 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.
☒	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.
☒	Attach a conceptual development plan showing all access points and adjacent streets.

Project Buildout Year: 2029 for Phases 1-3 Ambient or CMP Growth Rate (% Per Year): 3%
2033 for Full Buildout

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

302 Innovation Drive, Suite 100

Murfreesboro, TN 37130

Franklin, TN 37067

greg.judy@neel-schaffer.com

615-217-0500

dyan.damron@volkert.com

615-656-1845

MEMORANDUM OF UNDERSTANDING SIGN OFF:

APPLICANT:

Joshua Gibbs

Digitally signed by Joshua Gibbs

Reason: I am approving this document

8.18.23

Location: KolterLand

Date: 2023.08.18.10:39:16 -05'00'

Name

Signature

Date

*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.

3RD PARTY

TRAFFIC

CONSULTANT:

Dyan Damron, PE, PTP

Dyan Damron

8/18/23

Name

Signature

Date

CITY

ENGINEER:

GLENN HARPER

Glenn Harper

8/22/23

Name

Signature

Date

DIRECTOR OF

DEVELOPMENT

SERVICES:

Paul Kolter

Paul Kolter

8/22/23

Name

Signature

Date

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



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 % Growth	Station 45	Annual % Growth	Station 47	Annual % Growth	Station 44	Annual % Growth	Station 46	Annual % Growth	Total	Annual % Growth
Street	Tom J Hitch Pkwy		Bear Creek Pk		Iron Bridge Rd		Nashville Hwy		Nashville Hwy			
Location	South of Bear Creek Pike		East of Tom J Hitch Pkwy		West of Tom J Hitch Pkwy		North of Bear Creek Pike		South of Bear Creek Pike			
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



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Peak Hour Turning Movement Count

Columbia, TN



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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

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left 5.1	Thru 5.2	Right 5.3	U-Turn 5.4	App Total	Left 5.5	Thru 5.6	Right 5.7	U-Turn 5.8	App Total	Left 5.9	Thru 5.10	Right 5.11	U-Turn 5.12	App Total	Left 5.13	Thru 5.14	Right 5.15	U-Turn 5.16	App 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

Time	Northbound					Southbound					Eastbound					Westbound					Int. Total
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left 5.1	Thru 5.2	Right 5.3	U-Turn 5.4	App Total	Left 5.5	Thru 5.6	Right 5.7	U-Turn 5.8	App Total	Left 5.9	Thru 5.10	Right 5.11	U-Turn 5.12	App Total	Left 5.13	Thru 5.14	Right 5.15	U-Turn 5.16	App Total	
0715 - 0730	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	
0745 - 0800	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	
Total	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	

Passenger Vehicles (1-3)

Time	Northbound					Southbound					Eastbound					Westbound					Int. Total
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left 5.1	Thru 5.2	Right 5.3	U-Turn 5.4	App Total	Left 5.5	Thru 5.6	Right 5.7	U-Turn 5.8	App Total	Left 5.9	Thru 5.10	Right 5.11	U-Turn 5.12	App Total	Left 5.13	Thru 5.14	Right 5.15	U-Turn 5.16	App 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)

Time	Northbound					Southbound					Eastbound					Westbound					Int. Total
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left 5.1	Thru 5.2	Right 5.3	U-Turn 5.4	App Total	Left 5.5	Thru 5.6	Right 5.7	U-Turn 5.8	App Total	Left 5.9	Thru 5.10	Right 5.11	U-Turn 5.12	App Total	Left 5.13	Thru 5.14	Right 5.15	U-Turn 5.16	App 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)

Time	Northbound					Southbound					Eastbound					Westbound					Int. Total
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left 5.1	Thru 5.2	Right 5.3	U-Turn 5.4	App Total	Left 5.5	Thru 5.6	Right 5.7	U-Turn 5.8	App Total	Left 5.9	Thru 5.10	Right 5.11	U-Turn 5.12	App Total	Left 5.13	Thru 5.14	Right 5.15	U-Turn 5.16	App 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

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	EB Sa	WB Sb			App Total	EB Sc	WB Sd			App Total	NB Se	SB Sf			App Total	NB Sg	SB Sh			App 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



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Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	1630 - 1730



Session Parameters

(Drop Down Menu)

1400 - 1830

Volume

All vehicles

All Vehicles	Northbound					Southbound					Eastbound					Westbound					Int Total
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left 5.1	Thru 5.2	Right 5.3	U-Turn 5.4	App Total	Left 5.5	Thru 5.6	Right 5.7	U-Turn 5.8	App Total	Left 5.9	Thru 5.10	Right 5.11	U-Turn 5.12	App Total	Left 5.13	Thru 5.14	Right 5.15	U-Turn 5.16	App Total	
Time																					
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

Time	Northbound					Southbound					Eastbound					Westbound					Int. Total
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left 5.1	Thru 5.2	Right 5.3	U-Turn 5.4	App Total	Left 5.1	Thru 5.6	Right 5.7	U-Turn 5.8	App Total	Left 5.9	Thru 5.10	Right 5.11	U-Turn 5.12	App Total	Left 5.13	Thru 5.14	Right 5.15	U-Turn 5.16	App Total	
1630 - 1645	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	
1700 - 1715	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	
Total	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	

Passenger Vehicles (1-3)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left 5.1	Thru 5.2	Right 5.3	U-Turn 5.4	App Total	Left 5.5	Thru 5.6	Right 5.7	U-Turn 5.8	App Total	Left 5.9	Thru 5.10	Right 5.11	U-Turn 5.12	App Total	Left 5.13	Thru 5.14	Right 5.15	U-Turn 5.16	App 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)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left 5.1	Thru 5.2	Right 5.3	U-Turn 5.4	App Total	Left 5.5	Thru 5.6	Right 5.7	U-Turn 5.8	App Total	Left 5.9	Thru 5.10	Right 5.11	U-Turn 5.12	App Total	Left 5.13	Thru 5.14	Right 5.15	U-Turn 5.16	App 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)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
	Left 5.1	Thru 5.2	Right 5.3	U-Turn 5.4	App Total	Left 5.5	Thru 5.6	Right 5.7	U-Turn 5.8	App Total	Left 5.9	Thru 5.10	Right 5.11	U-Turn 5.12	App Total	Left 5.13	Thru 5.14	Right 5.15	U-Turn 5.16	App 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

Time		Northbound					Southbound					Eastbound					Westbound					Int Total
		TN-99 Nashville Hwy					TN-6 Nashville Hwy					TN-99 Bear Creek Pike					TN-99 Bear Creek Pike					
		EB Sa	WB Sb			App Total	EB Sc	WB Sd			App Total	NB Se	SB Sf			App Total	NB Sg	SB Sh			App 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	
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	



[Click here for Map](#)

Peak Hour Turning Movement Count

Columbia, TN



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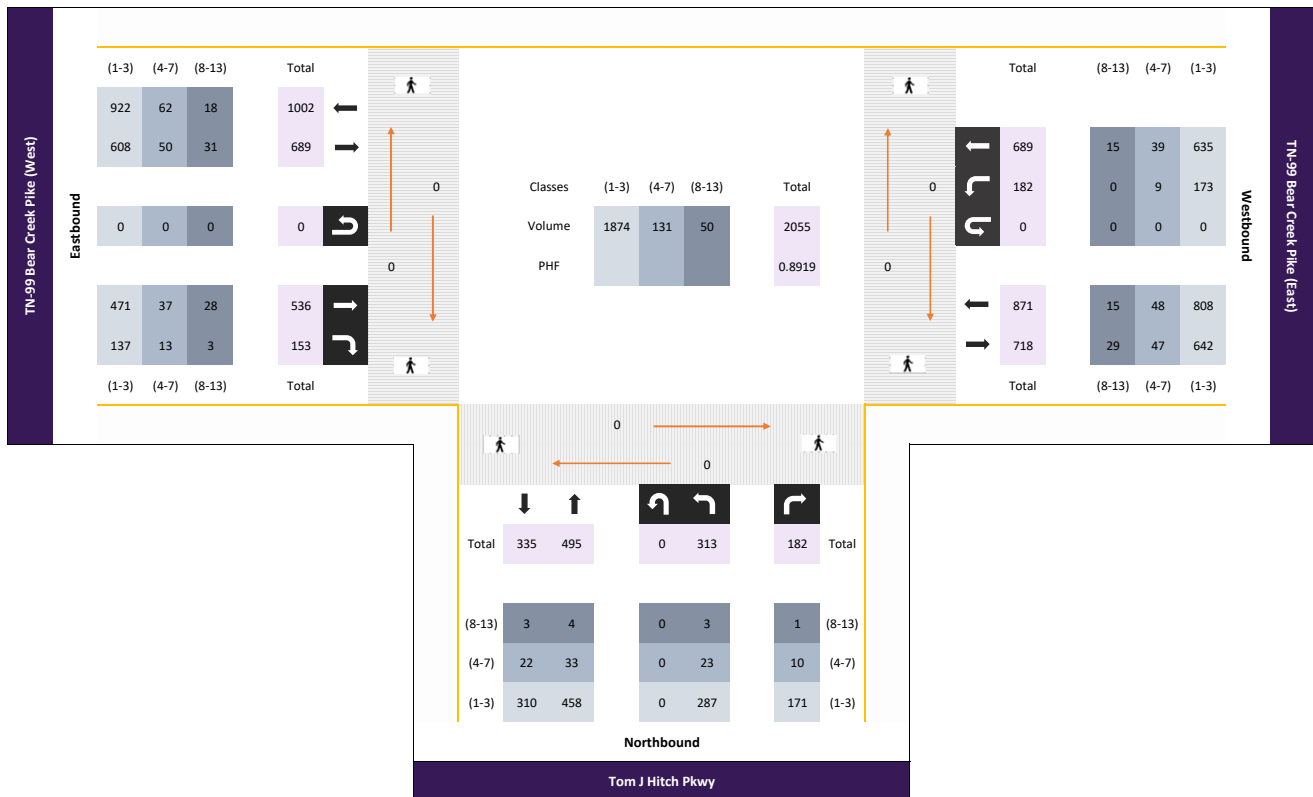
Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	0715 - 0815

Session Parameters

(Drop Down Menu)

0600 - 0900

Volume



All vehicles

All Vehicles	Northbound										Eastbound				Westbound				Int. Total		
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)				TN-99 Bear Creek Pike (East)						
	Left 6.1		Right 6.2	U-Turn 6.3	App Total					App Total	Thru 6.4	Right 6.5	U-Turn 6.6	App Total	Left 6.7	Thru 6.8		U-Turn 6.9		App Total	
Time	89	-	57	0	146	-	-	-	-	0	-	135	37	0	172	37	156	-	0	193	511
0715 - 0730	86	-	49	0	135	-	-	-	-	0	-	139	41	0	180	40	183	-	0	223	538
0730 - 0745	90	-	51	0	141	-	-	-	-	0	-	130	41	0	171	64	200	-	0	264	576
0745 - 0800	48	-	25	0	73	-	-	-	-	0	-	132	34	0	166	41	150	-	0	191	430
0800 - 0815																					
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

Time	Northbound										Eastbound				Westbound				Int Total		
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)				TN-99 Bear Creek Pike (East)						
	Left 6.1		Right 6.2	U-Turn 6.3	App Total					App Total	Thru 6.4	Right 6.5	U-Turn 6.6	App Total	Left 6.7	Thru 6.8		U-Turn 6.9		App Total	
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	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)

Time	Northbound					Eastbound					Westbound					Int Total					
	Tom J Hitch Pkwy					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)										
	Left 6.1		Right 6.2	U-Turn 6.3	App Total					App Total	Thru 6.4	Right 6.5	U-Turn 6.6	App Total	Left 6.7		Thru 6.8		U-Turn 6.9	App Total	
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)

Time	Northbound										Eastbound					Westbound					Int Total
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)				TN-99 Bear Creek Pike (East)						
	Left 6.1		Right 6.2	U-Turn 6.3	App Total					App Total	Thru 6.4	Right 6.5	U-Turn 6.6	App Total	Left 6.7	Thru 6.8		U-Turn 6.9	App Total		
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)

Continuation: Week of 0-19																					
Time	Northbound										Eastbound					Westbound					Int Total
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 6.1		Right 6.2	U-Turn 6.3	App Total					App Total	Thru 6.4	Right 6.5	U-Turn 6.6	App Total	Left 6.7	Thru 6.8		U-Turn 6.9	App Total		
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

Access Points	Northbound					Eastbound					Westbound					Int Total			
	Tom J Hitch Pkwy					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)								
Time	EB 6a	WB 6b			App Total					App Total	NB 6e	SB 6f		App Total	NB 6g	SB 6h		App Total	
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
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	-
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



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Peak Hour Turning Movement Count

Columbia, TN



www.marrtraffic.com

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

Session Parameters

(Drop Down Menu)

1400 - 1830

Volume



All vehicles

Air Vehicles	Northbound										Eastbound					Westbound					Int Total
	Tom J Hitch Pkwy					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)										
	Left 6.1		Right 6.2	U-Turn 6.3	App Total					App Total	Thru 6.4	Right 6.5	U-Turn 6.6	App Total	Left 6.7	Thru 6.8		U-Turn 6.9	App Total		
Time	48	-	57	0	105	-	-	-	-	0	-	159	51	0	210	59	198	-	0	257	
1615 - 1630	37	-	55	0	92	-	-	-	-	0	-	188	76	0	264	65	178	-	0	243	
1630 - 1645	37	-	52	0	89	-	-	-	-	0	-	175	62	0	237	57	192	-	0	249	
1645 - 1700	53	-	49	0	102	-	-	-	-	0	-	156	50	0	206	85	193	-	0	278	
1700 - 1715																					
Total	175	0	213	0	388	0	0	0	0	0	0	678	239	0	917	266	761	0	0	1027	
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

Time	Northbound										Eastbound				Westbound				Int Total		
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)				TN-99 Bear Creek Pike (East)						
	Left 6.1		Right 6.2	U-Turn 6.3	App Total					App Total	Thru 6.4	Right 6.5	U-Turn 6.6	App Total	Left 6.7	Thru 6.8		U-Turn 6.9		App Total	
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)

Time	Northbound										Eastbound					Westbound					Int Total
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 6.1		Right 6.2	U-Turn 6.3	App Total					App Total		Thru 6.4	Right 6.5	U-Turn 6.6	App Total	Left 6.7	Thru 6.8		U-Turn 6.9	App Total	
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)

Time	Northbound										Eastbound					Westbound					Int Total
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)				TN-99 Bear Creek Pike (East)						
	Left 6.1		Right 6.2	U-Turn 6.3	App Total					App Total	Thru 6.4	Right 6.5	U-Turn 6.6	App Total	Left 6.7	Thru 6.8		U-Turn 6.9	App Total		
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)

Time	Northbound										Eastbound					Westbound					Int Total
	Tom J Hitch Pkwy										TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 6.1		Right 6.2	U-Turn 6.3	App Total					App Total	Thru 6.4	Right 6.5	U-Turn 6.6	App Total	Left 6.7	Thru 6.8		U-Turn 6.9	App Total		
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

Time	Northbound					Eastbound					Westbound					Int Total					
	Tom J Hitch Pkwy					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)										
	EB 6a	WB 6b			App Total					App Total	NB 6e	SB 6f			App Total		NB 6g	SB 6h			App Total
1615 - 1630	0	0	-	-	0	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1630 - 1645	0	0	-	-	0	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1645 - 1700	0	0	-	-	0	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1700 - 1715	0	0	-	-	0	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	-
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



[Click here for Map](#)

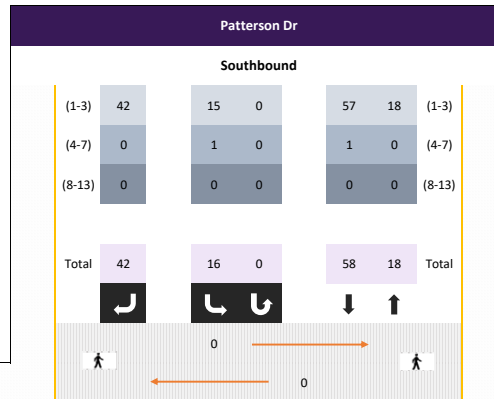
Peak Hour Turning Movement Count

Columbia, TN



www.marrtraffic.com

Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	0715 - 0815

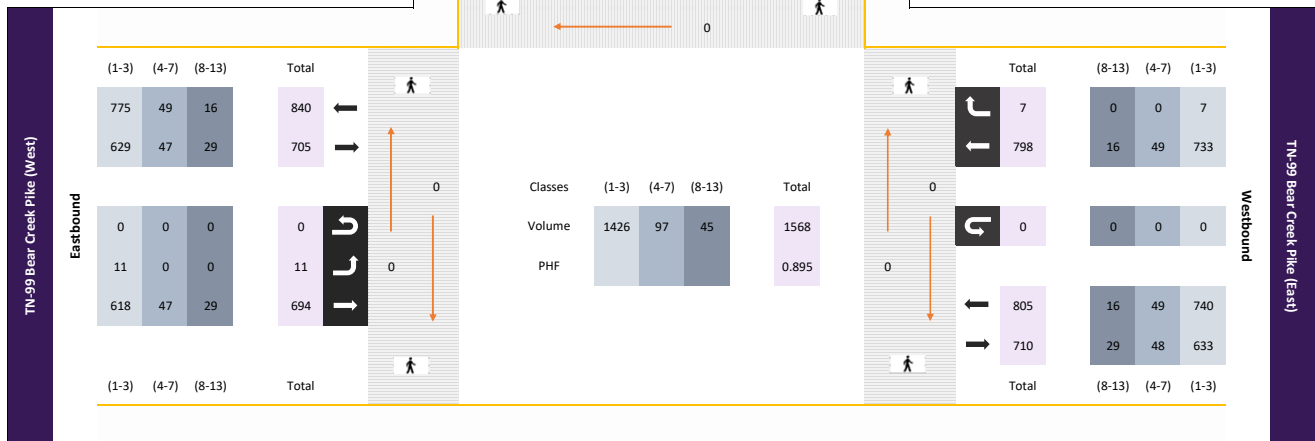


Session Parameters

(Drop Down Menu)

0600 - 0900

Volume



All vehicles

All Vehicles						Southbound					Eastbound					Westbound					Int Total
						Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
					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	
Time	-	-	-	-	0	5	-	8	0	13	1	187	-	0	188	-	182	1	0	183	384
0715 - 0730	-	-	-	-	0	6	-	17	0	23	5	176	-	0	181	-	230	4	0	234	438
0730 - 0745	-	-	-	-	0	2	-	11	0	13	3	171	-	0	174	-	206	2	0	208	395
0745 - 0800	-	-	-	-	0	3	-	6	0	9	2	160	-	0	162	-	180	0	0	180	351
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

Time						Southbound				Eastbound				Westbound							
						Patterson Dr				TN-99 Bear Creek Pike (West)				TN-99 Bear Creek Pike (East)							
					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)

Time						Southbound					Eastbound					Westbound					Int Total
						Patterson Dr				TN-99 Bear Creek Pike (West)				TN-99 Bear Creek Pike (East)							
					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			
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)

Time						Southbound					Eastbound					Westbound					Int Total
						Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
					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		
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

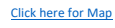
Combination Trucks (8-13)

Time							Southbound				Eastbound				Westbound					Int Total	
							Patterson Dr				TN-99 Bear Creek Pike (West)				TN-99 Bear Creek Pike (East)						
						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
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	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

Pedestrians

Time						Southbound					Eastbound					Westbound					Int Total
						Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
					App Total	EB 2c	WB 2d			App Total	NB 2e	SB 2f			App Total	NB 2g	SB 2h			App 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

Columbia, TN



TN-99 Bear Creek Pike (West)

Eastbound

Class	(1-3)	(4-7)	(8-13)	Total
Through	876	21	30	927
Left	849	21	34	904
Right	0	0	0	0
U-turn	43	0	0	43
Other	806	21	34	861

Westbound

Class	(8-13)	(4-7)	(1-3)	Total
Through	0	1	14	15
Left	30	21	840	891
Right	0	0	0	0
U-turn	30	22	854	906
Other	34	21	811	866

Classes	(1-3)	(4-7)	(8-13)	Total
Volume	1744	43	64	1851
PHF				0.9804

All vehicles

Time						Southbound					Eastbound					Westbound					Int Total
						Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
					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			
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

Time						Southbound				Eastbound				Westbound					Int Total	
						Patterson Dr				TN-99 Bear Creek Pike (West)				TN-99 Bear Creek Pike (East)						
					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			
1600 - 1615	-	-	-	-	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
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
Total	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

Passenger Vehicles (1-3)

Time						Southbound				Eastbound				Westbound				Int Total			
						Patterson Dr				TN-99 Bear Creek Pike (West)				TN-99 Bear Creek Pike (East)							
					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		
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)

Time						Southbound					Eastbound					Westbound					Int Total
						Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
					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		
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)

Time							Southbound				Eastbound				Westbound				Int Total		
							Patterson Dr				TN-99 Bear Creek Pike (West)				TN-99 Bear Creek Pike (East)						
						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
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

Requests						Southbound				Eastbound				Westbound				Int Total
						Patterson Dr				TN-99 Bear Creek Pike (West)				TN-99 Bear Creek Pike (East)				
					App Total	EB 2c	WB 2d		App Total	NB 2e	SB 2f		App Total	NB 2g	SB 2h		App Total	
Time	-	-	-	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0
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
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
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



[Click here for Map](#)

Peak Hour Turning Movement Count

Columbia, TN



www.marrtraffic.com

Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	0715 - 0815

Session Parameters

(Drop Down Menu)

0600 - 0900

Volume



All vehicles

All Vehicles	Northbound					Southbound					Eastbound					Westbound					Int Total	
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)						
	Left 7.1	Thru 7.2	Right 7.3	U-Turn 7.4	App Total	Left 7.5	Thru 7.6	Right 7.7	U-Turn 7.8	App Total	Left 7.9	Thru 7.10	Right 7.11	U-Turn 7.12	App Total	Left 7.13	Thru 7.14	Right 7.15	U-Turn 7.16	App Total		
Time	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

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 7.1	Thru 7.2	Right 7.3	U-Turn 7.4	App Total	Left 7.5	Thru 7.6	Right 7.7	U-Turn 7.8	App Total	Left 7.9	Thru 7.10	Right 7.11	U-Turn 7.12	App Total	Left 7.13	Thru 7.14	Right 7.15	U-Turn 7.16	App 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)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 7.1	Thru 7.2	Right 7.3	U-Turn 7.4	App Total	Left 7.5	Thru 7.6	Right 7.7	U-Turn 7.8	App Total	Left 7.9	Thru 7.10	Right 7.11	U-Turn 7.12	App Total	Left 7.13	Thru 7.14	Right 7.15	U-Turn 7.16	App 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)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 7.1	Thru 7.2	Right 7.3	U-Turn 7.4	App Total	Left 7.5	Thru 7.6	Right 7.7	U-Turn 7.8	App Total	Left 7.9	Thru 7.10	Right 7.11	U-Turn 7.12	App Total	Left 7.13	Thru 7.14	Right 7.15	U-Turn 7.16	App 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)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 7.1	Thru 7.2	Right 7.3	U-Turn 7.4	App Total	Left 7.5	Thru 7.6	Right 7.7	U-Turn 7.8	App Total	Left 7.9	Thru 7.10	Right 7.11	U-Turn 7.12	App Total	Left 7.13	Thru 7.14	Right 7.15	U-Turn 7.16	App 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

Questions	Northbound					Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	EB 7a	WB 7b			App Total	EB 7c	WB 7d			App Total	NB 7e	SB 7f			App Total	NB 7g	SB 7h			App Total	Int 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



www.marrtraffic.com

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

Session Parameters

(Drop Down Menu)

1400 - 1830

Volume



All vehicles

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 7.1	Thru 7.2	Right 7.3	U-Turn 7.4	App Total	Left 7.5	Thru 7.6	Right 7.7	U-Turn 7.8	App Total	Left 7.9	Thru 7.10	Right 7.11	U-Turn 7.12	App Total	Left 7.13	Thru 7.14	Right 7.15	U-Turn 7.16	App 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

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 7.1	Thru 7.2	Right 7.3	U-Turn 7.4	App Total	Left 7.5	Thru 7.6	Right 7.7	U-Turn 7.8	App Total	Left 7.9	Thru 7.10	Right 7.11	U-Turn 7.12	App Total	Left 7.13	Thru 7.14	Right 7.15	U-Turn 7.16	App 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)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 7.1	Thru 7.2	Right 7.3	U-Turn 7.4	App Total	Left 7.5	Thru 7.6	Right 7.7	U-Turn 7.8	App Total	Left 7.9	Thru 7.10	Right 7.11	U-Turn 7.12	App Total	Left 7.13	Thru 7.14	Right 7.15	U-Turn 7.16	App 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)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 7.1	Thru 7.2	Right 7.3	U-Turn 7.4	App Total	Left 7.5	Thru 7.6	Right 7.7	U-Turn 7.8	App Total	Left 7.9	Thru 7.10	Right 7.11	U-Turn 7.12	App Total	Left 7.13	Thru 7.14	Right 7.15	U-Turn 7.16	App 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)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 7.1	Thru 7.2	Right 7.3	U-Turn 7.4	App Total	Left 7.5	Thru 7.6	Right 7.7	U-Turn 7.8	App Total	Left 7.9	Thru 7.10	Right 7.11	U-Turn 7.12	App Total	Left 7.13	Thru 7.14	Right 7.15	U-Turn 7.16	App 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

Time	Northbound					Southbound					Eastbound					Westbound					
	Mt. Olivet Rd					Local Rd					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	EB 7a	WB 7b			App Total	EB 7c	WB 7d			App Total	NB 7e	SB 7f			App Total	NB 7g	SB 7h			App Total	Int 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



[Click here for Map](#)

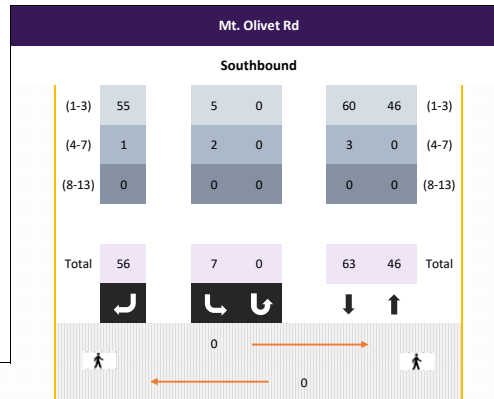
Peak Hour Turning Movement Count

Columbia, TN



www.marrtraffic.com

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

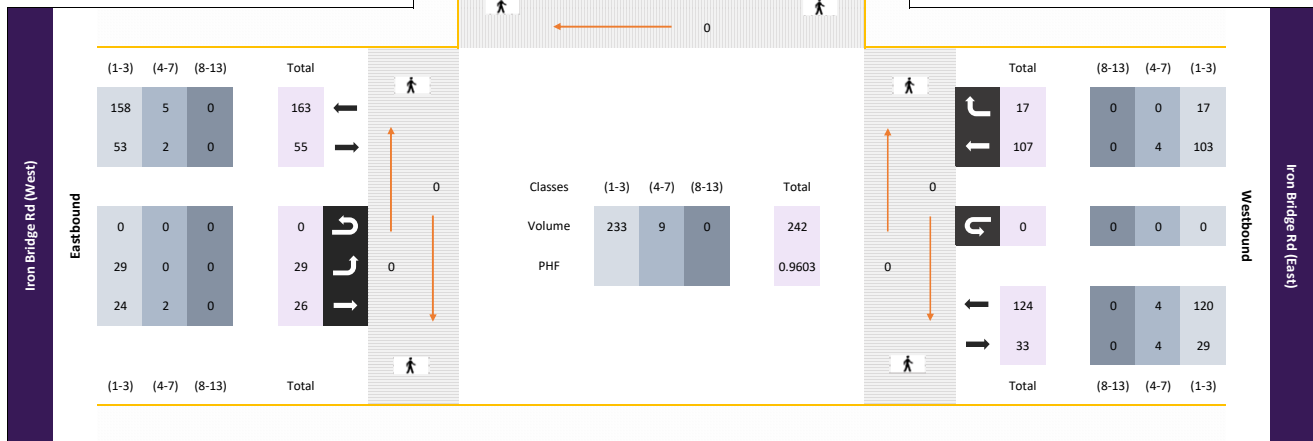


Session Parameters

(Drop Down Menu)

0600 - 0900

Volume



All vehicles

Time						Southbound				Eastbound				Westbound				Int Total			
						Mt. Olivet Rd				Iron Bridge Rd (West)				Iron Bridge Rd (East)							
					App Total	Left 8.1	Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5	U-Turn 8.6	App Total		Thru 8.7	Right 8.8	U-Turn 8.9		App Total		
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)						
Time					App Total	Left 8.1	Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5	U-Turn 8.6	App Total		Thru 8.7	Right 8.8	U-Turn 8.9	App Total	Int Total	
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
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

Passenger Vehicles (1-3)

Time						Southbound				Eastbound				Westbound				Int. Total			
						Mt. Olivet Rd				Iron Bridge Rd (West)				Iron Bridge Rd (East)							
					App. Total	Left 8.1	Right 8.2	U-Turn 8.3	App. Total	Left 8.4	Thru 8.5	U-Turn 8.6	App. Total		Thru 8.7	Right 8.8	U-Turn 8.9		App. Total		
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)							
Time					App Total	Left 8.1	Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5	U-Turn 8.6	App Total		Thru 8.7	Right 8.8	U-Turn 8.9	App Total	Int Total		
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)

Time						Southbound				Eastbound				Westbound					Int Total	
						Mt. Olivet Rd				Iron Bridge Rd (West)				Iron Bridge Rd (East)						
					App Total	Left 8.1	Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5	U-Turn 8.6	App Total		Thru 8.7	Right 8.8	U-Turn 8.9	App Total		
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
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

Pedestrians

Requests						Southbound				Eastbound				Westbound				Int Total				
						Mt. Olivet Rd				Iron Bridge Rd (West)				Iron Bridge Rd (East)								
Time					App Total	EB 8c	WB 8d		App Total	NB 8e	SB 8f		App Total	NB 8g	SB 8h		App Total					
	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
		-	-	-	-	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	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



[Click here for Map](#)

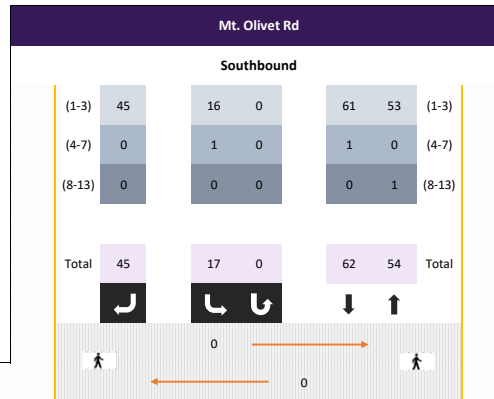
Peak Hour Turning Movement Count

Columbia, TN



www.marrtraffic.com

Tuesday, May 18, 2021	
Period	0600 - 1900
Peak Hour	1515 - 1615

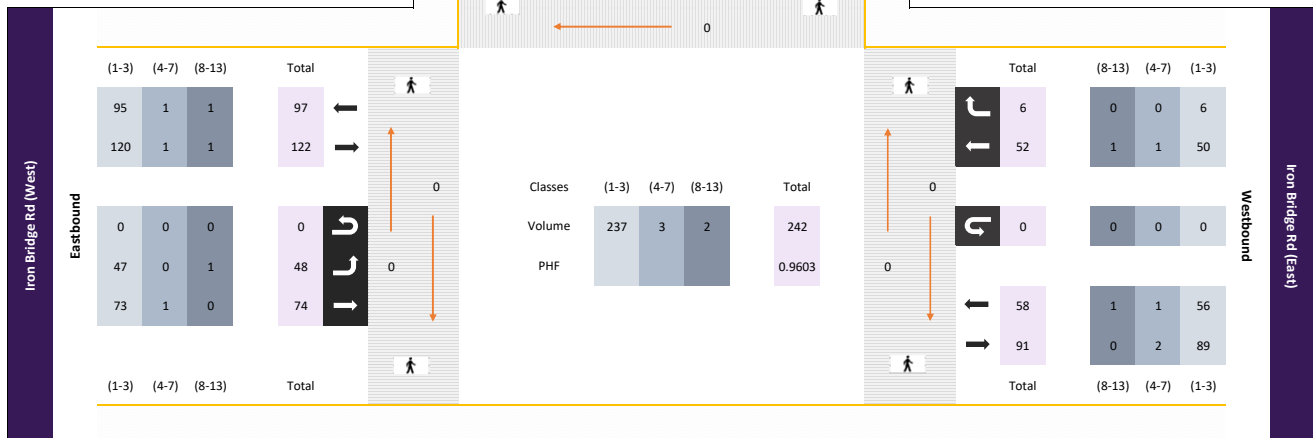


Session Parameters

(Drop Down Menu)

1400 - 1830

Volume



All vehicles

All Vehicles						Southbound					Eastbound					Westbound					Int Total
						Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
					App Total	Left 8.1		Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5	U-Turn 8.6	App Total		Thru 8.7	Right 8.8	U-Turn 8.9	App Total		
Time	-	-	-	-	0	4	-	12	0	16	14	16	-	0	30	-	13	3	0	16	62
1515 - 1530	-	-	-	-	0	7	-	17	0	24	11	13	-	0	24	-	14	1	0	15	63
1530 - 1545	-	-	-	-	0	1	-	10	0	11	10	22	-	0	32	-	13	1	0	14	57
1545 - 1600	-	-	-	-	0	5	-	6	0	11	13	23	-	0	36	-	12	1	0	13	60
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

Time						Southbound				Eastbound				Westbound					Int Total	
						Mt. Olivet Rd				Iron Bridge Rd (West)				Iron Bridge Rd (East)						
					App Total	Left 8.1	Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5	U-Turn 8.6	App Total		Thru 8.7	Right 8.8	U-Turn 8.9	App Total		
1515 - 1530	-	-	-	-	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
1545 - 1600	-	-	-	-	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
Total	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

Passenger Vehicles (1-3)

Time						Southbound				Eastbound				Westbound					Int Total		
						Mt. Olivet Rd				Iron Bridge Rd (West)				Iron Bridge Rd (East)							
					App Total	Left 8.1	Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5	U-Turn 8.6	App Total		Thru 8.7	Right 8.8	U-Turn 8.9	App Total			
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)

Time						Southbound					Eastbound					Westbound					Int Total
						Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
					App Total	Left 8.1	Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5	U-Turn 8.6	App Total		Thru 8.7	Right 8.8	U-Turn 8.9	App Total			
1515 - 1530	-	-	-	-	0	1	-	0	0	1	0	0	-	0	0	0	0	0	1		
1530 - 1545	-	-	-	-	0	0	-	0	0	0	0	0	-	0	0	-	1	0	1		
1545 - 1600	-	-	-	-	0	0	-	0	0	0	0	1	-	0	1	-	0	0	1		
1600 - 1615	-	-	-	-	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	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)

Time							Southbound				Eastbound				Westbound					Int Total	
							Mt. Olivet Rd				Iron Bridge Rd (West)				Iron Bridge Rd (East)						
						App Total	Left 8.1	Right 8.2	U-Turn 8.3	App Total	Left 8.4	Thru 8.5	U-Turn 8.6	App Total		Thru 8.7	Right 8.8	U-Turn 8.9	App Total		
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	0	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

Access Points	Access Point Data																				
						Southbound					Eastbound					Westbound					
						Mt. Olivet Rd					Iron Bridge Rd (West)					Iron Bridge Rd (East)					
Time					App Total	EB 8c	WB 8d			App Total	NB 8e	SB 8f			App Total	NB 8g	SB 8h			App Total	Int Total
1515 - 1530	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1530 - 1545	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1545 - 1600	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1600 - 1615	-	-	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	-
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



[Click here for Map](#)

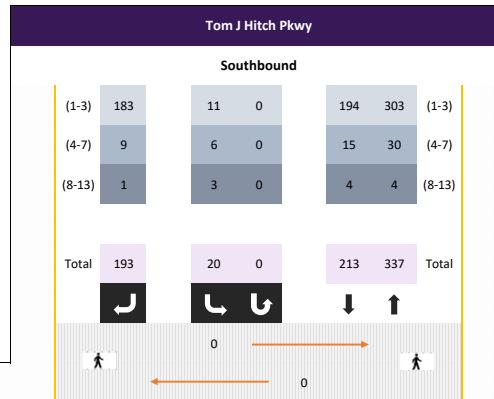
Peak Hour Turning Movement Count

Columbia, TN



www.marrtraffic.com

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

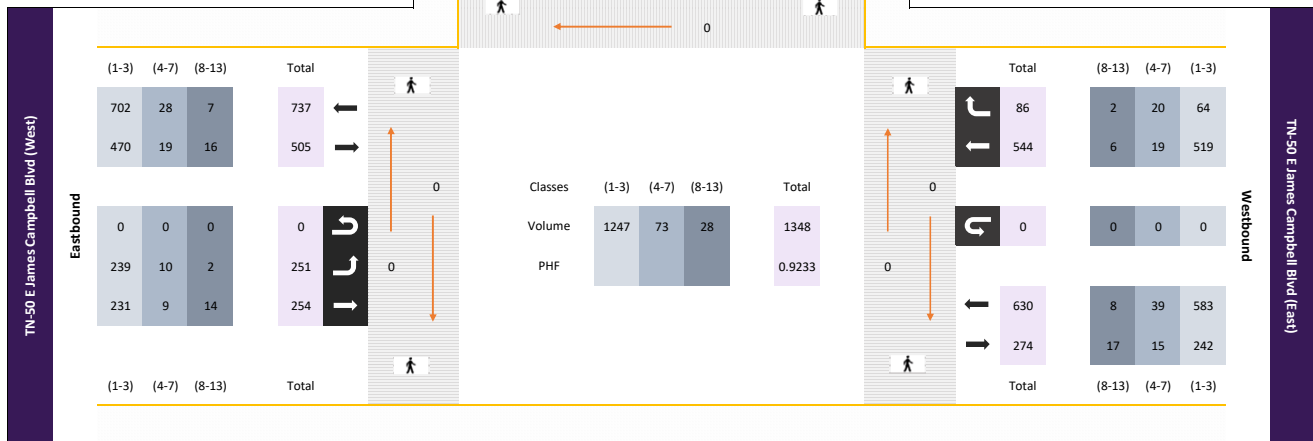


Session Parameters

(Drop Down Menu)

0600 - 0900

Volume



All vehicles

Time						Southbound					Eastbound					Westbound					Int Total
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					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	
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

Time						Southbound					Eastbound					Westbound					Int Total
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					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	
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)

Time						Southbound				Eastbound				Westbound				Int. Total			
						Tom J Hitch Pkwy				TN-50 E James Campbell Blvd (West)				TN-50 E James Campbell Blvd (East)							
					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
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)

Time						Southbound					Eastbound					Westbound					Int Total
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					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	
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)

Time						Southbound					Eastbound					Westbound					Int. Total
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					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	
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

Time						Southbound					Eastbound					Westbound					Int Total
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
		WB 4b			App Total	EB 4c	WB 4d			App Total	NB 4e	SB 4f			App Total	NB 4g	SB 4h			App 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](#)

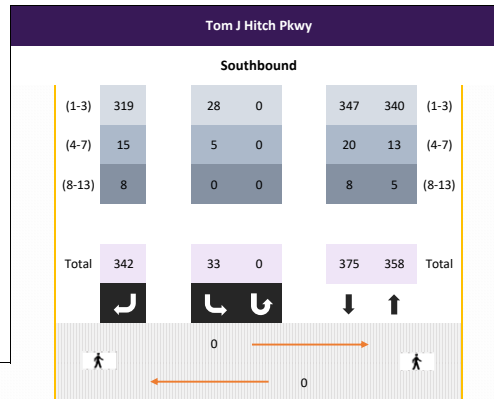
Peak Hour Turning Movement Count

Columbia, TN



www.marrtraffic.com

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

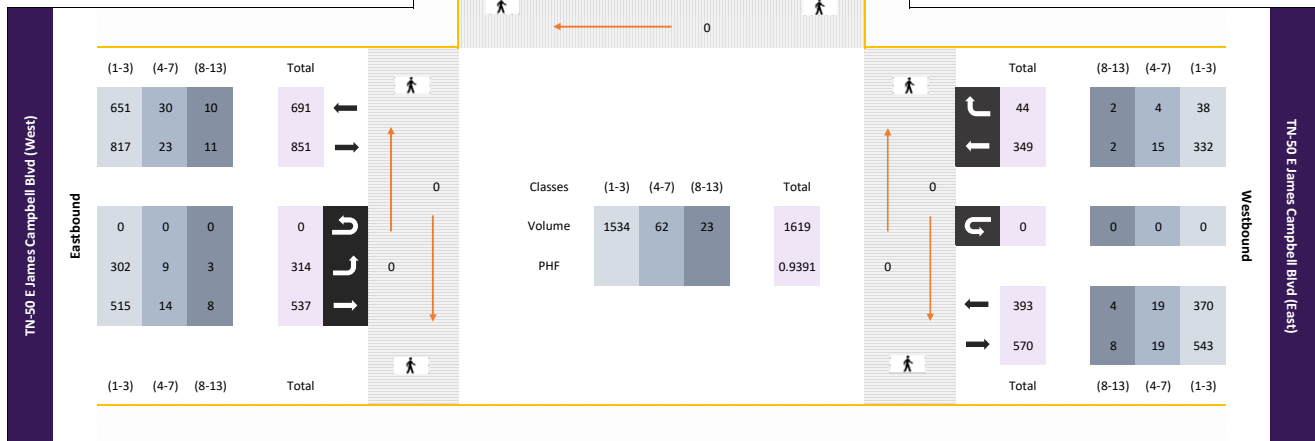


Session Parameters

(Drop Down Menu)

1400 - 1830

Volume



All vehicles

Time						Southbound					Eastbound					Westbound					Int Total
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					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	
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

Time						Southbound					Eastbound					Westbound					Int Total
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					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	
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)

Time						Southbound				Eastbound				Westbound				Int. Total			
						Tom J Hitch Pkwy				TN-50 E James Campbell Blvd (West)				TN-50 E James Campbell Blvd (East)							
					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
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		-	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)

Time						Southbound				Eastbound				Westbound				Int Total			
						Tom J Hitch Pkwy				TN-50 E James Campbell Blvd (West)				TN-50 E James Campbell Blvd (East)							
					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
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)

Time						Southbound					Eastbound					Westbound					Int Total
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
					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	
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

Time						Southbound					Eastbound					Westbound					Int Total
						Tom J Hitch Pkwy					TN-50 E James Campbell Blvd (West)					TN-50 E James Campbell Blvd (East)					
		WB 4b			App Total	EB 4c	WB 4d			App Total	NB 4e	SB 4f			App Total	NB 4g	SB 4h			App 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



[Click here for Map](#)

Peak Hour Turning Movement Count

Columbia, TN



www.marrtraffic.com

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

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Driveway					Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App 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)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Driveway					Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App 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)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Driveway					Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App 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)

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Driveway					Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App 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

Time	Northbound					Southbound					Eastbound					Westbound					Int Total
	Driveway					Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App 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	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

Pedestrians	Northbound					Southbound					Eastbound					Westbound					int
	Driveway					Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	EB 1a	WB 1b			App Total	EB 1c	WB 1d			App Total	NB 1e	SB 1f			App Total	NB 1g	SB 1h			App Total	
Time																					
0700 - 0715	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0715 - 0730	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0730 - 0745	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0745 - 0800	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	-
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Classified Turn Movement Count || All vehicles

Columbia, TN



Marr Traffic
DATA COLLECTION

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Site 1 of 1

Driveway
Patterson Dr
TN-99 Bear Creek Pike (West)
TN-99 Bear Creek Pike (East)

Date

Tuesday, February 22, 2022

Weather

Cloudy
60°F

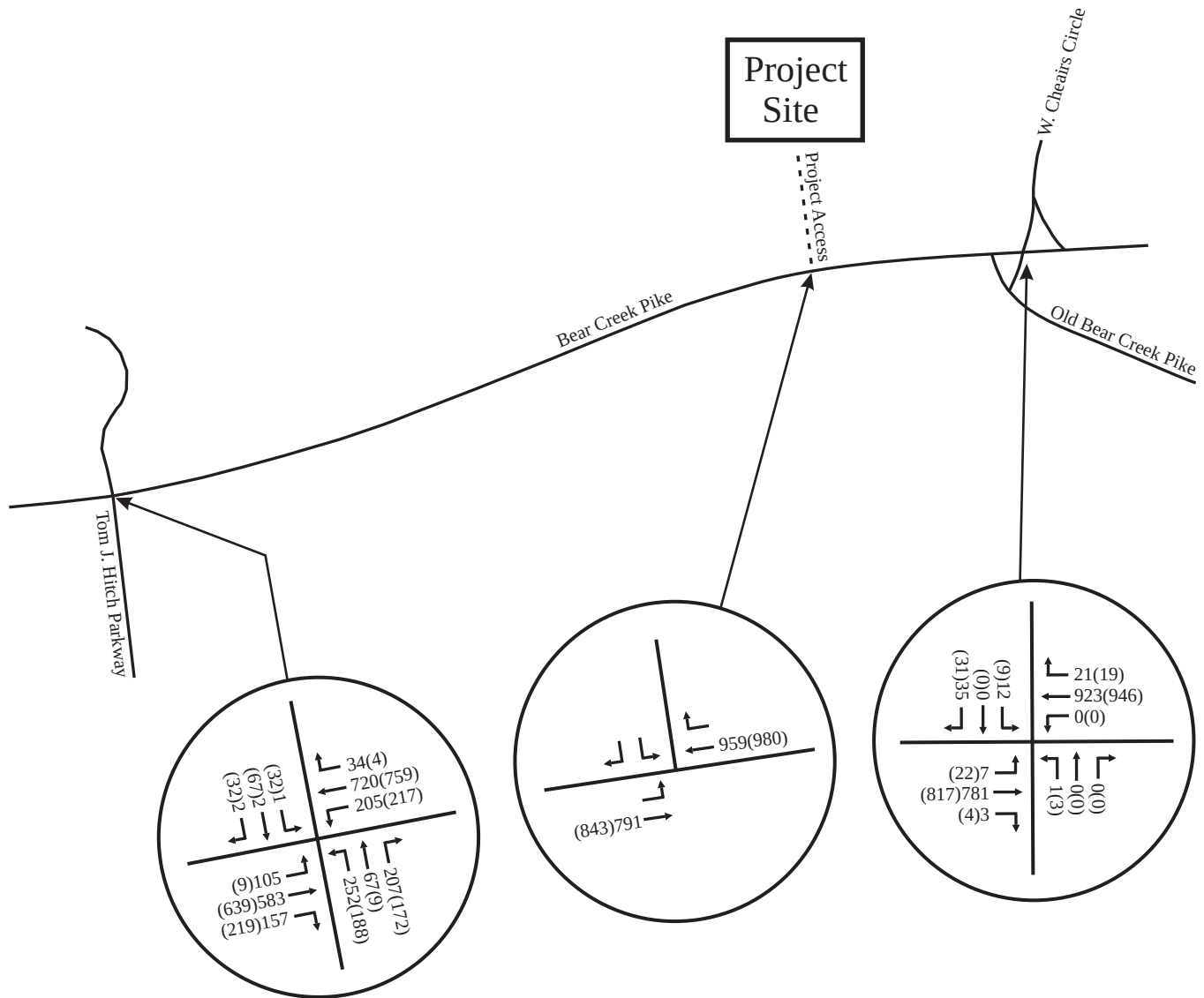
Lat/Long

35.636515°, -86.993469°

0600 - 1900 (Weekday 13h Session) (02-22-2022)

All vehicles

TIME	Northbound					Southbound					Eastbound					Westbound					Int Total
	Driveway					Patterson Dr					TN-99 Bear Creek Pike (West)					TN-99 Bear Creek Pike (East)					
	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App 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



No Scale

XX - AM Peak Hour Volumes
 (XX) - PM Peak Hour Volumes

Figure 4.
Existing Year 2023 Peak Hour Traffic Volumes



[Click here for Map](#)

Peak Hour Turning Movement Count

Columbia, TN



www.marrtraffic.com



Tuesday, August 22, 2023	
Period	0600 - 0900
Peak Hour	0715 - 0815

* the Peak Hour Diagram does not include Bikes

Session Parameters

(Drop Down Menu)

Peak Hour

Volume



All vehicles

Time	Northbound						Southbound						Eastbound						Westbound						Int Total
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left 1.1	Thru 1.2	Right 1.3		U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7		U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11		U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15		U-Turn 1.16	App 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)

Time	Northbound						Southbound						Eastbound						Westbound						Int Total
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left 1.1	Thru 1.2	Right 1.3		U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7		U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11		U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15		U-Turn 1.16	App 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)

Time	Northbound						Southbound						Eastbound						Westbound						Int Total
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left 1.1	Thru 1.2	Right 1.3		U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7		U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11		U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15		U-Turn 1.16	App 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)

Time		Northbound						Southbound						Eastbound						Westbound						Int Total
		Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
		Left 1.1	Thru 1.2	Right 1.3		U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7		U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11		U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15		U-Turn 1.16	App Total	
0715 - 0730	0	2	0	-	0	2	0	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	0	2
0745 - 0800	0	2	0	-	0	2	0	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	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

Time	Northbound						Southbound						Eastbound						Westbound						Int Total
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left 1.1	Thru 1.2	Right 1.3		U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7		U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11		U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15		U-Turn 1.16	App 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



[Click here for Map](#)

Peak Hour Turning Movement Count

Columbia, TN



Tuesday, August 22, 2023	
Period	1600 - 1800
Peak Hour	1600 - 1700

* the Peak Hour Diagram does not include Bikes

 **Session Parameters**

(Drop Down Menu)

Peak Hour

Volume



All vehicles

Time	Northbound						Southbound						Eastbound						Westbound						Int Total
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left 1.1	Thru 1.2	Right 1.3		U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7		U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11		U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15		U-Turn 1.16	App 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)

Time	Northbound						Southbound						Eastbound						Westbound						Int Total
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left 1.1	Thru 1.2	Right 1.3		U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7		U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11		U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15		U-Turn 1.16	App 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)

Single Unit Trucks (47)	Northbound						Southbound						Eastbound						Westbound						Int Total
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left 1.1	Thru 1.2	Right 1.3		U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7		U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11		U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15		U-Turn 1.16	App Total	
Time																									
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

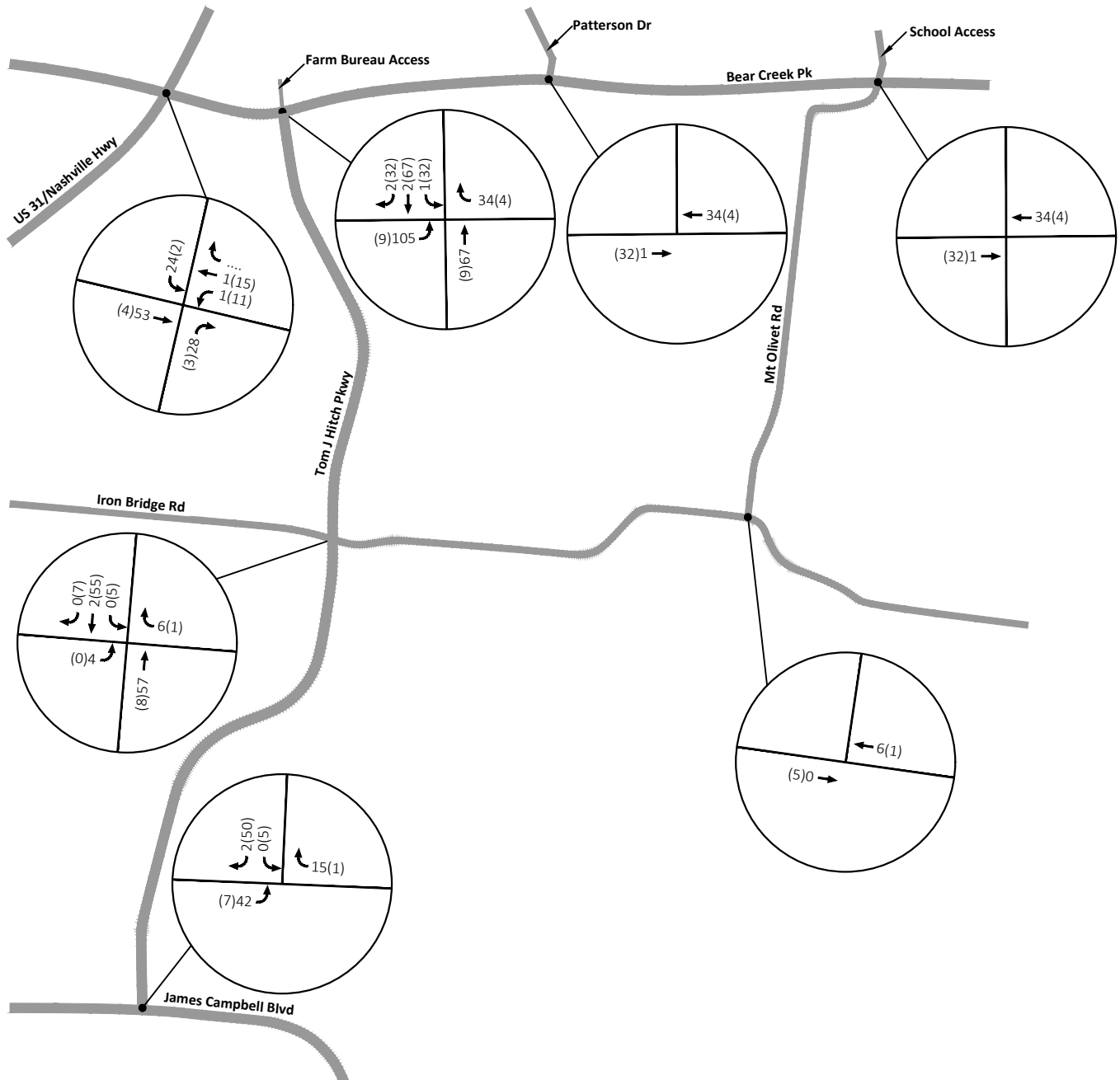
Combination Trucks (8-13)

Time	Northbound							Southbound							Eastbound							Westbound							Int Total
	Tom J Hitch Pkwy (South)							Tom J Hitch Pkwy (North)							Iron Bridge Rd (West)							Iron Bridge Rd (East)							
	Left 1.1	Thru 1.2	Right 1.3		U-Turn 1.4	App Total		Left 1.5	Thru 1.6	Right 1.7		U-Turn 1.8	App Total		Left 1.9	Thru 1.10	Right 1.11		U-Turn 1.12	App Total		Left 1.13	Thru 1.14	Right 1.15		U-Turn 1.16	App 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	0		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

Time	Northbound						Southbound						Eastbound						Westbound						Int Total
	Tom J Hitch Pkwy (South)						Tom J Hitch Pkwy (North)						Iron Bridge Rd (West)						Iron Bridge Rd (East)						
	Left 1.1	Thru 1.2	Right 1.3		U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7		U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11		U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15		U-Turn 1.16	App 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

ireitirreriric

**Legend:**

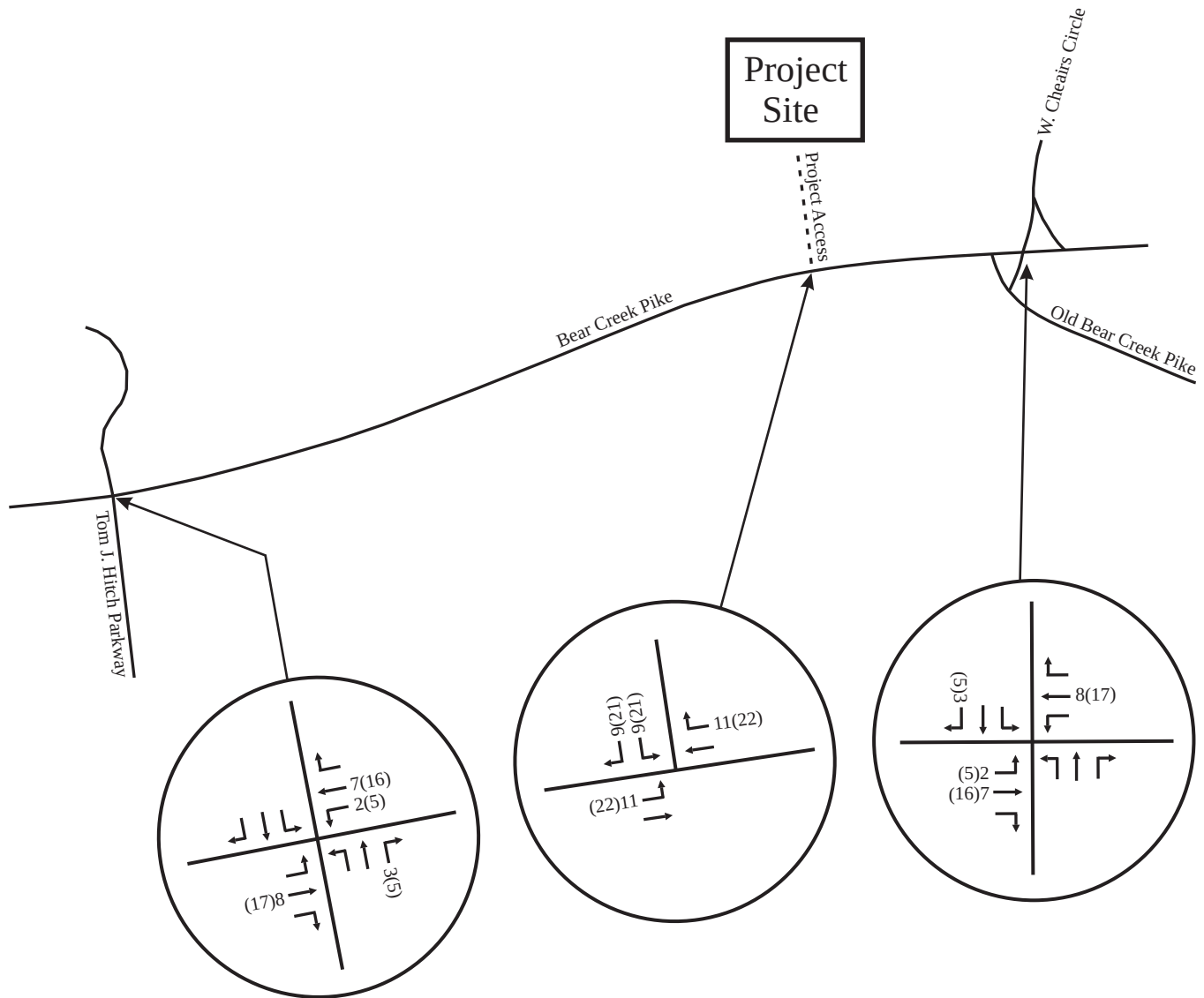
XXX - AM Peak Hour Traffic Volumes

(XXX) - PM Peak Hour Traffic Volumes

(Not to Scale)

APPENDIX E

BACKGROUND PROJECT DATA

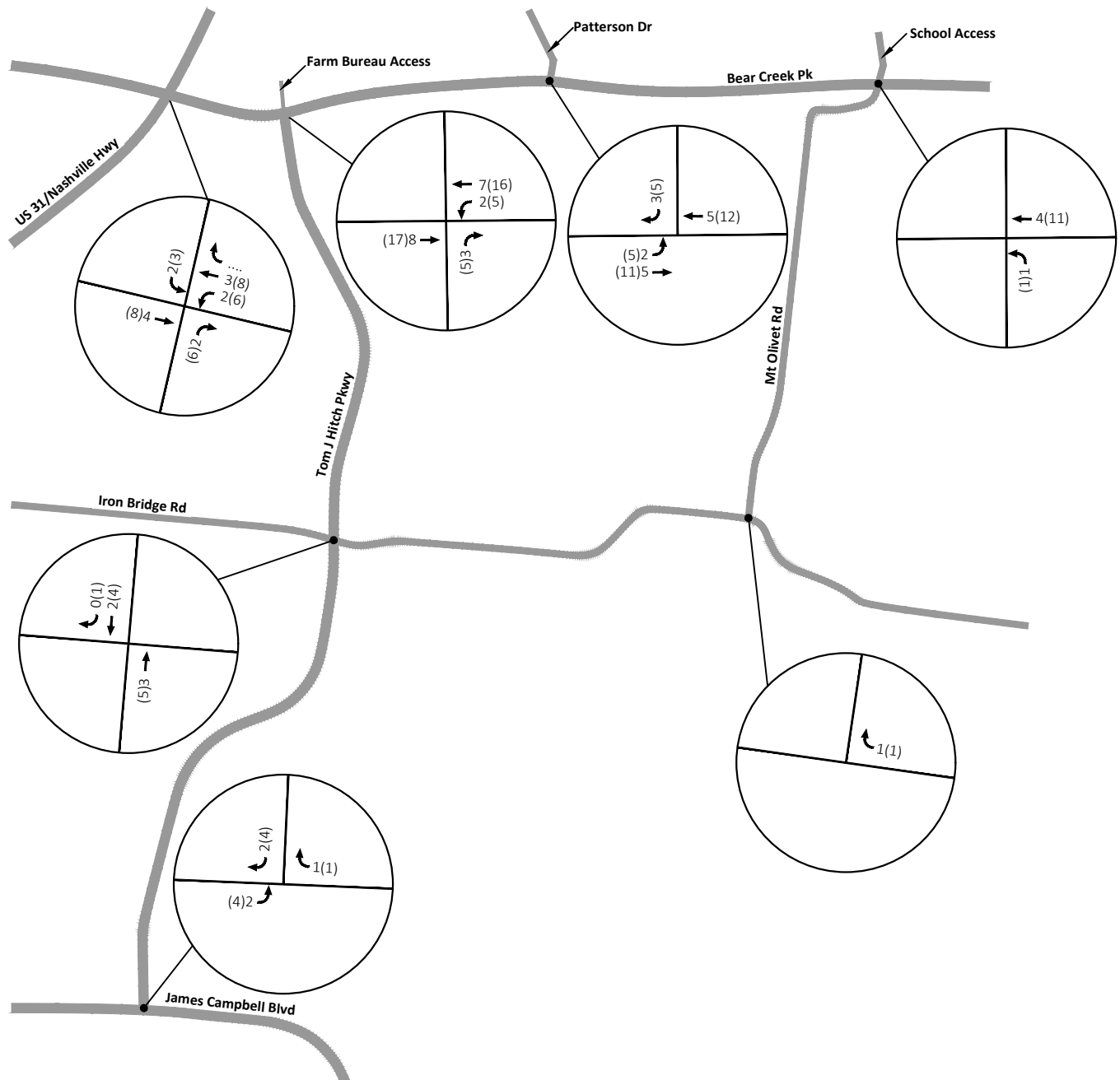


No Scale

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)

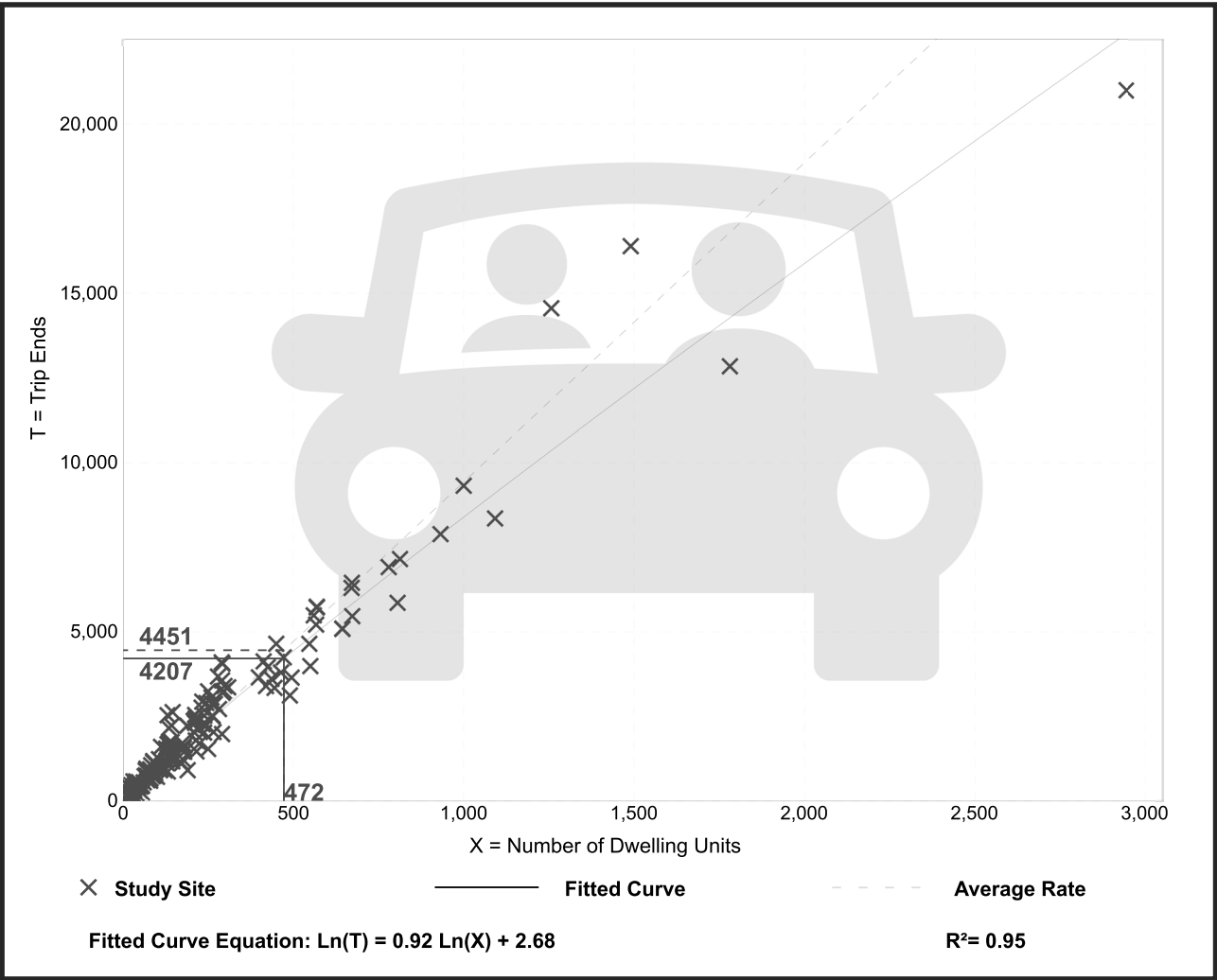
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

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



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

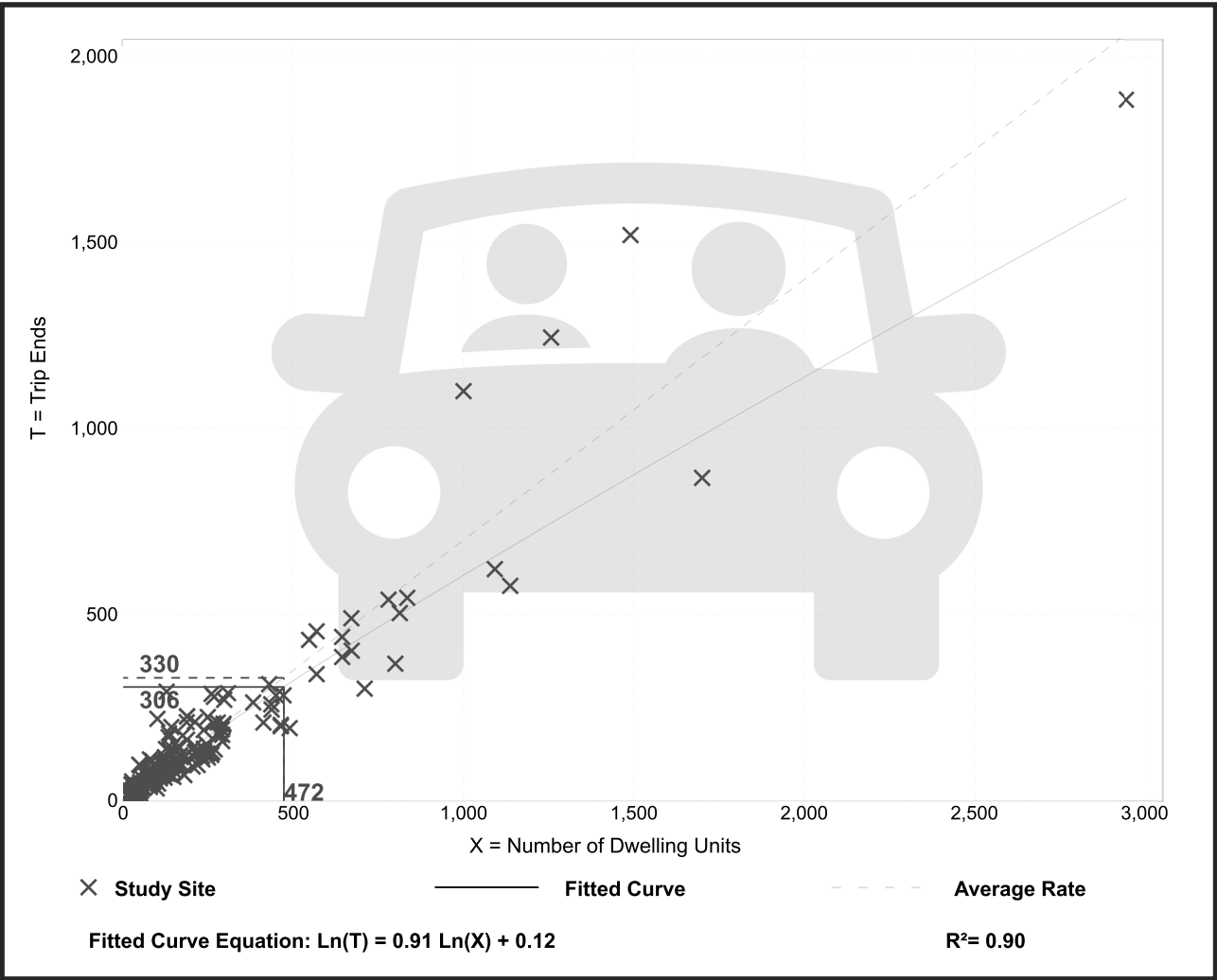
Avg. Num. of Dwelling Units: 226

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



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

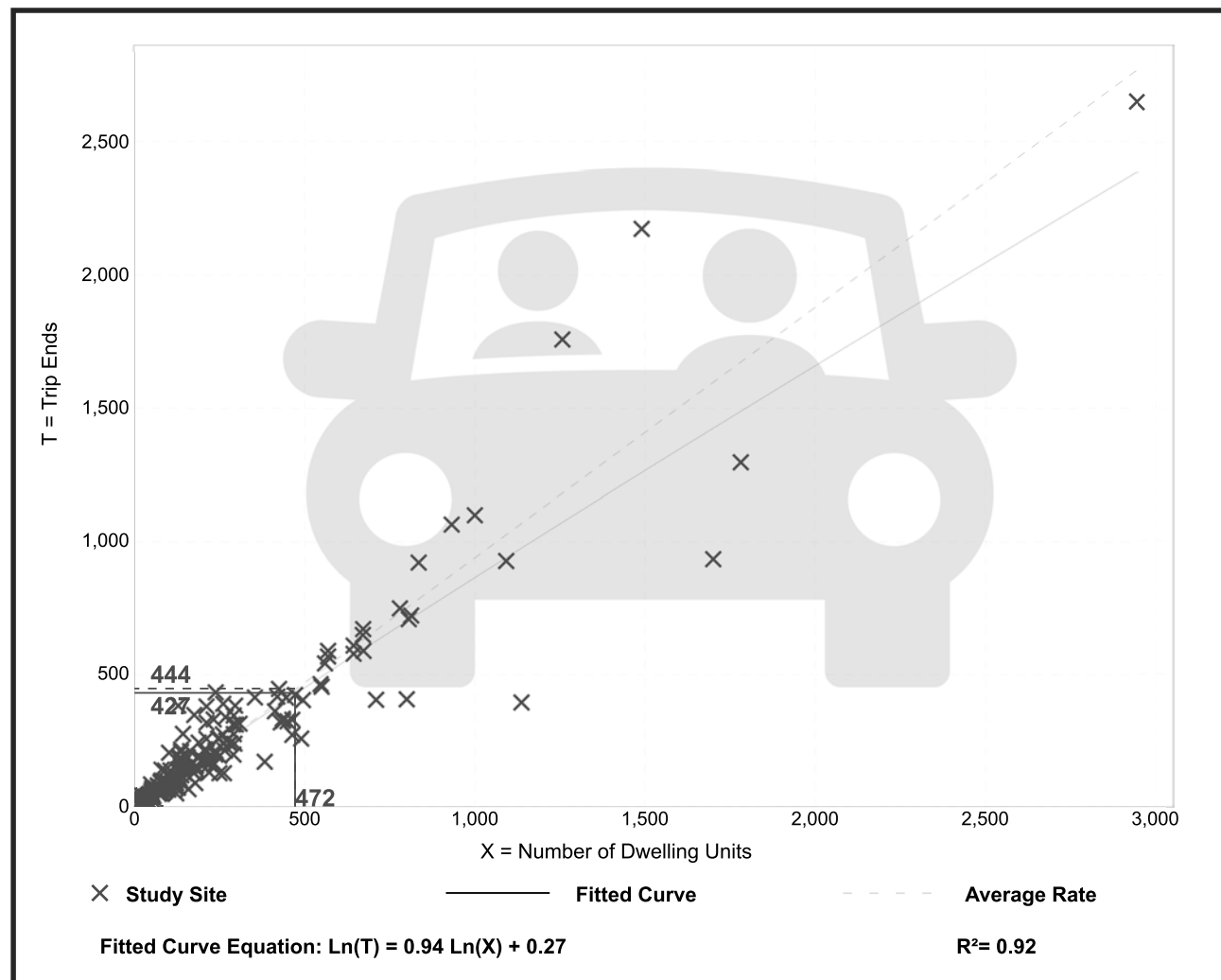
Avg. Num. of Dwelling Units: 248

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



Single-Family Attached Housing (215)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 22

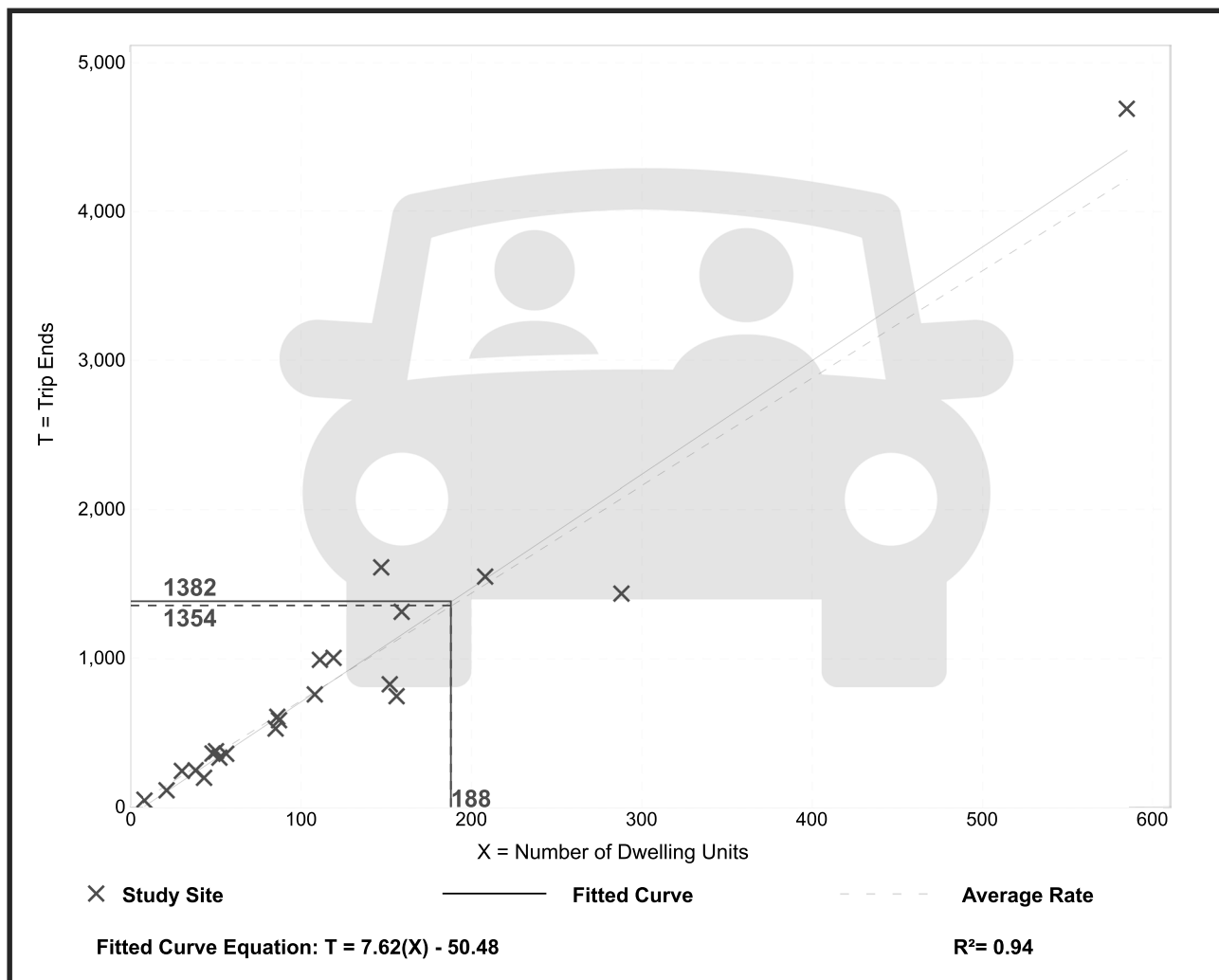
Avg. Num. of Dwelling Units: 120

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



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

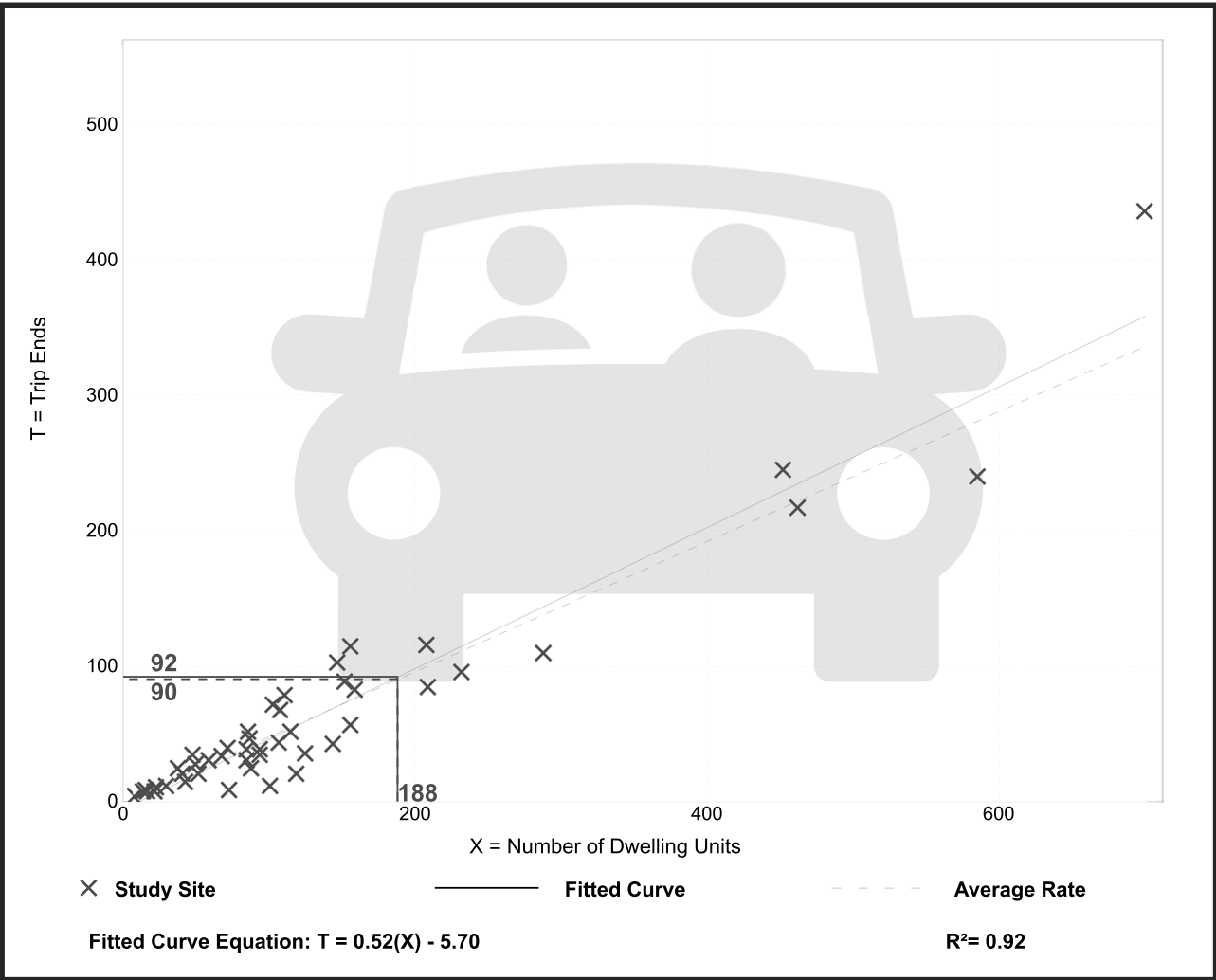
Directional Distribution:

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



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

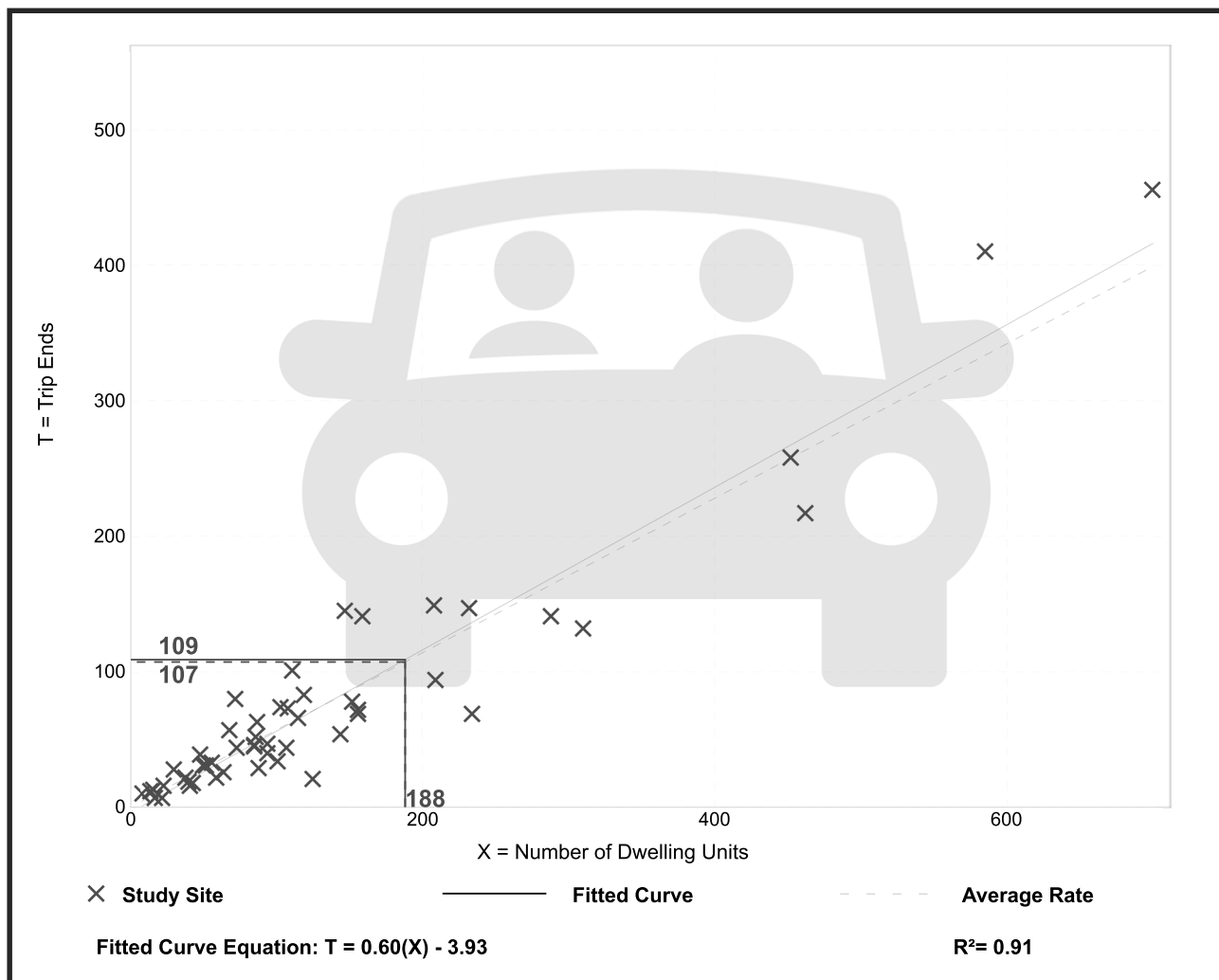
Avg. Num. of Dwelling Units: 136

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



Senior Adult Housing - Single-Family (251)

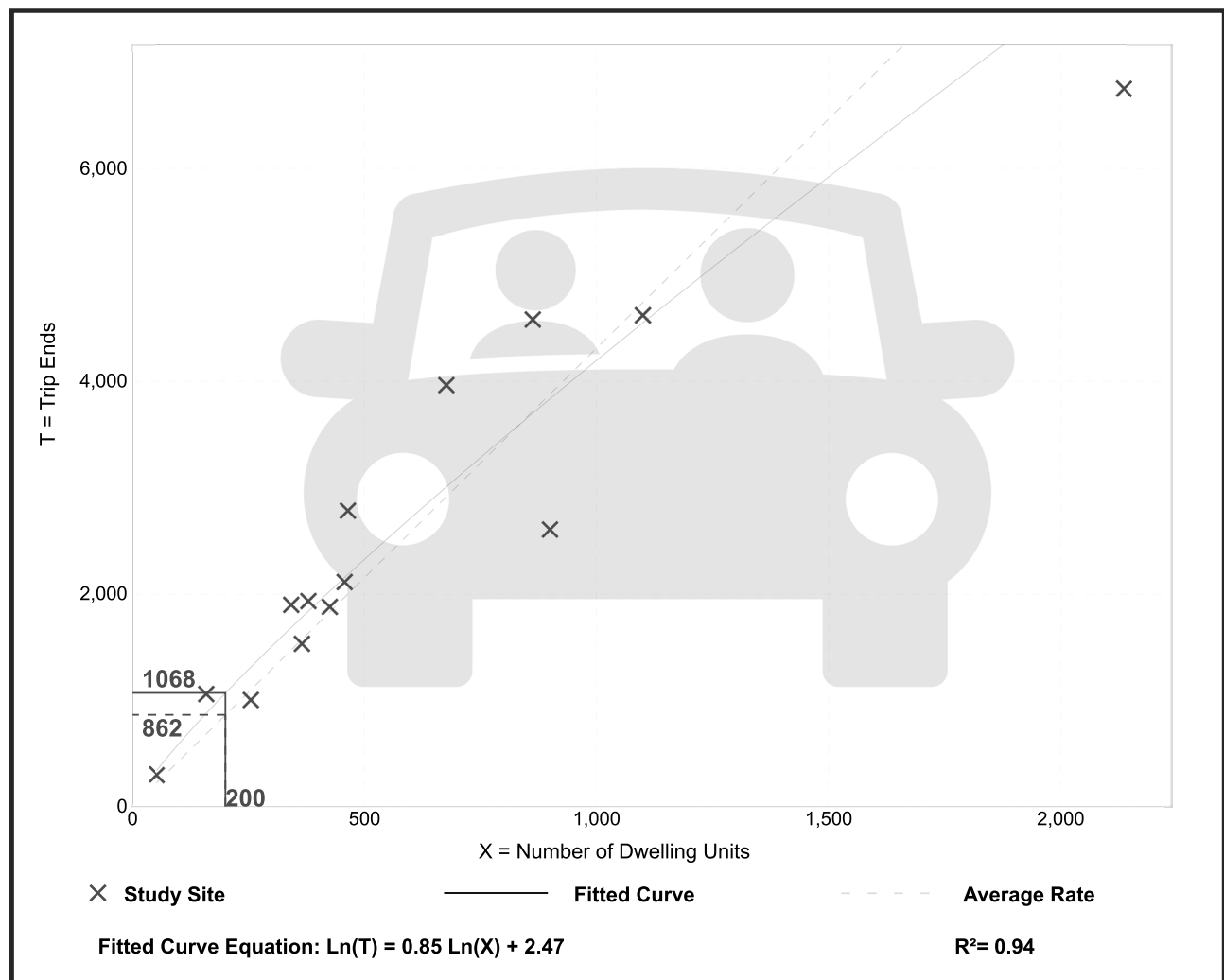
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

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



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

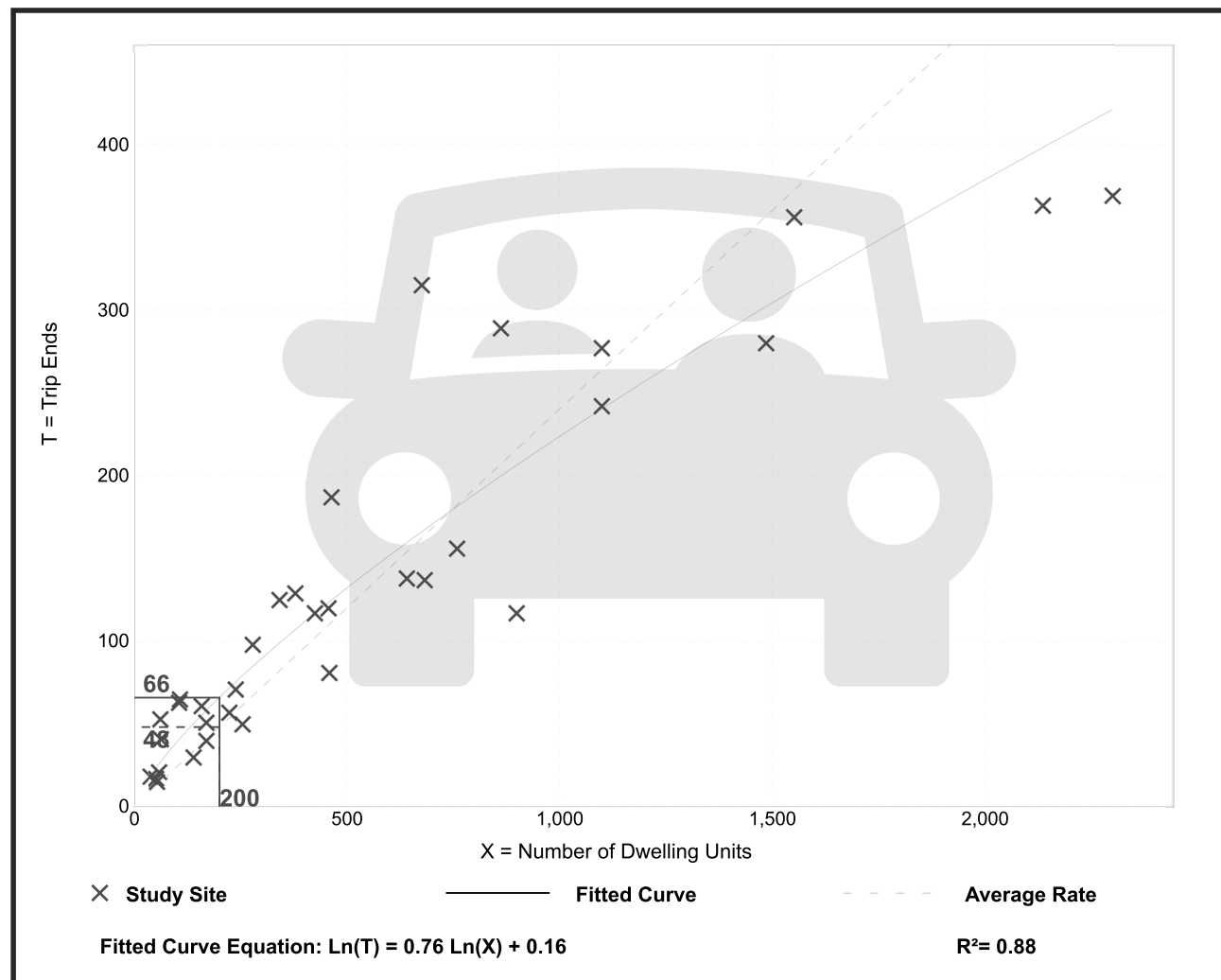
Avg. Num. of Dwelling Units: 557

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



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

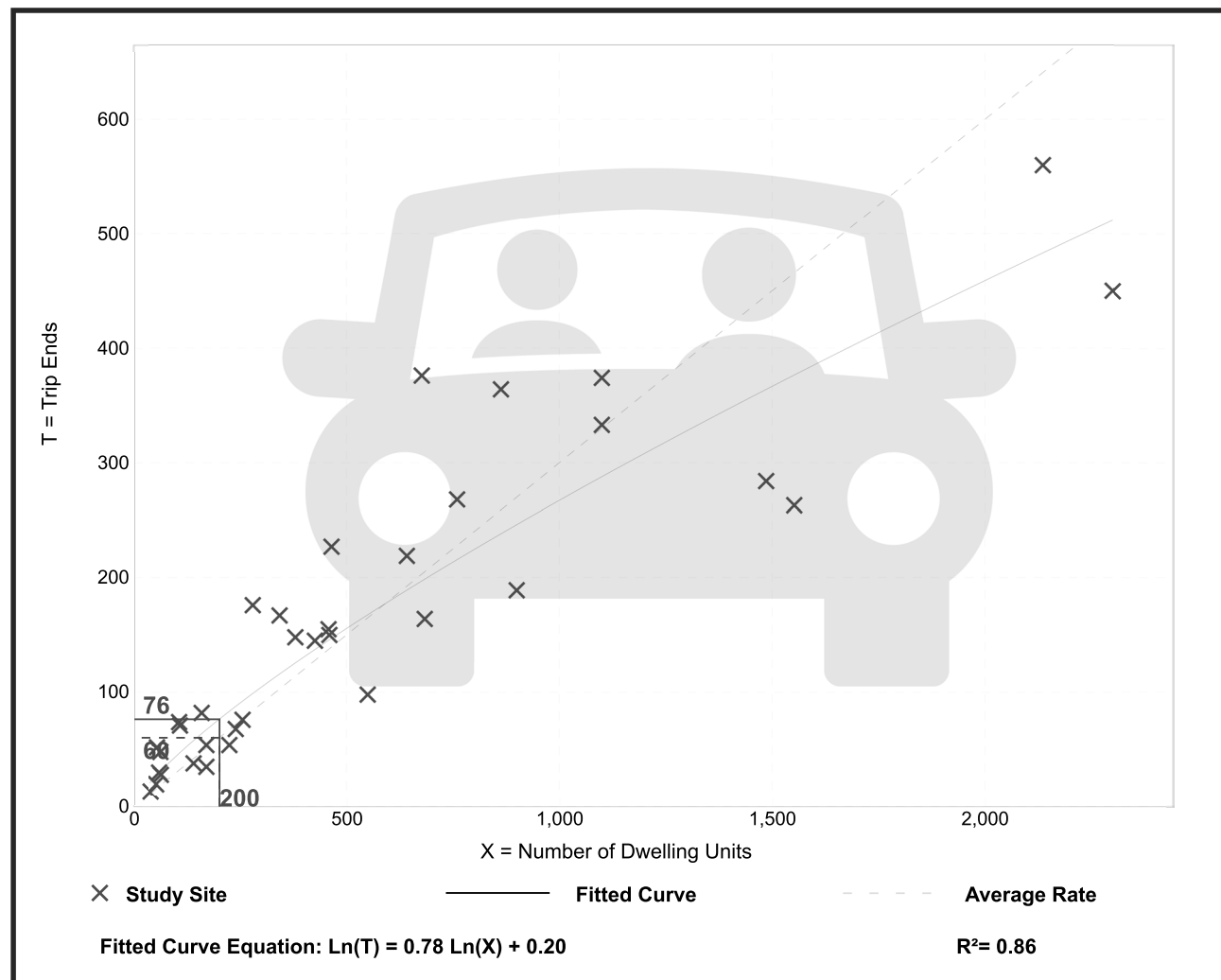
Avg. Num. of Dwelling Units: 556

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



Single-Family Detached Housing

(210)

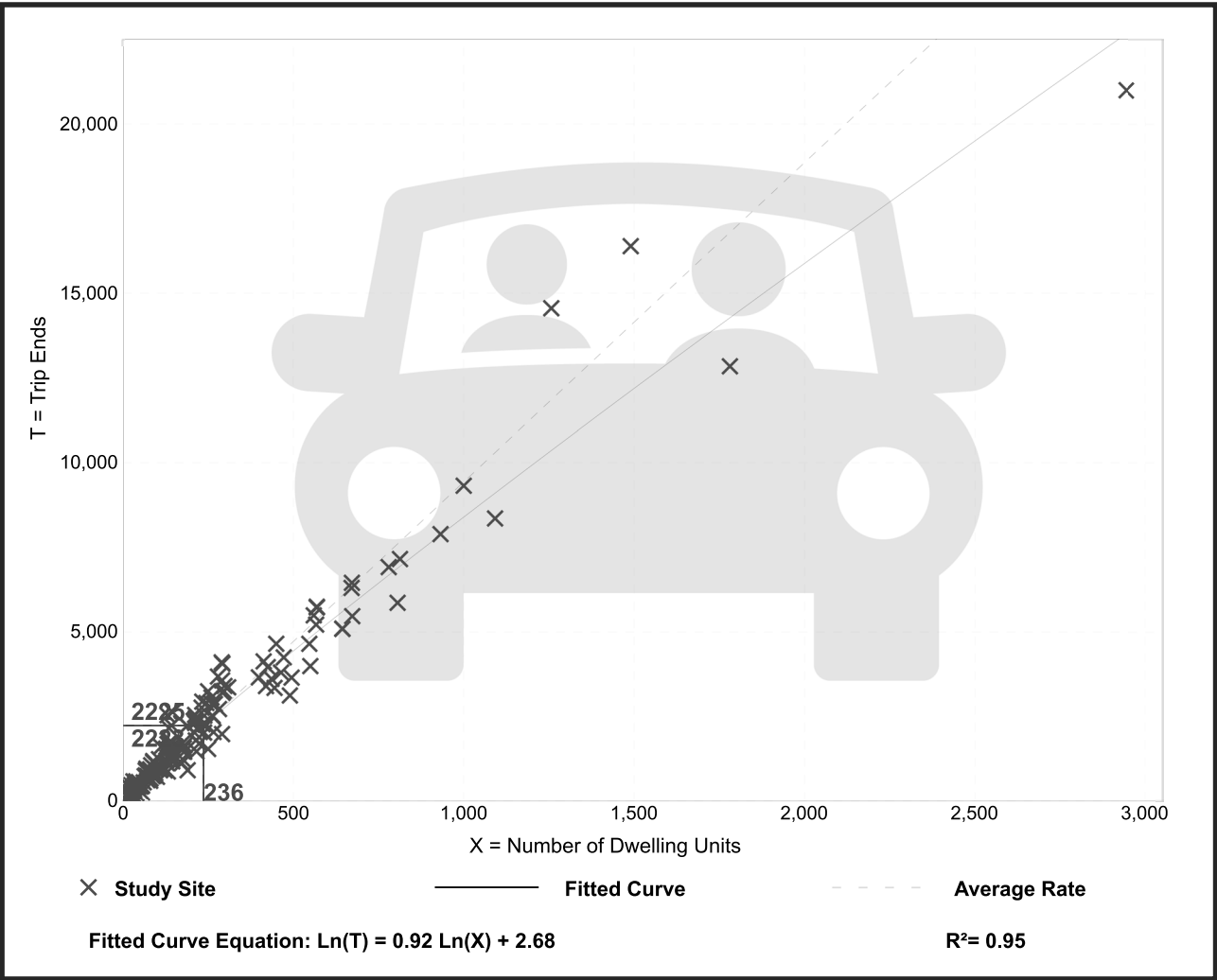
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

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



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

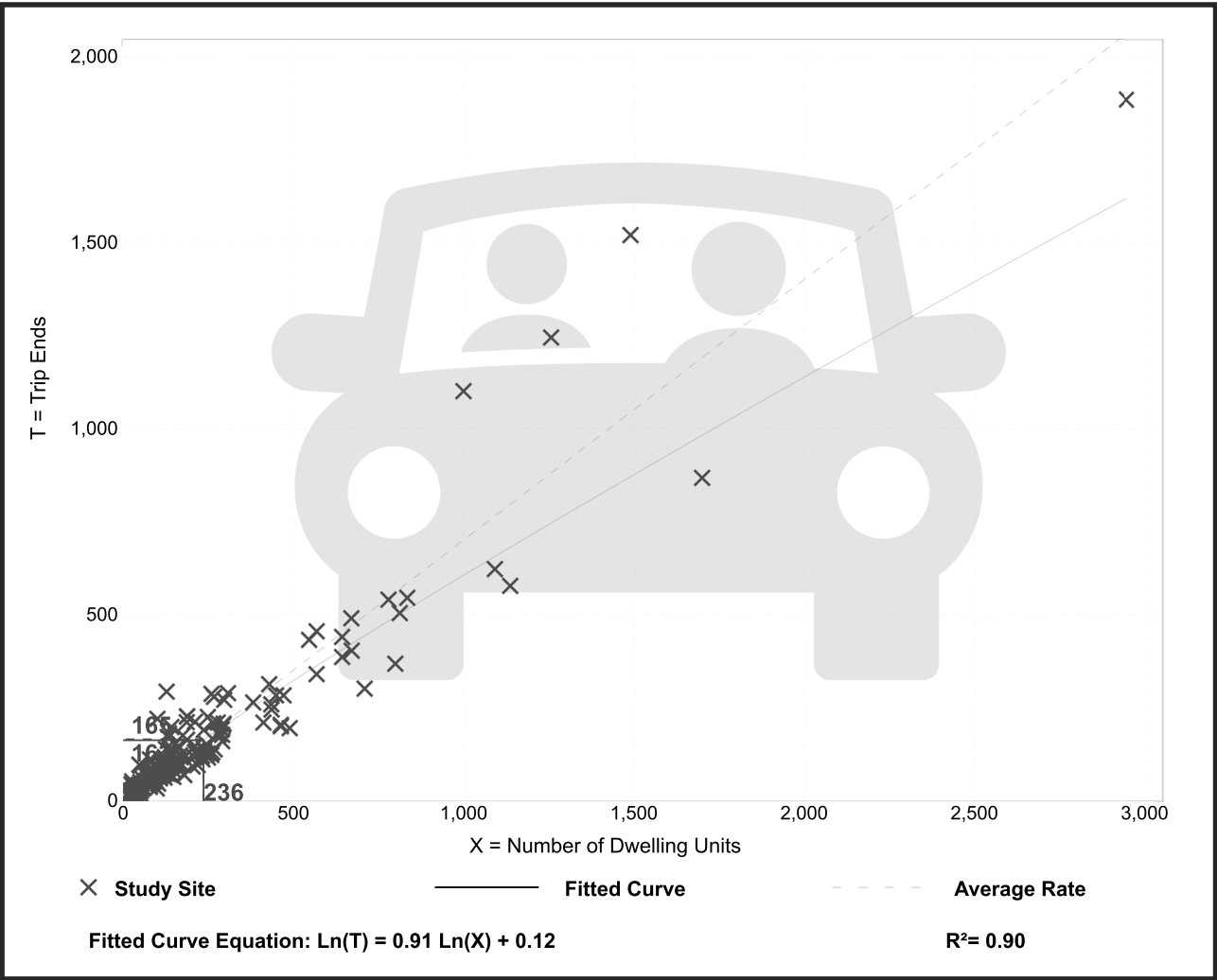
Avg. Num. of Dwelling Units: 226

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



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

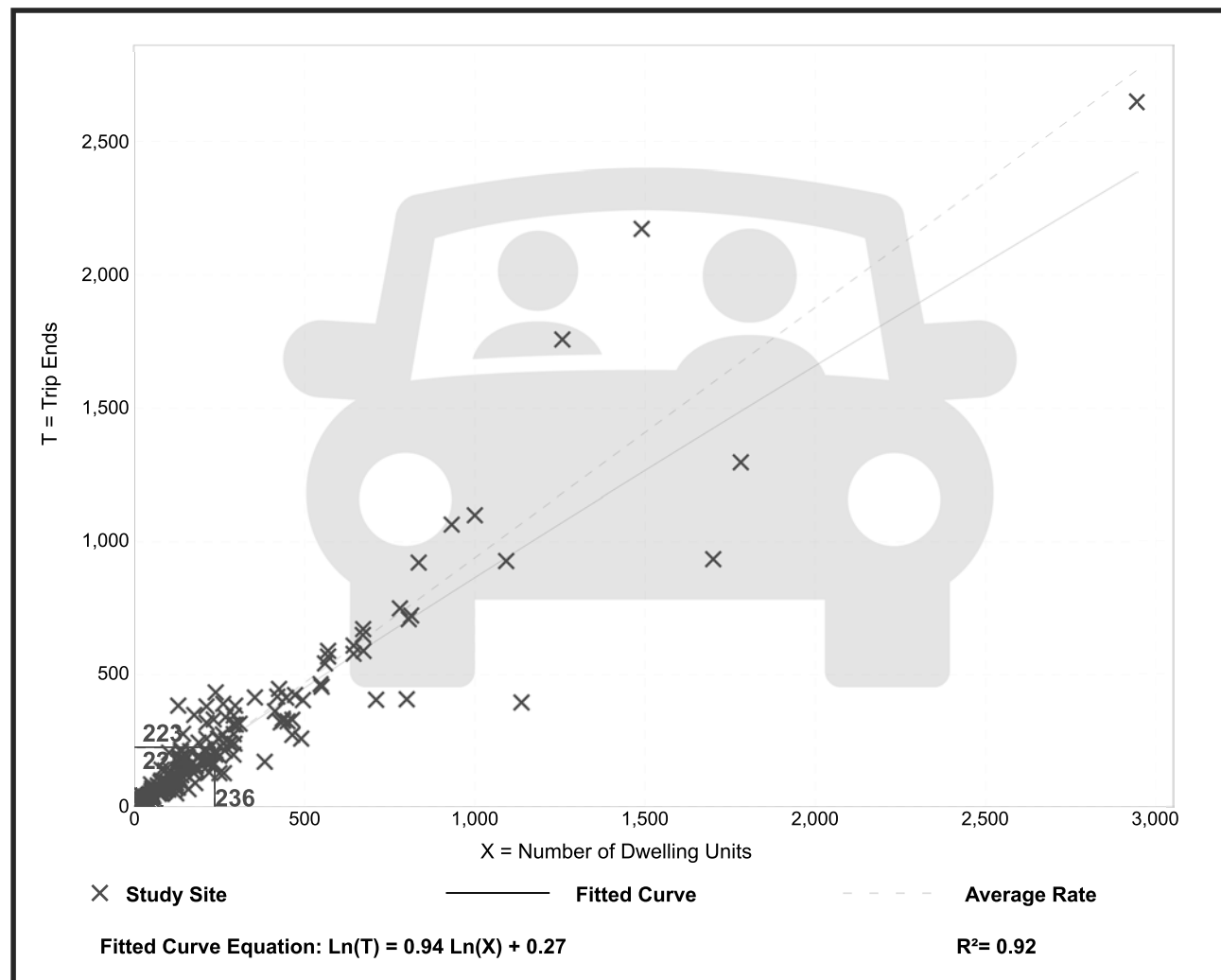
Avg. Num. of Dwelling Units: 248

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



Single-Family Attached Housing (215)

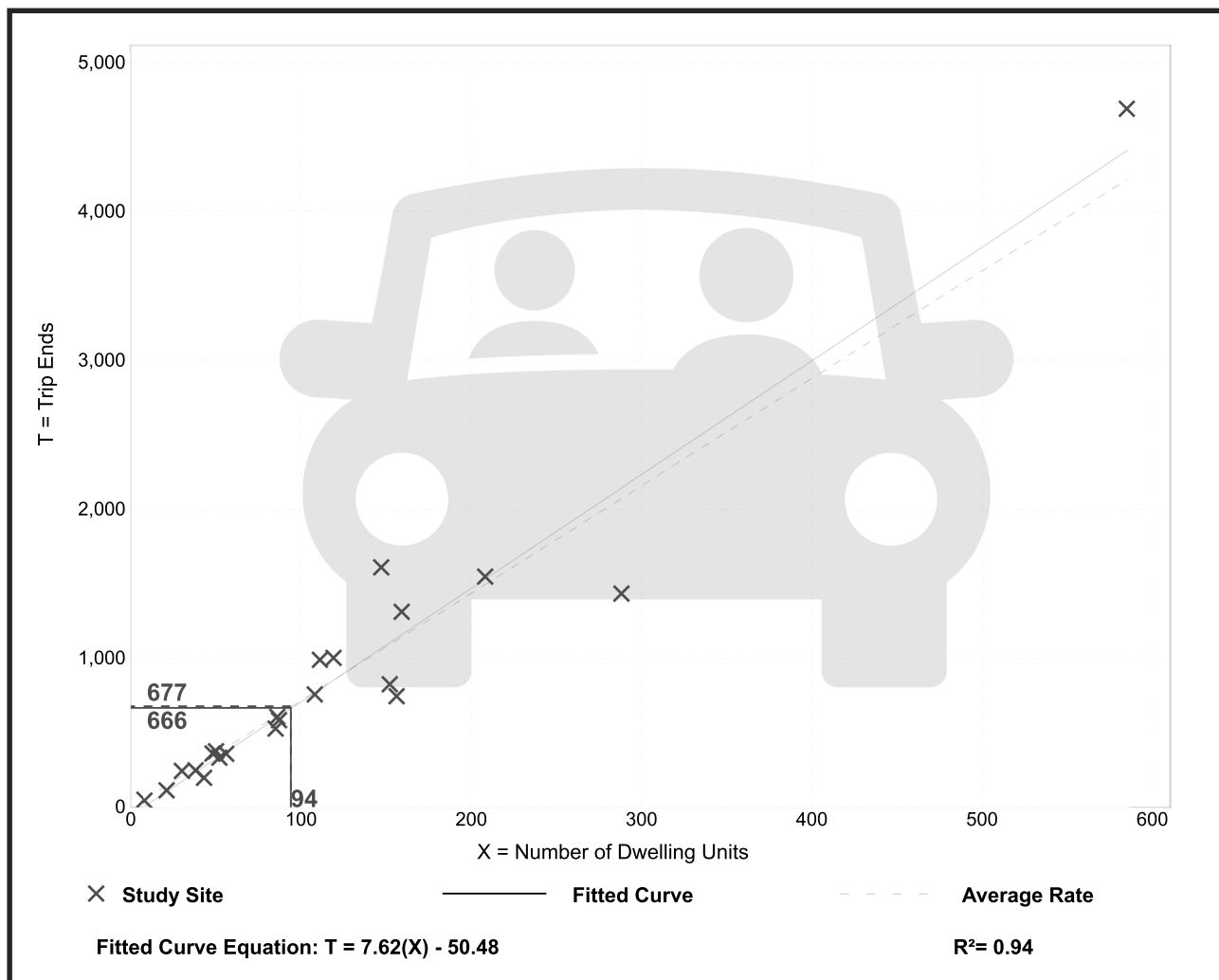
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

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



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

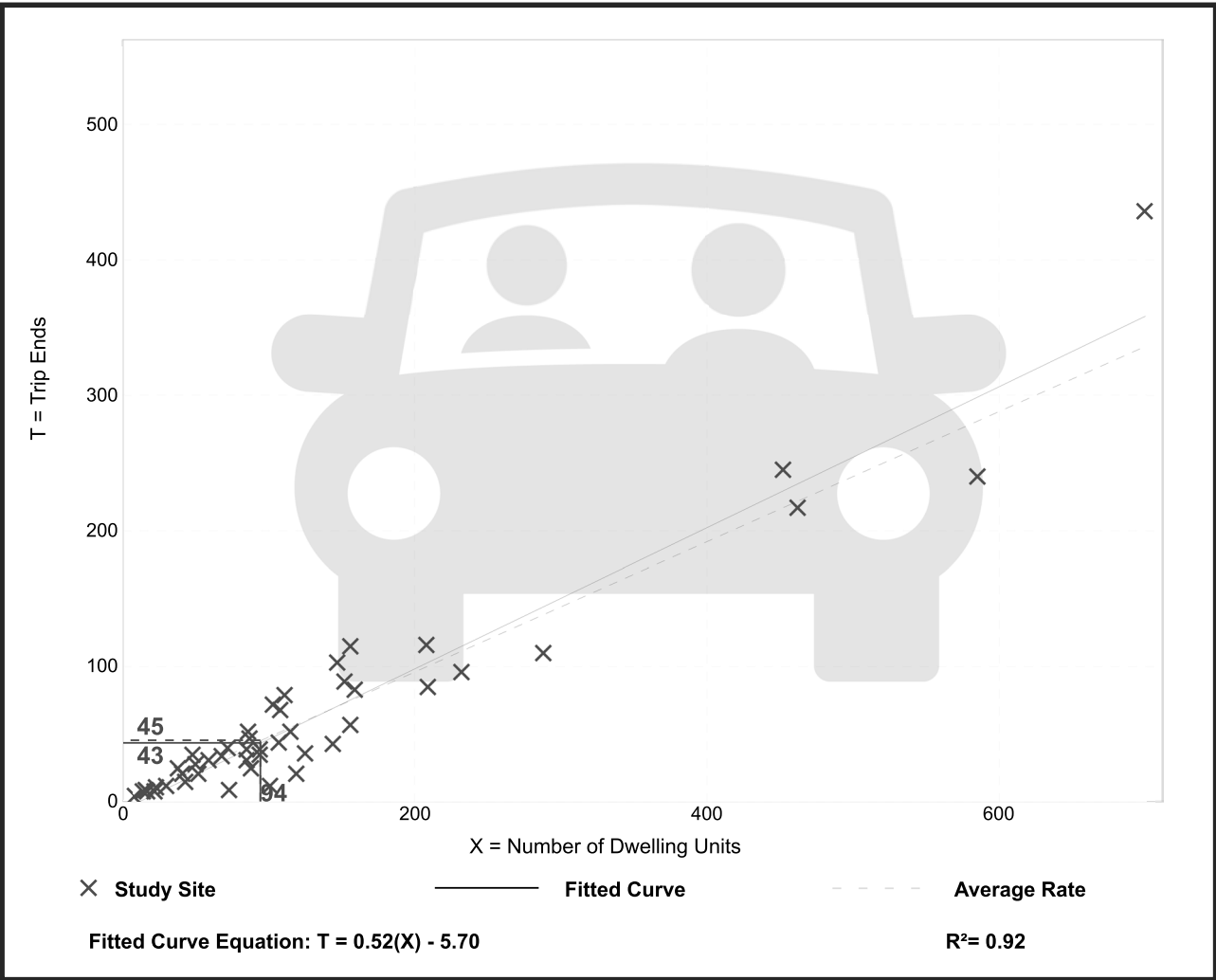
Directional Distribution:

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



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

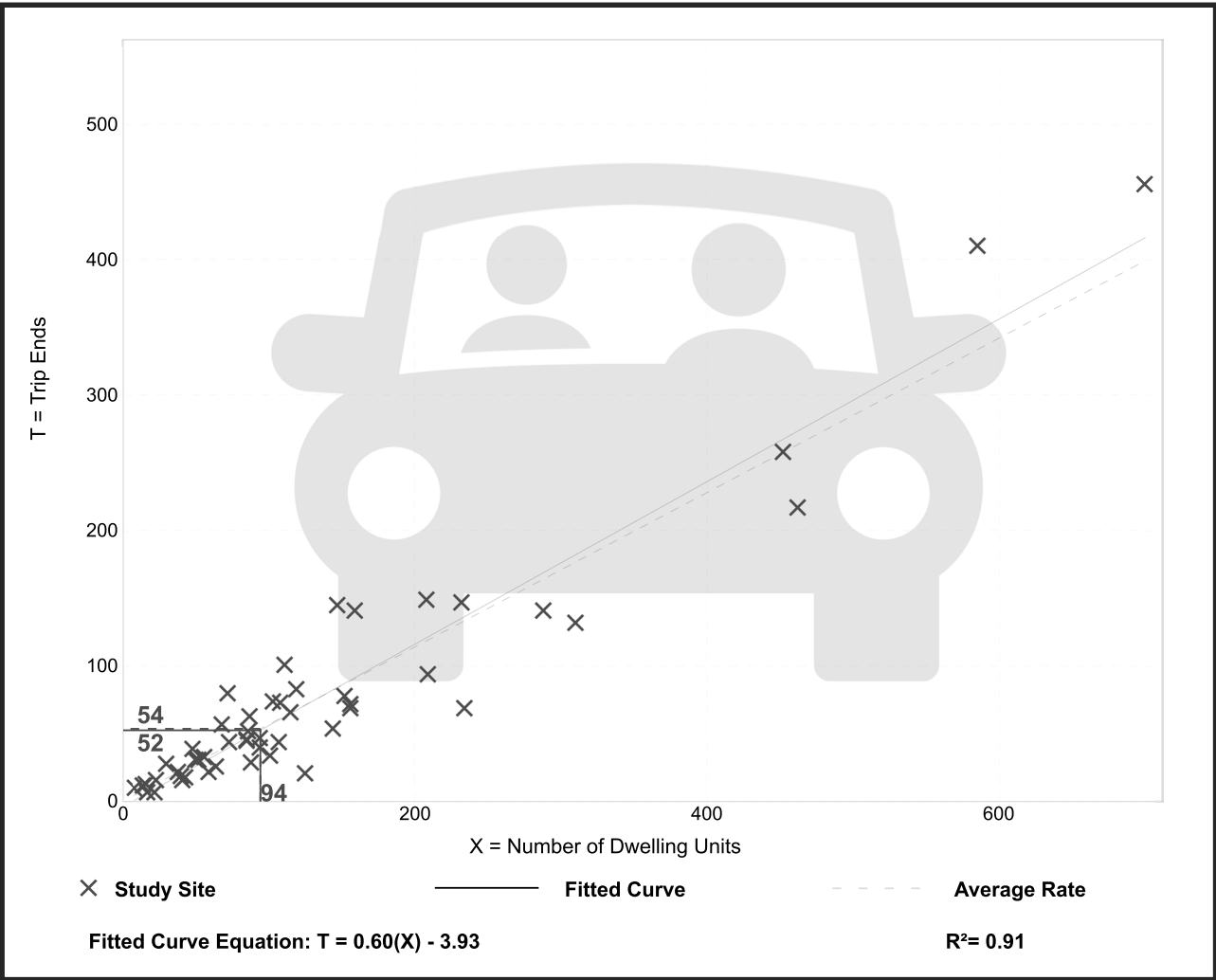
Directional Distribution:

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



Day Care Center

(565)

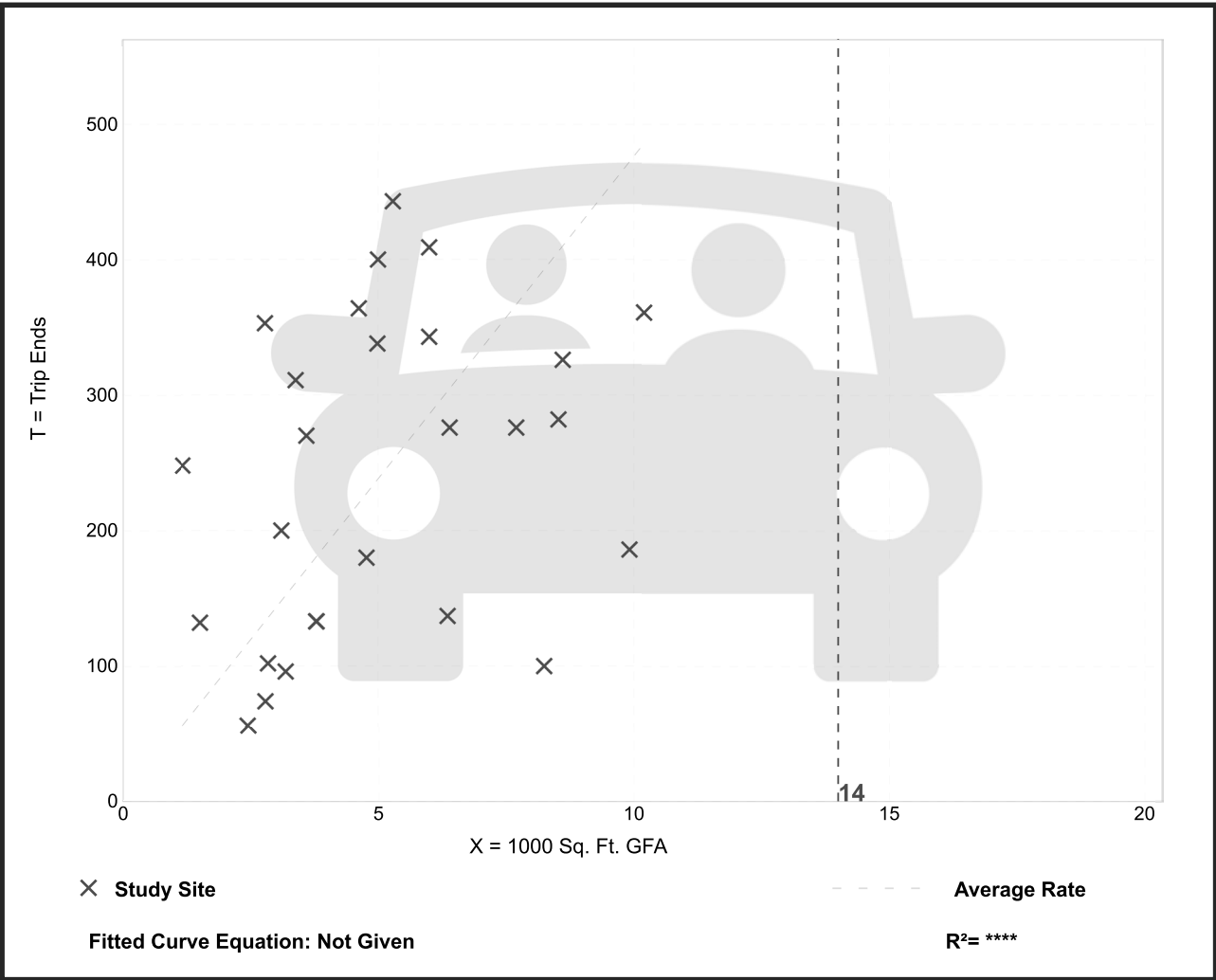
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

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



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

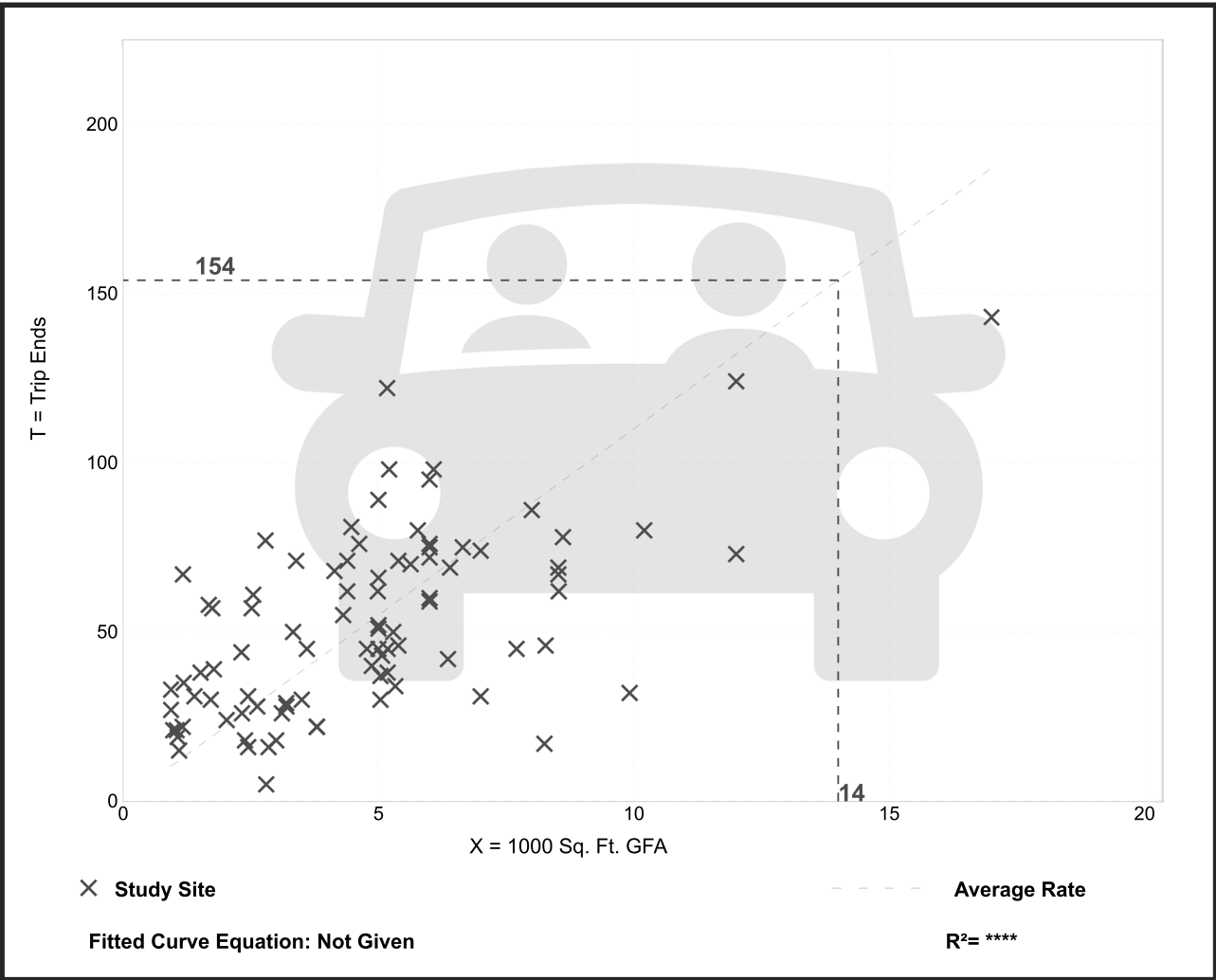
Avg. 1000 Sq. Ft. GFA: 5

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



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

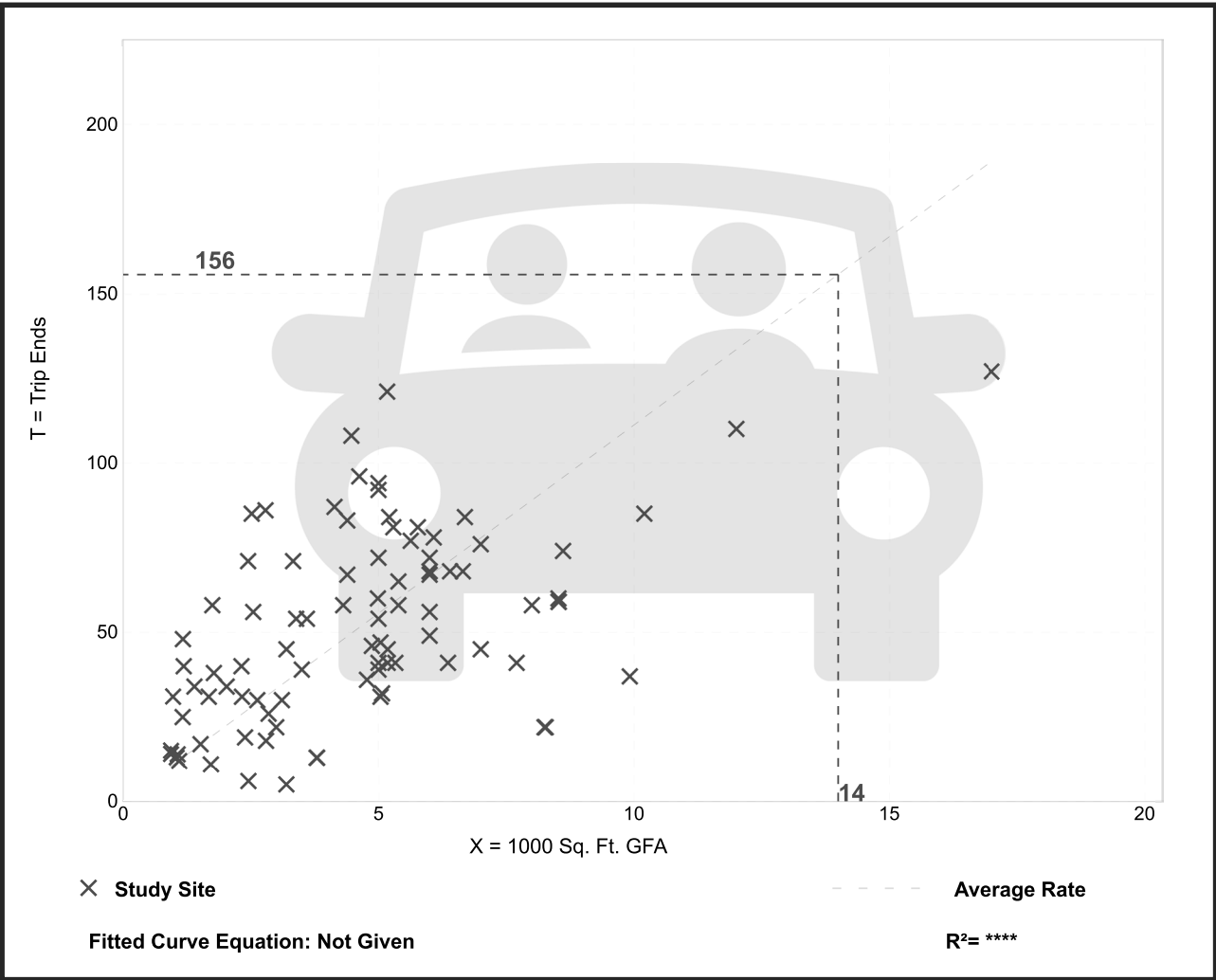
Avg. 1000 Sq. Ft. GFA: 5

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



Senior Adult Housing - Single-Family (251)

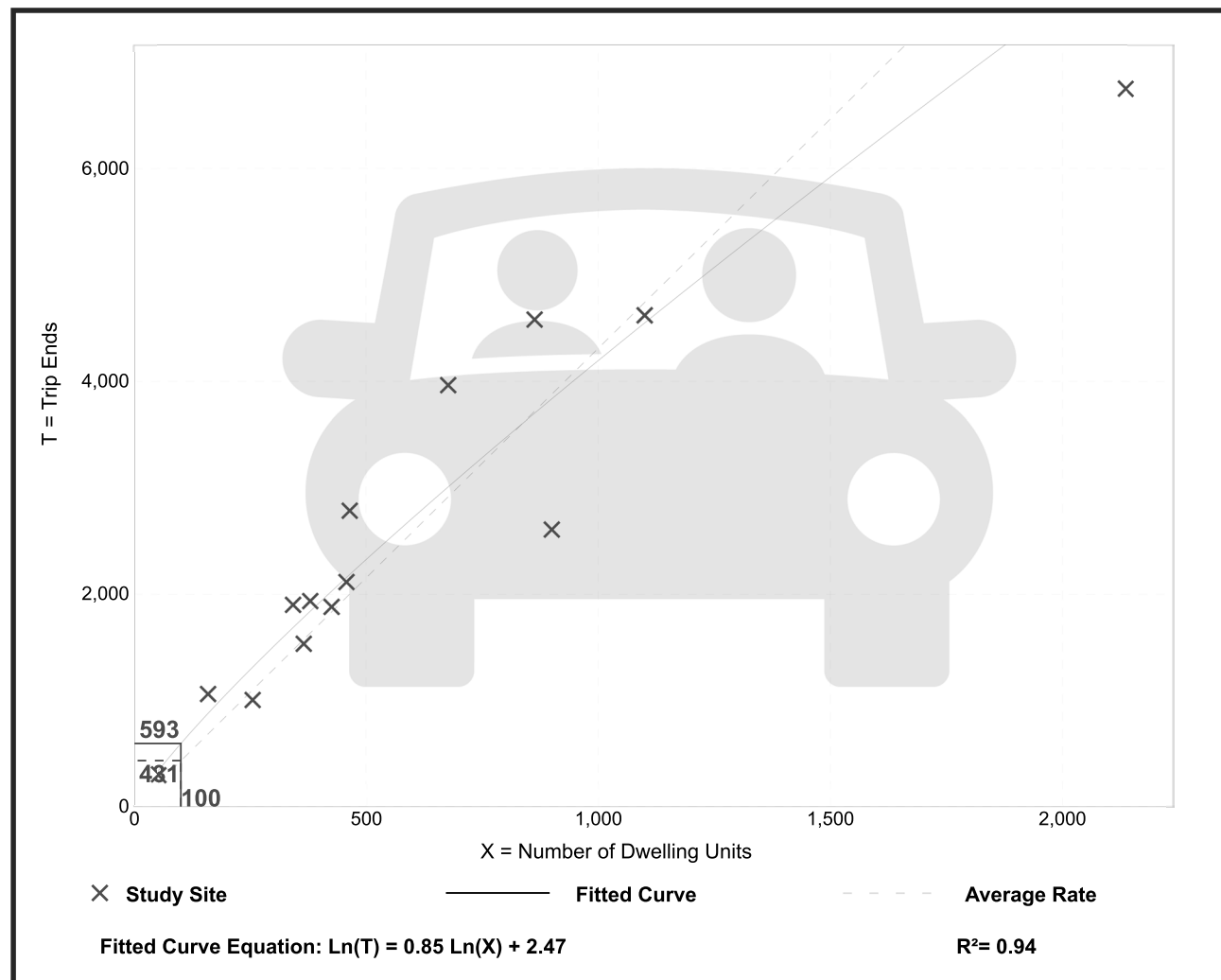
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

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



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

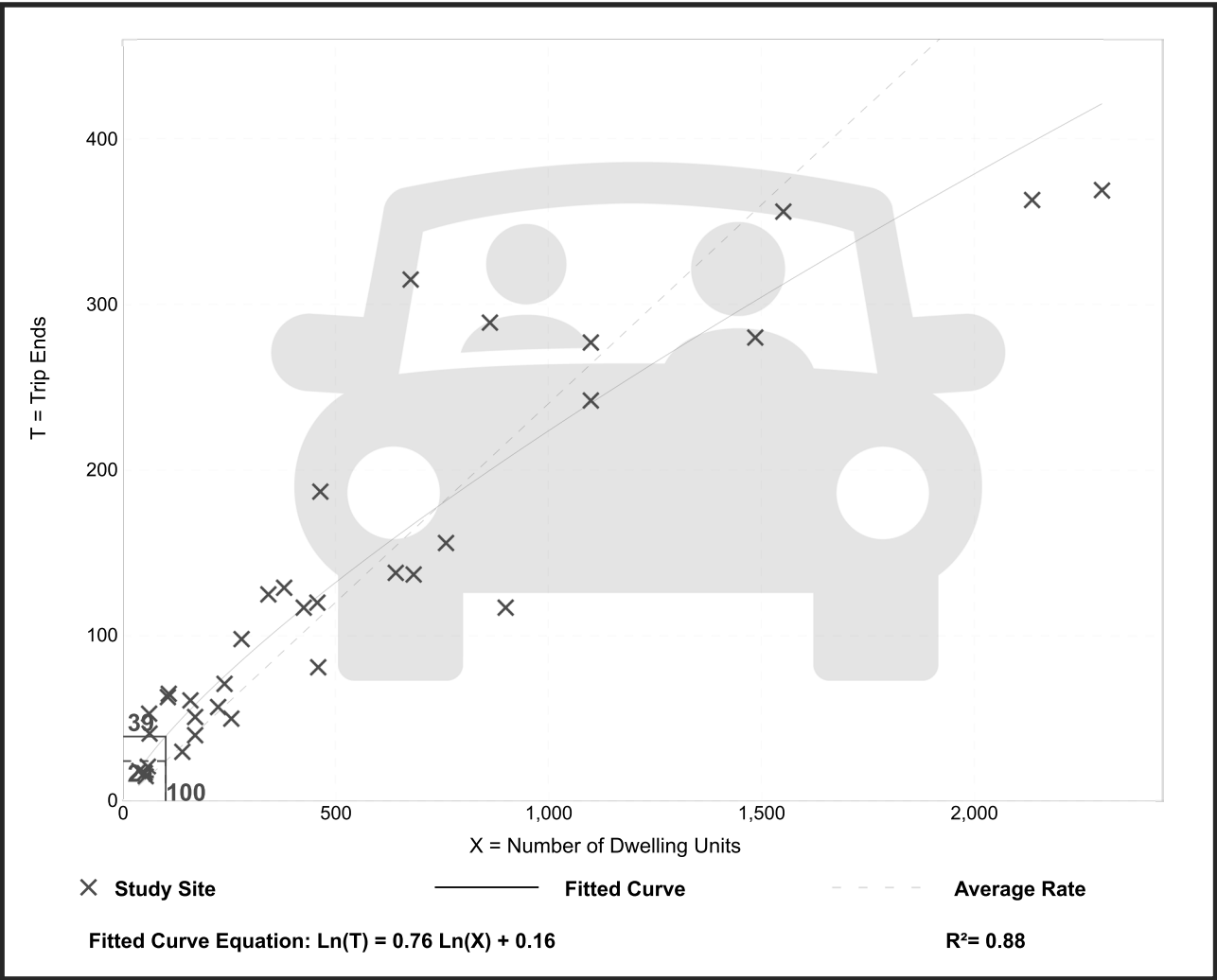
Avg. Num. of Dwelling Units: 557

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



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

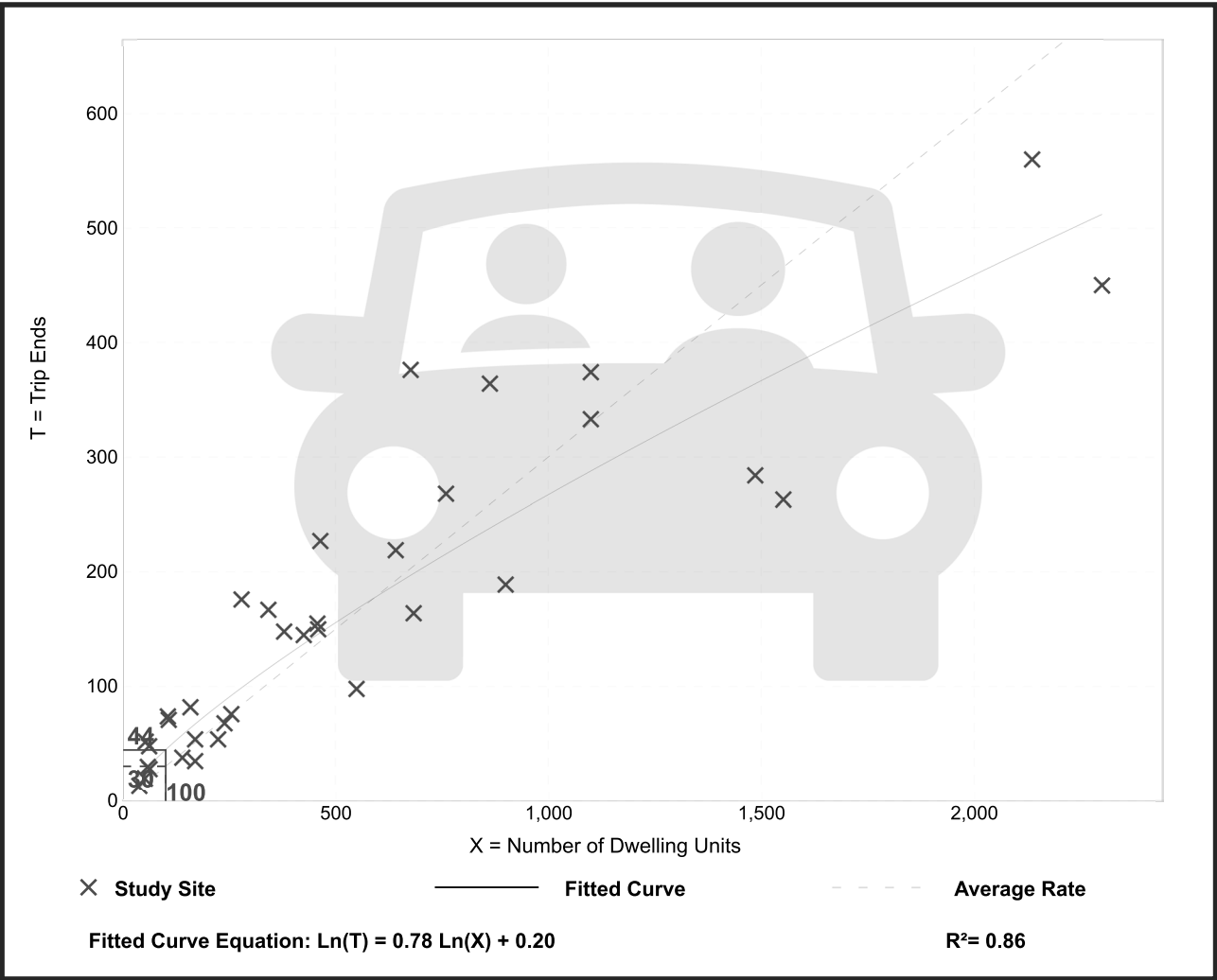
Avg. Num. of Dwelling Units: 556

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



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 Volumes (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 Volumes (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

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 Pkwy			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 Volumes (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 Pkwy			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 Volumes (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

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 Volumes (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 Volumes (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

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 Volumes (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 Volumes (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

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 Volumes (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 Volumes (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

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 Volumes (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												
Exit	5%											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 Volumes (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

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 Volumes (Full Buildout)	418	364	0	0	782	145	0	0	0	29	0	281
New Site Traffic (Phase 1-3)												
Directional Distribution												
Enter	15%											15%
Exit												
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%											15%
Exit												
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 Volumes (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

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 Volumes (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%		
Traffic Assignment										25%		
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 Volumes (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

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)
Bear Creek Pk & Tom J Hitch Pkwy/ Farm Bureau Access	Signal	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)
		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)	--
Bear Creek Pk & Patterson Dr/ Site Access 1	TWSC	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)
	Signal	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+)	--
		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)
Bear Creek Pk & Mt Olivet Rd/School Access	Signal	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)
	TWSC	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)
Tom J Hitch Pkwy & Iron Bridge Rd	Signal	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)
	TWSC	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)	--
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)
Bear Creek Pk & Tom J Hitch Pkwy/ Farm Bureau Access	Signal	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)
		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)
Bear Creek Pk & Patterson Dr/ Site Access 1	TWSC	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)
		EB Left Turn	B (10.2)	B (11.7)	B (11.7)	--	B (12.3)	B (12.3)	--
	Signal	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+)	--
		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)
Bear Creek Pk & Mt Olivet Rd/School Access	Signal	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)
		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)
Tom J Hitch Pkwy & Iron Bridge Rd	Signal	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)
		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)	--
Iron Bridge Rd & Mt Olivet Rd	TWSC	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)	--
		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)	--
		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)	--
James Campbell Blvd & Tom J Hitch Pkwy	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)
		EB Left Turn	--	--	--	--	--	A (7.8)	--
		SB Approach	--	--	--	--	--	B (10.8)	--
		EB Left Turn	--	--	--	--	--	--	--
		SB Approach	--	--	--	--	--	--	--

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 6 th Edition results reported above.				

2023 EXISTING CONDITIONS

HCM Signalized Intersection Capacity Analysis

1: Nashville Hwy/US 31 & US 43/Bear Creek Pk

Columbia Bluffs
2023 Existing

												
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												

HCM 6th Signalized Intersection Summary

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

Columbia Bluffs
2023 Existing



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(l)	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	8.3	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+1.2), 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 O(veh)	0.1	-	-	-	1.8	

HCM 6th Signalized Intersection Summary

4: Mt Olivet Rd/School Access & Bear Creek Pk

Columbia Bluffs
2023 Existing

												
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											

HCM 6th Signalized Intersection Summary

5: Tom J Hitch Pkwy & Iron Bridge Rd

Columbia Bluffs
2023 Existing



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+I), s	12.5	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 O(veh)	1.9	-	-	-	1.3	2.6

HCM Signalized Intersection Capacity Analysis

1: Nashville Hwy/US 31 & US 43/Bear Creek Pk

Columbia Bluffs
2023 Existing

												
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												

HCM 6th Signalized Intersection Summary

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

Columbia Bluffs
2023 Existing



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	20.0	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+1.5), 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

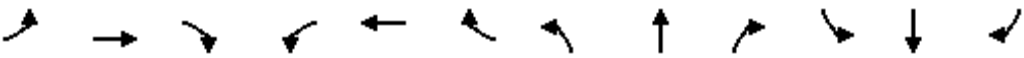
HCM 6th Ctrl Delay	52.4
HCM 6th LOS	D

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	

HCM 6th Signalized Intersection Summary

4: Mt Olivet Rd/School Access & Bear Creek Pk

Columbia Bluffs
2023 Existing

												
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											

HCM 6th Signalized Intersection Summary

5: Tom J Hitch Pkwy & Iron Bridge Rd

Columbia Bluffs
2023 Existing



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+I), s	12.6	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 O(veh)	1.3	-	-	-	2.2	4.3

2031 BACKGROUND CONDITIONS

HCM Signalized Intersection Capacity Analysis

1: Nashville Hwy/US 31 & US 43/Bear Creek Pk

Columbia Bluffs
2031 Background AM

												
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												

HCM 6th Signalized Intersection Summary

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

Columbia Bluffs
2031 Background AM



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(l)	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+1.6), s	13.6	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	

HCM 6th Signalized Intersection Summary

4: Mt Olivet Rd/School Access & Bear Creek Pk

Columbia Bluffs
2031 Background AM

												
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											

HCM 6th Signalized Intersection Summary

5: Tom J Hitch Pkwy & Iron Bridge Rd

Columbia Bluffs
2031 Background AM



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(l)	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	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	27.0			10.0	5.0	27.0		10.0				
Max Q Clear Time (g_c+12), s	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 O(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

HCM Signalized Intersection Capacity Analysis

1: Nashville Hwy/US 31 & US 43/Bear Creek Pk

Columbia Bluffs
2031 Background PM

												
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 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			163.7									
Intersection Capacity Utilization			92.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

Columbia Bluffs
2031 Background PM



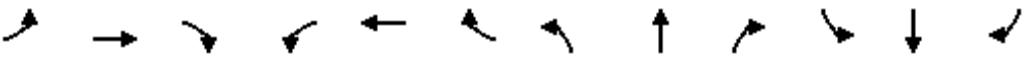
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	858	296	335	960	4	217	9	269	32	67	32
Future Volume (veh/h)	9	858	296	335	960	4	217	9	269	32	67	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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	20.0	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+1.6), s	13.6	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	

HCM 6th Signalized Intersection Summary

4: Mt Olivet Rd/School Access & Bear Creek Pk

Columbia Bluffs
2031 Background PM

												
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											

HCM 6th Signalized Intersection Summary

5: Tom J Hitch Pkwy & Iron Bridge Rd

Columbia Bluffs
2031 Background PM



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+I2), s	12.5	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

HCM Signalized Intersection Capacity Analysis

1: Nashville Hwy/US 31 & US 43/Bear Creek Pk

2031 Projected AM
2031 Projected AM

												
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									F
HCM 2000 Volume to Capacity ratio			1.17									
Actuated Cycle Length (s)			165.5									
Intersection Capacity Utilization			96.2%									F
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

2031 Projected AM
2031 Projected AM



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(l)	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	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+1.5), s	13.6	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											

HCM 6th TWSC
3: Site Access 1/Patterson Dr & Bear Creek Pk

2031 Projected AM
2031 Projected AM

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			

HCM 6th Signalized Intersection Summary

4: Mt Olivet Rd/School Access & Bear Creek Pk

2031 Projected AM
2031 Projected AM

												
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											

HCM 6th Signalized Intersection Summary

5: Tom J Hitch Pkwy & Iron Bridge Rd

2031 Projected AM
2031 Projected AM



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	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	5.0	27.0		10.0	5.0	27.0		10.0				
Max Q Clear Time (g_c+12), s	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

HCM Signalized Intersection Capacity Analysis

1: Nashville Hwy/US 31 & US 43/Bear Creek Pk

2031 Projected PM
2031 Projected PM

												
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												

HCM 6th Signalized Intersection Summary

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

2031 Projected PM
2031 Projected PM



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+1.5), s	13.6	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									

HCM 6th TWSC
3: Site Access 1/Patterson Dr & Bear Creek Pk

2031 Projected PM
2031 Projected PM

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		

HCM 6th Signalized Intersection Summary
4: Mt Olivet Rd/School Access & Bear Creek Pk

2031 Projected PM
2031 Projected PM

												
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											

HCM 6th Signalized Intersection Summary

5: Tom J Hitch Pkwy & Iron Bridge Rd

2031 Projected PM
2031 Projected PM



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+12, s)	10.3	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

HCM Signalized Intersection Capacity Analysis

1: Nashville Hwy/US 31 & US 43/Bear Creek Pk

Columbia Bluffs
2031 Projected AM with Imps

												
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												

HCM 6th Signalized Intersection Summary

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

Columbia Bluffs

2031 Projected AM with Imps



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(l)	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	25.0	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	18.6	76.5	23.8	7.0	6.6	88.5	5.0	25.8				
Max Q Clear Time (g_c+20.6)	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

HCM 6th Signalized Intersection Summary

3: Site Access 1/Patterson Dr & Bear Creek Pk

Columbia Bluffs
2031 Projected AM with Imps



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	1.0	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+I), 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									

HCM 6th Signalized Intersection Summary

4: Mt Olivet Rd/School Access & Bear Creek Pk

Columbia Bluffs
2031 Projected AM with Imps

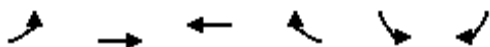


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	286	767	37	24	858	43	114	61	37	62	31	235
Future Volume (veh/h)	286	767	37	24	858	43	114	61	37	62	31	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	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+12, s)	12.9	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									

HCM 6th Signalized Intersection Summary

7: James Campbell Blvd & Tom J Hitch Pkwy

Columbia Bluffs
2031 Projected AM with Imps



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
Phs Duration (G+Y+Rc), s			67.0		13.0	19.9
Change Period (Y+Rc), s			6.0		6.0	6.0
Max Green Setting (Gmax), s			61.0		7.0	17.0
Max Q Clear Time (g_c+I1), s			6.7		9.0	13.2
Green Ext Time (p_c), s			1.4		0.0	0.7
Intersection Summary						
HCM 6th Ctrl Delay			24.4			
HCM 6th LOS			C			

HCM Signalized Intersection Capacity Analysis

1: Nashville Hwy/US 31 & US 43/Bear Creek Pk

Columbia Bluffs
2031 Projected PM with Imps

												
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												

HCM 6th Signalized Intersection Summary

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

Columbia Bluffs

2031 Projected PM with Imps



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(l)	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+Q), 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

HCM 6th Signalized Intersection Summary

3: Site Access 1/Patterson Dr & Bear Creek Pk

Columbia Bluffs
2031 Projected PM with Imps



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	1.0	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+12, s)	12.4	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

HCM 6th Signalized Intersection Summary

4: Mt Olivet Rd/School Access & Bear Creek Pk

Columbia Bluffs
2031 Projected PM with Imps

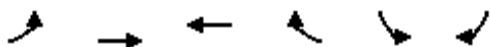


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	1119	9	29	1018	105	67	6	37	14	11	52
Future Volume (veh/h)	45	1119	9	29	1018	105	67	6	37	14	11	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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+1.2), s	12.6	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									

HCM 6th Signalized Intersection Summary

7: James Campbell Blvd & Tom J Hitch Pkwy

Columbia Bluffs
2031 Projected PM with Imps



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

HCM 6th Signalized Intersection Summary

Columbia Bluffs

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

2031 Projected AM with Imps & 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.

HCM 6th Signalized Intersection Summary

Columbia Bluffs

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

2031 Projected PM with Imps & Widening

												
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

HCM Signalized Intersection Capacity Analysis

1: Nashville Hwy/US 31 & US 43/Bear Creek Pk

Columbia Bluffs
2034 Background AM

												
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												

HCM 6th Signalized Intersection Summary

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

Columbia Bluffs
2034 Background AM



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	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+1.5), 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 O(veh)	0.1	-	-	-	7	

HCM 6th Signalized Intersection Summary

4: Mt Olivet Rd/School Access & Bear Creek Pk

Columbia Bluffs
2034 Background AM

												
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									

HCM 6th Signalized Intersection Summary

5: Tom J Hitch Pkwy & Iron Bridge Rd

Columbia Bluffs
2034 Background AM



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+I2), s	18.1	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	-	-	-	-	

HCM Signalized Intersection Capacity Analysis

1: Nashville Hwy/US 31 & US 43/Bear Creek Pk

Columbia Bluffs
2034 Background PM

												
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												

HCM 6th Signalized Intersection Summary

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

Columbia Bluffs
2034 Background PM



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	20.0	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+1.5), 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	

HCM 6th Signalized Intersection Summary

4: Mt Olivet Rd/School Access & Bear Creek Pk

Columbia Bluffs
2034 Background PM

												
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											

HCM 6th Signalized Intersection Summary

5: Tom J Hitch Pkwy & Iron Bridge Rd

Columbia Bluffs
2034 Background PM



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			
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			
Approach Delay, s/veh	18.4				19.4				13.1			
Approach LOS	B				B				B			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	5.0	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+I), s	12.8	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

HCM Signalized Intersection Capacity Analysis

1: Nashville Hwy/US 31 & US 43/Bear Creek Pk

2034 Projected AM
2034 Projected AM

												
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												

HCM 6th Signalized Intersection Summary

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

2034 Projected AM
2034 Projected AM



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	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+1.5), 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											

HCM 6th TWSC
3: Site Access 1/Patterson Dr & Bear Creek Pk

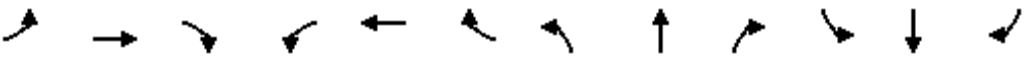
2034 Projected AM
2034 Projected AM

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				

HCM 6th Signalized Intersection Summary

4: Mt Olivet Rd/School Access & Bear Creek Pk

2034 Projected AM
2034 Projected AM

												
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											

HCM 6th Signalized Intersection Summary

5: Tom J Hitch Pkwy & Iron Bridge Rd

2034 Projected AM
2034 Projected AM



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+I), s	12.9	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	

HCM Signalized Intersection Capacity Analysis

1: Nashville Hwy/US 31 & US 43/Bear Creek Pk

2034 Projected PM
2034 Projected PM

												
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												

HCM 6th Signalized Intersection Summary

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

2034 Projected PM
2034 Projected PM



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	20.0	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+1.5), 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

HCM 6th TWSC
3: Site Access 1/Patterson Dr & Bear Creek Pk

2034 Projected PM
2034 Projected PM

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			

HCM 6th Signalized Intersection Summary
4: Mt Olivet Rd/School Access & Bear Creek Pk

2034 Projected PM

2034 Projected PM

												
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			
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			
Approach Delay, s/veh	77.0				84.5				35.7			
Approach LOS	E				F				D			
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											

HCM 6th Signalized Intersection Summary

5: Tom J Hitch Pkwy & Iron Bridge Rd

2034 Projected PM
2034 Projected PM



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	5.0	22.0		10.0	5.0	22.0		10.0				
Max Q Clear Time (g_c+1.2), s	13.2	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

HCM Signalized Intersection Capacity Analysis

1: Nashville Hwy/US 31 & US 43/Bear Creek Pk

Columbia Bluffs
2034 Projected AM with Imps

												
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												

HCM 6th Signalized Intersection Summary

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

Columbia Bluffs

2034 Projected AM with Imps



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+10), s	10.6	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

HCM 6th Signalized Intersection Summary

3: Site Access 1/Patterson Dr & Bear Creek Pk

Columbia Bluffs
2034 Projected AM with Imps



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												
Approach Delay, s/veh												
47.8												
Approach LOS												
D												
Timer - Assigned Phs												
1 2 3 4 5 6 8												
Phs Duration (G+Y+Rc), s												
1.0 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+I), 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												

HCM 6th Signalized Intersection Summary

4: Mt Olivet Rd/School Access & Bear Creek Pk

Columbia Bluffs
2034 Projected AM with Imps

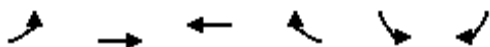


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	315	844	40	36	923	47	122	65	62	67	33	256
Future Volume (veh/h)	315	844	40	36	923	47	122	65	62	67	33	256
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	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+I), 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									

HCM 6th Signalized Intersection Summary

7: James Campbell Blvd & Tom J Hitch Pkwy

Columbia Bluffs
2034 Projected AM with Imps



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				

HCM Signalized Intersection Capacity Analysis

1: Nashville Hwy/US 31 & US 43/Bear Creek Pk

Columbia Bluffs
2034 Projected PM with Imps

												
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												

HCM 6th Signalized Intersection Summary

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

Columbia Bluffs
2034 Projected PM with Imps



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(l)	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+1.6), 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											

HCM 6th Signalized Intersection Summary

3: Site Access 1/Patterson Dr & Bear Creek Pk

Columbia Bluffs
2034 Projected PM with Imps



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	8.3	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+12, s)	12.5	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									

HCM 6th Signalized Intersection Summary

4: Mt Olivet Rd/School Access & Bear Creek Pk

Columbia Bluffs
2034 Projected PM with Imps

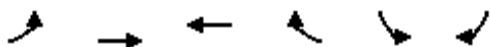


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	1209	9	54	1109	113	71	7	56	15	12	64
Future Volume (veh/h)	53	1209	9	54	1109	113	71	7	56	15	12	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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+I), s	13.1	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									

HCM 6th Signalized Intersection Summary

7: James Campbell Blvd & Tom J Hitch Pkwy

Columbia Bluffs
2034 Projected PM with Imps



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+l1), 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

HCM 6th Signalized Intersection Summary

Columbia Bluffs

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

2034 Projected AM with Imps & Widening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	863	230	264	1175	34	472	67	265	1	2	2
Future Volume (veh/h)	105	863	230	264	1175	34	472	67	265	1	2	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	970	258	297	1320	37	582	0	298	1	2	2
Peak Hour Factor	0.92	0.89	0.89	0.89	0.89	0.92	0.89	0.92	0.89	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	119	988	1094	292	1160	983	578	0	465	16	16	14
Arrive On Green	0.04	0.53	0.53	0.13	0.62	0.62	0.16	0.00	0.16	0.01	0.01	0.01
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	3563	0	1585	1781	1870	1585
Grp Volume(v), veh/h	114	970	258	297	1320	37	582	0	298	1	2	2
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	0	1585	1781	1870	1585
Q Serve(g_s), s	5.2	73.3	8.7	18.9	89.5	1.3	23.4	0.0	23.4	0.1	0.2	0.2
Cycle Q Clear(g_c), s	5.2	73.3	8.7	18.9	89.5	1.3	23.4	0.0	23.4	0.1	0.2	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	119	988	1094	292	1160	983	578	0	465	16	16	14
V/C Ratio(X)	0.96	0.98	0.24	1.02	1.14	0.04	1.01	0.00	0.64	0.06	0.12	0.14
Avail Cap(c_a), veh/h	119	988	1094	292	1160	983	578	0	465	86	91	77
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	33.4	8.3	51.2	27.4	10.6	60.4	0.0	44.4	70.9	70.9	71.0
Incr Delay (d2), s/veh	68.5	24.3	0.2	56.8	72.8	0.0	39.2	0.0	3.0	1.7	3.2	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.5	47.7	8.4	21.6	79.9	0.8	19.5	0.0	14.4	0.1	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	109.2	57.7	8.5	108.1	100.2	10.7	99.7	0.0	47.4	72.6	74.2	75.6
LnGrp LOS	F	E	A	F	F	B	F	A	D	E	E	E
Approach Vol, veh/h	1342			1654			880			5		
Approach Delay, s/veh	52.6			99.6			82.0			74.4		
Approach LOS	D			F			F			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.3	83.1		6.9	12.0	96.4		29.0				
Change Period (Y+Rc), s	6.4	6.9		5.6	6.4	6.9		5.6				
Max Green Setting (Gmax), s	18.9	76.2		7.0	5.6	89.5		23.4				
Max Q Clear Time (g_c+I1), s	20.9	75.3		2.2	7.2	91.5		25.4				
Green Ext Time (p_c), s	0.0	0.7		0.0	0.0	0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay 79.3

HCM 6th LOS E

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

Columbia Bluffs

2: Tom J Hitch Pkwy/Farm Bureau Access & Bear Creek Pk

2034 Projected PM with Imps & Widening

												
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 Information

	Major Street	Minor Street
Street Name	Bear Creek Pk	Patterson Dr
Direction	EB/WB	NB/SB
Number of Lane:	2	2
Approach 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 Met	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 Information

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 Information

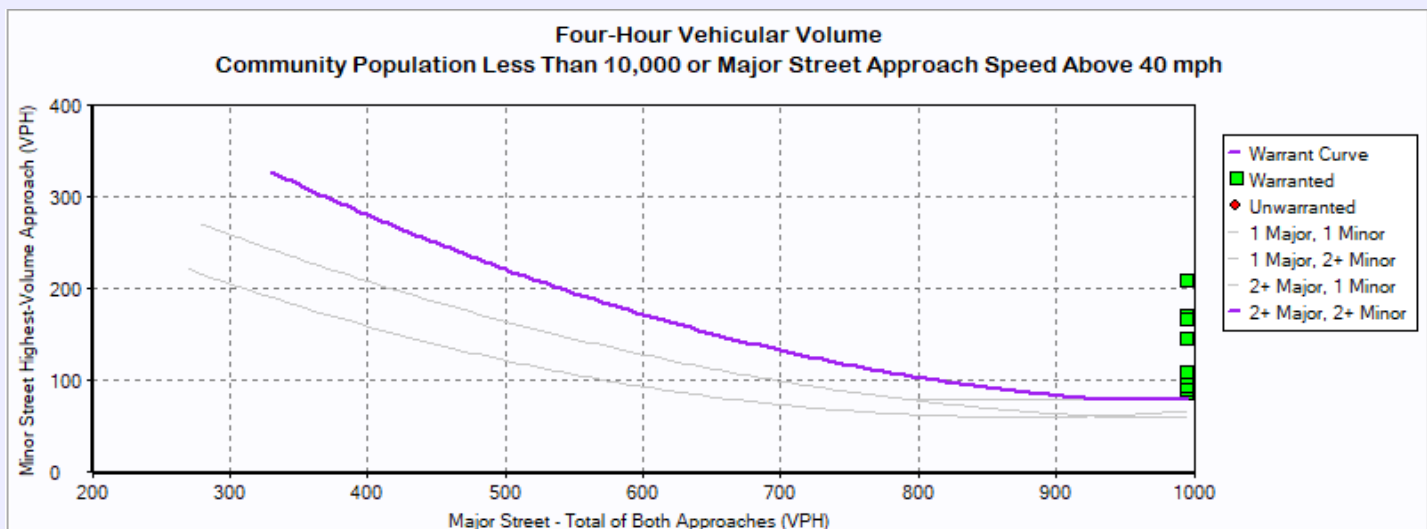
	Major Street	Minor Street
Street Name	Bear Creek Pk	Patterson Dr
Direction	EB/WB	NB/SB
Number of Lane:	2	2
Approach Speed	45	25

Warrant 2 Met? **Yes**

Details:

Notes 13 Hours met (4 required)

Low population **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 Information

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

Warrant 3 Met? **Yes**

Details

Low Population? **No**

Condition A Met? **No**

Notes 0 Hours met (1 required)

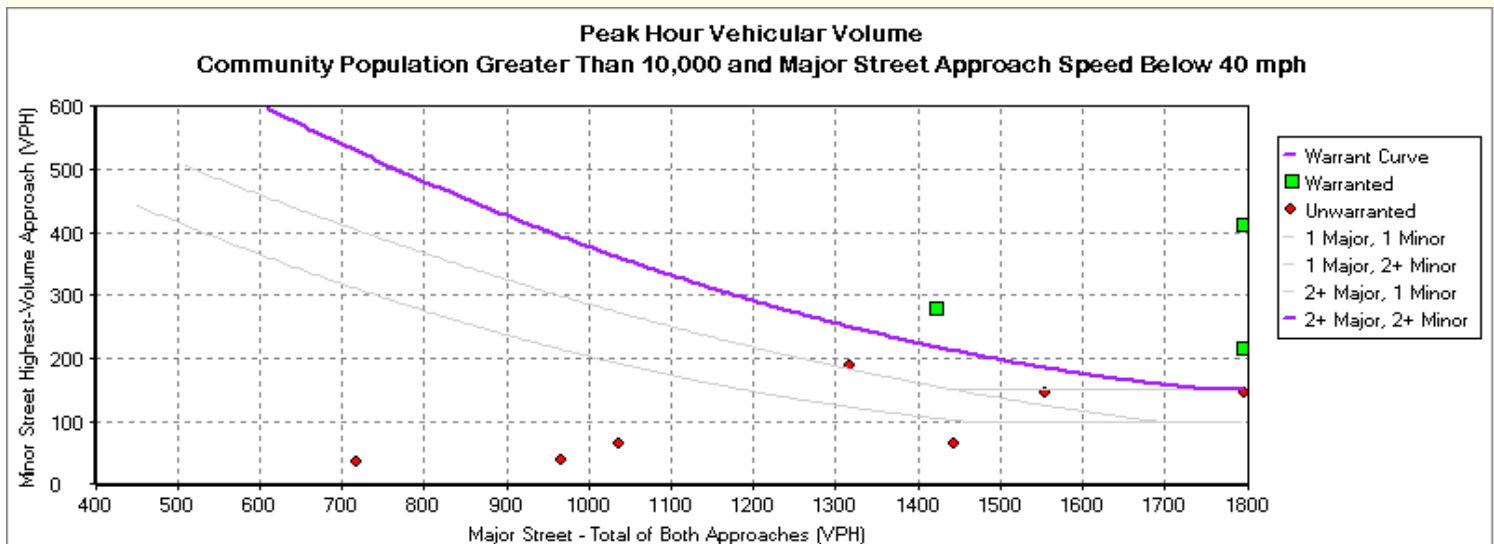
Condition B Met? **Yes**

Notes 7 Hours met (1 required)

Minor Approach Time Delay Condition Met? **Not Met**

Minor Approach Volume Condition Met? **Met**

Total Entering Intersection Volume Condition Met? **Not Met**



Hour	Major Street Total All Approaches (vph)	Minor Street Highest Volume Approach (vph)
6:00	1,238	98
7:00	2,158	209
8:00	1,552	170
9:00	1,230	103
10:00	1,263	87
11:00	1,251	85
12:00	1,328	89
13:00	1,258	94
14:00	1,598	103
15:00	1,969	108
16:00	2,071	146
17:00	1,774	166
18:00	1,044	108

Intersection: Bear Creek Pk & Patterson Dr

Control: One-way Stop

Day: Tuesday

Date: 2/22/2022

Count by: Marr Traffic



Street			Bear Creek Pike				Bear Creek Pike								Patterson Drive				Intersection	
Direction			Eastbound				Westbound				Northbound				Southbound				15-Min	Rolling
TOD	15-Min	Increment	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	Total	Hour Total
AM	6:00	- 6:15	0	118	0	118	0	62	0	62				0	1	0	2	3	183	970
	6:15	- 6:30	1	120	2	123	0	93	0	93				0	2	0	5	7	223	1156
	6:30	- 6:45	0	147	0	147	0	108	0	108				0	1	0	4	5	260	1364
	6:45	- 7:00	1	167	0	168	0	124	0	124				0	4	0	8	12	304	1546
	7:00	- 7:15	1	186	0	187	0	168	0	168				0	1	0	13	14	369	1680
	7:15	- 7:30	4	221	1	226	0	189	1	190				0	7	0	8	15	431	1659
	7:30	- 7:45	1	185	0	186	0	241	0	241				0	1	0	14	15	442	1539
	7:45	- 8:00	3	177	0	180	0	239	1	240				0	3	0	15	18	438	1385
	8:00	- 8:15	6	150	0	156	0	186	1	187				0	2	0	3	5	348	1173
	8:15	- 8:30	3	135	0	138	0	163	1	164				0	1	0	8	9	311	1057
	8:30	- 8:45	4	125	0	129	0	150	2	152				0	1	0	6	7	288	967
	8:45	- 9:00	5	88	0	93	0	129	0	129				0	1	0	3	4	226	923
	9:00	- 9:15	4	95	0	99	0	117	0	117				0	4	0	12	16	232	955
	9:15	- 9:30	5	111	0	116	0	95	3	98				0	0	0	7	7	221	970
	9:30	- 9:45	3	109	0	112	0	127	0	127				0	0	0	5	5	244	994
	9:45	- 10:00	6	113	1	120	0	127	2	129				0	0	0	9	9	258	1020
	10:00	- 10:15	3	127	0	130	0	105	0	105				0	1	0	11	12	247	974
	10:15	- 10:30	8	116	0	124	0	114	0	114				0	0	0	7	7	245	970
Midday	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
	11:00	- 11:15	8	117	0	125	0	110	1	111				0	3	0	4	7	243	946
	11:15	- 11:30	10	128	0	138	0	114	1	115				0	0	0	4	4	257	943
	11:30	- 11:45	2	113	0	115	0	108	0	108				0	0	0	2	2	225	954
	11:45	- 12:00	7	106	0	113	0	96	0	96				0	2	0	10	12	221	998
	12:00	- 12:15	7	121	0	128	0	109	0	109				0	0	0	3	3	240	1004
	12:15	- 12:30	10	119	0	129	0	130	0	130				0	1	0	8	9	268	1000
	12:30	- 12:45	4	126	0	130	0	128	0	128				0	1	0	10	11	269	972
	12:45	- 13:00	7	104	0	111	0	113	0	113				0	0	0	3	3	227	941
	13:00	- 13:15	7	123	0	130	0	101	0	101				0	2	0	3	5	236	943
	13:15	- 13:30	4	104	1	109	0	125	2	127				0	0	0	4	4	240	963
	13:30	- 13:45	5	112	0	117	0	115	1	116				0	1	0	4	5	238	1012
	13:45	- 14:00	1	101	1	103	0	115	2	117				0	1	0	8	9	229	1121
	14:00	- 14:15	4	134	0	138	0	114	0	114				0	0	0	4	4	256	1207
	14:15	- 14:30	7	156	0	163	0	122	0	122				0	0	0	4	4	289	1290
	14:30	- 14:45	3	150	0	153	0	174	4	178				0	1	0	15	16	347	1363
	14:45	- 15:00	3	149	1	153	0	154	1	155				0	0	0	7	7	315	1423
PM	15:00	- 15:15	6	152	0	158	0	168	1	169				0	4	0	8	12	339	1471
	15:15	- 15:30	11	154	1	166	0	189	0	189				0	1	0	6	7	362	1480
	15:30	- 15:45	12	190	1	203	0	194	4	198				0	0	0	6	6	407	1517
	15:45	- 16:00	9	174	0	183	0	171	1	172				0	0	0	8	8	363	1482
	16:00	- 16:15	7	152	0	159	0	171	3	174				0	1	0	14	15	348	1518
	16:15	- 16:30	10	173	0	183	0	206	3	209				0	1	0	6	7	399	1547
	16:30	- 16:45	9	153	0	162	0	202	2	204				0	0	0	6	6	372	1469
	16:45	- 17:00	8	174	0	182	0	207	5	212				0	1	0	4	5	399	1422
	17:00	- 17:15	15	158	0	173	0	197	2	199				0	1	0	4	5	377	1262
	17:15	- 17:30	14	161	0	175	0	138	2	140				0	0	0	6	6	321	1137
	17:30	- 17:45	11	132	0	143	0	176	1	177				0	0	0	5	5	325	1012
	17:45	- 18:00	5	105	0	110	0	124	2	126				0	2	0	1	3	239	853
	18:00	- 18:15	10	87	0	97	0	152	0	152				0	0	0	3	3	252	741
	18:15	- 18:30	9	76	0	85	0	103	2	105				0	1	0	5	6	196	489
	18:30	- 18:45	7	67	0	74	0	83	3	86				0	1	0	5	6	166	293
	18:45	- 19:00	5	56	0	61	0	61	0	61				0	0	0	5	5	127	127
AM	7:00	- 8:00	9	769	1	779	0	837	2	839	0	0	0	0	12	0	50	62		1680
PM	16:15	- 17:15	42	658	0	700	0	812	12	824	0	0	0	0	3	0	20	23		1547

Intersection: Bear Creek Pk & Patterson Dr
Control: One-way Stop
Day: Tuesday
Date: 2/22/2022
Count by: Marr Traffic



2022 Existing (Unadjusted)

Street			Bear Creek Pike				Bear Creek Pike								Patterson Drive				Intersection	
Direction			Eastbound				Westbound				Northbound				Southbound				Hourly Total	Rolling Hour Total
TOD	Hourly Increment		L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
AM	6:00	- 7:00	2	552	2	556	0	387	0	387	0	0	0	0	8	0	19	27	970	970
	7:00	- 8:00	9	769	1	779	0	837	2	839	0	0	0	0	12	0	50	62	1680	1680
	8:00	- 9:00	18	498	0	516	0	628	4	632	0	0	0	0	5	0	20	25	1173	1173
	9:00	- 10:00	18	428	1	447	0	466	5	471	0	0	0	0	4	0	33	37	955	955
	10:00	- 11:00	20	469	0	489	0	453	1	454	0	0	0	0	5	0	26	31	974	974
Midday	11:00	- 12:00	27	464	0	491	0	428	2	430	0	0	0	0	5	0	20	25	946	946
	12:00	- 13:00	28	470	0	498	0	480	0	480	0	0	0	0	2	0	24	26	1004	1004
	13:00	- 14:00	17	440	2	459	0	456	5	461	0	0	0	0	4	0	19	23	943	943
	14:00	- 15:00	17	589	1	607	0	564	5	569	0	0	0	0	1	0	30	31	1207	1207
PM	15:00	- 16:00	38	670	2	710	0	722	6	728	0	0	0	0	5	0	28	33	1471	1471
	16:00	- 17:00	34	652	0	686	0	786	13	799	0	0	0	0	3	0	30	33	1518	1518
	17:00	- 18:00	45	556	0	601	0	635	7	642	0	0	0	0	3	0	16	19	1262	1262
	18:00	- 19:00	31	286	0	317	0	399	5	404	0	0	0	0	2	0	18	20	741	741

Intersection: **Bear Creek Pike & Patterson Drive**

Control: One-way Stop

Day:

Date:

Count by:



2031 Background Growth 27% (9 years at 3%)

Street			Bear Creek Pike				Bear Creek Pike								Patterson Drive				Intersection	
Direction			Eastbound				Westbound				Northbound				Southbound				Hourly Total	Rolling Hour Total
TOD	Hourly Increment		L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
AM	6:00	- 7:00	3	701	3	707	0	491	0	491	0	0	0	0	10	0	24	34	1232	1232
	7:00	- 8:00	11	977	1	989	0	1063	3	1066	0	0	0	0	15	0	64	79	2134	2134
	8:00	- 9:00	23	632	0	655	0	798	5	803	0	0	0	0	6	0	25	31	1489	1489
	9:00	- 10:00	23	544	1	568	0	592	6	598	0	0	0	0	5	0	42	47	1213	1213
	10:00	- 11:00	25	596	0	621	0	575	1	576	0	0	0	0	6	0	33	39	1236	1236
Midday	11:00	- 12:00	34	589	0	623	0	544	3	547	0	0	0	0	6	0	25	31	1201	1201
	12:00	- 13:00	36	597	0	633	0	610	0	610	0	0	0	0	3	0	30	33	1276	1276
	13:00	- 14:00	22	559	3	584	0	579	6	585	0	0	0	0	5	0	24	29	1198	1198
	14:00	- 15:00	22	748	1	771	0	716	6	722	0	0	0	0	1	0	38	39	1532	1532
PM	15:00	- 16:00	48	851	3	902	0	917	8	925	0	0	0	0	6	0	36	42	1869	1869
	16:00	- 17:00	43	828	0	871	0	998	17	1015	0	0	0	0	4	0	38	42	1928	1928
	17:00	- 18:00	57	706	0	763	0	806	9	815	0	0	0	0	4	0	20	24	1602	1602
	18:00	- 19:00	39	363	0	402	0	507	6	513	0	0	0	0	3	0	23	26	941	941

LUC 210
Residential Single-family Detached
Daily Traffic 2223

236 Dwelling Units

Columbia Bluffs - Phases 1-3



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%				65% 5% 30%				5%					
	Exit %																				
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
Residential Single-family Attached (Townhomes)
Daily Traffic 666

Columbia Bluffs - Phases 1-3
94 Dwelling Units



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%				65% 5% 30%				5%					
	Exit %																				
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
Senior Adult Housing - Single Family
Daily Traffic 593

200 Dwelling Units

Columbia Bluffs - Phases 1-3



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%				65% 5% 30%				5%					
	Exit %																				
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
Day Care Center
Daily Traffic 667

14,000 s.f.

Columbia Bluffs - Phases 1-3



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%				65% 5% 30%				5%					
	Exit %																				
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 Total	Rolling Hour Total
TOD	Hourly Increment		L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
AM	6:00	- 7:00	3	701	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.

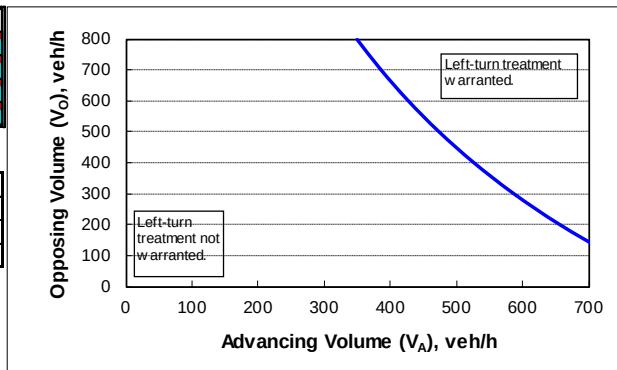
2-lane roadway (English)

INPUT

Variable	Value
85 th 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.

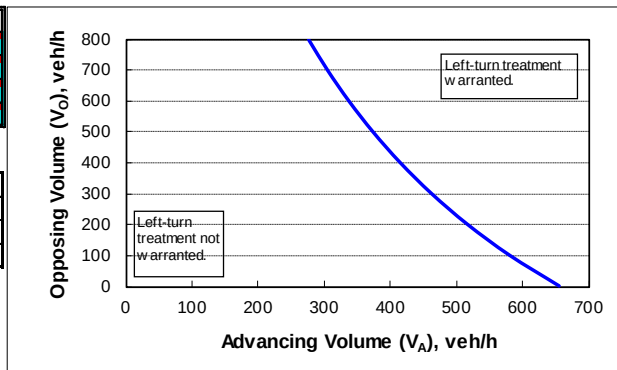
2-lane roadway (English)

INPUT

Variable	Value
85 th 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.

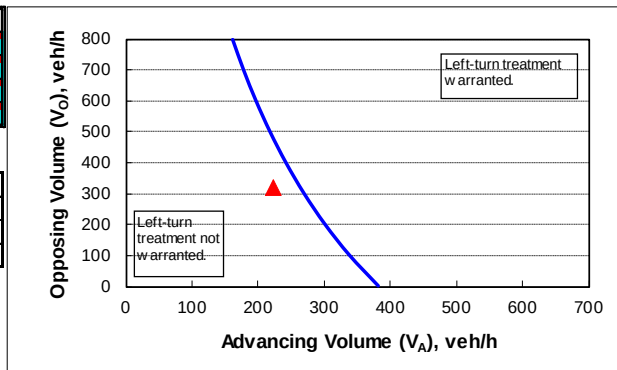
2-lane roadway (English)

INPUT

Variable	Value
85 th 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.

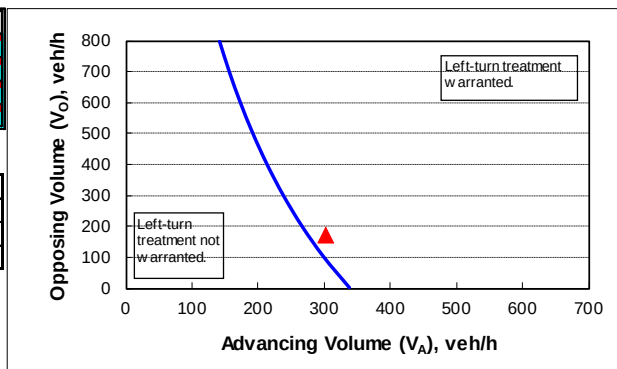
2-lane roadway (English)

INPUT

Variable	Value
85 th 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

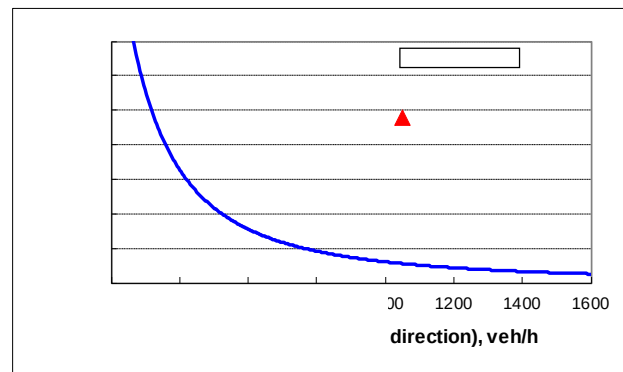
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

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

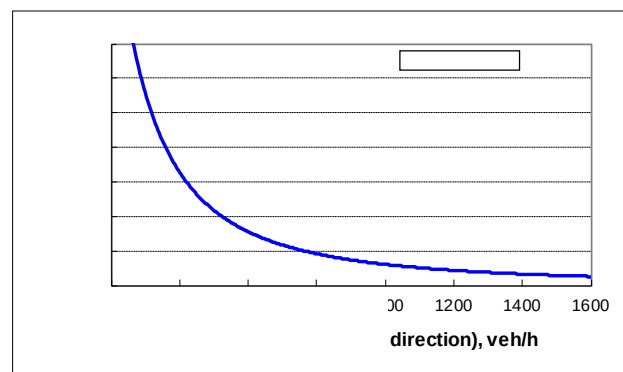
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

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

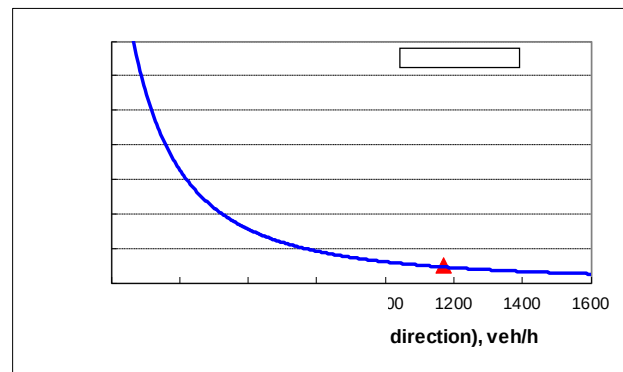
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

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

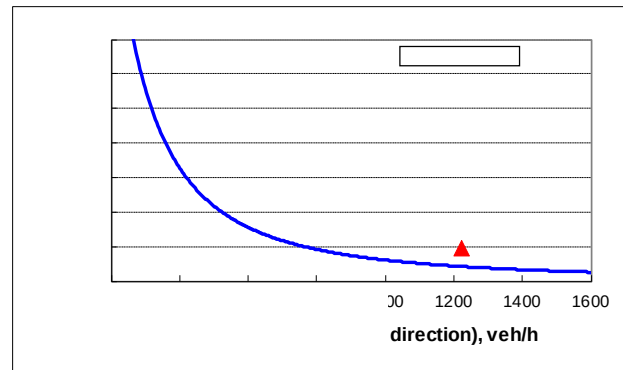
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

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

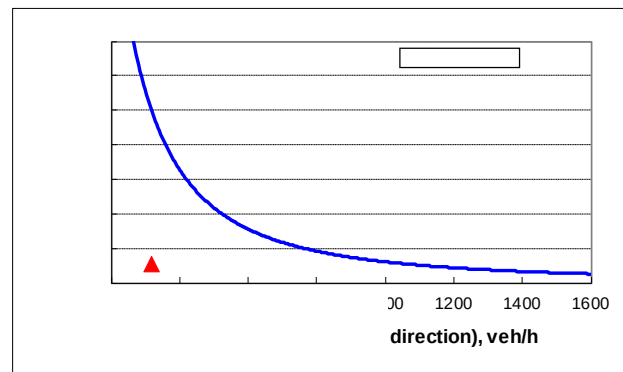
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

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

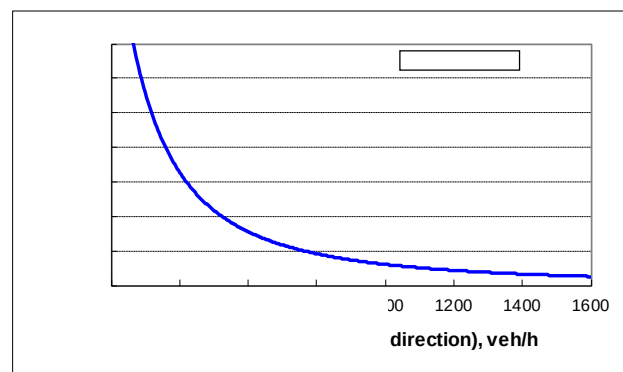
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

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 Detached)	143 DU	143 DU
2	North	Single-family Housing (Attached or Detached)	143 DU	286 DU
3	North	Single-family Housing (Attached or Detached)	143 DU	429 DU
3B	North	Day Care Center	14,000 SF	429 DU + 14,000 SF
4	South	Single-family Housing (Attached or Detached)	143 DU	572 DU + 14,000 SF
5	South	Single-family Housing (Attached or Detached)	143 DU	715 DU + 14,000 SF
6	South	Single-family Housing (Attached or Detached)	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 phasing for the northbound and southbound approaches.	850 DU	Can be completed with Bear Creek Pk widening by Others.
#3	Bear Creek Pike and Patterson Drive/Site Access 1		
-	Construct Site Access 1 with 1 entering lane and 2 exiting lanes.	1 DU	
-	Construct eastbound right turn deceleration lane.	143 DU	
-	Construct westbound left turn deceleration lane.	143 DU	
-	Construct westbound right turn deceleration lane.	429 DU	
-	Install at traffic signal.	286 DU	
-	Widen Patterson Drive to provide a separate left turn lane.	429 DU + 14,000 SF Day Care	
#4	Bear Creek Pike and Mt Olivet Road/School Access		
-	Restripe southbound approach to provide a shared left turn/through lane and a right turn only lane.	429 DU	
-	Modify traffic signal design to provide protected/permissive left turn signal phasing and southbound right turn overlap phasing.	429 DU	
#5	Tom J Hitch Parkway and Iron Bridge Road		
-	No Improvements Recommended.	NA	
#6	Iron Bridge Road and Mt Olivet Road		
-	No Improvements Recommended.	NA	
#7	James Campbell Boulevard and Tom J Hitch Parkway		
-	Install at traffic signal with protected/permissive left turn signal phasing for the eastbound approach and a southbound right turn overlap.	429 DU	
#8	Iron Bridge Road and Site Access 2		
-	Construct Site Access 2 aligned with Yanahli Park Access.	430 DU	
-	Construct eastbound left turn deceleration lane on Iron Bridge Road.	715 DU	

COLUMBIA

City of Columbia, Tennessee

BLUFFS



Architectural Review Team Submittal



COLUMBIA BLUFFS ARCHITECTURE

DEVELOPER
JIM HARVEY
KOLTER LAND
14025 RIVEREDGE DRIVE, SUITE 175
TAMPA, FL 33637

KOLTERLAND

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



TABLE OF CONTENTS:

- 2. DEVELOPMENT TEAM
- 3. DEVELOPMENT PLAN
- 4. ARCHITECTURAL DESIGN GUIDELINES
- 5. FACADE VARIETY
- 6. ACTIVE ADULT NEIGHBORHOOD
- 8. COURTYARD AND LARGE LOT HOMES
- 11. ALLEY-LOADED PRIMARY RESIDENTIAL
- 13. TOWNHOMES
- 15. DAYCARE
- 11. MAIN AMENITY ARCHITECTURE
- 12. CIVIC SPACE ARCHITECTURE



	Single Family & Townhomes	Active Adult Single Family
Building Height and Massing	- Primarily a mix of 1-story and 2-story, with a maximum of 3-story - Attached garages encouraged	
Building Separation	- Single Family: 10' minimum - Townhomes: 15' minimum	Single Family: 10' minimum
Street Facades	- Maximize frontage and orientation onto residential streets - Porches should orient to residential streets - Entries visible from residential streets	- Maximize frontage and orientation onto residential streets - Porches should orient to residential streets - Entries visible from residential streets
Building Entries	Porches minimum 6' deep and 6' wide	
Roof Forms	- Roofs may vary in style, but should be designed to create unity to the full community - All roof forms to be reviewed and approved by the master developer	- Roofs may vary in style, but should be designed to create unity to the full community - All roof forms to be reviewed and approved by the master developer
Roof Detail	- All roofs should create eaves for shadow and rain protection - Where used, gutters should be expressed as positive elements adding desirable detail	- All roofs should create eaves for shadow and rain protection - Where used, gutters should be expressed as positive elements adding desirable detail
Parking	- Garage-parked - Garages minimum depth of 22' - Garage doors with windows required	- Garage-parked - Garages minimum depth of 22' - Garage doors should have windows

ARCHITECTURAL GUIDELINE NOTE:
The architectural guidelines and conceptual elevations are intended to convey the architectural quality and design intent. Final elevations and color schemes will be brought back to be approved by the ADRT at final PUD-R Development Plan.

COMPLIANCE NOTE:
The architectural guidelines as shown in this pattern book represent compliance with the standards set by the Zoning Ordinance except in areas requesting a modification of standards which are requested to be approved through the PUD-R Preliminary Development Plan process.

Architectural Building Materials
In keeping with the upscale project image, the materials used for structures at Columbia Bluffs should be appropriate for the individual building design concepts and shall be consistent with the project theme. Materials shall be selected and used with consideration to building scale, color scheme, mass, and the surrounding environment.

- Roofing Materials**
Permitted:
- Dimensional Asphalt Shingles
 - Laminated Shingles
 - Copper Finishes
 - Standing Seam Metal Roofs
- Not Permitted:
- Rolled Asphalt
 - Asbestos Cement Shingles
 - Brightly Colored Metal Roofing

- Exterior Siding Materials**
Permitted:
- Brick
 - Stone
 - Natural Wood Accents
 - Stucco
 - Hardie Plank/Panels
 - Cementitious Fiber Siding/Cladding
- Not Permitted:
- All Plastics (including vinyl)
 - Plywood
 - Exposed Concrete Block

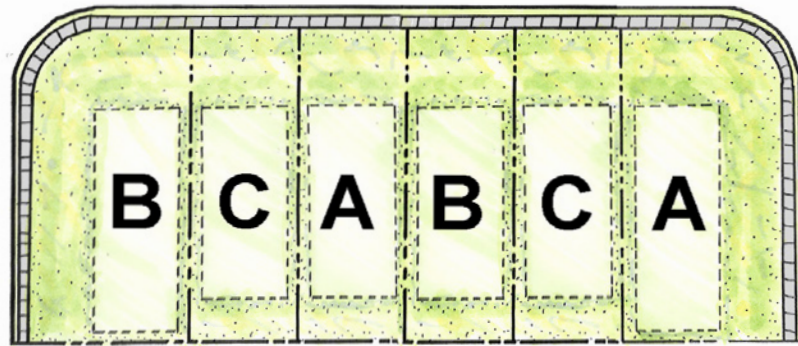
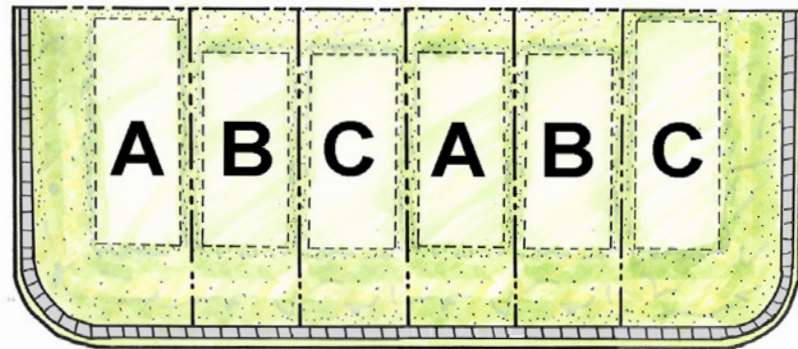
Awnings
Permitted:
High Quality Heavy Canvas
Illuminated Awnings
Metal Awnings

- Colors**
Permitted:
- Muted
 - Natural
 - Earth Tones
- Conditional Permitted:
- Bright
 - Primary Colors (per review and approval of the Master Developer)
- Building Requirements:
- Maximum Height (Stories) 3 stories





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



In order to avoid monotony of architectural design, no approval shall be issued for the construction of a dwelling if it is substantially like any proposed neighboring building for which on approval has already been issued or is being concurrently considered.

- A building shall be considered neighboring if it fronts on the same street as the building under construction or an intersecting street; no building elevation may be repeated across from, adjacent to, or diagonal to a similar building elevation. There shall be a minimum of a 2-lot gap between each similar building elevation (see diagram to above in which A, B, and C represent different elevation styles).
- Vary garage door locations to the front facade of the house when possible. Avoid continuous runs of garages in the same unbroken plain.
- Vary roof orientation, ridge lines, and eave heights between each lot when possible.
- Building facade colors and design elements should vary between each lot with a variation of massing and architectural details on each block.
- Landscaping should vary in composition from building to building when possible.

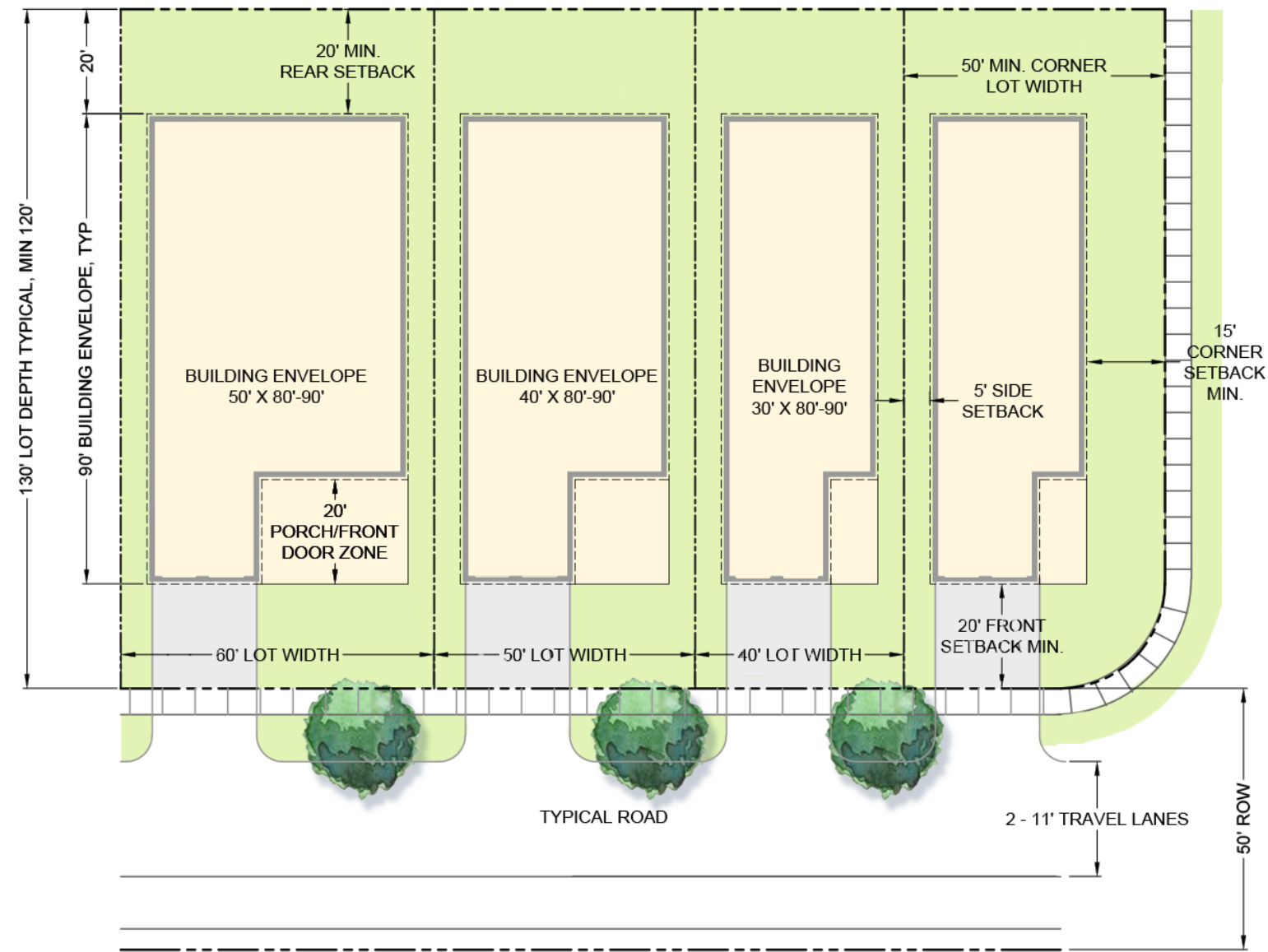
Final determination of the appropriate elevation pattern and variety is subject to review by the Architectural Design Review Team.

FACADE VARIETY



ACTIVE ADULT SINGLE FAMILY

COLOR RENDERING PRESENTS AN
ILLUSTRATIVE DEPICTION OF ARCHITECTURE
AND LANDSCAPE MATERIAL



LOT RANGE: 40'-60' 208 HOMES

BUILDING SETBACKS:

FRONT:	20'
REAR:	20'
SIDE:	5'
CORNER:	15'

ALL LOTS TO HAVE FRONT LOADED GARAGES
 - MINIMUM 20' OF DRIVEWAY ON LOT
 - MINIMUM 22' DEPTH FOR ALL GARAGES

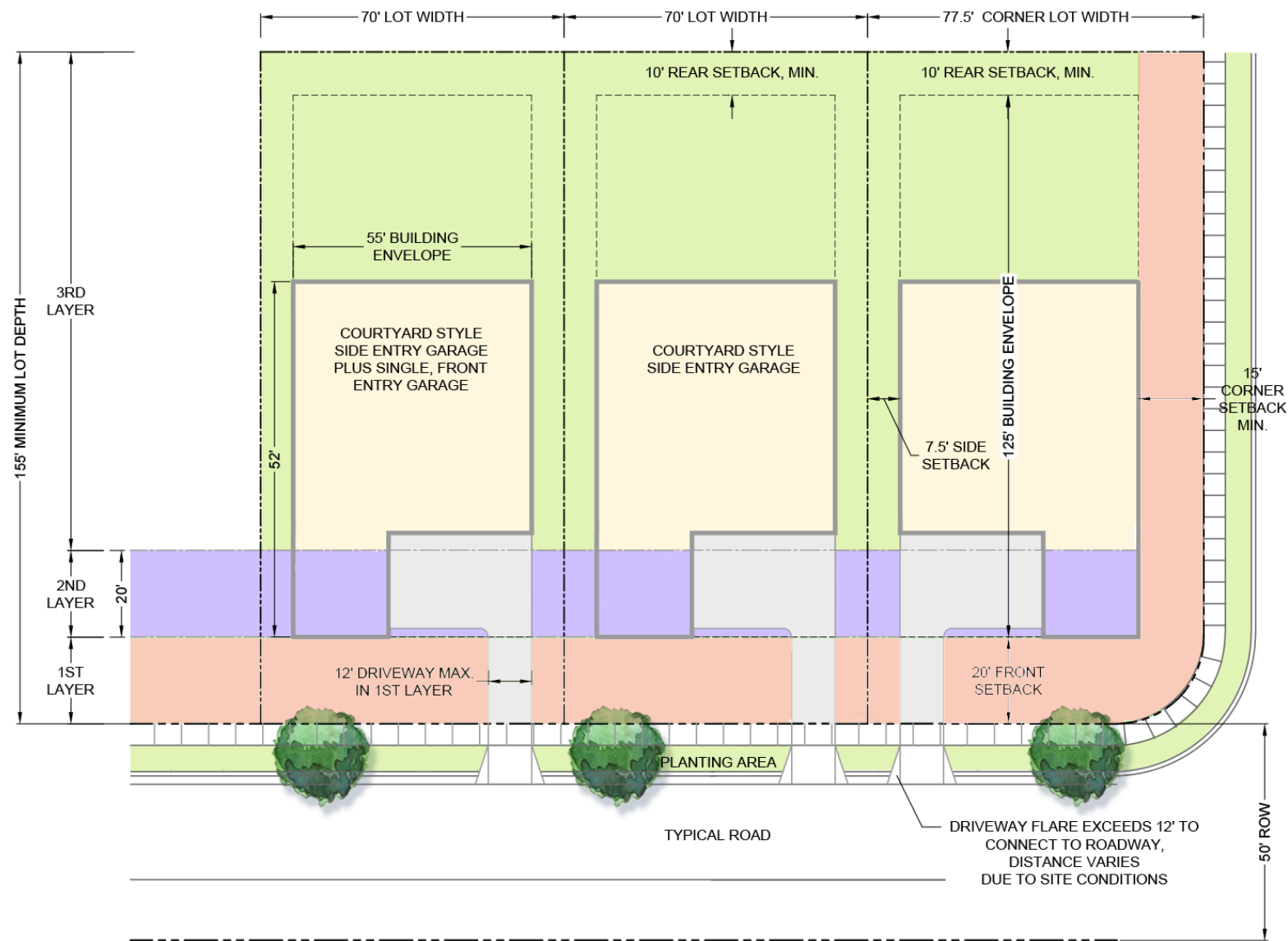
SITE SETBACKS ARE DUE TO ALL INCLUSIVE
 MAINTENANCE APPLICATION GOVERNED BY THE
 PROPOSED HOA, TO BE DEED RESTRICTED.

ACTIVE ADULT SINGLE FAMILY



COLOR RENDERING PRESENTS AN
ILLUSTRATIVE DEPICTION OF ARCHITECTURE
AND LANDSCAPE MATERIAL

COURTYARD HOMES



LOT: 70' MINIMUM 104

BUILDING SETBACKS:

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

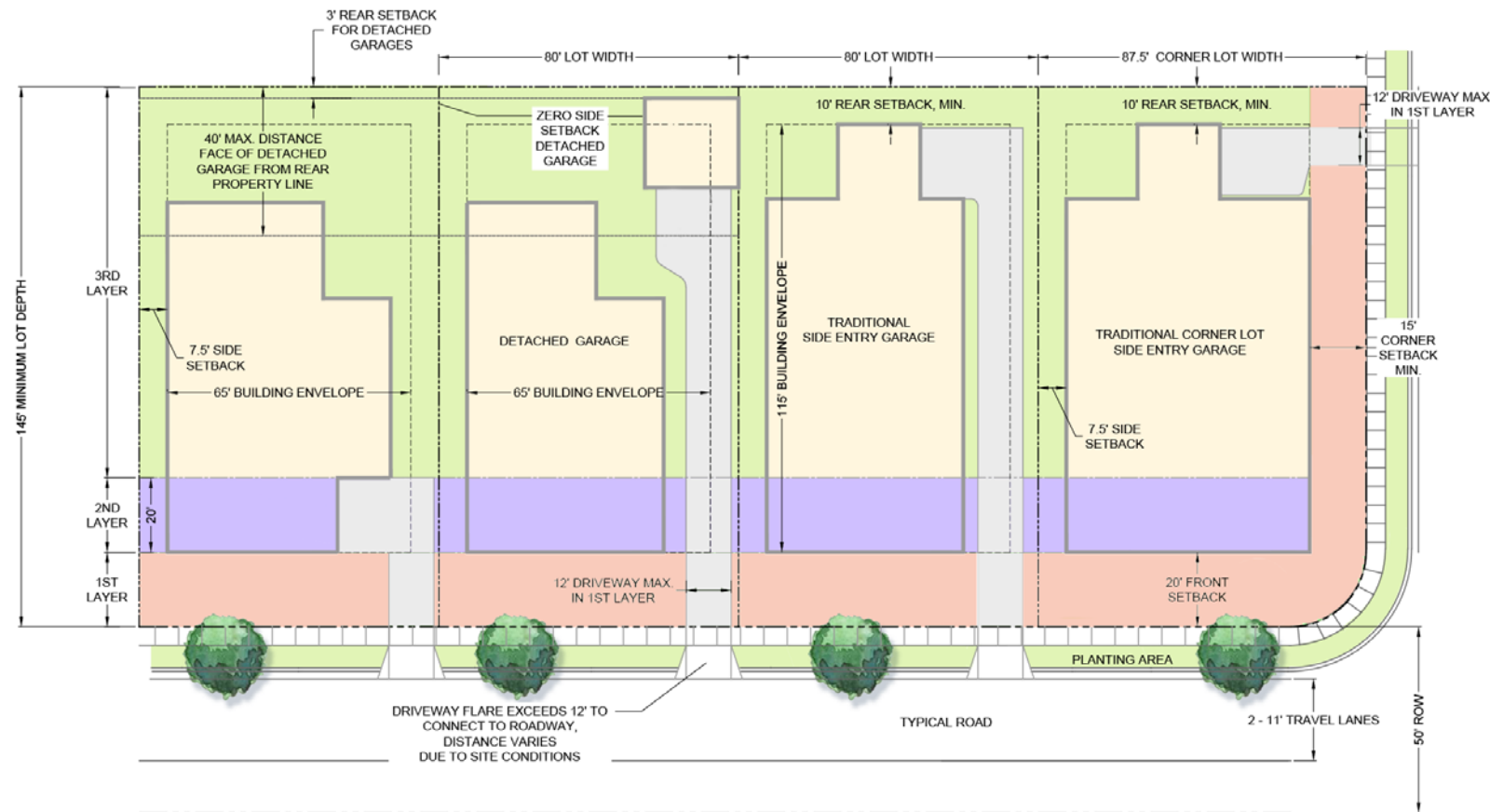
ALL LOTS TO HAVE SIDE LOADED GARAGES WITH THE OPTION OF A SINGLE, FRONT-LOADED GARAGE IN THE 3RD LAYER.

- MINIMUM 20' LENGTH OF DRIVEWAY ON LOT
- MINIMUM 22' DEPTH FOR ALL GARAGES



LARGE LOT HOMES

COLOR RENDERING PRESENTS AN
ILLUSTRATIVE DEPICTION OF ARCHITECTURE
AND LANDSCAPE MATERIAL



LOTS: 80' MINIMUM 130 HOMES

BUILDING SETBACKS:

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

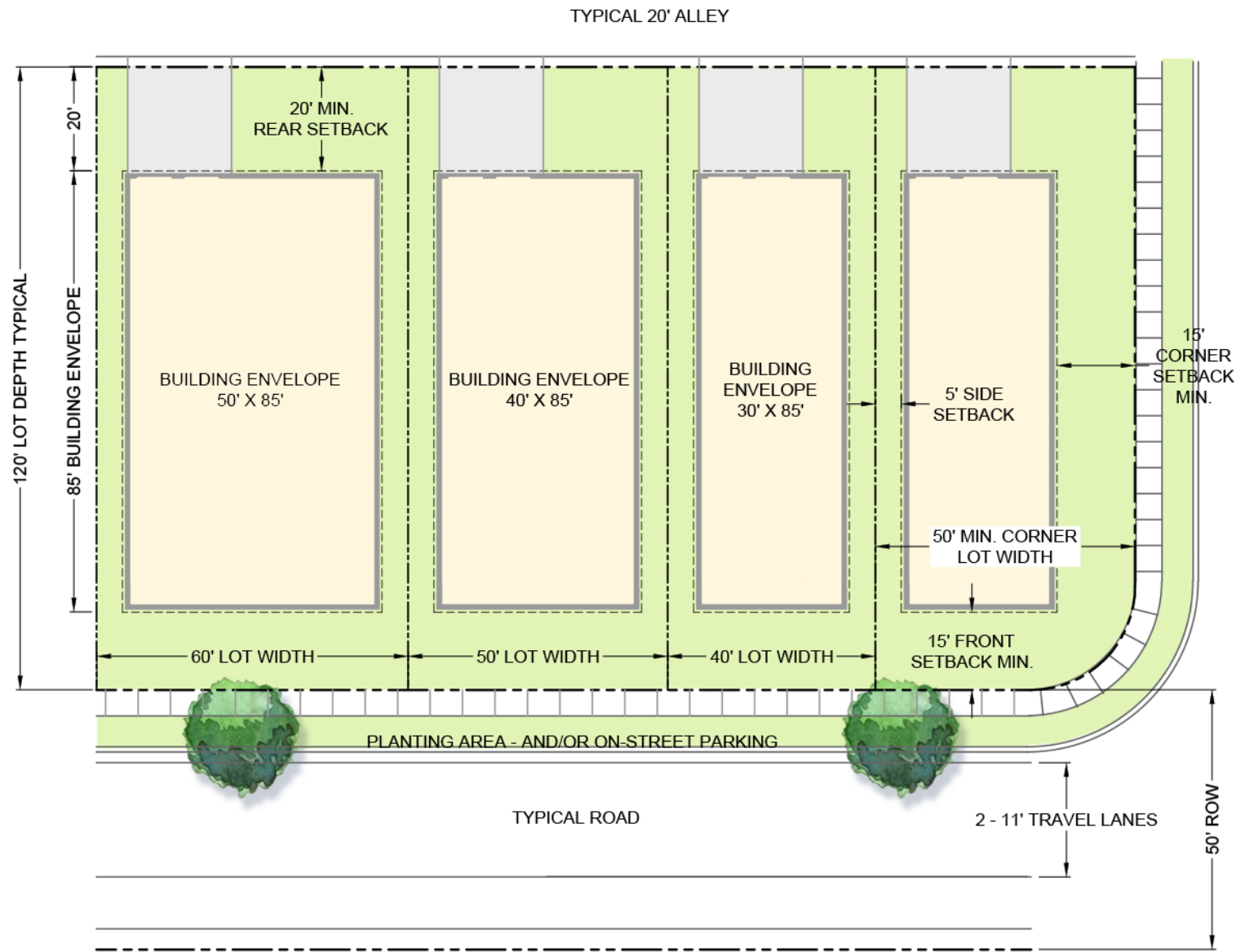
LOTS WILL HAVE A MIX OF GARAGE LOCATIONS,
ATTACHED AND DETACHED

- MINIMUM 20' OF DRIVEWAY ON LOT
- MINIMUM 22' DEPTH FOR ALL GARAGES



SINGLE-FAMILY ALLEY LOADED

COLOR RENDERING PRESENTS AN
ILLUSTRATIVE DEPICTION OF ARCHITECTURE
AND LANDSCAPE MATERIAL



LOT RANGE: 40'-60'
144 HOMES

BUILDING SETBACKS:
 FRONT: 15'
 REAR: 20'
 SIDE: 5'
 CORNER: 15'

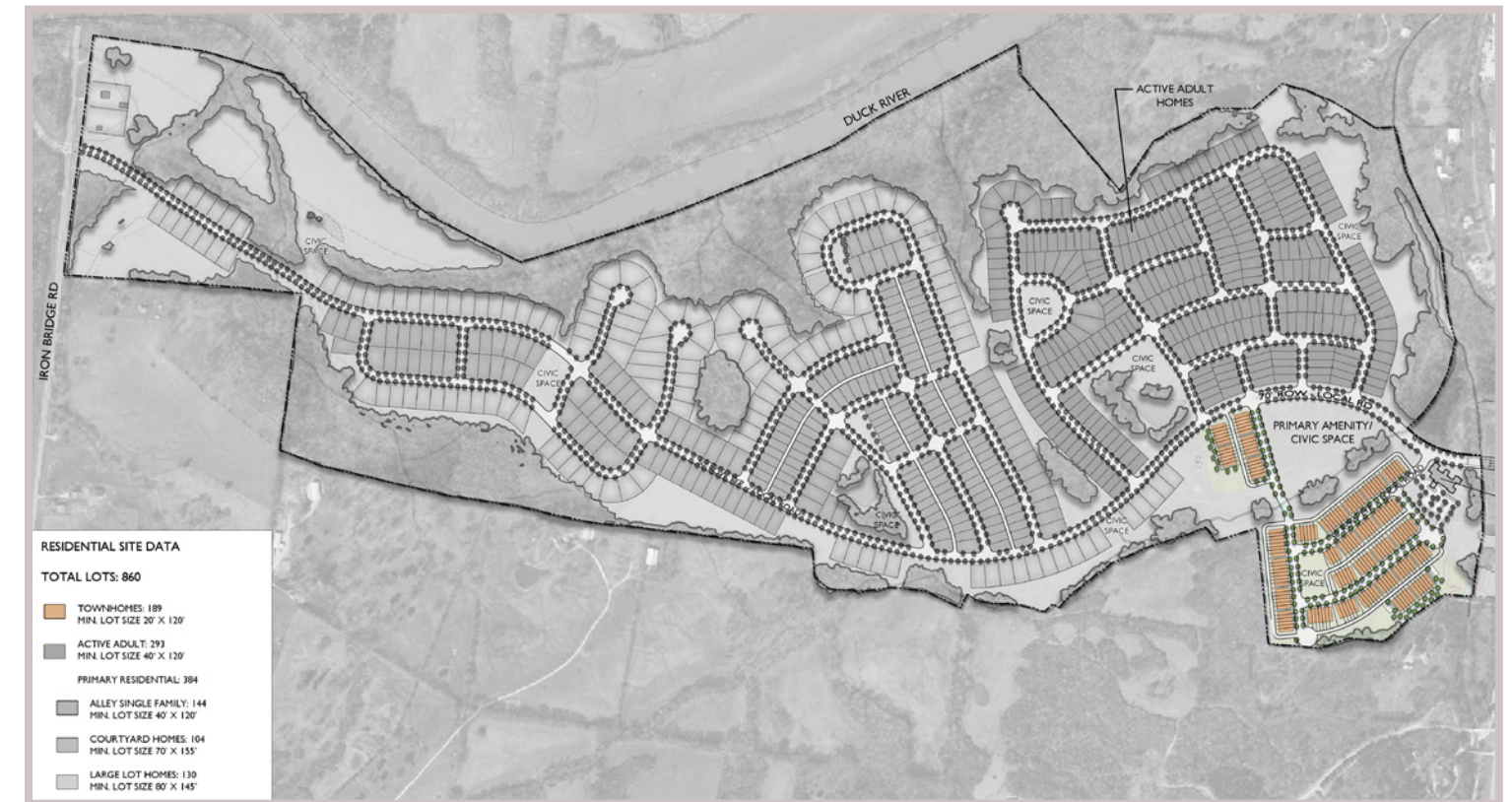
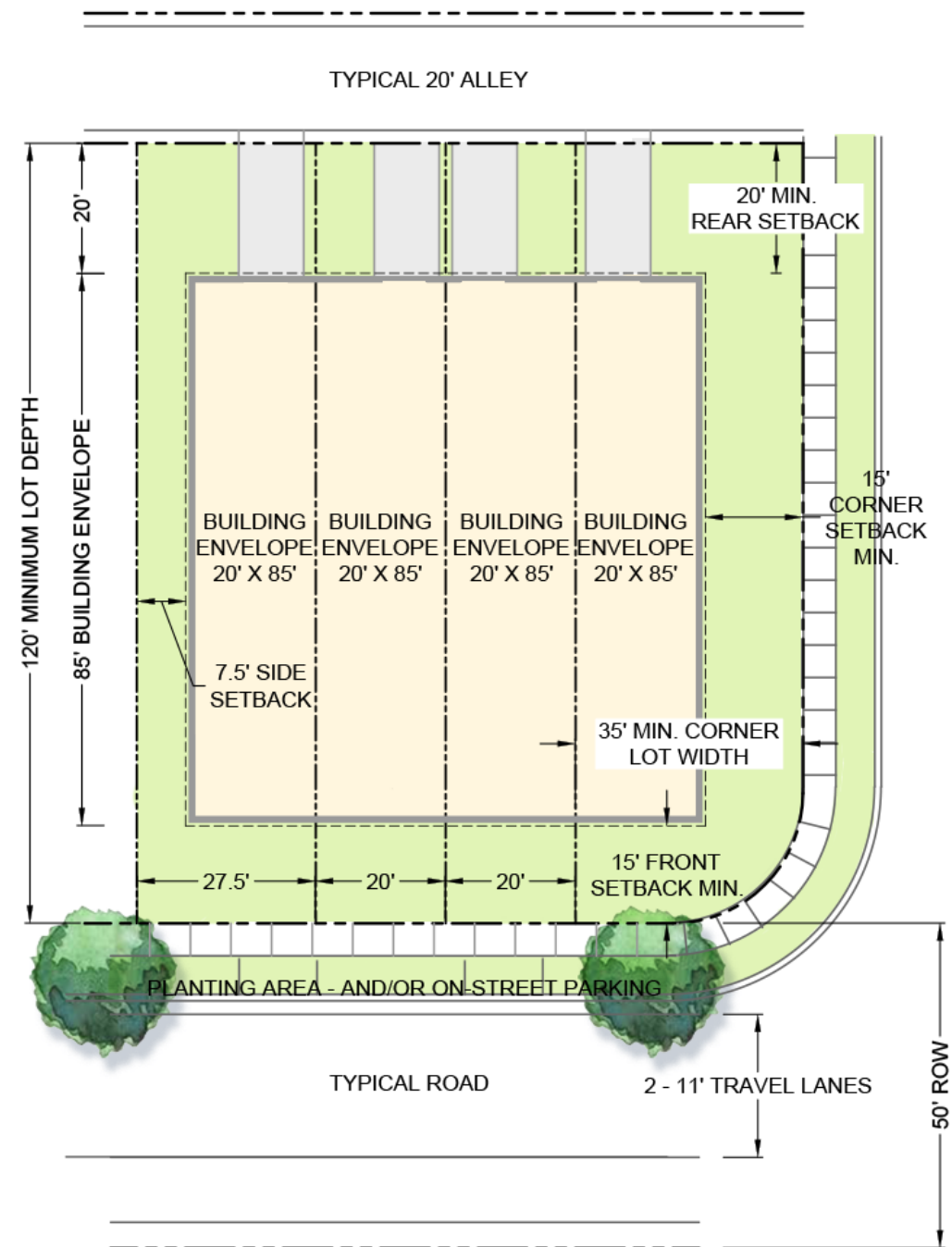
ALL LOTS TO HAVE REAR LOADED GARAGES
 - MINIMUM 20' LENGTH OF DRIVEWAY ON LOT
 - MINIMUM 22' DEPTH FOR ALL GARAGES

SINGLE-FAMILY ALLEY LOADED



COLOR RENDERING PRESENTS
AN ILLUSTRATIVE DEPICTION OF
ARCHITECTURE AND LANDSCAPE
MATERIAL

TOWNHOMES



LOTS: 20' MINIMUM 189 HOMES

BUILDING SETBACKS:

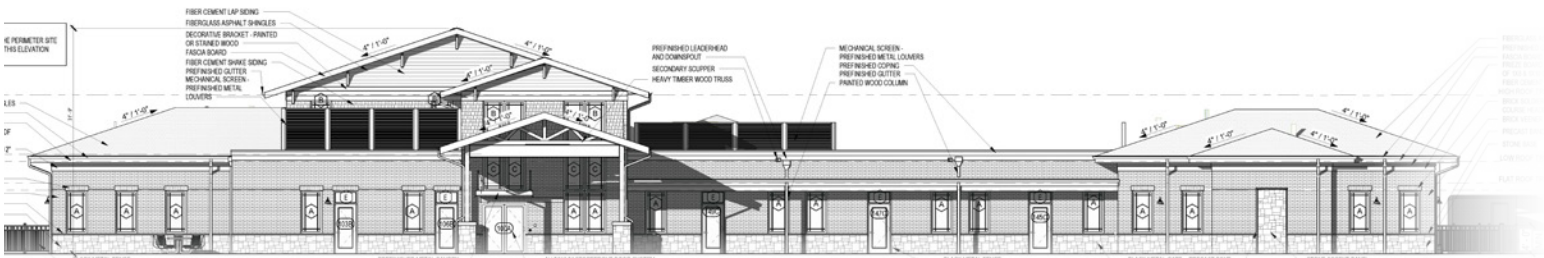
FRONT:	15'
REAR:	20'
SIDE:	7.5'
CORNER:	15'

ALL LOTS TO HAVE REAR LOADED GARAGES

- MINIMUM 20' LENGTH OF DRIVEWAY ON LOT
- MINIMUM 22' DEPTH FOR ALL GARAGES

TOWNHOME BUILDINGS WILL CONSIST OF 4, 6, 7, AND 8 UNIT BUILDINGS.

DAYCARE ELEVATIONS



WEST ELEVATION



EAST ELEVATION



SOUTH ELEVATION



NORTH ELEVATION

ELEVATIONS ARE CONCEPTUAL.
FINAL APPROVALS TO BE DETERMINED WITH FMDP.



DAYCARE

CHILD DAYCARE TO BE APPROXIMATELY 12,000-14,000 SQFT., AND WILL SERVE AS A BENEFIT NOT ONLY TO THE LOCAL NEIGHBORHOOD BUT TO THE COMMUNITY AS WELL.

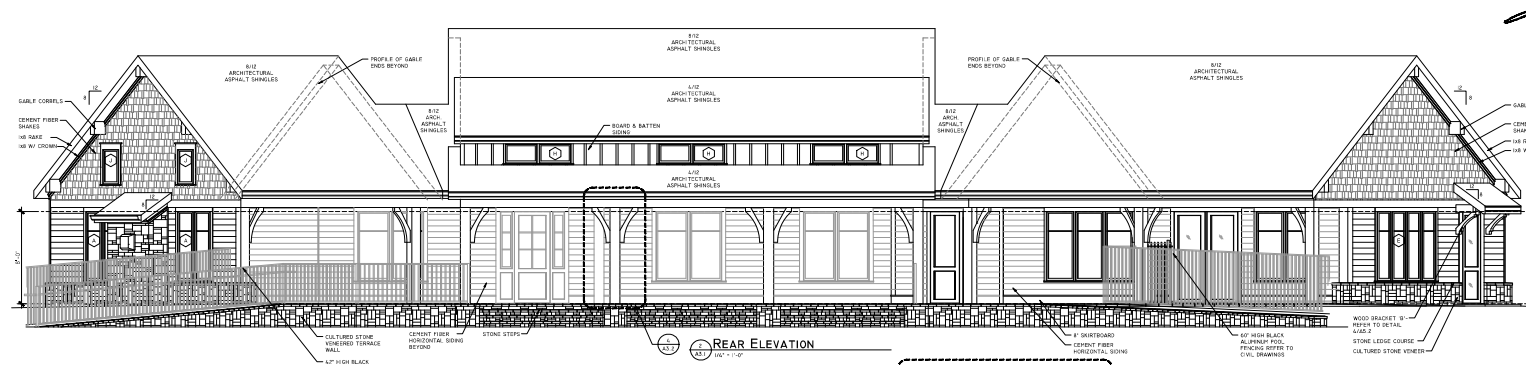
AMENITY PHOTOGRAPHS



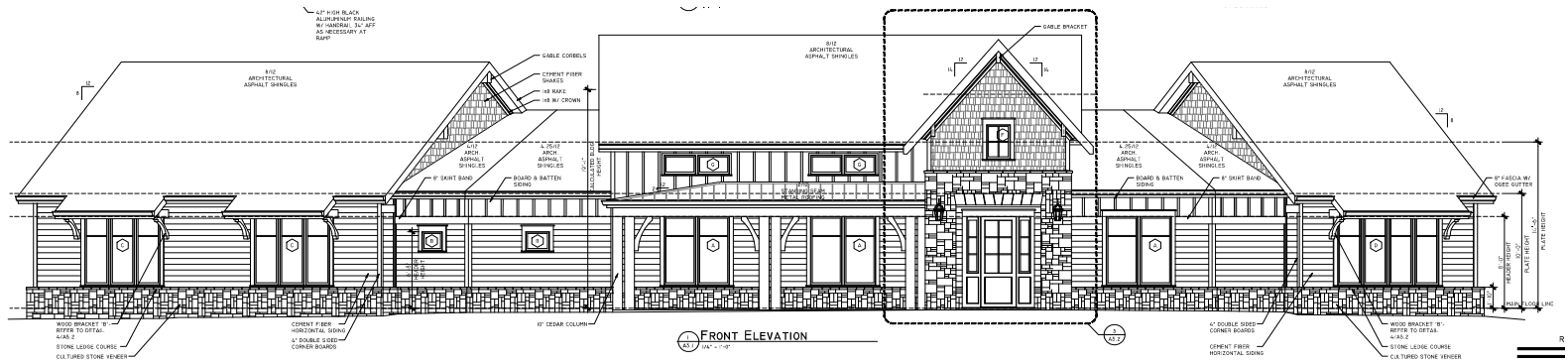
POOL AND CLUBHOUSE FROM SIMILAR KOLTER PROJECT



AMENITY ELEVATIONS



IMAGES AND ELEVATIONS ARE CONCEPTUAL.
FINAL APPROVALS TO BE DETERMINED WITH FMDP.





5 CIVIC SPACES ARE PLANNED FOR THIS SITE.

THREE OF THESE SITES WILL HAVE COVERED MAILBOX KIOSKS. COVERED SEATING WILL BE PROVIDED IN MOST PARKS.

IMAGES ARE TO PROVIDE EXAMPLES OF TYPES OF COVERED SEATING AND MAILBOX KIOSKS, BUT COULD BE SUBJECT TO REVISIONS AT FMDP APPROVALS.

CIVIC SPACE ARCHITECTURE

October 13, 2023

Kolter Land
Joshua Gibbs
1704 Tellico Dr,
Thompsons Station, TN 37179

Re: 420 Bear Creek Pike , Columbia Bluffs

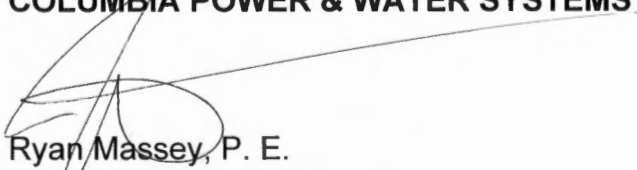
Dear Sir:

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

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 “CBA” _____, 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.

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.

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 corner 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, 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:

(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 by 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.

(e) Notification; Construction; Inspection. The District Design Review Committee shall make best efforts to notify the applicant of its decision within the time allowances set out in its design approval process guidelines. However, a delay in reviewing an application shall not be deemed consent to construction. If approval is given, construction of the Improvements may begin. All construction must comply with the submitted plans. The District Design Review Committee or its agent may inspect the property during construction but has no obligation to make any such inspection. Any inspection made by the District Design Review Committee is made for the benefit of the District Design Review Committee or District Declarant, and is not made for the benefit of or to be relied upon by any third party or Owner.

(f) Completion. When the primary building and landscaping are completed in substantial compliance with the approved plans and specifications, the District Design Review Committee may on request issue a Certificate of Substantial Conformance. The Certificate shall describe any areas of deficiency that need to be corrected. All Fines and other enforcement shall be waived so long as the deficiencies are corrected within sixty (60) days. Upon correction of all deficiencies, the District Design Review Committee shall issue a Certificate of Completion and Release in recordable form. If no Certificate of Substantial Conformance is requested, the District Design Review Committee shall not be estopped from later determining that a deficiency needs correction, and reserves all rights of Fines and enforcement.

(g) Governmental Compliance. Owners are responsible for making sure that construction conforms to governmental regulations and all local building codes. If the District Design Review Committee notes noncompliance, the Owner will be required to make the necessary changes. However, the District Design Review Committee is not responsible for compliance with governmental requirements.

Section 5. Approval of Architects, Builders. District Declarant shall have the right to approve any and all architects or builders in all or any portion of the District, in its sole discretion. District Declarant's approval of an architect, builder or other design professional shall not constitute any representation or endorsement of such professional's character, experience or professional capabilities.

Section 6. Enforcement.

(a) Fines. The District Design Review Committee may require the Builder or Owner to post a deposit from which the District Design Review Committee may deduct Fines for failure to comply with the approved plans and specifications, tree regulations and rules for builder conduct. The collection of a Fine shall not in any way diminish the available remedies at law or equity.

(b) Suit Permitted. If any construction is begun that has not been approved or that deviates from approved plans and specifications, the District Design Review Committee, District Declarant or the District Association may require the Owner to resolve the dispute through binding arbitration or may bring suit seeking damages, specific performance, declaratory decree and/or injunction, or any other remedy at law or in equity. The Board shall be empowered to bring suits on behalf of the District Association. If suit is brought and the court finds that the construction was not

approved or that the construction deviated from the approved plans or specifications, then the party bringing suit shall also be awarded reasonable attorney's fees, even if the relief requested is not granted.

(c) Trees and Hedges. Improper cutting, removal, lack of care or intentional damage to existing trees and hedges may be subject to the imposition of Fines plus a requirement that the tree be replaced with an approved species of comparable caliper, or, if approved by the District Design Review Committee, a combination of trees totaling the caliper of the removed tree, or that hedges be replaced with an approved hedge plant. Fines shall be set by the District Design Review Committee.

(d) Drainage. After reasonable notice (except in an emergency), District Declarant or the District Association shall have the right but not the obligation to enter onto a Lot and correct improper grading or other modification to the Lot which causes drainage problems. Such corrections shall be made at the cost and expense of the Owner of the Lot, who shall promptly reimburse District Declarant or the District Association, as applicable. The Lot shall be subject to a lien for the cost if not paid. District Declarant or the District Association, as applicable, shall not be required to repair or replace landscaping or other improvements after such action.

(e) No Waiver. Failure to enforce any provision of this Declaration shall not be deemed a waiver of the right to do so at any time thereafter.

Section 7. Liability. District Declarant and District Design Review Committee and its inspectors are concerned primarily with aesthetic considerations, and are not responsible for compliance with governmental requirements or design or construction defects or use of materials affecting the safety or structural integrity of the building. Approval by the District Design Review Committee of an application shall not constitute a basis for any liability of the Qualified Architect, District Declarant, members of the District Design Review Committee, the Directors of the Board or the District Association for failure of the plans to conform to any applicable building codes or inadequacy or deficiency in the plans resulting in defects in the improvements, or for the performance or quality of work of any builder or architect approved by it, or for non-compatible or unstable soil conditions or soil erosion, or any other condition of the property.

ARTICLE XI USE RESTRICTIONS

Section 1. Use Restrictions. In addition to all other covenants contained herein, the use of the Property is subject to the following; provided, however, that if any Supplemental Declaration or Sub-District Declaration expressly permits uses or matters that would otherwise be prohibited, with the express consent of District Declarant, then such Supplemental Declaration or Sub-District Declaration shall control over this Declaration for purposes of this Article XI:

(a) Maintenance of Exterior and Interior. Except as provided in this District Declaration or any Supplemental Declaration, each Owner shall be responsible for the maintenance of, and shall maintain, the exterior and interior of its Lot and any Improvements in a clean, sanitary, and attractive condition, and shall (1) keep its Lot free from rubbish, litter, and noxious weeds; (2) maintain, cultivate, and keep in good

condition and repair shrubs, trees, grass, lawns, plantings, and other landscaping located, or from time to time placed, within the bounds of its Lot; and (3) replace dead plants, shrubs, trees, grass, or landscaping of the same or similar type. If any irrigation system is in place on any Lot, the Master Association may require that the Owner maintain such irrigation system and keep such system in use to the extent required to keep a maintain healthy landscaping.

(b) Association to Landscape Common Area. Except as otherwise provided herein, the District Association shall have the right and the obligation at any time to plant, replace, maintain, and cultivate shrubs, trees, grass, plantings, and other landscaping upon the Common Maintenance Area located on the Property. No Owner shall remove, alter, or injure in any way any shrubs, trees, grass, plants or other landscaping placed upon or about a Lot by District Declarant or the District Association, without first obtaining the written consent of the Board.

(c) Signs and Billboards; Exterior Lights. No sign or billboard of any kind shall be displayed to the public view on any portion of the Common Area, except for (1) directional or informational signs, established by District Declarant or the District Association, (2) signs used by District Declarant, or by its successors or assigns, to advertise the Property, provided such signs are located on the Common Area, and (3) signs permitted under any Supplemental Declaration or Sub-District Declaration, provided that the Board may establish or require a common signage system for such purposes and such system shall prevail over the general provisions of this subsection.

(d) Quiet Enjoyment. No noxious, offensive or illegal activity shall be carried on, in or upon any Lot or any part of the Property, nor shall anything be done thereon that may be or may become an annoyance or nuisance to the neighborhood, that shall interfere in any way with any Owner's quiet enjoyment of its respective Lot, or that shall increase the rate of insurance in any way.

(e) Temporary Structures. No structure of a temporary character or other out-building shall be used on any Lot or the Common Area at any time as a residence or otherwise, either temporarily or permanently. Notwithstanding the foregoing, District Declarant or its agents shall have the right to conduct any business necessary for the sale of Lots, including showing model Lots and maintaining a sales and/or construction office on the Common Area or in any Lot owned by Declarant. In furtherance thereof Declarant shall have an easement over all of the Common Area for ingress, egress and parking for itself, its agents, employees, and prospective buyers of Lots for so long as District Declarant or any subsidiary or affiliated company owns any interest in the Property, and District Declarant may block or restrict access over and across roadways so long as access to a particular Lot owned by a Person other than District Declarant is not prohibited.

(f) Animals. No animals, reptiles, rodents, livestock, birds, or poultry of any kind shall be raised, bred or kept in or on any Lots, other than bona fide service animals or household pets. No household pets shall be kept outside the dwelling or housing unit, and any outside activity shall be under the active control I.E. leashed, of the Owner or one acting on the Owner's behalf. Without limiting the foregoing, animals who repeatedly bark, are aggressive, or other create a negative impact on other Owners

or other persons may be subject to further restrictions and, in the discretion of the Board, removed from the Development. No animal may be kept in a manner that, in the sole determination of the Board, is unhealthy or cruel for such animal, including without limitation keeping animals tied up or tethered for extended periods of time. In making any determination of cruelty or unhealthy conditions, the Board shall have the right but not the obligation to consult governmental or private animal control or shelter organizations. The Board may permit variances to the restrictions set forth in this subsection in the Board's sole discretion. The Board may establish further rules and regulations for control of animals and household pets, and may impose Fines for violations of the foregoing or additional rules and regulations in addition to requiring removal of animals from the Development.

(g) Vehicles. No truck, trailer, camper, boat, van or similar equipment or disabled vehicle shall be permitted to remain upon or within the Common Area or public streets unless on a space designated for such use by the District Association. No such equipment may be stored or permitted to remain upon a Lot or any portion of the Common Area or public streets for more than forty-eight (48) hours unless stored in an enclosed garage.

(h) Exterior Structures. No fences, ornamental screens, awnings, screen doors, sunshades except as approved by or under general rules adopted by the District Design Review Committee.

(i) Garbage Collection. All rubbish, trash, and garbage shall be removed from the Property regularly and shall not be allowed to accumulate thereon. All refuse containers, clothes lines, woodpiles, storage areas, machinery, or equipment shall be kept in such a manner as not to be visible from neighboring property or contiguous streets. No incinerators shall be kept or maintained on any Lot. Refuse containers shall not be placed outside for trash pickup prior to 6:00 p.m. on the day prior to such pickup, and shall be returned to non-visible areas no later than the end of the day on which pickup is made. No debris, trash, ashes, lawn clippings, leaves, leaf bags or other refuse may be thrown or dumped on any of the Lots or Common Area. Debris and trash during the construction of an Owner's Improvements shall be collected by each Owner (or his or her representative) in containers approved by the District Design Review Committee and periodically removed so that no unsightly condition occurs on the Lot or adjoining Lots.

(j) Taxes and Utilities. Each Owner shall pay any real and personal property taxes or charges assessed against their respective Lot and Improvements and the utility charges for said Improvements.

(k) Infections, Plant Diseases or Insects. No Owner shall permit anything or condition to exist upon any portion of such Owner's Lot that shall induce, breed, or harbor infections, plant diseases, vermin or noxious insects.

(l) Reasonable Inspection and Entry. The Board shall have the right of inspection and entry onto Lots in order to perform the duties and obligations of the Board under this Declaration and under the Bylaws. In addition, District Declarant, the District Association, and their designees shall have the right to enter upon a Lot for the

purpose of cutting grass, hedges and shrubbery and providing maintenance agreed upon with the Owner thereof.

(m) Trade or Business. No gainful profession, occupation, trade or other nonresidential use shall be conducted in any Lot designated for residential purposes or upon the District Common Area or any portion thereof without the prior approval of the Board. Special Use Parcels or areas in which a mix of business and residential purposes are appropriate shall be governed by the provisions of any Supplemental Declaration or Sub-District Declaration covering such portions of the Development. The Board may disapprove such a trade or business in the event that it determines that the trade or business would have a negative impact on the Property, including, without limitation, creating problems related to traffic, parking or security. In determining whether to approve a trade or business conducted in a residential Lot, the Board shall be provided with detailed information on (i) the type of trade or business and (ii) the activities related thereto that could potentially affect the Property. In the event that the Board approves a certain trade or business (the “Approved Use”), then so long as the activities related to that Approved Use do not materially change from the activities described to and approved by the Board, the Board (whether or not the composition of the Board changes) shall not have the right to disapprove the Approved Use after the date of the original approval, subject to subparagraph (s) below. Notwithstanding the foregoing, an Owner or occupant residing in a unit within the Development may conduct business activities within the unit so long as: (a) the existence or operation of the business activity is not apparent or detectable by sight, sound, signage or smell from outside the Unit; (b) the business activity conforms to all applicable zoning, law, statute or ordinance requirements; (c) the business activity does not involve persons coming onto the Development who do not reside in the Development or door-to-door solicitation of residents of the Development; and (d) the business activity is consistent with the residential character of the Property and does not constitute a nuisance, or a hazardous or offensive use, or threaten the security or safety of other residents of the Development, as may be determined in the sole discretion of the Board. The terms “business” and “trade”, as used in this provision, shall be construed to have their ordinary, generally accepted meanings, and shall include, without limitation, any occupation, work or activity undertaken on an ongoing basis which involves the provision of goods or services to persons other than the provider’s family and for which the provider receives a fee, compensation, or other form of consideration, regardless of whether: (i) such activity is engaged in full or part-time; (ii) such activity is intended to or does generate a profit; or (iii) a license is required therefor.

(n) Compliance with Law. The District Association and each Owner shall comply promptly with all laws, statutes, ordinances, rules and regulations of federal, state or municipal governments or authorities applicable to use, occupancy, construction and maintenance of any Improvements upon the Lots, including without limitation any zoning or other approvals or restrictions.

(o) Damage from Plants. No Owner shall permit any plant, tree, shrubbery or other similar item to exist upon any portion of such Owner’s Lot that shall damage or create a nuisance on another Lot or that has not been approved by the District Design Review Committee. The Board shall determine conclusively, in its sole and absolute

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.

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: _____

EXHIBIT A
PROPERTY DESCRIPTION

TO BE INSERTED UPON FORMATION OF ASSOCIATION

DRAFT

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:
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Franklin, Tennessee 37067

DISTRICT DECLARATION OF COVENANTS,
CONDITIONS, AND RESTRICTIONS
FOR ***PRIMARY NEIGHBORHOOD*** AT
COLUMBIA BLUFFS

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DISTRICT DECLARATION OF COVENANTS,
CONDITIONS, AND RESTRICTIONS FOR
THE PRIMARY NEIGHBORHOOD DISTRICT AT COLUMBIA BLUFFS

This DISTRICT DECLARATION OF COVENANTS, CONDITIONS, AND RESTRICTIONS (this “Declaration”) is made effective as of _____, 2023, by _____, _____ (“District Declarant”).

W I T N E S 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.

Section 8. “Common Maintenance Area” shall mean the Common Area and any portion of the Property for which the District Association has assumed or has been designated as the responsible party for maintenance obligations or otherwise designated by this Declaration or any Supplemental Declaration or a Sub-District Declaration as a Common Maintenance Parcel.

Section 9. “Common Maintenance Parcel Assessments” are Assessments to which Common Maintenance Parcels are subjected, in addition to any General Assessments.

Section 10. “Common Maintenance Parcel” shall mean any Lot designated by this Declaration or any Supplemental Declaration as a Common Maintenance Parcel, but excluding any Common Maintenance Parcels that are within the authority or responsibility of the Master Association or within the authority or responsibility of a Sub-District Association.

Section 11. “Community-Wide Standard” shall mean the standard of conduct, maintenance, or other activity generally prevailing in the Development as established in the reasonable discretion of the Master Declarant, District Declarant or the applicable Board of Directors.

Section 12. “District Association” shall mean **Columbia Bluffs Primary Residential Owners Association**, a Tennessee nonprofit corporation, its successors and assigns.

Section 13. “District Declarant” means _____, a _____ limited liability company, its successors and assigns.

Section 14. “Declarant Control Period” means the period ending on the earlier to occur of: (i) the date that the District Declarant voluntarily relinquishes control of the Association; and (ii) when homes have been completed on eighty (80%) of the lots within the District and such lots have been conveyed to third party residential owners.

Section 15. “Development” means the Residential to be developed on real property that includes, among other areas, the District, to be known as Town Columbia, and shall be deemed to include the real property described in the Master Declaration, as may be modified, amended, expanded or contracted from time to time.

Section 16. “District” shall have the meaning given in the premises of this Declaration.

Section 17. “District Assessment” means the Assessment to be paid by the District to the Master Association as set forth in the Master Declaration or Supplemental Declaration.

Section 18. “District Representative” means the Person selected by the Board of Directors to be the representative of the District in meetings or otherwise with the Master Association.

Section 19. “District Design Code” shall mean the aesthetic and functional plan for the District, to be implemented through the regulation of land use, landscaping, architecture and such other matters as may be included in the District Design Code. The District Design Code is originally adopted by the District Declarant and may be amended by the District Declarant or District Design Review Committee, with the consent of District Declarant and Master Declarant

during the applicable Declarant Control Period, from time to time. The District Design Code does not need to be recorded to be effective but shall be available from the District Design Review Committee.

Section 20. “Final Plat” means, collectively, all plats of a portion of the Property from time to time recorded in the real estate records of the Office of the Judge of Probate for Maury County, Tennessee, as such may be amended from time to time as the Property is developed. The term “Final Plat” may include a plat established by a condominium regime.

Section 21. “Improvements” shall mean buildings, outbuildings, underground installations, grading, slope and drainage alterations, roads, driveways, parking areas, fences, screening walls and barriers, retaining walls, stairs, decks, windbreaks, landscaping, plantings, planted trees and shrubs, poles, signs, lighting, loading areas, and all other man-made changes to the natural configuration and vegetation of the Property, whether above or below the land surface.

Section 22. “Lot” or “Lots” shall mean a separate parcel of the Property now or hereafter set forth as a Lot on any Final Plat, including without limitation open space, conservation areas, or Common Area within a District, or separate parcels conveyed by other property description if no Final Plat has been recorded, and shall be deemed to refer to any and all Improvements located thereon or comprising such Lot.

Section 23. “Master Association” shall mean and refer to the Columbia Bluffs Master Association, Inc., a Tennessee nonprofit corporation, its successors and assigns, **IF REQUIRED.**

Section 24. “Master Declarant” shall mean the Declarant of the Master Declaration, its successors and assigns.

Section 25. “Master Declaration” shall mean that certain Master Declaration of Covenants, Conditions, and restrictions for Columbia Bluffs, of record at Book _____, page _____, Maury County Register’s Office, as may be supplemented, amended, or revised from time to time.

Section 26. “Master Design Code” shall mean the aesthetic and functional plan for the Development, to be implemented through the regulation of land use, landscaping, architecture and such other matters as may be included in the Master Design Code. The Master Design Code is originally adopted by the Master Declarant and may be amended from time to time by the Master Declarant or Master Design Review Committee, with the consent of Master Declarant during the Declarant Control Period applicable to the Master Declaration. The Master Design Code does not need to be recorded to be effective but shall be available from the Master Design Review Committee.

Section 27. “Mortgage” shall include a deed of trust or mortgage encumbering any Unit.

Section 28. “Mortgagee” shall include a beneficiary under or holder of a note secured by a Mortgage who has provided actual, written notice to the Master Association of such interest.

Section 29. “Mortgagor” shall include the trustor or grantor of a Mortgage.

Section 30. “Operating Budget” shall have the meaning given in Article IX, Section 2 of this Declaration.

Section 31. “Owner” shall mean and refer to one or more Persons or entities, including District Declarant or Master Declarant, who holds or hold the record title to any Lot, but excluding in all cases any party holding an interest merely as security for the performance of an obligation.

Section 32. “Person” shall mean a natural person, a corporation, a partnership, a limited liability company, a trust, a trustee, or any other legal entity.

Section 33. “Property” shall mean and refer to the real property described in Exhibit A attached hereto, and any additional real property submitted to this Declaration from time to time pursuant to a Supplemental Declaration and added to the District.

Section 34. “Special Assessment” shall have the meaning given in Article IX, Section 5 of this Declaration.

Section 35. “Special Use Assessment” shall mean the Assessment applied to a Special Use Parcel by Supplemental Declaration, which may be in lieu of all other Assessments; subject to the provisions of Article IX.

Section 36. “Special Use Parcel” shall mean a Lot of unconventional size, shape, location or use that calls for special design and assessment considerations as designated by Master Declarant or District Declarant. Typically, a Special Use Parcel will be used for commercial purposes, civic purposes, an age-restricted neighborhood, multi-family residential, or community or recreational facilities.

Section 37. “Streetscape, Pedestrian, Utility and Street Maintenance Easement” shall include all streetscape, pedestrian, utility and street easements located adjacent to street rights-of-way and medians in public rights of way.

Section 38. “Sub-District Association” shall mean an owners association established to maintain or regulate only a portion of the District pursuant to a Sub-District Declaration, such as a condominium association, if any, with the prior consent of Master Declarant and District Declarant.

Section 39. “Sub-District” shall mean a portion of the District that has been subjected to particular restrictions, covenants or regulations by Supplemental Declaration or a Sub-District Declaration, , if any, and may be maintained or regulated by a Sub-District Association.

Section 40. “Sub-District Declaration” shall mean a declaration of restrictive covenants and other matters applicable only to a Sub-District.

Section 41. “Supplemental Declaration” shall mean an amendment to this Declaration, including the addition of additional property, Lots or Master Common Area subjected to this Declaration. Such Supplemental Declaration may, but is not required to, impose, expressly or by reference, additional restrictions and obligations to the provisions of this Declaration, or to

exempt such property from certain provisions and restrictions of this Declaration. The term “Declaration” as used herein shall include this Declaration, together with any and all Supplemental Declaration, together with any amendments, restatements or other additions or removals thereto.

Section 42. “Telecommunication Services” shall mean residential and commercial services involving the provision of voice, internet, entertainment, television or other related services.

Section 43. Defined Terms. Capitalized terms used herein and not otherwise defined shall have the meaning given in the Master Declaration.

ARTICLE II DISTRICT AND SUB-DISTRICT ASSOCIATIONS

Section 1. Establishment. This Declaration is a District Declaration as referred to in the Master Declaration, and is established by District Declarant with the consent of Master Declarant.

Section 2. District Sub-District Associations. District Declarant or other Persons may from time to time, with the consent of Master Declarant and District Declarant, establish Sub-Districts within the District to be governed by a Sub-District Association by filing a Sub-District Declaration, Supplemental Declaration, or other means of record. Each area within a Sub-District may consist of one or more Lots within the District, one or more parcels described by property description (each of which will be deemed a Lot), one or more uses, or otherwise as determined by the applicable declarant, District Declarant, or Master Declarant, in their sole discretion, but subject in each case to the consent of Master Declarant and District Declarant. Upon establishment of a Sub-District, and at any time and from time to time, the applicable declarant may but shall not be required to impose additional restrictive covenants that are applicable to such Sub-District or to exempt all or a portion of the Sub-District from one or more provisions of this Declaration, with the consent of the Master Declarant and District Declarant. The applicable declarant may establish, or cause the Sub-District to establish, one or more Sub-District Associations for the management and preservation of such Sub-District, each with the power to establish and collect Assessments for, among other things, the payments of Assessments to the Master Association or District Association s as may be in the Master Declaration, this Declaration, or in this Declaration.

Section 3. Sub-District Declaration. A Sub-District shall be entitled to establish one or more Sub-District Declarations applicable to a Sub-District and a Sub-District Association for the administration thereof, but such Sub-District Declarations and all Sub-District Associations shall in each case be subject to the prior review and approval of District Declarant and Master Declarant in their respective sole discretion, and shall be deemed subordinate to the Master Declaration and this Declaration.

Section 4. Sub-District Representatives. Unless otherwise established by the declarant in a Sub-District Declaration, it shall be the responsibility of Owners within a Sub-District to establish equitable, fair and representative procedures for the selection of any representative to the District Association as may be established, in each case to be approved by District Declarant. If applicable, no voting or representative rights shall be available to a Sub-

District until such time as a Sub-District Representative has been duly selected. Each Sub-District will be governed, controlled and subject to the powers and authority vested in the Master Association and the District Association, whether or not the District has elected a District Representative.

ARTICLE III PROPERTY RIGHTS AND EASEMENTS

Section 1. Common Area. Every Owner shall have a right and easement of enjoyment in and to the Common Area that is appurtenant to the title to such Owner's Lot, subject to any restrictions or limitations contained in the Master Declaration, this Declaration or in any Deed or amendment thereto conveying the Common Area to the District Association or subjecting the Common Area to this Declaration. Any Owner may delegate his or her right of enjoyment to their family, tenants, customers, and invitees, as applicable, subject to reasonable regulation by the Board and in accordance with procedures the Board may adopt from time to time.

Section 2. Exceptions to Rights. The Owner's right granted in Section 1 above shall be subject to the following:

- (a) The right of the Master Association or District Association to dedicate or transfer all or any part of the Common Area to any public body, agency, authority, or utility for such purposes as are consistent with the purposes of the Master Association set forth in the Master Declaration or the District Association set forth in this Declaration.
- (b) The limitation of Owner rights only to those areas of the Common Area for which such Owner shall pay a portion of the Common Expenses related thereto.
- (c) Each Owner's responsibility to pay for Common Expenses, fees, Fines and other charges hereunder assessed by the Board or the District Association against an Owner's Lot.
- (d) The right of Master Declarant, District Declarant or other declarant under a Sub-District Declaration to limit, restrict, or regulate the use of the Common Area in their sole discretion.

Section 3. Owner Easements. Subject to the limitations of Section 2 above, every Owner, its successors and assigns, shall have the following perpetual easements with respect to the Property; provided, that for purposes of this Section 3, Common Area shall be deemed to include Common Area that is now or hereafter created within a District, without regard to whether the District Association has ownership of such areas or responsibilities for maintenance or otherwise with respect such areas:

- (a) A non-exclusive easement of ingress and egress to its Lot over, across and through the Common Area and Streetscape, Pedestrian and Utility Maintenance Easements.
- (b) A perpetual easement in common with the Owners of all other Lots to use all pipes, wires, cables, public utility lines and other Common Elements serving its Lot.

(c) A nonexclusive, perpetual and reciprocal access easement for ingress and egress in common with the Owners of all other Lots for access over any drive aisles or alleys located, constructed and available on or within any Lot, but expressly excluding private driveways constructed solely for internal use only within a Lot, and any areas excluded from use by a Supplemental Declaration, this Declaration, or a Sub-District Declaration.

(d) A perpetual and non-exclusive easement in, over and through all Common Area and to use the entranceways, pedestrian systems and other common improvements within the Property subject to the right of the Board to:

(i) promulgate rules and regulations for the use and enjoyment thereof; and,

(ii) suspend the enjoyment and voting rights of any Owner for any period during which any Assessment for Common Expenses or Fine or other charge or fee hereunder remains unpaid, or for any period during which any infraction of its published rules and regulations continues, it being understood that any suspension for either non-payment of any assessment or a breach of the rules and regulations of the District Association shall not constitute a waiver or discharge of the Owner's obligation to pay the assessment..

Section 4. District Declarant and District Association Easements. The District Declarant and the District Association, their successors and assigns, and their contractors and agents shall have the following perpetual easements with respect to the Property:

(a) A perpetual and non-exclusive easement for the maintenance of any Common Elements and Streetscape, Pedestrian, and Utility Maintenance Easements, which may presently, or hereinafter encroach upon a Lot.

(b) A perpetual and non-exclusive right of access to each Lot: (1) to inspect same for the purpose of verifying conformance with this Declaration and any rules and regulations of the District Association, (2) to remedy any violations set forth in this Declaration or in any rules and regulations of the District Association, and (3) to perform any operations required in connection with the maintenance, repairs or replacements of or to the Common Area, or any equipment, facilities or fixtures affecting or serving other lot(s) or the Common Elements; provided that requests for entry are made in advance and that any such entry is at a time reasonably convenient to the Owner. In the case of an emergency, such right of entry shall be immediate, whether Owner is present at the time or not.

(c) A perpetual and non-exclusive easement in, over, upon, across and through the Common Area for surface water runoff and drainage caused by natural forces and elements, grading, and/or the improvements located upon the Property. No individual Owner shall directly or indirectly interfere with or alter the drainage and runoff patterns and systems within the Property without written approval of the Master Association.

(d) A perpetual and non-exclusive easement in, upon, over, across and through the Common Area for the purpose of installation, maintenance, repair, service and replacement of all sewer, water, power and telephone pipes, lines, mains, conduits, waters, poles, transformers, meters, and any and all other equipment or machinery necessary or incidental to the proper functioning of any utility company or other entity that requires same for the purpose of

furnishing one or more of the foregoing services as determined and authorized by the Master Association.

(e) A perpetual and non-exclusive easement of unobstructed ingress and egress in, upon, over, across and through the Common Area to the District Association, the Master Association, and their respective officers, agents and employees and all police, fire, and ambulance personnel in the proper performance of their respective duties (including but not limited to emergency or other necessary repairs to a lot upon which the Owner has failed to perform) and for repair and maintenance of the Common Elements. Except in the event of emergencies, the rights accompanying the easements provided for in this subsection shall be exercised only during reasonable daylight hours and then, whenever practical, only after advance notice to the Owner(s) directly affected thereby.

(f) The District Declarant reserves the right and easement, which shall be a covenant running with the land, for and to the benefit of District Declarant and District Association for the installation and use of entrance Improvements to be located on the entrances to the District. The estimated and actual cost of operating and maintaining any improvement thereon will be the responsibility of the District Association. Excluding the Master Declarant or District Declarant, and any of their respective affiliates, the publication or display of any signage or other matter by any Person, whether or not such Person is a Member of the District Association, upon any Improvement on the entry feature easement will be subject to contract with the District Association for the reasonable compensation for services and operating expenses in connection therewith.

Section 5. Easement Related to Infrastructure and Other Improvements. Notwithstanding the foregoing or anything else contained herein to the contrary, District Declarant and/or the District Association shall have and hereby retain the right, but not the obligation, to create, install, construct, modify, repair, replace and maintain certain forms of infrastructure for the District that may consist of curbs, streets, service drives, sidewalks, and other hardscape, landscaping, street trees, street lights, irrigation systems, brick pads, benches, bridges, street furniture, walking paths, parks, trash receptacles, drainage facilities, signage, utilities, and any apparatuses related thereto, as well as other improvements not necessarily enumerated above. Said improvements may be installed along the roads or within any Lot or in the Common Area of the District if deemed necessary or desirable by the District Declarant and/or the District Association, in their sole and absolute discretion, for the overall functionality or aesthetics of the District. Continued maintenance, repair and replacement of any of the aforementioned infrastructure or improvements, if and once installed, shall be the responsibility of the Lot Owner if located within said Owner's Lot, or the responsibility of the applicable District Association if located within the Common Area of the District or the responsibility of the Master Association if located within the Master Common Area. Any costs and expense associated with this right may be reallocated and assessed by the District Association as a Common Expense. Notwithstanding the foregoing, when exercising said right, neither District Declarant nor the District Association shall do anything which may reduce the number of parking spaces within the Lot. In addition, neither District Declarant nor the District Association shall have the right to modify an existing building located on a Lot without the consent of the Lot Owner. An easement is hereby granted to the District Declarant, the District Association and to any construction or management company selected by the District Declarant or the District Association to enter in or cross over the Common Area or to enter or cross over any Lot to

create, install, construct, modify, repair, replace and maintain any of the aforementioned forms of infrastructure or improvements located within any portion of the District.

Section 6. Easements for Utilities and Related Purposes. The District Association is authorized and empowered to grant (and shall from time to time grant) such licenses, easements and/or rights of way for sewer lines, water lines, electrical cables, telephone cables, television and other communication cables, internal and external wiring and antennae, gas lines, drainage, slopes, storm drains, regulatory signage, street lights, underground conduits and/or such other purposes related to the provision of public utilities and other common services to the District as may be considered necessary, appropriate or desirable by the Board for the orderly maintenance, preservation and enjoyment of the Common Area or for the preservation of the health, safety, convenience and/or welfare of the Owners of the lots and District Declarant. A ten (10) foot nonexclusive underground utility easement for the District Association is reserved along all the frontage (but behind right of way), both sides, and rear of all Lots, and on both sides of the sidelines of all corner Lots. Additional easements are reserved on the recorded plat(s), as amended from time to time. Within these easements, no construction of any kind shall be placed or permitted to remain which will in any way damage or interfere with the installation or maintenance of utilities.

Section 7. Streetscape, Pedestrian, Utility, and Street Maintenance Easements. Streetscape, Pedestrian, Utility, and Street Maintenance Easements shall include all streetscape, pedestrian, utility, and street maintenance easements located adjacent to street rights-of-way, and required pavers and medians in public rights-of-way.

Section 8. Easements of Encroachment. There shall be reciprocal appurtenant easements of encroachment as between each Lot and such portion or portions of the Improvements adjacent thereto or as between adjacent Lots due to unintentional placement or settling or shifting of Improvements constructed, reconstructed or altered thereon.

Section 9. General Easement. The District Declarant, so long as it shall retain record title to any Lot or other tract within the District or the Common Area, and the District Association, reserve the right and easement to the use of the Common Area and any Lot (regardless of ownership) or any portion thereof, as may be needed for repair, maintenance or construction on such Lot or any other Lot or the Common Area.

Section 10. Revision of Common Area. Notwithstanding any other provision of this Declaration, District Declarant shall have the right by recording a Final Plat or otherwise to revise any Common Area, in whole or in part, including without limitation the conversion to other types or uses of property, the increase or decrease in size, or the granting of easements or construction of improvements in such Common Area.

ARTICLE IV MEMBERSHIP AND VOTING RIGHTS

Section 1. Membership in the District Association. Every Person who is the record owner of a joint or undivided fee interest in any Lot shall be deemed to be a member of the Association (each such person or entity, a “Member”). Membership shall be appurtenant to and may not be separated from such fee interest ownership, and any transfer of a Lot shall operate automatically to transfer to the new record owner thereof the membership in the Association

appurtenant thereto. The foregoing is not intended to include persons who hold an interest merely as security for the performance of an obligation, and the giving of a security interest shall not terminate that Member's membership.

Section 2. Assignment by Declarant. Notwithstanding the foregoing, District Declarant may at any time assign, pledge, hypothecate or alienate its membership and/or District Declarant's rights as District Declarant herein, but any transfer by District Declarant of title to a Lot shall automatically transfer the membership in the Association appurtenant thereto, free and clear from any such assignment, pledge, hypothecation or alienation.

Section 3. Voting Rights. Voting and other rights of the Members shall be as set forth in the By-Laws of the Association.

ARTICLE V MAINTENANCE

Section 1. District Association's Responsibility. The District Association shall maintain and keep in good repair the Common Maintenance Area. Subject to the provisions of any Supplemental Declaration or Sub-District Declaration, such maintenance may include, without limitation, maintaining, repairing, and replacing, subject to any insurance then in effect, all trees, landscaping and other flora, structures, irrigation system, storm water control and any other Improvements situated upon the Common Area or the Common Maintenance Area, and the maintenance of non-public streets, parking areas, or driveways, street or entrance lighting, signage, including without limitation directional signage.

Section 2. Common Maintenance Parcels. The District Association shall maintain those portions of Common Maintenance Parcels as this Declaration or any Supplemental Declaration establishes as a District Association responsibility, and may charge to the Owners of such Common Maintenance Parcel a Common Maintenance Parcel Assessment, as appropriate.

(a) Unless otherwise established by Supplemental Declaration, the District Association shall provide for the maintenance, care, repair, and replacement of the following portions of the Common Maintenance Parcels, to be funded by Common Maintenance Parcel Assessments: the exterior landscaping (except such landscaping installed by, or on behalf of, the Lot Owner and such landscaping enclosed by a fence, if any), walkways, and porches located upon or about each Common Maintenance Parcel. The District Association also shall maintain the exterior of each Common Maintenance Parcel as follows: painting, maintenance, and repair of exterior building surfaces as the Board shall deem necessary and proper, including roofs, gutters, downspouts, exterior building surfaces, trees, shrubs, grass, walks, replacement of trim, caulking and other repairs to roof covers (to include the repair and replacement of all components of the roof of each Common Maintenance Parcel), and other miscellaneous repairs. Such exterior maintenance shall not include glass surfaces (weather windows or sliding glass doors), HVAC equipment, storm doors, front or rear entry doors, garage doors, fences, screens, or patio covers. The balance of the improvements located on the respective Common Maintenance Parcels shall be maintained by the Owner of the particular Lot involved. For the sole purpose of performing the exterior maintenance upon each Lot required by this Article V, the duly authorized employees or agents of the District Association shall have the right, after reasonable notice to the Owner, to enter upon any Lot and into any Lot at reasonable hours of any day.

(b) Notwithstanding any foregoing provision to the contrary, the duly authorized agents or employees of the District Association shall have the right to enter in or upon any Lot or into any structure or located on a Lot, without notice to the Owner thereof, when, in the judgment of the District Association, acting through its Board of Directors, such entrance is necessary to prevent damage to such Lot or surrounding Lots or Common Area by fire, criminal act, natural disaster, or other similar emergency.

(c) Notwithstanding the obligations of the District Association with respect to maintenance of certain portions of the exterior of certain Lots, the District Association shall have no obligation to repair interior or structural portions of any Lot or personal property that is lost or damaged as a result of construction defects, damage or maintenance issues of exterior portions of any Lot, including without limitation damage resulting from water leaks, foundational issues, or settling or structural matters. Each Owner shall bear full responsibility for obtaining and maintaining such insurance as may be desired for protection against such losses.

(d) Notwithstanding the foregoing, if the need for exterior maintenance and repair of Common Maintenance Parcels by the District Association as required by this section is caused by the willful or grossly negligent conduct or act an Owner, his/her family, guest, invitees, or other Persons using or occupying his/her Lot with his/her express or implied permission, the cost of such repair or maintenance may be assessed against such Owner as a Special Assessment of this Declaration upon a finding by the Board, which shall be due and payable thirty (30) days from the date of notice thereof, such Assessment to be collected and enforced as provided in this Declaration. Such Special Assessment shall not require the approval of any of the Members; provided, however, that any Owner against which any such Assessment is levied shall be entitled to notice, a hearing at a time and place set by the Board in its sole discretion, and an opportunity to do the corrective work required (provided that the work is performed by a competent contractor mutually agreeable to both parties and in a manner and quality agreed to by the Board), prior to a Special Assessment being levied against such Owner in accordance with the provisions of this subsection.

Section 3. Owner's Responsibility. Except as provided in the foregoing Section 1. Section 2. or otherwise set forth in a District Declaration, the Owner of each Lot shall have the sole responsibility for maintenance of all exterior and interior portions of the Lot, all Improvements located thereon, the land, flora and landscaping within the boundaries of the Lot; and other improvements not maintained by the District Association. Each Owner shall maintain its Lot in a manner consistent with the Community Wide Standard, the applicable covenants set forth in this Declaration, and such rules and regulations as may be established by the Board from time to time.

ARTICLE VI

INSURANCE AND CASUALTY LOSSES

Section 1. Insurance. The Board of Directors for the District Association, or its duly authorized agent, shall have the authority to and shall obtain insurance for all insurable improvements on the Common Area against loss or damage by fire or other hazards, including extended coverage, vandalism, and malicious mischief. This insurance shall be in an amount sufficient to cover the full replacement costs of any repair or reconstruction in the event of damage or destruction from any such hazard.

(a) The Board shall also obtain a public liability policy covering the Common Area and District Association for all damage or injury caused by the negligence of the District Association or any of its employees or agents. The public liability policy shall have at least a One Million Dollar (\$1,000,000.00) single person limit as respects bodily injury and property damage, a One Million Dollar (\$1,000,000.00) limit per occurrence, and a Five Hundred Thousand Dollar (\$500,000.00) minimum property damage limit. The policy or policies may contain a reasonable deductible, and the amount thereof shall be added to the face amount of the policy in determining whether the insurance at least equals the full replacement cost.

(b) In addition to the other insurance required by this Section, the Board shall obtain, as a Common Expense, worker's compensation insurance, if and to the extent necessary, and a fidelity bond or bonds on directors, officers, employees, and other persons handling or responsible for the District Association's funds. The amount of fidelity coverage shall be determined in the directors' best business judgment, but may not be less than three months' Assessments, plus reserves on hand. Bonds shall contain a waiver of all defenses based upon the exclusion of persons serving without compensation and may not be canceled or substantially modified without at least thirty (30) days' prior written notice to the District Association. The Board shall also obtain, as a Common Expense, a reasonably available amount of Directors and Officers Errors and Omissions insurance.

(c) Premiums for all insurance required by this Article VI, shall be Common Expenses of the District Association and shall be included in the General Assessment.

Section 2. Insurance; Common Maintenance Parcels.

(a) The District Association shall, as a Common Expense applicable only to Lots that are Common Maintenance Parcels, obtain and continue in effect adequate blanket all-risk casualty insurance, if reasonably available, and if not reasonably available, fire and extended coverage, in such form as the Board deems appropriate for one hundred (100%) percent of the replacement cost of the Lots that are Common Maintenance Parcels, excluding the replacement of any finishes, fixtures, cabinets, appliances, flooring, or other improvements installed or supplied by the Owners, or their tenants, or personal property of the Owners, or their tenants, guests, and invitees located within such Lots.

(b) Neither the District Declarant nor the District Association has constructed the Lots on the Common Maintenance Parcels, and neither District Declarant nor the District Association shall be liable for any claims or causes of action of any kind whatsoever in law or in equity arising from or in any way relating to the construction of improvements upon the Common Maintenance Parcels that was performed by parties other than District Declarant, its agents, employees, subsidiaries or other affiliated entities.

(c) Premiums for all insurance required by this Article VI, Section 2, shall be Common Expenses of the Association applicable only to Common Maintenance Parcels and shall be included in the Common Maintenance Parcel Assessment. The policy or policies may contain a reasonable deductible, and the amount thereof shall be added to the face amount of the policy in determining whether the insurance at least equals the full replacement cost.

Section 3. Disbursement of Proceeds. Proceeds of insurance policies with respect to Common Area shall be disbursed as follows:

(a) If the damage or destruction for which the proceeds are paid is to be repaired or reconstructed, the proceeds, or such portion thereof as may be required for such purpose, shall be disbursed in payment of such repairs or reconstruction as hereinafter provided. Any proceeds remaining after defraying such costs of repairs or reconstruction to the Common Area or, in the event no repair or construction is made shall be retained by and for the benefit of the District Association and placed in a capital improvements account.

(b) If it is determined that the damage or destruction to the Common Area for which the proceeds are paid shall not be repaired or reconstructed, such proceeds shall be disbursed in the manner as provided for excess proceeds in Section 2(a) above.

Section 4. Repair and Reconstruction. If the damage or destruction to the Common Area for which the insurance proceeds are paid is to be repaired or reconstructed, and such proceeds are not sufficient to defray the cost thereof, the Board of Directors may use reserve or capital improvements account funds, or may levy a Special Assessment against all Lots. Additional Assessments may be made in like manner at any time during or following the completion of any repair or reconstruction.

Section 5. Annual Review of Policies. At least annually, the Board shall review all insurance policies that are required by this Article VI to be maintained by the District Association in order to ascertain whether the coverage contained in the policies is sufficient. If the Board deems such coverage to be insufficient, the Board may expand the coverage to the extent it reasonably deems necessary.

ARTICLE VII NO PARTITION

Whenever all or any part of the Common Area shall be taken (or conveyed in lieu of and under threat of condemnation by the Board) by any authority having the power of condemnation or eminent domain, the award made for such taking shall be payable to the District Association as Trustee for all Owners to be disbursed as follows: If the taking involves a portion of the Common Area on which Improvements have been constructed, then, unless within sixty (60) days after such taking the District Declarant or the District Association shall otherwise agree, the District Association shall restore or replace such Improvements so taken on the remaining land included in the Common Area to the extent lands are available therefor, in accordance with plans approved by the Board and the District Design Review Committee. If such Improvements are to be repaired or restored, the above provisions in Article V hereof regarding the disbursement of funds in respect to casualty damage or destruction shall apply. If the taking does not involve any Improvements on the Common Area, or if there is a decision made not to repair or restore, or if there are net funds remaining after any such restoration or replacement is completed, then such award or net funds shall be disbursed to the District Association and used for such purposes as the Board shall determine.

ARTICLE VIII RIGHTS AND OBLIGATIONS OF THE DISTRICT ASSOCIATION

In addition to the powers delegated to the District Association by its Articles of Organization or the laws of the State of Tennessee, the District Association shall be empowered to perform each of the following duties related to the Property and Common Area:

Section 1. Operation and Maintenance of Common Maintenance Area. To operate, maintain and otherwise manage or provide for the operation, maintenance and management of the Common Maintenance Area, together with all easements for operation and maintenance purposes and for the benefit of the District Association or the Owners over and within the Common Area; to keep all Improvements, if any, of whatever purpose from time to time located on the Common Area in good order, condition, and repair.

Section 2. Title. Any other provision of this Declaration or the Bylaws notwithstanding, the District Association always shall maintain lien free title to the Common Area, excepting only a lien for current year taxes, provided, however, that the District Association may mortgage or convey the Common Area with an affirmative vote of at least sixty-seven percent (67%) of the Directors; and provided, further, that the District Association may accept a conveyance of the Common Area subject to a lien or other encumbrance.

Section 3. Seasonal or Other Decorations. To install and maintain seasonal and other decorations, lighting, street banners, and other items designed to enhance the appearance or attractiveness of the District or the enjoyment or experience of those living, shopping or otherwise participating in the District, in the sole discretion of the District Declarant or Board of Directors, the cost of which shall be a Common Expense.

Section 4. Water and Other Utilities. To acquire, provide, and/or pay for, water, sewerage, garbage disposal, electrical, telephone, gas, and other necessary utility services for the Common Area.

Section 5. Taxes and Assessments. To pay all real and personal property taxes and assessments separately levied upon or assessed against the District Association and/or the property owned by the District Association. Such taxes and assessments may be contested or compromised by the District Association; provided, however, that they are paid or a bond in an amount at least equal to such taxes and assessments is posted prior to the sale or other disposition of any property to satisfy the payment of such taxes or assessments.

Section 6. Insurance. To obtain from reputable insurance companies qualified to do business in the State of Tennessee the insurance set forth in this Declaration, and to maintain in force at all times such insurance as is required by this Declaration.

Section 7. Personal Property and Real Property for Common Use. The District Association, through action of its Board of Directors, may acquire, hold, and dispose of tangible and intangible personal property and real property. The Board, acting on behalf of the District Association, shall accept any real or personal property, leasehold, or other property interests within Maury County conveyed to it by the District Declarant as permitted herein.

Section 8. Rules and Regulations. The District Association, through its Board of Directors or otherwise, may make and enforce reasonable rules and regulations governing the use of the Property, which rules and regulations shall be consistent with the rights and duties established by this Declaration. Sanctions for violations of the rules and regulations may include reasonable monetary Fines (as hereinafter defined) and suspension of the right to use the Common Area. The Board shall, in addition, have the power to seek relief in any court for violations or to abate nuisances. In addition, the District Association, through the Board or otherwise, may, by contract or other agreement, enforce city or county ordinances or permit the

City of Columbia or Maury County to enforce ordinances on the Property for the benefit of the District Association and the Owners.

Section 9. Traffic Control. The Board may make rules and regulations concerning driving and parking within the Property, subject to applicable governmental requirements and restrictions. Without limiting the foregoing, to the extent permitted by local governmental authority, the District Association may construct traffic calming devices and post speed limits or other traffic signs and take other measures deemed necessary to discourage excessive speed and to promote a safe environment. The District Association may enforce such rules and regulations with penalties, Fines, or towing, and shall have all remedies set forth in this Declaration.

Section 10. Implied Rights. The District Association may exercise any other right or privilege given to it expressly by this Declaration or the Bylaws, any law, statute, or ordinance, and every other right or privilege reasonably to be implied from the existence of any right or privilege given to it herein or reasonably necessary to effectuate any such right or privilege.

ARTICLE IX ASSESSMENTS

Section 1. Creation of Assessments. There shall be created annual Assessments as may be from time to time specifically authorized by the Board of Directors as follows (collectively, the “Annual Assessments”):

(a) The Board may levy general assessments for expenses determined by the Board to benefit the District Association and/or the district as a whole, including without limitation, expenses incurred by the District Association in fulfilling its maintenance obligations set forth in this Declaration or otherwise expressly or implicitly authorized by this Declaration, reserves as deemed appropriate by the Board, and the District Assessment (“General Assessments”).

(b) The Board may levy a Common Maintenance Parcel Assessment against Common Maintenance Parcels for expenses determined by the Board to benefit only such Common Maintenance Parcels, including without limitation, expenses incurred by the District Association in fulfilling its maintenance or service obligations with respect to such Common Maintenance Parcels. Common Maintenance Parcels may be established with different levels of services and maintenance obligations for the District Association, and the Common Maintenance Parcel Assessment applicable to Common Maintenance Parcels may reflect such differences.

(c) The Board may levy a Special Use Assessment to the extent established by a Supplemental Declaration for any Special Use Parcel. In the event a Special Use Assessment is established, the General Assessments shall not apply to such Special Use Parcels. If no Special Use Assessment is established in a Supplemental Declaration by oversight or error, then the Declarant or the Board may at any time thereafter establish a Special Use Assessment in the Declarant’s or the Board’s discretion, to be applied to such Special Use Assessment from after the date of such establishment. The Special Use Assessment may include maintenance or landscaping responsibilities for areas within the District but not located within the Special Use Parcel.

Section 2. Operating Budget. It shall be the duty of the Board to prepare a budget covering the estimated costs of operating the District Association during the coming year,

including without limitation Common Expenses and Common Maintenance expenses (the “Operating Budget”).

Section 3. Capital Budget and Contribution. The Board of Directors shall annually prepare a capital budget that shall take into account the number and nature of replaceable assets, the expected life of each asset, and the expected repair or replacement cost (the “Capital Budget”). The Board shall set the required capital contribution, if any, in an amount sufficient to permit meeting the projected capital needs of the District Association, as shown on the Capital Budget, with respect both to amount and timing by Assessments over the period of the Budget. The capital contribution required shall be fixed by the Board and included within the Operating Budget and Assessment. The Capital Budget shall also provide for the establishment of separate reserve accounts to hold the proceeds of the Assessments imposed for capital expenditures.

Section 4. Allocation of General Assessments. Unless otherwise set forth in any Supplemental Declaration or District Declaration, General Assessments shall be allocated against all Lots (other than Special Use Parcels) within the District equally. Assessments for Special Use Parcels may include the responsibility for specific areas or maintenance or landscaping within the Development that shall not be considered in setting the General Assessments.

The Board shall set Assessments based on the Operating Budget and the Capital Budget. The Board shall cause a copy of the Operating Budget, the Capital Budget, and the amount of each General Assessment to be communicated to the Members of the District Association at least ten (10) days prior to the year for which Assessments shall be made. The Operating Budget, together with the Capital Budget and the Annual Assessments (collectively, the “Budget”), shall be adopted by the Board at a duly called meeting of the Board. Notwithstanding the foregoing, however, in the event a Budget is not established for any reason for any year, then and until such time as a Budget shall have been determined as provided herein, the Budget in effect for the then current year shall continue for the succeeding year. No failure to provide the Operating Budget or Assessments as required hereunder shall relieve any Lot Owner from payment of such Assessments once established.

Section 5. Special Assessments. In addition to the Annual Assessments authorized above, the Board may levy, during any calendar year, special assessments, applicable only to that year, to be used solely to defray, in whole or in part, the cost of any construction, reconstruction, or unexpected repair or replacement of a capital improvement, including the necessary fixtures and personal property related thereto (“Special Assessments”). The Board may levy a Special Assessment against all Lots for such expenses determined by the Board to benefit the District Association and/or the District as a whole, and may levy a Special Assessment against particular Lots for such expenses as may be determined by the Board to benefit less than the Master Association or District as a whole.

Section 6. Assessment Obligation. Assessments against each Lot shall commence on recording of a Supplemental Declaration, District Declaration or Sub-District Declaration applicable to such Lot, provided, however, that the applicable Supplemental Declaration or District Declaration or Sub-District Declaration may, with the approval of Master Declarant and District Declarant, suspend or delay the payment of Assessments as set forth therein. Each Owner, by acceptance of his or her Deed, is deemed to covenant and agree to pay all Assessments levied by the District Association, whether or not such obligation is so expressed in such Deed. Each Owner shall be deemed a direct beneficiary of the Common Expenses of the

Master Association, which are made for the benefit of the entire Development, and apportionment of the District Assessment shall be payable by 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.

Section 3. Construction Subject to Review.

(a) Review of Plans. Prior to construction, the District Design Review Committee must review and approve construction plans and specifications for all Improvements on any Lot within the Property. No construction on any Lot shall begin and no Improvements on any Lot shall be modified except in accordance with an approved plan. Once a plan is approved, any modification to that plan, or any modification to the finished Improvement, must also be reviewed and approved.

(b) Common Area. Construction of any Improvement upon the Common Area (other than initial construction by the Declarant), or modification of any existing structure, as well as any material alteration of the landscaping or topography of any Common Area, must be approved in advance by the Design Review Committee.

(c) Scope. The Design Code shall set standards for all aspects or improvement on any Lot visible from the outside, including without limitation the size and shape of any building, its roof, windows, doors, porches and other components, placement on the Lot, fences, drainage, paving and landscaping and all finish materials. The Design Code may also regulate the type, placement and number of Improvements that may be constructed on a Lot and the uses to which those Lots may be put. Review shall include materials and color selection and selection and placement of any ornamentation or functional accessories, including but not limited to the following:

- (i) Materials and color selection for the main building and any outbuilding (including roof, doors, windows and trim);
- (ii) Driveways, walks, patios and other ground surface materials;
- (iii) Parking areas and drive through lanes;
- (iv) Outdoor eating areas;
- (v) Lighting;
- (vi) Signage of any type;
- (vii) Antennas, satellite dishes or receivers, solar panels or other devices that are visible from outside the Lot;
- (viii) Fountains, swimming pools, or other water features;
- (ix) Privacy walls or other fences and gates;
- (x) Awnings, flower boxes, shelves, statues, or other outdoor ornamentations, and window coverings visible through the window;
- (xi) Construction trailers or other trailers, temporary structures, tents, shacks, and sheds;
- (xii) Grills or fire pits; and

(xiii) Permanent or semi-permanent play equipment, whether or not secured, such as tree houses, trampolines, basketball hoops, skateboard ramps and swing sets.

The listing of a category does not imply that such construction is permitted.

(d) Exception. Interior construction and modifications not affecting the external structure or appearance of any building and not visible from the exterior are not subject to review. However, construction drawings are required as part of the review process to assist in interpreting the design.

(e) Trees. Owners may be required to plant street trees on their Lot or within Common Area or public rights-of-way adjacent to their Lot, in accordance with the direction of the District Design Review Committee, to maintain trees and to replace trees that die or that become damaged or diseased, or the District Association may elect to take such actions for the benefit of Owners, the cost of which will be part of the Common Expenses. The cutting, removal or intentional damage of new or existing trees (including neglect, excessive pruning or failure to use due care with equipment or when removing other trees permitted to be removed) shall be prohibited and subject to enforcement under this Declaration. The District Design Review Committee may require the relocation and replanting of trees that must be removed for construction. If particularly significant trees are found within a Lot, the District Design Review Committee shall determine whether the placement of the building should be altered to accommodate the trees, or whether the trees may be removed. If trees or other growth block sidewalks or other areas, the Owner may be required to prune, trim or remove such growth. The Master Association may also take action to keep sidewalks and other areas clear, including pruning, trimming and removal of limbs on trees within a Lot, and may enter any Lot for such purpose.

(f) Drainage. All plans shall comply with and Owners shall be solely responsible for applicable drainage, water conservation, erosion control and stormwater detention requirements. No alteration of existing grade or any planting, fences or other improvements that alter the flow of water shall be permitted without the express consent of the District Design Review Committee, which approval shall be for the exclusive benefit of the Declarant or District Association, as applicable, and shall not remove or alter the responsibility of any Owner or builder for compliance with such requirements. Notwithstanding any other provision of this Declaration, neither District Declarant nor the District Association shall have the responsibility to ensure that drainage or grading of Lots is properly accomplished. Each Owner shall be solely responsible to ensure that grading and drainage are in compliance with all applicable laws, codes, regulations and other requirements, including without limitation any easements for drainage, whether or not shown on any recorded plat and must provide a as-built drawing of finished grading and drainage to ensure these items are in compliance. The Homeowner will be charged in the event they do not provide the approved as-builts to the Committee, and there are costs to the developer to fix any grading or drainage that were not caused by the developer.

(g) Modifications. Modifications after completion of construction, or additions or changes to the approved plans during construction, must be reviewed and approved. However, review is not required to paint with originally approved materials and colors, or to replace the roof or other components with duplicates of the original material. Significant new landscaping, grading and any removal of trees or plants must be approved in advance.

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.

(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 of the Owner or one acting on the Owner's behalf. Without limiting the foregoing, animals who repeatedly bark, are aggressive, or other create a negative impact on other Owners or other persons may be subject to further restrictions and, in the discretion of the Board, removed from the Development. No animal may be kept in a manner that, in the sole determination of the Board, is unhealthy or cruel for such animal, including without limitation keeping animals tied up or tethered for extended periods of time. In making any determination of cruelty or unhealthy conditions, the Board shall have the right but not the obligation to consult governmental or private animal control or shelter organizations. The Board may permit variances to the restrictions set forth in this subsection in the Board's sole discretion. The Board may establish further rules and regulations for control of animals and household pets, and may impose Fines for violations of the foregoing or additional rules and regulations in addition to requiring removal of animals from the Development.

(g) Vehicles. No truck, trailer, camper, boat, van or similar equipment or disabled vehicle shall be permitted to remain upon or within the Common Area or public streets unless on a space designated for such use by the District Association. No such equipment may be stored or permitted to remain upon a Lot or any portion of the Common Area or public streets for more than forty-eight (48) hours unless stored in an enclosed garage.

(h) Exterior Structures. No fences, ornamental screens, awnings, screen doors, sunshades except as approved by or under general rules adopted by the District Design Review Committee.

(i) Garbage Collection. All rubbish, trash, and garbage shall be removed from the Property regularly and shall not be allowed to accumulate thereon. All refuse containers, clothes lines, woodpiles, storage areas, machinery, or equipment shall be kept in such a manner as not to be visible from neighboring property or contiguous streets. No incinerators shall be kept or maintained on any Lot. Refuse containers shall not be placed outside for trash pickup prior to

6:00 p.m. on the day prior to such pickup, and shall be returned to non-visible areas no later than the end of the day on which pickup is made. No debris, trash, ashes, lawn clippings, leaves, leaf bags or other refuse may be thrown or dumped on any of the Lots or Common Area. Debris and trash during the construction of an Owner's Improvements shall be collected by each Owner (or his or her representative) in containers approved by the District Design Review Committee and periodically removed so that no unsightly condition occurs on the Lot or adjoining Lots.

(j) Taxes and Utilities. Each Owner shall pay any real and personal property taxes or charges assessed against their respective Lot and Improvements and the utility charges for said Improvements.

(k) Infections, Plant Diseases or Insects. No Owner shall permit anything or condition to exist upon any portion of such Owner's Lot that shall induce, breed, or harbor infections, plant diseases, vermin or noxious insects.

(l) Reasonable Inspection and Entry. The Board shall have the right of inspection and entry onto Lots in order to perform the duties and obligations of the Board under this Declaration and under the Bylaws. In addition, District Declarant, the District Association, and their designees shall have the right to enter upon a Lot for the purpose of cutting grass, hedges and shrubbery and providing maintenance agreed upon with the Owner thereof.

(m) Trade or Business. No gainful profession, occupation, trade or other nonresidential use shall be conducted in any Lot designated for residential purposes or upon the District Common Area or any portion thereof without the prior approval of the Board. Special Use Parcels or areas in which a mix of business and residential purposes are appropriate shall be governed by the provisions of any Supplemental Declaration or Sub-District Declaration covering such portions of the Development. The Board may disapprove such a trade or business in the event that it determines that the trade or business would have a negative impact on the Property, including, without limitation, creating problems related to traffic, parking or security. In determining whether to approve a trade or business conducted in a residential Lot, the Board shall be provided with detailed information on (i) the type of trade or business and (ii) the activities related thereto that could potentially affect the Property. In the event that the Board approves a certain trade or business (the "Approved Use"), then so long as the activities related to that Approved Use do not materially change from the activities described to and approved by the Board, the Board (whether or not the composition of the Board changes) shall not have the right to disapprove the Approved Use after the date of the original approval, subject to subparagraph (s) below. Notwithstanding the foregoing, an Owner or occupant residing in a unit within the Development may conduct business activities within the unit so long as: (a) the existence or operation of the business activity is not apparent or detectable by sight, sound, signage or smell from outside the Unit; (b) the business activity conforms to all applicable zoning, law, statute or ordinance requirements; (c) the business activity does not involve persons coming onto the Development who do not reside in the Development or door-to-door solicitation of residents of the Development; and (d) the business activity is consistent with the residential character of the Property and does not constitute a nuisance, or a hazardous or offensive use, or threaten the security or safety of other residents of the Development, as may be determined in the sole discretion of the Board. The terms "business" and "trade", as used in this provision, shall be construed to have their ordinary, generally accepted meanings, and shall include, without limitation, any occupation, work or activity undertaken on an ongoing basis which involves the provision of goods or services to persons other than the provider's family and for which the

provider receives a fee, compensation, or other form of consideration, regardless of whether: (i) such activity is engaged in full or part-time; (ii) such activity is intended to or does generate a profit; or (iii) a license is required therefor.

(n) Compliance with Law. The District Association and each Owner shall comply promptly with all laws, statutes, ordinances, rules and regulations of federal, state or municipal governments or authorities applicable to use, occupancy, construction and maintenance of any Improvements upon the Lots, including without limitation any zoning or other approvals or restrictions.

(o) Damage from Plants. No Owner shall permit any plant, tree, shrubbery or other similar item to exist upon any portion of such Owner's Lot that shall damage or create a nuisance on another Lot or that has not been approved by the District Design Review Committee. The Board shall determine conclusively, in its sole and absolute 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,

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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DRAFT

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: _____

EXHIBIT A
PROPERTY DESCRIPTION

TO BE INSERTED UPON FORMATION OF ASSOCIATION

DRAFT

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



KEY MAP
LI.I

N.T.S

NEIGHBORHOOD CLUBHOUSE



WALKING PATHS



POOL



PICKLE BALL COURTS



DOG PARK



PICKLE BALL COURTS



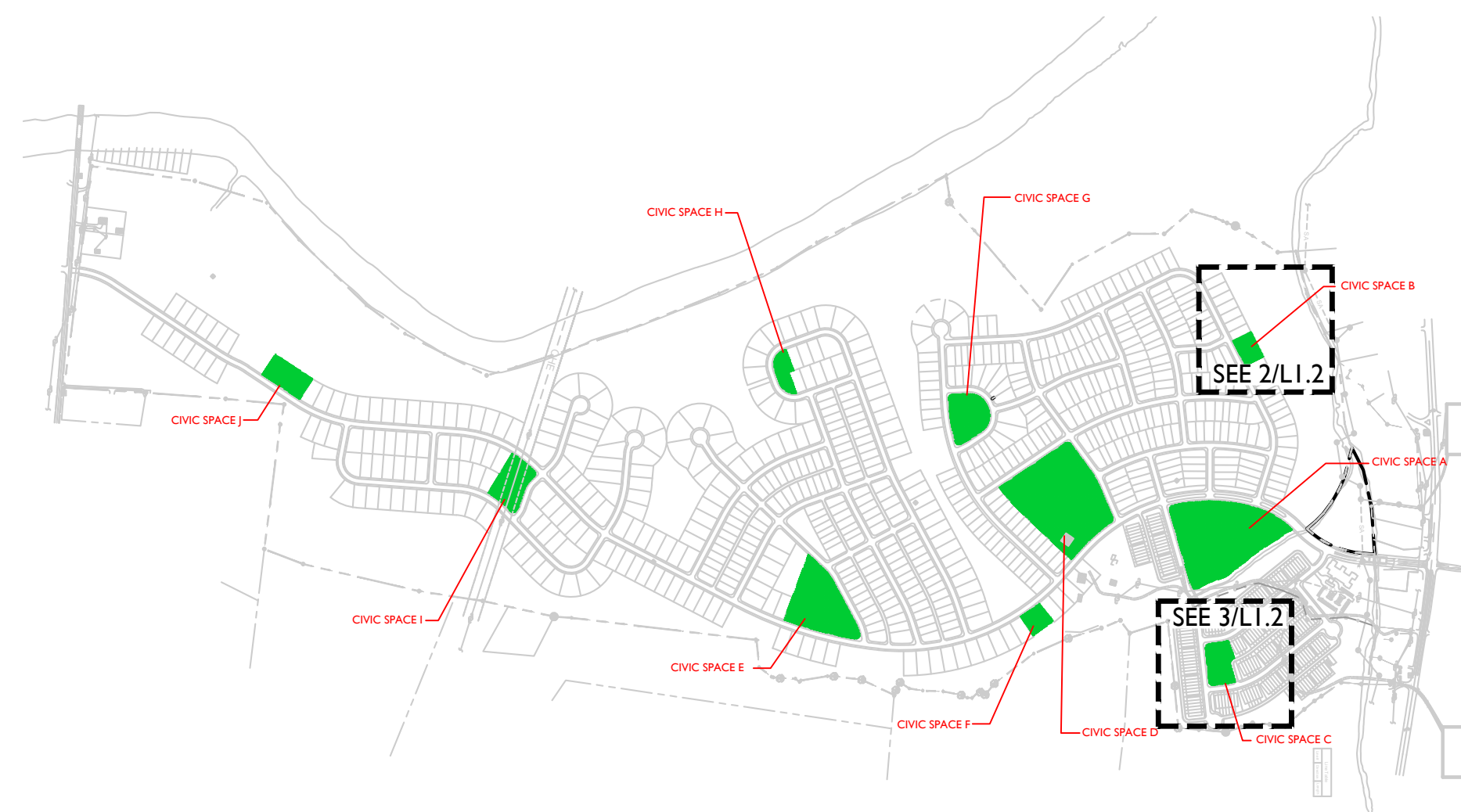
SWING BENCH



2
LI.I

CIVIC SPACE - A
CONCEPTUAL PLAN

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



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'



3
LI.2
CIVIC SPACE - C
CONCEPTUAL PLAN NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.

0' 30' 60'

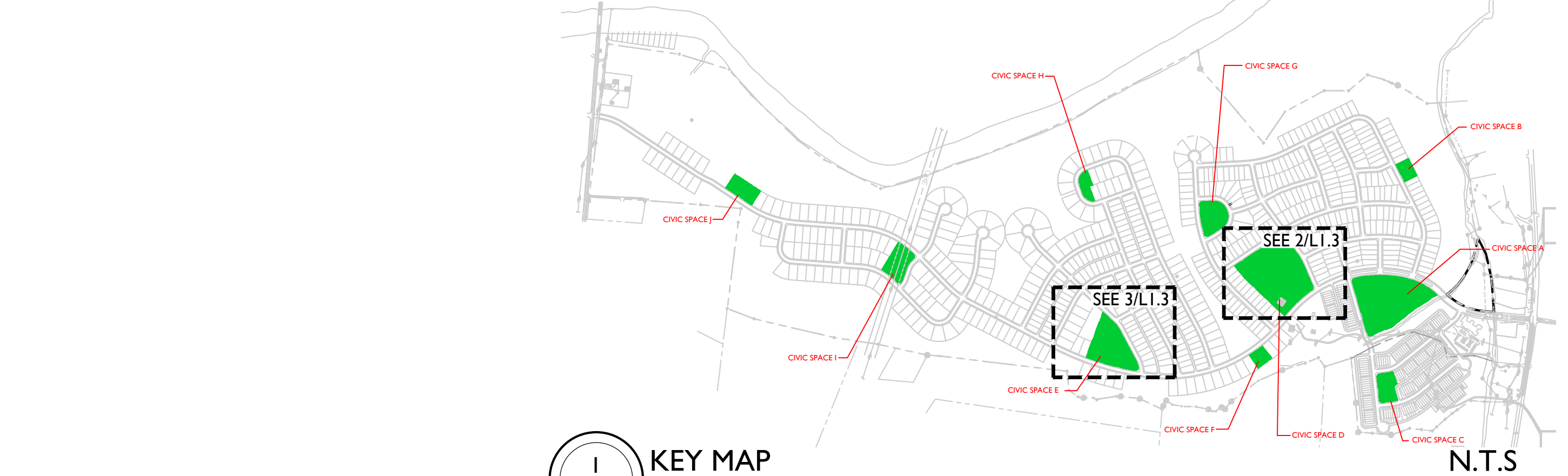




2
LI.3
CIVIC SPACE - D
CONCEPTUAL PLAN

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

0' 50' 100'



3
LI.3
CIVIC SPACE - E
CONCEPTUAL PLAN

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

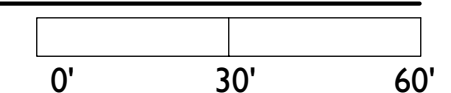
0' 30' 60'





2
LI.4
CIVIC SPACE - F
CONCEPTUAL PLAN

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



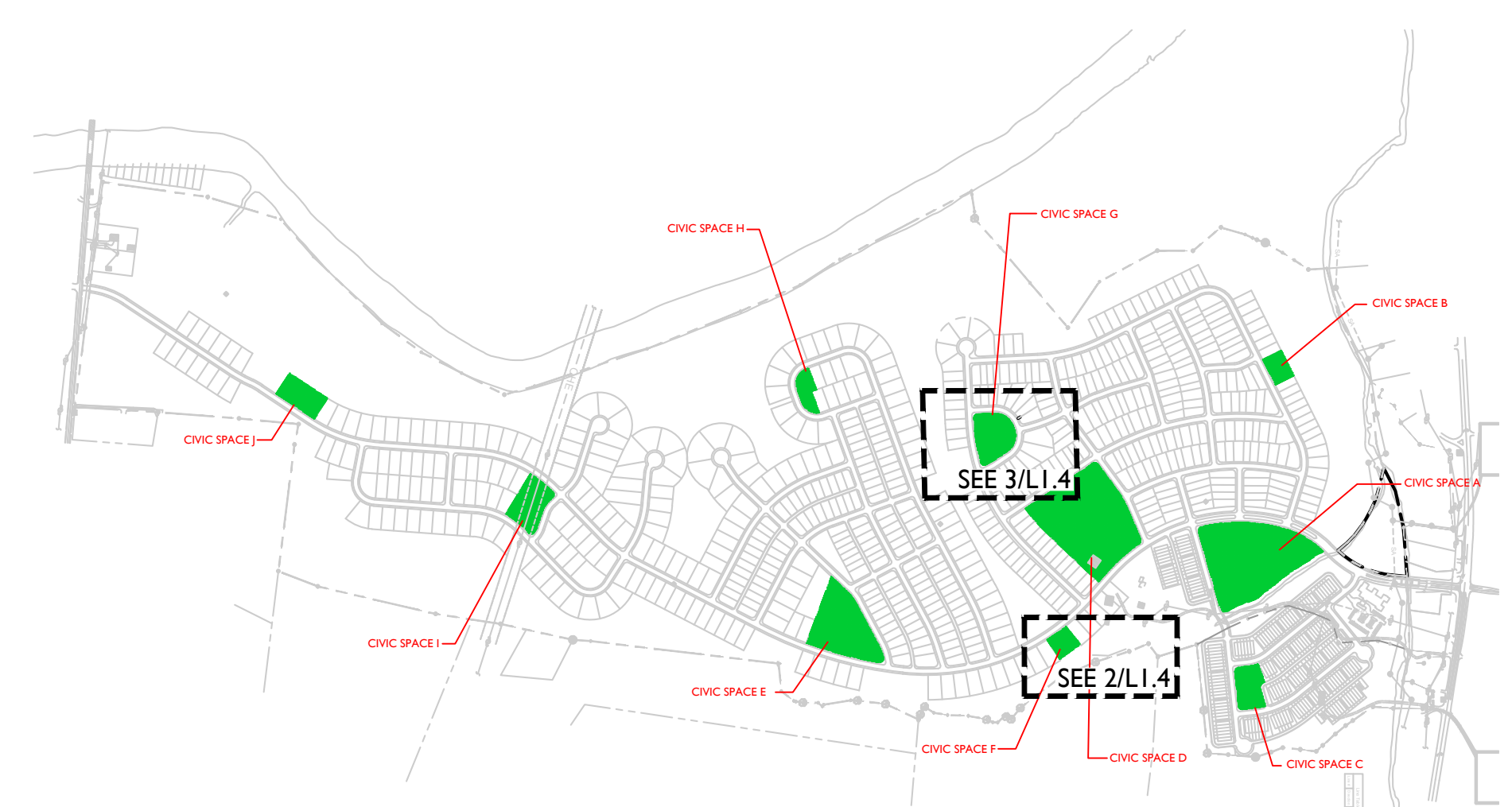
SWINGS



FORMAL PARK



PLAYGROUND



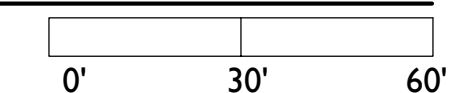
1
LI.4
KEY MAP

N.T.S



3
LI.4
CIVIC SPACE - G
CONCEPTUAL PLAN

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



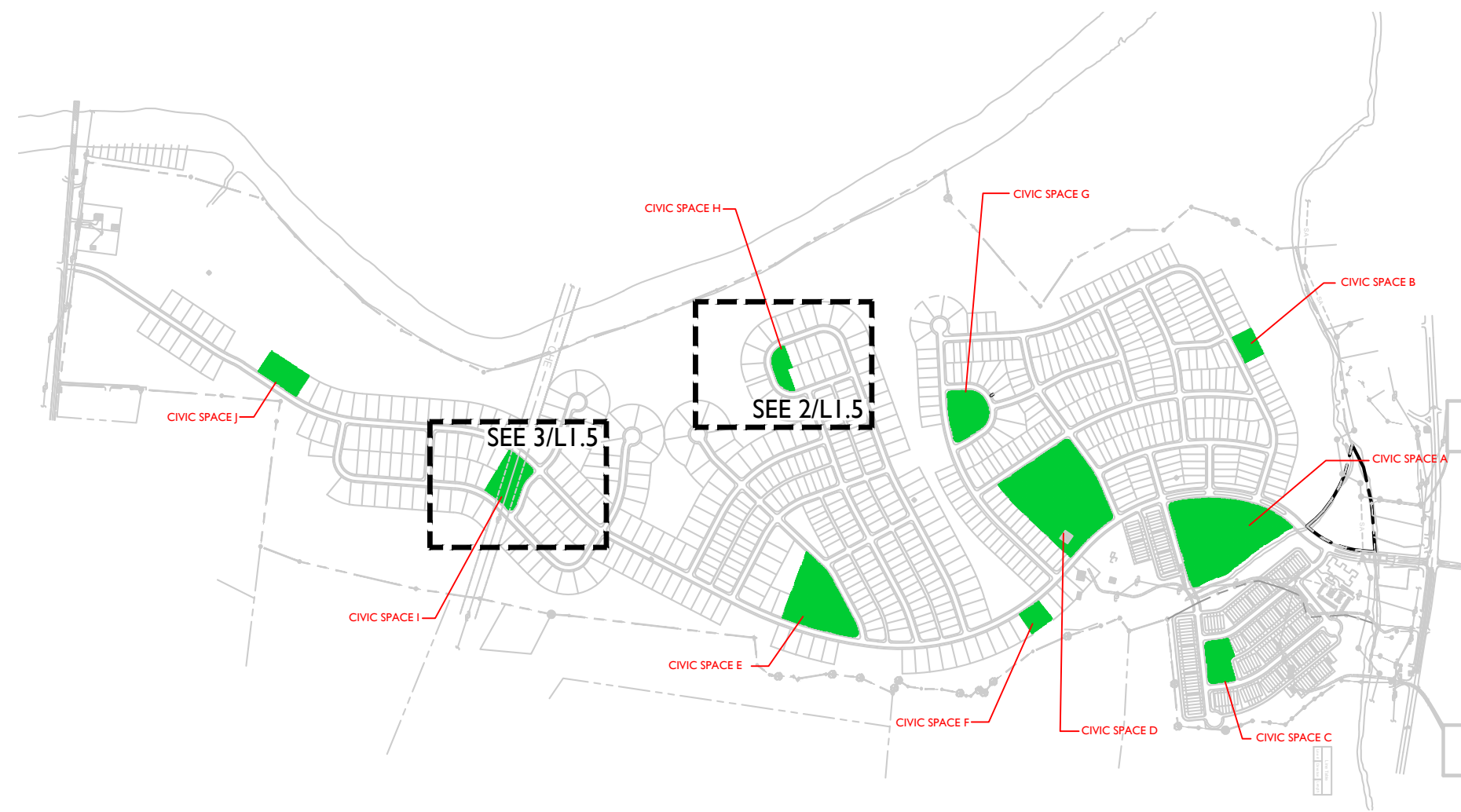
FORMAL PARK



COMMUNITY GARDEN



DOG PARK



1 KEY MAP
L1.5 N.T.S



2 CIVIC SPACE - H
L1.5 CONCEPTUAL PLAN
NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.
0' 30' 60'



SWINGS



PLAYGROUND



PLAYGROUND



3 CIVIC SPACE - I
L1.5 CONCEPTUAL PLAN
NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.
0' 30' 60'



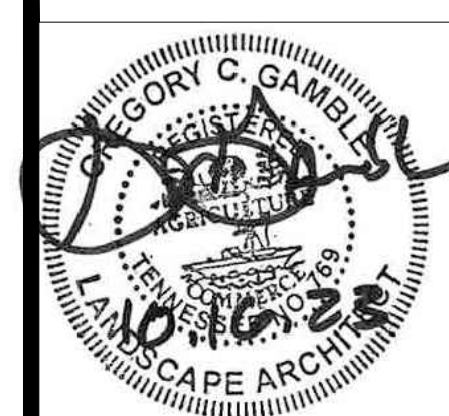
SWINGS



MAIL KIOSK

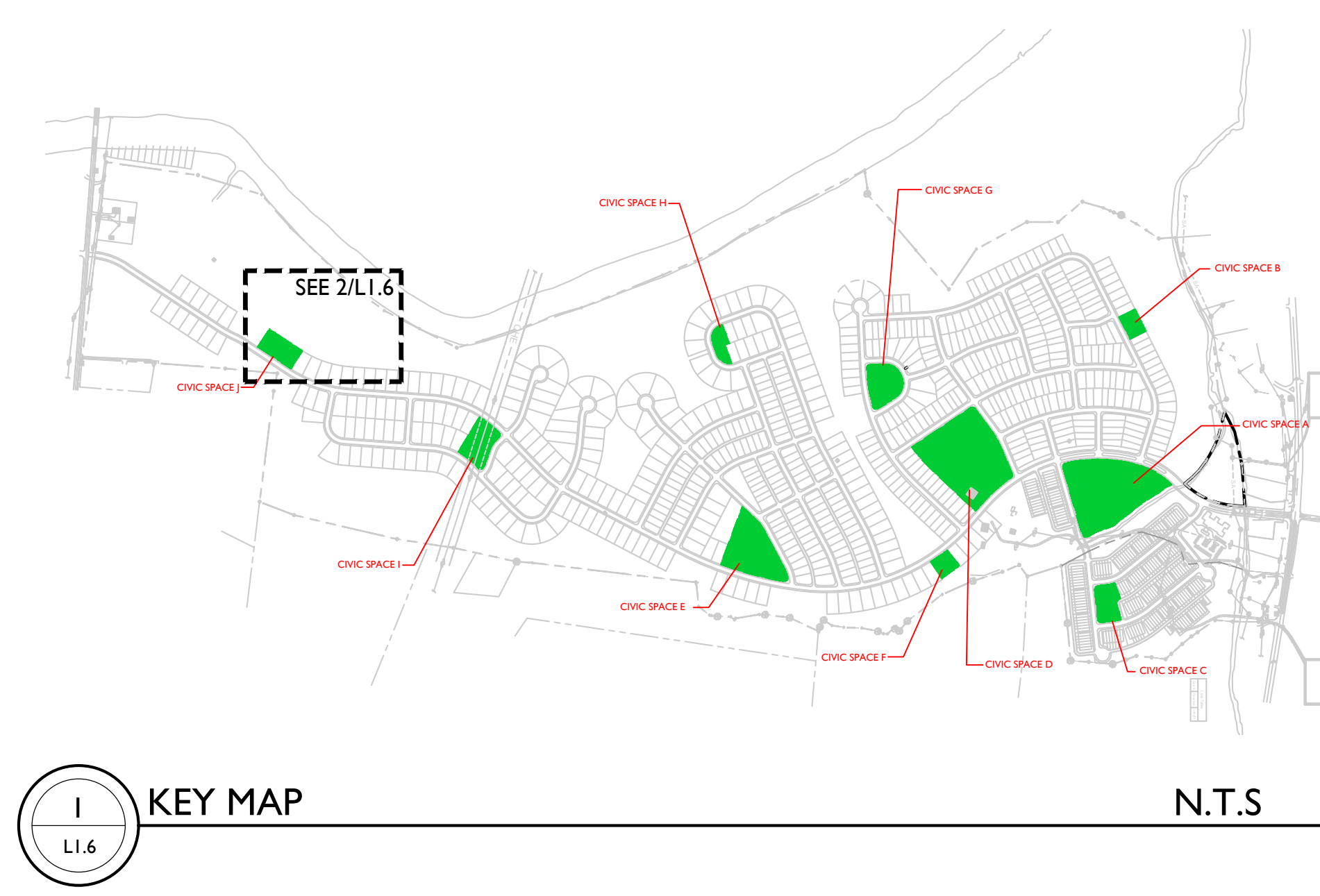


FORMAL PLANTING



Date: October 16, 2023

Revision Date	
△	
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△	



2
LI.6
CIVIC SPACE - J
CONCEPTUAL PLAN
NOTE: CONCEPTUAL PLANS AND CHARACTER IMAGES TO DISPLAY DESIGN INTENT.



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



OPEN FIELD

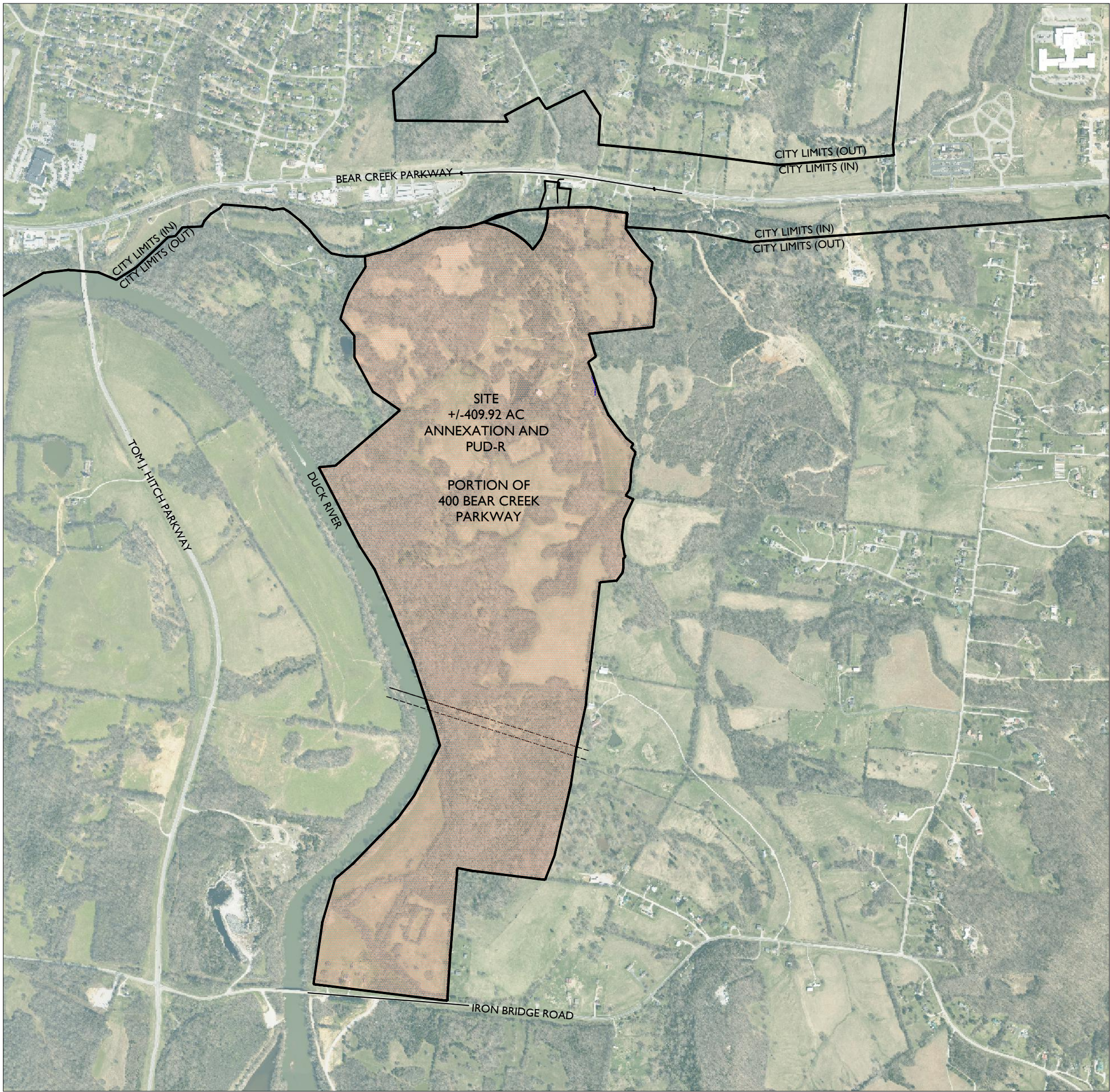


MULTI-PURPOSE FIELD

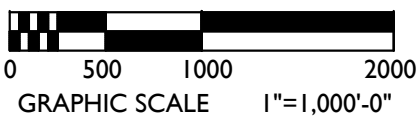
COLUMBIA BLUFFS

PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN & ANNEXATION REQUEST

400 BEAR CREEK PARKWAY
COLUMBIA, TENNESSEE



LOCATION MAP



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@csdgtm.com

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

COMMITMENT TO ENVIRONMENTAL STEWARDSHIP

I. 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).

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:
- Storm water erosion control applications I.E.
 - Stormwater Detention Areas,
 - natural riparian buffers
 - silt fencing
 - sediment ponds
 - Check dams
 - Ongoing stormwater monitoring of Environmental Controls of water runoff areas and tributaries
 - 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.

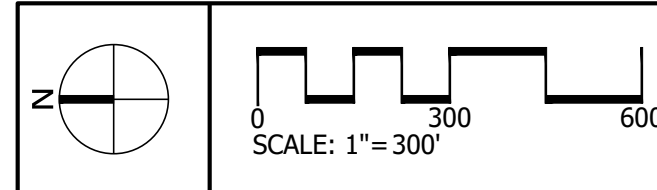


PRE-APP: August 30, 2023
INITIAL SUBMITTAL: October 16, 2023

Bear Creek Pike
Columbia, Maury County, Tennessee

[illegible]

PROJECT NO.: 21-160-01





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Nashville, TN 37211
615.248.9999
csdgt.com

COLUMBIA BLUFFS

PMDP

Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

INITIAL SUBMITTAL

ISSUE DATE: 10/16/2023

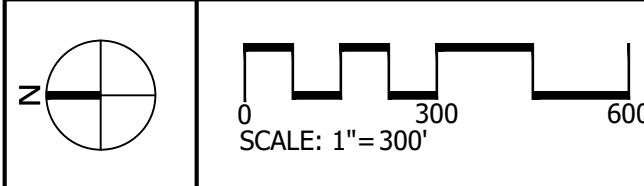
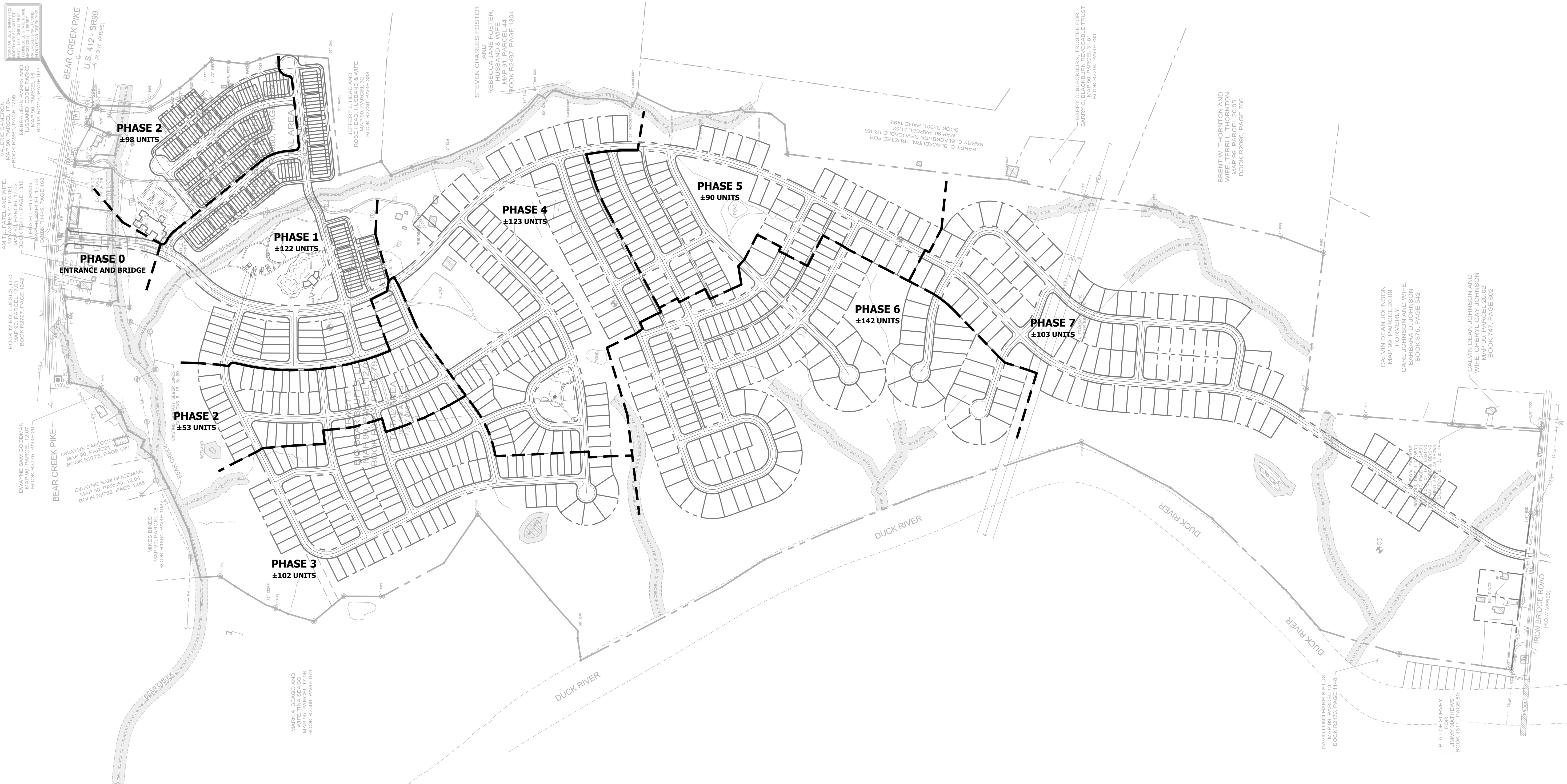
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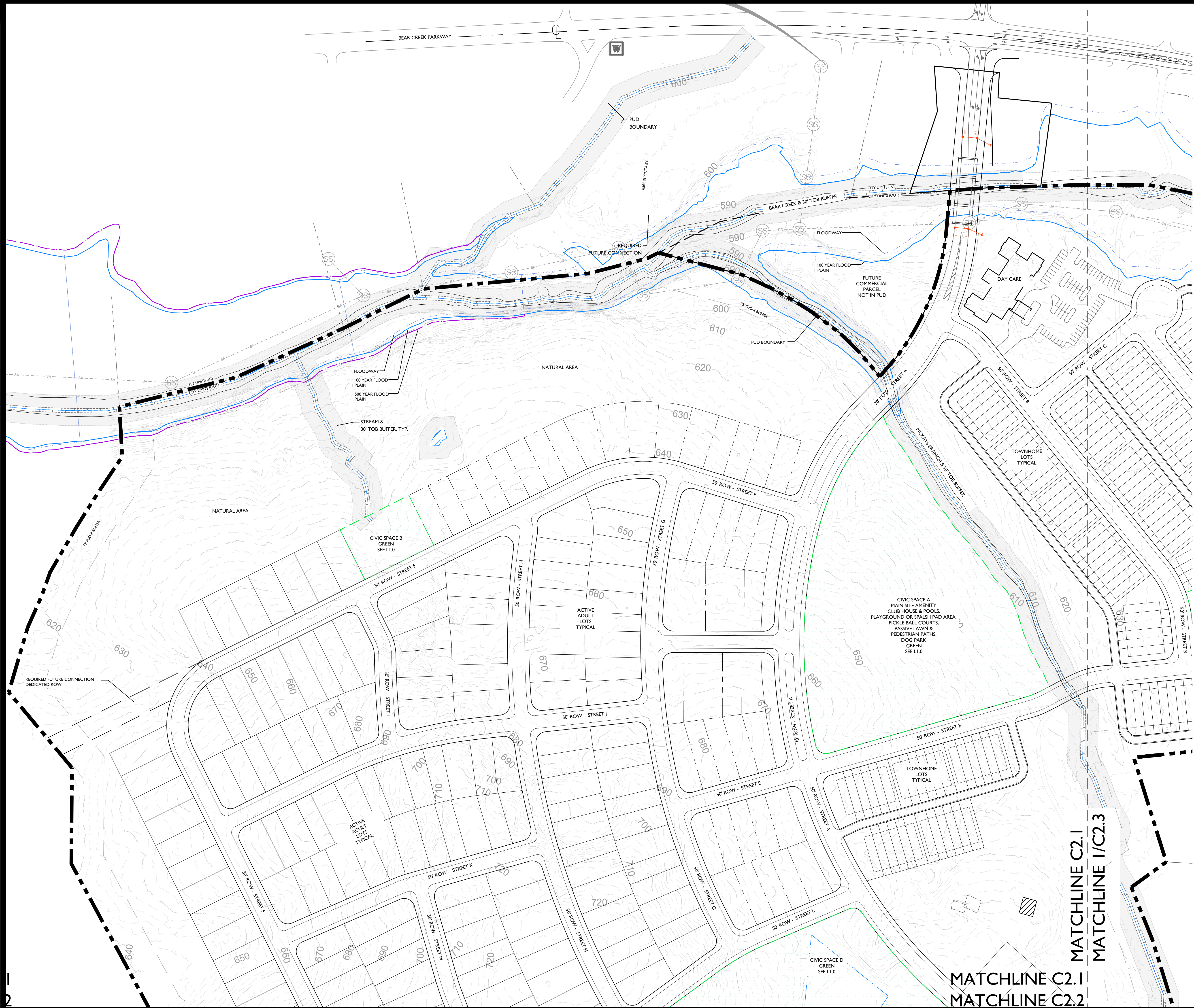
DRAWN BY: TWG
CHECKED BY: TWG

PHASING PLAN

C1.00

PROJECT NO.: 21-160-01





COLUMBIA BLUFFS

**PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN &
ANNEXATION REQUEST**

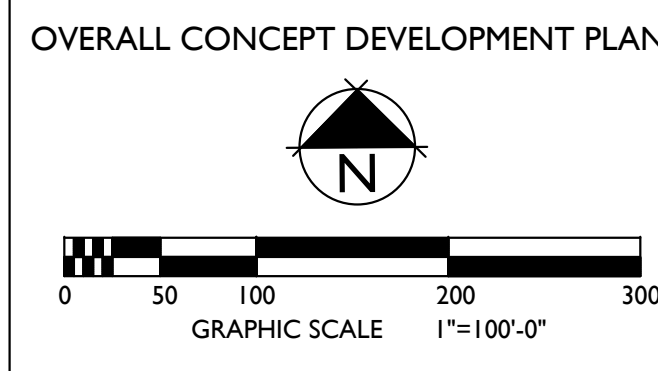
400 Bear Creek Parkway, Columbia, Tennessee



Date: October 16, 2023

Revision Date

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MATCHLINE C2.1
MATCHLINE C2.2

MATCHLINE C2.1
MATCHLINE C2.2

MATCHLINE C2.2
MATCHLINE C2.4

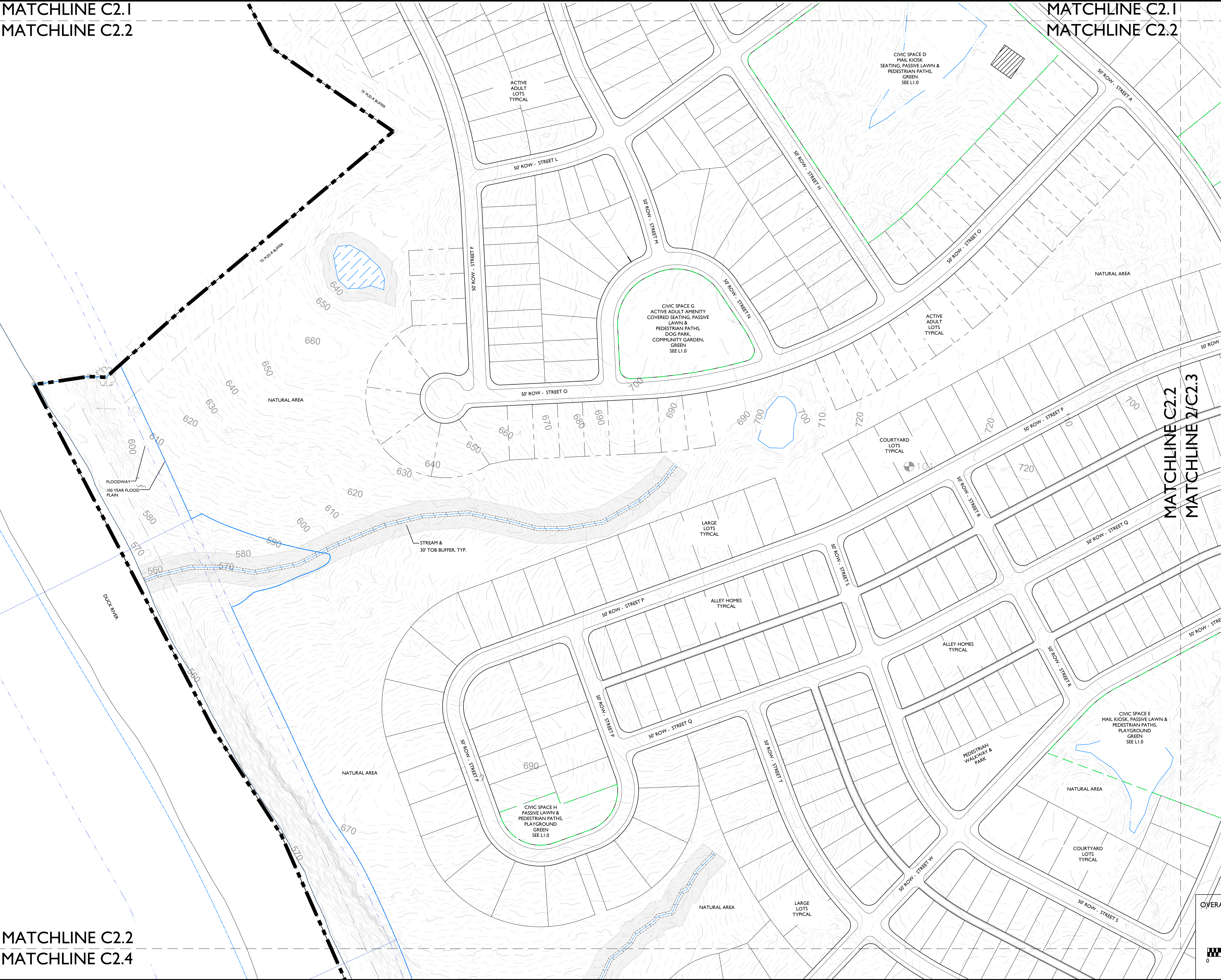


COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN &
ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee

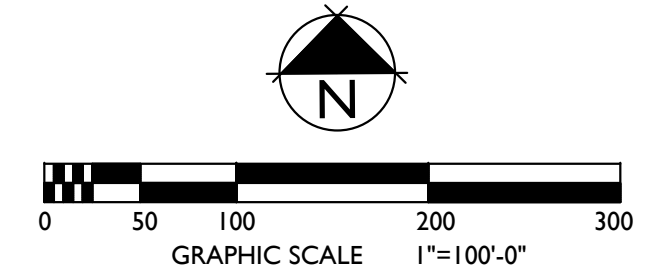


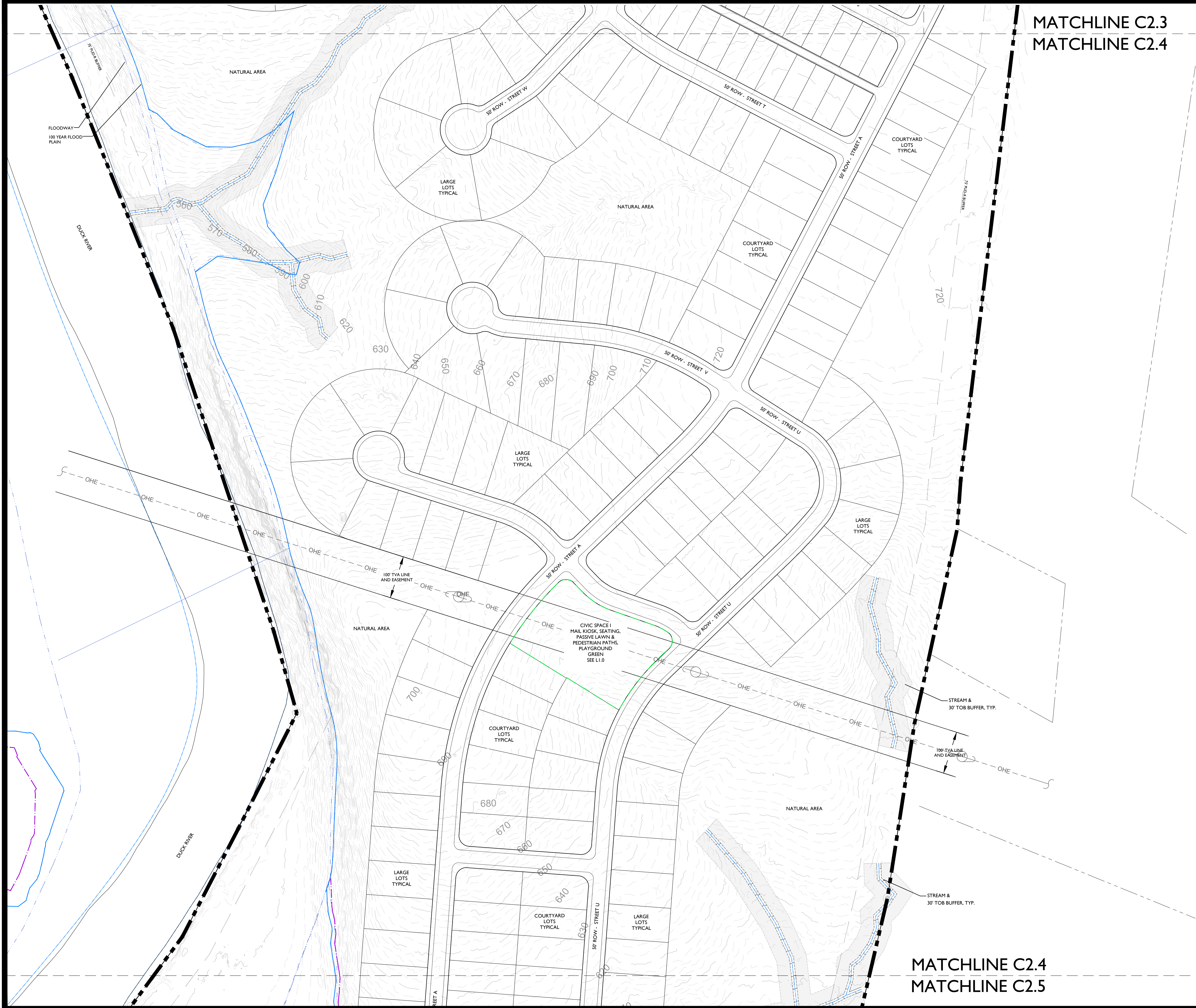
Date: October 16, 2023
Revision Date
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ENLARGED
PUD-R PMDP
SHEET
C2.2



OVERALL CONCEPT DEVELOPMENT PLAN



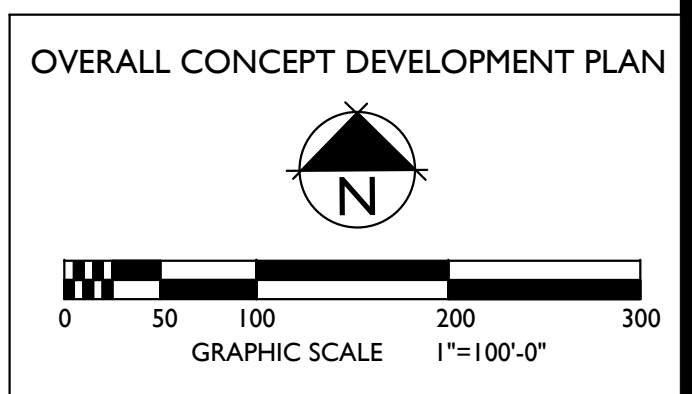


COLUMBIA BLUFFS
 PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN &
 ANNEXATION REQUEST
 400 Bear Creek Parkway, Columbia, Tennessee



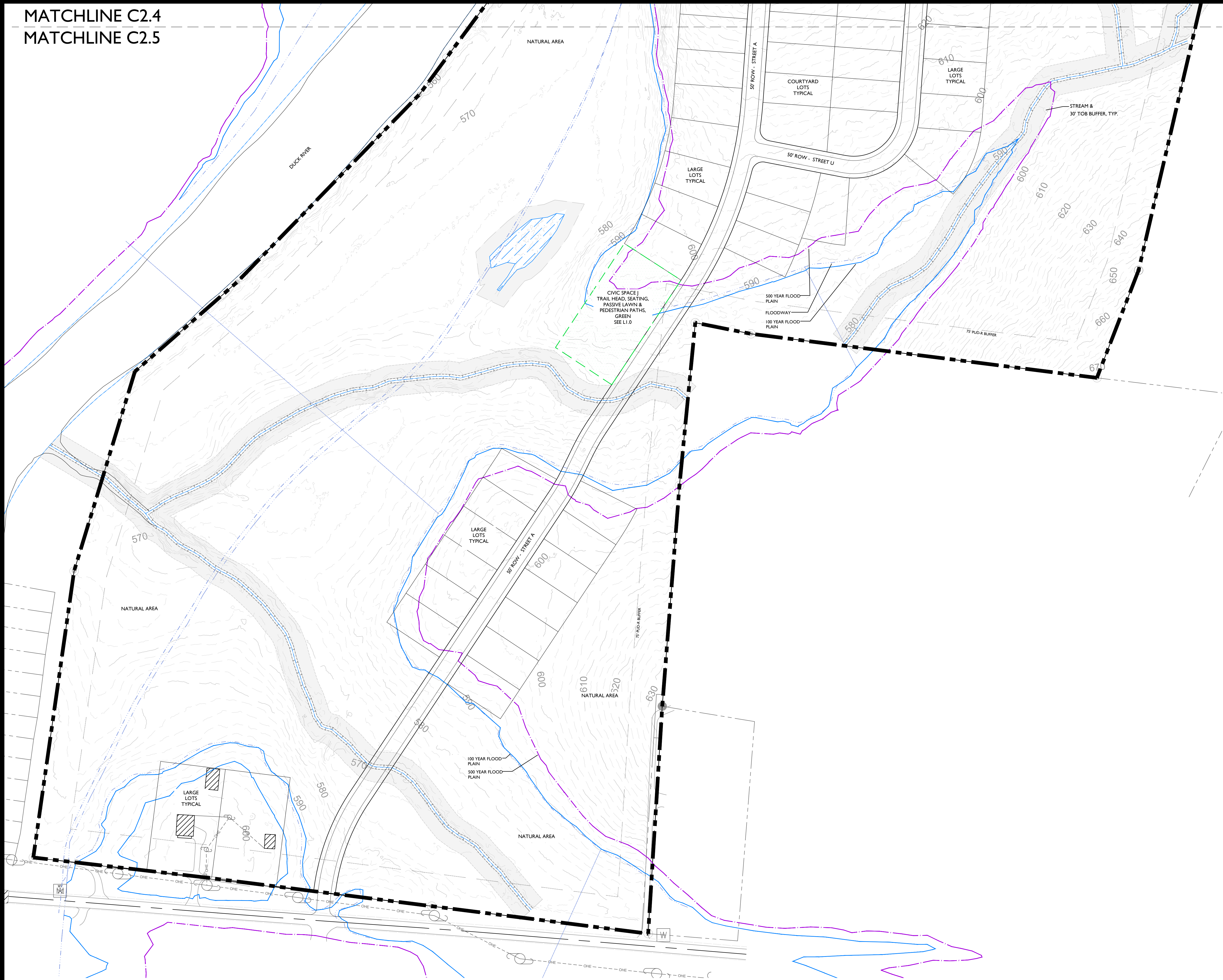
Date: October 16, 2023

Revision	Date
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2	
3	



ENLARGED
 PUD-R PMDP
 SHEET
C2.4

MATCHLINE C2.4
MATCHLINE C2.5

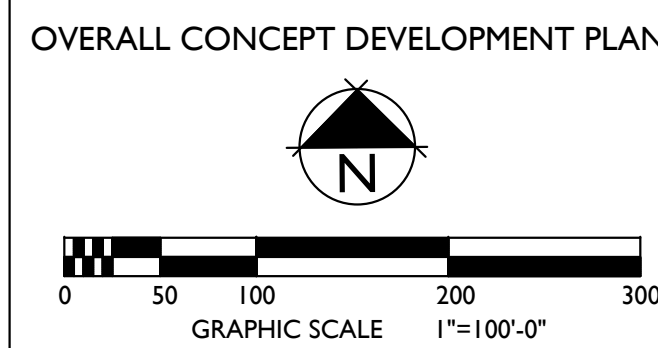


COLUMBIA BLUFFS
PUD-R PRELIMINARY MASTER DEVELOPMENT PLAN &
ANNEXATION REQUEST
400 Bear Creek Parkway, Columbia, Tennessee



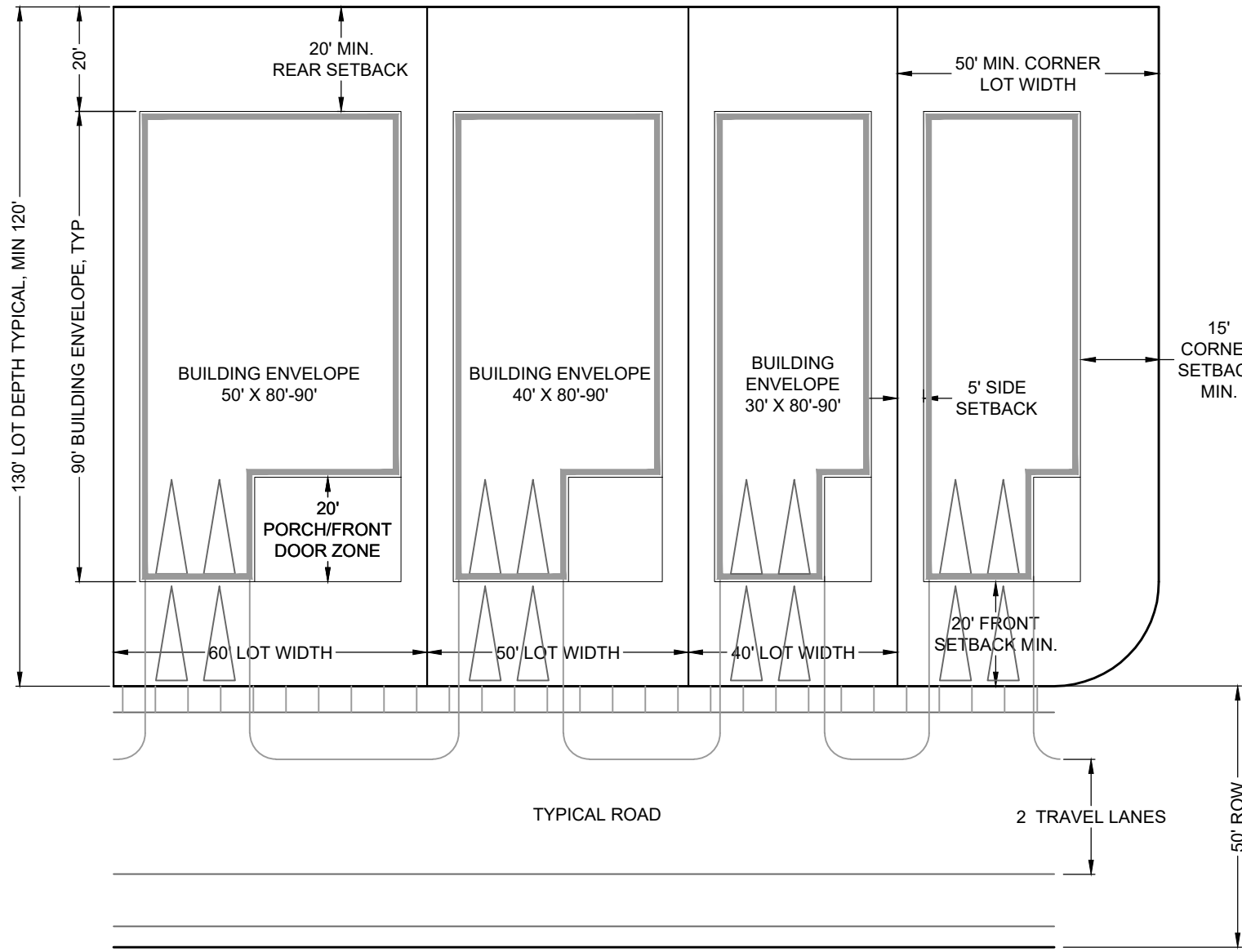
Date: October 16, 2023
Revision Date

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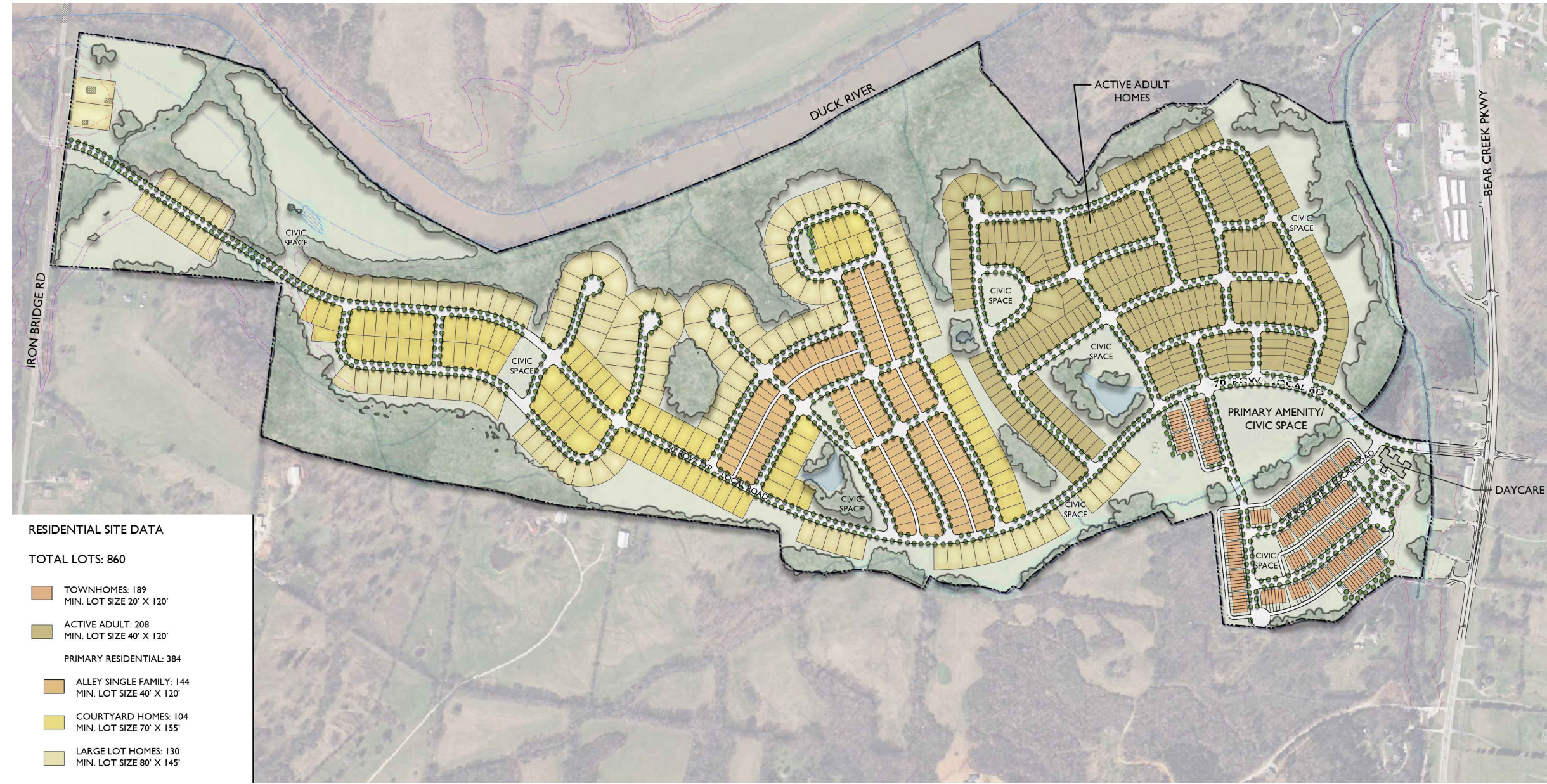
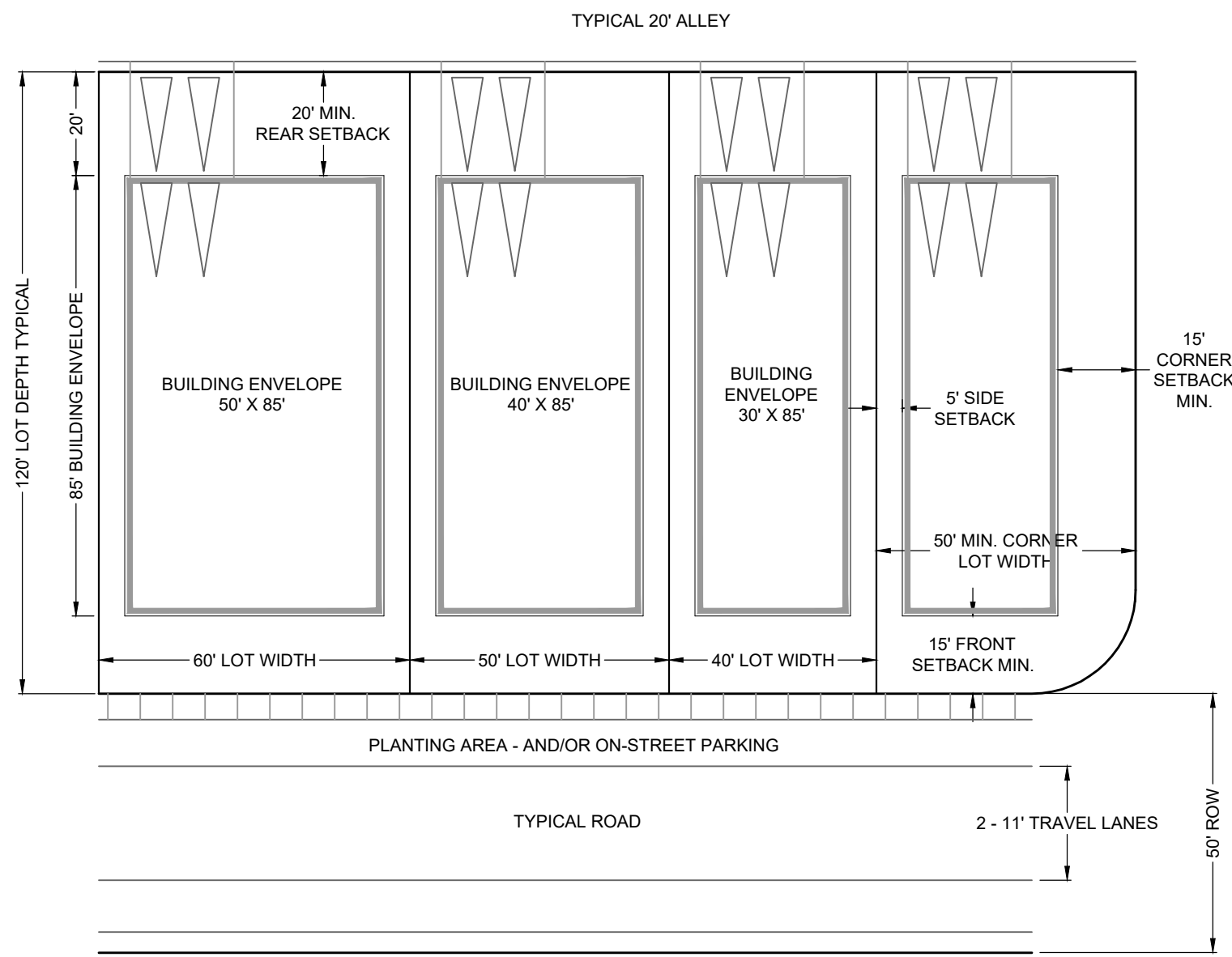


ENLARGED
PUD-R PMDP
SHEET
C2.5

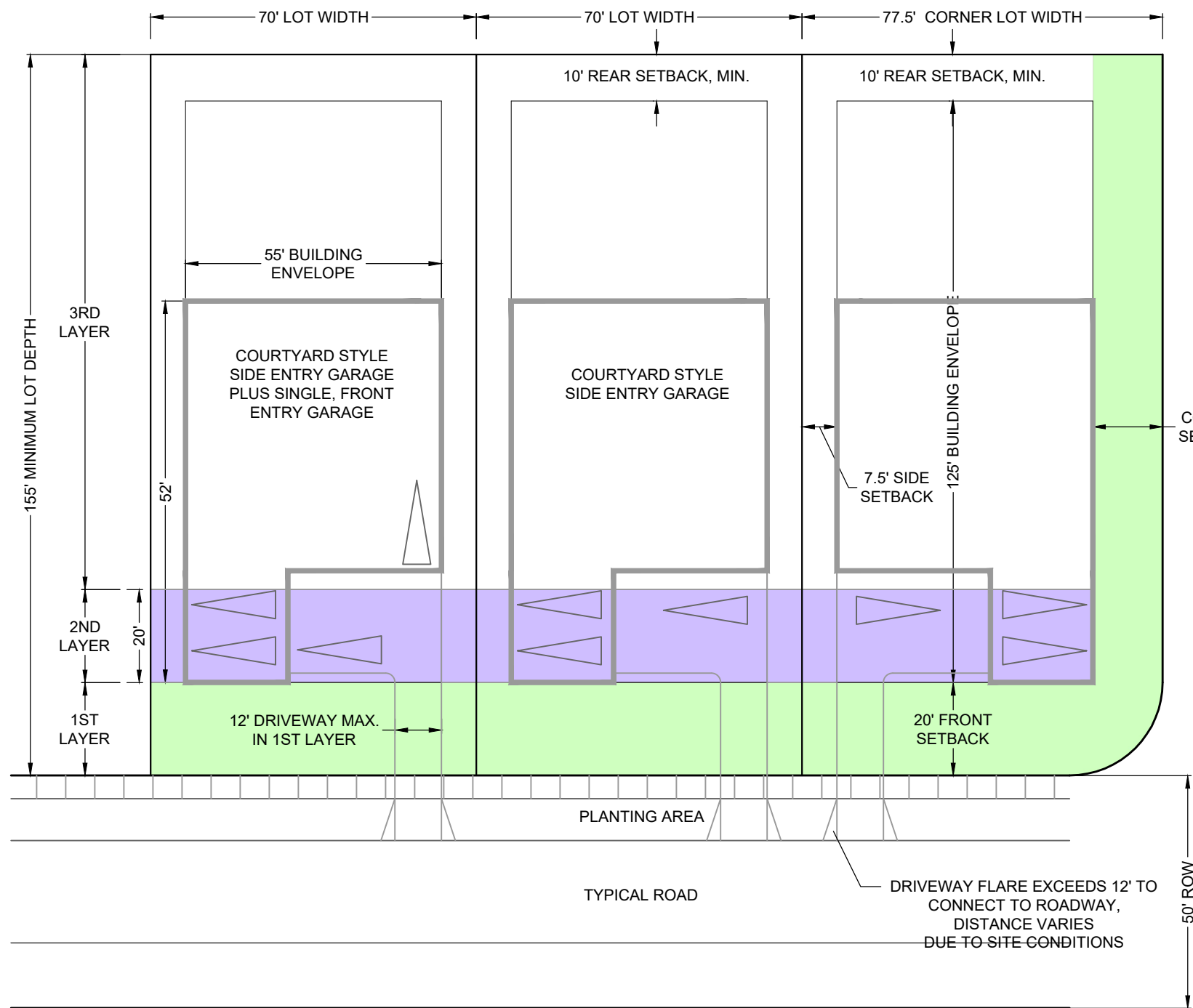
ACTIVE ADULT/ AGE RESTRICTED DETACHED SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 40' X 120'; 50' X 120'; 60' X 120'
SETBACKS: FRONT: 20' MIN.
SIDE: 5' MIN.
CORNER: 15' MIN.
REAR: 20' MIN.
MODIFICATION REQUESTS: REDUCTION IN SIDE SETBACK FROM 10' TO 5'
GARAGE LOCATED IN 2ND LAYER
DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16'
DRIVEWAY TO BE 18' WIDE IN FIRST LAYER



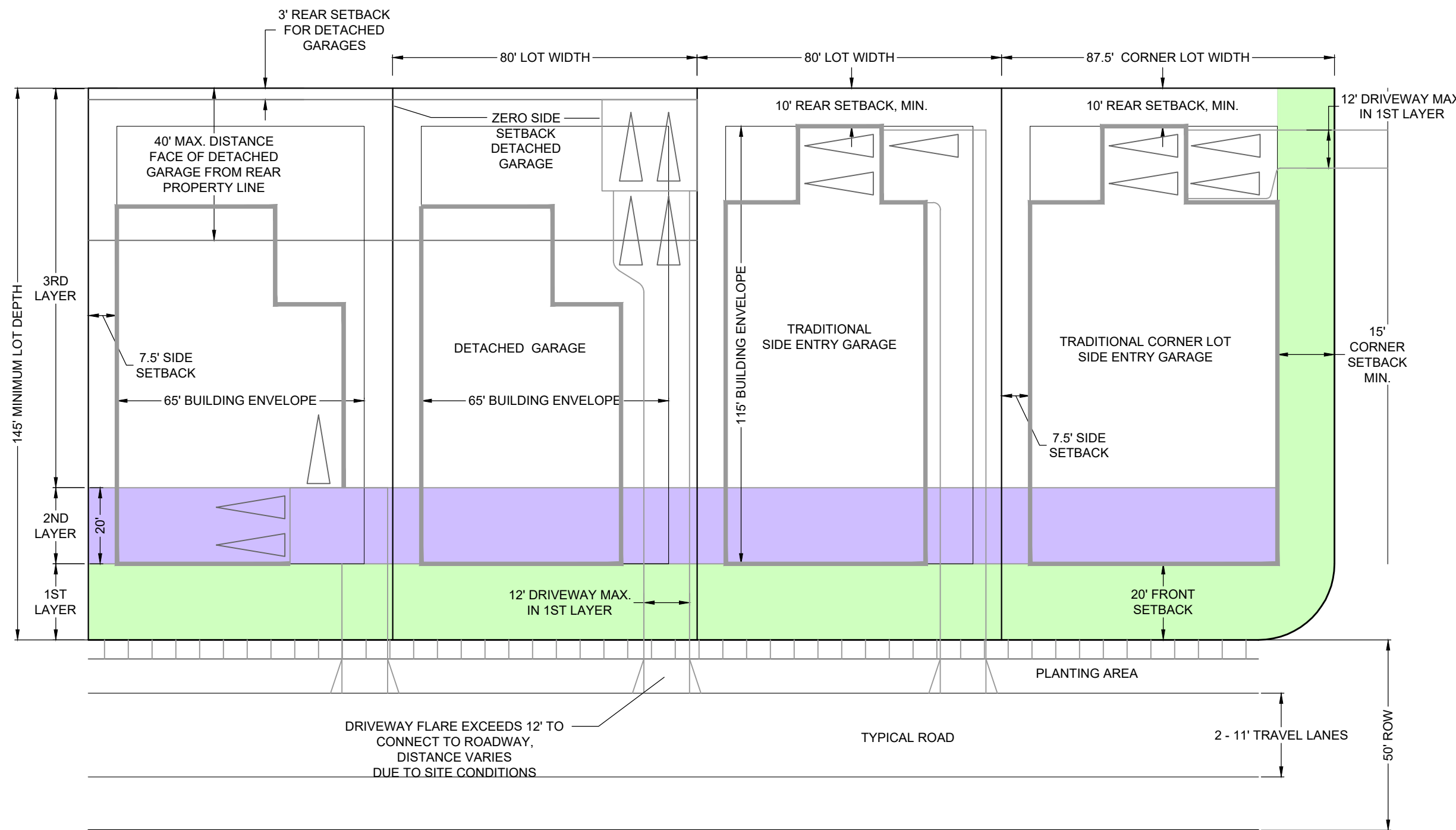
PRIMARY RESIDENTIAL - ALLEY LOADED DETACHED SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 40' X 120'; 50' X 120'; 60' X 120'
SETBACKS: FRONT: 20' MIN.
SIDE: 5' MIN.
CORNER: 15' MIN.
REAR: 20' MIN.
MODIFICATION REQUESTS: REDUCTION IN SIDE SETBACK FROM 10' TO 5'



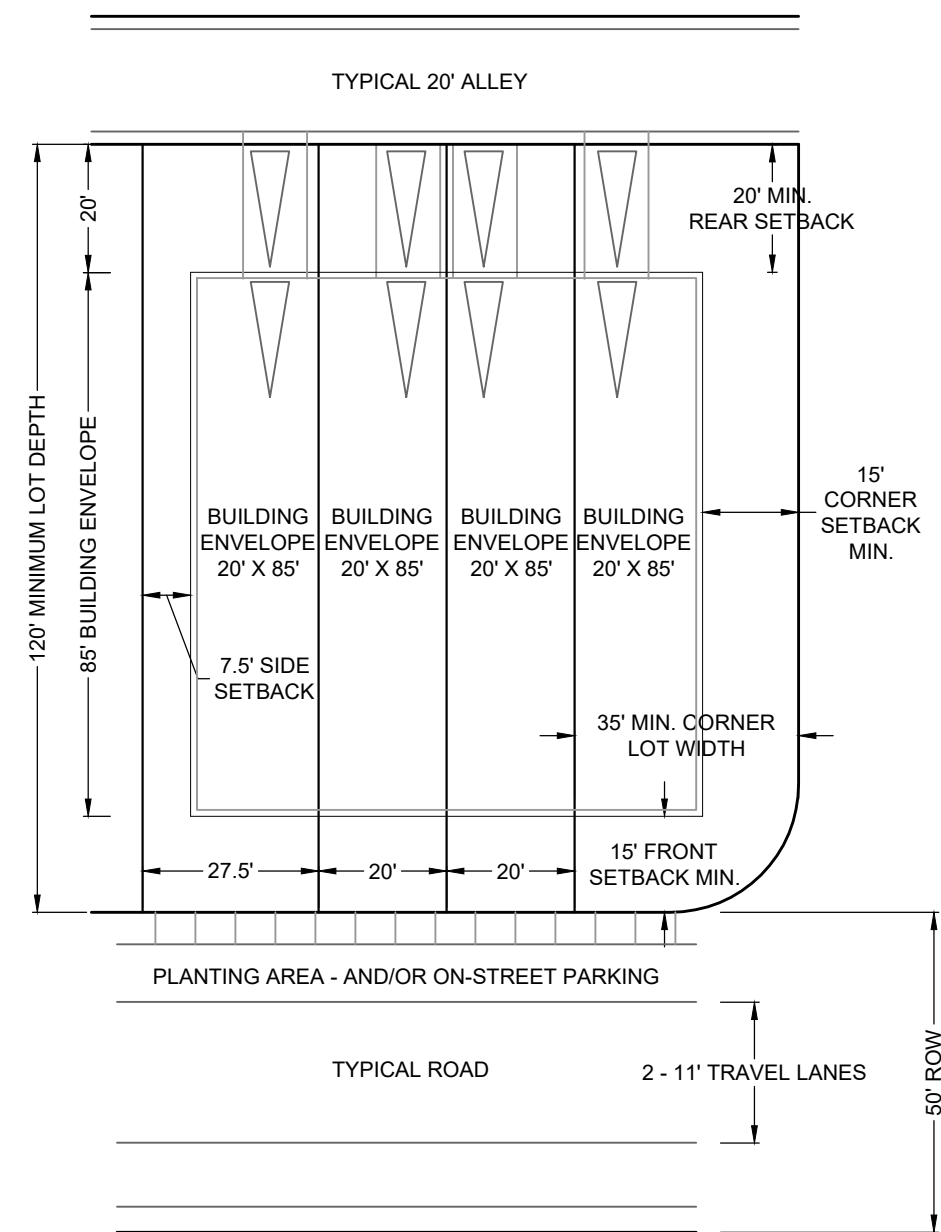
PRIMARY RESIDENTIAL COURTYARD SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 70' MIN. X 155'
SETBACKS: FRONT: 20' MIN.
SIDE: 7.5' MIN.
CORNER: 15' MIN.
REAR: 10' MIN.
MODIFICATION REQUESTS: REDUCTION IN SIDE SETBACK FROM 10' TO 7.5'
GARAGE LOCATED IN 2ND LAYER
DOUBLE CAR GARAGE DOORS ALLOWED; MAXIMUM WIDTH 16'
DRIVEWAY TO BE 12' WIDE IN FIRST LAYER



PRIMARY RESIDENTIAL LARGE LOT SINGLE-FAMILY HOMES
TYPICAL LOT DIMENSIONS 80' MIN. X 145'
SETBACKS: FRONT: 20' MIN.
SIDE: 7.5' MIN.
CORNER: 15' MIN.
REAR: 10' MIN.
MODIFICATION REQUESTS: 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



PRIMARY RESIDENTIAL ALLEY LOADED TOWN HOMES
TYPICAL INTERIOR LOT DIMENSIONS 20' MIN. X 120'
UNITS PER BUILDING: 4, 6, 7, OR 8
SETBACKS: FRONT: 15' MIN.
SIDE: 7.5' MIN.
CORNER: 15' MIN.
REAR: 20' MIN.
MODIFICATION REQUESTS: REDUCTION IN SIDE SETBACK FROM 10' TO 7.5'



1 ACTIVE ADULT LOT DIAGRAM

N.T.S

2 SINGLE-FAMILY ALLEY LOT DIAGRAM

N.T.S

3 KEY MAP

N.T.S

4 COURTYARD HOME LOT DIAGRAM

N.T.S

5 LARGE LOT HOME LOT DIAGRAM

N.T.S

6 TOWN HOME LOT DIAGRAM

N.T.S



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COLUMBIA BLUFFS

PMDP

Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

INITIAL SUBMITTAL

ISSUE DATE: 10/16/2023

REVISION HISTORY:

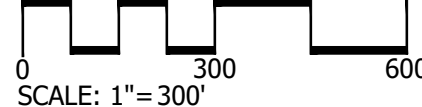
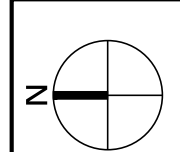
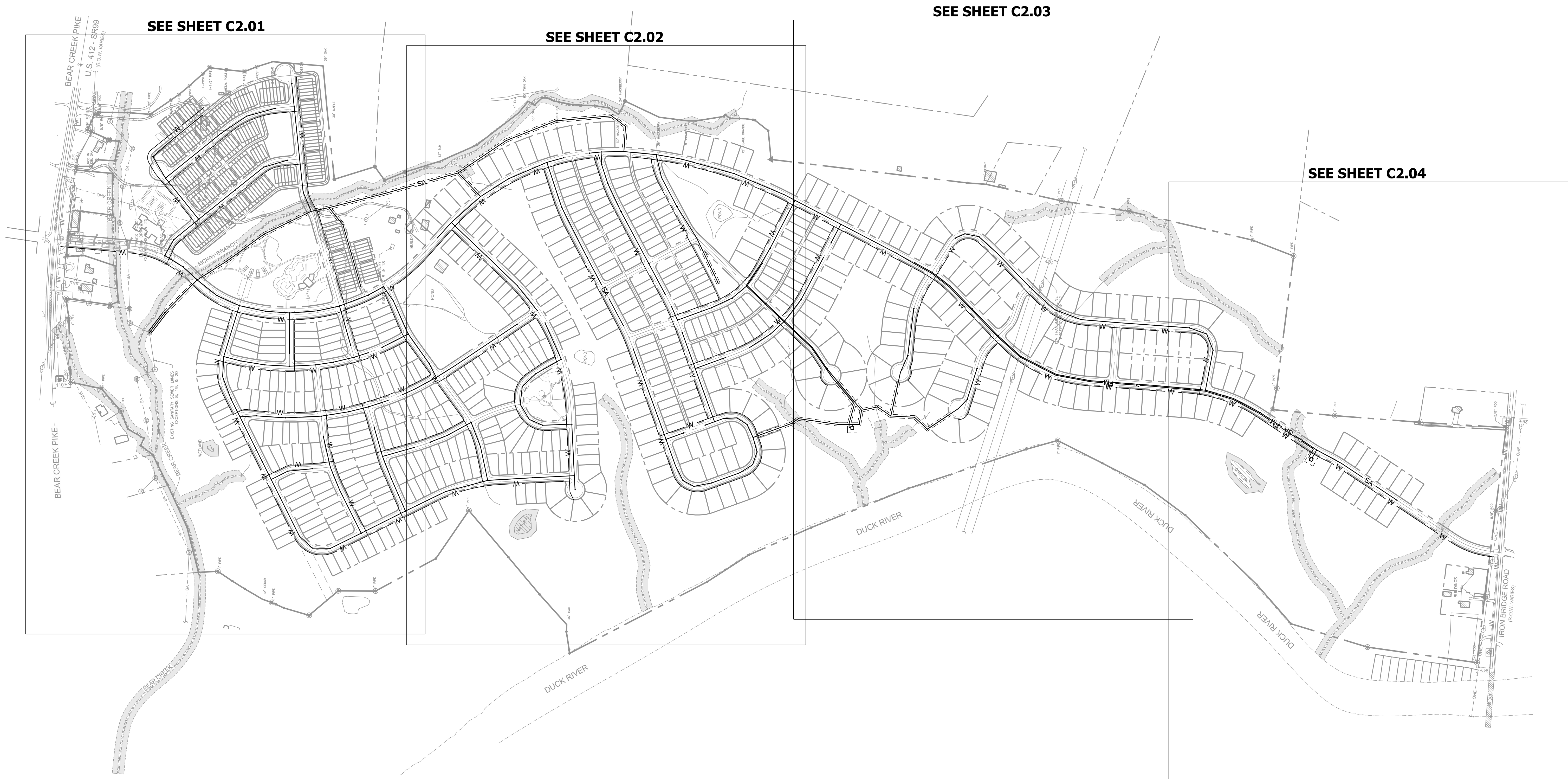
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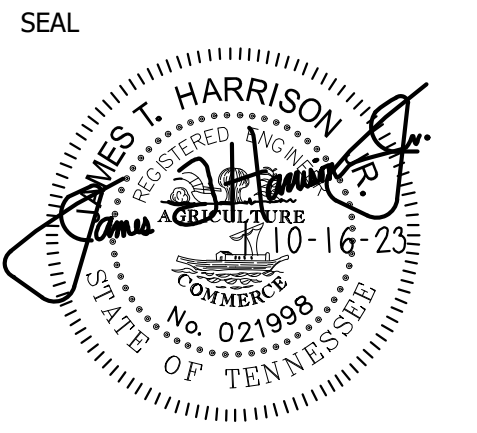
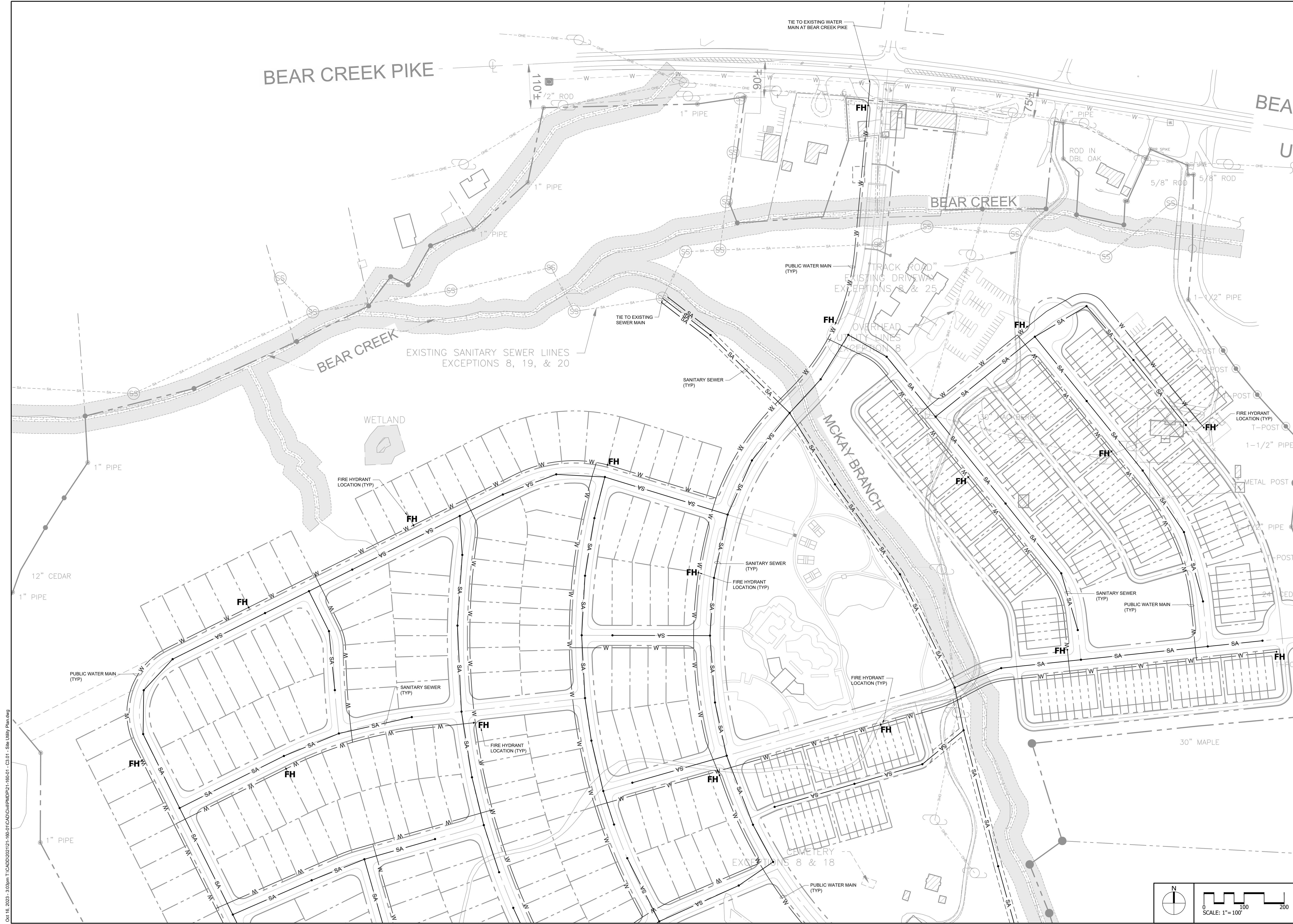
DRAWN BY: TWG
CHECKED BY: TWG

OVERALL UTILITY PLAN

C3.00

PROJECT NO.: 21-160-01





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

ISSUE SET:
INITIAL SUBMITTAL

ISSUE DATE: 10/16/2023

Rev	Description	Date
1	Initial Submittal	10/16/23

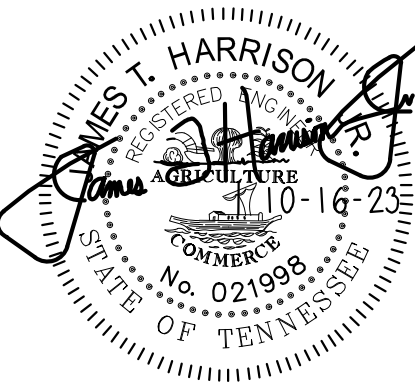
DRAWN BY: TWG
CHECKED BY: TWG

SITE UTILITY PLAN

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



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COLUMBIA BLUFFS

PMDP

Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

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ISSUE DATE: 10/16/2023

[illegible]

DRAWN BY: TWG
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SITE UTILITY PLAN

C3.02

PROJECT NO.: 21-160-01



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COLUMBIA BLUFFS

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Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

INITIAL SUBMITTAL

ISSUE DATE: 10/16/2023

Rev.	Description	Date
1	Initial Submittal	10/16/20

DRAWN BY: TWG
CHECKED BY: TWG

SITE UTILITY PLAN

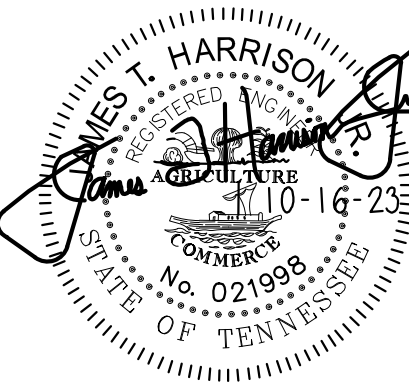
C3.03

PROJECT NO.: 21-160-01



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csdgt.com

SEAL



COLUMBIA BLUFFS

PMDP

Bear Creek Pike
Columbia, Maury County, Tennessee

ISSUE SET:

INITIAL SUBMITTAL

ISSUE DATE: 10/16/2023

REVISION HISTORY:

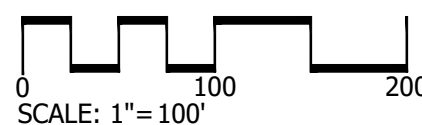
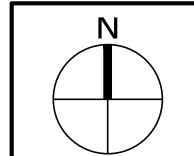
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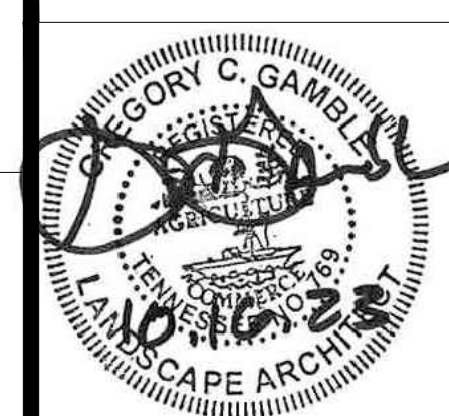
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SITE UTILITY PLAN

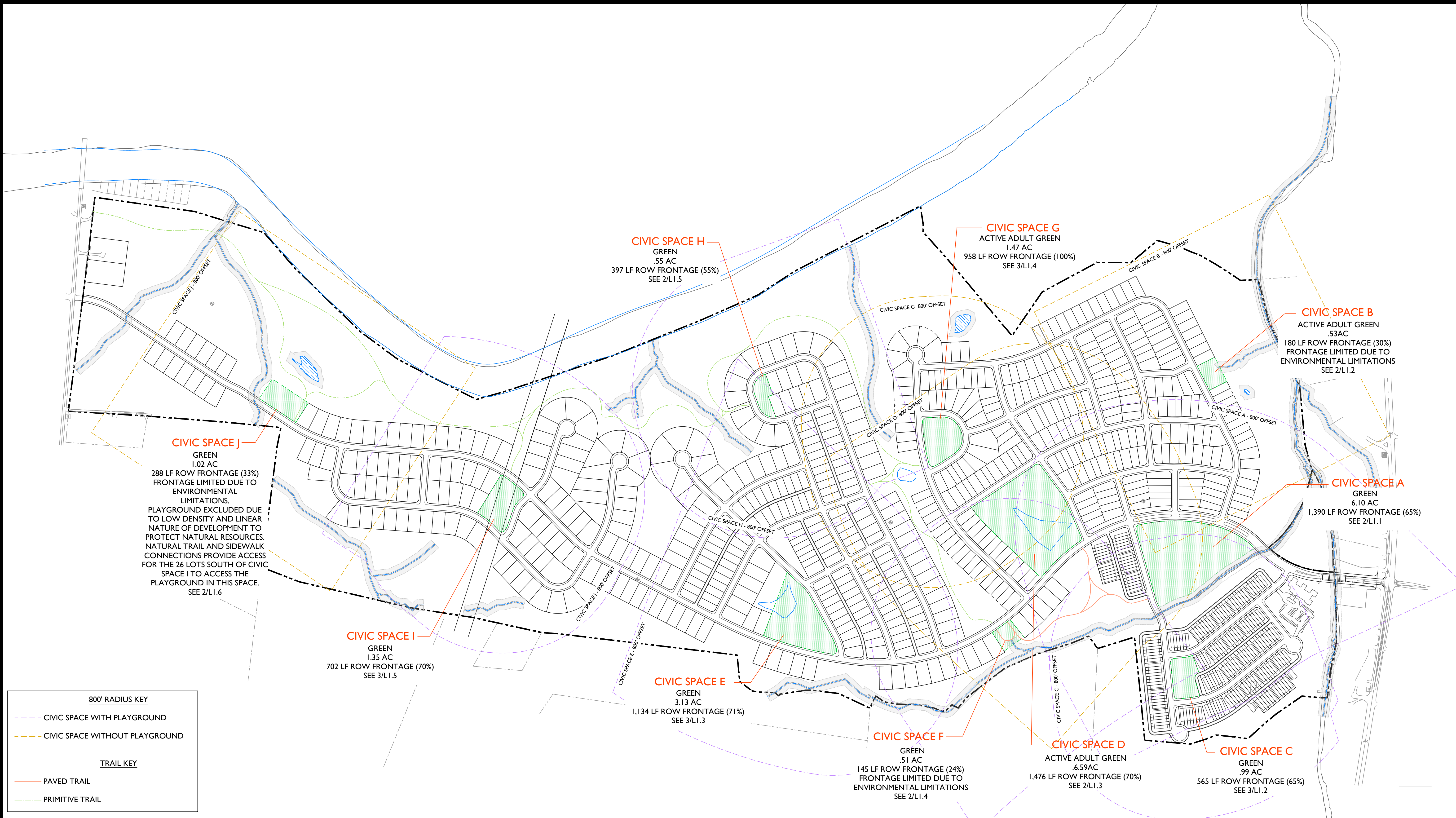
C3.04

PROJECT NO.: 21-160-01





Date: October 16, 2023
Revision Date
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800' RADIUS KEY

--- CIVIC SPACE WITH PLAYGROUND
--- CIVIC SPACE WITHOUT PLAYGROUND

TRAIL KEY

--- PAVED TRAIL
--- PRIMITIVE TRAIL

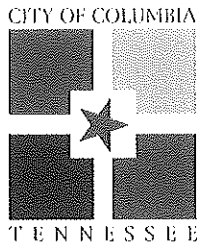
OVERALL CIVIC SPACE PLAN

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 LI.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



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.

A handwritten signature in dark ink, appearing to read "Donnie Boshers", is written over a light blue horizontal line.

Donnie Boshers, Director
City of Columbia, TN
Wastewater Department

Something Good Around Every Corner

1244 Treatment Plant Road Columbia, Tennessee 38401 Phone 931.560.1001



October 13, 2023

Mr. Joshua Gibbs

Kolter Land

14025 Riveredge Drive, Suite 175

Tampa, FL 33637

Sent via email: jgibbs@kolter.com

**RE: Water Availability Letter
Big Bear Bluffs Single Family - 129 Units
400 Bear Creek Pike
Tax Map 90, Parcel 12.01
Columbia, Maury County, TN**

Dear Mr. Gibbs:

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

As submitted by the applicant, the proposed development includes up to 860 single-family residential units in townhome and detached configurations, an approximately 4,600 square-foot amenity building with pool, a daycare, and irrigation for common areas. CPWS has evaluated the projected water demands for the proposed development and is able to meet a fire-flow capacity of 1,000 gpm at 20 psi for all proposed lots (as submitted by the applicant in concept plan dated 9/29/2023) while maintaining the existing level of service and pressures in this portion of the distribution system. CPWS can provide water for the proposed development according to the following requirements:

- Water availability for the proposed 860 units is contingent upon the schedule of development as provided by the applicant. Any acceleration of the schedule (start, finish, or increased unit count per phase) will require re-evaluation of water availability. Acceptance of an accelerated schedule is not guaranteed. The schedule as provided by the applicant is as follows:



Project Phase	Approximate Units	Sitework Started	Vertical Construction Completion	Notes
Phase 1	129	Q1 2026	Q2 2028	
Phase 2	142	Q2 2028	Q4 2029	Includes amenity building
Phase 3	109	Q3 2029	Q1 2031	Includes daycare
Phase 4	135	Q4 2030	Q2 2032	
Phase 5	112	Q1 2032	Q2 2033	
Phase 6	122	Q2 2033	Q1 2034	
Phase 7	94	Q1 2030	Q2 2033	

- This Water Availability Letter represents water availability for the entire development, but a new water service application and fee is required for subsequent phases. Water service is not guaranteed until the relevant impact fees are paid for each meter to be installed.
- A new 12-inch water main will be required to be installed by the Applicant from Bear Creek Pike, south through the spine road of the proposed development to Iron Bridge Road. From there a 16-inch main will be installed west to Tom J Hitch Parkway. From the intersection of Tom J Hitch Parkway and Iron Bridge Road, a new 16-inch water main will be installed north to the existing 12-inch CPWS water main located just south of the Duck River bridge on Tom J Hitch, as well as south to the existing 12-main near 1451 Tom J Hitch Parkway. The attached figure provides a visual representation of these requirements.
- A permanent, exclusive 20-foot water main easement will be provided by the developer for the new 16-inch and 12-inch water mains. Within the development, the easement may overlap the right-of-way of the spine road.
- Lane additions or other required improvements at Bear Creek Pike or other roadways may necessitate additional construction to relocate any impacted existing water mains.
- All off-site improvements must be constructed, tested per CPWS standards and deeded over to CPWS prior to connection of any domestic water meter used for full-time residence.
- The remainder of the water mains in the development shall be a minimum of 8-inch diameter with looped connections throughout the development. Final design to accommodate fire protection loads may necessitate an increase in some water main sizes in the development.

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



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

- Present the attached fireflow analysis figure for coordination and approval of development from the Columbia Fire Marshall.
- Prior to expiration of this water letter, remit to CPWS the new water service fees for Phase 1 of the development as follows:

New Water Service Fee: \$1,500 + \$370 per SFU (129 SFUs)	\$49,230.00
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- 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,

A handwritten signature in blue ink that reads "Eric King". The signature is fluid and cursive, with the first and last names clearly legible.

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

cc: Jonathan Hardin, CPWS
File 22-092



PUD-R Justification

Date: October 16, 2023

Project: Columbia Bluffs Preliminary PUD-R Master Development Plan

Property and Master Plan Description

Identifying paths for new development, suburban neighborhood development, through *Connect Columbia*

- **Fostered as part of a practice of managed growth that relies on balancing growth, economic development and community development**
Columbia Bluffs seeks to be a master planned community with diversity of housing options and civic opportunities.
- **Preservation of historic, cultural and environmental assets**
Columbia Bluffs seeks to build civic areas around the historic/cultural history of the property and utilize proactive measures to protect the natural environmental systems supporting the Duck River.
- **Connectivity**
Columbia Bluffs seeks to provide a north-south roadway connection between Iron Bridge and Bear Creek Parkway as well as provide stub road opportunities for future development to the east.
- ***Connect Columbia* Top Priorities: allowing a PUD model that will allow flexibility with more assurance of the final outcome**
Columbia Bluffs seeks to create a master planned neighborhood with commitments on density, architectural character, quality amenities, and protected open space.
- **Suburban Neighborhood goals: future development emphasizing connectivity and housing diversity, pedestrian friendly**
Columbia Bluffs seeks to develop 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.



PUD-R Justification

Date: October 16, 2023

Project: Columbia Bluffs Preliminary PUD-R Master Development Plan

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.



PUD-R Justification

Date: October 16, 2023

Project: Columbia Bluffs Preliminary PUD-R Master Development Plan

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



PUD-R Justification

Date: October 16, 2023

Project: Columbia Bluffs Preliminary PUD-R Master Development Plan

- vi. Ongoing stormwater monitoring of Environmental Controls of water runoff areas and tributaries
- B. Compliance with CGP, ARAP and NPDES permitting to address the protections that provide additional oversight to the project.

Throughout the duration of the project, these types of practices within the action areas will ensure environmental compliance with local, state and federal requirements.

3. Strategy for Protection when construction is completed.

Once development is completed permanent storm water detention areas and water out fall locations will be cleaned and stabilized in accordance with the local, state, and federal guidelines.

PUD Standards and the Columbia Bluffs Plans

The Columbia Bluffs Master Plan will address and satisfy the standards for PUD Development as defined in 3.7.1 PUD-R District Standards: **PUD-Residential:** *Specifically, this District is intended for predominantly Residential areas on sites where there are sufficient existing infrastructure, services, and utilities available for a proposed Development.*
Development in this District:

- a. Is walkable and provides a diverse mixture of housing choices and Building Types,*
- b. Is necessary to implement and is consistent with the Comprehensive Plan,*
- c. Cannot under any circumstances, plan, or design conform to one or more of the other Districts and standards therefor due to its necessary and intrinsic Uses or size or form,*
- d. Provides an innovative plan and design,*
- e. Is harmonious with and respects the land use, character, and natural or man-made features of both the subject property and Adjacent property,*
- f. Promotes quality and environmentally sensitive planning and design by taking advantage of special site characteristics, locations and land uses,*
- g. Provides Civic Space,*
- h. Is the best use of the site consistent with the goals of protecting and enhancing the natural environment. There are specific Development standards provided for this District, which may be supplemented by additional standards approved as part of the applicable Final Master PUD Development Plan.*



PUD-R Justification

Date: October 16, 2023

Project: Columbia Bluffs Preliminary PUD-R Master Development Plan

Modifications of Standards

The following modifications of standards will be requested by the developer to reduce the development footprint and increase the open space held in preservation. The reduction in ROW width, setbacks, and variations in garage locations will provide for a unique, clustered neighborhood experience.

1. Reduction in ROW width from 70' to 50' provides approximately 19 acres of additional land placed into open space. (+/-41,730 LF of roadway).
2. Reduction in side setbacks from 10' to 7.5' on front loaded homes and townhomes provides approximately 6.6 acres of additional land placed into open space. (113,400 sf townhomes + 175,500 sf front load x 2 side yards x 2.5' reduction).
3. Reduction in side setbacks from 10' to 5' on detached alley loaded homes and active adult homes provides approximately 9.7 acres of additional land placed into open space. (397 homes x 120' depth x 2 side yards x 5' reduction = 422,400 SF)
4. Allow garage in 2nd layer on courtyard style homes (garage doors not facing frontage in second layer)
5. Allow double garage doors with a maximum width of 16' wide, single door with windows
6. Allow primary residential driveways to be 12' instead of 10' across the 1st layer and active adult driveways to be 18' across the 1st layer

COLUMBIA

City of Columbia, Tennessee

BLUFFS



Architectural Review Team Submittal



COLUMBIA BLUFFS ARCHITECTURE

DEVELOPER
JIM HARVEY
KOLTER LAND
14025 RIVEREDGE DRIVE, SUITE 175
TAMPA, FL 33637

KOLTERLAND

ENGINEER
JIM HARRISON
CIVIL SITE DESIGN GROUP
2305 KLINE AVENUE, SUITE 300
NASHVILLE, TN 37211



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



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- 2. DEVELOPMENT TEAM
- 3. DEVELOPMENT PLAN
- 4. ARCHITECTURAL DESIGN GUIDELINES
- 5. FACADE VARIETY
- 6. ACTIVE ADULT NEIGHBORHOOD
- 8. COURTYARD AND LARGE LOT HOMES
- 11. ALLEY-LOADED PRIMARY RESIDENTIAL
- 13. TOWNHOMES
- 15. DAYCARE
- 11. MAIN AMENITY ARCHITECTURE
- 12. CIVIC SPACE ARCHITECTURE

SUBMITTED: 10/16/2023

DEVELOPMENT TEAM



	Single Family & Townhomes	Active Adult Single Family
Building Height and Massing	- Primarily a mix of 1-story and 2-story, with a maximum of 3-story - Attached garages encouraged	
Building Separation	- Single Family: 10’ minimum - Townhomes: 15’ minimum	Single Family: 10’ minimum
Street Facades	- Maximize frontage and orientation onto residential streets - Porches should orient to residential streets - Entries visible from residential streets	- Maximize frontage and orientation onto residential streets - Porches should orient to residential streets - Entries visible from residential streets
Building Entries	Porches minimum 6’ deep and 6’ wide	
Roof Forms	- Roofs may vary in style, but should be designed to create unity to the full community - All roof forms to be reviewed and approved by the master developer	- Roofs may vary in style, but should be designed to create unity to the full community - All roof forms to be reviewed and approved by the master developer
Roof Detail	- All roofs should create eaves for shadow and rain protection - Where used, gutters should be expressed as positive elements adding desirable detail	- All roofs should create eaves for shadow and rain protection - Where used, gutters should be expressed as positive elements adding desirable detail
Parking	- Garage-parked - Garages minimum depth of 22’ - Garage doors with windows required	- Garage-parked - Garages minimum depth of 22’ - Garage doors should have windows

ARCHITECTURAL GUIDELINE NOTE:
The architectural guidelines and conceptual elevations are intended to convey the architectural quality and design intent. Final elevations and color schemes will be brought back to be approved by the ADRT at final PUD-R Development Plan.

COMPLIANCE NOTE:
The architectural guidelines as shown in this pattern book represent compliance with the standards set by the Zoning Ordinance except in areas requesting a modification of standards which are requested 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

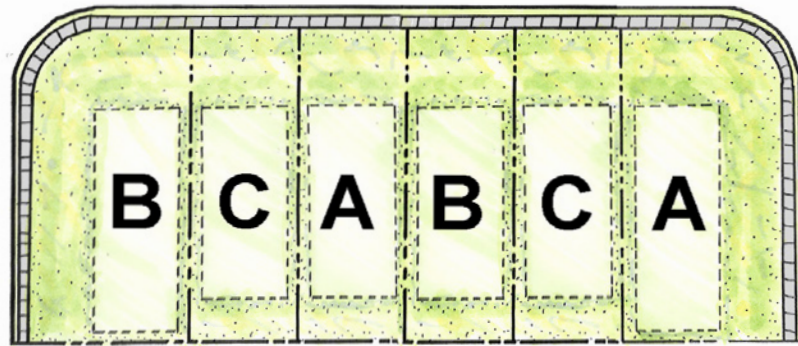
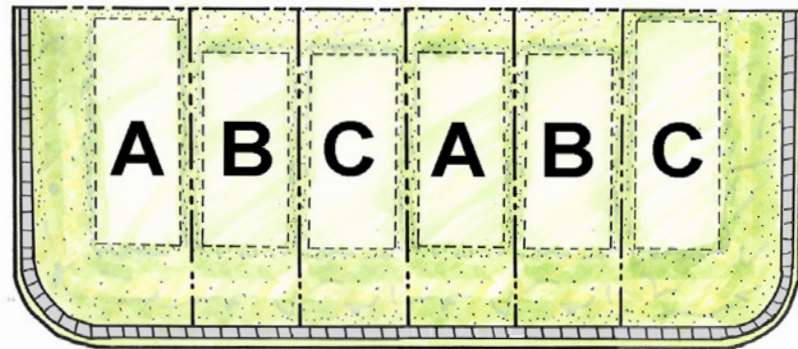
Awnings
Permitted:
High Quality Heavy Canvas
Illuminated Awnings
Metal Awnings

- 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.

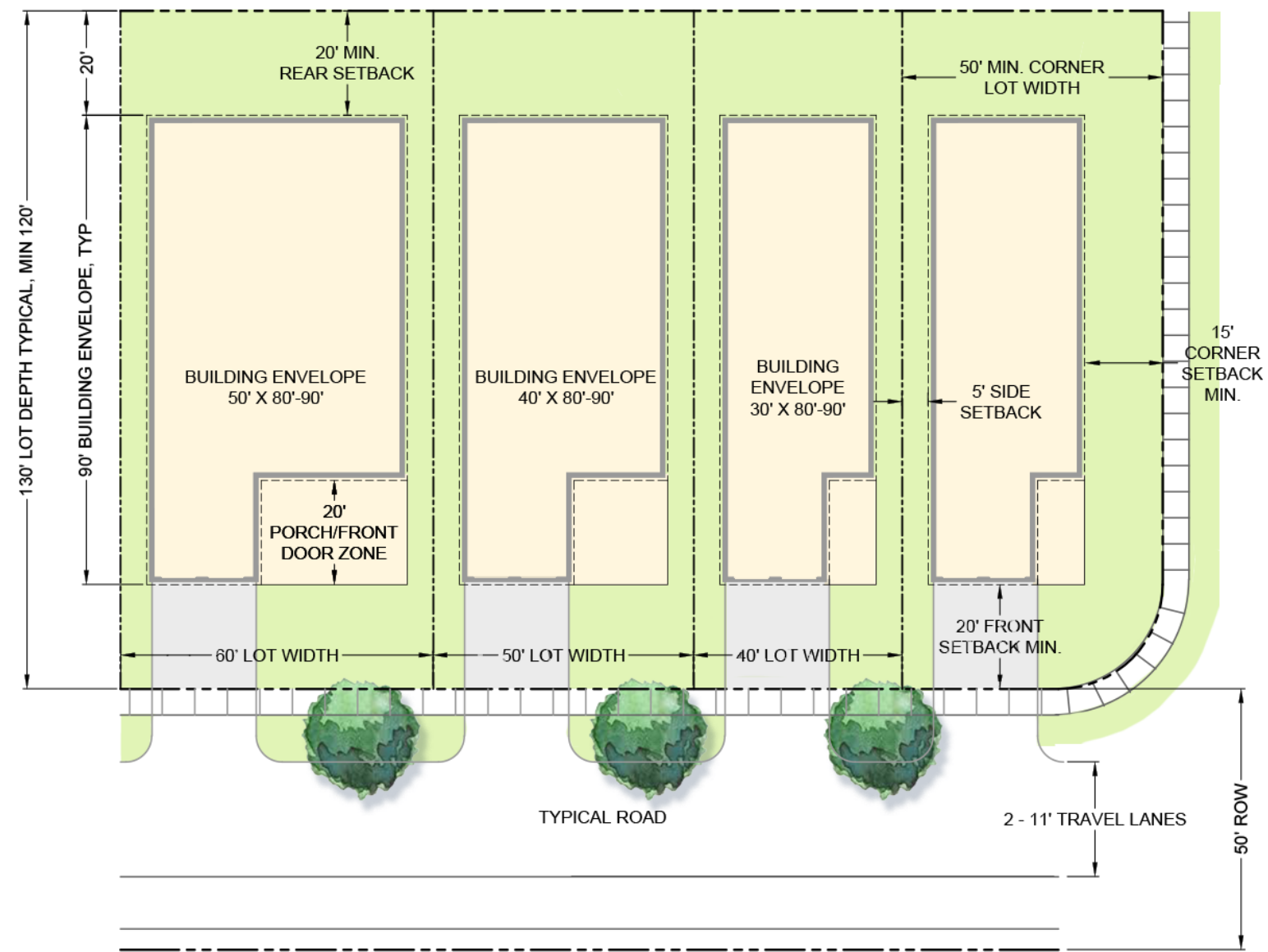
- A building shall be considered neighboring if it fronts on the same street as the building under construction or an intersecting street; no building elevation may be repeated across from, adjacent to, or diagonal to a similar building elevation. There shall be a minimum of a 2-lot gap between each 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.



ACTIVE ADULT SINGLE FAMILY

COLOR RENDERING PRESENTS AN
ILLUSTRATIVE DEPICTION OF ARCHITECTURE
AND LANDSCAPE MATERIAL



LOT RANGE: 40'-60' 208 HOMES

BUILDING SETBACKS:

FRONT:	20'
REAR:	20'
SIDE:	5'
CORNER:	15'

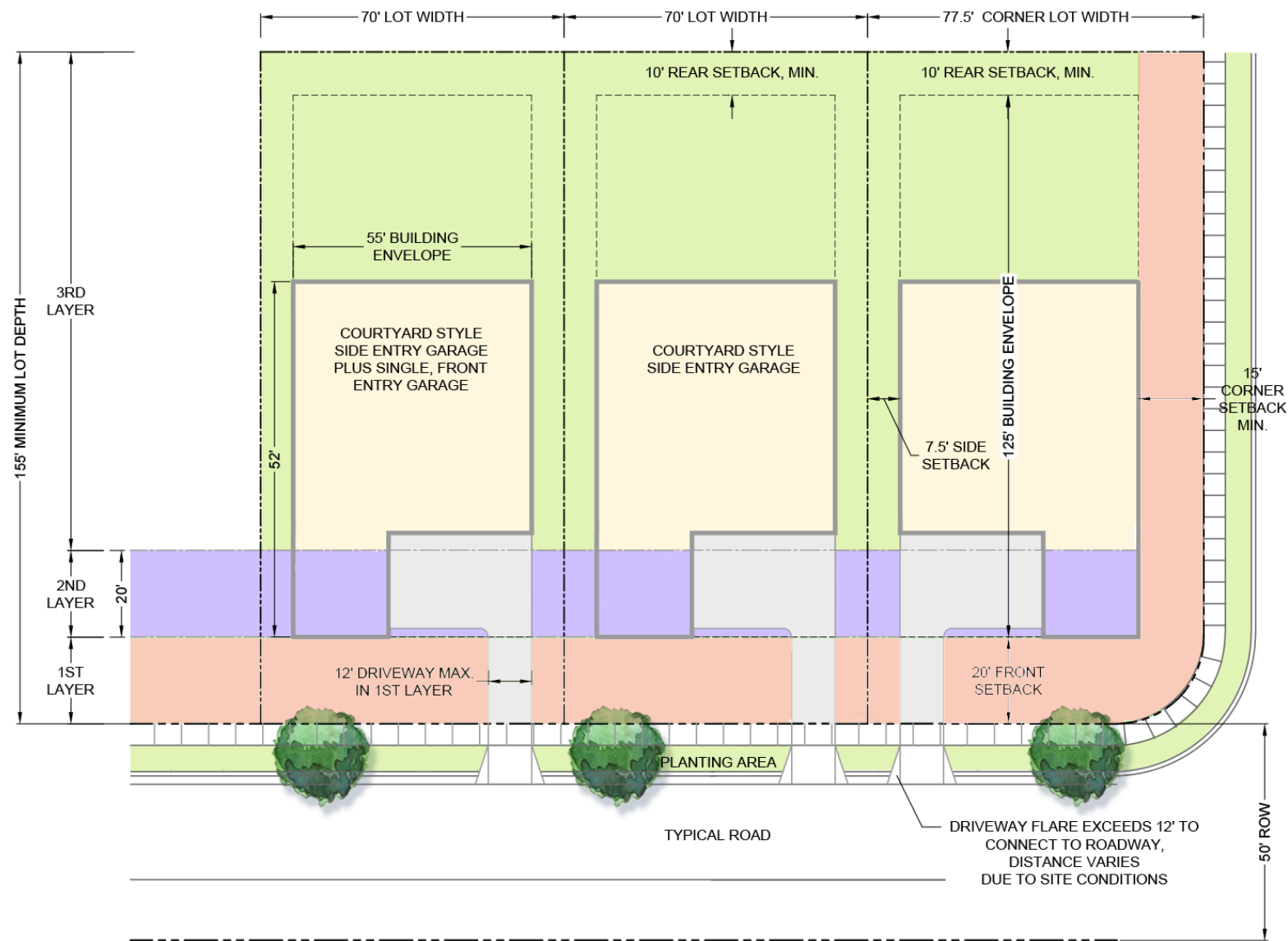
ALL LOTS TO HAVE FRONT LOADED GARAGES
 - MINIMUM 20' OF DRIVEWAY ON LOT
 - MINIMUM 22' DEPTH FOR ALL GARAGES

SITE SETBACKS ARE DUE TO ALL INCLUSIVE
 MAINTENANCE APPLICATION GOVERNED BY THE
 PROPOSED HOA, TO BE DEED RESTRICTED.

ACTIVE ADULT SINGLE FAMILY



COLOR RENDERING PRESENTS AN
ILLUSTRATIVE DEPICTION OF ARCHITECTURE
AND LANDSCAPE MATERIAL



LOT: 70' MINIMUM 104

BUILDING SETBACKS:

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

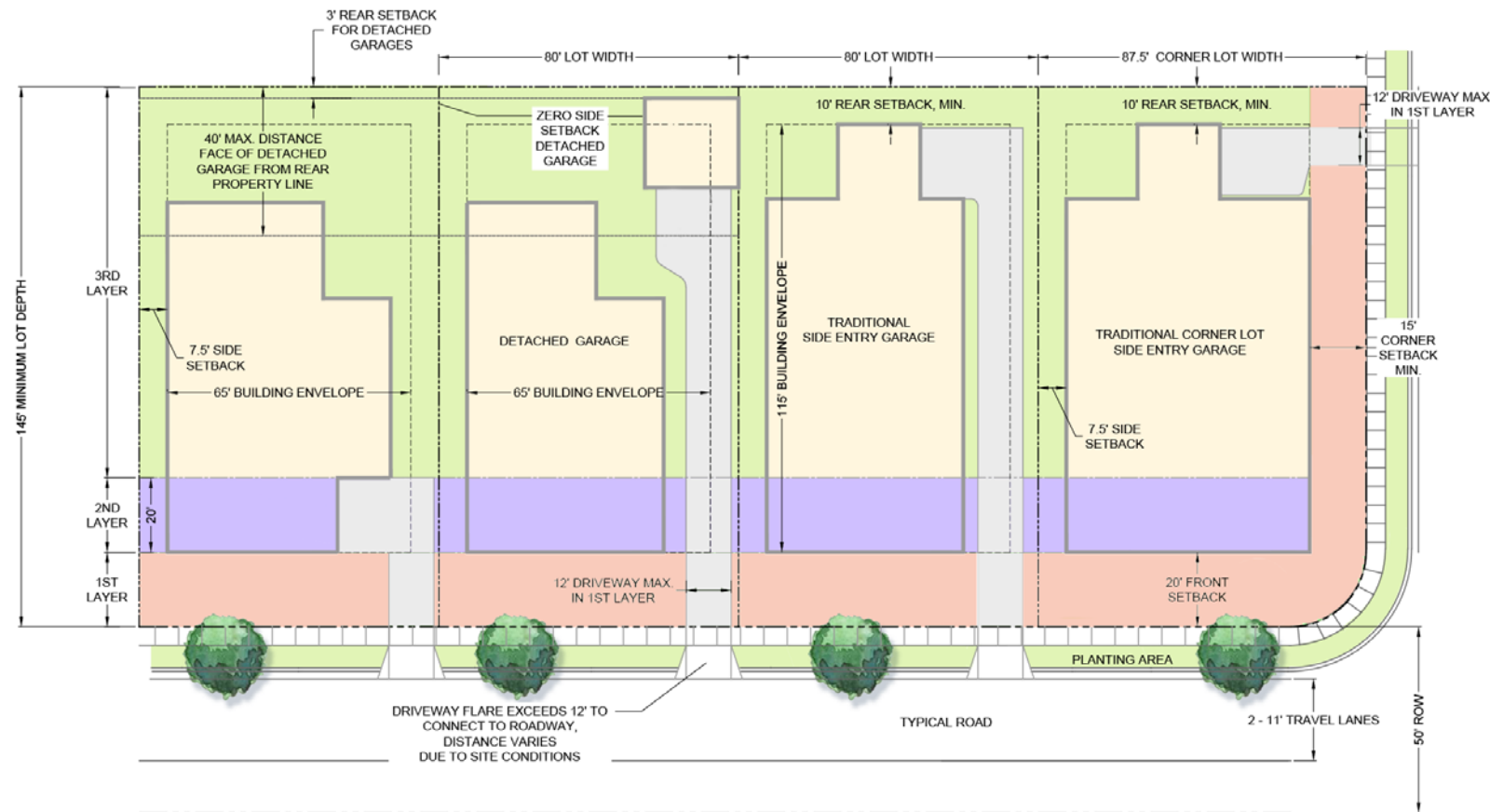
ALL LOTS TO HAVE SIDE LOADED GARAGES WITH THE OPTION OF A SINGLE, FRONT-LOADED GARAGE IN THE 3RD LAYER.

- MINIMUM 20' LENGTH OF DRIVEWAY ON LOT
- MINIMUM 22' DEPTH FOR ALL GARAGES



LARGE LOT HOMES

COLOR RENDERING PRESENTS AN
ILLUSTRATIVE DEPICTION OF ARCHITECTURE
AND LANDSCAPE MATERIAL



LOTS: 80' MINIMUM 130 HOMES

BUILDING SETBACKS:

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

LOTS WILL HAVE A MIX OF GARAGE LOCATIONS,
ATTACHED AND DETACHED

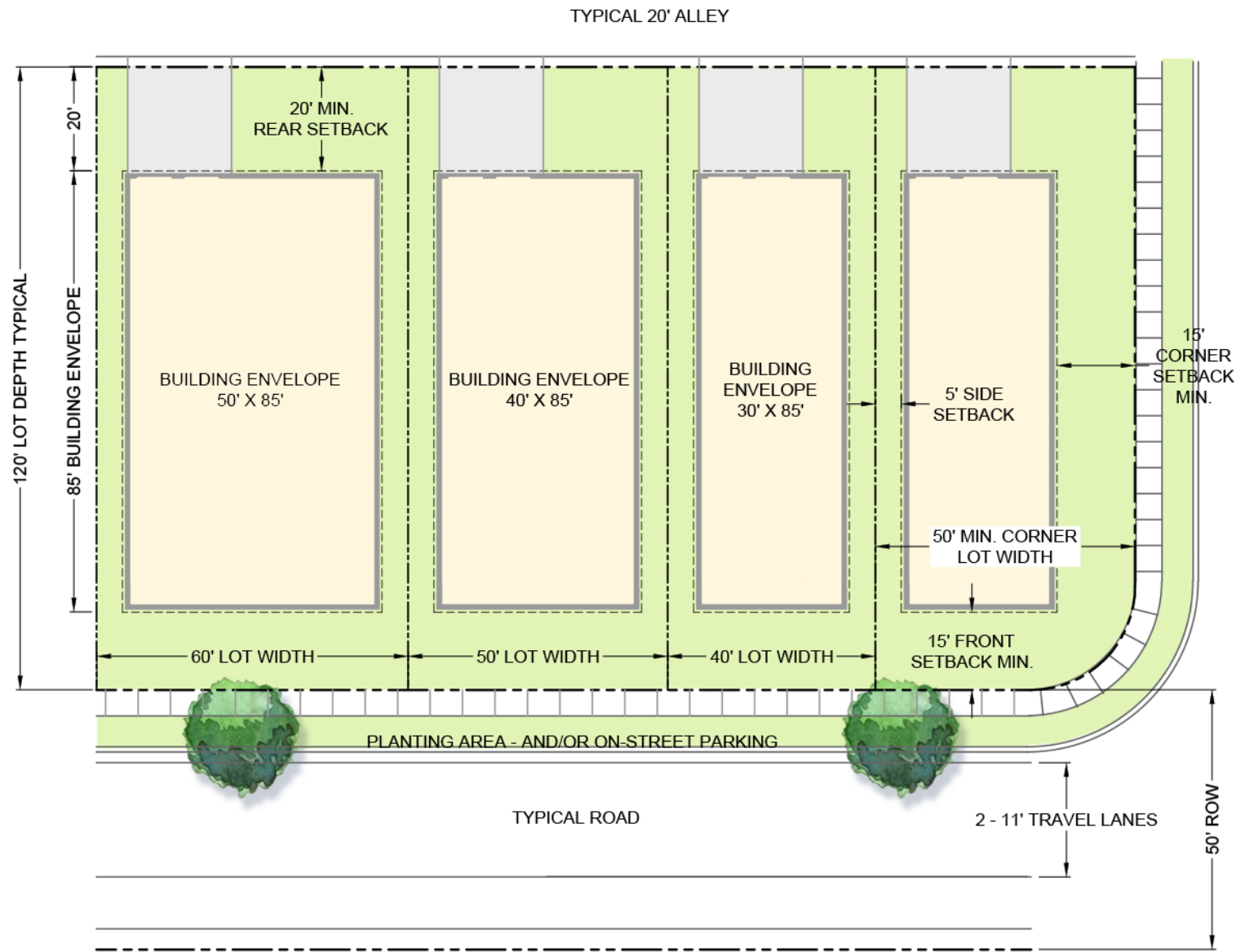
- MINIMUM 20' OF DRIVEWAY ON LOT
- MINIMUM 22' DEPTH FOR ALL GARAGES

LARGE LOT HOMES



SINGLE-FAMILY ALLEY LOADED

COLOR RENDERING PRESENTS AN
ILLUSTRATIVE DEPICTION OF ARCHITECTURE
AND LANDSCAPE MATERIAL



LOT RANGE: 40'-60'
144 HOMES

BUILDING SETBACKS:
 FRONT: 15'
 REAR: 20'
 SIDE: 5'
 CORNER: 15'

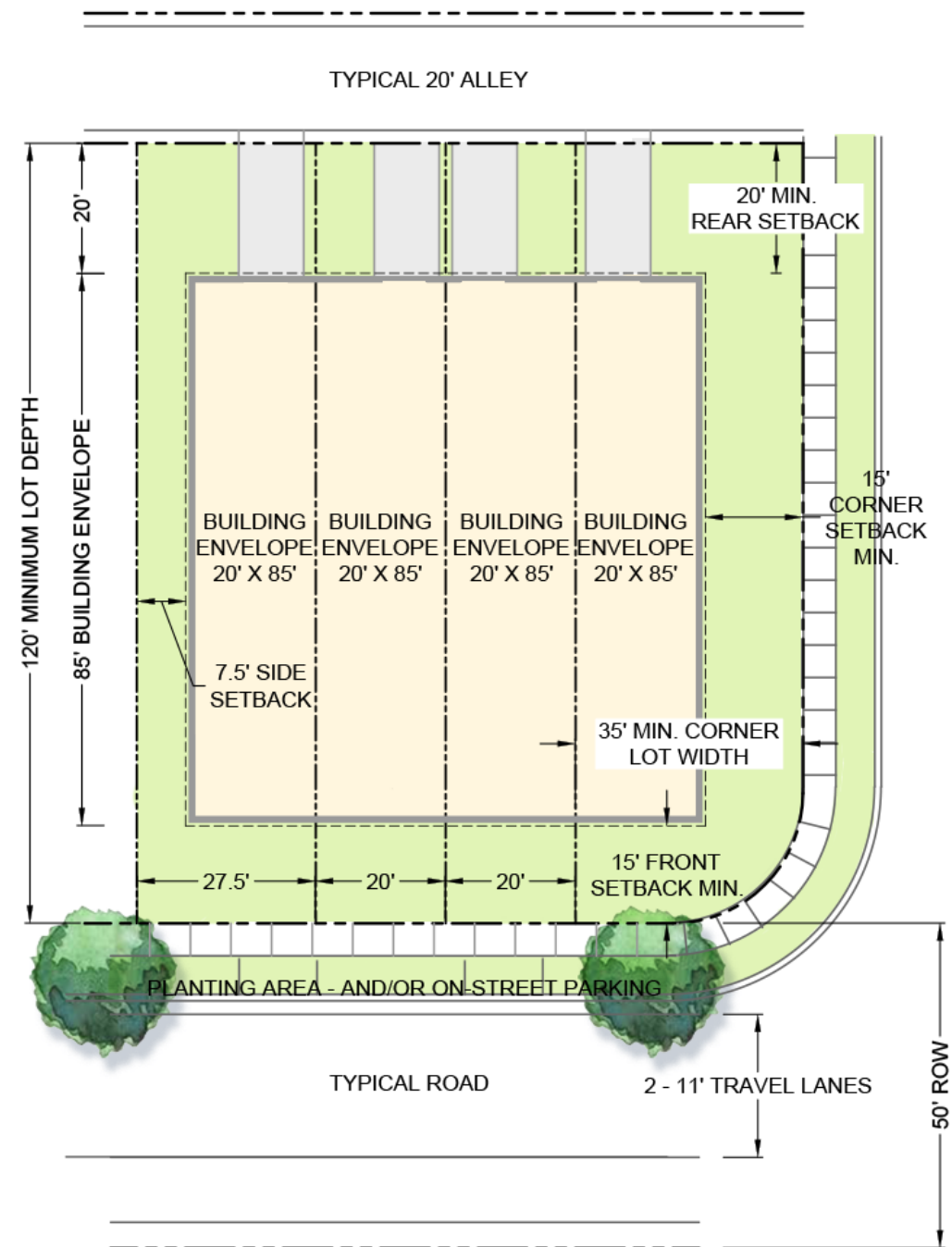
ALL LOTS TO HAVE REAR LOADED GARAGES
 - MINIMUM 20' LENGTH OF DRIVEWAY ON LOT
 - MINIMUM 22' DEPTH FOR ALL GARAGES

SINGLE-FAMILY ALLEY LOADED



COLOR RENDERING PRESENTS
AN ILLUSTRATIVE DEPICTION OF
ARCHITECTURE AND LANDSCAPE
MATERIAL

TOWNHOMES



LOTS: 20' MINIMUM 189 HOMES

BUILDING SETBACKS:

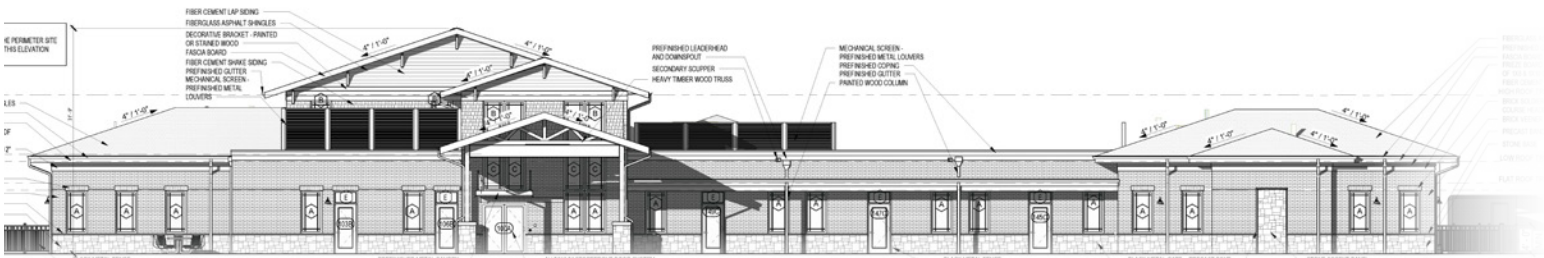
FRONT:	15'
REAR:	20'
SIDE:	7.5'
CORNER:	15'

ALL LOTS TO HAVE REAR LOADED GARAGES

- MINIMUM 20' LENGTH OF DRIVEWAY ON LOT
- MINIMUM 22' DEPTH FOR ALL GARAGES

TOWNHOME BUILDINGS WILL CONSIST OF 4, 6, 7, AND 8 UNIT BUILDINGS.

DAYCARE ELEVATIONS



WEST ELEVATION



EAST ELEVATION



SOUTH ELEVATION



NORTH ELEVATION

ELEVATIONS ARE CONCEPTUAL.
FINAL APPROVALS TO BE DETERMINED WITH FMDP.



DAYCARE

CHILD DAYCARE TO BE APPROXIMATELY 12,000-14,000 SQFT., AND WILL SERVE AS A BENEFIT NOT ONLY TO THE LOCAL NEIGHBORHOOD BUT TO THE COMMUNITY AS WELL.

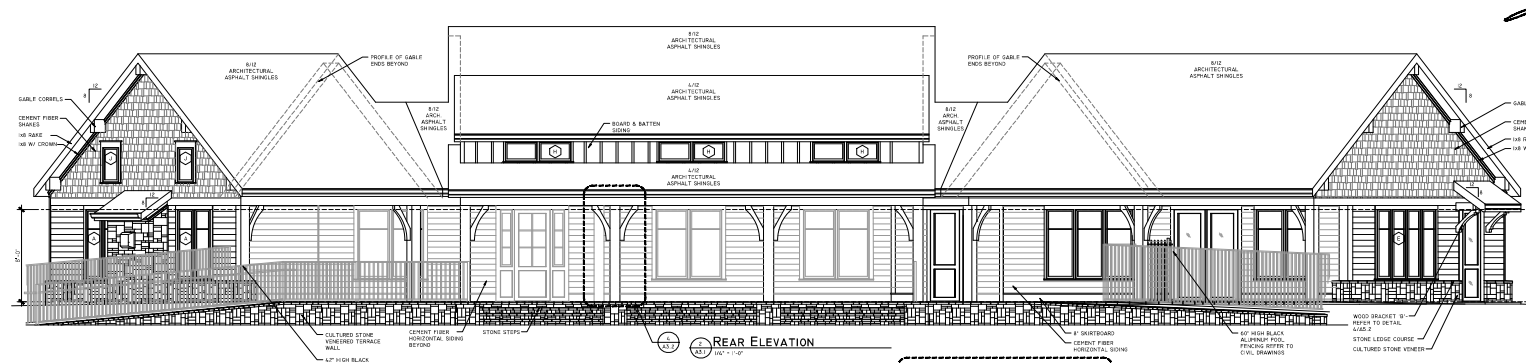
AMENITY PHOTOGRAPHS



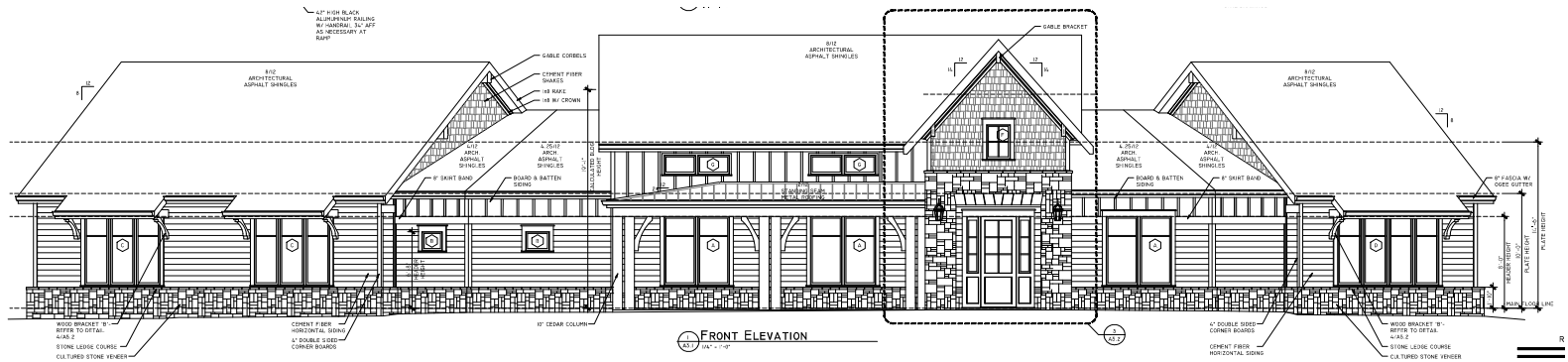
POOL AND CLUBHOUSE FROM SIMILAR KOLTER PROJECT



AMENITY ELEVATIONS



IMAGES AND ELEVATIONS ARE CONCEPTUAL.
FINAL APPROVALS TO BE DETERMINED WITH FMDP.





5 CIVIC SPACES ARE PLANNED FOR THIS SITE.

THREE OF THESE SITES WILL HAVE COVERED MAILBOX KIOSKS. COVERED SEATING WILL BE PROVIDED IN MOST PARKS.

IMAGES ARE TO PROVIDE EXAMPLES OF TYPES OF COVERED SEATING AND MAILBOX KIOSKS, BUT COULD BE SUBJECT TO REVISIONS AT FMDP APPROVALS.

CIVIC SPACE ARCHITECTURE



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 **FMDD**
- ☒ Approximate height, bulk, and the utilization of structures including activities and the number of living units.



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

Print Name

KELI FRYMIRE

Signature

10/16/2023

Date



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PLANNING COMMISSION
PROJECT DEVELOPMENT APPLICATION

SUBMITTAL REQUIREMENTS

** 1 hard copy of all materials for submittal + PDF copy on a USB thumb drive or CD (no multiple applications on one storage device)*

Fold hard copy submittals larger than 8½"x11"

ADDRESS/LOCATION	400 Bear Creek Pike		
	TAX MAP: 90	GROUP:	PARCEL: 12.01
SUMMARY OF NATURE OF REQUEST AND WORK	Annexation request and PUD-R rezoning request for a little over 400 acres between Bear Creek and Iron Bridge Road. PUD-R neighborhood to provide a variety of homes, including Active Adult/age restricted area, town homes, and large single family home lots.		

DATE OF PRE-APPLICATION CONFERENCE	8/30/2023	<i>Pre-application meetings are scheduled for Wednesdays.</i>
------------------------------------	-----------	---

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:	<u>Annexations/Rezoning/PUD's:</u> ☐ 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 <u>Plats/PUDs:</u> ☐ Project Name (include Sections & Phases) Columbia Bluffs PUD-R Preliminary Master Plan ☐ Total Number of Lots 866 residential lots ☐ Total acreage +/-409.52 acres

**File naming nomenclature examples:*

*Freedom Point Site Plan
Freedom Point Master Plan
Freedom Point Final Plat*

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

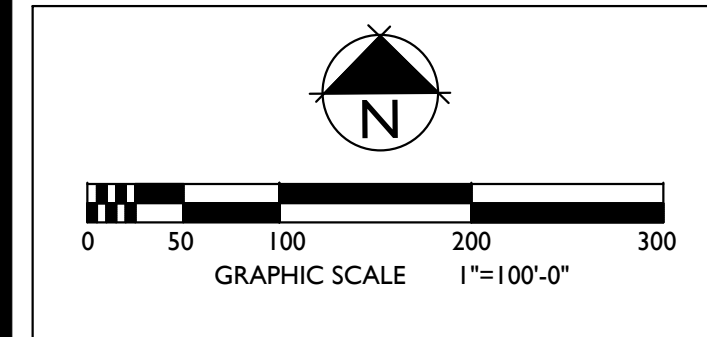
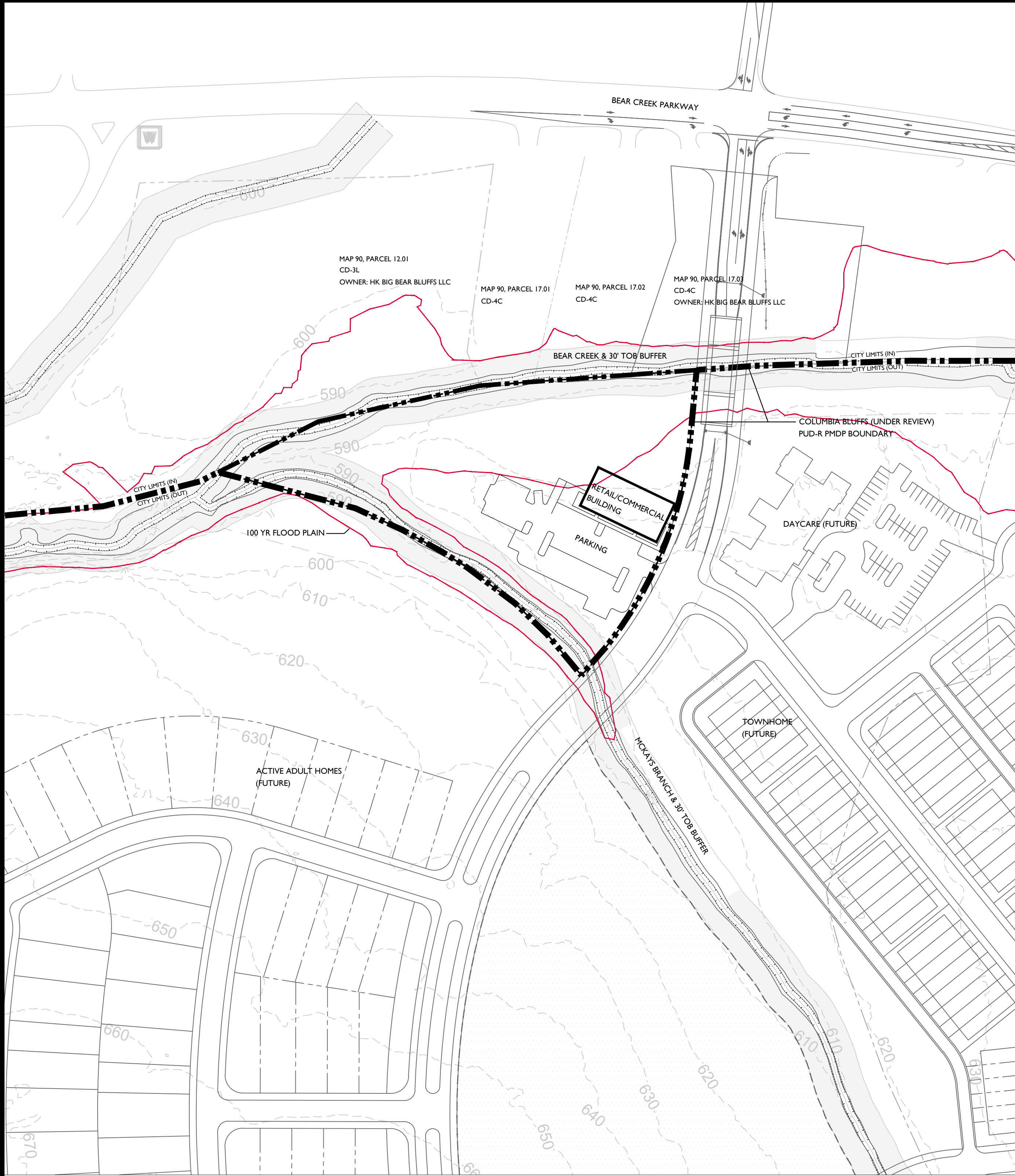
PROPERTY OWNER NAME	HK Big Bear Bluffs, LLC	PHONE	813-615-1244
ADDRESS	14025 Riveredge Dr. Ste 175 Tampa FL 33637	EMAIL	jgibbs@kolter.com

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.

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



CONCEPTUAL DEVELOPMENT PLAN CD-4 DESIGN CRITERIA:

GROSS SITE AREA: +/-3.36 AC	PARKING PER ZONING ORDINANCE STANDARD
7,200 SF NON-RESIDENTIAL BUILDING (60'X120')	PARKING PROVIDED: SURFACE IN 3RD LAYER
TOTAL IMPERVIOUS SURFACE RATIO: 80% MAX	+/- 54 PARKING SPACES SHOWN ON PLAN (1 PER 133 SF)
MAXIMUM BUILDING LENGTH: 120'	
SETBACKS:	
FRONT: 6' - 20'	
SIDE: 6' MIN.	
REAR: 3' MIN.	

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

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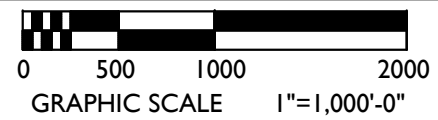
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LOCATION MAP



PROJECT INFORMATION:

PARCEL: PORTION OF MAP 90 PARCEL 12.01
ADDRESS: PORTION OF 400 BEAR CREEK PARKWAY

PROPOSED USE: NEIGHBORHOOD SERVING COMMERCIAL
CONFORMING TO THE APPROVED CD-4 USES.

CONTACT:

APPLICANT/LANDSCAPE ARCHITECT:
GREG GAMBLE OR KELI FRYMIRE
GAMBLE DESIGN COLLABORATIVE
3020 STANSBERRY LANE, SUITE 201
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DEVELOPER:
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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:

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DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE

PORTION OF 400 BEAR CREEK PARKWAY ANNEXATION, REZONING REQUEST & CONCEPTUAL DEVELOPMENT PLAN

Columbia, Tennessee



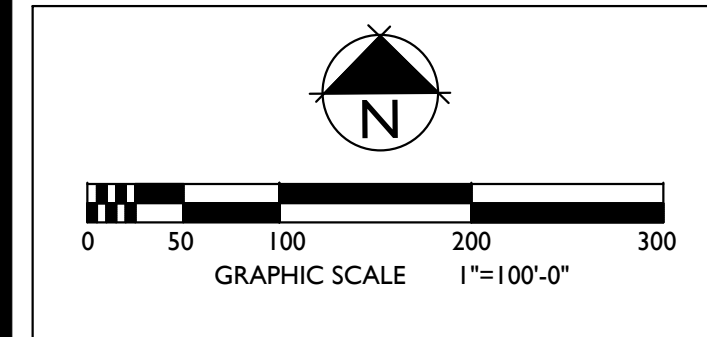
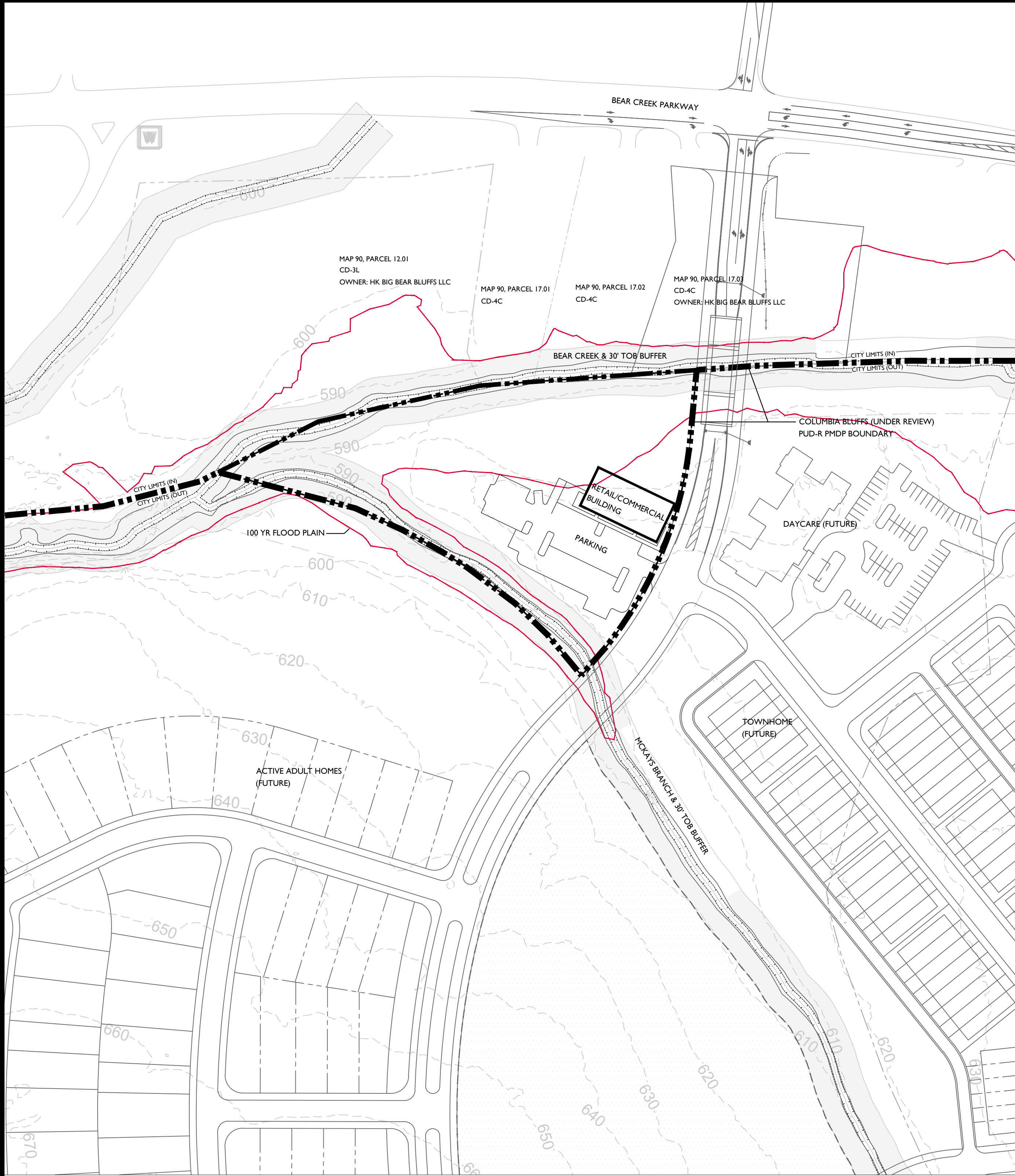
Date: OCTOBER 16, 2023
Revision Date

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△	_____

CONCEPTUAL
DEVELOPMENT PLAN

SHEET

LI.0



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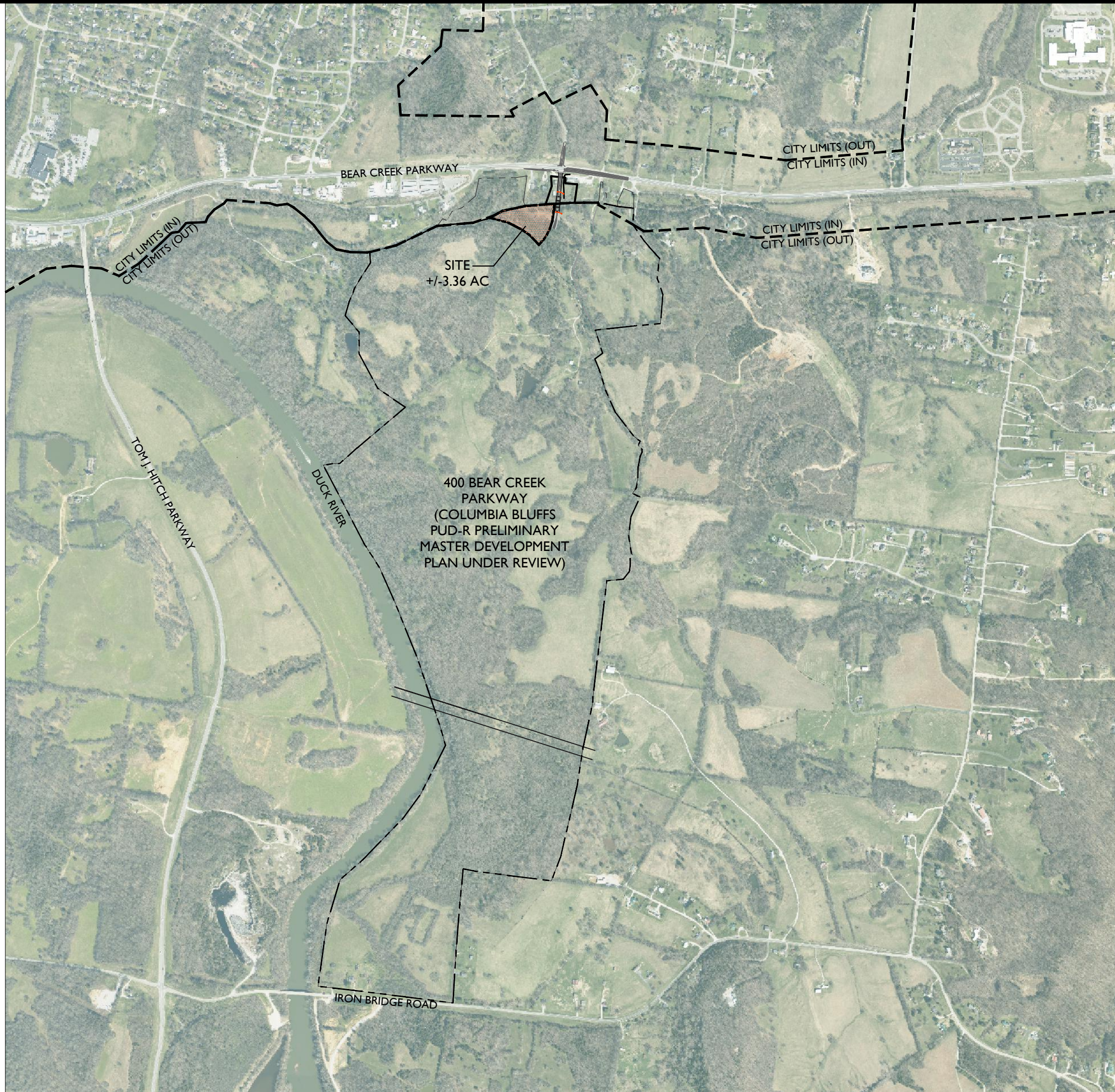
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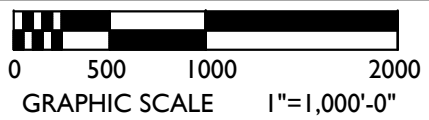
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LOCATION MAP



PROJECT INFORMATION:

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PROPOSED USE: NEIGHBORHOOD SERVING COMMERCIAL
CONFORMING TO THE APPROVED CD-4 USES.

CONTACT:

APPLICANT/LANDSCAPE ARCHITECT:
GREG GAMBLE OR KELI FRYMIRE
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3020 STANSBERRY LANE, SUITE 201
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jgibbs@kolter.com

OWNER:
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ANNEXATION AND REZONING REQUEST:

REQUEST TO ANNEX +/-3.36 ACRES AND REZONE TO CD-4
FUTURE LAND USE: SUBURBAN NEIGHBORHOOD

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DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE

PORTION OF 400 BEAR CREEK PARKWAY
ANNEXATION, REZONING REQUEST &
CONCEPTUAL DEVELOPMENT PLAN
Columbia, Tennessee



Date: OCTOBER 16, 2023

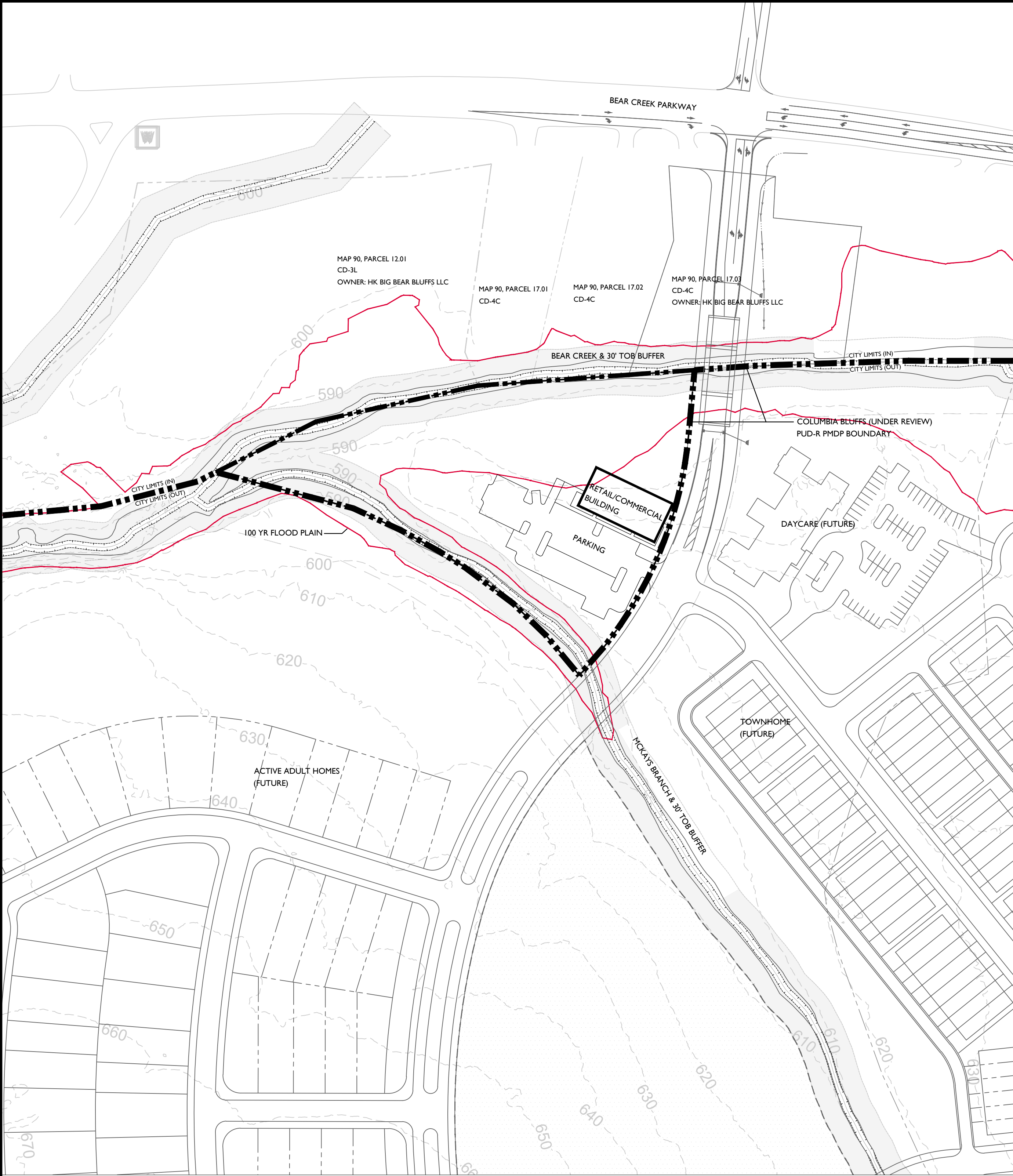
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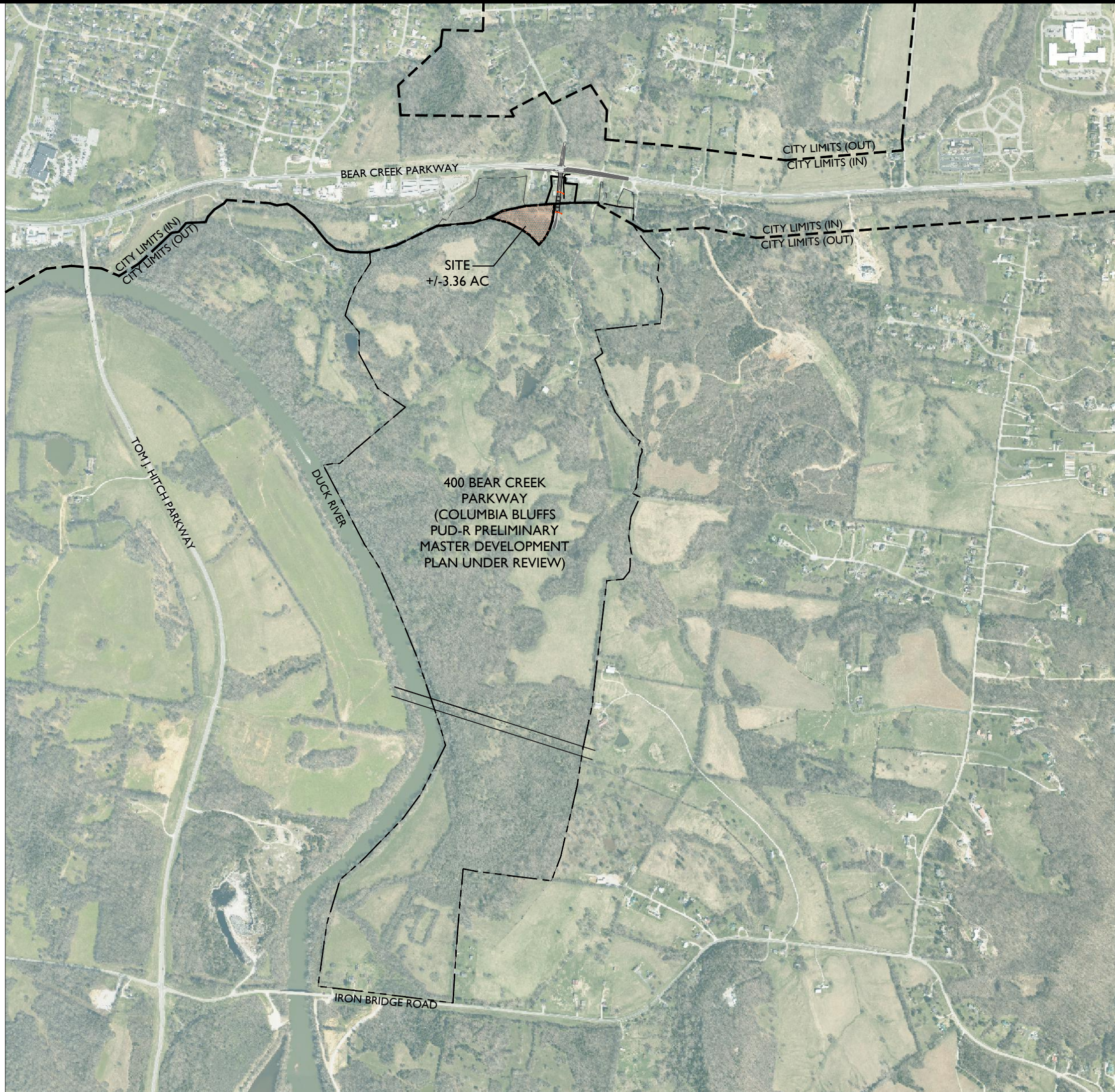
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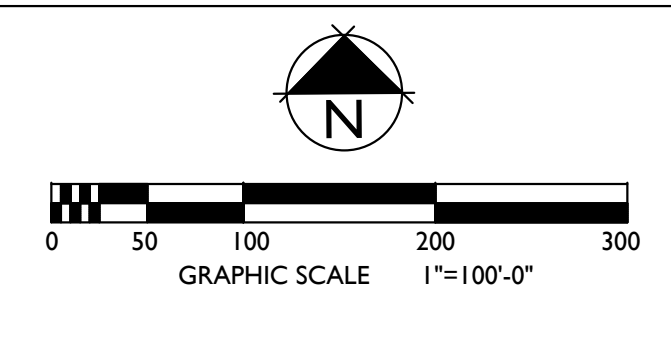
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DEVELOPMENT PLANNING AND
LANDSCAPE ARCHITECTURE

PORTION OF 400 BEAR CREEK PARKWAY
ANNEXATION, REZONING REQUEST &
CONCEPTUAL DEVELOPMENT PLAN
Columbia, Tennessee



Date: OCTOBER 16, 2023
Revision Date

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CONCEPTUAL
DEVELOPMENT PLAN

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**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°01'16" 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 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.



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

11/10/2022

Print Name

Date

Signature

A handwritten signature in blue ink, appearing to read "James P. Harvey", is written over a horizontal line.

STAFF USE ONLY

Docket Number:

Requested Agenda:

Something Good Around Every Corner

City Hall 700 North Garden Street Columbia, Tennessee 38401 Phone 931.560.1560

**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 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

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	<i>Pre-application meetings are scheduled for Wednesdays.</i>
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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:	<u>Annexations/Rezoning/PUD's:</u> ☐ 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 <u>Plats/PUDs:</u> ☐ Project Name (include Sections & Phases) Columbia Bluffs PUD-R Preliminary Master Plan ☐ Total Number of Lots 866 residential lots ☐ Total acreage +/-409.52 acres

**File naming nomenclature examples:*

*Freedom Point Site Plan
Freedom Point Master Plan
Freedom Point Final Plat*

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.

<u>Greg Gamble</u> APPLICANT NAME	 APPLICANT SIGNATURE	<u>10/16/2023</u> DATE
HK Big Bear Bluffs LLC <u>James P. Harvey</u> PROPERTY OWNER NAME	 PROPERTY OWNER SIGNATURE	<u>10/10/2023</u> 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	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	<i>Pre-application meetings are scheduled for Wednesdays.</i>
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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:	<u>Annexations/Rezoning/PUD's:</u> ☐ 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 <u>Plats/PUDs:</u> ☐ Project Name (include Sections & Phases) Columbia Bluffs Annexation/Commercial CD4 Rezoning ☐ Total Number of Lots <u>1 non-residential lot</u> ☐ Total acreage <u>+/-3.27 acres</u>
<i>*File naming nomenclature examples: Freedom Point Site Plan Freedom Point Master Plan Freedom Point Final Plat</i>	

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.

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