CITY OF COLUMBIA
TENNESSEE

AGENDA

The Columbia Planning Commission Technical Committee will meet on Tuesday, May 10, 2022 at 10:00 A.M., in Conference Room A, basement level, City Hall, to consider the following:

1. 22-0098 - Final Plat For Ridge At Carters Station 1B
   Request from T-Square Engineering for approval of a Final Plat with surety for Phase 1B of Ridge at Carter's Station, being TAX MAP 42 PARCEL 3.13.

   22-0098_APPLICATION

   22-0098_FLAT PLAT

2. 22-0100 - Theta Pike & Columbia Rock Road - Theta Pike Estates Preliminary Plat

   Request from Pentagon Reids LP for approval of Theta Pike Estates Preliminary Plat consisting of 211 single family lots at THETA PIKE AND COLUMBIA ROCK ROAD.

   22-0100_APPLICATION_0418

   22-0100_GEOTECHNICAL REPORT_0418

   DOCUMENTS

   Documents:

   22-0100_APPLICATION_0418.PDF
   22-0100_PRELIMINARY PLAT_0418.PDF
   22-0100_ILLUSTRATIVE LAYOUT_0418.PDF
   22-0100_GEOTECHNICAL REPORT_0418.PDF
   22-0100_TRAFFIC IMPACT STUDY_0418.PDF

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	0 Theta Pike, Columbia, TN East of Theta Pike, North of		
	TAX MAP: 075	GROUP:	PARCEL: 001.03
SUMMARY OF NATURE OF REQUEST AND WORK	Preliminary plat for 211 single family lot subdivision on 92.42 Acres.		

REQUEST DATE FOR PRE-APPLICATION CONFERENCE	2/13/2022	*Pre-application meetings are scheduled for Wednesdays.*

SELECT REQUEST	SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO:
☐ Annexation ☐ Rezoning ☐ Sketch Plat – *Must be submitted at least two weeks prior to Preliminary Plat submittal* ☒ Preliminary Plat ☐ Final Plat ☐ PUD Preliminary Master Plan ☐ PUD Final Site Plan ☐ Multi-Family Site Plan ☐ Other: _____ **File naming nomenclature examples:* *Freedom Point Site Plan* *Freedom Point Master Plan* *Freedom Point Final Plat* *Freedom Point Elevations*	<u>Annexations/Rezoning:</u> ☐ Written Legal Description copy ☐ Requested Zone Listed ☐ Compliance with Comprehensive Plan ☐ Annexation Permission Form ☐ Plans and/or Plats conforming to City standards <u>Plats/PUDs:</u> • Project Name (include Sections & Phases) Theta Pike Estates • Total Number of Lots 211 • Total acreage 92.42

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	Pentagon Reids, LP	PHONE	(305) 755.3400 x102 (Mike) (760) 486-1931 (Luis)
ADDRESS	~~111 A 3rd Avenue N~~ Nashville, TN 37248	EMAIL	luiscampos@pentagon-holdings.com mike.shemsie@landgroup.biz

PROPERTY OWNER NAME	STARLING P. DAVIS Legacy Trust	PHONE	615.485.6047
ADDRESS	32 Washington Park Nashville, TN 37205	EMAIL	

Pentagon Reids, LP
6700 Tower Circle
Suite 330
Franklin, TN
37067

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.

~~Pentagon Reids, LP~~ APPLICANT NAME	APPLICANT SIGNATURE	~~April 18, 2022~~ DATE
~~Starling P. Davis Legacy Trust~~ PROPERTY OWNER NAME	Authentisign ~~Starling Davis~~ PROPERTY OWNER SIGNATURE	~~April 18, 2022~~ DATE

STAFF USE ONLY

DOCKET NO.		FEE PAID	
RECEIPT NO.		REQUESTED AGENDA	

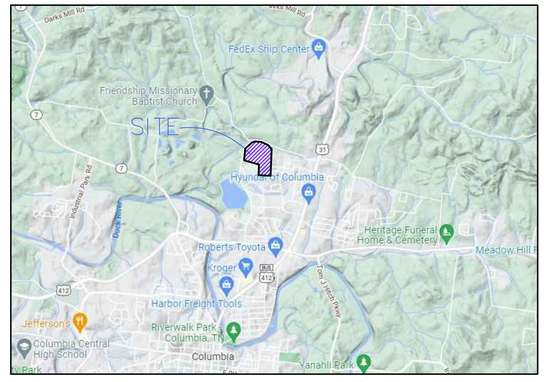
DATE NOTICES SENT TO ADJACENT PROPERTY OWNERS	
DATE OF PUBLIC NOTICES IN DAILY HERALD	

BOARD ACTION	

PRELIMINARY PLAT
OF
THETA PIKE ESTATES

GRAPHIC SCALE 1" = 100'
0 50 100 200

PROJECT LOCATION



DEVELOPER
PENTAGON REIDS, LP
6700 TOWER CIRCLE, SUITE 330
FRANKLIN, TN 37067

OWNERS
DAVIS STARLING, LEGACY TRUST ETAL CO
STARLING DAVIS CLARK TRUSTEE PROPERTY
TAX MAP 075, PARCEL 001.03
THETA DRIVE, COLUMBIA, TN 38401
ZONED RS-10

PROPERTY IS ZONED RS-10

Sheet List Table

Sheet Title	Sheet Title
PP1	PRELIMINARY PLAT
PP2	PRELIMINARY PLAT
PP3	PRELIMINARY PLAT
PP4	PROPOSED UTILITY PLAN
PP5	PROPOSED UTILITY PLAN
PP6	LOT INFORMATION
PP7	DETAILS

I HEREBY CERTIFY THAT THESE PLANS AND SPECIFICATIONS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION, AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF TENNESSEE.

MICHAEL R. SHAMSIE, P.E.
TN. P.E. #106732
EXP. DATE OCTOBER 2022
4/18/2022
DATE
ALL SHEET COVERED BY SEAL
IF SEAL AND/OR SIGNATURE IS NOT A CONTRASTING COLOR, THIS DOCUMENT IS NOT AN ORIGINAL.

REVISIONS

NO.	DESCRIPTION	DATE

Landmark
ENGINEERING GROUP
3440 38TH AVENUE, SUITE 4
(309) 755-3400
MOLINE, IL 61265
FAX (309) 755-3522
CIVIL ENGINEERING AND LAND SURVEYING
TENNESSEE DESIGN FIRM NUMBER F-21044

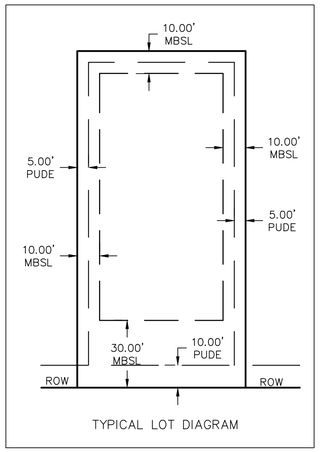
PRELIMINARY PLAT
THETA PIKE ESTATES
COLUMBIA, TENNESSEE

DATE: 4/18/2022
DRAWN BY: HLG
CHECKED BY: MRS

PP1

01-21-1650

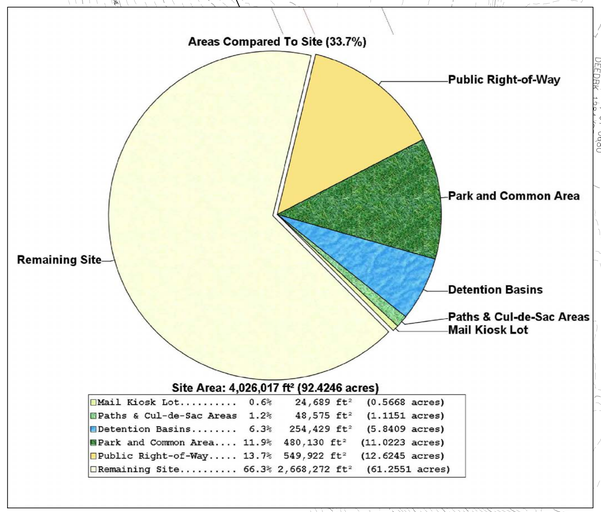
PRELIMINARY PLAT
OF
THETA PIKE ESTATES



TYPICAL LOT DIAGRAM

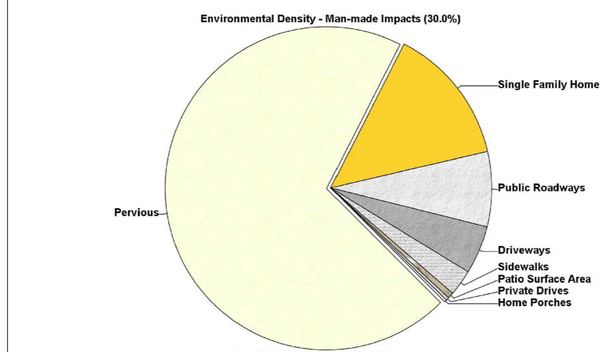
LEGEND

- PROPERTY LINE
- 610 EXISTING CONTOUR
- 610 PROPOSED CONTOUR
- EXISTING LOT LINE/R.O.W.
- EXISTING BITUMINOUS PAVEMENT
- EXISTING CURB AND GUTTER
- PROPOSED EASEMENT
- PROPOSED BUILDING SETBACK
- PROPOSED CURB AND GUTTER
- W EXISTING WATERMAIN
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- PROPOSED 8" WATER LINE
- PROPOSED FIRE HYDRANT
- PROPOSED CURB BOX
- PROPOSED TV&S
- EXISTING STORM INLET
- PROPOSED STORM INLET
- PROPOSED STORM MANHOLE
- PROPOSED FLARED END SECTION (FES)
- PROPOSED STORM SEWER
- PROPOSED UNDERDRAIN
- EXISTING SANITARY MANHOLE
- EXISTING FORCEMAIN
- EXISTING SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- >> PROPOSED 8" SANITARY SEWER
- EXISTING TELEPHONE LINE
- EXISTING TELEPHONE PEDESTAL
- EXISTING ELECTRIC BOX
- EXISTING FIBER OPTIC BOX
- UE EXISTING UNDERGROUND ELECTRIC LINE
- FO EXISTING UNDERGROUND MEDIA/ FIBER OPTICS LINE
- GAS EXISTING GAS LINE
- EXISTING POWER POLE
- EXISTING LIGHT POLE



Site Area: 4,026,017 ft² (92.4246 acres)

Mail Kiosk Lot.....	0.6%	24,689 ft²	(0.5668 acres)
Paths & Cul-de-Sac Areas	1.2%	48,575 ft²	(1.1151 acres)
Detention Basins.....	6.3%	254,429 ft²	(5.8409 acres)
Park and Common Area....	11.9%	480,130 ft²	(11.0223 acres)
Public Right-of-Way.....	13.7%	549,922 ft²	(12.6245 acres)
Remaining Site.....	66.3%	2,668,272 ft²	(61.2551 acres)



Total Site: 4,026,018 ft² (92.4247 acres)

Home Porches.....	0.3%	10,972 ft²	(0.2519 acres)	Private Drives....	0.3%	12,888 ft²	(0.2959 acres)
Patio Surface Area	0.6%	24,004 ft²	(0.5511 acres)	Sidewalks.....	2.6%	104,514 ft²	(2.3993 acres)
Driveways.....	4.8%	194,185 ft²	(4.4579 acres)	Public Roadways...	7.5%	302,423 ft²	(6.9427 acres)
Single Family Home	13.8%	556,970 ft²	(12.7863 acres)	Pervious.....	70.0%	2,820,062 ft²	(64.7397 acres)

FOR LOT INFORMATION IS ON SHEET PP6

FOR UTILITIES INFORMATION SEE SHEETS PP4 AND PP5

4/18/2022

REVISIONS		
NO.	DESCRIPTION	DATE

Landmark
ENGINEERING GROUP
3440 38TH AVENUE, SUITE 4
(309) 755-3400
MOLINE, IL 61265
FAX (309) 755-5522
CIVIL ENGINEERING AND LAND SURVEYING
TENNESSEE DESIGN FIRM NUMBER F-21044

PRELIMINARY PLAT
THETA PIKE ESTATES
COLUMBIA, TENNESSEE

DATE: 4/18/2022
DRAWN BY: HLG
CHECKED BY: MRS

PP2

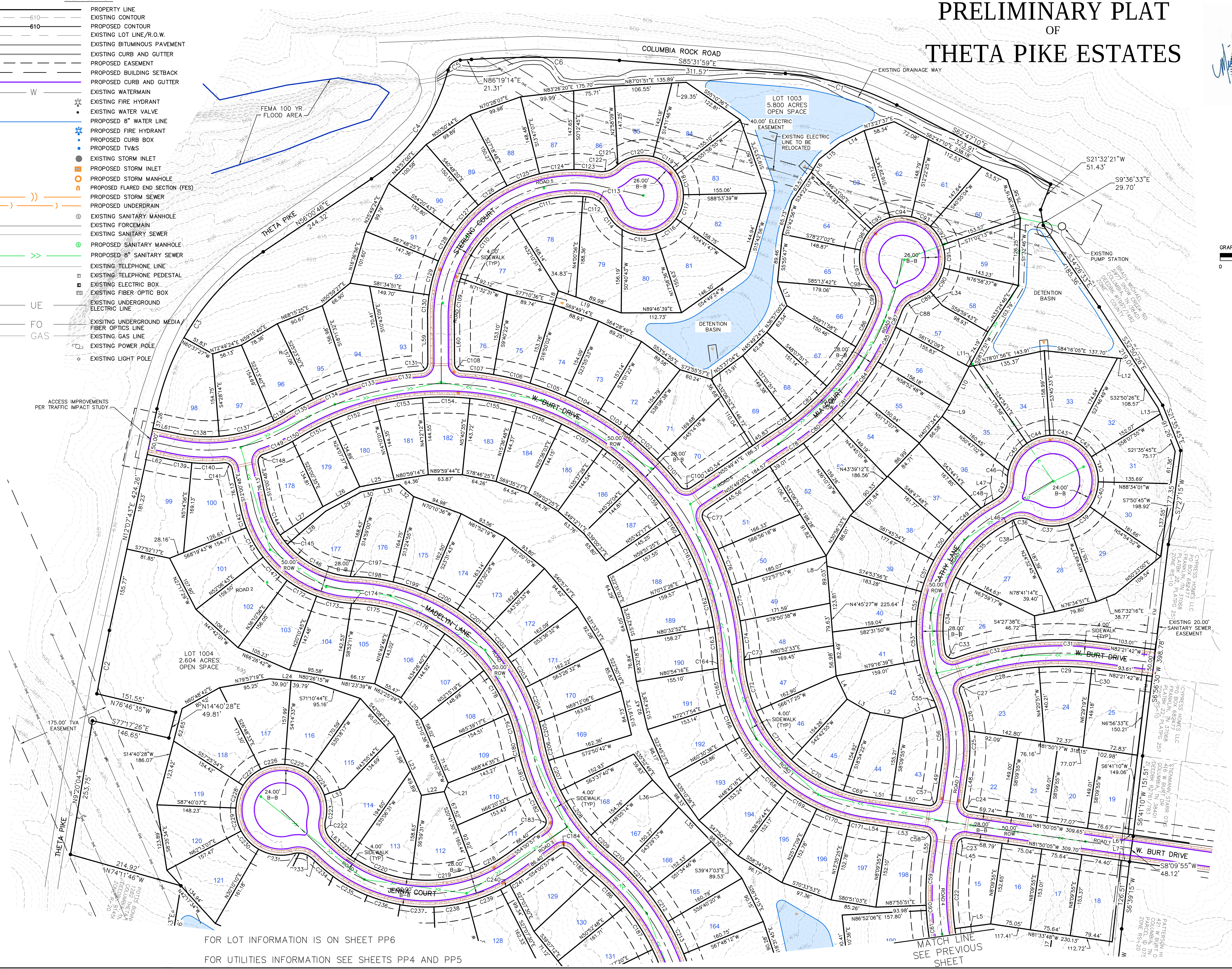
01-21-1650

PRELIMINARY PLAT
OF
THETA PIKE ESTATES

4/18/2022

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING LOT LINE/R.O.W.
- EXISTING BITUMINOUS PAVEMENT
- EXISTING CURB AND GUTTER
- PROPOSED EASEMENT
- PROPOSED BUILDING SETBACK
- PROPOSED CURB AND GUTTER
- EXISTING WATERMAIN
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- PROPOSED 8" WATER LINE
- PROPOSED FIRE HYDRANT
- PROPOSED CURB BOX
- PROPOSED TV&S
- EXISTING STORM INLET
- PROPOSED STORM INLET
- PROPOSED STORM MANHOLE
- PROPOSED FLARED END SECTION (FES)
- PROPOSED STORM SEWER
- PROPOSED UNDERDRAIN
- EXISTING SANITARY MANHOLE
- EXISTING FORCEMAIN
- EXISTING SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- PROPOSED 8" SANITARY SEWER
- EXISTING TELEPHONE LINE
- EXISTING TELEPHONE PEDESTAL
- EXISTING ELECTRIC BOX
- EXISTING FIBER OPTIC BOX
- EXISTING UNDERGROUND ELECTRIC LINE
- EXISTING UNDERGROUND MEDIA FIBER OPTICS LINE
- EXISTING GAS LINE
- EXISTING POWER POLE
- EXISTING LIGHT POLE



FOR LOT INFORMATION IS ON SHEET PP6

FOR UTILITIES INFORMATION SEE SHEETS PP4 AND PP5

NO.	DESCRIPTION	DATE
	REVISIONS	

Landmark
ENGINEERING GROUP
3440 38TH AVENUE, SUITE 4 MOLINE, IL. 61265
(309) 755-3400 FAX (309) 755-5522
CIVIL ENGINEERING AND LAND SURVEYING
TENNESSEE DESIGN FIRM NUMBER F-21044

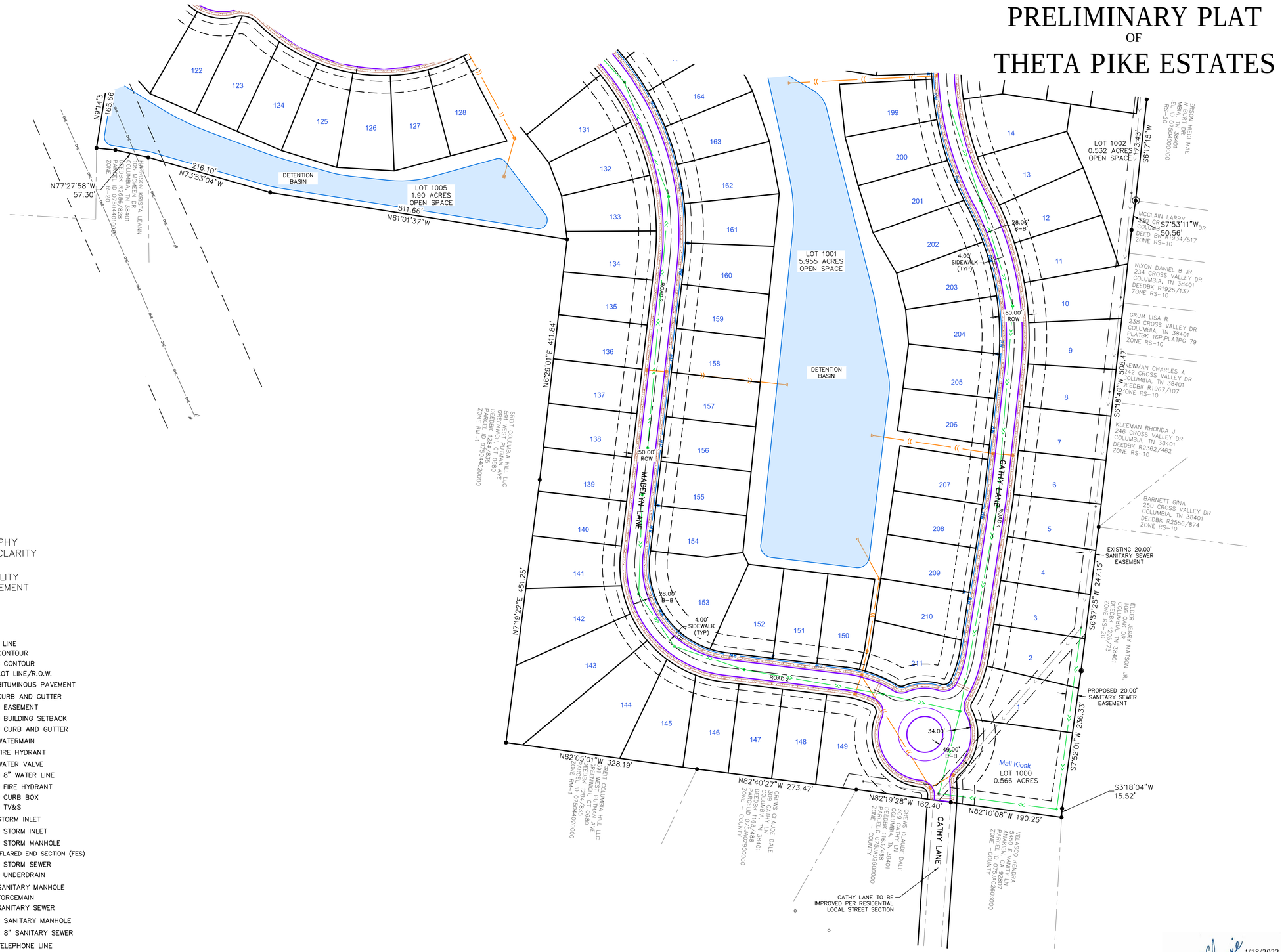
PRELIMINARY PLAT
THETA PIKE ESTATES
COLUMBIA, TENNESSEE

DATE: 4/18/2022
DRAWN BY: HLG
CHECKED BY: MRS

PP3

01-21-1650

PRELIMINARY PLAT
OF
THETA PIKE ESTATES



EXISTING TOPOGRAPHY
TURNED OFF FOR CLARITY

PUDE – PUBLIC UTILITY
AND DRAINAGE EASEMENT

LEGEND

- PROPERTY LINE
- 610 EXISTING CONTOUR
- 610 PROPOSED CONTOUR
- EXISTING LOT LINE/R.O.W.
- EXISTING BITUMINOUS PAVEMENT
- EXISTING CURB AND GUTTER
- PROPOSED EASEMENT
- PROPOSED BUILDING SETBACK
- PROPOSED CURB AND GUTTER
- W EXISTING WATERMAIN
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- PROPOSED 8" WATER LINE
- PROPOSED FIRE HYDRANT
- PROPOSED CURB BOX
- PROPOSED TV&S
- EXISTING STORM INLET
- PROPOSED STORM INLET
- PROPOSED STORM MANHOLE
- PROPOSED FLARED END SECTION (FES)
- PROPOSED STORM SEWER
- PROPOSED UNDERDRAIN
- EXISTING SANITARY MANHOLE
- EXISTING FORCEMAIN
- EXISTING SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- PROPOSED 8" SANITARY SEWER
- EXISTING TELEPHONE LINE
- EXISTING TELEPHONE PEDESTAL
- EXISTING ELECTRIC BOX
- EXISTING FIBER OPTIC BOX
- UE EXISTING UNDERGROUND ELECTRIC LINE
- FO EXISITNG UNDERGROUND MEDIA/ FIBER OPTICS LINE
- GAS EXISTING GAS LINE
- EXISTING POWER POLE
- EXISTING LIGHT POLE

4/18/2022

NO.	REVISIONS DESCRIPTION	DATE

Landmark
ENGINEERING GROUP
3440 38TH AVENUE, SUITE 4
(309) 755-3400
MOLINE, IL 61265
FAX (309) 755-5522
CIVIL ENGINEERING AND LAND SURVEYING
TENNESSEE DESIGN FIRM NUMBER F-21044

PROPOSED UTILITY PLAN

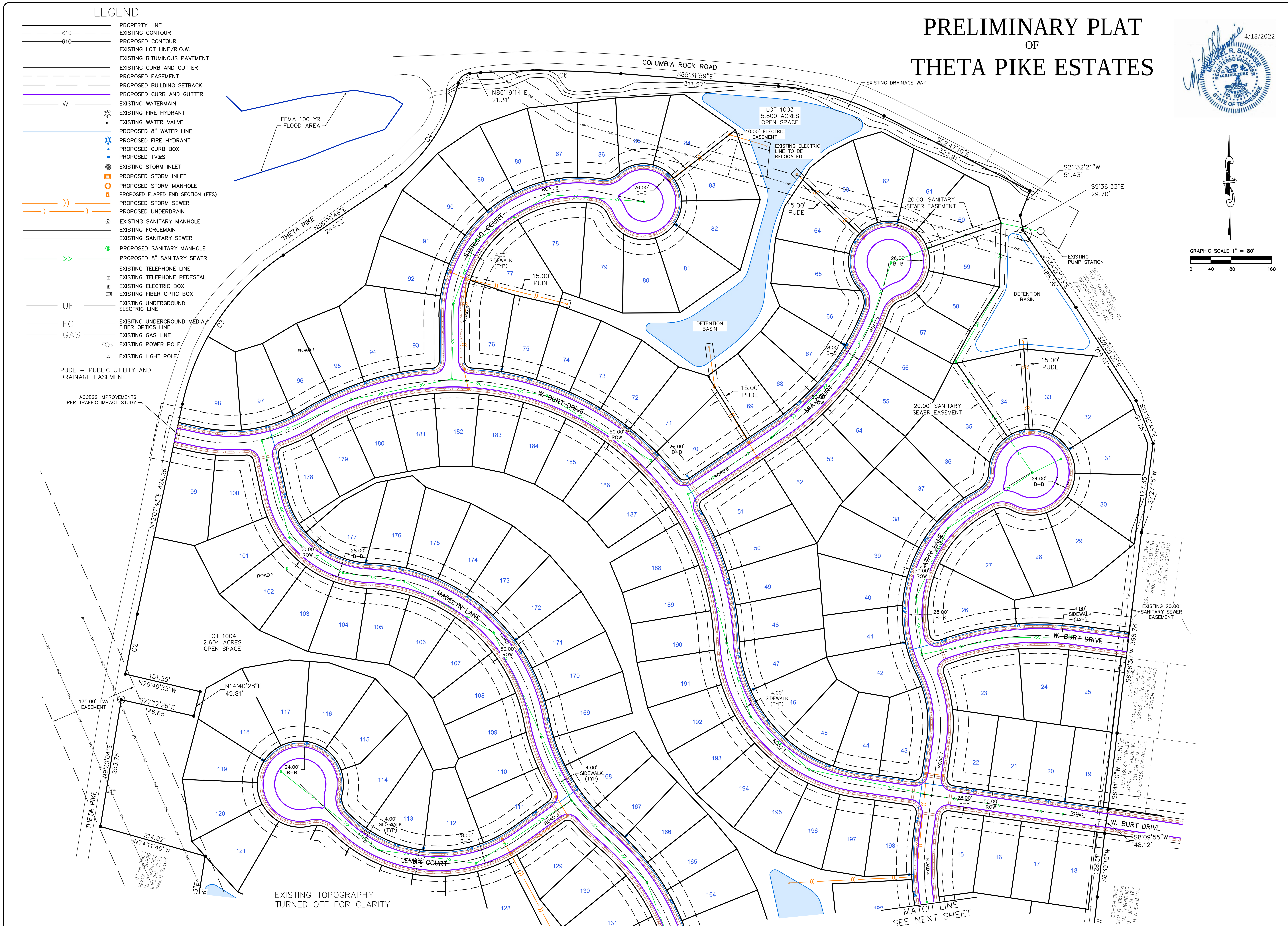
THETA PIKE ESTATES
COLUMBIA, TENNESSEE

DATE: 4/18/2022
DRAWN BY: HLG
CHECKED BY: MRS

PP4

01-21-1650

PRELIMINARY PLAT
OF
THETA PIKE ESTATES


LEGEND
PROPERTY LINE
EXISTING CONTOUR
PROPOSED CONTOUR
EXISTING LOT LINE/R.O.W.
EXISTING BITUMINOUS PAVEMENT
EXISTING CURB AND GUTTER
PROPOSED EASEMENT
PROPOSED BUILDING SETBACK
PROPOSED CURB AND GUTTER
EXISTING WATERMAIN
EXISTING FIRE HYDRANT
EXISTING WATER VALVE
PROPOSED 8" WATER LINE
PROPOSED FIRE HYDRANT
PROPOSED CURB BOX
PROPOSED TV&S
EXISTING STORM INLET
PROPOSED STORM INLET
PROPOSED STORM MANHOLE
PROPOSED FLARED END SECTION (FES)
PROPOSED STORM SEWER
PROPOSED UNDERDRAIN
EXISTING SANITARY MANHOLE
EXISTING FORCEMAIN
EXISTING SANITARY SEWER
PROPOSED SANITARY MANHOLE
PROPOSED 8" SANITARY SEWER
EXISTING TELEPHONE LINE
EXISTING TELEPHONE PEDESTAL
EXISTING ELECTRIC BOX
EXISTING FIBER OPTIC BOX
EXISTING UNDERGROUND ELECTRIC LINE
EXISTING UNDERGROUND MEDIA/ FIBER OPTICS LINE
EXISTING GAS LINE
EXISTING POWER POLE
EXISTING LIGHT POLE
PUDE – PUBLIC UTILITY AND DRAINAGE EASEMENT
ACCESS IMPROVEMENTS PER TRAFFIC IMPACT STUDY
FEMA 100 YR FLOOD AREA
COLUMBIA ROCK ROAD
S85°31'59"E 311.57'
N86°19'14"E 21.31'
EXISTING DRAINAGE WAY
LOT 1003 5.800 ACRES OPEN SPACE
40.00' ELECTRIC EASEMENT
EXISTING ELECTRIC LINE TO BE RELOCATED
S62°47'10"E 323.91'
S21°32'21"W 51.43'
S9°36'33"E 29.70'
EXISTING PUMP STATION
20.00' SANITARY SEWER EASEMENT
DETENTION BASIN
THETA PIKE
N56°00'46"E 244.32'
STERLING COURT
W. BURT DRIVE
MIA COURT
MADELYN LANE
JENNA COURT
KATHY LANE
LOT 1004 2.604 ACRES OPEN SPACE
N12°07'43"E 424.26'
151.55' N76°46'35"W
S77°17'26"E 146.65'
N14°40'28"E 49.81'
175.00' TVA EASEMENT
N9°20'04"E 253.75'
214.92' N74°11'46"W
S34°26'33"E 185.36'
S32°50'26"E 219.01'
S21°35'45"E 91.26'
S7°27'15"W 177.35'
S6°56'30"W 398.78'
S6°41'10"W 151.51'
S8°09'55"W 48.12'
S6°39'15"W 126.51'
EXISTING 20.00' SANITARY SEWER EASEMENT
EXISTING TOPOGRAPHY TURNED OFF FOR CLARITY
MATCH LINE SEE NEXT SHEET
GRAPHIC SCALE 1" = 80'

Michael R. Shamsie, Registered Engineer, State of Tennessee — 4/18/2022

NO.	REVISIONS DESCRIPTION	DATE

Landmark ENGINEERING GROUP
3440 38TH AVENUE, SUITE 4 MOLINE, IL 61265
(309) 755-3400 FAX (309) 755-5522
CIVIL ENGINEERING AND LAND SURVEYING
TENNESSEE DESIGN FIRM NUMBER F-21044

PROPOSED UTILITY PLAN
THETA PIKE ESTATES
COLUMBIA, TENNESSEE

DATE: 4/18/2022
DRAWN BY: HLG
CHECKED BY: MRS

PP5

01-21-1650

Curve Table

Curve #	Length	Radius	Delta	Chord Direction	Chord Length
C8	36.79	215.00	9.81	N0° 09' 33"W	36.75
C9	13.27	14.00	54.32	S22° 05' 58"W	12.78
C10	103.21	90.00	65.70	N16° 24' 32"E	97.64
C11	17.08	90.00	10.87	N21° 52' 45"W	17.05
C12	14.14	14.00	57.87	S1° 37' 15"W	13.55
C13	66.68	225.00	16.98	N22° 04' 02"E	66.43
C14	18.66	225.00	4.75	N11° 12' 08"E	18.65
C15	12.31	525.00	1.34	N5° 38' 28"E	12.31
C16	70.12	525.00	7.65	N1° 08' 35"E	70.07
C17	68.92	525.00	7.52	N6° 26' 38"W	68.87
C18	69.44	525.00	7.58	N13° 59' 37"W	69.39
C19	22.86	525.00	2.50	N26° 39' 19"W	22.86
C20	66.99	475.00	8.08	S23° 51' 46"E	66.93
C21	101.55	475.00	12.25	S13° 41' 53"E	101.36
C22	130.48	475.00	15.74	S0° 17' 46"W	130.07
C23	21.99	14.00	90.00	S53° 09' 55"W	19.80
C24	21.99	14.00	90.00	S36° 50' 05"E	19.80
C25	67.94	275.00	14.16	N1° 05' 15"E	67.77
C26	73.44	275.00	15.30	N13° 38' 25"W	73.22
C27	22.31	14.00	91.29	S24° 21' 24"W	20.02
C28	143.39	525.00	15.65	S77° 49' 41"W	142.94
C29	99.29	525.00	10.84	N88° 55' 46"W	99.14
C30	10.54	525.00	1.15	N82° 56' 11"W	10.53
C31	121.42	575.00	12.10	N88° 24' 40"W	121.20
C32	155.79	575.00	15.52	S77° 46' 38"W	155.32
C33	24.22	14.00	99.10	S60° 25' 58"E	21.31
C34	144.88	225.00	36.89	S7° 33' 56"W	142.39
C35	130.59	225.00	33.26	S42° 38' 23"W	128.77
C36	35.34	39.00	51.92	N87° 46' 02"W	34.15
C37	71.24	85.00	48.02	S85° 48' 53"E	69.17
C38	4.77	39.00	7.00	S62° 46' 09"W	4.76
C39	52.06	85.00	35.09	N52° 37' 51"E	51.25
C40	49.92	85.00	33.65	N18° 15' 34"E	49.21
C41	49.40	85.00	33.30	N15° 13' 03"W	48.71
C42	45.03	85.00	30.35	N47° 02' 38"W	44.50
C43	46.79	85.00	31.54	N77° 59' 22"W	46.20
C44	45.71	85.00	30.81	S70° 50' 08"W	45.16
C45	62.95	85.00	42.44	S34° 12' 45"W	61.53
C46	18.77	85.00	12.65	S6° 40' 03"W	18.73
C47	40.11	39.00	58.93	N29° 48' 15"E	38.37
C48	15.94	275.00	3.32	S57° 36' 28"W	15.93
C49	70.77	275.00	14.74	S48° 34' 32"W	70.57
C50	62.24	275.00	12.97	S34° 43' 09"W	62.11
C51	63.04	275.00	13.13	S21° 40' 05"W	62.90
C52	55.79	275.00	11.62	S9° 17' 23"W	55.69
C53	73.72	275.00	15.36	S4° 12' 03"E	73.50
C54	67.11	275.00	13.98	S18° 52' 16"E	66.94
C55	25.58	225.00	6.51	N22° 36' 18"W	25.57
C56	108.04	225.00	27.51	N5° 35' 29"W	107.01
C57	21.99	14.00	90.00	N53° 09' 55"E	19.80
C58	21.99	14.00	90.00	N36° 50' 05"W	19.80
C59	93.78	525.00	10.23	S3° 02' 53"W	93.65
C60	9.74	525.00	1.06	S2° 36' 02"E	9.74
C61	69.50	525.00	7.58	S6° 55' 27"E	69.45
C62	71.72	525.00	7.83	S14° 37' 49"E	71.67
C63	73.54	525.00	8.03	S22° 33' 24"E	73.48
C64	12.22	525.00	1.33	S27° 14' 10"E	12.22
C65	65.65	475.00	7.92	N23° 56' 36"W	65.60
C66	94.95	475.00	11.45	N14° 15' 25"W	94.79
C67	99.47	475.00	12.00	N2° 31' 52"W	99.29
C68	23.58	475.00	2.84	N4° 53' 26"E	23.58
C69	51.55	275.00	10.74	S76° 27' 51"E	51.48
C70	114.28	275.00	23.81	S59° 11' 21"E	113.46
C71	113.15	275.00	23.57	S35° 29' 50"E	112.35
C72	98.64	275.00	20.55	S13° 26' 03"E	98.11
C73	2.75	275.00	0.57	S2° 52' 17"E	2.75
C74	70.72	565.00	7.17	N6° 10' 12"W	70.67
C75	69.61	565.00	7.06	N13° 17' 07"W	69.57
C76	71.37	565.00	7.24	N20° 26' 01"W	71.32
C77	21.05	14.00	86.14	S12° 45' 15"W	19.12
C78	37.18	525.00	4.06	N55° 51' 24"E	37.17
C79	40.76	475.00	4.92	N55° 25' 38"E	40.75
C80	69.44	525.00	7.58	N50° 02' 20"E	69.39
C81	68.43	525.00	7.47	N42° 30' 56"E	68.38
C82	92.02	475.00	11.10	N47° 25' 09"E	91.88
C83	91.76	475.00	11.07	N36° 20' 06"E	91.62
C84	70.20	525.00	7.66	N34° 57' 03"E	70.15
C85	72.88	525.00	7.95	N27° 08' 34"E	72.83
C86	79.32	475.00	9.57	N26° 00' 59"E	79.23
C87	30.25	525.00	3.30	N21° 30' 54"E	30.25
C88	35.85	39.00	52.66	S46° 11' 48"W	34.60
C89	32.13	80.00	23.01	N61° 01' 24"E	31.91
C90	50.96	80.00	36.50	N31° 16' 14"E	50.10
C91	44.66	80.00	31.99	N2° 58' 12"W	44.08
C92	42.05	80.00	30.12	N34° 01' 22"W	41.57
C93	39.86	80.00	28.54	N63° 21' 16"W	39.44
C94	40.31	80.00	28.87	S87° 56' 25"W	39.88
C95	41.97	80.00	30.06	S58° 28' 43"W	41.49
C96	44.54	80.00	31.90	S27° 29' 59"W	43.97
C97	74.89	80.00	53.64	S15° 16' 11"E	72.19
C98	5.54	39.00	8.13	N38° 01' 22"W	5.53
C99	37.57	39.00	55.19	N6° 21' 44"W	36.13
C100	21.05	14.00	86.14	S81° 06' 29"E	19.12
C101	66.29	565.00	6.72	N41° 24' 01"W	66.25
C102	69.96	565.00	7.09	N48° 18' 32"W	69.92
C103	70.22	565.00	7.12	N55° 25' 00"W	70.18
C104	69.98	565.00	7.10	N62° 31' 33"W	69.94
C105	69.93	565.00	7.09	N69° 37' 13"W	69.89
C106	70.62	565.00	7.16	N76° 44' 48"W	70.57
C107	60.10	565.00	6.09	N83° 22' 29"W	60.07
C108	21.05	14.00	86.14	S43° 21' 11"E	19.12
C109	73.60	225.00	18.74	S9° 05' 13"W	73.27
C110	154.57	225.00	39.36	S38° 08' 19"W	151.55
C111	142.14	225.00	36.20	S75° 55' 02"W	139.79
C112	12.06	225.00	3.07	N84° 26' 57"W	12.06
C113	41.77	39.00	61.37	N52° 13' 39"W	39.81
C114	47.77	75.00	36.49	S39° 47' 19"E	46.97
C115	65.37	75.00	49.94	S83° 00' 22"E	63.32
C116	48.07	75.00	36.72	N53° 39' 49"E	47.25
C117	47.66	75.00	36.41	N17° 05' 56"E	46.86
C118	48.36	75.00	36.95	N19° 34' 43"W	47.53
C119	49.42	75.00	37.75	N56° 55' 39"W	48.53
C120	70.29	75.00	53.70	S77° 20' 44"W	67.75
C121	4.59	75.00	3.51	S48° 44' 29"W	4.59
C122	35.67	39.00	52.40	N73° 11' 16"E	34.44
C123	46.08	275.00	9.60	N85° 24' 44"W	46.02
C124	65.15	275.00	13.57	S83° 00' 04"W	64.99
C125	64.93	275.00	13.53	S69° 27' 02"W	64.78
C126	64.76	275.00	13.49	S55° 56' 26"W	64.61
C127	64.99	275.00	13.54	S42° 25' 28"W	64.84
C128	64.61	275.00	13.46	S28° 55' 26"W	64.46
C129	66.11	275.00	13.77	S15° 18' 22"W	65.95
C130	41.77	275.00	8.70	S4° 04' 03"W	41.73
C131	21.05	14.00	86.14	N42° 47' 05"E	19.12
C132	64.82	565.00	6.57	S82° 34' 02"W	64.78
C133	73.69	565.00	7.47	S75° 32' 39"W	73.64
C134	71.00	565.00	7.20	S68° 12' 29"W	70.95
C135	61.08	565.00	6.19	S61° 30' 40"W	61.05
C136	22.96	275.00	4.78	N60° 48' 19"E	22.95
C137	107.19	275.00	22.33	N74° 21' 47"E	106.51
C138	79.67	275.00	16.60	S86° 10' 16"E	79.39
C139	39.02	325.00	6.88	S81° 18' 40"E	39.00
C140	60.44	325.00	10.66	N89° 55' 16"E	60.36
C141	20.38	14.00	83.39	N53° 42' 36"W	18.63
C142	37.93	225.00	9.66	S16° 50' 32"E	37.88
C143	63.68	225.00	16.22	S29° 46' 47"E	63.47
C144	65.59	175.00	21.47	S22° 45' 02"E	65.21
C145	22.02	175.00	7.21	S37° 05' 33"E	22.00
C146	135.79	175.00	44.46	S62° 55' 32"E	132.41
C147	62.56	225.00	15.93	S45° 51' 11"E	62.35
C148	20.38	14.00	83.39	S29° 41' 01"W	18.63
C149	60.10	325.00	10.60	N66° 04' 58"E	60.01
C150	13.45	325.00	2.37	N59° 35' 58"E	13.45
C151	67.05	515.00	7.46	S62° 08' 36"W	67.00
C152	89.53	515.00	9.96	S70° 51' 11"W	89.41
C153	89.56	515.00	9.96	S80° 48' 54"W	89.44
C154	88.80	515.00	9.88	N89° 15' 49"W	88.69
C155	89.32	515.00	9.94	N79° 21' 19"W	89.21
C156	89.77	515.00	9.99	N69° 23' 35"W	89.66
C157	90.09	515.00	10.02	N59° 23' 15"W	89.98
C158	88.78	515.00	9.88	N49° 26' 15"W	88.67
C159	91.71	515.00	10.20	N39° 23' 49"W	91.59
C160	37.32	515.00	4.15	N32° 13' 09"W	37.31
C161	93.03	515.00	10.35	N24° 58' 05"W	92.91
C162	92.95	515.00	10.34	N14° 37' 21"W	92.82
C163	61.73	515.00	6.87	N6° 01' 06"W	61.69
C164	16.29	325.00	2.87	S4° 01' 12"E	16.28
C165	69.46	325.00	12.25	S11° 34' 43"E	69.33
C166	66.87	325.00	11.79	S23° 35' 45"E	66.75
C167	66.97	325.00	11.81	S35° 23' 34"E	66.85
C168	67.27	325.00	11.86	S47° 13' 30"E	67.15
C169	65.57	325.00	11.56	S58° 56' 03"E	65.46
C170	66.34	325.00	11.70	S70° 33' 43"E	66.23
C171	30.77	325.00	5.42	S79° 07' 20"E	30.76
C172	62.84	225.00	16.00	S61° 49' 10"E	62.64
C173	66.98	225.00	17.06	S78° 20' 57"E	66.73
C174	3.45	225.00	0.88	S87° 19' 00"E	3.45
C175	82.73	325.00	14.59	N80° 27' 48"W	82.51
C176	99.92	325.00	17.61	N64° 21' 47"W	99.52
C177	101.03	325.00	17.81	N46° 39' 01"W	100.62
C178	93.23	325.00	16.44	N29° 31' 36"W	92.91
C179	59.24	325.00	10.44	N16° 05' 12"W	59.16
C180	21.15	425.00	2.85	S12° 17' 25"E	21.14
C181	73.75	425.00	9.94	S18° 41' 12"E	73.66
C182	53.63	425.00	7.23	S27° 16' 21"E	53.59
C183	20.75	14.00	84.90	N11° 33' 51"E	18.90
C184	20.75	14.00	84.90	N83° 31' 57"W	18.90
C185	66.95	425.00	9.03	S45° 35' 39"E	66.89
C186	81.50	425.00	10.99	N44° 36' 49"W	81.37
C187	95.75	425.00	12.91	N32° 39' 56"W	95.55
C188	96.55	425.00	13.02	N19° 42' 11"W	96.34
C189	95.74	425.00	12.91	N6° 44' 29"W	95.54
C190	51.52	425.00	6.95	N3° 11' 06"E	51.49
C191	58.21	200.00	16.68	S1° 40' 48"E	58.00
C192	49.96	200.00	14.31	S17° 10' 29"E	49.83
C193	54.35	200.00	15.57	S32° 07' 01"E	54.18
C194	46.25	200.00	13.25	S46° 31' 35"E	46.15
C195	56.08	200.00	16.07	S61° 11' 02"E	55.90
C196	48.29	200.00	13.83	S76° 08' 03"E	48.18
C197	7.95	175.00	2.60	S86° 27' 18"E	7.95
C198	73.11	375.00	11.17	N82° 10' 13"W	73.00
C199	66.19	375.00	10.11	N71° 31' 41"W	66.10
C200	65.31	375.00	9.98	N61° 28' 54"W	65.23
C201	65.46	375.00	10.00	N51° 29' 29"W	65.38
C202	66.10	375.00	10.10	N41° 26' 27"W	66.02
C203	64.36	375.00	9.83	N31° 28' 28"W	64.28
C204	69.59	375.00	10.63	N21° 14' 28"W	69.49
C205	33.12	375.00	5.06	N13° 23' 41"W	33.11
C206	41.17	375.00	6.29	S14° 00' 36"E	41.15
C207	60.33	375.00	9.22	S21° 45' 49"E	60.26
C208	101.71	375.00	15.54	S34° 08' 33"E	101.40
C209	53.63	375.00	8.19	S46° 00' 36"E	53.59
C210	29.80	475.00	3.59	N48° 18' 37"W	29.79
C211	67.09	475.00	8.09	N42° 28' 00"W	67.03
C212	67.09	475.00	8.09	N34° 22' 27"W	67.04
C213	67.41	475.00	8.13	N26° 15' 44"W	67.35
C214	67.47	475.00	8.14	N18° 07' 38"W	67.42
C215	67.52	475.00	8.14	N9° 59' 08"W	67.46
C216	67.11	475.00	8.09	N1° 51' 58"W	67.05
C217	37.11	475.00	4.48	N4° 25' 11"E	37.10
C218	66.73	250.00	15.29	N61° 39' 44"E	66.53
C219	120.79	250.00	27.68	N83° 09' 01"E	119.62
C220	122.68	250.00	28.12	S68° 56' 59"E	121.46
C221	39.48	250.00	9.05	S50° 22' 03"E	39.44
C222	40.11	39.00	58.93	S16° 22' 48"E	38.37
C223	47.88	85.00	32.27	N3° 03' 10"W	47.25
C224	52.67	85.00	35.51	N36° 56' 31"W	51.84
C225	46.08	85.00	31.06	N70° 13' 35"W	45.52
C226	46.07	85.00	31.05	S78° 43' 00"W	45.50
C227	45.43	85.00	30.62	S47° 52' 47"W	44.89
C228	44.86	85.00	30.24	S17° 26' 59"W	44.34
C229	44.67	85.00	30.11	S12° 43' 30"E	44.16
C230	47.55	85.00	32.05	S43° 48' 22"E	46.93
C231	66.67	85.00	44.94	S82° 18' 02"E	64.97
C232	12.01	39.00	17.64	S84° 02' 55"W	11.96
C233	28.10	39.00	41.29	N66° 29' 16"W	27.50
C234	42.39	300.00	8.10	S49° 53' 29"E	42.35
C235	73.39	300.00	14.02	S60° 56' 49"E	73.20
C236	64.04	300.00	12.23	S74° 04' 14"E	63.92
C237	63.55	300.00	12.14	S86° 15' 16"E	63.43
C238	64.95	300.00	12.41	N81° 28' 28"E	64.83
C239	64.91	300.00	12.40	N69° 04' 24"E	64.78
C240	20.01	300.00	3.82	N60° 57' 49"E	20.01
C241	26.37	300.00	5.04	N56° 32' 03"E	26.36
C242	205.39	150.00	78.45	S32° 34' 05"E	189.71
C243	29.47	150.00	11.26	S77° 25' 22"E	29.42
C244	23.13	244.09	5.43	N80° 06' 47"W	23.12
C245	10.00	217.10	2.64	N75° 25' 50"W	10.00
C246	59.52	217.10	15.71	N66° 15' 22"W	59.34
C247	13.27	14.00	54.32	S85° 31' 16"E	12.78
C248	63.34	90.00	40.33	S87° 28' 50"W	62.04
C249	19.99	14.00	81.82	N66° 43' 53"E	18.34
C250	51.90	175.00	16.99	N17° 19' 23"E	51.71
C251	51.53	165.00	17.89	N74° 06' 19"W	51.32
C252	21.16	14.00	86.60	N21° 51' 24"W	19.20
C253	167.00	90.00	106.31	S31° 42' 39"E	144.05
C254	21.16	14.00	86.60	N41° 33' 54"W	19.20
C255	5.84	165.00	2.03	N2° 45' 06"E	5.84

Line Table

Line #	Length	Direction
L1	65.970	N70° 39' 07"E
L2	62.657	S80° 10' 36"E
L3	49.683	S59° 56' 02"E
L4	48.312	S25° 24' 54"E
L5	67.515	S82° 25' 36"W
L6	10.003	N81° 50' 05"W
L7	15.822	N81° 50' 05"W
L8	19.338	N04° 45' 27"W
L9	25.381	N32° 28' 37"E
L10	80.518	N27° 08' 04"E
L11	8.546	N78° 01' 56"E
L12	16.916	S84° 16' 05"E
L13	12.517	S21° 35' 45"E
L14	51.430	S63° 02' 08"W
L15	50.000	N51° 49' 24"E
L16	28.023	N30° 55' 00"E
L17	48.187	S21° 19' 54"E
L18	27.255	N17° 38' 30"E
L19	124.815	N70° 34' 53"W
L20	55.271	S42° 28' 07"E
L21	17.790	N24° 08' 24"E
L22	43.322	N80° 49' 24"E
L23	121.867	S24° 34' 01"E
L24	79.683	S85° 37' 21"E
L25	65.852	S79° 05' 11"W
L26	78.360	N61° 40' 33"E
L27	95.943	S56° 30' 43"W
L28	95.124	S49° 18' 10"W
L29	76.114	N61° 40' 33"E
L30	22.733	N79° 05' 11"E
L31	49.607	N79° 05' 11"E
L32	34.404	S49° 38' 30"E
L33	40.000	S70° 48' 40"W
L34	35.000	N40° 28' 55"W
L35	88.410	S43° 48' 06"E
L36	71.038	S43° 39' 36"E
L37	13.539	S07° 15' 04"E
L38	22.003	S25° 08' 22"E
L39	35.118	S14° 26' 44"W
L40	24.642	N06° 18' 46"E
L41	15.646	S79° 47' 44"W
L42	11.538	N06° 18' 46"E
L43	12.476	S08° 49' 36"W
L44	18.516	S08° 49' 36"W
L45	28.123	N08° 09' 55"E
L46	19.579	S59° 16' 04"W
L47	19.579	S59° 16' 04"W
L48	67.742	S08° 09' 55"W
L49	67.742	S08° 09' 55"W
L50	69.956	S81° 50' 05"E
L51	40.252	S81° 50' 05"E
L53	70.130	S81° 50' 05"E
L54	40.077	S81° 50' 05"E
L55	28.123	N08° 09' 55"E
L59	86.905	N00° 17' 03"W
L60	86.905	N00° 17' 03"W
L61	46.056	S77° 52' 17"E
L62	46.056	S77° 52' 17"E
L63	7.697	S45° 50' 37"E
L64	7.697	S45° 50' 37"E
L67	46.897	N08° 26' 12"E

lot 1	14,352.2 ft^2	(0.329481 acres)
lot 2	12,497.0 ft^2	(0.286891 acres)
lot 3	11,790.8 ft^2	(0.270681 acres)
lot 4	11,619.5 ft^2	(0.266747 acres)
lot 5	11,449.6 ft^2	(0.262847 acres)
lot 6	11,303.4 ft^2	(0.259490 acres)
lot 7	11,320.9 ft^2	(0.259893 acres)
lot 8	11,456.7 ft^2	(0.263010 acres)
lot 9	12,058.0 ft^2	(0.276813 acres)
lot 10	13,399.4 ft^2	(0.307607 acres)
lot 11	12,677.6 ft^2	(0.291038 acres)
lot 12	12,096.5 ft^2	(0.277697 acres)
lot 13	12,457.0 ft^2	(0.285974 acres)
lot 14	13,569.8 ft^2	(0.311520 acres)
lot 15	12,758.7 ft^2	(0.292899 acres)
lot 16	11,469.2 ft^2	(0.263297 acres)
lot 17	11,587.2 ft^2	(0.266006 acres)
lot 18	11,811.5 ft^2	(0.271155 acres)
lot 19	11,138.5 ft^2	(0.255704 acres)
lot 20	11,483.9 ft^2	(0.263634 acres)
lot 21	11,348.7 ft^2	(0.260531 acres)
lot 22	12,621.7 ft^2	(0.289755 acres)
lot 23	17,010.1 ft^2	(0.390498 acres)
lot 24	12,470.6 ft^2	(0.286286 acres)
lot 25	15,505.2 ft^2	(0.355949 acres)
lot 26	16,858.6 ft^2	(0.387021 acres)
lot 27	16,714.0 ft^2	(0.383701 acres)
lot 28	14,545.7 ft^2	(0.333924 acres)
lot 29	15,480.1 ft^2	(0.355374 acres)
lot 30	12,961.3 ft^2	(0.297550 acres)
lot 31	13,396.3 ft^2	(0.307536 acres)
lot 32	14,581.9 ft^2	(0.334755 acres)
lot 33	14,580.0 ft^2	(0.334710 acres)
lot 34	14,402.5 ft^2	(0.330636 acres)
lot 35	13,947.9 ft^2	(0.320199 acres)
lot 36	13,400.0 ft^2	(0.307622 acres)
lot 37	12,669.4 ft^2	(0.290849 acres)
lot 38	13,626.2 ft^2	(0.312814 acres)
lot 39	15,397.8 ft^2	(0.353484 acres)
lot 40	14,859.2 ft^2	(0.341120 acres)
lot 41	12,237.1 ft^2	(0.280925 acres)
lot 42	13,408.3 ft^2	(0.307812 acres)
lot 43	13,794.8 ft^2	(0.316685 acres)
lot 44	12,031.8 ft^2	(0.276213 acres)
lot 45	12,786.3 ft^2	(0.293533 acres)
lot 46	12,851.5 ft^2	(0.295029 acres)
lot 47	12,962.6 ft^2	(0.297580 acres)
lot 48	12,939.4 ft^2	(0.297049 acres)
lot 49	13,964.9 ft^2	(0.320590 acres)
lot 50	14,074.9 ft^2	(0.323116 acres)
lot 51	14,546.5 ft^2	(0.333942 acres)
lot 52	14,631.2 ft^2	(0.335886 acres)
lot 53	12,191.7 ft^2	(0.279882 acres)
lot 54	11,653.1 ft^2	(0.267518 acres)
lot 55	12,379.2 ft^2	(0.284186 acres)
lot 56	11,884.1 ft^2	(0.272821 acres)
lot 57	12,019.9 ft^2	(0.275938 acres)
lot 58	10,720.7 ft^2	(0.246113 acres)
lot 59	12,022.9 ft^2	(0.276007 acres)
lot 60	13,067.9 ft^2	(0.299998 acres)
lot 61	10,848.9 ft^2	(0.249056 acres)
lot 62	13,655.3 ft^2	(0.313482 acres)
lot 63	13,919.9 ft^2	(0.319556 acres)
lot 64	13,093.3 ft^2	(0.300581 acres)
lot 65	12,533.3 ft^2	(0.287725 acres)
lot 66	12,922.2 ft^2	(0.296653 acres)
lot 67	11,704.2 ft^2	(0.268691 acres)
lot 68	11,703.9 ft^2	(0.268684 acres)
lot 69	11,884.7 ft^2	(0.272834 acres)
lot 70	15,056.6 ft^2	(0.345653 acres)
lot 71	13,615.0 ft^2	(0.312557 acres)
lot 72	12,380.3 ft^2	(0.284212 acres)
lot 73	12,307.8 ft^2	(0.282548 acres)
lot 74	12,149.9 ft^2	(0.278924 acres)
lot 75	12,222.8 ft^2	(0.280598 acres)
lot 76	13,934.0 ft^2	(0.319880 acres)
lot 77	16,211.7 ft^2	(0.372170 acres)
lot 78	15,376.0 ft^2	(0.352984 acres)
lot 79	14,526.1 ft^2	(0.333473 acres)
lot 80	12,970.7 ft^2	(0.297766 acres)
lot 81	14,313.6 ft^2	(0.328596 acres)
lot 82	14,172.5 ft^2	(0.325356 acres)
lot 83	14,095.7 ft^2	(0.323592 acres)
lot 84	14,466.7 ft^2	(0.332110 acres)
lot 85	11,934.4 ft^2	(0.273976 acres)
lot 86	12,102.0 ft^2	(0.277824 acres)
lot 87	12,044.8 ft^2	(0.276510 acres)
lot 88	12,135.5 ft^2	(0.278593 acres)
lot 89	12,185.0 ft^2	(0.279729 acres)
lot 90	12,352.5 ft^2	(0.283573 acres)
lot 91	12,147.1 ft^2	(0.278858 acres)
lot 92	12,263.7 ft^2	(0.281535 acres)
lot 93	14,249.8 ft^2	(0.327131 acres)
lot 94	14,622.0 ft^2	(0.335675 acres)
lot 95	12,610.6 ft^2	(0.289500 acres)
lot 96	12,556.1 ft^2	(0.288249 acres)
lot 97	12,773.0 ft^2	(0.293229 acres)
lot 98	16,273.0 ft^2	(0.373576 acres)
lot 99	17,267.4 ft^2	(0.396406 acres)
lot 100	13,752.9 ft^2	(0.315723 acres)
lot 101	13,225.7 ft^2	(0.303621 acres)
lot 102	13,068.3 ft^2	(0.300008 acres)
lot 103	12,494.6 ft^2	(0.286838 acres)
lot 104	11,567.1 ft^2	(0.265544 acres)
lot 105	10,965.8 ft^2	(0.251739 acres)
lot 106	11,277.8 ft^2	(0.258904 acres)
lot 107	11,569.7 ft^2	(0.265603 acres)
lot 108	11,539.1 ft^2	(0.264901 acres)
lot 109	11,333.1 ft^2	(0.260173 acres)
lot 110	11,705.3 ft^2	(0.268718 acres)
lot 111	13,039.2 ft^2	(0.299338 acres)
lot 112	13,198.2 ft^2	(0.302988 acres)
lot 113	14,142.5 ft^2	(0.324668 acres)
lot 114	16,621.9 ft^2	(0.381586 acres)
lot 115	13,426.9 ft^2	(0.308238 acres)
lot 116	14,536.2 ft^2	(0.333704 acres)
lot 117	14,577.4 ft^2	(0.334652 acres)
lot 118	15,516.4 ft^2	(0.356207 acres)
lot 119	12,152.9 ft^2	(0.278992 acres)
lot 120	12,287.1 ft^2	(0.282073 acres)
lot 121	13,816.7 ft^2	(0.317187 acres)
lot 122	12,980.7 ft^2	(0.297996 acres)
lot 123	13,699.9 ft^2	(0.314507 acres)
lot 124	12,704.2 ft^2	(0.291649 acres)
lot 125	13,040.5 ft^2	(0.299368 acres)
lot 126	13,008.8 ft^2	(0.298642 acres)
lot 127	12,723.3 ft^2	(0.292086 acres)
lot 128	12,686.5 ft^2	(0.291242 acres)
lot 129	12,060.5 ft^2	(0.276871 acres)
lot 130	12,188.0 ft^2	(0.279798 acres)
lot 131	12,424.6 ft^2	(0.285230 acres)
lot 132	12,304.3 ft^2	(0.282467 acres)
lot 133	12,143.9 ft^2	(0.278785 acres)
lot 134	11,655.0 ft^2	(0.267561 acres)
lot 135	11,461.3 ft^2	(0.263116 acres)
lot 136	11,520.2 ft^2	(0.264466 acres)
lot 137	11,526.5 ft^2	(0.264611 acres)
lot 138	11,407.4 ft^2	(0.261878 acres)
lot 139	11,419.4 ft^2	(0.262153 acres)
lot 140	11,615.2 ft^2	(0.266647 acres)
lot 141	12,298.2 ft^2	(0.282327 acres)
lot 142	15,913.0 ft^2	(0.365311 acres)
lot 143	22,948.8 ft^2	(0.526832 acres)
lot 144	21,132.4 ft^2	(0.485134 acres)
lot 145	13,743.3 ft^2	(0.315503 acres)
lot 146	11,741.2 ft^2	(0.269542 acres)
lot 147	11,439.6 ft^2	(0.262617 acres)
lot 148	11,620.4 ft^2	(0.266769 acres)
lot 149	16,502.9 ft^2	(0.378855 acres)
lot 150	12,076.0 ft^2	(0.277227 acres)
lot 151	11,659.4 ft^2	(0.267662 acres)
lot 152	13,058.6 ft^2	(0.299784 acres)
lot 153	18,426.5 ft^2	(0.423013 acres)
lot 154	11,739.2 ft^2	(0.269496 acres)
lot 155	11,721.3 ft^2	(0.269085 acres)
lot 156	11,783.7 ft^2	(0.270517 acres)
lot 157	11,650.3 ft^2	(0.267453 acres)
lot 158	11,396.0 ft^2	(0.261615 acres)
lot 159	11,420.0 ft^2	(0.262167 acres)
lot 160	11,465.7 ft^2	(0.263216 acres)
lot 161	12,144.9 ft^2	(0.278807 acres)
lot 162	12,700.3 ft^2	(0.291558 acres)
lot 163	12,614.4 ft^2	(0.289587 acres)
lot 164	12,575.7 ft^2	(0.288698 acres)
lot 165	12,140.2 ft^2	(0.278700 acres)
lot 166	11,675.1 ft^2	(0.268024 acres)
lot 167	11,819.5 ft^2	(0.271338 acres)
lot 168	12,519.7 ft^2	(0.287412 acres)
lot 169	12,916.9 ft^2	(0.296531 acres)
lot 170	12,567.6 ft^2	(0.288512 acres)
lot 171	12,571.7 ft^2	(0.288607 acres)
lot 172	12,936.2 ft^2	(0.296975 acres)
lot 173	12,862.1 ft^2	(0.295272 acres)
lot 174	12,816.3 ft^2	(0.294222 acres)
lot 175	13,060.7 ft^2	(0.299833 acres)
lot 176	13,563.4 ft^2	(0.311372 acres)
lot 177	13,631.9 ft^2	(0.312944 acres)
lot 178	12,458.3 ft^2	(0.286004 acres)
lot 179	10,752.0 ft^2	(0.246832 acres)
lot 180	10,868.9 ft^2	(0.249516 acres)
lot 181	11,182.5 ft^2	(0.256714 acres)
lot 182	11,066.9 ft^2	(0.254062 acres)
lot 183	11,126.4 ft^2	(0.255427 acres)
lot 184	11,197.5 ft^2	(0.257060 acres)
lot 185	11,243.2 ft^2	(0.258108 acres)
lot 186	11,098.9 ft^2	(0.254795 acres)
lot 187	11,492.6 ft^2	(0.263834 acres)
lot 188	12,566.8 ft^2	(0.288494 acres)
lot 189	12,604.3 ft^2	(0.289355 acres)
lot 190	12,201.3 ft^2	(0.280103 acres)
lot 191	12,341.4 ft^2	(0.283321 acres)
lot 192	12,473.6 ft^2	(0.286353 acres)
lot 193	12,496.1 ft^2	(0.286871 acres)
lot 194	12,516.9 ft^2	(0.287347 acres)
lot 195	12,187.7 ft^2	(0.279790 acres)
lot 196	12,356.7 ft^2	(0.283670 acres)
lot 197	11,841.4 ft^2	(0.271841 acres)
lot 198	12,380.6 ft^2	(0.284220 acres)
lot 199	12,578.2 ft^2	(0.288755 acres)
lot 200	12,404.3 ft^2	(0.284763 acres)
lot 201	12,598.5 ft^2	(0.289222 acres)
lot 202	12,608.8 ft^2	(0.289459 acres)
lot 203	12,483.6 ft^2	(0.286584 acres)
lot 204	12,407.1 ft^2	(0.284827 acres)
lot 205	11,857.3 ft^2	(0.272206 acres)
lot 206	12,077.8 ft^2	(0.277269 acres)
lot 207	11,811.4 ft^2	(0.271152 acres)
lot 208	11,497.0 ft^2	(0.263935 acres)
lot 209	11,559.2 ft^2	(0.265364 acres)
lot 210	11,712.8 ft^2	(0.268888 acres)
lot 211	13,148.1 ft^2	(0.301838 acres)

Total: 2,716,861.0 ft^2 (62.370545 acres)
Average: 12,876.1 ft^2 (0.295595 acres)

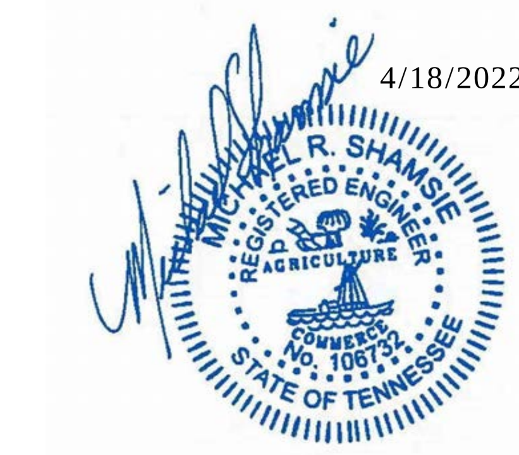
Closed Surfaces: 211 (100%), Open Alignment: 0, Total Count: 211

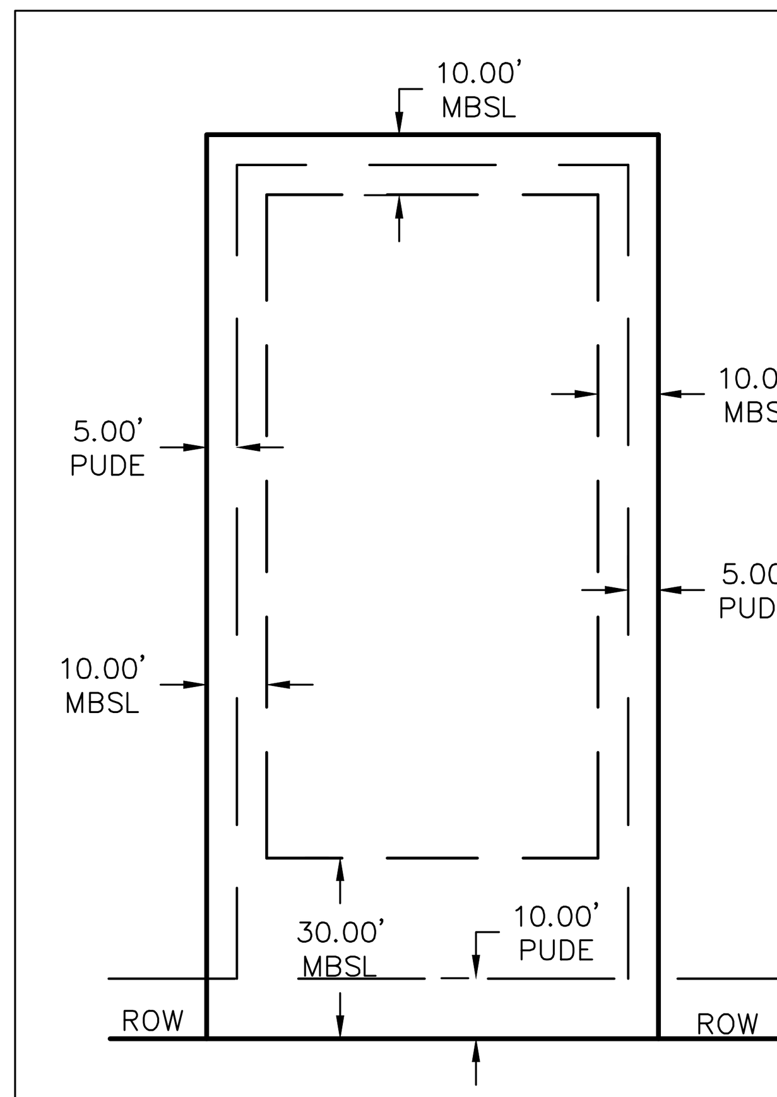
Smallest: lot 58 10,720.7 ft^2 (0.246113 acres)
Largest: lot 143 22,948.8 ft^2 (0.526832 acres)

TOTAL SITE ACREAGE = 92.425± ACRES

CUL-DE-SAC LENGTHS

CATHY LANE = 478.11'
JENNA COURT = 622.22'
MIA COURT = 650.00'
STERLING COURT = 650.00'





TYPICAL LOT DIAGRAM

REVISIONS		
NO.	DESCRIPTION	DATE

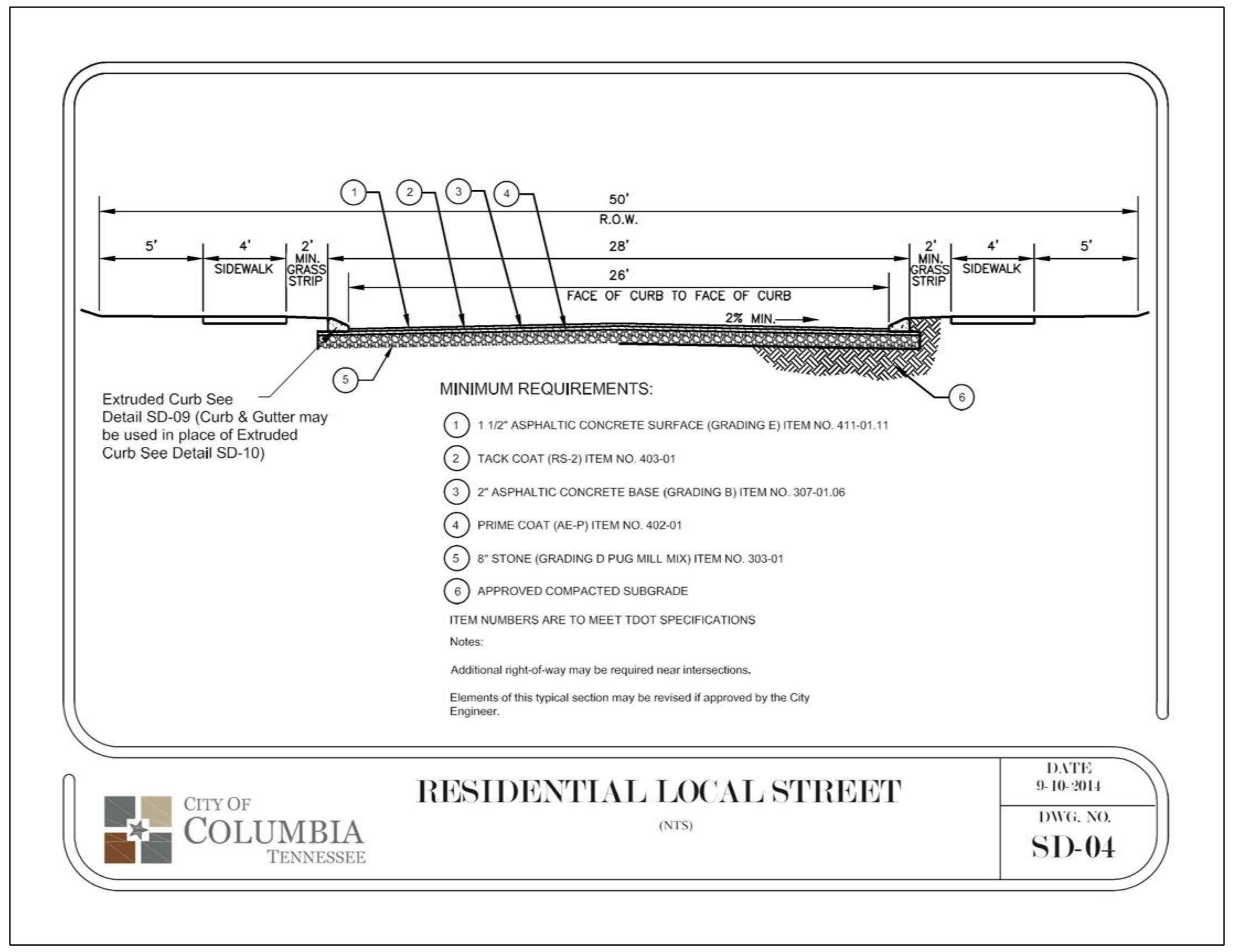
Landmark ENGINEERING GROUP
3440 38TH AVENUE, SUITE 4 MOLINE, IL. 61265
(309) 755-3400 FAX (309) 755-5522
CIVIL ENGINEERING AND LAND SURVEYING
TENNESSEE DESIGN FIRM NUMBER F-21044

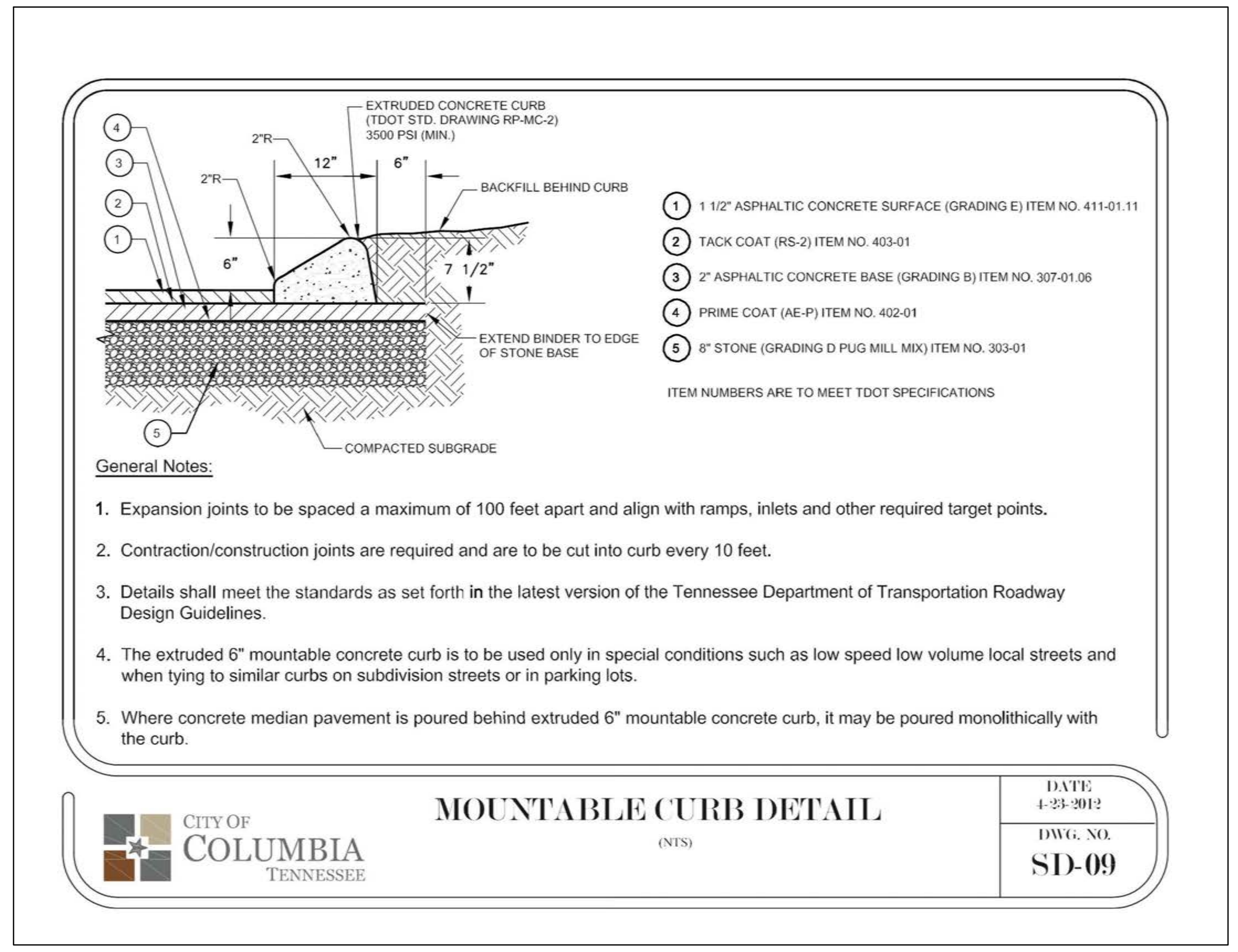
LOT INFORMATION
THETA PIKE ESTATES
COLUMBIA, TENNESSEE

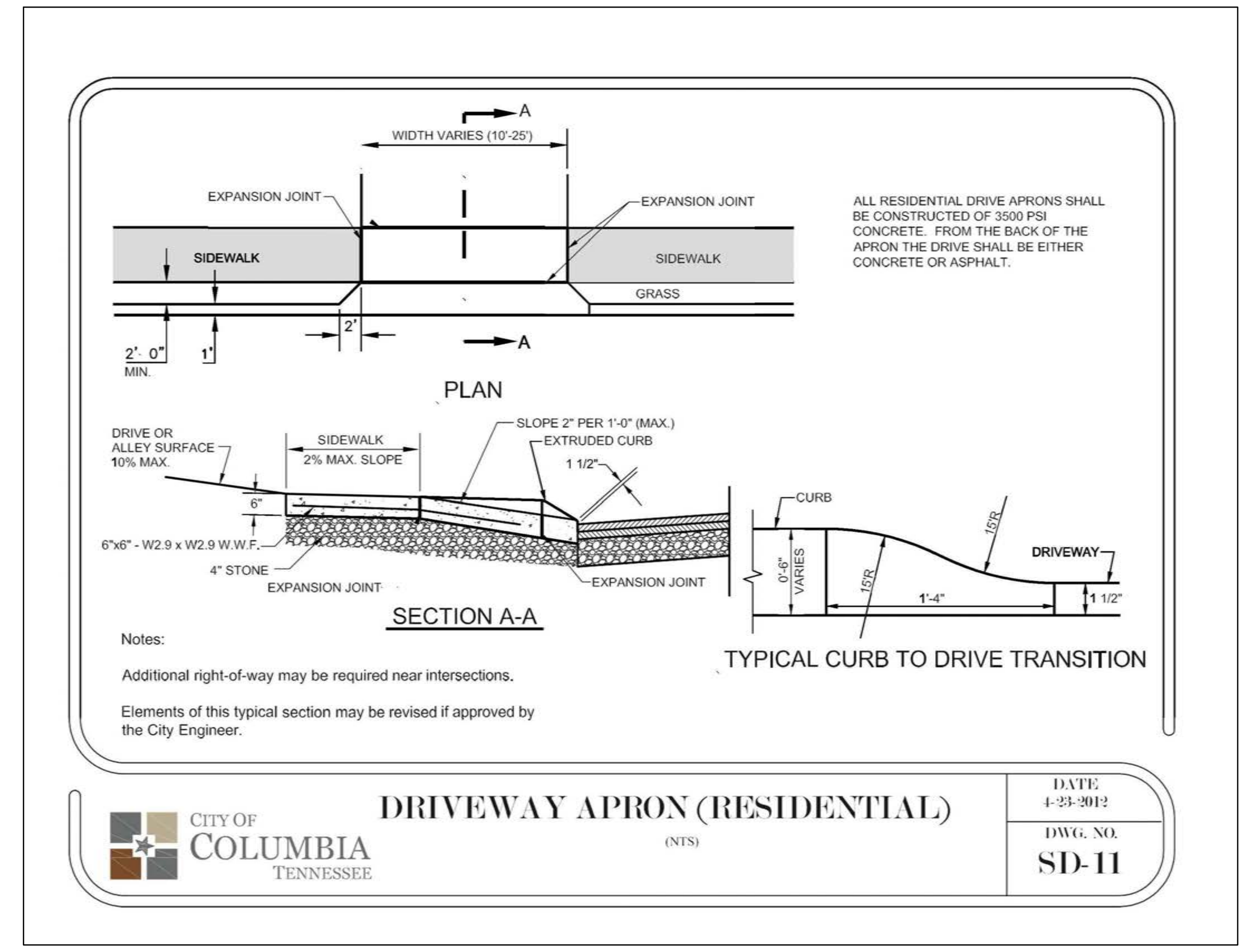
DATE: 4/18/2022
DRAWN BY: HLG
CHECKED BY: MRS

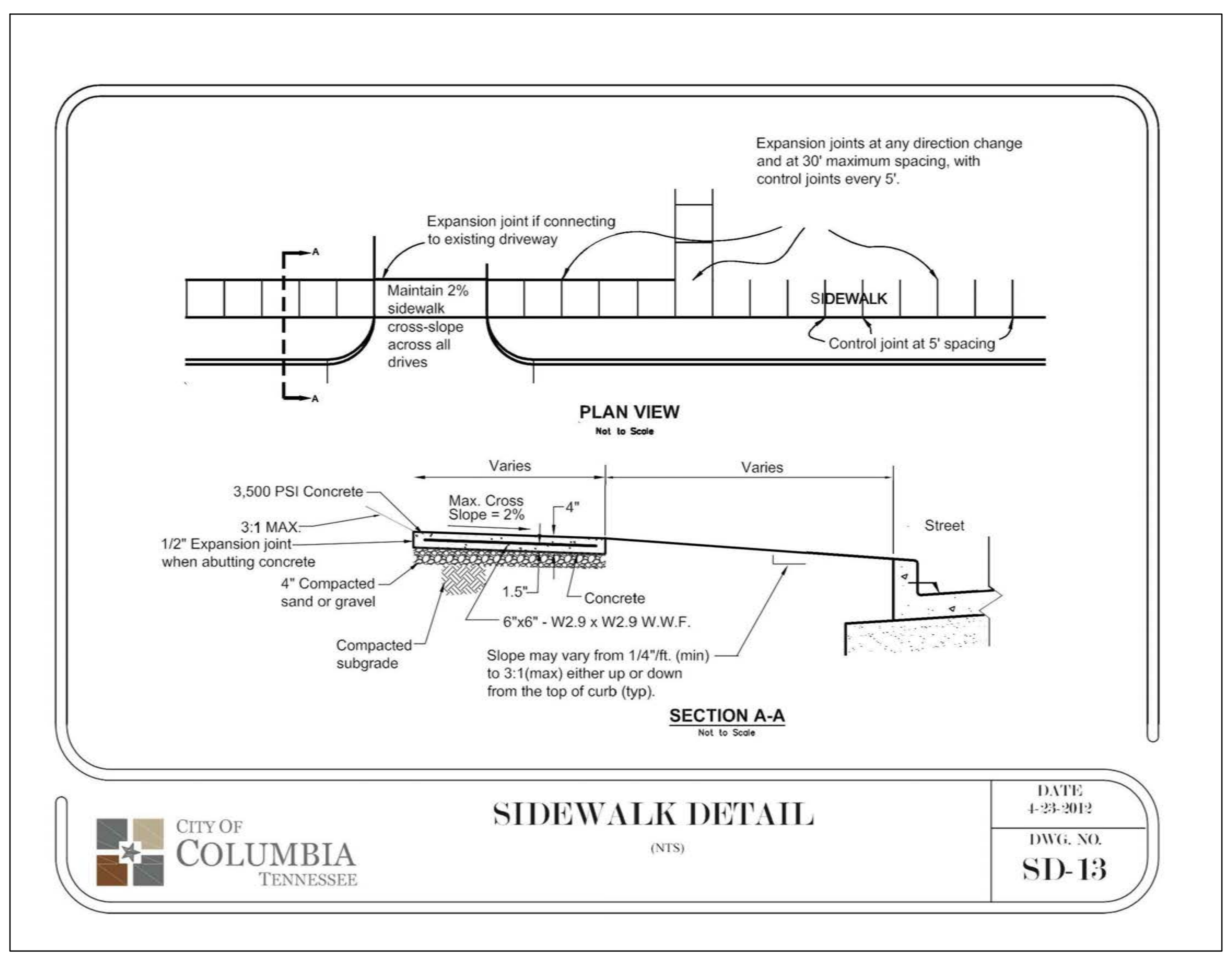
PP6

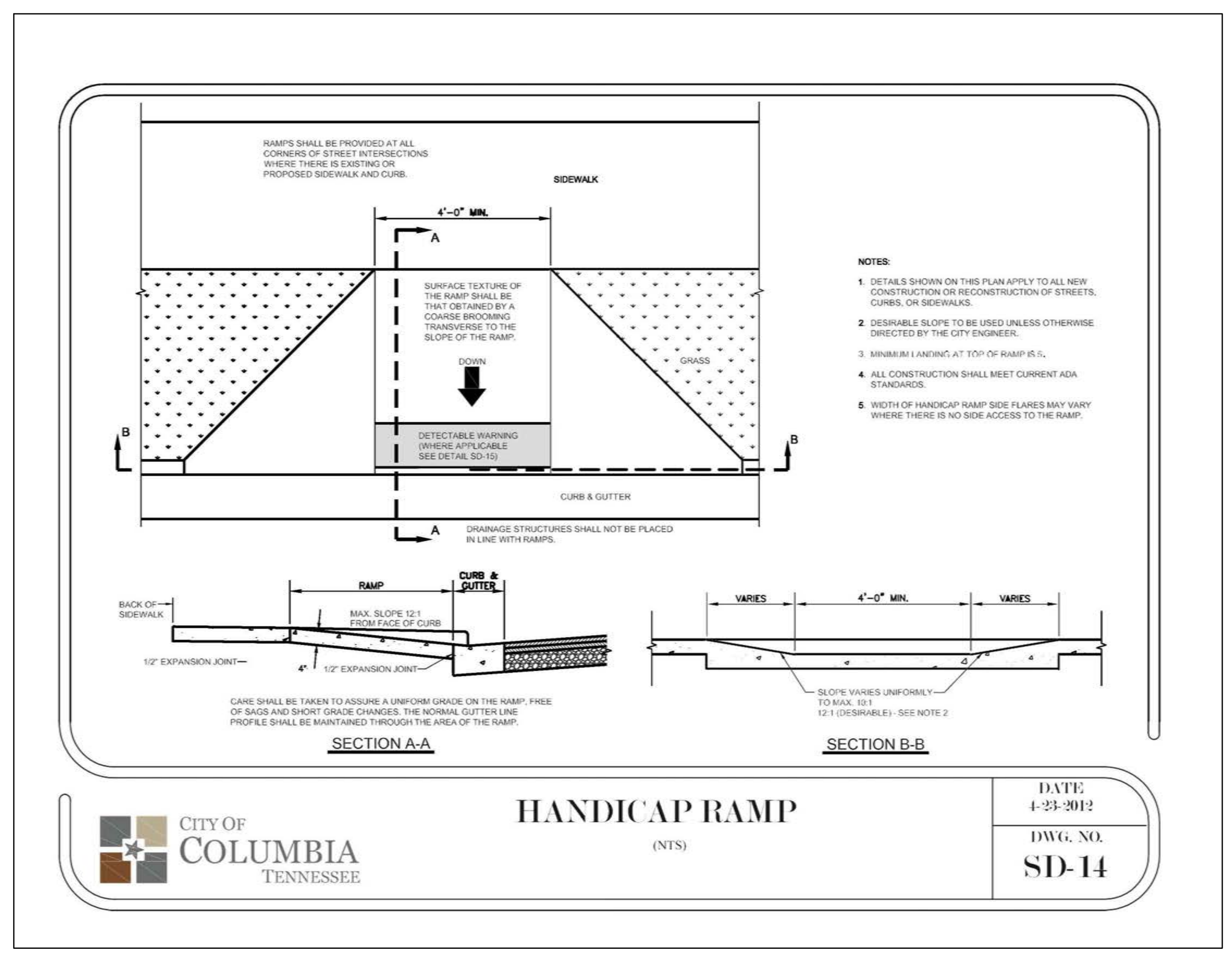
01-21-1650

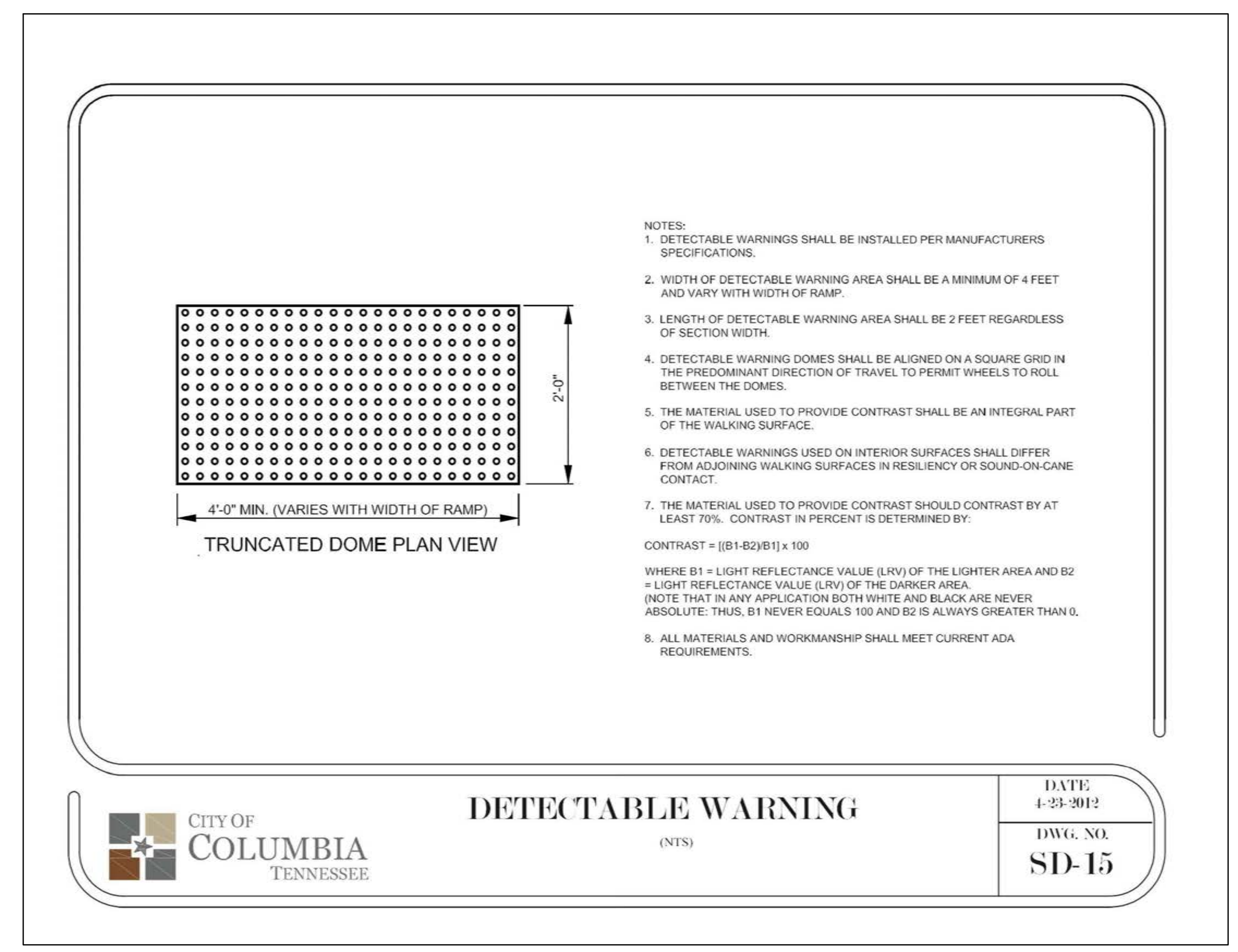


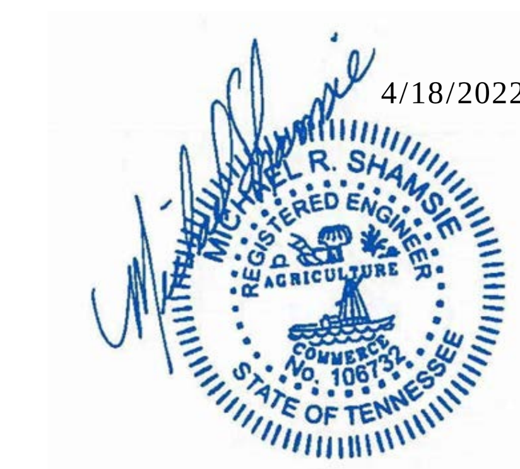












REVISIONS

NO.	DESCRIPTION	DATE

Landmark ENGINEERING GROUP
CIVIL ENGINEERING AND LAND SURVEYING
TENNESSEE DESIGN FIRM NUMBER F-21044

DETAILS

THETA PIKE ESTATES
COLUMBIA, TENNESSEE

DATE: 4/18/2022
DRAWN BY: HLG
CHECKED BY: MRS

PP7

01-21-1650

Theta Pike Estates

Columbia, Maury County, TN

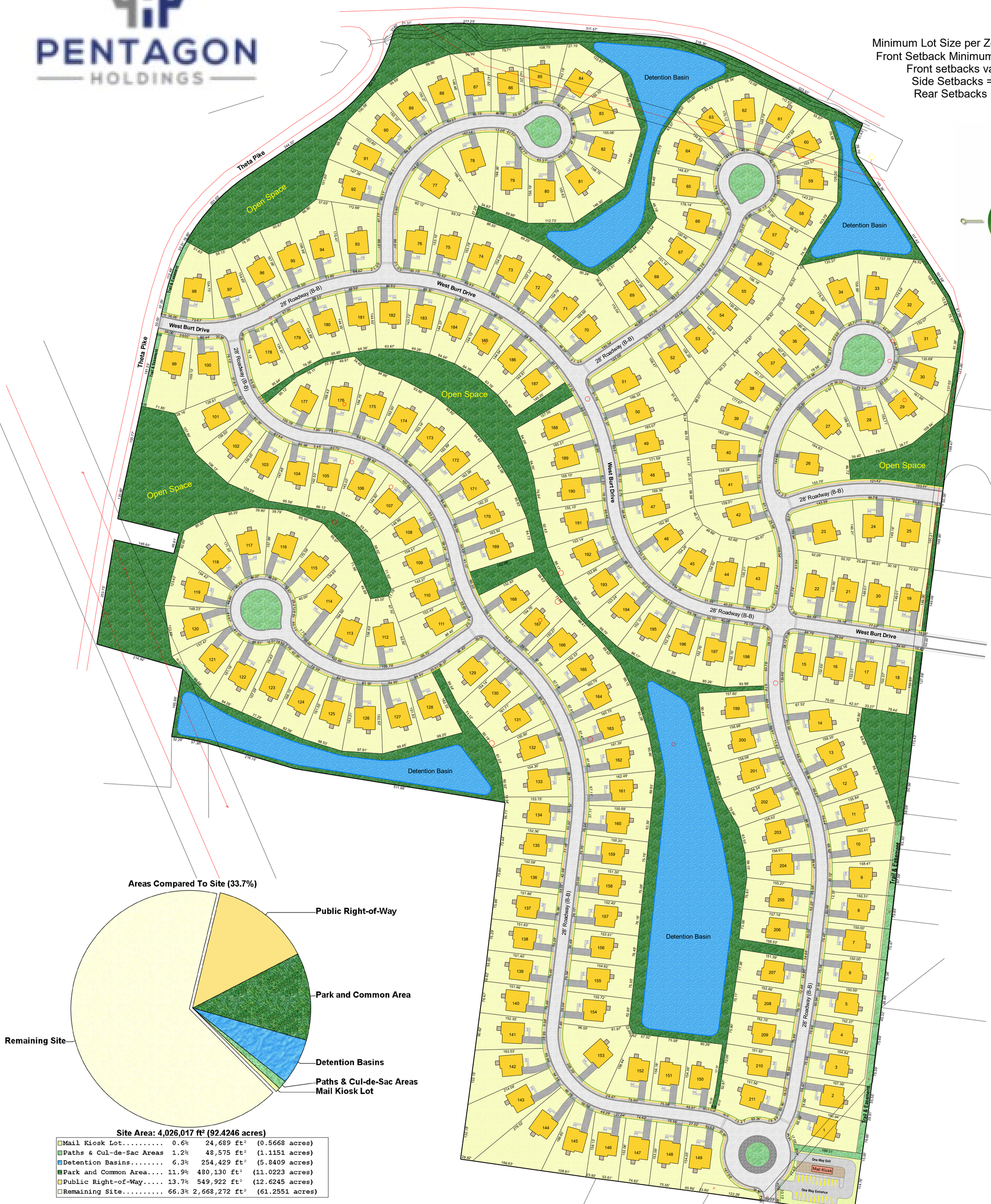
PENTAGON HOLDINGS

Columbia TN RS-10 Zoning
211 Single Family Homes

Minimum Lot Size per Zoning Code = 10,000 SF
Front Setback Minimum = 30' per Zoning Code
Front setbacks vary from 30' to 60'
Side Setbacks = minimum of 10'
Rear Setbacks = minmim of 30'

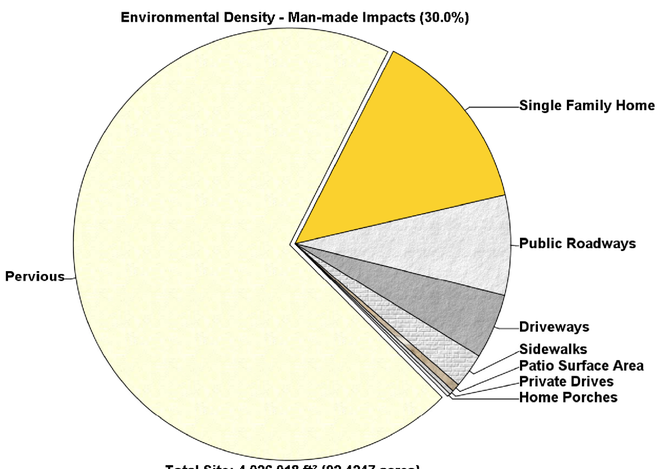
N

1" = 120 feet



Site Area: 4,026,017 ft² (92.4246 acres)

Mail Kiosk Lot.....	0.6%	24,689 ft²	(0.5668 acres)
Paths & Cul-de-Sac Areas	1.2%	48,575 ft²	(1.1151 acres)
Detention Basins.....	6.3%	254,429 ft²	(5.8409 acres)
Park and Common Area....	11.9%	480,130 ft²	(11.0223 acres)
Public Right-of-Way.....	13.7%	549,922 ft²	(12.6245 acres)
Remaining Site.....	66.3%	2,668,272 ft²	(61.2551 acres)



Total Site: 4,026,018 ft² (92.4247 acres)

Home Porches.....	0.3%	10,972 ft²	(0.2519 acres)	Private Drives....	0.3%	12,888 ft²	(0.2959 acres)
Patio Surface Area	0.6%	24,004 ft²	(0.5511 acres)	Sidewalks.....	2.6%	104,514 ft²	(2.3993 acres)
Driveways.....	4.8%	194,185 ft²	(4.4579 acres)	Public Roadways...	7.5%	302,423 ft²	(6.9427 acres)
Single Family Home	13.8%	556,970 ft²	(12.7863 acres)	Pervious.....	70.0%	2,820,062 ft²	(64.7397 acres)

Landmark Engineering Group, Inc.

LandMentor

April 5, 2022

Landmark Engineering
3440 38th Avenue
Suite 4
Moline, IL 61265

Attention: Mr. Don Shamsie
Don.shamsie@landgroup.biz

Subject: **REPORT OF GEOTECHNICAL EXPLORATION**
Proposed Theta Pike Development
(Parcel ID 075 001.03)
Maury County, Tennessee
GEOServices Project No. 31-221126

Dear Mr. Shamsie:

We are submitting the results of the geotechnical exploration performed for the Theta Pike development in Maury County, Tennessee. The geotechnical exploration was performed in accordance with GEOServices Proposal No. 13-221117, dated February 3, 2022, and authorized by you on February 4, 2022.

The following report presents our findings and recommendations for the proposed development. Should you have any questions regarding this report, or if we can be of any further assistance, please contact us at your convenience.

Sincerely,

GEOServices, LLC

Scott Nidiffer
Staff Professional

JERRY WAYNE GAMMON REGISTERED ENGINEER AGRICULTURE COMMERCE No. 111633 STATE OF TENNESSEE
4/5/2022
31-221126

Jerry W. Gammon, P.E.
Vice President Nashville Area Manager
TN 111633

REPORT OF

GEOTECHNICAL EXPLORATION

Proposed Theta Pike Development
Maury County, TN

GEOServices Project No. 31-221126

Submitted to:

Landmark Engineering
3440 38th Avenue
Suite 4
Moline, IL 61265

Submitted by:

GEOServices, LLC
91 South Eastgate Court
Lebanon, TN 37090

Phone (615) 547-9314
Fax (615) 547-9451

GEOServices, LLC, Geotechnical and Materials Engineers

TABLE OF CONTENTS

Page

APPENDICIES

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this geotechnical exploration was to characterize the subsurface conditions for the design and construction of the proposed Theta Pike Development in Maury County, Tennessee. This report provides recommendations for general site preparation, excavation and fill requirements, and general foundation design recommendations.

1.2 PROJECT INFORMATION AND SITE DESCRIPTION

Initial project information was provided in a February 1, 2022, email transmission from Mr. Don Shamsie (Landmark Engineering) to Mr. Jerry Gammon (GEOS). Attached to the email was an outlined ariel photo showing proposed site location, and a document titled "Theta Pike Tax Records". We understand that a new residential development is planned to be developed on the approximately 118-acre site located in Maury County, Tennessee. We assume the structures will be multi story structures, assumed to be wood-framed with vinyl, stone, and brick veneer, slab-on-grade, and supported by shallow foundations. A grading plan has not been provided at this time. We have assumed cut depths and fill thicknesses will be less than about 5 feet, respectively. At this time, structural loading information has not been provided. From past experience with similar projects, we assume maximum column and wall loadings will be about 40 kips and 1 kip per linear foot (klf), respectively.

At the time of site reconnaissance, the site was observed to be a generally moderate to dense forested areas. During site reconnaissance, possible water/drainage features were observed in several locations. During field exploration, surficial evidence of probable karst activity was observed on-site in several locations. We observed a total of 17 possible karst features on the site and the

locations can be found in Appendix C. One of the karst features appeared to be a suspected "cavern" that was approximately 5-feet tall by 2-3 feet wide by 30 feet long/deep. The "cavern" entrance and inside of the "cavern" can be seen in Appendix C Photos 6 and 7. The overall site was observed to be gradually varying in elevation across the acreage, generally increasing in elevation from the perimeter of the site to the middle of the site.

1.3 SCOPE OF STUDY

This geotechnical exploration involved a site reconnaissance, field exploration, and engineering analysis. The following sections of this report present discussions of the field exploration, site conditions, and general recommendations. Following the text of this report, figures, observation trench logs and site photographs are provided in the appendices. Appendix A provides figures and observation trench logs. Appendix B provides a summary of the laboratory testing results. Appendix C provides representative site photographs. Appendix D provides the typical sinkhole repair detail.

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, bedrock, surface water, subsurface water, or air, on, or below, or around this site. Any statements in this report or on the observation trench summary regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes.

2.0 EXPLORATION

2.1 FIELD EXPLORATION

The site subsurface conditions were explored on March 23, 24, and 25, 2022 with a total of fifty-five (55) observation trenches at the approximate locations shown by Figure 3 in Appendix A. The observation trench locations were established in the field by measuring distances from known site reference points and GPS coordinates extrapolated from Google Earth.

Observation trench locations were advanced using a subcontracted mini-excavator. Sampling of the soils on site was accomplished using a dynamic cone penetrometer (DCP). In dynamic cone penetrometer (DCP) testing, a 1.5-inch diameter cone (45^{o} vertex angle) is driven into the subgrade soil with a 15-pound steel mass falling 20 inches. The blows required to drive the embedded cone a depth of 1-3/4 inch have been correlated to N-values derived from the Standard Penetration Test (SPT). These blow counts provide an indication of the relative density of granular materials and strength of cohesive materials.

Upon completion, the excavations were observed for the presence of groundwater and then backfilled with the excavated material. Minor settlement of the backfill should be expected over time. Detailed observation trench records are presented in Appendix A.

2.2 LABORATORY TEST PROGRAM

Soil samples collected during excavation were transported to our laboratory for visual classification and laboratory testing. The following laboratory testing was performed on select samples to determine various properties of the soil:

- Natural Moisture Content (ASTM D 2216): Moisture content determinations were performed. The natural moisture content is defined as the ratio of the weight of water present in the soil to the dry weight of soil.

- Atterberg Limits (ASTM D 4318): Atterberg Limits tests were performed. These tests help us to confirm our visual classifications according to the AASHTO Classification System and the Unified Soil Classification System (USCS). The plastic limit and liquid limit represent the moisture content at which a cohesive soil changes from a semi-solid to a plastic state and from a plastic state to liquid state, respectively.

Laboratory testing results are included in Appendix B.

3.0 SUBSURFACE CONDITIONS

3.1 GEOLOGIC CONDITIONS

The subject site is located within the Central Basin Physiographic Province of Middle Tennessee. The Central Basin is an elliptical basin surrounded by the Highland Rim. The Basin is subdivided into inner and outer sections. The inner section is generally smooth and gently rolling in contrast to the higher and more deeply dissected outer Basin. Bedrock is primarily Ordovician limestone, shale and dolomite in the outer Basin. The inner basin is generally covered with limestone with patches of bare platy rock and thin topsoil with glade areas supporting red cedar trees. The region is moderate in karst development with many sinkholes and some large caves present, notably in the glade areas.

The Geologic Map of the Godwin Quadrangle, Tennessee (Tennessee Division of Geology, 1964) shows the site is underlain by the Hermitage Formation, Carters Limestone formation and Lebanon Limestone formation. The Hermitage formation is typically a medium-gray to brownish-gray limestone. Residual soil formed by the in-place solution weathering of the parent limestone is typically a brownish sandy to silty clay. The horizontal bedding and somewhat uniform weathering characteristics of the Hermitage formation do not typically create conditions conducive to the creation of karst features, except where the formation weathers through to the

underlying Carters formation, which is much more susceptible for the development of Karst.

The Carters Limestone formation is typically a hard, light gray to brown, cryptocrystalline (i.e., microscopically crystalline), medium- to thick-bedded, brittle limestone with occasional thin chert lenses. The limestone weathers to produce a 5- to 10-foot thick layer of native soil (residuum) which is typically an orange to brown silty clay. The soil/rock interface may be irregular due to a layer of rounded boulders at the base of the soil zone.

The Lebanon Limestone formation is typically a medium-gray to medium dark-gray and brown-gray to yellowish-brown, cryptocrystalline to very fine-grained, thin-bedded limestone with thin shale partings, fossiliferous, and dolomitic fucoids common. These limestones generally weather to produce a layer of native soil (residuum) which is typically a brown or reddish-brown high plasticity clay with chert. Glades (i.e., areas of very thin soil) are common on which only limited vegetation, other than cedar trees, will grow.

The limestone bedrock consisting of Carters Limestone formation is susceptible to solution weathering and the creation of karst features, such as sinkholes. In general, because of the shallow overburden soils, karst features are relatively small in horizontal extent, but can extend into the bedrock several feet. Review of the USGS Godwin Quadrangle, Tennessee, Topographic Quadrangle Map (1964) indicated the presence of several closed depressions on-site which can be seen in the photo within the appendices. We note the scale of the map often precludes mapping of smaller depressions.

Since the bedrock underlying the site mainly consists of carbonate rock, the site is susceptible to the typical carbonate hazards of irregular weathering, cave and cavern conditions, and overburden

sinkholes. Carbonate rock, while appearing very hard and resistant, is soluble in slightly acidic water. This characteristic, plus differential weathering of the bedrock mass, is responsible for the hazards. Of these hazards, the occurrence of sinkholes is potentially the most damaging to overlying soil-supported structures. In Middle Tennessee, sinkholes occur primarily due to differential weathering of the bedrock and "flushing" or "raveling" of overburden soils into the cavities in the bedrock. The loss of solids creates a cavity or "dome" in the overburden. Growth of the dome over time or excavation over the dome can create a condition in which rapid, local subsidence or collapse of the roof of the dome occurs.

3.2 SUBSURFACE CONDITIONS

A surficial layer of topsoil was encountered in each of the 55 observation trenches to depths ranging from 2 to 12 inches below the existing ground surface elevation. Beneath the surficial layers, alluvial and/or residual soils were encountered to refusal or termination depths ranging from about 1 to 8 feet below the existing ground surface elevation.

3.2.1 Alluvial Soils

Alluvial soils were encountered in 4 of the 55 observation trenches to depths ranging from about 2 to 10 feet below the existing ground surface elevation before encountering termination or deeper soil strata. Alluvial soils are soil which have been placed in their current position by the actions of water. The alluvial soils generally consisted of brown and dark brown clays with varying amounts of sand. A dynamic cone penetrometer (DCP) was used to evaluate the consistency or density of the subsurface soils encountered in select observation trenches. The DCP values of the alluvial soils ranged from 1 blow per increment (bpi) to 3 bpi, indicating a consistency of very soft. Moisture content of the samples of alluvial soils obtained in the exploration ranged from 20.9 to

30.0 percent. Atterberg limits testing on a selected alluvial sample retrieved from OT-21 yielded a liquid limit (LL) of 30 percent and a plasticity index (PI) of 13 percent. This soil is classified as lean clay (CL) in accordance with the Unified Soil Classification System (USCS).

3.2.2 Residual Soils

Beneath the surficial layers or alluvial soils, residual soil was encountered in 48 of the 55 observation trenches to excavator refusal or termination depths ranging from about 1 to 10 feet below the existing ground surface elevation. Residual soil is formed from the in-place weathering of the underlying bedrock. The residual soil generally consisted of brown, orange brown, light brown, dark brown, and yellow brown clays with varying amounts of chert fragments, boulders, rock fragments, sand, and black oxide nodules. A dynamic cone penetrometer (DCP) was used to evaluate the consistency or density of the subsurface soils encountered in select observation trenches. The DCP values of the residual soil ranged from 1 blow per increment (bpi) to 13 bpi, indicating a consistency of very soft to stiff. The natural moisture content of the residual soils retrieved from the observation trenches ranged from 17.8 to 44.2 percent. Atterberg limits testing on four selected samples of the residual soils from observation trenches OT-4, OT-13, OT-15 and OT-36 yielded liquid limits (LL) of 53 to 42 percent and plasticity indices (PI) ranging from 25 to 14 percent. The tested soil is classified as fat clay (CH) and lean clay (CL) in accordance with the Unified Soil Classification System (USCS).

3.2.3 Refusal Conditions

Observation trench refusal materials were encountered in 26 of the 55 observation trenches at depths ranging from about less than 3 inches to 8 feet below existing ground surface elevation. Refusal is a designation applied to any material that cannot be penetrated by the bucket of the mini excavator. Observation trench refusal may indicate dense gravel or cobble layers, boulders, rock

ledges or pinnacles, or the top of continuous bedrock. Based on our observations during the observation trench excavations, we anticipate the refusals are due to encountering limestone bedrock, immovable boulders, and/or rock ledges or pinnacles.

The following table presents the observation trench refusal and/or termination depths at each observation trench location:

OBSERVATION TRENCH REFUSAL DEPTHS					
Location	Depth (feet)	Location	Depth (feet)		
OT-1	1	OT-20	.8	OT-38	>8
OT-2	2 - 4	OT-21	>9	OT-39	>8
OT-3	3	OT-22	6	OT-40	>8
OT-4	>8	OT-23	5.5	OT-41	3.2
OT-5	>8	OT-24	.5	OT-42	5
OT-6	3.5 - 7	OT-24a	>8	OT-43	>8
OT-7	2 – 4.5	OT-25	1.5 - 3	OT-44	>8
OT-8	2 – 3.5	OT-26	1	OT-45	>8
OT-9	3.5	OT-27	>8	OT-46	>8
OT-10	1	OT-28	5	OT-47	>8
OT-11	.2	OT-29	1 - 6	OT-48	>8
0T-12	4 – 8<	OT-30	>8	OT-49	7
OT-13	>8	OT-31	4	OT-50	8
OT-14	>8	OT-32	>8	OT-51	>8
OT-15	>8	OT-33	.2 - 4	OT-52	6
OT-16	>8	OT-34	>8	OT-53	>8
OT-17	>8	OT-35	>8	OT-54	>8
OT-18	>8	OT-36	>8		
OT-19	4-6.5	OT-37	>8		

Note: Refusal depths are taken from the ground surface elevation at time of exploration. Refusal depths are rounded to the nearest ½-foot.

3.2.4 Subsurface Water

Subsurface water was not encountered in any of the observation trenches during field activities. However, discontinuous zones of perched water may exist within the overburden and/or at the contact with bedrock. Subsurface water levels may fluctuate due to seasonal change in precipitation amounts or due to construction activities in the area. The groundwater presented in this report is the information that was collected at the time of our field activities. We recommend that the contractor determine the actual groundwater level at the site at the time of the construction activities.

3.2.5 General

The above subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The observation trench record included in Appendix A should be reviewed for specific information at individual test locations. The depth and thickness of the subsurface strata indicated on the observation trench records were generalized from and interpolated between test locations. The transition between materials will be more or less gradual than indicated and may be abrupt. Information on actual subsurface conditions exists only at the specific observation trench locations and is relevant to the time the exploration was performed. Variations may occur and should be expected between observation trench locations. The stratification lines were used for our analytical purposes and, unless specifically stated otherwise, should not be used as the basis for design or construction cost estimates.

4.0 GENERAL RECOMMENDATIONS

4.1 SITE ASSESSMENT

Based on the results of our subsurface exploration, this site is adaptable for proposed development. However, as with most sites, some inherent geotechnical challenges should be considered during the construction phases. These challenges include the underlying karst geology, soft soil conditions, shallow refusal conditions, moisture sensitive soils, and differential bearing concerns.

4.1.1 Karst Geology

A certain degree of risk with respect to sinkhole formation and subsidence should be considered with any site located within geologic areas underlain by potentially soluble rock units. While an extensive effort to assess the potential for sinkhole formation on this site was beyond the scope of this evaluation, our observation trenches did encounter some indications of possible sinkhole development. Topographic mapping indicated the presence of several closed depressions onsite, along with several others within 1 mile of the site. As stated previously, several areas of probable karst activity were noted by GEOS personnel onsite. These areas consisted primarily of locally depressed areas and dropout areas. If any karst feature is located in an area that require fill materials to achieve subgrade elevation, the observed karst feature should be stripped of clayey soil and the "throat" be remediated prior to structural backfill. GEOServices should be retained to provide recommendations during development activities.

At this time, we do not recommend developing over the top of the karst features, particularly at photos 6 and 7. Based on the provided layout plan, we anticipate ten to twenty lots/units will need to be adjusted that are shown over the suspected "cavern". Additional geotechnical services, likely

involving drilling, rock coring, and/or geophysical ERI testing should be performed in order to determine if these lots/units are suitable for construction.

4.1.2 Soft Soil Conditions

Soft soil conditions were encountered in 13 of the 55 observation trenches to depths as deep as 5 feet below existing ground surface elevation. These weak zones encountered can potentially impact the performance of the proposed structures and/or pavements depending on final grades. At this time, we have not been provided with a final grading plan. It's likely that some of the weak soils will be removed during mass grading activities. However, if these areas are not completely removed during mass grading activities, they will perform unsatisfactorily during initial proofroll activities in their current condition. Therefore, we recommend that the owner carry a contingency budget to undercut these weak areas during mass grading activities. We recommend that the contractor determine the consistency of the soil in these areas at the site at the time of the construction activities prior to undercutting and replacing.

4.1.3 Shallow Refusal Conditions

Observation trench refusal materials were encountered in 26 of the 55 observation trenches at depths ranging from about less than 3 inches to 8 feet below existing ground surface elevation. The refusal materials encountered were generally hard and could not be penetrated by the excavator bucket. These refusal materials may be encountered in potential utility areas and portions of the building foundations. As such, we anticipate excavation of the refusal materials may require blasting or hoe-ramming for removal, if required by site grading and utility installation activities.

4.1.4 Moisture Sensitive Soils

The subgrade soils at this site, as with most sites in middle Tennessee, consist of clayey soils. These

materials will be sensitive to changes in moisture contents. As such, it will be advantageous to perform grading activities during periods of warm and/or dry weather. Areas that are wet or become unstable can possibly be repaired by scarification and re-compaction if grading occurs during warm, dry weather. If grading occurs during wet, cool weather, we expect the possibility of soft soil at or near the surface soils across the site that, if encountered, would have to be undercut and replaced.

4.1.5 Differential Bearing Concerns

Based on the results of our subsurface exploration and the anticipated cut and fill requirements to develop the site, the possibility exists that a portion of the building foundations may bear in residual soil and/or structural soil fill material, while a portion could be bearing on refusal materials. This condition will result in a differential bearing condition which could result in excessive differential settlement across the buildings. As a result, the following recommendation will reduce the concern with differential settlement.

4.2 SITE PREPARATION

4.2.1 Subgrade

Vegetation, topsoil, organic soils, utilities, loose rock fragments greater than 6 inches and other debris should be removed from the proposed construction area. Any unsuitable fill materials (if encountered) should be removed and replaced. The actual depth of removal should be determined by a representative of the geotechnical engineer at the time of construction.

After completion of stripping operations and any required excavations to reach planned subgrade elevation, we recommend that the subgrade be proofrolled with a fully loaded, tandem-axle dump truck or other pneumatic-tired construction equipment of similar weight. The geotechnical engineer

or his representative should observe proofrolling. Weak or unstable areas should be remediated at the geotechnical engineer's recommendation. Areas to receive structural soil fill should also be proofrolled prior to the placement of any fill.

4.2.2 Structural Soil Fill

Material considered suitable for use as structural fill should be clean soil free of organics, trash, and other deleterious material, containing no rock fragments greater than 6 inches in any one dimension. Preferably, structural soil fill material should have a standard Proctor (ASTM D698) maximum dry density of 90 pcf or greater and a plasticity index (PI) of 35 percent or less. Materials with a PI greater that 35 percent are susceptible to volume changes with changes in moisture content. Volume changes in the foundation subgrade can cause structural distress in buildings, floor slabs, and pavements. Material to be used as structural fill should be tested by the geotechnical engineer to confirm that it meets the project requirements before being placed. This testing typically requires at least 3 to 4 days to complete. To avoid delays during grading, samples of proposed fill materials (both on-site and off-site) should be collected during site preparation.

Structural fill should be placed in loose, horizontal lifts not exceeding 8 inches in thickness. Each lift should be compacted to at least 95 percent of the soil's maximum dry density per the standard Proctor method (ASTM D698) and within the range of minus (-) 2 percent to plus (+) 2 percent of the optimum moisture content. Each lift should be tested by geotechnical personnel to confirm that the contractors' method is capable of achieving the project requirements before placing any subsequent lifts. Any areas, which have become soft or frozen, should be removed before additional structural fill is placed. Structural soil fill placement should be accomplished under the full-time or near full-time observation of a representative of the geotechnical engineer.

4.2.3 Shotrock Fill Materials

Shotrock fill, with acceptable gradation, can be used as structural fill. Shotrock utilized as structural fill should be well graded with a maximum rock size of 12 inches and be placed in lifts not to exceed 18 inches thick. Shotrock of this size should be placed at depths deeper than 4 feet below planned subgrade levels in the building area. The rock or stone should have a maximum particle size of 8-inches in the largest dimension up to proposed subgrade (from minus 4 feet below subgrade up to subgrade) when mixed with satisfactory material.

Shotrock fill should have adequate fines to effectively "choke" the larger rock pieces, adequately filling voids or open spaces. The larger rock pieces should lie flat and not overlap each other. The percentage of soil in the fill should be limited to a maximum of 10 percent. Shotrock fill should be compacted using complete passes of a D-8 class crawler tractor, or equivalent. A pass is defined as a complete coverage of the surface with the D-8 track overlapping 50 percent. Half of the passes should be in each perpendicular direction. Shotrock fill placement should be accomplished under the full-time observation of a representative of the geotechnical engineer.

4.2.4 Compacted Crushed Stone Fill

Compacted crushed stone fill should be Type A, Class A, and Grading D in accordance with Section 903.05 of the Tennessee Department of Transportation specifications. The crushed stone fill should be placed in loose, horizontal lifts not exceeding 10 inches in loose thickness. Each lift should be compacted to at least 95 percent of maximum dry density per the standard Proctor method (ASTM D698). Each lift should be compacted and tested by geotechnical personnel to confirm that the contractor's method is capable of achieving the project requirements before placing any subsequent lifts.

4.3 FOUNDATIONS

4.3.1 Option #1: Soil Bearing Foundations

Foundations for the proposed construction are anticipated to bear on residual soils and/or properly compacted structural fill. The recommended allowable bearing capacity for design of the foundations is 2,000 pounds per square foot (psf) or less. We recommend that continuous foundations be a minimum of 18 inches wide and isolated spread footings be a minimum of 24 inches wide to reduce the possibility of a localized punching shear failure. Exterior footings should be designed to bear at least 18 inches below finished exterior grade to protect against frost.

As mentioned previously, refusal was encountered at depths ranging from less than 3 inches to 8 feet below the existing ground surface elevation. Depending on the cut and fill depths required, it should be anticipated that competent bedrock may be encountered during foundation and/or utility excavations. If rock is encountered at the foundation bearing elevation over a small portion of the building pads, we recommend the rock be removed to a minimum depth of 12 inches below planned bearing elevation. The area can then be backfilled with properly compacted crushed stone. The crushed stone will help act as a "cushion" to prevent point loading of the foundation. If desired, the foundation designer may also elect to include additional reinforcing steel into the foundations at these transition points to help resist negative moment forces.

Foundation excavations should be opened, the subgrade evaluated, remedial work performed, and concrete placed in an expeditious manner. Exposure to weather often reduces foundation support capabilities, thus necessitating remedial measures prior to concrete placement. It is also important that proper surface drainage be maintained both during construction (especially in terms of maintaining dry footing trenches) and after construction.

4.3.2 Option #2: Rock Bearing Foundations

If bedrock is encountered over the majority of the building foundations, the remaining isolated foundation areas underlain by soil can be over-excavated to bedrock, cleaned of remaining soil particles, and backfilled with lean concrete, flowable fill, or compacted rock fill. The recommended allowable bearing capacity for design of the foundations bearing on bedrock is 4,000 pounds per square foot (psf) or less.

Foundation excavations should be opened, the subgrade evaluated, remedial work performed, and concrete placed in an expeditious manner. Exposure to weather often reduces foundation support capabilities, thus necessitating remedial measures prior to concrete placement. It is also important that proper surface drainage be maintained both during construction (especially in terms of maintaining dry footing trenches) and after construction.

4.3.2 Slab-on-Grade

For slab-on-grade construction, the site should be prepared as previously described. We recommend that the subgrade be topped with a minimum 4-inch layer of crushed stone. A polyethylene vapor barrier is not required if the designer utilizes a dense graded aggregate base. The subgrade should be proofrolled and approved prior to the placement of the crushed stone.

At sites that have high plasticity soils, certain precautions should be considered to minimize or eliminate the potential for volume changes. We recommend the soils directly beneath the slab undergo additional plasticity testing during construction to determine the plasticity of the underlying soils. Once this has been completed, recommendations for the required depth of removal can be provided, if needed. If removal of the highly plastic soils is not desirable, then measures should be taken to protect the soils from excessive amounts of wetting or drying. In addition, modification of the soils by lime or cement treatment can be utilized to reduce the soil

plasticity.

4.4 SLOPES

Analysis of proposed slopes for stability was not included in the authorized scope of services. If the client would like this service completed for proposed slopes, GEOS can perform these services for an additional fee, upon request. When requested, GEOS will issue an additional services proposal for review and authorization.

5.0 CONSTRUCTION CONSIDERATIONS

5.1 EXCAVATIONS

Excavator refusal materials were encountered at depths ranging from about less than 3 inches to 8 feet below the existing ground surface elevation. Excavator refusal conditions generally correspond to materials which require blasting for removal. Typically, soils penetrated by the bucket of the excavator can be removed with conventional earthmoving equipment. However, excavation equipment varies, and field refusal conditions may vary. The weathering process is erratic and variations in the rock profile can occur in small lateral distances. Therefore, it is possible that some partially weathered rock and/or rock pinnacles or ledges requiring difficult excavation techniques may be encountered in isolated areas of the site between our observation trench locations.

Overblasting Concerns

We caution against extensive overblasting in building areas during the site grading operations. Overblasting typically damages below grade bedrock by fracturing or heaving the rock from its original position. This often creates difficulties for foundations and floor slabs supported on these

materials by creating voids in the rock unit and greatly reducing the support capacity. Any areas damaged by overblasting should be evaluated by the geotechnical engineer to determine appropriate corrective measures.

Excavation Safety

Excavations should be sloped or shored in accordance with local, state, and federal regulations, including OSHA (29 CFR Part 1926) excavation trench safety standards. The contractor is usually solely responsible for site safety. This information is provided only as a service and under no circumstances should GEOServices be assumed to be responsible for construction site safety.

5.2 FOUNDATION CONSTRUCTION

Foundation excavations should be opened, the subgrade evaluated, remedial work performed, and concrete placed in an expeditious manner. Exposure to weather often reduces foundation support capabilities, thus necessitating remedial measures prior to concrete placement. It is also important that proper surface drainage be maintained both during construction (especially in terms of maintaining dry footing trenches) and after construction. Soil backfill for footings should be placed in accordance with the recommendations for structural fill presented herein.

Foundation subgrade observations should be performed by a GEOServices geotechnical engineer, or his qualified representative, so that the recommendations provided in this report are consistent with the site conditions encountered. A dynamic cone penetrometer (DCP) is commonly utilized to provide information that is compared to the data obtained in the geotechnical report. Where unacceptable materials are encountered, the material should be excavated to stiff, suitable soils or remediated at the geotechnical engineer's direction. Typical remedial measures consist of undercutting, overexcavation, or combinations thereof.

5.3 MOISTURE SENSITIVE SOILS

The fine-grained soils encountered at this site will be sensitive to disturbances caused by construction traffic and changes in moisture content. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. Construction traffic patterns should be varied to prevent the degradation of previously stable subgrade. In addition, plastic soils which become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. We caution if site grading is performed during the wet weather season, methods such as discing and allowing the material to dry will be required to meet the required compaction recommendations. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

5.4 PLASTIC SOILS CONSIDERATIONS

Based on our experience in the this area, soils with plasticity indices (PI) less than 35 percent have a slight potential for volume changes with changes in moisture content, and soils with a PI greater than 50 percent are highly susceptible to volume changes. Between these values, we consider the soils to be moderately susceptible to volume changes. The laboratory test results indicate that portions of the on-site soils are slightly susceptible with PI values up to 30 percent.

Highly plastic soils have the potential to shrink or swell with significant changes in moisture content. Unlike other areas of the country where high plasticity soils cause considerable foundation problems, this area does not typically endure long periods of severe drought or wet weather. However, in recent years drought conditions have been sufficient to cause soil shrinkage and related structural distress of buildings, floor slabs and pavements at sites underlain by high plasticity soils.

Several construction considerations may reduce the potential for volume changes in the subgrade soils. Foundations should be excavated, checked, and concreted in the same day to prevent excessive wetting or drying of the foundation soils. The subgrade should be protected from excessive drying and wetting by covering the subgrade prior to slab construction. The site should be graded in order to drain surface water away from the area both during and after construction. Installing moisture barriers around the perimeter of the slab will help limit the moisture variation of the soil and reduce the potential for shrinking or swelling.

5.5 DRAINAGE AND SURFACE WATER CONCERNS

To reduce the potential for undercut and construction induced dropouts, water should not be allowed to collect in the foundation excavations, on floor slab areas, or on prepared subgrades of the construction area either during or after construction. Undercut or excavated areas should be sloped to facilitate removal of any collected rainwater, subsurface water, or surface runoff. Positive site surface drainage should be provided to reduce infiltration of surface water around the perimeter of the building structures. The grades should be sloped away from the building structures and surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill.

5.6 SINKHOLE CORRECTIVE ACTIONS AND CONSIDERATIONS

As stated previously, several areas of karst activity were noted by GEOS personnel onsite. Several areas showed signs typically associated with extensive karst weathering. Based on our experience, we believe these observations are indicative of an elevated sinkhole risk across the site. The areas noted during site reconnaissance consisted primarily of locally depressed areas and dropout areas. The dropouts noted onsite were observed to from about 5 feet to as deep as 15 feet deeper than immediate surrounding ground surface elevation. We also note this site likely contains smaller areas of possible karst activity which may not be shown on topographic mapping

due to the scale of the map often precluding smaller depressions. Based on observations, we expect that this development will require remediation of karst features onsite. A typical sinkhole repair diagram is included in Appendix D.

As previously mentioned, we dot recommend developing over the karst feature identified at photos 6 and 7. Based on the provided layout plan, we anticipate ten to twenty lots/units will need to be adjusted that are shown over the suspected karst features. As with essentially all projects in karst terrain, there will remain the potential for sinkhole development, especially in those areas not designated for cap grouting. If a sinkhole develops, the appropriate corrective action is dependent on the size and location of the sinkhole. As described herein, GEOServices should be retained to observe site and subgrade preparation activities.

We recommend that existing weak soils be removed from the depressed areas to underlying stiff or better residual soil or bedrock and evaluated by GEOServices. At that time, recommendations will be provided for backfill, which will likely consist of an inverted filter or lean concrete placement if a throat is encountered or lining the bottom of the excavation with geotextile prior to backfilling with clean structural fill.

During construction and based on our experience, corrective actions, such as proper grade selection and positive site drainage, can be performed to decrease but not eliminate the potential for sinkhole development.

In general, the portions of a site that are excavated to achieve the desired grades will have a higher risk of sinkhole development than the areas that are filled, because of the exposure of relic fractures in the soil to rainfall and runoff. On the other hand, those portions of a site that receive a modest amount of fill (or that have been filled in the past) will have a decreased risk of

sinkhole development caused by rainfall because that placement of a cohesive soil fill over these areas effectively caps the area with a relatively impervious "blanket" of remolded soil. Therefore, the recommendations that follow incorporate a modest remedial treatment program designed to make the surface of the soil in excavated areas less permeable.

Although it is our opinion that the risk of ground subsidence associated with sinkhole formation cannot be eliminated, we have found that several measures are useful in site design and development to reduce this potential risk. These measures include:

- Maintaining positive site drainage to route surface waters well away from structural areas both during construction and for the life of the structure.
- The scarification and re-compaction of the upper 6 to 10 inches of soil in earthwork cut areas.
- Verifying that subsurface piping beneath structures is carefully constructed and pressure tested prior to its placement in service.
- The use of pavement or lined ditches, particularly in cut areas, to collect and transport surface water to areas away from structures.

Considerations when building within a sinkhole prone area are to provide positive surface drainage away from any proposed building or parking area both during and after construction. Backfill in utility trenches of other excavations should consist of compacted, well-graded material such as dense graded aggregate or compacted on site soils. The use of an open graded stone such as No. 57 stone is not recommended unless the stone backfill is provided an exit path and not allowed to pond. If sinkhole conditions are observed, the type of corrective action is most appropriately determined by GEOServices on a case-by-case basis.

6.0 LIMITATIONS

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. This report is for our geotechnical work only. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other warranty, express or implied, is made.

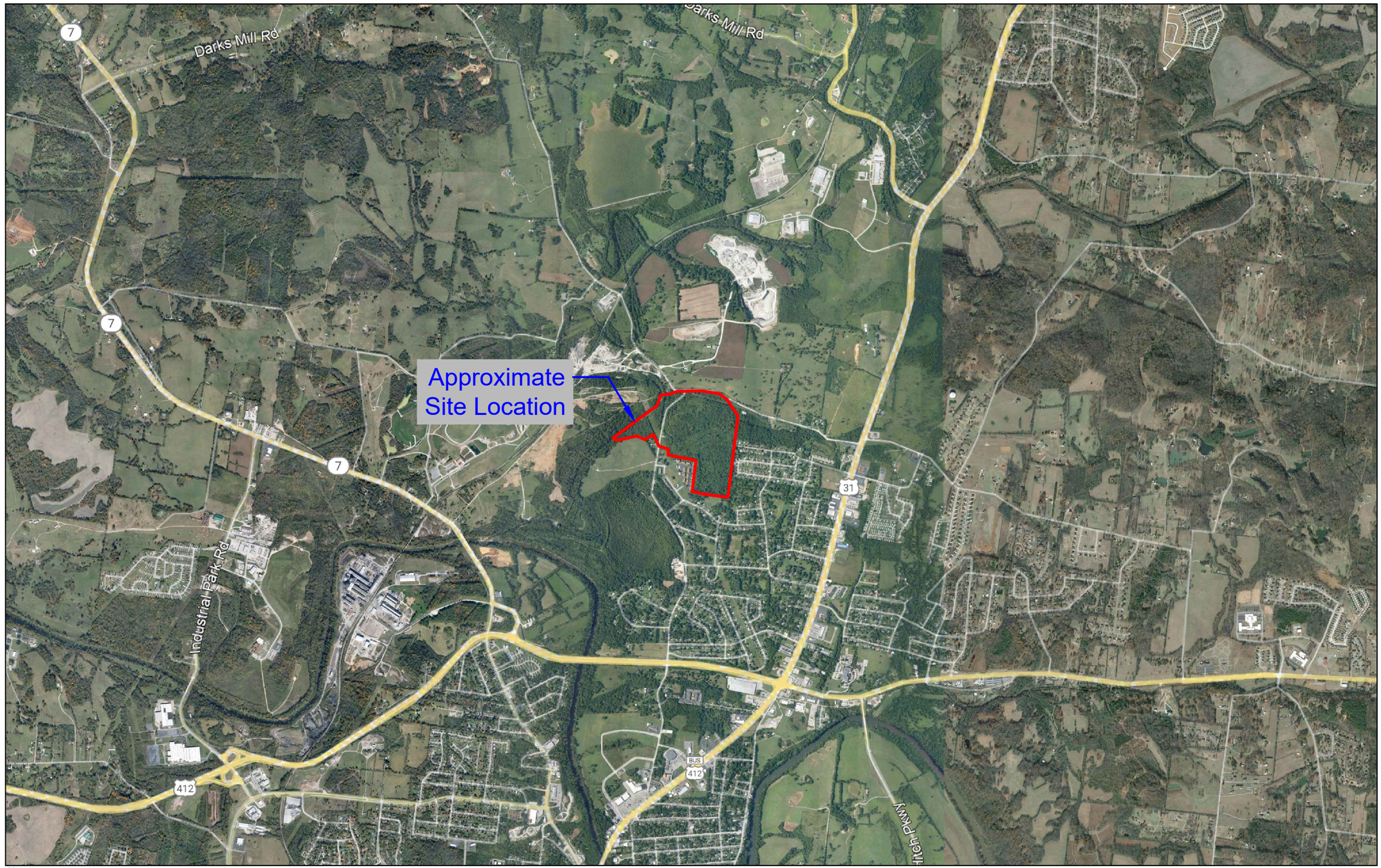
The analyses and recommendations submitted herein are based, in part, upon the data obtained from the exploration. The nature and extent of variations between the observation trenches will not become evident until construction. We recommend that GEOServices be retained to observe the project construction in the field. GEOServices cannot accept responsibility for conditions which deviate from those described in this report if not retained to perform construction observation and testing. If variations appear evident, then we will re-evaluate the recommendations of this report. In the event that any changes in the nature, design, or location of the structures are planned, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed, and conclusions modified or verified in writing. Also, if the scope of the project should change significantly from that described herein, these recommendations may have to be re-evaluated.

GEOServices, LLC, Geotechnical and Materials Engineers

APPENDICES

GEOServices, LLC, Geotechnical and Materials Engineers

APPENDIX A



Notes:

1) Aerial Provided by: Google Earth Pro, (08/21/2014)

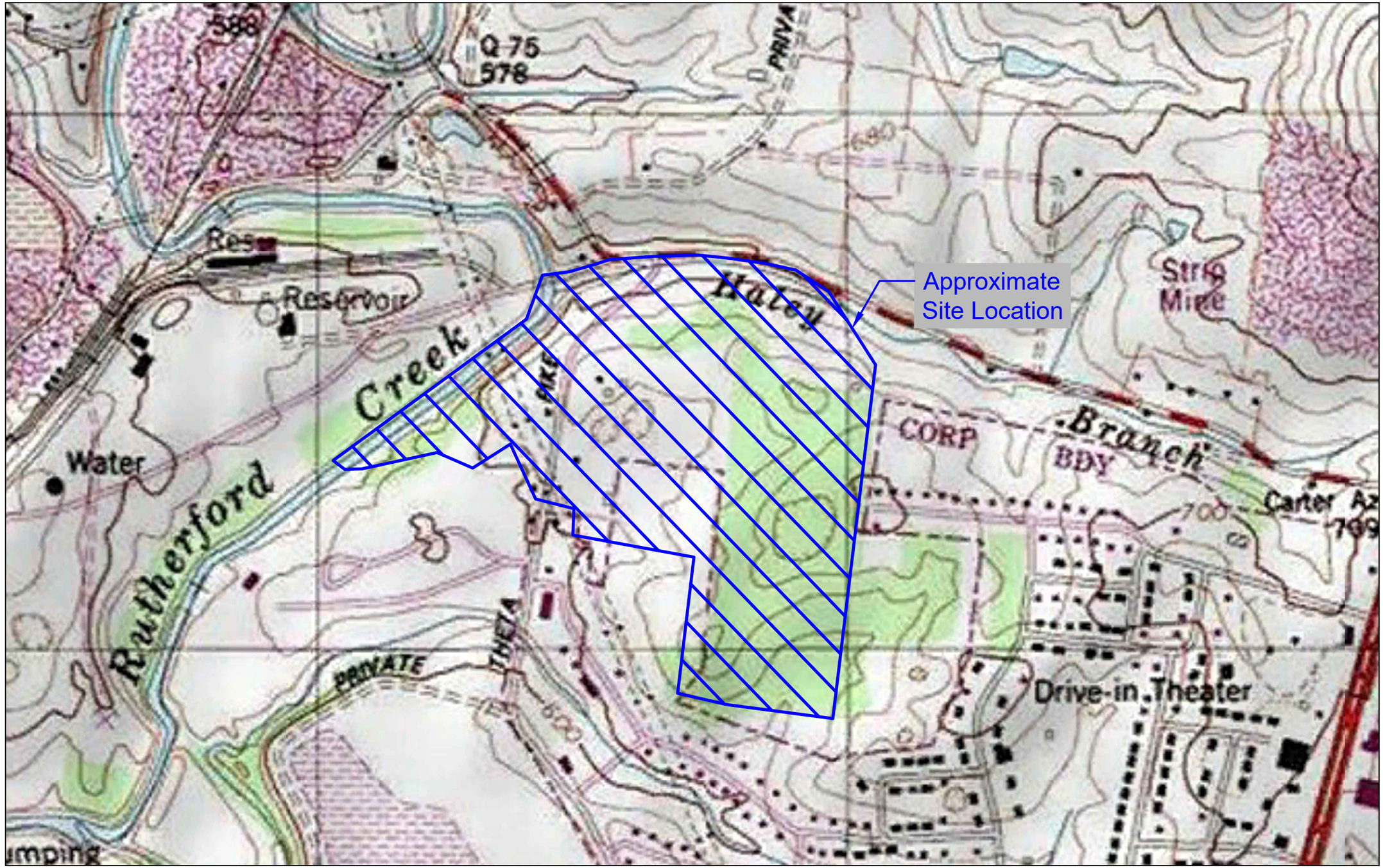
Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

Site Vicinity Plan
Proposed Theta Pike Development
Maury County, Tennessee

DATE:
03/28/2022

GEOS Project No.
31-221126

FIGURE:
1



Source Provided by: MYTOPO

GEOS Universal Engineering Sciences
Geotechnical, Environmental and Materials Engineers

USGS Topographic Map
Proposed Theta Pike Development
Maury County, Tennessee

DATE:
03/28/2022

GEOS Project No.
31-221126

FIGURE:
2

N

Rock Products Rd
Theta Pike
Rock Products Rd
Rock Products Rd
W Burt Dr
W Burt Dr
Cross Valley Dr
N Hardin Dr
Shady Dr
FUTURE DRIVE
McMeen Cir
Caldwell Dr
Theta Pike
Burchell Ln

OT-1 OT-2 OT-3 OT-4 OT-5 OT-6 OT-7 OT-8 OT-9 OT-10 OT-11 OT-12 OT-13 OT-14 OT-15 OT-16 OT-17 OT-18 OT-19 OT-20 OT-21 OT-22 OT-23 OT-24 OT-24A OT-25 OT-26 OT-27 OT-28 OT-29 OT-30 OT-31 OT-32 OT-33 OT-34 OT-35 OT-36 OT-37 OT-38 OT-39 OT-40 OT-41 OT-42 OT-43 OT-44 OT-45 OT-46 OT-47 OT-48 OT-49 OT-50 OT-51 OT-52 OT-53 OT-54

Google Earth

Notes:

1) Site Source Provided by: Client
2) Aerial Provided by: Google Earth Pro, (08/21/2014)
3) Observation Trench Locations are shown in general arrangement only
4) Do Not use Observation Trench Locations for determinations of Distance or Quantities

Observation Trench Location & Identifier

Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

Observation Trench Location Plan
Proposed Theta Pike Development
Maury County, Tennessee

DATE: 03/28/2022
GEOS Project No. 31-221126
FIGURE: 3

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-1	GEOS Universal Engineering Sciences
GEOServices Project No. 31-221126		
Date Excavated: March 21, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil and Weathered Limestone Slabs					
1.0	Refusal at 1.0 Feet on Probable Limestone Bedrock					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-2	GEOServices Universal Engineering Sciences
GEOServices Project No. 31-221126		Geotechnical, Environmental and Materials Engineers
Date Excavated: March 21, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0	Rocky Lean CLAY (CL) with fine-sand traces and limestone fragments to cobbles - brown; firm; moist; (RESIDUUM)	7-8-8				22
2.0						
3.0	Lean CLAY (CL) with fine-sand traces and limestone fragments to cobbles - brown; moist; (RESIDUUM)					22
4.0	Refusal at 2.0 to 4.0 Feet on Probable Uneven Limestone Bedrock					
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-3	
GEOServices Project No. 31-221126		
Date Excavated: March 21, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		5-5-5				27
2.0	Fat CLAY (CH) with fine-sand traces - brown; firm; moist; (RESIDUUM)					
3.0	Refusal at 2.5 to 3.0 Feet on Probable Uneven Limestone Bedrock					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-4	GEOS Universal Engineering Sciences
GEOServices Project No. 31-221126		
Date Excavated: March 21, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with fine-sand traces - orange-brown, brown; stiff; moist; (RESIDUUM)	9-9-9				22
2.0						
3.0		9-10-10	36	21	15	22
4.0						
5.0		10-10-10				23
6.0						
7.0						
8.0	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-5	GEOS Universal Engineering Sciences
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		8-9-9				24
2.0						
3.0		9-9-9				22
4.0	Fat CLAY (CH) with fine-sand traces, black-oxide nodules, and limestone boulder - yellow-brown, brown, orange-brown; stiff; moist; (RESIDUUM)					
5.0		9-9-10				24
6.0						
7.0						
8.0	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-6	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with fine-sand traces and limestone boulders - brown, tan-brown; firm to stiff; moist; (RESIDUUM)	5-5-6				26
2.0						
3.0		9-9-9				24
4.0						
5.0		9-9-10				
6.0						
7.0	Refusal at 3.5 to 7.0 Feet on Probable Pinnacled Limestone Bedrock					
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-7	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		6-7-8				20
2.0	Lean CLAY (CL) with fine-sand traces and few chert fragments - brown; firm; moist; (RESIDUUM)					
3.0		8-8-9				
4.0						
	Refusal at 2.0 to 4.5 Feet on Probable Pinnacled Limestone Bedrock					
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-8	
GEOServices Project No. 31-221126		
Date Excavated: March 21, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		6-6-7				42
2.0	Fat CLAY (CH) with fine-sand traces, black-oxide nodules, and limestone boulders - brown, red-brown; firm; moist; (RESIDUUM)					
3.0						
4.0	Refusal at 2.0 to 3.5 Feet on Probable Uneven Limestone Bedrock					
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-9	
GEOServices Project No. 31-221126		
Date Excavated: March 21, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with fine-sand traces, chert fragments, and limestone cobbles to boulders - brown; moist; (RESIDUUM)					18
2.0						
3.0						
4.0	Refusal at 3.5 Feet on Probable Limestone Bedrock					
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-10	GEOS Universal Engineering Sciences
GEOServices Project No. 31-221126		
Date Excavated: March 21, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil and Limestone Cobbles					
1.0	Refusal at 1.0 Feet on Probable Limestone Bedrock					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-11	
GEOServices Project No. 31-221126		
Date Excavated: March 21, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (2 inches)					
1.0	Refusal at 0.2 Feet on Probable Limestone Bedrock					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-12	
GEOServices Project No. 31-221126		
Date Excavated: March 21, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with fine-sand - dark-brown; soft; moist; (ALLUVIUM)	3-3-3				25
2.0						
3.0		6-6-7				22
4.0						
5.0	Lean CLAY (CL) with fine-sand traces - brown, orange-brown; firm; moist; (RESIDUUM)	5-5-5				26
6.0						
7.0						
8.0						
9.0	Refusal at 4.0 to 8.0+ Feet on Probable Pinnacled Limestone Bedrock					

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-13	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with fine-sand - brown, light-brown; stiff; moist; (RESIDUUM)					
		8-9-9				23
2.0						
3.0						
		9-9-9	32	18	14	25
4.0						
5.0						
		9-9-9				23
6.0						
7.0						
8.0	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-14	Universal Engineering Sciences
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with fine-sand traces and black-oxide nodules - orange-brown; stiff; moist; (RESIDUUM)	10-10-10				29
2.0						
3.0		9-10-11				30
4.0						
5.0	Fat CLAY (CH) with fine-sand traces - yellow-brown; stiff; moist; (RESIDUUM)	11-11-11				32
6.0						
7.0						
8.0	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-15	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with fine-sand - brown, orange-brown; firm to stiff; moist; (RESIDUUM)					
		6-7-8				21
2.0						
3.0						
		10-10-10	53	28	25	28
4.0						
5.0		10-10-10				32
6.0						
7.0						
8.0	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-16	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with fine-sand traces - brown; very-soft to stiff; moist; (RESIDUUM)					
		1-1-1				21
2.0						
3.0						
		9-9-9				19
4.0						
5.0						
	Fat CLAY (CH) with fine-sand traces - brown, yellow-brown, tan-brown; stiff; moist; (RESIDUUM)	9-10-11				38
6.0						
7.0						
8.0	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development Columbia, Tennessee GEOServices Project No. 31-221126	TEST PIT OBSERVATION RECORD Test Pit No.: OT-17	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: March 22, 2022	**Observed By: Charlie Capps**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with fine-sand - brown, orange-brown; firm to stiff; moist; (RESIDUUM)					
		8-8-8				26
2.0						
3.0						
		9-9-9				27
4.0						
5.0						
	Fat CLAY (CH) with fine-sand - brown, orange-brown, yellow-brown; stiff; moist; (RESIDUUM)	10-11-11				
6.0						
7.0						
8.0	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-18	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with fine-sand and boulders - brown, orange-brown, yellow-brown; stiff; moist; (RESIDUUM)	8-9-9				29
2.0						
3.0		9-9-9				30
4.0						
5.0		10-11-11				30
6.0						
7.0						
8.0	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-19	
GEOServices Project No. 31-221126		
Date Excavated: March 21, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0						25
2.0						
3.0						24
4.0	Fat CLAY (CH) with fine-sand traces and chert fragments - brown; moist; (RESIDUUM)					
5.0						
6.0						
7.0	Refusal at 4.0 to 6.5+ Feet in Probable Limestone Bedrock Crevice					
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-20	GEOS Universal Engineering Sciences
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil and Limestone Slabs					
1.0	Refusal at 0.8 Feet on Probable Limestone Bedrock					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-21	Universal Engineering Sciences
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with fine-sand - dark-brown; very-soft; moist; (ALLUVIUM)					
		2-2-2				25
2.0						
3.0						
		2-2-2				21
4.0	Lean CLAY (CL) with fine-sand - brown; stiff; moist; (RESIDUUM)					
5.0						
		8-9-9				20
6.0						
7.0						
8.0						
9.0	Observation Trench Terminated at 9 Feet - No Refusal					

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-22	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0						
		6-7-8				36
2.0						
3.0						
	Fat CLAY (CH) with fine-sand - brown, orange-brown; firm to stiff; moist; (RESIDUUM)	10-10-10				41
4.0						
5.0						
		10-10-10				
6.0						
	Refusal at 6.0 Feet on Probable Limestone Bedrock					
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-23	GEOS Universal Engineering Sciences
GEOServices Project No. 31-221126		
Date Excavated: March 21, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0						29
2.0	Fat CLAY (CH) with fine-sand traces, black-oxide nodules, and limestone fragments to boulders - orange-brown; moist; (RESIDUUM)					
3.0						28
4.0						
	Rocky Fat CLAY (CH) with fine-sand traces, black-oxide nodules, and limestone fragments to boulders - orange-brown; moist; (RESIDUUM)					
5.0						26
	Refusal at 5.5 Feet on Probable Limestone Bedrock					
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-24	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Refusal at 0 to 0.5 Feet on Probable Uneven Limestone Bedrock					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-24a	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	Observed By: Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with fine-sand, black-oxide nodules, and chert fragments - light-brown, brown; firm; moist; (RESIDUUM)	6-6-7				22
2.0						
3.0		7-7-7				21
4.0						
5.0		4-5-5				24
6.0						
7.0						
8.0						
9.0	Observation Trench Terminated at 9 Feet - No Refusal					

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-25	GEOS Universal Engineering Sciences
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0						36
2.0	Fat CLAY (CH) with fine-sand limestone boulders, and chert fragments - brown; moist; (RESIDUUM)					
3.0	Refusal at 1.5 to 3.0 Feet on Probable Uneven Limestone Bedrock					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-26	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0	Refusal at 1 Foot on Probable Limestone Bedrock					
2.0						
3.0						
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-27	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-221126		
Date Excavated: March 21, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with fine-sand traces and black-oxide nodules - brown; stiff; moist; (RESIDUUM)					
		8-8-9				22
2.0						
3.0						
		9-9-9				20
4.0						
5.0						
		9-9-9				20
6.0						
7.0						
8.0	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-28	
GEOServices Project No. 31-221126		
Date Excavated: March 21, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		6-7-7				25
2.0						
	Sandy Fat CLAY (CH) with black-oxide nodules and limestone boulders - orange-brown; firm; moist; (RESIDUUM)					
3.0		7-8-8				33
4.0						
5.0	Refusal at 5.0 Feet on Probable Limestone Bedrock					
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-29	
GEOServices Project No. 31-221126		
Date Excavated: March 21, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		8-9-9				25
2.0						
3.0	Fat CLAY (CH) with fine-sand traces, black-oxide nodules, and chert fragments - brown; moist; (RESIDUUM)	9-9-9				21
4.0						
5.0		9-9-9				32
6.0	Refusal at 1.0 to 6.0 Feet on Probable Pinnacled Limestone Bedrock					
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-30	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0						
		1-1-1				30
2.0						
3.0						
		1-1-1				27
4.0						
5.0						
	Lean CLAY (CL) with fine-sand - dark-brown; very-soft; moist; (ALLUVIUM)	1-1-1				28
6.0						
7.0						
						23
8.0						
9.0						
10.0						
	Observation Trench Terminated at 10 Feet - No Refusal					

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-31	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with fine-sand - brown; very-soft; moist; (ALLUVIUM)	1-1-1				25
2.0						
3.0	Lean CLAY (CL) with fine-sand and limestone cobbles - dark-brown; very-soft; moist; (ALLUVIUM)	1-1-1				24
4.0	Refusal at 4.0 Feet on Probable Limestone Bedrock					
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development Columbia, Tennessee GEOServices Project No. 31-221126	TEST PIT OBSERVATION RECORD Test Pit No.: OT-32	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: March 22, 2022	**Observed By: Charlie Capps**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		2-2-2				20
2.0	Lean CLAY (CL) with trace fine-sand - brown, orange-brown with black oxide nodules; very soft to stiff; moist; (RESIDUUM)					
3.0		10-10-10				30
4.0						
5.0		11-11-12				29
6.0	Fat CLAY (CH) - tan-brown; stiff; moist; (RESIDUUM)					
7.0						
8.0						
9.0	Observation Trench Terminated at 8 Feet - No Refusal					

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-33	GEOS Universal Engineering Sciences
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with fine-sand traces - brown; moist; (RESIDUUM)					
2.0						
3.0						
4.0	Refusal at 0.2 to 4.0 Feet on Probable Pinnacled Limestone Bedrock					
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-34	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with trace fine-sand and boulders - brown, orange-brown with black oxide nodules; stiff; moist; (RESIDUUM)					
		9-9-9				36
2.0						
3.0						
		10-10-10				44
4.0						
5.0						
		11-11-11				37
6.0						
7.0						
8.0						
	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-35	Universal Engineering Sciences
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with fine-sand - brown; firm; moist; (RESIDUUM)	5-5-5				22
2.0						
3.0		5-6-6				25
4.0						
5.0		5-6-6				25
6.0						
7.0						
8.0						
9.0	Observation Trench Terminated at 8 Feet - No Refusal					

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-36	GEOS Universal Engineering Sciences
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with fine-sand traces - brown, reddish brown with black oxide nodules; firm to stiff; moist; (RESIDUUM)					
		8-8-9				29
2.0						
3.0						
		10-10-10	42	23	19	26
4.0						
5.0						
		13-13-13				24
6.0						
7.0						
8.0						
	Observation Trench Termination at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-37	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with trace fine-sand - brown, orange-brown with black oxide nodules; firm to stiff; moist; (RESIDUUM)					
		5-5-6				31
2.0						
3.0						
		9-9-9				27
4.0						
5.0						
	Fat CLAY (CH) - tan-brown; stiff; moist; (RESIDUUM)	10-10-10				
6.0						
7.0						
8.0						
	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-38	Universal Engineering Sciences
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with trace fine-sand - brown with black oxide nodules; firm to stiff; moist; (RESIDUUM)	8-8-8				29
2.0						
3.0		9-9-9				34
4.0						
5.0						38
6.0	Fat CLAY (CH) with trace fine-sand and rock fragments, boulders - brown with black oxide nodules; moist; (RESIDUUM)					
7.0						
8.0	Observation Trench Termination at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-39	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with trace fine-sand - brown; firm; moist; (RESIDUUM)	8-8-8				21
2.0						
3.0	Fat CLAY (CH) with trace fine-sand and trace chert fragments - brown, orange-brown; stiff; moist; (RESIDUUM)	9-10-10				30
4.0						
5.0		12-12-13				33
6.0						
7.0						
8.0	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-40	GEOS Universal Engineering Sciences
GEOServices Project No. 31-221126		Geotechnical, Environmental and Materials Engineers
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with trace fine-sand - brown; soft to firm; moist; (RESIDUUM)					
		4-4-5				22
2.0						
3.0						
		5-5-5				22
4.0						
5.0						
	Fat CLAY (CH) with trace fine-sand and chert fragments - brown, orange-brown; stiff; moist; (RESIDUUM)	9-9-9				24
6.0						
7.0						
8.0	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development Columbia, Tennessee GEOServices Project No. 31-221126	TEST PIT OBSERVATION RECORD Test Pit No.: OT-41	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: March 22, 2022	**Observed By: Charlie Capps**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with trace fine-sand - brown, yellowish-brown with black oxide nodules; firm; moist; (RESIDUUM)	8-8-9				28
2.0						
3.0	Observation Trench Refusal at 3.2 Feet					
4.0						
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-42	
GEOServices Project No. 31-221126		
Date Excavated: March 23, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with trace fine-sand - brown; soft to firm; moist; (RESIDUUM)					
		2-3-3				41
2.0						
3.0						
		5-6-7				28
4.0						
5.0						
	Observation Trench Refusal at 5 Feet					
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-43	GEOS Universal Engineering Sciences
GEOServices Project No. 31-221126		Geotechnical, Environmental and Materials Engineers
Date Excavated: March 23, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with trace fine-sand and trace chert fragments - brown, orange brown with black oxide nodules; firm to stiff; moist; (RESIDUUM)					
		8-8-8				32
2.0						
3.0						
		9-9-9				27
4.0						
5.0						
		10-11-12				39
6.0						
7.0						
8.0	Observation Trench Termination at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-44	
GEOServices Project No. 31-221126		
Date Excavated: March 22, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with trace fine-sand - brown, yellowish-brown with black oxide nodules; firm to stiff; moist; (RESIDUUM)	8-8-8				27
2.0						
3.0		10-10-10				33
4.0						
5.0		11-11-11				33
6.0	Fat CLAY (CH) with trace fine-sand and trace white slickensides - brown, yellowish-brown with black oxide nodules; firm to stiff; moist; (RESIDUUM)					
7.0						
8.0	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-45	
GEOServices Project No. 31-221126		
Date Excavated: March 23, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0						
	Lean CLAY (CL) with trace fine-sand - light brown; soft; moist; (RESIDUUM)	4-4-5				22
2.0						
3.0						
		8-9-9				28
4.0						
5.0	Fat CLAY (CH) with trace fine-sand - brown, orange-brown with black oxide nodules; stiff; moist; (RESIDUUM)					
		9-9-9				27
6.0						
7.0						
8.0						
	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-46	
GEOServices Project No. 31-221126		
Date Excavated: March 23, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with fine-sand - brown, light brown; soft to firm; moist; (RESIDUUM)					
		2-3-3				22
2.0						
3.0						
		5-6-7				19
4.0						
5.0		7-8-8				22
6.0						
7.0						
8.0	Observation Trench Termination at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-47	
GEOServices Project No. 31-221126		
Date Excavated: March 23, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with trace fine-sand - brown, orange brown with black oxide nodules; soft to stiff; moist; (RESIDUUM)					
		4-4-5				25
2.0						
3.0						
		8-8-8				24
4.0						
5.0						
		9-9-10				24
6.0						
7.0						
						30
8.0						
	Observation Trench Termination at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-48	
GEOServices Project No. 31-221126		
Date Excavated: March 23, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with trace fine-sand with rock fragments and boulders - brown, orange-brown with black oxide nodules; soft to stiff; moist; (RESIDUUM)					
		5-5-6				22
2.0						
3.0						
		8-9-9				23
4.0						
5.0						
		9-9-9				23
6.0						
7.0						
8.0						
9.0	Observation Trench Terminated at 8.5 Feet - No Refusal					

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development Columbia, Tennessee GEOServices Project No. 31-221126	TEST PIT OBSERVATION RECORD Test Pit No.: OT-49	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: March 23, 2022	**Observed By: Charlie Capps**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Fat CLAY (CH) with trace fine-sand - brown, orange-brown with black oxide nodules; firm; moist; (RESIDUUM)	5-5-5				29
2.0						
3.0		7-8-8				34
4.0						
5.0		8-8-9				
6.0						
7.0	Observation Trench Refusal at 7 Feet					
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-50	
GEOServices Project No. 31-221126		
Date Excavated: March 23, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with fine-sand - brown; very soft to firm; moist; (RESIDUUM)	1-1-1				23
2.0						
3.0		5-5-5				22
4.0						
5.0						21
6.0						
7.0						
8.0	Observation Trench Refusal at 8 Feet					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-51	GEOS Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
GEOServices Project No. 31-221126		
Date Excavated: March 23, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (6 inches)					
1.0	Lean CLAY (CL) with trace fine-sand - brown; firm; moist; (RESIDUUM)					
		5-5-6				24
2.0						
3.0						
		8-8-9				25
4.0						
5.0						
		7-7-7				25
6.0						
7.0						
8.0	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-52	
GEOServices Project No. 31-221126		
Date Excavated: March 23, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0		5-5-6				21
2.0						
3.0	Fat CLAY (CH) with trace fine-sand with chert fragments - brown, reddish-brown with black oxide nodules; firm to stiff; moist; (RESIDUUM)	8-8-8				43
4.0						
5.0						
6.0	Observation Trench Refusal at 6 Feet					
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development Columbia, Tennessee GEOServices Project No. 31-221126	TEST PIT OBSERVATION RECORD Test Pit No.: OT-53	Universal Engineering Sciences Geotechnical, Environmental and Materials Engineers
Date Excavated: March 23, 2022	**Observed By: Charlie Capps**	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (4 inches)					
1.0	SILT (ML) with fine-sand - dark brown; very soft; moist; (RESIDUUM)	1-1-1				24
2.0						
3.0		1-1-1				22
4.0						
5.0		3-3-3				21
6.0	Lean CLAY (CL) with trace fine-sand - brown; soft; moist; (RESIDUUM)					
7.0						
8.0	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

Proposed Theta Pike Development	TEST PIT OBSERVATION RECORD	
Columbia, Tennessee	Test Pit No.: OT-54	
GEOServices Project No. 31-221126		
Date Excavated: March 23, 2022	**Observed By:** Charlie Capps	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0	Fat CLAY (CH) with trace fine-sand - brown; firm; moist; (RESIDUUM)	2-2-3				23
2.0						
3.0		6-7-8				22
4.0						
5.0	Fat CLAY (CH) with trace fine-sand with chert fragments - brown, orange-brown; moist; (RESIDUUM)	8-8-8				23
6.0						
7.0						
8.0	Observation Trench Terminated at 8 Feet - No Refusal					
9.0						

Excavated test pit

Excavated material

Comments: No groundwater observed during excavation of observation trench.

GEOServices, LLC, Geotechnical and Materials Engineers

APPENDIX B

SOIL DATA SUMMARY
Proposed Theta Pike Development - Columbia, TN
GEOServices Project No. 31-221126
March 31, 2022

Observation Trench Number	Sample Number	Depth (feet)	Natural Moisture Content	Atterberg Limits			Soil Type
				LL	PL	PI	
OT-2	1	1	21.7				
	2	3	22.2				
OT-3	1	1	26.8				
OT-4	1	1	21.5				
	2	3	22.2	36	21	15	CL
	3	5	22.9				
OT-5	1	1	24.2				
	2	3	22.1				
	3	5	23.9				
OT-6	1	1	26				
	2	3	23.9				
OT-7	1	1	20.1				
OT-8	1	1	42.4				
OT-9	1	1	17.8				
OT-12	1	1	24.5				
	2	3	22.2				
	3	5	25.6				
OT-13	1	1	23.1				
	2	3	24.8	32	18	14	CL
	3	5	22.5				
OT-14	1	1	29.3				
	2	3	30.4				
	3	5	31.5				
OT-15	1	1	20.7				
	2	3	28.2	53	28	25	CH
	3	5	32.3				
OT-16	1	1	21.1				
	2	3	19.4				
	3	5	38				
OT-17	1	1	25.6				
	2	3	27				

SOIL DATA SUMMARY
Proposed Theta Pike Development - Columbia, TN
GEOServices Project No. 31-221126
March 31, 2022

Observation Trench Number	Sample Number	Depth (feet)	Natural Moisture Content	Atterberg Limits			Soil Type
				LL	PL	PI	
OT-18	1	1	28.9				
	2	3	30.3				
	3	5	29.8				
OT-19	1	1	24.7				
	2	3	23.5				
OT-21	1	1	24.9				
	2	3	20.9	30	17	13	CL
	3	5	20.4				
OT-22	1	1	35.7				
	2	3	41.1				
OT-23	1	1	29.2				
	2	3	27.6				
	3	5	25.9				
OT-24A	1	1	21.5				
	2	3	21.4				
	3	5	24.1				
OT-25	1	1	35.6				
OT-27	1	1	30.6				
	2	1	22				
	3	3	20.4				
	4	5	19.8				
OT-28	1	1	24.9				
	2	3	32.6				
OT-29	1	1	24.5				
	2	3	20.5				
	3	5	32.4				
OT-30	1	1	30				
	2	3	26.6				
	3	5	27.8				
	4	8	23.4				
OT-31	1	1	25.1				
	2	3	24.2				

SOIL DATA SUMMARY
Proposed Theta Pike Development - Columbia, TN
GEOServices Project No. 31-221126
March 31, 2022

Observation Trench Number	Sample Number	Depth (feet)	Natural Moisture Content	Atterberg Limits			Soil Type
				LL	PL	PI	
OT-32	1	1	20.3				
	2	3	30.3				
	3	5	29.4				
OT-34	1	1	36.3				
	2	3	44.2				
	3	5	36.8				
OT-35	1	1	21.6				
	2	3	25				
	3	5	24.6				
OT-36	1	1	28.6				
	2	3	26.4	42	23	19	CL
	3	5	23.8				
OT-37	1	1	31				
	2	3	26.8				
OT-38	1	1	28.8				
	2	3	34				
	3	5	38				
OT-39	1	1	21.3				
	2	3	30.1				
	3	5	32.8				
OT-40	1	1	21.8				
	2	3	21.7				
	3	5	24.2				
OT-41	1	1	28.2				
OT-42	1	1	41.1				
	2	3	28.2				
OT-43	1	1	32.3				
	2	3	26.6				
	3	5	39				
OT-44	1	1	26.5				
	2	3	32.5				
	3	5	33.4				

SOIL DATA SUMMARY
Proposed Theta Pike Development - Columbia, TN
GEOServices Project No. 31-221126
March 31, 2022

Observation Trench Number	Sample Number	Depth (feet)	Natural Moisture Content	Atterberg Limits			Soil Type
				LL	PL	PI	
OT-45	1	1	21.9				
	2	3	28.2				
	3	5	27.4				
OT-46	1	1	22.2				
	2	3	18.6				
	3	5	22.4				
OT-47	1	1	24.5				
	2	3	24.2				
	3	5	23.8				
	4	7	30.4				
OT-48	1	1	22.3				
	2	3	22.8				
	3	5	23.1				
OT-49	1	1	28.5				
	2	3	34.3				
OT-50	1	1	23.1				
	2	3	21.7				
	3	5	21.3				
OT-51	1	1	24.1				
	2	3	24.8				
	3	5	25.2				
OT-52	1	1	21.3				
	2	3	42.8				
OT-53	1	1	24				
	2	3	21.9				
	3	5	21.1				
OT-54	1	1	22.9				
	2	3	21.9				
	3	5	22.7				

GEOServices, LLC, Geotechnical and Materials Engineers

APPENDIX C

N

Photo: 1

Photo: 2

Photo: 3

Photo: 4

Notes:

1) Site Source Provided by: Client
2) Aerial Provided by: Google Earth Pro, (08/21/2014)

Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

Representative Photos
Proposed Theta Pike Development
Maury County, Tennessee

DATE: 03/28/2022

GEOS Project No. 31-221126

FIGURE: 4

N

Photo: 5

Photo: 6

Photo: 7

Photo: 8

Notes:

1) Site Source Provided by: Client
2) Aerial Provided by: Google Earth Pro, (08/21/2014)

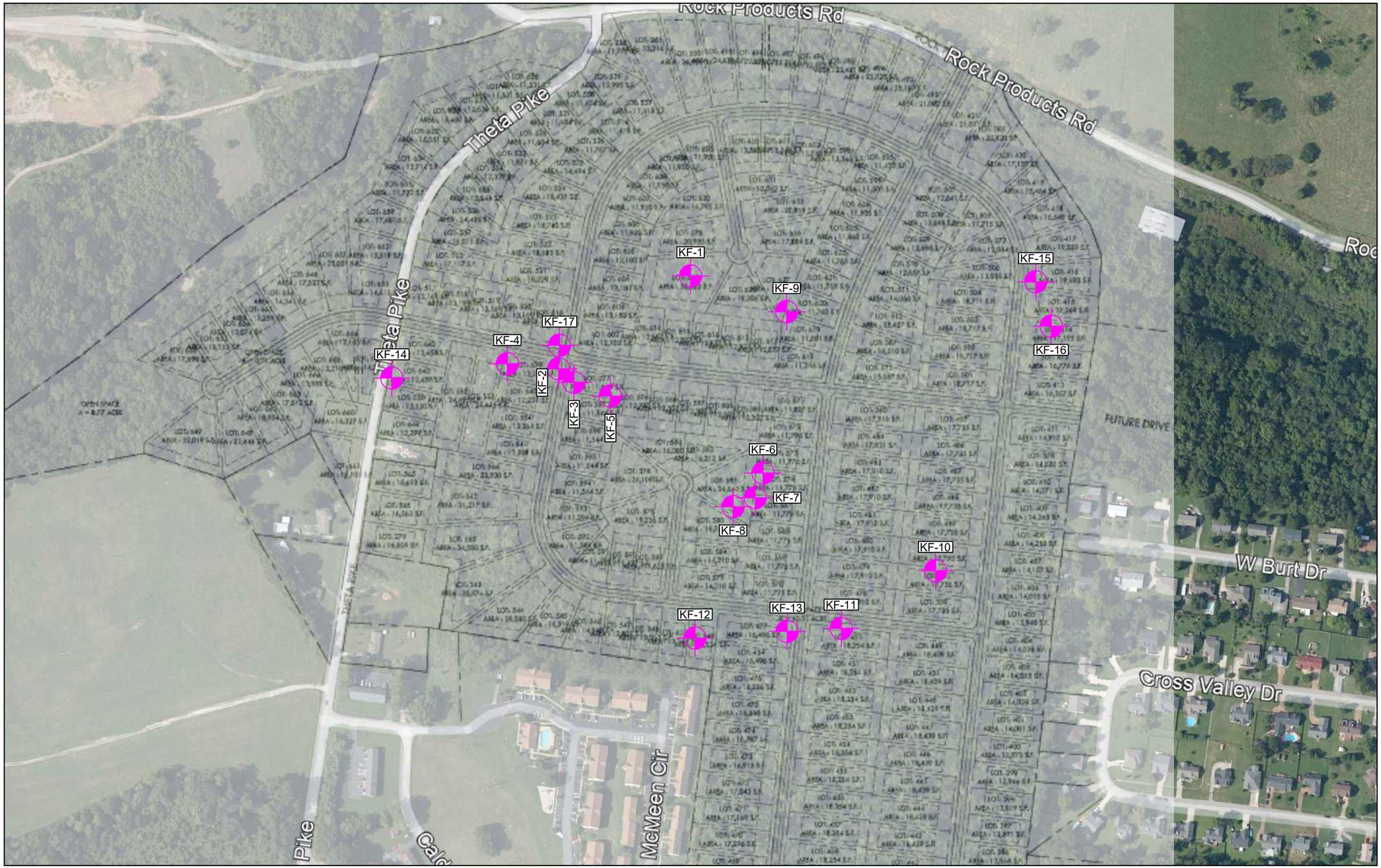
Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

Representative Photos
Proposed Theta Pike Development
Maury County, Tennessee

DATE: 03/28/2022

GEOS Project No. 31-221126

FIGURE: 5



Notes:

1) Site Source Provided by: Client
2) Aerial Provided by: Google Earth Pro, (08/21/2014)
3) Possible Karst Feature Locations are shown in general arrangement only
4) Do Not use Possible Karst Feature Locations for determinations of Distance or Quantities

Possible Karst Feature Location & Identifier

Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

Possible Karst Feature Location Plan
Proposed Theta Pike Development
Maury County, Tennessee

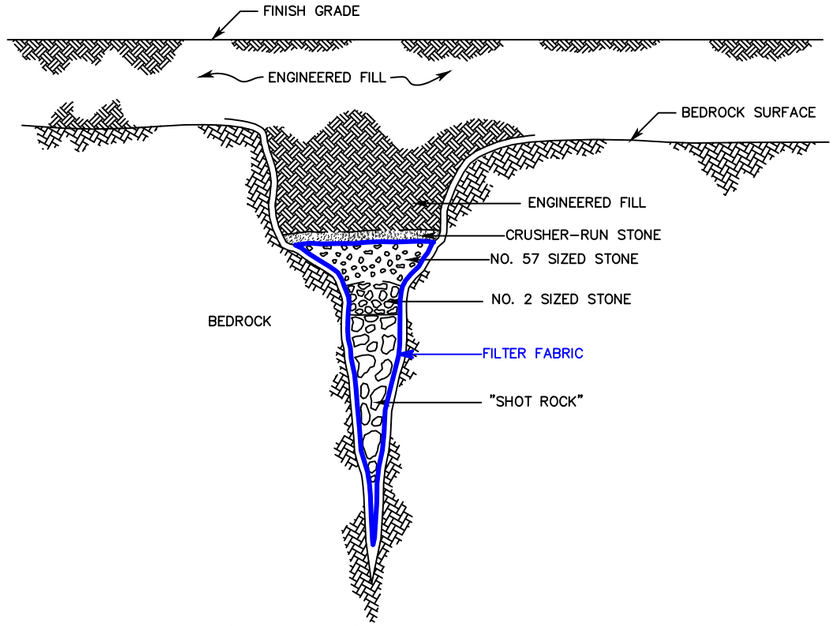
DATE: 04/05/2022

GEOS Project No. 31-221126

FIGURE: 6

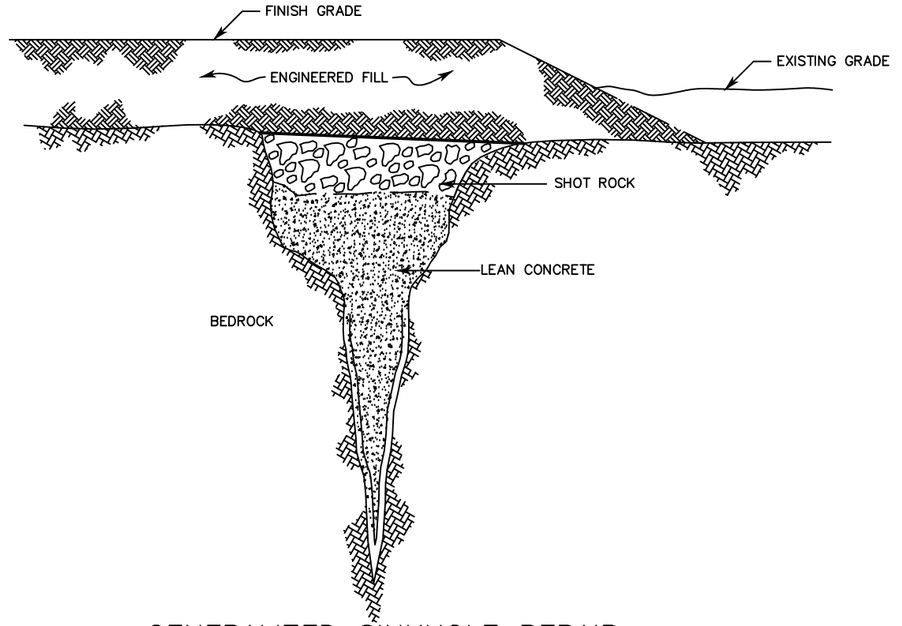
GEOServices, LLC, Geotechnical and Materials Engineers

APPENDIX D



GENERALIZED SINKHOLE REPAIR

FOR USE IN NON–BUILDING AREAS



GENERALIZED SINKHOLE REPAIR

FOR USE IN BUILDING AREAS

ACTUAL DIMENSIONS OF EXCAVATION AND VOLUMES
OF BACKFILL MATERIAL WILL BE BASED ON THE GEOTECHNICAL
ENGINEERS FIELD OBSERVATIONS DURING THE REPAIR

Universal Engineering Sciences
GEOS
Geotechnical, Environmental and Materials Engineers

Typical Sinkhole Repair Detail
Proposed Theta Pike Development
Maury County, Tennessee

DATE:
03/28/2022

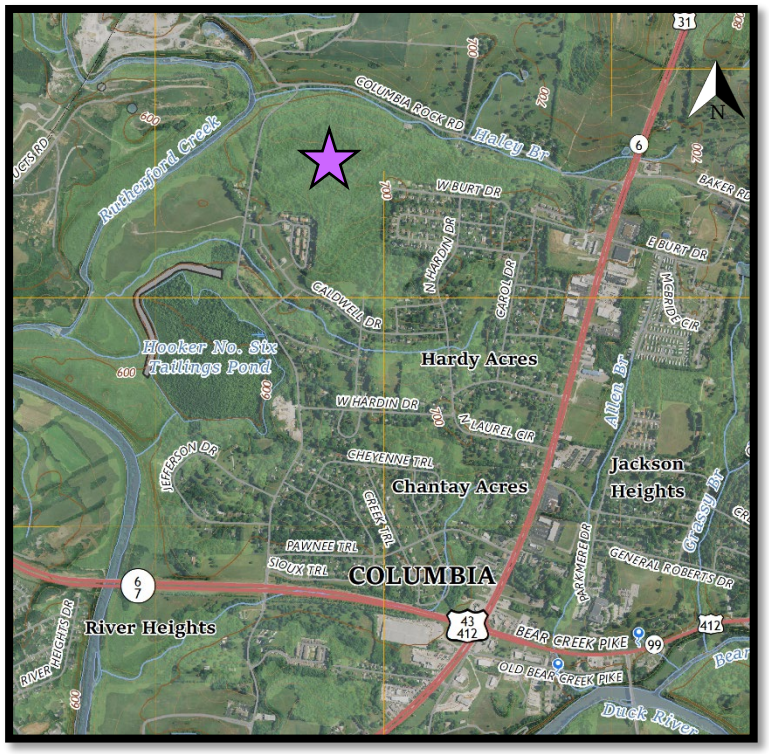
GEOS Project No.
31-221126

FIGURE:
6

Theta Pike Estates

Traffic Impact Study

4/15/2022



Vicinity Map
(Not to Scale)

Prepared For:
Landmark Engineering Group, Inc.

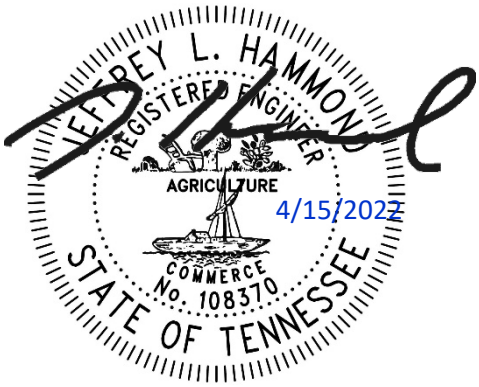
BURCH TRANSPORTATION

901 Woodland Street ● Nashville, TN 37206
(615) 258-8551 ● www.burchtransportation.com

THETA PIKE ESTATES
TRAFFIC IMPACT STUDY

PREPARED FOR:

LANDMARK ENGINEERING GROUP, INC.



PREPARED BY:

BURCH TRANSPORTATION, LLC

BURCH
TRANSPORTATION

Table of Contents

List of Tables

List of Figures

Appendix

1. Executive Summary

The Theta Pike Estates development is proposed to be located on a currently undeveloped tract at the intersection of Theta Pike and Columbia Rock Road in Columbia, TN. A total of 216 single family dwelling units are proposed. Vehicular site access will be provided through extensions of several existing streets as well as one new access point located on Theta Pike.

In order to provide data for this study, turning movement counts were conducted at the study intersections of Theta Pike and Columbia Rock Road, Theta Pike and US 43 Bypass, Nashville Highway and W Burt Drive, and Nashville Highway and Columbia Rock Road for the AM and PM peak hours. The count data utilized for the TIS was collected Tuesday – Thursday during March 2022. No adjustment was necessary to account for traffic impacts of the on-going Covid-19 Pandemic. Historic traffic data obtained from Tennessee Department of Transportation were used to establish typical traffic conditions for the basis of the analysis.

The analyses presented in this report indicate that the proposed development will generate a manageable amount of new vehicular traffic to the study area. In total, the residential project is expected to generate approximately 2,049 vehicle trips per day, 150 vehicles per hour (vph) during the AM peak hour, and 205 vph during the PM peak hour.

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:

<u>Theta Pike and Site Access</u>

- The Site Accesses should be designed to include width for one entering lane and two exiting lanes.
- Stop-control should be provided on the Site Access approach to Theta Pike. A Stop Sign (R1-1) should be installed and a stop line pavement marking.
- The Site Accesses 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 triangle. The access location should provide a minimum sight distance of 390 feet looking to the north and 335 feet looking to the south on Theta Pike.

<u>Theta Pike and Columbia Rock Road</u>

- Although not likely to be a significant arrival or departure route for the proposed development, this intersection has been identified by the City as having special safety needs. It is recommended that a combination horizontal alignment/intersection sign with a supplemental speed plaque (W1-10L, W13-1P) be installed facing eastbound traffic at a location approximately 300 feet west of the intersection.

<u>W Burt Drive and Grandview Drive</u>

- With the extension W Burt Drive into and through the development, this intersection should prioritize east-west through movements. A Stop sign has already been installed on the northbound Grandview Drive approach, establishing W Burt Drive as the priority movement. No other improvements are recommended here. To further communicate the road condition, combination horizontal alignment/intersection signs (W1-10d) should be installed on the

eastbound and westbound approaches of W Burt Drive at approximately 250 feet west of the intersection and 150 feet east of the intersection.

W Burt Drive and Nashville Highway

- Lengthen the southbound right turn lane by 70 feet to accommodate the projected 95th percentile queue length of 200 feet.
- Consider adjusting signal phase splits to minimize delay as future conditions warrant.

2. Introduction

The Theta Pike Estates development is proposed to be located on a currently undeveloped tract at the intersection of Theta Pike and Columbia Rock Road in Columbia, TN. A total of 216 single family dwelling units are proposed for the 92.4-acre project site. The property is located just outside of the current City Limits of Columbia (but within the Urban Growth Boundary) and is proposed to be zoned RS-10. According to the site plan provided by Landmark Engineering Group, Inc., the proposed development includes one site accesses on Theta Pike, a site access which extends W Burt Drive to the west, a site access which extends Davis Valley Drive to the west and a site access which extends Cathey Lane to the north. The residential development will be internally connected by a network of public streets.

The project site location is presented in Figure 1. The current site plan is included in Appendix A for reference. For the purpose of this traffic analysis, the residential development is expected to be complete in three years, which is a year 2025 horizon. The intention of this traffic impact study (TIS) is to identify the amount of traffic expected to be generated by the proposed residential 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.

Figure 1: Project Site Location

(Not to Scale)

3. Existing Conditions

The project site is served by Theta Pike, W Burt Drive, and Cathey Lane. Indirect but primary access will also be from Nashville Highway and US 43. The following provides a description of the roadways and intersections within the study area and the existing traffic data.

3.1 Roadway Descriptions

Theta Pike, adjacent to the project site, is categorized as a collector street according to the *Connect Columbia* Transportation Plan. The land uses along Theta Pike near the project site are primarily residential uses; mostly suburban single family, though some multifamily housing does exist adjacent to the proposed development. Theta Pike is a two-way street that generally travels in a north-south direction. The section of Theta Pike adjacent to the project site includes one travel lane in each direction. There are no curb, gutter, paved shoulder, sidewalks, or bike lanes on Theta Pike along the project site frontage. The posted speed limit on Theta Pike in the vicinity of the project site is 35 mph.

Looking south on Theta Pike adjacent to the project site

W Burt Drive is a local residential street providing access to the site from Nashville Highway. The proposed development will include construction of an extension of W Burt Drive westward from its present terminus to Theta Pike. W Burt Drive is a two-way, two-lane street with no shoulders, sidewalks, etc. and a posted speed limit of 25 mph.

Looking east on W Burt Drive near the location of its proposed extension

Cathey Lane is a local residential street providing indirect access to the site from other local residential streets. The proposed development will include construction of an extension of Cathey Lane northward into the site. Cathey Lane is a two-way, two-lane street with no shoulders, sidewalks, etc. and an unposted but statutory speed limit of 25 mph.

Nashville Highway (US 31, SR6) is the primary north-south arterial in the study area providing access to Saturn Parkway and the City of Spring Hill to the north and the City of Columbia to the south. A few residences exist on Nashville Highway, but the primary land use is commercial. Near to the study area, it is a four-lane divided highway with paved shoulders and a grass median. Median openings and turn lanes exist at some, but not all intersections and driveways in the area. The posted speed limit is 45 mph.

US 43 (US 412, SR 6) is the primary east-west arterial in the study area providing access across the Duck River to northwest Columbia. East of the study area, the highway becomes Bear Creek Pike and is a primary access route to I-65. US 43 west of Nashville Highway is partially access controlled, only having intersections for public streets, including Theta Pike. Near to the study area, it is a four-lane divided highway with paved shoulders and a grass median. The posted speed limit is 45 mph.

3.2 Intersection Descriptions

The following four (4) intersections were studied in this analysis:

- Nashville Highway & Columbia Rock Road (One-way stop-control)
- Nashville Highway & W Burt Drive (Signal)
- US 43 & Theta Pike (Signal)
- Theta Pike and Columbia Rock Road (One-way stop control)
- W Burt Drive and Grandview Drive (Yield control)

The intersection of **Nashville Highway and Columbia Rock Road** is a stop-controlled intersection with three approaches. The northbound approach of Nashville Highway includes one shared left turn/through lane and one through lane. The southbound approach includes one through lanes and one shared through/right turn lane, though the paved outside shoulder on this approach generally serves as a de facto separate right turn lane. The eastbound approach of Columbia Rock Road contains one shared lane for left, through, and right turning movements. The Columbia Rock Road approach is stop-controlled and the Nashville Highway approaches are free-flow. This intersection was identified in the Connect Columbia Transportation Plan as having unique operational issues with a recommendation to provide a northbound left turn lane (ID #8) and ultimately to align the Columbia Rock Road and Baker Road approaches and investigate signalization (ID #23).

The intersection of **Nashville Highway and W Burt Drive** is a signalized intersection with four approaches. The northbound approach includes one left turn lane with 110 feet of storage, one through lane, and one shared through/right turn lane. The southbound approach has one left turn lane with 100 feet of storage, two through lanes, and one right turn lane with 125 feet of storage and controlled by a yield condition. The eastbound approach has one shared lane for through and left turn movements and one right turn lane with 250 feet of storage. The westbound approach has one shared lane for left, through, and right turns.

Looking north on Nashville Highway at the W Burt Drive intersection

The intersection of **US 43 and Theta Pike** is a signalized intersection with four approaches. The northbound approach includes one left turn lane with 75 feet of storage and one shared through/right

turn lane. The southbound approach has one left turn lane and one shared through/right turn lane with 150 feet of storage. The eastbound approach has one left turn lane with 145 feet of storage, one through lane, and one shared through/right turn lane. The westbound approach has one left turn lane with 110 feet of storage, one through lane, and one shared through/right turn lane. This intersection was also identified in the Connect Columbia Transportation Plan as having unique operational issues with a recommendation to provide eastbound and westbound right turn lanes as well as a warning beacon to the signal ahead sign on the eastbound approach (ID #17).

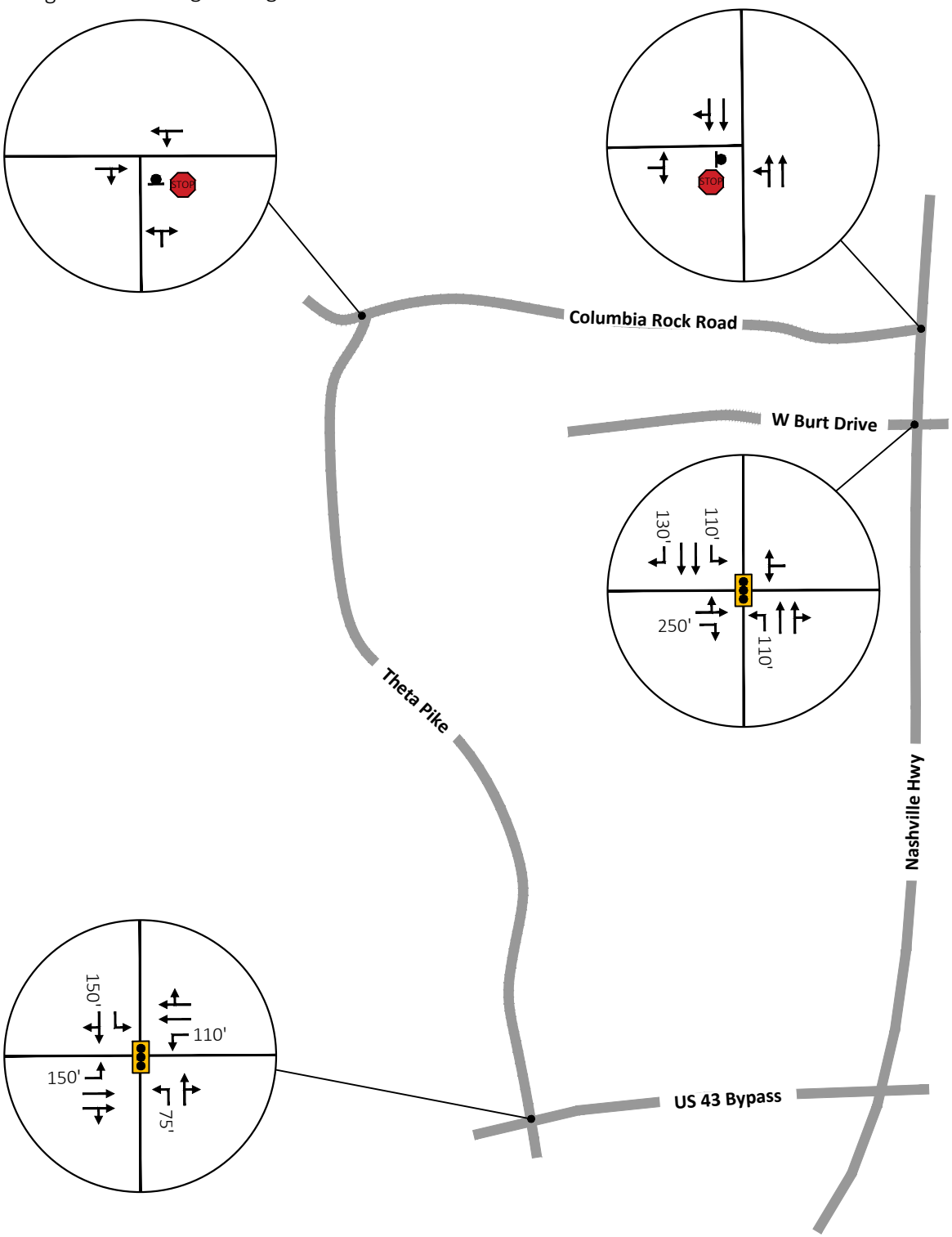
The intersection of **Theta Pike and Columbia Rock Road** is a stop-controlled intersection with three approaches. The northbound approach (stop-controlled) of Theta Pike includes one shared lane for left and right turns. Both the eastbound and westbound approaches (free flow) of Columbia Rock Road include one shared lane for through and right turns.

Looking south on Columbia Rock Road at the Theta Pike intersection

The three-legged intersection of **W Burt Drive and Grandview Drive** operates with yield control on the eastbound Burt Drive approach. The northbound Grandview Drive and westbound Burt Drive approaches operate free flow. This intersection was included due to the atypical geometry and Burt Drive's proposed extension, making it function more like a neighborhood collector street. Traffic volumes here are not significant and traffic counts and analysis were not required as part of this study. All approaches have one shared lane for all movements.

Figure 2 presents the intersection laneage and traffic control for the existing conditions.

Figure 2: Existing Laneage and Traffic Control



Legend:

→	Existing Laneage
XXX'	Storage Length (feet)
TWLTL	Two-way Left-Turn Lane
	Stop-control
	Traffic Signal

(Not to Scale)

3.3 Existing Traffic Volumes

Existing traffic data on Theta Pike and on Nashville Highway were obtained from the Tennessee Department of Transportation (TDOT). Given the much higher volumes on Nashville Highway, data from this count station provide for a more reliable trend estimation and have been used in the provision of growth and Covid factors. The 2020 weekday Average Daily Traffic (ADT) counts in the study area were collected in November 2020 after the onset of the Covid-19 Pandemic and reflect a decrease in traffic volumes compared to the year before. For this reason, 2019 ADT counts are provided in Figure 3. As shown, the ADT on Nashville Highway south of W Burt Drive was approximately 43,329 vehicles per day (vpd) in 2019. The ADT on Theta Pike south of Columbia Rock Road was approximately 1,669 vehicles per day in 2019. The TDOT count station data is included in Appendix B.

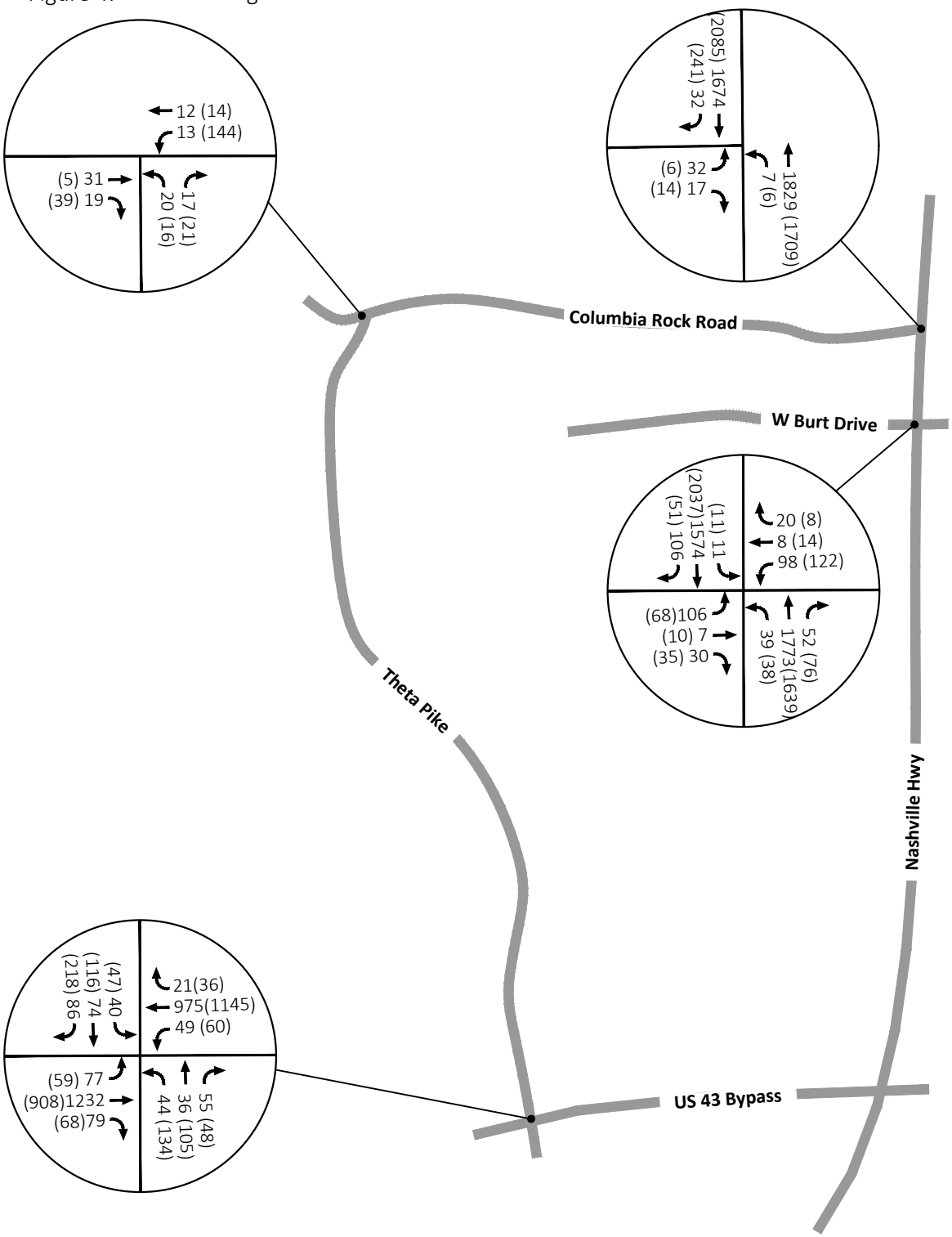
New turning movement counts were also collected for the four study intersections during March 2022. Based on review of these turning movement counts, the historical AADTs, and the weekday ADTs obtained from TDOT, it was determined that traffic on Nashville Pike has continued to grow since the onset of the Covid pandemic for both the AM and PM peak hours. The hourly count in 2022 is significantly higher than any year documented in TDOT's data. Therefore, peak period traffic was not factored to account for any effects of the pandemic. The traffic volumes were not balanced between the four study intersections since there are other driveways and minor street intersections in between.

The 2022 Existing Conditions Peak Hour Traffic Volumes are presented in Figure 4. The turning movement count data that was used to establish baseline conditions is included in Appendix C.

Figure 3: 2019 Average Daily Traffic Volumes

Source: TDOT traffic data, USGS.

Figure 4: 2022 Existing Peak Hour Traffic Volumes



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

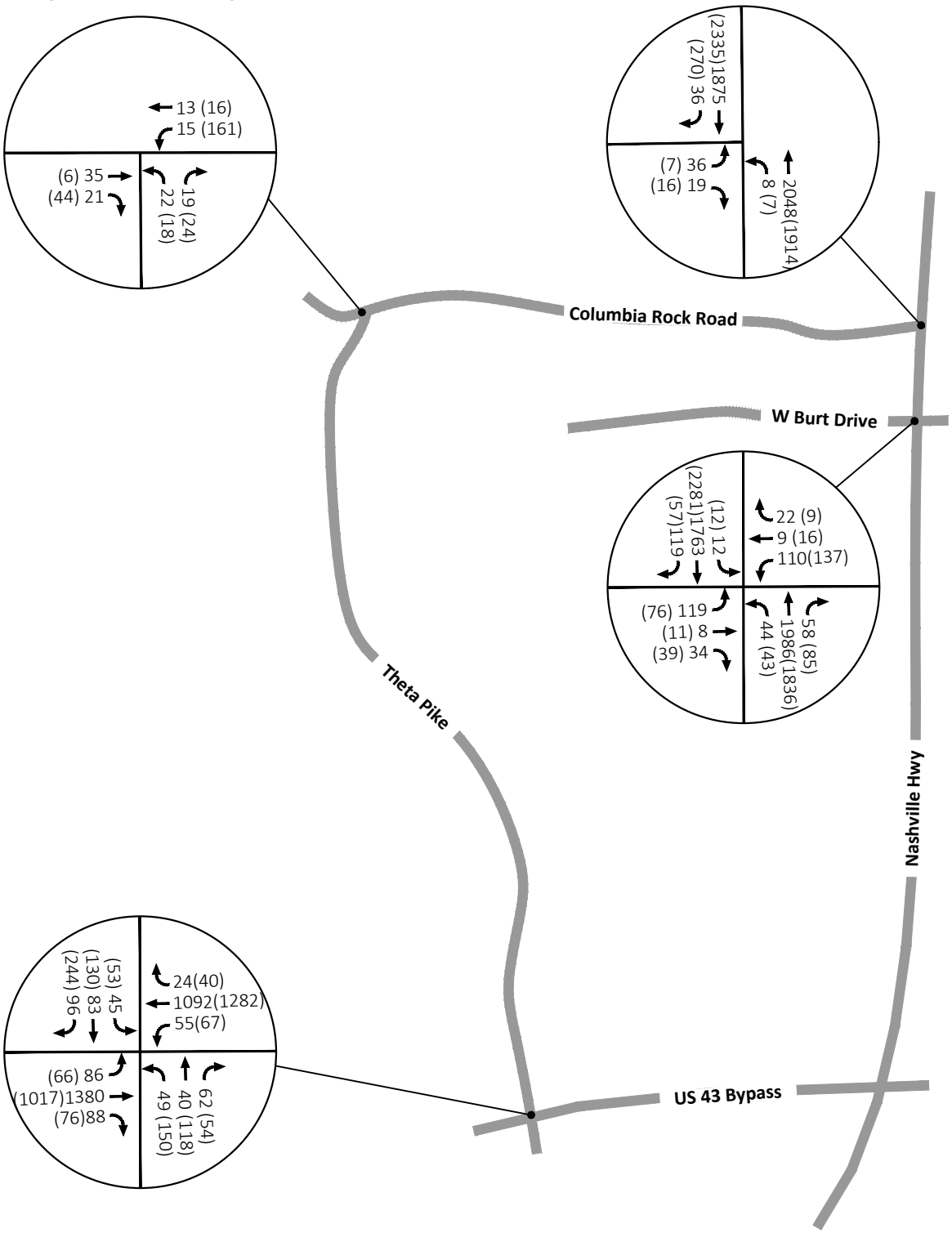
(Not to Scale)

4. Background Conditions

As previously stated, it is assumed that the proposed residential development will be completed in approximately three years, which would be in the year 2025. To account for additional traffic expected to be traveling on the study roadways in 2025 even if the development is not completed, background traffic volumes were established. A growth rate was applied to the existing peak hour traffic volumes. The historical TDOT count station traffic data on Nashville Highway were utilized to establish a growth trend. Because 2020 data were collected after the onset of travel changes due to the Covid-19 Pandemic, this year was omitted from growth factor considerations. Based on this analysis, the average annual traffic growth in the study area over the last four years (between 2019 and 2015) was found to be 3.9%. Conservatively, the 2022 Existing Peak Hour Traffic Volumes were increased by 12% (4% Annual Growth for 3 Years) to establish 2025 background traffic volumes.

The TDOT count station data and historical growth is included in Appendix B. The traffic calculation worksheets are included in Appendix E. Figure 5 presents the 2025 Background Conditions Peak Hour Traffic Volumes.

Figure 5: 2025 Background Peak Hour Traffic Volumes



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

(Not to Scale)

5. Projected Conditions

A trip generation process was used to estimate the amount of traffic that is expected to be generated by the proposed residential development with 216 dwelling units. Trip generation rates for the residential land use were taken from ITE's *Trip Generation Manual, 11th Edition*. The trip generation calculations were based on the single-family detached housing land use for the general urban/suburban setting. No adjustments were applied to the base trip generation to account for alternate modes, internal capture, or pass-by trips.

Table 1 below presents the new vehicular traffic expected to be generated by the proposed residential development. As shown, the residential development is expected to generate approximately 2,049 vehicle trips per day, 150 vehicles per hour (vph) during the AM peak hour, and 205 vph during the PM peak hour. Trip generation calculations are included in Appendix D.

Table 1: Trip Generation

Land Use	Size	Average Daily Traffic	AM Peak Hour			PM Peak Hour		
			Total	Enter	Exit	Total	Enter	Exit
Single-Family Detached Housing LUC 210	216 du	2,049	150	39	111	205	129	76
Source: ITE *Trip Generation Manual, 11th Edition.*								

A directional distribution was developed based on the existing traffic counts and street network as well as the proposed site accesses on Theta Pike, W Burt Drive, and Cathey Lane. Table 2 presents the roadways, directions, and percent distribution that traffic is expected to be coming from when entering the site.

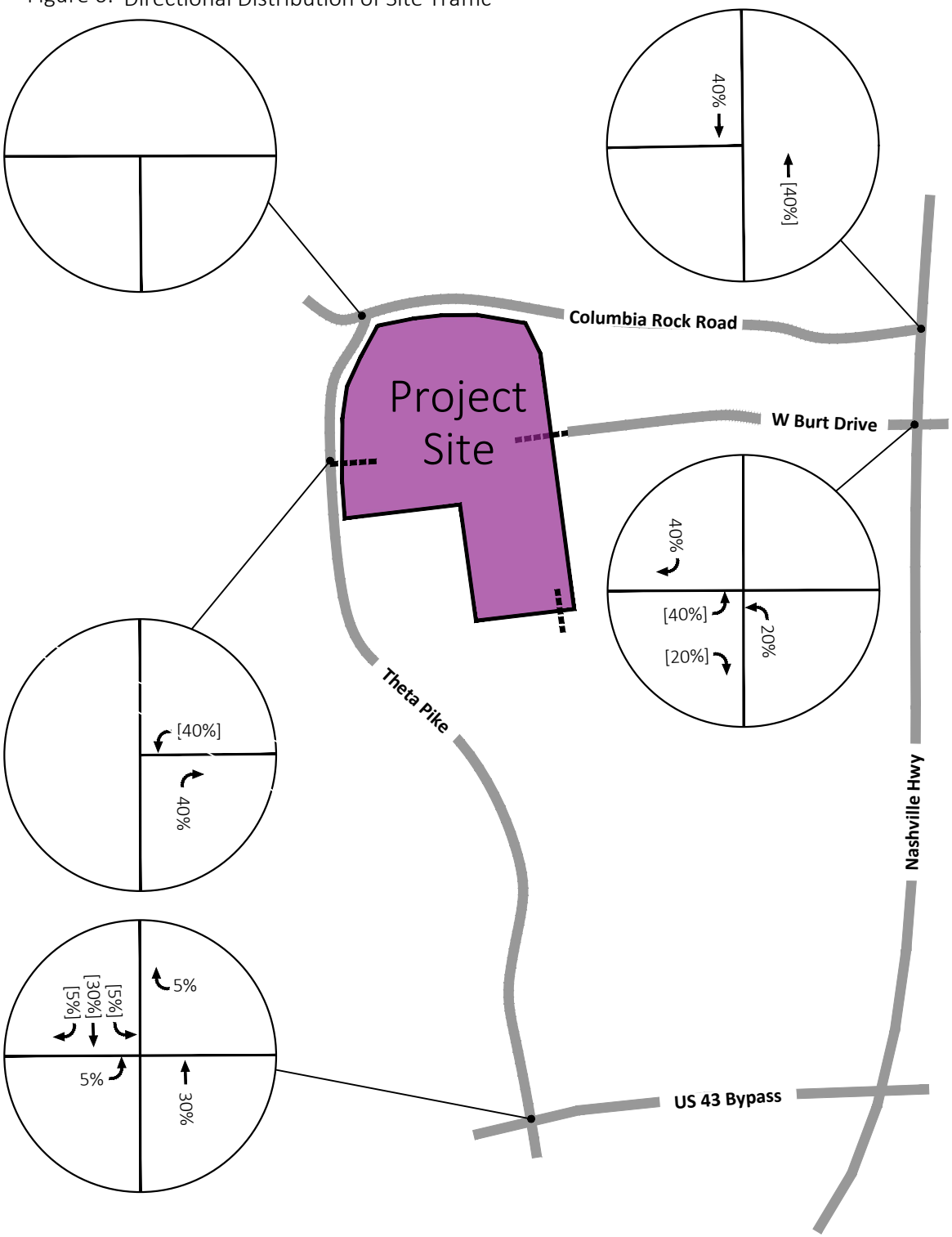
Table 2: Directional Distribution

Roadway	Entering Direction (From – To the Site)	Distribution %
Nashville Highway	North	40%
Nashville Highway	South	20%
Theta Pike	South	40%
Total	--	100%

The current site plan includes one access on Theta Pike, one access which is an extension of W Burt Drive, one access which is an extension of Davis Valley Drive and one access which is an extension of Cathey Lane. 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 6.

Using this directional distribution, the traffic generated by the site was assigned to the street network. The traffic assignment is presented in Figure 7. The site traffic was added to the background traffic volumes to obtain the 2025 Future Projected Peak Hour Traffic Volumes, which are presented in Figure 8. These volumes represent the total peak hour traffic expected at the study intersections following completion of the proposed development. The traffic calculation worksheets showing the traffic assignment and volume calculations are included in Appendix E.

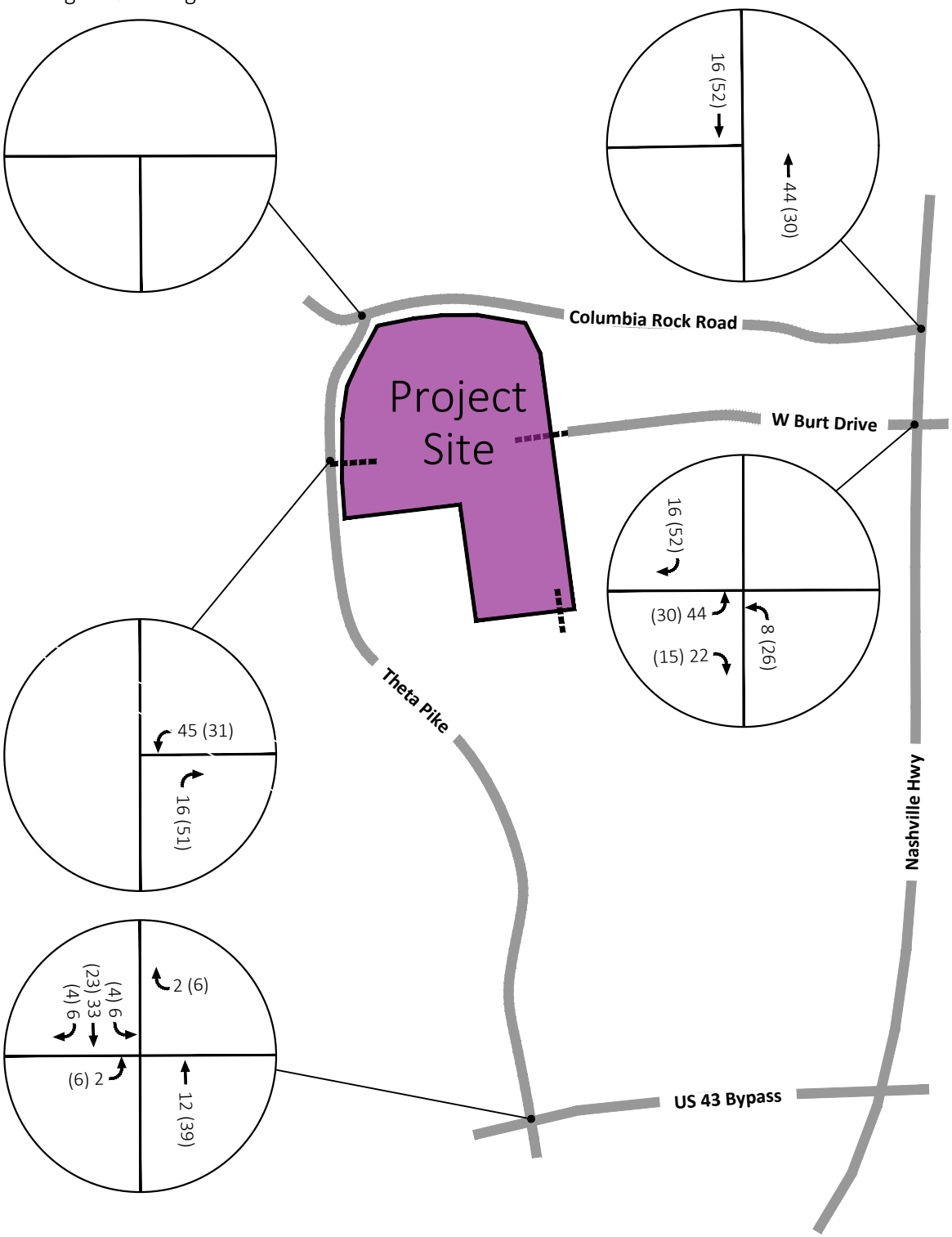
Figure 6: Directional Distribution of Site Traffic



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

(Not to Scale)

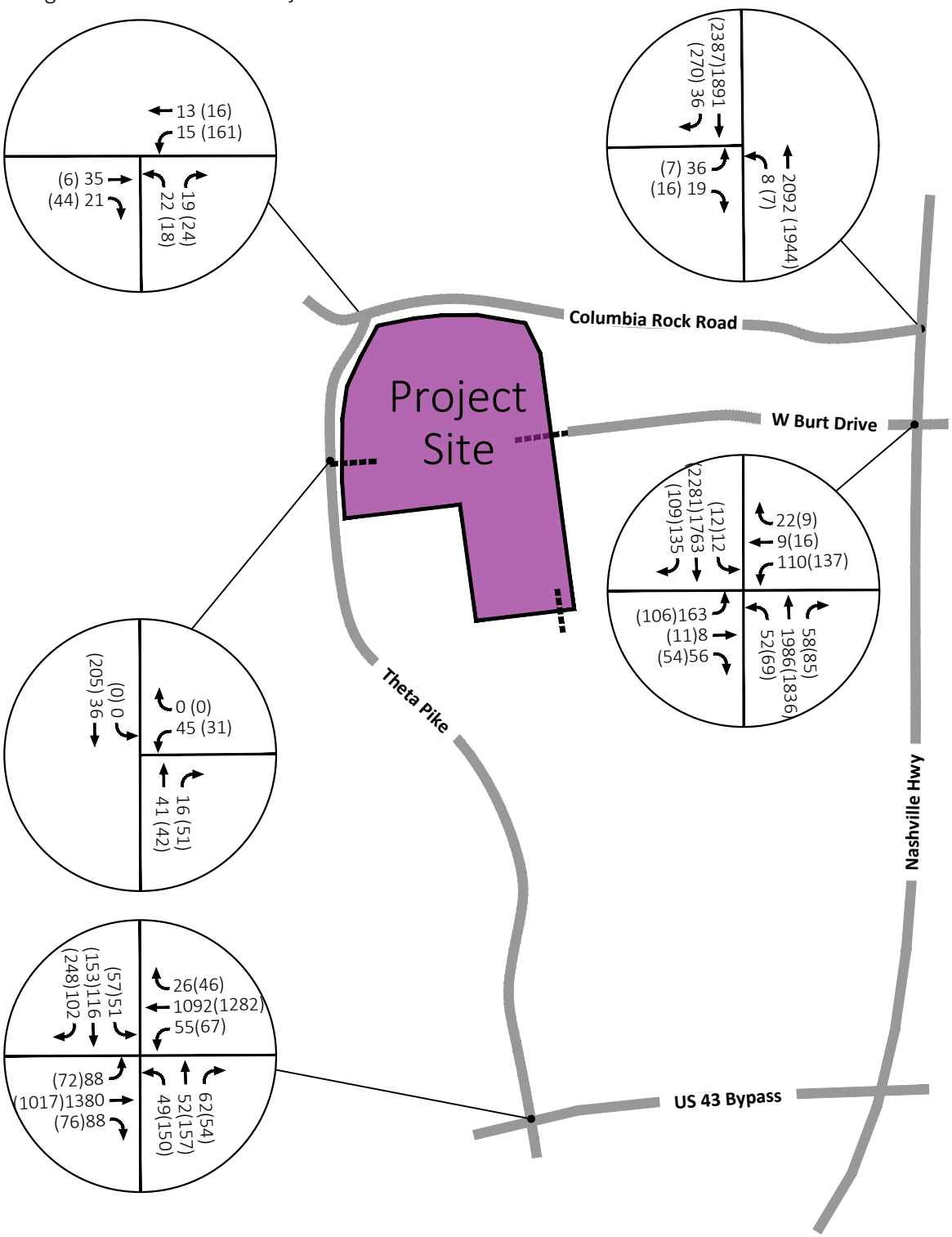
Figure 7: Assignment of Site Traffic



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

(Not to Scale)

Figure 8: 2025 Future Projected Peak Hour Traffic Volumes



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

(Not to Scale)

6. Traffic Operational Analysis

To evaluate the study intersections under Existing, Background, and Future Projected conditions, capacity analyses were conducted for the study intersections using Synchro 11 software and HCM 6th Edition methodology.

The 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 3 presents the descriptions of LOS for unsignalized intersections, and Table 4 presents the descriptions of LOS for signalized intersections.

Table 3: Description of Unsignalized Intersection Level of Service (LOS)

LOS	Control Delay (seconds per vehicle)	Description
A	0 – 10	Usually no conflicting traffic
B	> 10 – 15	Occasionally some delay due to conflicting traffic
C	> 15 – 25	Delay noticeable to vehicles, but not inconveniencing
D	> 25 – 35	Delay noticeable and irritating, increased likelihood of risk taking
E	> 35 – 50	Delay approaches tolerance level, risk-taking behavior likely
F	> 50	Delay exceeds tolerance level, high likelihood of vehicle risk taking
Source: *Highway Capacity Manual 6th Edition*		

Table 4: Description of Signalized Intersection Level of Service (LOS)

LOS v/c ≤ 1.0	Control Delay (seconds per vehicle)	Description
A	≤ 10	Volume-to-capacity ratio is low and either progression is exceptionally favorable or cycle length is short.
B	> 10 – 20	Progression is highly favorable or the cycle length is short. More vehicles stop than LOS A.
C	> 20 – 35	Progression is favorable or cycle lengths are moderate. Number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.
D	> 35 – 55	Volume-to-capacity is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.
E	> 55 – 80	Volume-to-capacity is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.
F	> 80	Volume-to-capacity is very high or exceeds 1.0, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.
Source: *Highway Capacity Manual, 6th Edition*		

6.1 Capacity Analysis

Tables 5 and 6 below present the results of the AM and PM peak hour analyses, respectively. The effect of the traffic growth under background conditions has a notable impact on the traffic operation, especially on the high-volume mainline approaches of Nashville Highway and US 43 Bypass. However, the two signalized intersections in the study area will continue to operate with manageable delays through the forecasted year and delays are not expected to worsen significantly with the project.

The stop-controlled eastbound approach of the intersection of Nashville Highway and Columbia Rock Road will also experience increasing delay in the background and projected conditions. While minor approach volumes remain low and will not be significantly impacted by the proposed development, the growth in mainline volumes on Nashville Highway will make turns from the minor approach increasingly difficult. This has been recognized and the eventual realignment of Columbia Rock Road and Baker Road with signalization is planned.

The new access point on Theta Pike is expected to operate with minimal delays due to the low volume of mainline traffic on Theta Pike.

The Synchro worksheets are included in Appendix F.

Table 5: Intersection Capacity Analysis – AM Peak Hour

Intersection	Approach / Lane Group	2022 Existing LOS (Delay in sec/veh)	2025 Background LOS (Delay in sec/veh)	2025 Projected LOS (Delay in sec/veh)
Nashville Highway & Columbia Rock Road (One-way Stop)	NB Left Turn	C (16.5)	C (19.1)	C (19.3)
	EB Approach	F (69.2)	F (122.6)	F (131.9)
Nashville Highway & W Burt Drive (Signal)	NB Left Turn	D (48.6)	D (53.3)	D (51.5)
	NB Through/Right Turn	D (35.3)	F (75.4)	F (91.4)
	SB Left Turn	D (54.6)	E (55.8)	E (57.9)
	SB Through	B (19.0)	F (40.3)	F (58.1)
	SB Right Turn	N/A	N/A	N/A
	EB Left Turn/Through	C (24.6)	C (25.1)	C (25.6)
	EB Right Turn	C (22.8)	C (23.0)	C (22.8)
	WB Left/Through/Right	C (29.4)	C (30.8)	C (32.4)
	Overall Intersection	**C (28.4)**	**E (57.7)**	**E (72.4)**
US 43 & Theta Pike (Signal)	NB Left Turn	C (26.5)	C (30.3)	C (30.3)
	NB Through/Right Turn	C (28.7)	C (32.3)	C (32.4)
	SB Left Turn	C (32.0)	C (30.6)	C (30.2)
	SB Through/Right Turn	D (44.8)	D (44.8)	D (52.0)
	EB Left Turn	D (51.7)	D (50.0)	D (51.4)
	EB Through/Right Turn	C (34.7)	D (37.0)	D (42.0)
	Westbound Left Turn	D (54.5)	E (55.7)	E (57.6)
	Westbound Through/Right Turn	C (23.7)	C (22.8)	C (25.2)
	Overall Intersection	**C (31.8)**	**C (32.9)**	**D (36.8)**
Theta Pike & Site Access (One-way Stop)	SB Left Turn	--	--	*A (7.3)*
	WB Approach	--	--	*A (9.2)*
Theta Pike & Columbia Rock Road (One-way Stop)	NB Approach	A (8.9)	A (8.9)	A (9.0)
	WB Left Turn	A (7.3)	A (7.4)	A (7.4)
Notes: HCM 6th Edition Results reported above.				

Table 6: Intersection Capacity Analysis – PM Peak Hour

Intersection	Approach / Lane Group	2022 Existing LOS (Delay in sec/veh)	2025 Background LOS (Delay in sec/veh)	2025 Projected LOS (Delay in sec/veh)
Nashville Highway & Columbia Rock Road (One-way Stop)	NB Left Turn	D (26.4)	D (33.9)	E (35.7)
	EB Approach	F (58.8)	F (91.5)	F (102.5)
Nashville Highway & W Burt Drive (Signal)	NB Left Turn	F (97.7)	E (79.8)	E (76.1)
	NB Through/Right Turn	B (16.6)	C (23.3)	C (26.2)
	SB Left Turn	F (111.6)	E (77.3)	F (80.8)
	SB Through	C (24.9)	F (66.9)	F (91.5)
	SB Right Turn	N/A	N/A	N/A
	EB Left Turn/Through	E (58.2)	D (44.6)	D (45.9)
	EB Right Turn	E (56.3)	D (43.0)	D (43.8)
	WB Left/Through/Right	E (72.8)	E (56.7)	E (59.6)
	Overall Intersection	**C (25.0)**	**D (47.8)**	**E (61.5)**
US 43 & Theta Pike (Signal)	NB Left Turn	C (29.6)	C (32.4)	C (33.1)
	NB Through/Right Turn	C (27.6)	C (28.8)	C (29.4)
	SB Left Turn	C (27.7)	C (28.8)	C (28.5)
	SB Through/Right Turn	D (45.0)	D (53.6)	E (56.7)
	EB Left Turn	E (61.7)	E (65.4)	E (66.2)
	EB Through/Right Turn	C (32.2)	D (45.7)	D (49.5)
	Westbound Left Turn	E (61.5)	E (65.2)	E (67.0)
	Westbound Through/Right Turn	D (46.0)	F (84.0)	F (98.5)
	Overall Intersection	**D (39.9)**	**E (60.9)**	**E (68.0)**
Theta Pike & Site Access (One-way Stop)	SB Left Turn	--	--	*A (7.4)*
	WB Approach	--	--	*B (10.4)*
Theta Pike & Columbia Rock Road (One-way Stop)	NB Approach	A (9.9)	B (10.2)	B (10.2)
	WB Left Turn	A (7.6)	A (7.6)	A (7.6)
Notes: HCM 6th Edition Results reported above.				

6.2 Queue Analysis and Signal Timing

As shown in Tables 5 and 6, several movements will experience increasing delay leading to LOS F conditions during background and projected scenarios. Some of these approach delays and overall intersection delays can be improved with adjustments to certain phase split times. To further quantify signal operations under the proposed conditions and to analyze the impact of signal timing adjustments on these intersections, queue analyses were conducted for the study intersections. The LOS and delay and the 95th Percentile Queue for the AM and PM peak hours under 2025 Future Projected Conditions with signal timing adjustment is presented in Table 7.

These results show that overall signal operations will operate with minimal LOS D through projected conditions. Also, lanes provided at these signalized intersections will accommodate future 95th percentile

queue lengths. One exception is the southbound right turn on Nashville Pike at the W Burt Drive intersection where the 95th percentile queue length of approximately 200 feet will exceed the available right turn lane storage by 70 feet.

Table 7: Queue Analysis Results for 2025 Projected Conditions, with Signal Timing Adjustments

Intersection	Approach / Lane Group	2025 Projected Conditions With Improvements, AM Peak		2025 Projected Conditions With Improvements, PM Peak	
		LOS (Delay)	95th Percentile Queue (veh/ln)	LOS (Delay)	95th Percentile Queue (veh/ln)
Nashville Highway & W Burt Drive (Signal)	NB Left Turn*	E (55.7)	4	F (82.4)	5
	NB Through/Right Turn	D (38.0)	14	C (23.7)	24
	SB Left Turn	E (62.9)	1	F (88.0)	1
	SB Through	C (21.2)	12	F (76.6)	26
	SB Right Turn*	N/A	8	N/A	7
	EB Left Turn/Through*	C (34.2)	11	D (51.7)	11
	EB Right Turn*	C (29.8)	5	D (49.2)	5
	WB Left/Through/Right	F (87.2)	7	E (79.0)	5
	Overall Intersection	**C (33.2)**	**N/A**	**D (54.0)**	**N/A**
US 43 & Theta Pike (Signal)	NB Left Turn	C (32.1)	2	E (58.8)	5
	NB Through*/Right Turn	C (34.2)	4	D (37.1)	13
	SB Left Turn	C (31.7)	6	C (34.8)	8
	SB Through*/Right Turn	D (54.1)	10	E (69.3)	20
	EB Left Turn	D (53.6)	3	E (78.9)	7
	EB Through/Right Turn	D (35.8)	16	D (40.2)	18
	Westbound Left Turn	E (59.6)	2	E (79.5)	5
	Westbound Through/Right Turn	C (23.8)	13	E (60.2)	30
	Overall Intersection	**C (33.7)**	**N/A**	**D (53.7)**	**N/A**

Notes: HCM 6th Edition Results reported above, 95th percentile queue rounded up to the nearest vehicle.
* Indicates movements on primary development access routes.

6.3 Site Access Review and Sight Distance

According to the current site plan and the project team, the proposed development will include one vehicular access point on Theta Pike, one access which is an extension of W Burt Drive, and one access which is an extension of Cathey Lane. These accesses are all interconnected as part of the development's internal street network and the Burt Drive access will extend Burt Drive westward, becoming the Theta Pike access. The site accesses will each include width for one entering lane and two exiting lanes, which will be sufficient to accommodate the residential development's traffic.

The neighborhood street network also includes a roundabout intersection located at the southern end of the project where Cathey Lane is planned to be extended to provide access to the development. The three-legged roundabout intersection will serve primarily as an internal distribution point with very little if any through traffic using it. Therefore, the capacity and operation of the roundabout is expected to be adequate.

A final site plan showing the precise location of the Theta Pike access location was not available at the time of this report. However, the general location of the access is known was evaluated to make sure that sufficient intersection sight distance will be available for vehicles exiting the project site. The other accesses at W Burt Drive and at Cathey Lane constitute extensions of these roads and sight distance measurements are not needed.

For a 35-mph speed as posted on Theta Pike, 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 250 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 35 mph, the design value for a driver turning left from a stop onto a two-lane roadway is 390 feet and for a driver turning right from a stop is 335 feet. Therefore, it is desirable to provide a minimum of 390 feet looking to the north and a minimum of 335 feet looking to the south on Theta Pike at the site access.

Based on a review of the general proposed site access location, it was determined that the proposed intersection on Theta Pike can be located such that the available intersection sight distance will be sufficient to accommodate left and right turns onto Theta Pike. The intersection location, along with associated grading, etc. should be designed to achieve clear sight distances of at least 390 feet looking to the north and 335 feet looking to the south from the driveway. The site plan and landscape plan should not include any landscape, hardscape, signs, or parking within the sight distance departure triangle that would restrict intersection sight distance for any site access.

6.4 Turn Lane Analysis

The proposed Site Access was evaluated for the need for left turn and right turn deceleration lanes on Theta Pike based on methodology presented in *NCHRP Report 457, Evaluating Intersection Improvements: An Engineering Study Guide*. Based on the 2025 Future Projected peak hour traffic volumes previously presented, turn lanes are not warranted on Theta Pike. This is primarily because the existing through volumes passing by the site on Theta Pike are well below the required threshold traffic volume to warrant separate turn lanes. Details of the turn lane analysis are included in Appendix G.

7. Conclusions and Recommendations

The Theta Pike Estates development is proposed to be located on a currently undeveloped tract at the intersection of Theta Pike and Columbia Rock Road in Columbia, TN. A total of 216 single family dwelling units are proposed. Vehicular site access will be provided through extensions of several existing streets as well as one new access point located on Theta Pike.

The analyses presented in this report indicate that the proposed development will generate a manageable amount of new vehicular traffic to the study area. In total, the residential project is expected to generate approximately 2,049 vehicle trips per day, 150 vehicles per hour (vph) during the AM peak hour, and 205 vph during the PM peak hour.

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:

Theta Pike and Site Access

- The Site Accesses should be designed to include width for one entering lane and two exiting lanes.
- Stop-control should be provided on the Site Access approach to Theta Pike. A Stop Sign (R1-1) should be installed and a stop line pavement marking.
- The Site Accesses 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 triangle. The access location should provide a minimum sight distance of 390 feet looking to the north and 335 feet looking to the south on Theta Pike.

Theta Pike and Columbia Rock Road

- Although not likely to be a significant arrival or departure route for the proposed development, this intersection has been identified by the City as having special safety needs. It is recommended that a combination horizontal alignment/intersection sign with a supplemental speed plaque (W1-10L, W13-1P) be installed facing eastbound traffic at a location approximately 300 feet west of the intersection.

W Burt Drive and Grandview Drive

- With the extension W Burt Drive into and through the development, this intersection should prioritize east-west through movements. A Stop sign has already been installed on the northbound Grandview Drive approach, establishing W Burt Drive as the priority movement. No other improvements are recommended here. To further communicate the road condition, combination horizontal alignment/intersection signs (W1-10d) should be installed on the eastbound and westbound approaches of W Burt Drive at approximately 250 feet west of the intersection and 150 feet east of the intersection.

W Burt Drive and Nashville Highway

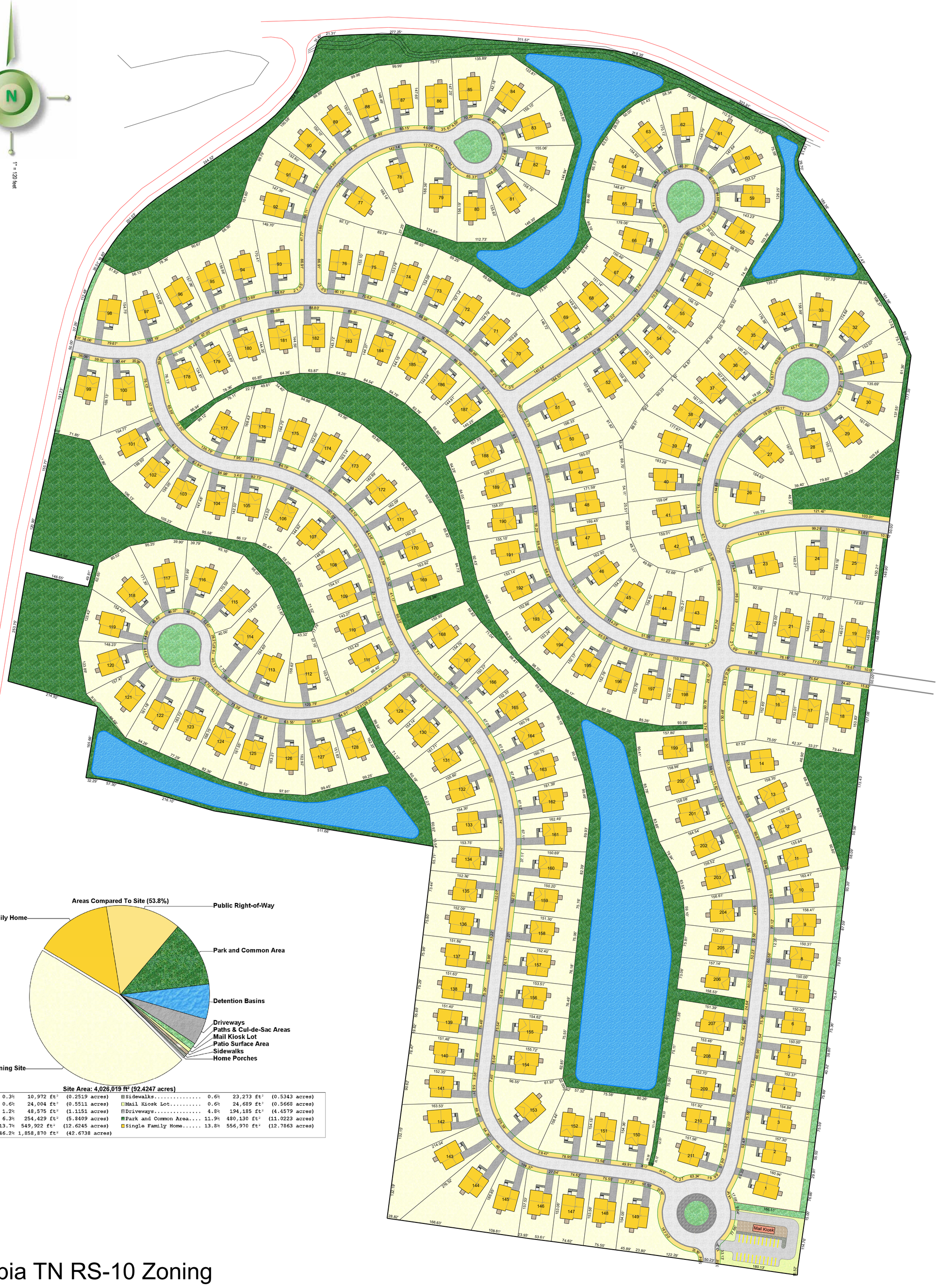
- Lengthen the southbound right turn lane by 70 feet to accommodate the projected 95th percentile queue length of 200 feet.
- Consider adjusting signal phase splits to minimize delay as future conditions warrant.

APPENDIX A
CURRENT CONCEPT PLAN

Theta Pike Estates

Columbia, Maury County, TN

1" = 120 feet



Site Area: 4,026,019 ft² (92.4247 acres)

Home Porches	0.3%	10,972 ft²	(0.2519 acres)	Sidewalks	0.6%	23,273 ft²	(0.5343 acres)
Patio Surface Area	0.6%	24,004 ft²	(0.5511 acres)	Mail Kiosk Lot	0.6%	24,689 ft²	(0.5668 acres)
Paths & Cul-de-Sac Areas	1.2%	48,575 ft²	(1.1151 acres)	Driveways	4.8%	194,185 ft²	(4.4579 acres)
Detention Basins	6.3%	254,429 ft²	(5.8409 acres)	Park and Common Area	11.9%	480,130 ft²	(11.0223 acres)
Public Right-of-Way	13.7%	549,922 ft²	(12.6245 acres)	Single Family Home	13.8%	556,970 ft²	(12.7863 acres)
Remaining Site	46.2%	1,858,870 ft²	(42.6738 acres)				

Columbia TN RS-10 Zoning
211 Single Family Homes

Minimum Lot Size per Zoning Code = 10,000 SF
Front Setback Minimum = 30' per Zoning Code
Front setbacks vary from 30' to 60'
Side Setbacks = minimum of 10'
Rear Setbacks = minmim of 30'

Landmark Engineering Group, Inc.

LandMentor

PENTAGON HOLDINGS

APPENDIX B
TDOT COUNT DATA & HISTORICAL ANALYSIS

TDOT Count Station Data Historical Growth Analysis (AADT)

Station No.	Station 179	Annual % Growth	Station 44	Annual % Growth		Annual % Growth
Street	Theta Pk		Nashville Hwy			
Location	South of Lake Dr		South of Burt Dr		Total	
Year						
2020*	1750	4.9%	37972	-12.4%	39722	-11.7%
2019	1669	10.8%	43329	5.9%	44998	6.1%
2018	1506	-15.1%	40922	-7.5%	42428	-7.8%
2017	1774	66.1%	44228	3.7%	46002	5.2%
2016	1068	-5.2%	42666	13.6%	43734	13.1%
2015	1127		37557		38684	
4-year Annual Avg Growth		14.1%		3.9%		4.1%

*2020 AADT not used in growth analysis due to traffic volume decline caused by the Covid-19 Pandemic.

APPENDIX C
TURNING MOVEMENT COUNTS

Collier Engineering Co., Inc.

2949 Nolensville Pike
Nashville, Tennessee 37211

File Name : Burt Dr at Nashville Hwy
Site Code :
Start Date : 3/22/2022
Page No : 1

Groups Printed- Vehicles

	Nashville Hwy From North					E. Burt Dr From East					Nashville Hwy From South					W. Burt Dr From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	1	221	12	0	234	12	2	9	0	23	5	488	11	0	504	32	2	3	0	37	798
06:45 AM	3	268	9	0	280	18	4	9	0	31	7	475	12	0	494	31	1	2	0	34	839
Total	4	489	21	0	514	30	6	18	0	54	12	963	23	0	998	63	3	5	0	71	1637
07:00 AM	1	229	16	0	246	14	0	8	0	22	4	346	5	0	355	32	2	10	0	44	667
07:15 AM	1	467	10	0	478	33	1	2	0	36	8	439	13	0	460	31	2	4	0	37	1011
07:30 AM	1	415	14	0	430	31	3	10	0	44	10	418	12	0	440	24	2	9	0	35	949
07:45 AM	7	396	20	0	423	20	0	4	0	24	11	477	12	0	500	28	1	6	0	35	982
Total	10	1507	60	0	1577	98	4	24	0	126	33	1680	42	0	1755	115	7	29	0	151	3609
08:00 AM	2	296	7	0	305	14	4	2	0	20	10	439	15	0	464	23	2	11	0	36	825
08:15 AM	2	319	12	0	333	17	1	2	0	20	11	396	20	0	427	20	1	5	0	26	806
*** BREAK ***																					
Total	4	615	19	0	638	31	5	4	0	40	21	835	35	0	891	43	3	16	0	62	1631
*** BREAK ***																					
04:00 PM	3	550	22	0	575	37	6	2	0	45	6	382	15	0	403	19	3	7	0	29	1052
04:15 PM	3	518	30	0	551	36	3	2	0	41	12	354	18	0	384	15	2	13	0	30	1006
04:30 PM	4	540	30	0	574	27	2	3	0	32	4	417	20	0	441	18	2	7	0	27	1074
04:45 PM	1	429	24	0	454	22	3	1	0	26	16	371	23	0	410	16	3	8	0	27	917
Total	11	2037	106	0	2154	122	14	8	0	144	38	1524	76	0	1638	68	10	35	0	113	4049
05:00 PM	1	440	30	0	471	16	4	3	0	23	12	425	20	0	457	21	3	7	0	31	982
05:15 PM	2	505	24	0	531	16	2	0	0	18	7	373	17	0	397	16	1	8	0	25	971
05:30 PM	5	429	28	0	462	17	2	1	0	20	10	273	10	0	293	9	2	10	0	21	796
05:45 PM	2	441	26	0	469	17	3	1	0	21	6	261	14	0	281	10	4	12	0	26	797
Total	10	1815	108	0	1933	66	11	5	0	82	35	1332	61	0	1428	56	10	37	0	103	3546
Grand Total	39	6463	314	0	6816	347	40	59	0	446	139	6334	237	0	6710	345	33	122	0	500	14472
Apprch %	0.6	94.8	4.6	0		77.8	9	13.2	0		2.1	94.4	3.5	0		69	6.6	24.4	0		
Total %	0.3	44.7	2.2	0	47.1	2.4	0.3	0.4	0	3.1	1	43.8	1.6	0	46.4	2.4	0.2	0.8	0	3.5	

Collier Engineering Co., Inc.

2949 Nolensville Pike
Nashville, Tennessee 37211

File Name : Columbia Rock Rd at Nashville Hwy
Site Code :
Start Date : 3/29/2022
Page No : 1

Groups Printed- Vehicles

	Nashville Hwy From North					From East					Nashville Hwy From South					Columbia Rock Rd From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	0	207	2	0	209	0	0	0	0	0	3	485	0	0	488	5	0	2	0	7	704
06:45 AM	0	253	6	0	259	0	0	0	0	0	2	469	0	0	471	9	0	2	0	11	741
Total	0	460	8	0	468	0	0	0	0	0	5	954	0	0	959	14	0	4	0	18	1445
07:00 AM	0	274	9	0	283	0	0	0	0	0	4	339	0	0	343	10	0	1	0	11	637
07:15 AM	0	295	9	0	304	0	0	0	0	0	0	349	0	0	349	7	0	4	0	11	664
07:30 AM	0	445	12	0	457	0	0	0	0	0	1	359	0	0	360	6	0	7	0	13	830
07:45 AM	0	408	7	0	415	0	0	0	0	0	2	410	0	0	412	12	0	4	0	16	843
Total	0	1422	37	0	1459	0	0	0	0	0	7	1457	0	0	1464	35	0	16	0	51	2974
08:00 AM	0	375	4	0	379	0	0	0	0	0	4	384	0	0	388	7	0	2	0	9	776
08:15 AM	0	325	7	0	332	0	0	0	0	0	1	391	0	0	392	9	0	4	0	13	737
*** BREAK ***																					
Total	0	700	11	0	711	0	0	0	0	0	5	775	0	0	780	16	0	6	0	22	1513
*** BREAK ***																					
04:00 PM	0	502	28	0	530	0	0	0	0	0	2	398	0	0	400	4	0	0	0	4	934
04:15 PM	0	504	52	0	556	0	0	0	0	0	3	441	0	0	444	4	0	1	0	5	1005
04:30 PM	0	416	62	0	478	0	0	0	0	0	2	404	0	0	406	1	0	3	0	4	888
04:45 PM	0	382	59	0	441	0	0	0	0	0	0	448	0	0	448	0	0	6	0	6	895
Total	0	1804	201	0	2005	0	0	0	0	0	7	1691	0	0	1698	9	0	10	0	19	3722
05:00 PM	0	481	68	0	549	0	0	0	0	0	1	416	0	0	417	1	0	4	0	5	971
05:15 PM	0	434	44	0	478	0	0	0	0	0	3	388	0	0	391	3	0	3	0	6	875
05:30 PM	0	427	29	0	456	0	0	0	0	0	1	423	0	0	424	1	0	0	0	1	881
05:45 PM	0	427	17	0	444	0	0	0	0	0	1	336	0	0	337	5	0	0	0	5	786
Total	0	1769	158	0	1927	0	0	0	0	0	6	1563	0	0	1569	10	0	7	0	17	3513
Grand Total	0	6155	415	0	6570	0	0	0	0	0	30	6440	0	0	6470	84	0	43	0	127	13167
Apprch %	0	93.7	6.3	0		0	0	0	0		0.5	99.5	0	0		66.1	0	33.9	0		
Total %	0	46.7	3.2	0	49.9	0	0	0	0	0	0.2	48.9	0	0	49.1	0.6	0	0.3	0	1	

Collier Engineering Co., Inc.

2949 Nolensville Pike
Nashville, Tennessee 37211

File Name : Columbia Rock Rd at Theta Pk
Site Code :
Start Date : 3/24/2022
Page No : 1

Groups Printed- Vehicles

	From North					Columbia Rock Rd From East					Theta Pk From South					Theta Pk From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:30 AM	0	0	0	0	0	5	19	0	0	24	1	0	3	0	4	0	4	1	0	5	33
06:45 AM	0	0	0	0	0	5	6	0	0	11	3	0	7	0	10	0	4	3	0	7	28
Total	0	0	0	0	0	10	25	0	0	35	4	0	10	0	14	0	8	4	0	12	61
07:00 AM	0	0	0	0	0	2	6	0	0	8	1	0	5	0	6	0	2	4	0	6	20
07:15 AM	0	0	0	0	0	2	3	0	0	5	3	0	6	0	9	0	8	3	0	11	25
07:30 AM	0	0	0	0	0	3	2	0	0	5	5	0	2	0	7	0	6	5	0	11	23
07:45 AM	0	0	0	0	0	6	4	0	0	10	7	0	4	0	11	0	12	6	0	18	39
Total	0	0	0	0	0	13	15	0	0	28	16	0	17	0	33	0	28	18	0	46	107
08:00 AM	0	0	0	0	0	2	3	0	0	5	5	0	5	0	10	0	5	5	0	10	25
08:15 AM	0	0	0	0	0	2	4	0	0	6	5	0	4	0	9	0	5	2	0	7	22
*** BREAK ***																					
Total	0	0	0	0	0	4	7	0	0	11	10	0	9	0	19	0	10	7	0	17	47
*** BREAK ***																					
04:00 PM	0	0	0	0	0	26	4	0	0	30	5	0	8	0	13	0	1	9	0	10	53
04:15 PM	0	0	0	0	0	51	6	0	0	57	5	0	9	0	14	0	1	15	0	16	87
04:30 PM	0	0	0	0	0	33	1	0	0	34	3	0	0	0	3	0	2	7	0	9	46
04:45 PM	0	0	0	0	0	34	3	0	0	37	3	0	4	0	7	0	1	8	0	9	53
Total	0	0	0	0	0	144	14	0	0	158	16	0	21	0	37	0	5	39	0	44	239
05:00 PM	0	0	0	0	0	30	3	0	0	33	4	0	5	0	9	0	1	6	0	7	49
05:15 PM	0	0	0	0	0	26	1	0	0	27	4	0	6	0	10	0	3	14	0	17	54
05:30 PM	0	0	0	0	0	9	3	0	0	12	8	0	4	0	12	0	5	7	0	12	36
05:45 PM	0	0	0	0	0	10	2	0	0	12	6	0	2	0	8	0	1	4	0	5	25
Total	0	0	0	0	0	75	9	0	0	84	22	0	17	0	39	0	10	31	0	41	164
Grand Total	0	0	0	0	0	246	70	0	0	316	68	0	74	0	142	0	61	99	0	160	618
Apprch %	0	0	0	0		77.8	22.2	0	0		47.9	0	52.1	0		0	38.1	61.9	0		
Total %	0	0	0	0	0	39.8	11.3	0	0	51.1	11	0	12	0	23	0	9.9	16	0	25.9	

All vehicles

	Northbound					Southbound					Eastbound					Westbound					
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	2.1	2.2	2.3	2.4	Total	2.5	2.6	2.7	2.8	Total	2.9	2.10	2.11	2.12	Total	2.13	2.14	2.15	2.16	Total	Total
0700 - 0715	6	10	10	0	26	9	10	18	0	37	17	304	11	0	332	9	207	3	0	219	614
0715 - 0730	13	9	17	0	39	12	16	27	0	55	21	341	17	0	379	4	256	7	0	267	740
0730 - 0745	19	9	14	0	42	8	27	22	0	57	19	279	15	0	313	16	285	4	2	307	719
0745 - 0800	6	8	14	0	28	11	21	19	0	51	20	308	36	0	364	18	227	7	0	252	695
Total	44	36	55	0	135	40	74	86	0	200	77	1232	79	0	1388	47	975	21	2	1045	2768
Approach %	32.59	26.67	40.74	0.00	-	20.00	37.00	43.00	0.00	-	5.55	88.76	5.69	0.00	-	4.50	93.30	2.01	0.19	-	
PHF	0.58	0.90	0.81	0.00	**0.80**	0.83	0.69	0.80	0.00	**0.88**	0.92	0.90	0.55	0.00	**0.92**	0.65	0.86	0.75	0.25	**0.85**	**0.94**

Passenger Vehicles (1-3)

	Northbound					Southbound					Eastbound					Westbound					
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	2.1	2.2	2.3	2.4	Total	2.5	2.6	2.7	2.8	Total	2.9	2.10	2.11	2.12	Total	2.13	2.14	2.15	2.16	Total	Total
0700 - 0715	6	10	10	0	26	7	10	17	0	34	16	291	11	0	318	8	185	1	0	194	572
0715 - 0730	13	8	14	0	35	11	16	27	0	54	21	322	17	0	360	4	230	7	0	241	690
0730 - 0745	17	9	12	0	38	7	27	18	0	52	19	260	15	0	294	15	255	4	2	276	660
0745 - 0800	6	8	14	0	28	11	21	19	0	51	20	286	35	0	341	17	200	6	0	223	643
Total	42	35	50	0	127	36	74	81	0	191	76	1159	78	0	1313	44	870	18	2	934	2565
Approach %	33.07	27.56	39.37	0.00	-	18.85	38.74	42.41	0.00	-	5.79	88.27	5.94	0.00	-	4.71	93.15	1.93	0.21	-	
PHF	0.62	0.88	0.89	0.00	**0.84**	0.82	0.69	0.75	0.00	**0.88**	0.90	0.90	0.56	0.00	**0.91**	0.65	0.85	0.64	0.25	**0.85**	**0.93**

Single Unit Trucks (4-7)

	Northbound					Southbound					Eastbound					Westbound					
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	2.1	2.2	2.3	2.4	Total	2.5	2.6	2.7	2.8	Total	2.9	2.10	2.11	2.12	Total	2.13	2.14	2.15	2.16	Total	Total
0700 - 0715	0	0	0	0	0	1	0	1	0	2	1	9	0	0	10	1	11	1	0	13	25
0715 - 0730	0	1	3	0	4	1	0	0	0	1	0	11	0	0	11	0	10	0	0	10	26
0730 - 0745	0	0	0	0	0	1	0	3	0	4	0	15	0	0	15	1	20	0	0	21	40
0745 - 0800	0	0	0	0	0	0	0	0	0	0	0	10	1	0	11	1	18	1	0	20	31
Total	0	1	3	0	4	3	0	4	0	7	1	45	1	0	47	3	59	2	0	64	122
Approach %	0.00	25.00	75.00	0.00	-	42.86	0.00	57.14	0.00	-	2.13	95.74	2.13	0.00	-	4.69	92.19	3.13	0.00	-	
PHF	0.00	0.25	0.25	0.00	**0.25**	0.75	0.00	0.33	0.00	**0.44**	0.25	0.75	0.25	0.00	**0.78**	0.75	0.74	0.50	0.00	**0.76**	**0.76**

Combination Trucks (8-13)

	Northbound					Southbound					Eastbound					Westbound					
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	2.1	2.2	2.3	2.4	Total	2.5	2.6	2.7	2.8	Total	2.9	2.10	2.11	2.12	Total	2.13	2.14	2.15	2.16	Total	Total
0700 - 0715	0	0	0	0	0	1	0	0	0	1	0	4	0	0	4	0	11	1	0	12	17
0715 - 0730	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	0	16	0	0	16	24
0730 - 0745	2	0	2	0	4	0	0	1	0	1	0	4	0	0	4	0	10	0	0	10	19
0745 - 0800	0	0	0	0	0	0	0	0	0	0	0	12	0	0	12	0	9	0	0	9	21
Total	2	0	2	0	4	1	0	1	0	2	0	28	0	0	28	0	46	1	0	47	81
Approach %	50.00	0.00	50.00	0.00	-	50.00	0.00	50.00	0.00	-	0.00	100.00	0.00	0.00	-	0.00	97.87	2.13	0.00	-	
PHF	0.25	0.00	0.25	0.00	**0.25**	0.25	0.00	0.25	0.00	**0.50**	0.00	0.58	0.00	0.00	**0.58**	0.00	0.72	0.25	0.00	**0.73**	**0.84**

Bikes

	Northbound					Southbound					Eastbound					Westbound					
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	2.1	2.2	2.3	2.4	Total	2.5	2.6	2.7	2.8	Total	2.9	2.10	2.11	2.12	Total	2.13	2.14	2.15	2.16	Total	Total
0700 - 0715	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0715 - 0730	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0730 - 0745	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0745 - 0800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Pedestrians

	Northbound					Southbound					Eastbound					Westbound					
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	EB	WB			App	EB	WB			App	NB	SB			App	NB	SB			App	Int
Time	2a	2b			Total	2c	2d			Total	2e	2f			Total	2g	2h			Total	Total
0700 - 0715	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0715 - 0730	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0730 - 0745	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
0745 - 0800	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

All vehicles

	Northbound					Southbound					Eastbound					Westbound					
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	2.1	2.2	2.3	2.4	Total	2.5	2.6	2.7	2.8	Total	2.9	2.10	2.11	2.12	Total	2.13	2.14	2.15	2.16	Total	Total
1615 - 1630	28	27	10	0	65	14	28	58	0	100	17	221	22	0	260	9	255	9	0	273	698
1630 - 1645	33	27	13	0	73	14	34	68	0	116	11	228	13	0	252	13	313	7	0	333	774
1645 - 1700	32	29	6	0	67	6	24	55	0	85	16	243	21	0	280	17	295	12	1	325	757
1700 - 1715	41	22	19	0	82	13	30	37	0	80	15	216	12	0	243	19	282	8	1	310	715
Total	134	105	48	0	287	47	116	218	0	381	59	908	68	0	1035	58	1145	36	2	1241	2944
Approach %	46.69	36.59	16.72	0.00	-	12.34	30.45	57.22	0.00	-	5.70	87.73	6.57	0.00	-	4.67	92.26	2.90	0.16	-	
PHF	0.82	0.91	0.63	0.00	**0.88**	0.84	0.85	0.80	0.00	**0.82**	0.87	0.93	0.77	0.00	**0.92**	0.76	0.91	0.75	0.50	**0.93**	**0.95**

Passenger Vehicles (1-3)

	Northbound					Southbound					Eastbound					Westbound					
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	2.1	2.2	2.3	2.4	Total	2.5	2.6	2.7	2.8	Total	2.9	2.10	2.11	2.12	Total	2.13	2.14	2.15	2.16	Total	Total
1615 - 1630	28	27	10	0	65	14	28	56	0	98	17	206	22	0	245	9	241	9	0	259	667
1630 - 1645	33	25	13	0	71	13	34	65	0	112	11	214	13	0	238	13	297	7	0	317	738
1645 - 1700	30	28	6	0	64	6	24	54	0	84	15	225	19	0	259	16	276	12	1	305	712
1700 - 1715	41	21	19	0	81	11	30	36	0	77	15	198	12	0	225	19	271	8	1	299	682
Total	132	101	48	0	281	44	116	211	0	371	58	843	66	0	967	57	1085	36	2	1180	2799
Approach %	46.98	35.94	17.08	0.00	-	11.86	31.27	56.87	0.00	-	6.00	87.18	6.83	0.00	-	4.83	91.95	3.05	0.17	-	
PHF	0.80	0.90	0.63	0.00	**0.87**	0.79	0.85	0.81	0.00	**0.83**	0.85	0.94	0.75	0.00	**0.93**	0.75	0.91	0.75	0.50	**0.93**	**0.95**

Single Unit Trucks (4-7)

	Northbound					Southbound					Eastbound					Westbound					
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	2.1	2.2	2.3	2.4	Total	2.5	2.6	2.7	2.8	Total	2.9	2.10	2.11	2.12	Total	2.13	2.14	2.15	2.16	Total	Total
1615 - 1630	0	0	0	0	0	0	0	1	0	1	0	7	0	0	7	0	10	0	0	10	18
1630 - 1645	0	2	0	0	2	1	0	3	0	4	0	5	0	0	5	0	10	0	0	10	21
1645 - 1700	1	1	0	0	2	0	0	1	0	1	1	2	2	0	5	1	10	0	0	11	19
1700 - 1715	0	1	0	0	1	2	0	1	0	3	0	5	0	0	5	0	6	0	0	6	15
Total	1	4	0	0	5	3	0	6	0	9	1	19	2	0	22	1	36	0	0	37	73
Approach %	20.00	80.00	0.00	0.00	-	33.33	0.00	66.67	0.00	-	4.55	86.36	9.09	0.00	-	2.70	97.30	0.00	0.00	-	
PHF	0.25	0.50	0.00	0.00	**0.63**	0.38	0.00	0.50	0.00	**0.56**	0.25	0.68	0.25	0.00	**0.79**	0.25	0.90	0.00	0.00	**0.84**	**0.87**

Combination Trucks (8-13)

	Northbound					Southbound					Eastbound					Westbound					
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	2.1	2.2	2.3	2.4	Total	2.5	2.6	2.7	2.8	Total	2.9	2.10	2.11	2.12	Total	2.13	2.14	2.15	2.16	Total	Total
1615 - 1630	0	0	0	0	0	0	0	1	0	1	0	8	0	0	8	0	4	0	0	4	13
1630 - 1645	0	0	0	0	0	0	0	0	0	0	0	9	0	0	9	0	6	0	0	6	15
1645 - 1700	1	0	0	0	1	0	0	0	0	0	0	16	0	0	16	0	9	0	0	9	26
1700 - 1715	0	0	0	0	0	0	0	0	0	0	0	13	0	0	13	0	5	0	0	5	18
Total	1	0	0	0	1	0	0	1	0	1	0	46	0	0	46	0	24	0	0	24	72
Approach %	100.00	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	0.25	0.00	0.00	0.00	**0.25**	0.00	0.00	0.25	0.00	**0.25**	0.00	0.72	0.00	0.00	**0.72**	0.00	0.67	0.00	0.00	**0.67**	**0.69**

Bikes

	Northbound					Southbound					Eastbound					Westbound					
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
Time	2.1	2.2	2.3	2.4	Total	2.5	2.6	2.7	2.8	Total	2.9	2.10	2.11	2.12	Total	2.13	2.14	2.15	2.16	Total	Total
1615 - 1630	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1630 - 1645	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1645 - 1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700 - 1715	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Pedestrians

	Northbound					Southbound					Eastbound					Westbound					
	Theta Pike (South)					Theta Pike (North)					TN-6 (West)					TN-6 (East)					
	EB	WB			App	EB	WB			App	NB	SB			App	NB	SB			App	Int
Time	2a	2b			Total	2c	2d			Total	2e	2f			Total	2g	2h			Total	Total
1615 - 1630	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1630 - 1645	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1645 - 1700	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
1700 - 1715	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	
PHF	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	**0.00**	**0.00**

APPENDIX D
TRIP GENERATION CALCULATIONS

Theta Pike
Subdivision Columbia

Trip Generation
Calculations

Land Use	Size	Unit	Weekday ADT	AM Peak Hour			PM Peak Hour		
				Total	Enter	Exit	Total	Enter	Exit
Single-Family Detached Housing LUC 210	216	DU	2,049	150	39	111	205	129	76
Total	**216**	**DU**	**2,049**	**150**	**39**	**111**	**205**	**129**	**76**

Source: *ITE Trip Generation Manual, 11th Edition*

APPENDIX E
TRAFFIC CALCULATION WORKSHEETS

Traffic Volume Calculations
#1 Nashville Highway & Columbia Rock Road

AM Peak Hour

Condition	Eastbound Columbia Rock Rd			Westbound Columbia Rock Rd			Northbound Nashville Hwy			Southbound Nashville Hwy		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2022 Existing Traffic Volumes	32	0	17	0	0	0	7	1829	0	0	1674	32
2025 Background Growth												
Growth Rate (4% Annual for 3 Years)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Background Growth Volumes	4	0	2	0	0	0	1	219	0	0	201	4
Approved Developments & % Remaining:												
None 50% Remaining												
Directional Distribution												
Enter %												
Exit %												
Assignment												
Enter 0	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	0
Total Assignment	0	0	0	0	0	0	0	0	0	0	0	0
2025 Background Traffic Volumes	36	0	19	0	0	0	8	2048	0	0	1875	36
New Site Traffic												
Directional Distribution												
Enter											40%	
Exit								40%				
Traffic Assignment												
Enter 39	0	0	0	0	0	0	0	0	0	0	16	0
Exit 111	0	0	0	0	0	0	0	44	0	0	0	0
Total Assignment	0	0	0	0	0	0	0	44	0	0	16	0
2025 Total Projected Traffic Volumes	36	0	19	0	0	0	8	2092	0	0	1891	36

PM Peak Hour

Condition	Eastbound Columbia Rock Rd			Westbound Columbia Rock Rd			Northbound Nashville Hwy			Southbound Nashville Hwy		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2022 Existing Traffic Volumes	6	0	14	0	0	0	6	1709	0	0	2085	241
2025 Background Growth												
Growth Rate (4% Annual for 3 Years)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Background Growth Volumes	1	0	2	0	0	0	1	205	0	0	250	29
Approved Developments & % Remaining:												
None 50% Remaining												
Directional Distribution												
Enter %												
Exit %												
Assignment												
Enter 0	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	0
Total Assignment	0	0	0	0	0	0	0	0	0	0	0	0
2025 Background Traffic Volumes	7	0	16	0	0	0	7	1914	0	0	2335	270
New Site Traffic												
Directional Distribution												
Enter											40%	
Exit								40%				
Traffic Assignment												
Enter 129	0	0	0	0	0	0	0	0	0	0	52	0
Exit 76	0	0	0	0	0	0	0	30	0	0	0	0
Total Assignment	0	0	0	0	0	0	0	30	0	0	52	0
2025 Total Projected Traffic Volumes	7	0	16	0	0	0	7	1944	0	0	2387	270

**Adjusted for rounding errors.*

Traffic Volume Calculations
#2 Nashville Highway & Burt Drive

AM Peak Hour

Condition	Eastbound Burt Dr			Westbound Burt Dr			Northbound Nashville Hwy			Southbound Nashville Hwy		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2022 Existing Traffic Volumes	106	7	30	98	8	20	39	1773	52	11	1574	106
2025 Background Growth												
Growth Rate (4% Annual for 3 Years)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Background Growth Volumes	13	1	4	12	1	2	5	213	6	1	189	13
Approved Developments & % Remaining:												
None 50% Remaining												
Directional Distribution												
Enter %												
Exit %												
Assignment												
Enter 0	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	0
Total Assignment	0	0	0	0	0	0	0	0	0	0	0	0
2025 Background Traffic Volumes	119	8	34	110	9	22	44	1986	58	12	1763	119
New Site Traffic												
Directional Distribution												
Enter							20%					40%
Exit	40%		20%									
Traffic Assignment												
Enter 39	0	0	0	0	0	0	8	0	0	0	0	16
Exit 111	44	0	22	0	0	0	0	0	0	0	0	0
Total Assignment	44	0	22	0	0	0	8	0	0	0	0	16
2025 Total Projected Traffic Volumes	163	8	56	110	9	22	52	1986	58	12	1763	135

PM Peak Hour

Condition	Eastbound Burt Dr			Westbound Burt Dr			Northbound Nashville Hwy			Southbound Nashville Hwy		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2022 Existing Traffic Volumes	68	10	35	122	14	8	38	1639	76	11	2037	51
2025 Background Growth												
Growth Rate (4% Annual for 3 Years)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Background Growth Volumes	8	1	4	15	2	1	5	197	9	1	244	6
Approved Developments & % Remaining:												
None 50% Remaining												
Directional Distribution												
Enter %												
Exit %												
Assignment												
Enter 0	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	0
Total Assignment	0	0	0	0	0	0	0	0	0	0	0	0
2025 Background Traffic Volumes	76	11	39	137	16	9	43	1836	85	12	2281	57
New Site Traffic												
Directional Distribution												
Enter							20%					40%
Exit	40%		20%									
Traffic Assignment												
Enter 129	0	0	0	0	0	0	26	0	0	0	0	52
Exit 76	30	0	15	0	0	0	0	0	0	0	0	0
Total Assignment	30	0	15	0	0	0	26	0	0	0	0	52
2025 Total Projected Traffic Volumes	106	11	54	137	16	9	69	1836	85	12	2281	109

**Adjusted for rounding errors.*

Traffic Volume Calculations
#3 US 43 Bypass & Theta Pike

AM Peak Hour

Condition	Eastbound US 43 Bypass			Westbound US 43 Bypass			Northbound Theta Pike			Southbound Theta Pike		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2022 Existing Traffic Volumes	77	1232	79	49	975	21	44	36	55	40	74	86
2025 Background Growth												
Growth Rate (4% Annual for 3 Years)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Background Growth Volumes	9	148	9	6	117	3	5	4	7	5	9	10
Approved Developments & % Remaining:												
None 50% Remaining												
Directional Distribution												
Enter %												
Exit %												
Assignment												
Enter 0	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	0
Total Assignment	0	0	0	0	0	0	0	0	0	0	0	0
2025 Background Traffic Volumes	86	1380	88	55	1092	24	49	40	62	45	83	96
New Site Traffic												
Directional Distribution												
Enter	5%					5%		30%				
Exit										5%	30%	5%
Traffic Assignment												
Enter 39	2	0	0	0	0	2	0	12	0	0	0	0
Exit 111	0	0	0	0	0	0	0	0	0	6	33	6
Total Assignment	2	0	0	0	0	2	0	12	0	6	33	6
2025 Total Projected Traffic Volumes	88	1380	88	55	1092	26	49	52	62	51	116	102

PM Peak Hour

Condition	Eastbound US 43 Bypass			Westbound US 43 Bypass			Northbound Theta Pike			Southbound Theta Pike		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2022 Existing Traffic Volumes	59	908	68	60	1145	36	134	105	48	47	116	218
2025 Background Growth												
Growth Rate (4% Annual for 3 Years)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Background Growth Volumes	7	109	8	7	137	4	16	13	6	6	14	26
Approved Developments & % Remaining:												
None 50% Remaining												
Directional Distribution												
Enter %												
Exit %												
Assignment												
Enter 0	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	0
Total Assignment	0	0	0	0	0	0	0	0	0	0	0	0
2025 Background Traffic Volumes	66	1017	76	67	1282	40	150	118	54	53	130	244
New Site Traffic												
Directional Distribution												
Enter	5%					5%		30%				
Exit										5%	30%	5%
Traffic Assignment												
Enter 129	6	0	0	0	0	6	0	39	0	0	0	0
Exit 76	0	0	0	0	0	0	0	0	0	4	23	4
Total Assignment	6	0	0	0	0	6	0	39	0	4	23	4
2025 Total Projected Traffic Volumes	72	1017	76	67	1282	46	150	157	54	57	153	248

**Adjusted for rounding errors.*

Traffic Volume Calculations
#4 Theta Pike & Columbia Rock Road

AM Peak Hour

Condition	Eastbound Columbia Rock Rd			Westbound Columbia Rock Rd			Northbound Theta Pike			Southbound Theta Pike		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2022 Existing Traffic Volumes	0	31	19	13	12	0	20	0	17	0	0	0
2025 Background Growth												
Growth Rate (4% Annual for 3 Years)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Background Growth Volumes	0	4	2	2	1	0	2	0	2	0	0	0
Approved Developments & % Remaining:												
None 50% Remaining												
Directional Distribution												
Enter %												
Exit %												
Assignment												
Enter 0	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	0
Total Assignment	0	0	0	0	0	0	0	0	0	0	0	0
2025 Background Traffic Volumes	0	35	21	15	13	0	22	0	19	0	0	0
New Site Traffic												
Directional Distribution												
Enter												
Exit												
Traffic Assignment												
Enter 39	0	0	0	0	0	0	0	0	0	0	0	0
Exit 111	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
2025 Total Projected Traffic Volumes	0	35	21	15	13	0	22	0	19	0	0	0

PM Peak Hour

Condition	Eastbound Columbia Rock Rd			Westbound Columbia Rock Rd			Northbound Theta Pike			Southbound Theta Pike		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2022 Existing Traffic Volumes	0	5	39	144	14	0	16	0	21	0	0	0
2025 Background Growth												
Growth Rate (4% Annual for 3 Years)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Background Growth Volumes	0	1	5	17	2	0	2	0	3	0	0	0
Approved Developments & % Remaining:												
None 50% Remaining												
Directional Distribution												
Enter %												
Exit %												
Assignment												
Enter 0	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	0
Total Assignment	0	0	0	0	0	0	0	0	0	0	0	0
2025 Background Traffic Volumes	0	6	44	161	16	0	18	0	24	0	0	0
New Site Traffic												
Directional Distribution												
Enter												
Exit												
Traffic Assignment												
Enter 129	0	0	0	0	0	0	0	0	0	0	0	0
Exit 76	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
2025 Total Projected Traffic Volumes	0	6	44	161	16	0	18	0	24	0	0	0

**Adjusted for rounding errors.*

APPENDIX F
CAPACITY ANALYSIS WORKSHEETS

2022 EXISTING CONDITIONS

Intersection	
Int Delay, s/veh	1

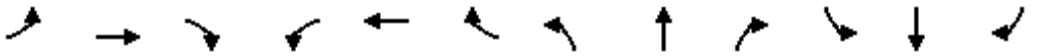
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	17	7	1829	1674	32
Future Vol, veh/h	32	17	7	1829	1674	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	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	35	18	8	1988	1820	35

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2848	928	1855	0	-	0
Stage 1	1838	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 14	270	322	-	-	-
Stage 1	112	-	-	-	-	-
Stage 2	313	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 14	270	322	-	-	-
Mov Cap-2 Maneuver	80	-	-	-	-	-
Stage 1	112	-	-	-	-	-
Stage 2	313	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	69.2	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	322	-	106	-	-
HCM Lane V/C Ratio	0.024	-	0.502	-	-
HCM Control Delay (s)	16.5	0	69.2	-	-
HCM Lane LOS	C	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	2.3	-	-

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	7	30	98	8	20	39	1773	52	11	1574	106
Future Volume (veh/h)	106	7	30	98	8	20	39	1773	52	11	1574	106
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	115	8	33	107	9	22	42	1927	57	12	1711	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	362	22	301	224	24	29	57	1980	58	21	1924	
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.03	0.56	0.56	0.01	0.54	0.00
Sat Flow, veh/h	1364	115	1585	683	126	153	1781	3525	104	1781	3554	1585
Grp Volume(v), veh/h	123	0	33	138	0	0	42	967	1017	12	1711	0
Grp Sat Flow(s),veh/h/ln	1479	0	1585	963	0	0	1781	1777	1852	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	1.2	5.6	0.0	0.0	1.6	35.4	36.1	0.5	28.8	0.0
Cycle Q Clear(g_c), s	4.9	0.0	1.2	10.5	0.0	0.0	1.6	35.4	36.1	0.5	28.8	0.0
Prop In Lane	0.93		1.00	0.78		0.16	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	384	0	301	277	0	0	57	998	1040	21	1924	
V/C Ratio(X)	0.32	0.00	0.11	0.50	0.00	0.00	0.73	0.97	0.98	0.56	0.89	
Avail Cap(c_a), veh/h	543	0	480	438	0	0	408	998	1040	408	1996	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.2	0.0	22.7	28.0	0.0	0.0	32.4	14.2	14.4	33.2	13.7	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.2	1.4	0.0	0.0	16.2	21.1	22.6	21.4	5.3	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(50%),veh/ln	1.7	0.0	0.4	2.2	0.0	0.0	0.9	15.8	17.1	0.3	9.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.6	0.0	22.8	29.4	0.0	0.0	48.6	35.3	37.0	54.6	19.0	0.0
LnGrp LOS	C	A	C	C	A	A	D	D	D	D	B	
Approach Vol, veh/h		156			138			2026			1723	A
Approach Delay, s/veh		24.3			29.4			36.5			19.2	
Approach LOS		C			C			D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	45.0		17.3	6.7	43.6		17.3				
Change Period (Y+Rc), s	4.5	7.0		4.5	4.5	7.0		4.5				
Max Green Setting (Gmax), s	15.5	38.0		20.5	15.5	38.0		20.5				
Max Q Clear Time (g_c+I1), s	2.5	38.1		6.9	3.6	30.8		12.5				
Green Ext Time (p_c), s	0.0	0.0		0.6	0.0	5.6		0.4				

Intersection Summary			
HCM 6th Ctrl Delay		28.4	
HCM 6th LOS		C	

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

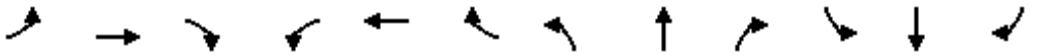
Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	31	19	13	12	20	17
Future Vol, veh/h	31	19	13	12	20	17
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	34	21	14	13	22	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	55	0	86	45
Stage 1	-	-	-	-	45	-
Stage 2	-	-	-	-	41	-
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	-	-	1550	-	915	1025
Stage 1	-	-	-	-	977	-
Stage 2	-	-	-	-	981	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1550	-	907	1025
Mov Cap-2 Maneuver	-	-	-	-	907	-
Stage 1	-	-	-	-	977	-
Stage 2	-	-	-	-	972	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.8	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	958	-	-	1550	-
HCM Lane V/C Ratio	0.042	-	-	0.009	-
HCM Control Delay (s)	8.9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	1232	79	49	975	21	44	36	55	40	74	86
Future Volume (veh/h)	77	1232	79	49	975	21	44	36	55	40	74	86
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	84	1339	86	53	1060	23	48	39	60	43	80	93
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	109	1485	95	73	1486	32	315	149	229	310	99	115
Arrive On Green	0.06	0.44	0.44	0.04	0.42	0.42	0.11	0.22	0.22	0.04	0.13	0.13
Sat Flow, veh/h	1781	3391	217	1781	3556	77	1781	664	1022	1781	789	917
Grp Volume(v), veh/h	84	700	725	53	530	553	48	0	99	43	0	173
Grp Sat Flow(s),veh/h/ln	1781	1777	1831	1781	1777	1856	1781	0	1686	1781	0	1705
Q Serve(g_s), s	4.1	32.3	32.6	2.6	21.9	21.9	1.8	0.0	4.3	1.8	0.0	8.7
Cycle Q Clear(g_c), s	4.1	32.3	32.6	2.6	21.9	21.9	1.8	0.0	4.3	1.8	0.0	8.7
Prop In Lane	1.00		0.12	1.00		0.04	1.00		0.61	1.00		0.54
Lane Grp Cap(c), veh/h	109	778	802	73	742	776	315	0	378	310	0	214
V/C Ratio(X)	0.77	0.90	0.90	0.72	0.71	0.71	0.15	0.00	0.26	0.14	0.00	0.81
Avail Cap(c_a), veh/h	262	863	890	262	863	902	315	0	378	486	0	366
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	40.9	23.1	23.1	41.9	21.4	21.4	25.5	0.0	28.3	31.8	0.0	37.7
Incr Delay (d2), s/veh	10.8	11.6	11.8	12.6	2.3	2.2	1.0	0.0	0.4	0.2	0.0	7.1
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	14.4	14.9	1.3	8.6	9.0	0.8	0.0	1.7	0.8	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.7	34.7	34.9	54.5	23.7	23.6	26.5	0.0	28.7	32.0	0.0	44.8
LnGrp LOS	D	C	C	D	C	C	C	A	C	C	A	D
Approach Vol, veh/h		1509			1136			147			216	
Approach Delay, s/veh		35.7			25.1			28.0			42.2	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	45.8	8.3	25.8	10.4	44.0	17.0	17.1
Change Period (Y+Rc), s	5.0	7.0	5.0	6.0	5.0	7.0	7.0	6.0
Max Green Setting (Gmax), s	13.0	43.0	12.0	19.0	13.0	43.0	10.0	19.0
Max Q Clear Time (g_c+I1), s	4.6	34.6	3.8	6.3	6.1	23.9	3.8	10.7
Green Ext Time (p_c), s	0.1	4.2	0.0	0.2	0.1	4.4	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	31.8
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.3

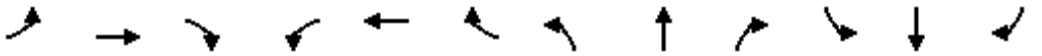
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	14	6	1709	2085	241
Future Vol, veh/h	6	14	6	1709	2085	241
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	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	7	15	7	1858	2266	262

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3340	1264	2528	0	-	0
Stage 1	2397	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	*~ 1	161	175	-	-	-
Stage 1	*54	-	-	-	-	-
Stage 2	*368	-	-	-	-	-
Platoon blocked, %	1			-	-	-
Mov Cap-1 Maneuver	*~ 1	161	175	-	-	-
Mov Cap-2 Maneuver	*43	-	-	-	-	-
Stage 1	*54	-	-	-	-	-
Stage 2	*368	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	58.8	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	175	-	88	-	-
HCM Lane V/C Ratio	0.037	-	0.247	-	-
HCM Control Delay (s)	26.4	0	58.8	-	-
HCM Lane LOS	D	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	0.9	-	-

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	10	35	122	14	8	38	1639	76	11	2037	51
Future Volume (veh/h)	68	10	35	122	14	8	38	1639	76	11	2037	51
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	74	11	38	133	15	9	41	1782	83	12	2214	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	280	39	274	193	17	10	53	2479	115	18	2478	
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.03	0.72	0.72	0.01	0.70	0.00
Sat Flow, veh/h	1376	225	1585	876	99	59	1781	3458	160	1781	3554	1585
Grp Volume(v), veh/h	85	0	38	157	0	0	41	910	955	12	2214	0
Grp Sat Flow(s),veh/h/ln	1601	0	1585	1034	0	0	1781	1777	1842	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	3.3	17.6	0.0	0.0	3.7	47.6	48.9	1.1	80.1	0.0
Cycle Q Clear(g_c), s	7.3	0.0	3.3	24.9	0.0	0.0	3.7	47.6	48.9	1.1	80.1	0.0
Prop In Lane	0.87		1.00	0.85		0.06	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	319	0	274	220	0	0	53	1273	1320	18	2478	
V/C Ratio(X)	0.27	0.00	0.14	0.71	0.00	0.00	0.77	0.71	0.72	0.65	0.89	
Avail Cap(c_a), veh/h	479	0	451	377	0	0	173	1273	1320	173	2478	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	57.7	0.0	56.1	68.6	0.0	0.0	77.1	13.2	13.3	78.9	19.5	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.2	4.2	0.0	0.0	20.6	3.4	3.5	32.7	5.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	1.3	6.6	0.0	0.0	2.0	18.1	19.2	0.7	31.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.2	0.0	56.3	72.8	0.0	0.0	97.7	16.6	16.8	111.6	24.9	0.0
LnGrp LOS	E	A	E	E	A	A	F	B	B	F	C	
Approach Vol, veh/h		123			157			1906			2226	A
Approach Delay, s/veh		57.6			72.8			18.5			25.4	
Approach LOS		E			E			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.2	121.7		32.2	9.3	118.6		32.2				
Change Period (Y+Rc), s	4.5	7.0		4.5	4.5	7.0		4.5				
Max Green Setting (Gmax), s	15.5	83.0		45.5	15.5	83.0		45.5				
Max Q Clear Time (g_c+I1), s	3.1	50.9		9.3	5.7	82.1		26.9				
Green Ext Time (p_c), s	0.0	17.8		0.6	0.0	0.9		0.8				

Intersection Summary			
HCM 6th Ctrl Delay		25.0	
HCM 6th LOS		C	

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

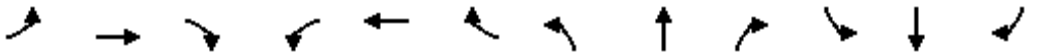
Intersection	
Int Delay, s/veh	6.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	5	39	144	14	16	21
Future Vol, veh/h	5	39	144	14	16	21
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	5	42	157	15	17	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	47	0	355	26
Stage 1	-	-	-	-	26	-
Stage 2	-	-	-	-	329	-
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	-	-	1560	-	643	1050
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	729	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1560	-	578	1050
Mov Cap-2 Maneuver	-	-	-	-	578	-
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	655	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.9	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	776	-	-	1560	-
HCM Lane V/C Ratio	0.052	-	-	0.1	-
HCM Control Delay (s)	9.9	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.3	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	908	68	60	1145	36	134	105	48	47	116	218
Future Volume (veh/h)	59	908	68	60	1145	36	134	105	48	47	116	218
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	64	987	74	65	1245	39	146	114	52	51	126	237
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	84	1289	97	86	1355	42	250	374	171	424	141	266
Arrive On Green	0.05	0.38	0.38	0.05	0.39	0.39	0.08	0.31	0.31	0.04	0.24	0.24
Sat Flow, veh/h	1781	3351	251	1781	3517	110	1781	1216	555	1781	581	1093
Grp Volume(v), veh/h	64	523	538	65	629	655	146	0	166	51	0	363
Grp Sat Flow(s),veh/h/ln	1781	1777	1825	1781	1777	1851	1781	0	1771	1781	0	1674
Q Serve(g_s), s	3.7	26.6	26.6	3.7	34.8	34.8	6.1	0.0	7.4	2.2	0.0	21.7
Cycle Q Clear(g_c), s	3.7	26.6	26.6	3.7	34.8	34.8	6.1	0.0	7.4	2.2	0.0	21.7
Prop In Lane	1.00		0.14	1.00		0.06	1.00		0.31	1.00		0.65
Lane Grp Cap(c), veh/h	84	683	702	86	685	713	250	0	545	424	0	407
V/C Ratio(X)	0.76	0.77	0.77	0.76	0.92	0.92	0.58	0.00	0.30	0.12	0.00	0.89
Avail Cap(c_a), veh/h	431	739	759	431	739	770	501	0	754	788	0	712
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	48.7	27.7	27.7	48.6	30.2	30.2	27.5	0.0	27.3	27.5	0.0	37.8
Incr Delay (d2), s/veh	13.0	4.5	4.4	12.9	15.8	15.4	2.1	0.0	0.3	0.1	0.0	7.3
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(50%),veh/ln	1.9	11.3	11.6	1.9	16.7	17.3	2.7	0.0	3.1	0.9	0.0	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.7	32.2	32.1	61.5	46.0	45.7	29.6	0.0	27.6	27.7	0.0	45.0
LnGrp LOS	E	C	C	E	D	D	C	A	C	C	A	D
Approach Vol, veh/h		1125			1349			312			414	
Approach Delay, s/veh		33.8			46.6			28.6			42.9	
Approach LOS		C			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	46.8	8.8	37.8	9.9	46.8	15.5	31.2
Change Period (Y+Rc), s	5.0	7.0	5.0	6.0	5.0	7.0	7.0	6.0
Max Green Setting (Gmax), s	25.0	43.0	25.0	44.0	25.0	43.0	23.0	44.0
Max Q Clear Time (g_c+I1), s	5.7	28.6	4.2	9.4	5.7	36.8	8.1	23.7
Green Ext Time (p_c), s	0.1	3.9	0.1	0.6	0.1	3.0	0.4	1.5

Intersection Summary	
HCM 6th Ctrl Delay	39.9
HCM 6th LOS	D

2025 BACKGROUND CONDITIONS

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	36	19	8	2048	1875	36
Future Vol, veh/h	36	19	8	2048	1875	36
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, #	1	-	-	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	39	21	9	2226	2038	39

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3189	1039	2077	0	-	0
Stage 1	2058	-	-	-	-	-
Stage 2	1131	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 8	227	264	-	-	-
Stage 1	84	-	-	-	-	-
Stage 2	270	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 8	227	264	-	-	-
Mov Cap-2 Maneuver	61	-	-	-	-	-
Stage 1	84	-	-	-	-	-
Stage 2	270	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	122.6	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	264	-	82	-	-
HCM Lane V/C Ratio	0.033	-	0.729	-	-
HCM Control Delay (s)	19.1	0	122.6	-	-
HCM Lane LOS	C	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	3.5	-	-

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	8	34	110	9	22	44	1986	58	12	1763	119
Future Volume (veh/h)	119	8	34	110	9	22	44	1986	58	12	1763	119
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, 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	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	129	9	37	120	10	24	48	2159	63	13	1916	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	382	23	330	231	24	30	61	1956	57	23	1894	
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
Prop Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.03	0.55	0.55	0.01	0.53	0.00
Unsig. Movement Delay												
Ln Grp Delay, s/veh	25.1	0.0	23.0	30.8	0.0	0.0	53.3	75.4	79.0	55.8	40.3	0.0
Ln Grp LOS	C	A	C	C	A	A	D	F	F	E	F	
Approach Vol, veh/h		175			154			2270			1929	
Approach Delay, s/veh		24.7			30.8			76.8			40.4	
Approach LOS		C			C			E			D	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Case No	2.0	4.0		7.0	2.0	3.0		8.0
Phs Duration (G+Y+Rc), s	5.4	46.5		19.4	7.0	45.0		19.4
Change Period (Y+Rc), s	4.5	7.0		4.5	4.5	7.0		4.5
Max Green (Gmax), s	15.5	38.0		20.5	15.5	38.0		20.5
Max Allow Headway (MAH), s	3.7	4.9		5.2	3.7	4.9		5.5
Max Q Clear (g_c+I1), s	2.5	41.5		7.7	3.9	40.0		14.5
Green Ext Time (g_e), s	0.0	0.0		0.7	0.1	0.0		0.4
Prob of Phs Call (p_c)	0.23	1.00		1.00	0.61	1.00		1.00
Prob of Max Out (p_x)	0.00	1.00		0.02	0.00	1.00		0.78

Left-Turn Movement Data								
Assigned Mvmt	1			7	5			3
Mvmt Sat Flow, veh/h	1781			1364	1781			677

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3526		113		3554		115

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		102		1585		1585		146

Left Lane Group Data								
Assigned Mvmt	1	0	0	7	5	0	0	3
Lane Assignment	L (Prot)			L+T	L (Prot)			L+T+R

Lanes in Grp	1	0	0	1	1	0	0	1
Grp Vol (v), veh/h	13	0	0	138	48	0	0	154
Grp Sat Flow (s), veh/h/ln	1781	0	0	1476	1781	0	0	939
Q Serve Time (g_s), s	0.5	0.0	0.0	0.0	1.9	0.0	0.0	6.8
Cycle Q Clear Time (g_c), s	0.5	0.0	0.0	5.7	1.9	0.0	0.0	12.5
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	1396	0	0	0	1381
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1487	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	14.9	0.0	0.0	0.0	14.9
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	2.4	0.0	0.0	0.0	9.1
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.8
Time to First Blk (g_f), s	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.6
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.6
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	0.93	1.00	0.00	0.00	0.78
Lane Grp Cap (c), veh/h	23	0	0	405	61	0	0	285
V/C Ratio (X)	0.57	0.00	0.00	0.34	0.78	0.00	0.00	0.54
Avail Cap (c_a), veh/h	387	0	0	516	387	0	0	397
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	35.0	0.0	0.0	24.6	34.2	0.0	0.0	29.2
Incr Delay (d2), s/veh	20.8	0.0	0.0	0.5	19.1	0.0	0.0	1.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	55.8	0.0	0.0	25.1	53.3	0.0	0.0	30.8
1st-Term Q (Q1), veh/ln	0.2	0.0	0.0	2.0	0.8	0.0	0.0	2.5
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.1	0.3	0.0	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.3	0.0	0.0	2.0	1.1	0.0	0.0	2.6
%ile Storage Ratio (RQ%)	0.08	0.00	0.00	0.16	0.25	0.00	0.00	0.21
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	2	0	0
Grp Vol (v), veh/h	0	1083	0	0	0	1916	0	0
Grp Sat Flow (s), veh/h/ln	0	1777	0	0	0	1777	0	0
Q Serve Time (g_s), s	0.0	39.5	0.0	0.0	0.0	38.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	39.5	0.0	0.0	0.0	38.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	985	0	0	0	1894	0	0
V/C Ratio (X)	0.00	1.10	0.00	0.00	0.00	1.01	0.00	0.00
Avail Cap (c_a), veh/h	0	985	0	0	0	1894	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	15.9	0.0	0.0	0.0	16.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	59.5	0.0	0.0	0.0	23.6	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	75.4	0.0	0.0	0.0	40.3	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	11.6	0.0	0.0	0.0	11.5	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	16.3	0.0	0.0	0.0	6.2	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	27.9	0.0	0.0	0.0	17.8	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	1.25	0.00	0.00	0.00	0.58	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	24.3	0.0	0.0	0.0	5.6	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.3	0.0	0.0	0.0	0.3	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		R		R		
Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	1139	0	37	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	1852	0	1585	0	1585	0	0
Q Serve Time (g_s), s	0.0	39.5	0.0	1.3	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	39.5	0.0	1.3	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.06	0.00	1.00	0.00	1.00	0.00	0.16
Lane Grp Cap (c), veh/h	0	1027	0	330	0	845	0	0
V/C Ratio (X)	0.00	1.11	0.00	0.11	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	1027	0	456	0	845	0	0
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	15.9	0.0	22.9	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	63.2	0.0	0.1	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	79.0	0.0	23.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	12.1	0.0	0.5	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	30.1	0.0	0.5	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	1.35	0.00	0.17	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	28.1	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	57.7
HCM 6th LOS	E

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	35	21	15	13	19	22
Future Vol, veh/h	35	21	15	13	19	22
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	38	23	16	14	21	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	61	0	96	50
Stage 1	-	-	-	-	50	-
Stage 2	-	-	-	-	46	-
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	-	903	1018
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	976	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1542	-	894	1018
Mov Cap-2 Maneuver	-	-	-	-	894	-
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	966	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.9	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	957	-	-	1542	-
HCM Lane V/C Ratio	0.047	-	-	0.011	-
HCM Control Delay (s)	8.9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	1380	88	55	1092	24	49	40	62	45	83	96
Future Volume (veh/h)	86	1380	88	55	1092	24	49	40	62	45	83	96
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q, 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	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	93	1500	96	60	1187	26	53	43	67	49	90	104
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	120	1611	103	78	1604	35	216	117	183	308	109	126
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
Prop Arrive On Green	0.07	0.47	0.47	0.04	0.45	0.45	0.06	0.18	0.18	0.04	0.14	0.14
Unsig. Movement Delay												
Ln Grp Delay, s/veh	50.0	37.0	37.9	55.7	22.8	22.7	30.3	0.0	32.3	30.6	0.0	44.8
Ln Grp LOS	D	D	D	E	C	C	C	A	C	C	A	D
Approach Vol, veh/h		1689			1273			163			243	
Approach Delay, s/veh		38.1			24.3			31.7			41.9	
Approach LOS		D			C			C			D	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	2.0	4.0	1.1	4.0	2.0	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	8.8	48.5	8.5	21.5	10.9	46.4	12.0	18.1
Change Period (Y+Rc), s	5.0	7.0	5.0	6.0	5.0	7.0	7.0	6.0
Max Green (Gmax), s	13.0	43.0	13.0	19.0	13.0	43.0	18.0	19.0
Max Allow Headway (MAH), s	4.2	4.1	4.3	4.4	4.2	4.1	4.3	4.4
Max Q Clear (g_c+I1), s	4.9	38.6	4.0	7.0	6.5	26.0	4.2	11.7
Green Ext Time (g_e), s	0.1	2.8	0.1	0.3	0.1	4.9	0.1	0.4
Prob of Phs Call (p_c)	0.77	1.00	0.70	1.00	0.90	1.00	0.99	1.00
Prob of Max Out (p_x)	0.01	0.98	0.00	0.00	0.10	0.16	0.00	0.15

Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1781		1781		1781		1781	

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3392		659		3555		791

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		216		1027		78		914

Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	L (Prot)		L (Pr/Pm)		L (Prot)		L (Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	60	0	49	0	93	0	53	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	2.9	0.0	2.0	0.0	4.5	0.0	2.2	0.0
Cycle Q Clear Time (g_c), s	2.9	0.0	2.0	0.0	4.5	0.0	2.2	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	1283	0	0	0	1189	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	12.1	0.0	0.0	0.0	12.1	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	10.5	0.0	0.0	0.0	2.4	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.1	0.0	0.0	0.0	0.5	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	78	0	308	0	120	0	216	0
V/C Ratio (X)	0.77	0.00	0.16	0.00	0.77	0.00	0.24	0.00
Avail Cap (c_a), veh/h	265	0	502	0	265	0	482	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	41.3	0.0	30.4	0.0	40.0	0.0	29.7	0.0
Incr Delay (d2), s/veh	14.4	0.0	0.2	0.0	10.0	0.0	0.6	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	55.7	0.0	30.6	0.0	50.0	0.0	30.3	0.0
1st-Term Q (Q1), veh/ln	1.2	0.0	0.8	0.0	1.9	0.0	0.9	0.0
2nd-Term Q (Q2), veh/ln	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.5	0.0	0.9	0.0	2.2	0.0	0.9	0.0
%ile Storage Ratio (RQ%)	0.35	0.00	0.15	0.00	0.37	0.00	0.31	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	783	0	0	0	593	0	0
Grp Sat Flow (s), veh/h/ln	0	1777	0	0	0	1777	0	0
Q Serve Time (g_s), s	0.0	36.1	0.0	0.0	0.0	24.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	36.1	0.0	0.0	0.0	24.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	844	0	0	0	802	0	0
V/C Ratio (X)	0.00	0.93	0.00	0.00	0.00	0.74	0.00	0.00
Avail Cap (c_a), veh/h	0	875	0	0	0	875	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	21.5	0.0	0.0	0.0	19.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	15.4	0.0	0.0	0.0	3.1	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	37.0	0.0	0.0	0.0	22.8	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	12.8	0.0	0.0	0.0	8.7	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	3.6	0.0	0.0	0.0	0.7	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	16.4	0.0	0.0	0.0	9.4	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.48	0.00	0.00	0.00	0.36	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	813	0	110	0	620	0	194
Grp Sat Flow (s), veh/h/ln	0	1831	0	1686	0	1856	0	1706
Q Serve Time (g_s), s	0.0	36.6	0.0	5.0	0.0	24.0	0.0	9.7
Cycle Q Clear Time (g_c), s	0.0	36.6	0.0	5.0	0.0	24.0	0.0	9.7
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.12	0.00	0.61	0.00	0.04	0.00	0.54
Lane Grp Cap (c), veh/h	0	870	0	300	0	837	0	235
V/C Ratio (X)	0.00	0.94	0.00	0.37	0.00	0.74	0.00	0.82
Avail Cap (c_a), veh/h	0	902	0	367	0	914	0	371
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	21.7	0.0	31.6	0.0	19.7	0.0	36.6
Incr Delay (d2), s/veh	0.0	16.3	0.0	0.7	0.0	3.0	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
Control Delay (d), s/veh	0.0	37.9	0.0	32.3	0.0	22.7	0.0	44.8
1st-Term Q (Q1), veh/ln	0.0	13.4	0.0	2.0	0.0	9.1	0.0	3.9
2nd-Term Q (Q2), veh/ln	0.0	3.9	0.0	0.1	0.0	0.7	0.0	0.5
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	17.4	0.0	2.0	0.0	9.8	0.0	4.4
%ile Storage Ratio (RQ%)	0.00	0.50	0.00	0.17	0.00	0.37	0.00	0.26
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	32.9
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.5

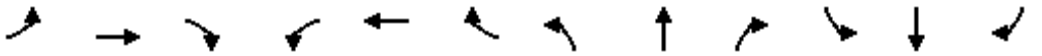
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	16	7	1914	2335	270
Future Vol, veh/h	7	16	7	1914	2335	270
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	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	8	17	8	2080	2538	293

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3741	1416	2831	0	-	0
Stage 1	2685	-	-	-	-	-
Stage 2	1056	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 3	127	132	-	-	-
Stage 1	37	-	-	-	-	-
Stage 2	296	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 3	127	132	-	-	-
Mov Cap-2 Maneuver	31	-	-	-	-	-
Stage 1	37	-	-	-	-	-
Stage 2	296	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	91.5	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	132	-	65	-	-
HCM Lane V/C Ratio	0.058	-	0.385	-	-
HCM Control Delay (s)	33.9	0	91.5	-	-
HCM Lane LOS	D	A	F	-	-
HCM 95th %tile Q(veh)	0.2	-	1.5	-	-

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	11	39	137	16	9	43	1836	85	12	2281	57
Future Volume (veh/h)	76	11	39	137	16	9	43	1836	85	12	2281	57
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	83	12	42	149	17	10	47	1996	92	13	2479	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	320	43	309	223	21	12	61	2305	105	26	2297	
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.03	0.67	0.67	0.01	0.65	0.00
Sat Flow, veh/h	1375	220	1585	881	110	60	1781	3460	158	1781	3554	1585
Grp Volume(v), veh/h	95	0	42	176	0	0	47	1017	1071	13	2479	0
Grp Sat Flow(s),veh/h/ln	1596	0	1585	1050	0	0	1781	1777	1842	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	2.8	15.6	0.0	0.0	3.4	57.4	59.5	0.9	83.0	0.0
Cycle Q Clear(g_c), s	6.4	0.0	2.8	22.0	0.0	0.0	3.4	57.4	59.5	0.9	83.0	0.0
Prop In Lane	0.87		1.00	0.85		0.06	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	363	0	309	256	0	0	61	1184	1227	26	2297	
V/C Ratio(X)	0.26	0.00	0.14	0.69	0.00	0.00	0.77	0.86	0.87	0.51	1.08	
Avail Cap(c_a), veh/h	592	0	562	480	0	0	215	1184	1227	215	2297	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.2	0.0	42.8	53.5	0.0	0.0	61.5	16.7	17.1	62.8	22.7	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.2	3.3	0.0	0.0	18.3	6.6	7.1	14.5	44.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	1.1	5.8	0.0	0.0	1.8	22.0	23.8	0.5	43.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.6	0.0	43.0	56.7	0.0	0.0	79.8	23.3	24.2	77.3	66.9	0.0
LnGrp LOS	D	A	D	E	A	A	E	C	C	E	F	
Approach Vol, veh/h		137			176			2135			2492	A
Approach Delay, s/veh		44.1			56.7			25.0			66.9	
Approach LOS		D			E			C			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.4	92.5		29.5	8.9	90.0		29.5				
Change Period (Y+Rc), s	4.5	7.0		4.5	4.5	7.0		4.5				
Max Green Setting (Gmax), s	15.5	83.0		45.5	15.5	83.0		45.5				
Max Q Clear Time (g_c+I1), s	2.9	61.5		8.4	5.4	85.0		24.0				
Green Ext Time (p_c), s	0.0	15.9		0.7	0.0	0.0		1.0				

Intersection Summary			
HCM 6th Ctrl Delay		47.8	
HCM 6th LOS		D	

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

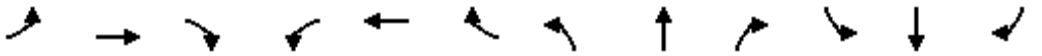
Intersection	
Int Delay, s/veh	6.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	6	44	161	16	18	24
Future Vol, veh/h	6	44	161	16	18	24
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	7	48	175	17	20	26

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	55	0	398	31
Stage 1	-	-	-	-	31	-
Stage 2	-	-	-	-	367	-
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	-	-	1550	-	607	1043
Stage 1	-	-	-	-	992	-
Stage 2	-	-	-	-	701	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1550	-	538	1043
Mov Cap-2 Maneuver	-	-	-	-	538	-
Stage 1	-	-	-	-	992	-
Stage 2	-	-	-	-	621	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.9	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	744	-	-	1550	-
HCM Lane V/C Ratio	0.061	-	-	0.113	-
HCM Control Delay (s)	10.2	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.4	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	1017	76	67	1282	40	150	118	54	53	130	244
Future Volume (veh/h)	66	1017	76	67	1282	40	150	118	54	53	130	244
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	72	1105	83	73	1393	43	163	128	59	58	141	265
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	94	1260	95	95	1326	41	245	402	185	432	155	291
Arrive On Green	0.05	0.38	0.38	0.05	0.38	0.38	0.09	0.33	0.33	0.04	0.27	0.27
Sat Flow, veh/h	1781	3350	252	1781	3519	109	1781	1211	558	1781	581	1092
Grp Volume(v), veh/h	72	586	602	73	703	733	163	0	187	58	0	406
Grp Sat Flow(s),veh/h/ln	1781	1777	1825	1781	1777	1851	1781	0	1770	1781	0	1674
Q Serve(g_s), s	4.6	35.0	35.1	4.6	43.0	43.0	7.3	0.0	9.0	2.7	0.0	26.8
Cycle Q Clear(g_c), s	4.6	35.0	35.1	4.6	43.0	43.0	7.3	0.0	9.0	2.7	0.0	26.8
Prop In Lane	1.00		0.14	1.00		0.06	1.00		0.32	1.00		0.65
Lane Grp Cap(c), veh/h	94	668	686	95	669	697	245	0	588	432	0	446
V/C Ratio(X)	0.76	0.88	0.88	0.77	1.05	1.05	0.66	0.00	0.32	0.13	0.00	0.91
Avail Cap(c_a), veh/h	390	669	688	390	669	697	453	0	682	756	0	645
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	53.3	33.1	33.2	53.3	35.6	35.6	29.3	0.0	28.5	28.7	0.0	40.6
Incr Delay (d2), s/veh	12.1	12.5	12.4	11.9	48.4	48.5	3.1	0.0	0.3	0.1	0.0	13.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	16.5	16.9	2.3	26.4	27.5	3.2	0.0	3.8	1.2	0.0	12.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.4	45.7	45.5	65.2	84.0	84.1	32.4	0.0	28.8	28.8	0.0	53.6
LnGrp LOS	E	D	D	E	F	F	C	A	C	C	A	D
Approach Vol, veh/h		1260			1509			350			464	
Approach Delay, s/veh		46.7			83.1			30.5			50.5	
Approach LOS		D			F			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	49.9	9.2	43.9	11.0	50.0	16.7	36.4
Change Period (Y+Rc), s	5.0	7.0	5.0	6.0	5.0	7.0	7.0	6.0
Max Green Setting (Gmax), s	25.0	43.0	25.0	44.0	25.0	43.0	23.0	44.0
Max Q Clear Time (g_c+I1), s	6.6	37.1	4.7	11.0	6.6	45.0	9.3	28.8
Green Ext Time (p_c), s	0.2	2.7	0.1	0.7	0.2	0.0	0.4	1.6

Intersection Summary	
HCM 6th Ctrl Delay	60.9
HCM 6th LOS	E

2025 FUTURE PROJECTED CONDITIONS

Intersection	
Int Delay, s/veh	1.8

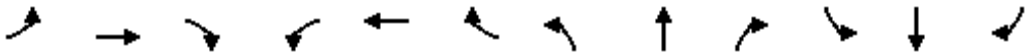
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	36	19	8	2092	1891	36
Future Vol, veh/h	36	19	8	2092	1891	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	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	39	21	9	2274	2055	39

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3230	1047	2094	0	-	0
Stage 1	2075	-	-	-	-	-
Stage 2	1155	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 7	225	260	-	-	-
Stage 1	82	-	-	-	-	-
Stage 2	262	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 7	225	260	-	-	-
Mov Cap-2 Maneuver	59	-	-	-	-	-
Stage 1	82	-	-	-	-	-
Stage 2	262	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	131.9	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	260	-	79	-	-
HCM Lane V/C Ratio	0.033	-	0.757	-	-
HCM Control Delay (s)	19.3	0	131.9	-	-
HCM Lane LOS	C	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	3.7	-	-

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	8	56	110	9	22	52	1986	58	12	1763	135
Future Volume (veh/h)	163	8	56	110	9	22	52	1986	58	12	1763	135
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, 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	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	177	9	61	120	10	24	57	2159	63	13	1916	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	424	17	376	223	23	30	73	1892	55	23	1805	
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
Prop Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.04	0.54	0.54	0.01	0.51	0.00
Unsig. Movement Delay												
Ln Grp Delay, s/veh	25.6	0.0	22.8	32.4	0.0	0.0	51.5	91.4	95.5	57.9	58.1	0.0
Ln Grp LOS	C	A	C	C	A	A	D	F	F	E	F	
Approach Vol, veh/h		247			154			2279			1929	
Approach Delay, s/veh		24.9			32.4			92.4			58.1	
Approach LOS		C			C			F			E	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Case No	2.0	4.0		7.0	2.0	3.0		8.0
Phs Duration (G+Y+Rc), s	5.4	47.1		22.2	7.6	45.0		22.2
Change Period (Y+Rc), s	4.5	7.0		4.5	4.5	7.0		4.5
Max Green (Gmax), s	15.5	38.0		20.5	15.5	38.0		20.5
Max Allow Headway (MAH), s	3.7	4.9		5.1	3.7	4.9		5.6
Max Q Clear (g_c+I1), s	2.5	42.1		10.2	4.4	40.0		17.5
Green Ext Time (g_e), s	0.0	0.0		0.9	0.1	0.0		0.2
Prob of Phs Call (p_c)	0.24	1.00		1.00	0.69	1.00		1.00
Prob of Max Out (p_x)	0.00	1.00		0.10	0.00	1.00		1.00

Left-Turn Movement Data								
Assigned Mvmt	1			7	5			3
Mvmt Sat Flow, veh/h	1781			1394	1781			581

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3526		71		3554		97

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		102		1585		1585		125

Left Lane Group Data								
Assigned Mvmt	1	0	0	7	5	0	0	3
Lane Assignment	L (Prot)			L+T	L (Prot)			L+T+R

Lanes in Grp	1	0	0	1	1	0	0	1
Grp Vol (v), veh/h	13	0	0	186	57	0	0	154
Grp Sat Flow (s), veh/h/ln	1781	0	0	1465	1781	0	0	803
Q Serve Time (g_s), s	0.5	0.0	0.0	0.0	2.4	0.0	0.0	7.3
Cycle Q Clear Time (g_c), s	0.5	0.0	0.0	8.2	2.4	0.0	0.0	15.5
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	1396	0	0	0	1352
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1475	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	17.7	0.0	0.0	0.0	17.7
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	2.2	0.0	0.0	0.0	9.5
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.3
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	0.95	1.00	0.00	0.00	0.78
Lane Grp Cap (c), veh/h	23	0	0	441	73	0	0	276
V/C Ratio (X)	0.58	0.00	0.00	0.42	0.78	0.00	0.00	0.56
Avail Cap (c_a), veh/h	369	0	0	493	369	0	0	328
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	36.7	0.0	0.0	24.9	35.5	0.0	0.0	30.7
Incr Delay (d2), s/veh	21.1	0.0	0.0	0.6	16.0	0.0	0.0	1.8
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	57.9	0.0	0.0	25.6	51.5	0.0	0.0	32.4
1st-Term Q (Q1), veh/ln	0.2	0.0	0.0	2.8	1.0	0.0	0.0	2.6
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.1	0.3	0.0	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.4	0.0	0.0	2.9	1.3	0.0	0.0	2.8
%ile Storage Ratio (RQ%)	0.08	0.00	0.00	0.23	0.30	0.00	0.00	0.22
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	2	0	0
Grp Vol (v), veh/h	0	1083	0	0	0	1916	0	0
Grp Sat Flow (s), veh/h/ln	0	1777	0	0	0	1777	0	0
Q Serve Time (g_s), s	0.0	40.1	0.0	0.0	0.0	38.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	40.1	0.0	0.0	0.0	38.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	953	0	0	0	1805	0	0
V/C Ratio (X)	0.00	1.14	0.00	0.00	0.00	1.06	0.00	0.00
Avail Cap (c_a), veh/h	0	953	0	0	0	1805	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	17.3	0.0	0.0	0.0	18.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	74.1	0.0	0.0	0.0	39.7	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	91.4	0.0	0.0	0.0	58.1	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	12.5	0.0	0.0	0.0	12.2	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	19.6	0.0	0.0	0.0	9.9	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	32.1	0.0	0.0	0.0	22.2	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	1.44	0.00	0.00	0.00	0.73	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	32.3	0.0	0.0	0.0	27.7	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.3	0.0	0.0	0.0	0.3	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		R		R		
Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	1139	0	61	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	1852	0	1585	0	1585	0	0
Q Serve Time (g_s), s	0.0	40.1	0.0	2.3	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	40.1	0.0	2.3	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.06	0.00	1.00	0.00	1.00	0.00	0.16
Lane Grp Cap (c), veh/h	0	993	0	376	0	805	0	0
V/C Ratio (X)	0.00	1.15	0.00	0.16	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	993	0	434	0	805	0	0
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	17.3	0.0	22.6	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	78.1	0.0	0.2	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	95.5	0.0	22.8	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	13.0	0.0	0.8	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	21.6	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	34.6	0.0	0.9	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	1.55	0.00	0.29	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	36.5	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	72.4
HCM 6th LOS	E

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	35	21	15	13	22	19
Future Vol, veh/h	35	21	15	13	22	19
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	38	23	16	14	24	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	61	0	96	50
Stage 1	-	-	-	-	50	-
Stage 2	-	-	-	-	46	-
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	-	903	1018
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	976	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1542	-	894	1018
Mov Cap-2 Maneuver	-	-	-	-	894	-
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	966	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.9	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	947	-	-	1542	-
HCM Lane V/C Ratio	0.047	-	-	0.011	-
HCM Control Delay (s)	9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	1380	88	55	1092	26	49	52	62	51	116	102
Future Volume (veh/h)	88	1380	88	55	1092	26	49	52	62	51	116	102
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q, 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	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	96	1500	96	60	1187	28	53	57	67	55	126	111
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	124	1581	101	78	1562	37	207	153	180	321	147	129
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
Prop Arrive On Green	0.07	0.47	0.47	0.04	0.44	0.44	0.05	0.20	0.20	0.04	0.16	0.16
Unsig. Movement Delay												
Ln Grp Delay, s/veh	51.4	42.0	43.2	57.6	25.2	25.0	30.3	0.0	32.4	30.2	0.0	52.0
Ln Grp LOS	D	D	D	E	C	C	C	A	C	C	A	D
Approach Vol, veh/h		1692			1275			177			292	
Approach Delay, s/veh		43.1			26.6			31.8			47.9	
Approach LOS		D			C			C			D	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	2.0	4.0	1.1	4.0	2.0	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	9.0	49.3	8.8	23.8	11.3	47.0	12.0	20.5
Change Period (Y+Rc), s	5.0	7.0	5.0	6.0	5.0	7.0	7.0	6.0
Max Green (Gmax), s	13.0	43.0	13.0	19.0	13.0	43.0	18.0	19.0
Max Allow Headway (MAH), s	4.2	4.1	4.3	4.4	4.2	4.1	4.3	4.4
Max Q Clear (g_c+I1), s	5.0	40.8	4.3	7.7	6.8	27.6	4.2	14.2
Green Ext Time (g_e), s	0.1	1.6	0.1	0.3	0.1	4.7	0.1	0.4
Prob of Phs Call (p_c)	0.78	1.00	0.75	1.00	0.91	1.00	1.00	1.00
Prob of Max Out (p_x)	0.01	1.00	0.01	0.00	0.15	0.20	0.00	0.76

Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1781		1781		1781		1781	

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3392		784		3548		917

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		216		921		84		808

Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	L (Prot)		L (Pr/Pm)		L (Prot)		L (Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	60	0	55	0	96	0	53	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	3.0	0.0	2.3	0.0	4.8	0.0	2.2	0.0
Cycle Q Clear Time (g_c), s	3.0	0.0	2.3	0.0	4.8	0.0	2.2	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	1267	0	0	0	1143	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	14.5	0.0	0.0	0.0	14.5	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	12.0	0.0	0.0	0.0	2.4	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.1	0.0	0.0	0.0	0.6	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	78	0	321	0	124	0	207	0
V/C Ratio (X)	0.77	0.00	0.17	0.00	0.78	0.00	0.26	0.00
Avail Cap (c_a), veh/h	255	0	502	0	255	0	462	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	43.0	0.0	29.9	0.0	41.6	0.0	29.7	0.0
Incr Delay (d2), s/veh	14.6	0.0	0.3	0.0	9.9	0.0	0.6	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	57.6	0.0	30.2	0.0	51.4	0.0	30.3	0.0
1st-Term Q (Q1), veh/ln	1.3	0.0	1.0	0.0	2.0	0.0	0.9	0.0
2nd-Term Q (Q2), veh/ln	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.6	0.0	1.0	0.0	2.4	0.0	0.9	0.0
%ile Storage Ratio (RQ%)	0.37	0.00	0.17	0.00	0.40	0.00	0.32	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	783	0	0	0	594	0	0
Grp Sat Flow (s), veh/h/ln	0	1777	0	0	0	1777	0	0
Q Serve Time (g_s), s	0.0	38.2	0.0	0.0	0.0	25.5	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	38.2	0.0	0.0	0.0	25.5	0.0	0.0
Lane Grp Cap (c), veh/h	0	828	0	0	0	782	0	0
V/C Ratio (X)	0.00	0.94	0.00	0.00	0.00	0.76	0.00	0.00
Avail Cap (c_a), veh/h	0	841	0	0	0	841	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	23.1	0.0	0.0	0.0	21.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	18.9	0.0	0.0	0.0	3.8	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	42.0	0.0	0.0	0.0	25.2	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	13.8	0.0	0.0	0.0	9.4	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	4.3	0.0	0.0	0.0	0.8	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	18.2	0.0	0.0	0.0	10.2	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.52	0.00	0.00	0.00	0.39	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	813	0	124	0	621	0	237
Grp Sat Flow (s), veh/h/ln	0	1831	0	1705	0	1855	0	1725
Q Serve Time (g_s), s	0.0	38.8	0.0	5.7	0.0	25.6	0.0	12.2
Cycle Q Clear Time (g_c), s	0.0	38.8	0.0	5.7	0.0	25.6	0.0	12.2
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.12	0.00	0.54	0.00	0.05	0.00	0.47
Lane Grp Cap (c), veh/h	0	854	0	333	0	817	0	276
V/C Ratio (X)	0.00	0.95	0.00	0.37	0.00	0.76	0.00	0.86
Avail Cap (c_a), veh/h	0	867	0	357	0	878	0	361
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	23.3	0.0	31.7	0.0	21.4	0.0	37.1
Incr Delay (d2), s/veh	0.0	19.9	0.0	0.7	0.0	3.6	0.0	14.8
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	43.2	0.0	32.4	0.0	25.0	0.0	52.0
1st-Term Q (Q1), veh/ln	0.0	14.5	0.0	2.3	0.0	9.8	0.0	5.0
2nd-Term Q (Q2), veh/ln	0.0	4.7	0.0	0.1	0.0	0.8	0.0	1.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	19.2	0.0	2.4	0.0	10.7	0.0	6.1
%ile Storage Ratio (RQ%)	0.00	0.55	0.00	0.19	0.00	0.41	0.00	0.36
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	36.8
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	16	7	1944	2387	270
Future Vol, veh/h	7	16	7	1944	2387	270
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, #	1	-	-	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	8	17	8	2113	2595	293

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3815	1444	2888	0	-	0
Stage 1	2742	-	-	-	-	-
Stage 2	1073	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 3	121	125	-	-	-
Stage 1	34	-	-	-	-	-
Stage 2	290	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 3	121	125	-	-	-
Mov Cap-2 Maneuver	28	-	-	-	-	-
Stage 1	34	-	-	-	-	-
Stage 2	290	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	102.5	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	125	-	60	-	-
HCM Lane V/C Ratio	0.061	-	0.417	-	-
HCM Control Delay (s)	35.7	0	102.5	-	-
HCM Lane LOS	E	A	F	-	-
HCM 95th %tile Q(veh)	0.2	-	1.6	-	-

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	11	54	137	16	9	69	1836	85	12	2281	109
Future Volume (veh/h)	106	11	54	137	16	9	69	1836	85	12	2281	109
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, 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	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	12	59	149	17	10	75	1996	92	13	2479	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	352	34	335	218	23	11	95	2269	104	25	2190	
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
Prop Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.05	0.66	0.66	0.01	0.62	0.00
Unsig. Movement Delay												
Ln Grp Delay, s/veh	45.9	0.0	43.8	59.6	0.0	0.0	76.1	26.2	27.3	80.8	91.5	0.0
Ln Grp LOS	D	A	D	E	A	A	E	C	C	F	F	
Approach Vol, veh/h		186			176			2163			2492	
Approach Delay, s/veh		45.2			59.6			28.5			91.5	
Approach LOS		D			E			C			F	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Case No	2.0	4.0		7.0	2.0	3.0		8.0
Phs Duration (G+Y+Rc), s	6.4	95.3		33.0	11.7	90.0		33.0
Change Period (Y+Rc), s	4.5	7.0		4.5	4.5	7.0		4.5
Max Green (Gmax), s	15.5	83.0		45.5	15.5	83.0		45.5
Max Allow Headway (MAH), s	3.7	4.9		5.0	3.7	4.9		5.5
Max Q Clear (g_c+I1), s	3.0	66.4		11.1	7.6	85.0		27.5
Green Ext Time (g_e), s	0.0	12.9		1.0	0.1	0.0		0.9
Prob of Phs Call (p_c)	0.39	1.00		1.00	0.94	1.00		1.00
Prob of Max Out (p_x)	0.00	0.80		0.00	0.01	1.00		0.00

Left-Turn Movement Data								
Assigned Mvmt	1			7	5			3
Mvmt Sat Flow, veh/h	1781			1427	1781			796

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3460		163		3554		107

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		158		1585		1585		54

Left Lane Group Data								
Assigned Mvmt	1	0	0	7	5	0	0	3
Lane Assignment	L (Prot)			L+T	L (Prot)			L+T+R

Lanes in Grp	1	0	0	1	1	0	0	1
Grp Vol (v), veh/h	13	0	0	127	75	0	0	176
Grp Sat Flow (s), veh/h/ln	1781	0	0	1589	1781	0	0	957
Q Serve Time (g_s), s	1.0	0.0	0.0	0.0	5.6	0.0	0.0	16.4
Cycle Q Clear Time (g_c), s	1.0	0.0	0.0	9.1	5.6	0.0	0.0	25.5
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	1405	0	0	0	1350
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1607	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	28.5	0.0	0.0	0.0	28.5
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	2.9	0.0	0.0	0.0	19.4
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4
Time to First Blk (g_f), s	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.3
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.3
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	0.91	1.00	0.00	0.00	0.85
Lane Grp Cap (c), veh/h	25	0	0	387	95	0	0	252
V/C Ratio (X)	0.51	0.00	0.00	0.33	0.79	0.00	0.00	0.70
Avail Cap (c_a), veh/h	205	0	0	566	205	0	0	426
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	65.9	0.0	0.0	45.5	63.0	0.0	0.0	56.0
Incr Delay (d2), s/veh	14.9	0.0	0.0	0.5	13.2	0.0	0.0	3.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	80.8	0.0	0.0	45.9	76.1	0.0	0.0	59.6
1st-Term Q (Q1), veh/ln	0.4	0.0	0.0	3.7	2.5	0.0	0.0	5.9
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.1	0.3	0.0	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.5	0.0	0.0	3.8	2.8	0.0	0.0	6.2
%ile Storage Ratio (RQ%)	0.13	0.00	0.00	0.30	0.66	0.00	0.00	0.49
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	2	0	0
Grp Vol (v), veh/h	0	1017	0	0	0	2479	0	0
Grp Sat Flow (s), veh/h/ln	0	1777	0	0	0	1777	0	0
Q Serve Time (g_s), s	0.0	62.1	0.0	0.0	0.0	83.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	62.1	0.0	0.0	0.0	83.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	1165	0	0	0	2190	0	0
V/C Ratio (X)	0.00	0.87	0.00	0.00	0.00	1.13	0.00	0.00
Avail Cap (c_a), veh/h	0	1165	0	0	0	2190	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	18.7	0.0	0.0	0.0	25.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	7.5	0.0	0.0	0.0	65.7	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	26.2	0.0	0.0	0.0	91.5	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	22.2	0.0	0.0	0.0	30.8	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	2.4	0.0	0.0	0.0	20.0	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	24.6	0.0	0.0	0.0	50.8	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	1.10	0.00	0.00	0.00	1.66	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	72.2	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		R		R		
Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	1071	0	59	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	1842	0	1585	0	1585	0	0
Q Serve Time (g_s), s	0.0	64.4	0.0	4.1	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	64.4	0.0	4.1	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.09	0.00	1.00	0.00	1.00	0.00	0.06
Lane Grp Cap (c), veh/h	0	1207	0	335	0	977	0	0
V/C Ratio (X)	0.00	0.89	0.00	0.18	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	1207	0	536	0	977	0	0
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	19.1	0.0	43.5	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	8.3	0.0	0.2	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	27.3	0.0	43.8	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	23.8	0.0	1.6	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	26.6	0.0	1.7	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	1.19	0.00	0.56	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	61.5
HCM 6th LOS	E

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	6.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	6	44	161	16	18	24
Future Vol, veh/h	6	44	161	16	18	24
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	7	48	175	17	20	26

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	55	0	398	31
Stage 1	-	-	-	-	31	-
Stage 2	-	-	-	-	367	-
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	-	-	1550	-	607	1043
Stage 1	-	-	-	-	992	-
Stage 2	-	-	-	-	701	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1550	-	538	1043
Mov Cap-2 Maneuver	-	-	-	-	538	-
Stage 1	-	-	-	-	992	-
Stage 2	-	-	-	-	621	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.9	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	744	-	-	1550	-
HCM Lane V/C Ratio	0.061	-	-	0.113	-
HCM Control Delay (s)	10.2	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	1017	76	67	1282	46	150	157	54	57	153	248
Future Volume (veh/h)	72	1017	76	67	1282	46	150	157	54	57	153	248
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q, 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	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	1105	83	73	1393	50	163	171	59	62	166	270
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	101	1237	93	95	1280	46	238	458	158	413	180	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
Prop Arrive On Green	0.06	0.37	0.37	0.05	0.37	0.37	0.08	0.34	0.34	0.04	0.28	0.28
Unsig. Movement Delay												
Ln Grp Delay, s/veh	66.2	49.5	49.3	67.0	98.5	99.0	33.1	0.0	29.4	28.5	0.0	56.7
Ln Grp LOS	E	D	D	E	F	F	C	A	C	C	A	E
Approach Vol, veh/h		1266			1516			393			498	
Approach Delay, s/veh		50.4			97.2			30.9			53.2	
Approach LOS		D			F			C			D	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	2.0	4.0	1.1	4.0	2.0	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	11.3	50.4	9.4	46.5	11.7	50.0	16.8	39.1
Change Period (Y+Rc), s	5.0	7.0	5.0	6.0	5.0	7.0	7.0	6.0
Max Green (Gmax), s	25.0	43.0	25.0	44.0	25.0	43.0	23.0	44.0
Max Allow Headway (MAH), s	4.2	4.1	4.3	4.3	4.2	4.1	4.3	4.4
Max Q Clear (g_c+I1), s	6.8	38.5	4.9	13.4	7.1	45.0	9.3	31.5
Green Ext Time (g_e), s	0.2	2.2	0.1	0.9	0.2	0.0	0.4	1.6
Prob of Phs Call (p_c)	0.91	1.00	0.87	1.00	0.92	1.00	1.00	1.00
Prob of Max Out (p_x)	0.00	0.95	0.00	0.00	0.00	1.00	0.00	0.05

Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1781		1781		1781		1781	

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3350		1329		3499		641

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		252		459		125		1042

Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	L (Prot)		L (Pr/Pm)		L (Prot)		L (Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	73	0	62	0	78	0	163	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	4.8	0.0	2.9	0.0	5.1	0.0	7.3	0.0
Cycle Q Clear Time (g_c), s	4.8	0.0	2.9	0.0	5.1	0.0	7.3	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	1151	0	0	0	953	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	33.1	0.0	0.0	0.0	35.1	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	29.1	0.0	0.0	0.0	3.6	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.2	0.0	0.0	0.0	3.6	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	95	0	413	0	101	0	238	0
V/C Ratio (X)	0.77	0.00	0.15	0.00	0.77	0.00	0.68	0.00
Avail Cap (c_a), veh/h	379	0	725	0	379	0	439	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	54.9	0.0	28.3	0.0	54.7	0.0	29.7	0.0
Incr Delay (d2), s/veh	12.0	0.0	0.2	0.0	11.5	0.0	3.5	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	67.0	0.0	28.5	0.0	66.2	0.0	33.1	0.0
1st-Term Q (Q1), veh/ln	2.1	0.0	1.2	0.0	2.2	0.0	3.1	0.0
2nd-Term Q (Q2), veh/ln	0.3	0.0	0.0	0.0	0.3	0.0	0.2	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.4	0.0	1.2	0.0	2.5	0.0	3.3	0.0
%ile Storage Ratio (RQ%)	0.55	0.00	0.21	0.00	0.43	0.00	1.11	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	586	0	0	0	706	0	0
Grp Sat Flow (s), veh/h/ln	0	1777	0	0	0	1777	0	0
Q Serve Time (g_s), s	0.0	36.5	0.0	0.0	0.0	43.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	36.5	0.0	0.0	0.0	43.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	656	0	0	0	650	0	0
V/C Ratio (X)	0.00	0.89	0.00	0.00	0.00	1.09	0.00	0.00
Avail Cap (c_a), veh/h	0	656	0	0	0	650	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	34.9	0.0	0.0	0.0	37.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	14.6	0.0	0.0	0.0	61.2	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	49.5	0.0	0.0	0.0	98.5	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	14.9	0.0	0.0	0.0	17.6	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	2.7	0.0	0.0	0.0	11.1	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	17.5	0.0	0.0	0.0	28.6	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.51	0.00	0.00	0.00	1.10	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	14.1	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	602	0	230	0	737	0	436
Grp Sat Flow (s), veh/h/ln	0	1825	0	1788	0	1848	0	1683
Q Serve Time (g_s), s	0.0	36.5	0.0	11.4	0.0	43.0	0.0	29.5
Cycle Q Clear Time (g_c), s	0.0	36.5	0.0	11.4	0.0	43.0	0.0	29.5
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.14	0.00	0.26	0.00	0.07	0.00	0.62
Lane Grp Cap (c), veh/h	0	674	0	616	0	676	0	474
V/C Ratio (X)	0.00	0.89	0.00	0.37	0.00	1.09	0.00	0.92
Avail Cap (c_a), veh/h	0	674	0	669	0	676	0	630
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	34.9	0.0	29.0	0.0	37.3	0.0	40.9
Incr Delay (d2), s/veh	0.0	14.4	0.0	0.4	0.0	61.7	0.0	15.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	49.3	0.0	29.4	0.0	99.0	0.0	56.7
1st-Term Q (Q1), veh/ln	0.0	15.3	0.0	4.8	0.0	18.3	0.0	12.0
2nd-Term Q (Q2), veh/ln	0.0	2.7	0.0	0.1	0.0	11.6	0.0	2.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	18.0	0.0	4.9	0.0	29.9	0.0	14.0
%ile Storage Ratio (RQ%)	0.00	0.52	0.00	0.40	0.00	1.14	0.00	0.83
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	15.2	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	68.0
HCM 6th LOS	E

2025 FUTURE PROJECTED CONDITIONS

WITH IMPROVEMENTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	8	56	110	9	22	52	1986	58	12	1763	135
Future Volume (veh/h)	163	8	56	110	9	22	52	1986	58	12	1763	135
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, 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	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	177	9	61	120	10	24	57	2159	63	13	1916	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	330	12	277	137	15	14	73	2188	64	22	2104	
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
Prop Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.04	0.62	0.62	0.01	0.59	0.00
Unsig. Movement Delay												
Ln Grp Delay, s/veh	34.2	0.0	29.8	87.2	0.0	0.0	55.7	38.0	40.0	62.9	21.2	0.0
Ln Grp LOS	C	A	C	F	A	A	E	D	D	E	C	
Approach Vol, veh/h		247			154			2279			1929	
Approach Delay, s/veh		33.1			87.2			39.5			21.4	
Approach LOS		C			F			D			C	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Case No	2.0	4.0		7.0	2.0	3.0		8.0
Phs Duration (G+Y+Rc), s	5.5	58.6		19.0	7.9	56.2		19.0
Change Period (Y+Rc), s	4.5	7.0		4.5	4.5	7.0		4.5
Max Green (Gmax), s	8.5	51.0		14.5	8.5	51.0		14.5
Max Allow Headway (MAH), s	3.7	4.9		5.1	3.7	4.9		5.6
Max Q Clear (g_c+I1), s	2.6	52.4		11.9	4.6	41.7		16.5
Green Ext Time (g_e), s	0.0	0.0		0.3	0.0	7.5		0.0
Prob of Phs Call (p_c)	0.26	1.00		1.00	0.73	1.00		1.00
Prob of Max Out (p_x)	0.01	1.00		1.00	0.80	0.86		1.00

Left-Turn Movement Data								
Assigned Mvmt	1			7	5			3
Mvmt Sat Flow, veh/h	1781			1405	1781			345

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3526		71		3554		89

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		102		1585		1585		80

Left Lane Group Data								
Assigned Mvmt	1	0	0	7	5	0	0	3
Lane Assignment	L (Prot)			L+T	L (Prot)			L+T+R

Lanes in Grp	1	0	0	1	1	0	0	1
Grp Vol (v), veh/h	13	0	0	186	57	0	0	154
Grp Sat Flow (s), veh/h/ln	1781	0	0	1476	1781	0	0	514
Q Serve Time (g_s), s	0.6	0.0	0.0	0.0	2.6	0.0	0.0	4.6
Cycle Q Clear Time (g_c), s	0.6	0.0	0.0	9.9	2.6	0.0	0.0	14.5
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	1396	0	0	0	1352
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1476	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	14.5	0.0	0.0	0.0	14.5
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	0.95	1.00	0.00	0.00	0.78
Lane Grp Cap (c), veh/h	22	0	0	342	73	0	0	167
V/C Ratio (X)	0.58	0.00	0.00	0.54	0.78	0.00	0.00	0.92
Avail Cap (c_a), veh/h	182	0	0	342	182	0	0	167
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	40.8	0.0	0.0	32.4	39.5	0.0	0.0	39.2
Incr Delay (d2), s/veh	22.0	0.0	0.0	1.8	16.2	0.0	0.0	48.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	62.9	0.0	0.0	34.2	55.7	0.0	0.0	87.2
1st-Term Q (Q1), veh/ln	0.3	0.0	0.0	3.5	1.1	0.0	0.0	3.1
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.2	0.3	0.0	0.0	2.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.4	0.0	0.0	3.7	1.4	0.0	0.0	5.4
%ile Storage Ratio (RQ%)	0.09	0.00	0.00	0.29	0.33	0.00	0.00	0.43
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	2	0	0
Grp Vol (v), veh/h	0	1083	0	0	0	1916	0	0
Grp Sat Flow (s), veh/h/ln	0	1777	0	0	0	1777	0	0
Q Serve Time (g_s), s	0.0	49.2	0.0	0.0	0.0	39.7	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	49.2	0.0	0.0	0.0	39.7	0.0	0.0
Lane Grp Cap (c), veh/h	0	1103	0	0	0	2104	0	0
V/C Ratio (X)	0.00	0.98	0.00	0.00	0.00	0.91	0.00	0.00
Avail Cap (c_a), veh/h	0	1103	0	0	0	2181	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	15.3	0.0	0.0	0.0	15.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	22.7	0.0	0.0	0.0	6.1	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	38.0	0.0	0.0	0.0	21.2	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	14.5	0.0	0.0	0.0	12.2	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	7.0	0.0	0.0	0.0	1.8	0.0	0.0

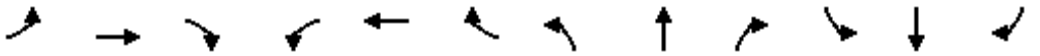
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	21.4	0.0	0.0	0.0	14.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.96	0.00	0.00	0.00	0.46	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		R		R		
Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	1139	0	61	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	1852	0	1585	0	1585	0	0
Q Serve Time (g_s), s	0.0	50.4	0.0	2.7	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	50.4	0.0	2.7	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.06	0.00	1.00	0.00	1.00	0.00	0.16
Lane Grp Cap (c), veh/h	0	1149	0	277	0	938	0	0
V/C Ratio (X)	0.00	0.99	0.00	0.22	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	1149	0	277	0	973	0	0
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	15.6	0.0	29.4	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	24.5	0.0	0.4	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	40.0	0.0	29.8	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	15.4	0.0	1.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	7.8	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	23.3	0.0	1.1	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	1.04	0.00	0.36	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	33.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	1380	88	55	1092	26	49	52	62	51	116	102
Future Volume (veh/h)	88	1380	88	55	1092	26	49	52	62	51	116	102
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q, 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	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	96	1500	96	60	1187	28	53	57	67	55	126	111
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	123	1634	104	78	1618	38	198	151	177	311	146	129
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
Prop Arrive On Green	0.07	0.48	0.48	0.04	0.46	0.46	0.05	0.19	0.19	0.04	0.16	0.16
Unsig. Movement Delay												
Ln Grp Delay, s/veh	53.6	35.8	36.6	59.6	23.8	23.7	32.1	0.0	34.2	31.7	0.0	54.1
Ln Grp LOS	D	D	D	E	C	C	C	A	C	C	A	D
Approach Vol, veh/h		1692			1275			177			292	
Approach Delay, s/veh		37.2			25.4			33.5			49.9	
Approach LOS		D			C			C			D	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	2.0	4.0	1.1	4.0	2.0	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	9.2	52.8	8.8	24.3	11.6	50.4	12.0	21.1
Change Period (Y+Rc), s	5.0	7.0	5.0	6.0	5.0	7.0	7.0	6.0
Max Green (Gmax), s	13.0	49.0	14.0	19.0	13.0	49.0	11.0	20.0
Max Allow Headway (MAH), s	4.2	4.1	4.3	4.4	4.2	4.1	4.3	4.4
Max Q Clear (g_c+I1), s	5.2	41.4	4.4	8.0	7.0	28.0	4.3	14.7
Green Ext Time (g_e), s	0.1	4.4	0.1	0.3	0.1	5.2	0.1	0.4
Prob of Phs Call (p_c)	0.79	1.00	0.77	1.00	0.92	1.00	1.00	1.00
Prob of Max Out (p_x)	0.02	0.75	0.00	0.00	0.18	0.09	0.06	0.59

Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1781		1781		1781		1781	

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3392		784		3548		917

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		216		921		84		808

Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	L (Prot)		L (Pr/Pm)		L (Prot)		L (Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	60	0	55	0	96	0	53	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	3.2	0.0	2.4	0.0	5.0	0.0	2.3	0.0
Cycle Q Clear Time (g_c), s	3.2	0.0	2.4	0.0	5.0	0.0	2.3	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	1267	0	0	0	1143	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	15.1	0.0	0.0	0.0	15.1	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	12.3	0.0	0.0	0.0	2.4	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.1	0.0	0.0	0.0	0.6	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	78	0	311	0	123	0	198	0
V/C Ratio (X)	0.77	0.00	0.18	0.00	0.78	0.00	0.27	0.00
Avail Cap (c_a), veh/h	244	0	502	0	244	0	311	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	45.0	0.0	31.5	0.0	43.5	0.0	31.3	0.0
Incr Delay (d2), s/veh	14.6	0.0	0.3	0.0	10.0	0.0	0.7	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	59.6	0.0	31.7	0.0	53.6	0.0	32.1	0.0
1st-Term Q (Q1), veh/ln	1.3	0.0	1.0	0.0	2.1	0.0	1.0	0.0
2nd-Term Q (Q2), veh/ln	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.7	0.0	1.0	0.0	2.5	0.0	1.0	0.0
%ile Storage Ratio (RQ%)	0.38	0.00	0.18	0.00	0.42	0.00	0.34	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	783	0	0	0	594	0	0
Grp Sat Flow (s), veh/h/ln	0	1777	0	0	0	1777	0	0
Q Serve Time (g_s), s	0.0	38.8	0.0	0.0	0.0	26.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	38.8	0.0	0.0	0.0	26.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	856	0	0	0	810	0	0
V/C Ratio (X)	0.00	0.91	0.00	0.00	0.00	0.73	0.00	0.00
Avail Cap (c_a), veh/h	0	916	0	0	0	916	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	22.8	0.0	0.0	0.0	21.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	13.0	0.0	0.0	0.0	2.7	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	35.8	0.0	0.0	0.0	23.8	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	14.2	0.0	0.0	0.0	9.7	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	3.1	0.0	0.0	0.0	0.6	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	17.3	0.0	0.0	0.0	10.3	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.50	0.00	0.00	0.00	0.39	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	813	0	124	0	621	0	237
Grp Sat Flow (s), veh/h/ln	0	1831	0	1705	0	1855	0	1725
Q Serve Time (g_s), s	0.0	39.4	0.0	6.0	0.0	26.0	0.0	12.7
Cycle Q Clear Time (g_c), s	0.0	39.4	0.0	6.0	0.0	26.0	0.0	12.7
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.12	0.00	0.54	0.00	0.05	0.00	0.47
Lane Grp Cap (c), veh/h	0	882	0	328	0	846	0	275
V/C Ratio (X)	0.00	0.92	0.00	0.38	0.00	0.73	0.00	0.86
Avail Cap (c_a), veh/h	0	944	0	341	0	956	0	363
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	23.0	0.0	33.4	0.0	21.1	0.0	39.0
Incr Delay (d2), s/veh	0.0	13.7	0.0	0.7	0.0	2.6	0.0	15.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	36.6	0.0	34.2	0.0	23.7	0.0	54.1
1st-Term Q (Q1), veh/ln	0.0	14.8	0.0	2.4	0.0	10.1	0.0	5.2
2nd-Term Q (Q2), veh/ln	0.0	3.3	0.0	0.1	0.0	0.6	0.0	1.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	18.2	0.0	2.5	0.0	10.7	0.0	6.4
%ile Storage Ratio (RQ%)	0.00	0.52	0.00	0.20	0.00	0.41	0.00	0.38
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	33.7
HCM 6th LOS	C

Intersection: 1: Nashville Hwy & Columbia Rock Rd

Movement	EB	NB	NB
Directions Served	LR	LT	T
Maximum Queue (ft)	73	160	149
Average Queue (ft)	58	51	49
95th Queue (ft)	80	159	153
Link Distance (ft)	545	776	776
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Nashville Hwy & W Burt Dr

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	248	100	138	88	261	286	29	273	300	140
Average Queue (ft)	162	52	89	45	253	220	6	214	212	84
95th Queue (ft)	272	119	163	97	266	321	25	307	306	197
Link Distance (ft)	317		317		567	567		776	776	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		75		110			110			115
Storage Blk Time (%)	53	0			26			22	18	0
Queuing Penalty (veh)	30	0			13			3	24	1

Intersection: 8: Theta Pike & Columbia Rock Rd

Movement	NB
Directions Served	LR
Maximum Queue (ft)	29
Average Queue (ft)	23
95th Queue (ft)	41
Link Distance (ft)	239
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Theta Pike & US 43 Bypass

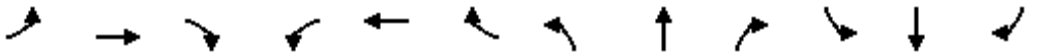
Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	73	428	380	50	316	224	49	74	174	246
Average Queue (ft)	52	260	235	26	248	180	16	67	53	134
95th Queue (ft)	76	412	375	53	328	241	49	82	154	256
Link Distance (ft)		879	879		663	663		310		429
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150			110			75		150	
Storage Blk Time (%)		19			29			4		11
Queuing Penalty (veh)		16			16			2		6

Intersection: 19:

Movement	WB
Directions Served	LR
Maximum Queue (ft)	30
Average Queue (ft)	24
95th Queue (ft)	43
Link Distance (ft)	288
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 110



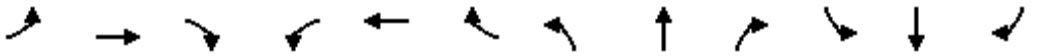
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	11	54	137	16	9	69	1836	85	12	2281	109
Future Volume (veh/h)	106	11	54	137	16	9	69	1836	85	12	2281	109
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	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	115	12	59	149	17	10	75	1996	92	13	2479	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	337	31	317	199	18	10	95	2343	107	25	2267	
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.05	0.68	0.68	0.01	0.64	0.00
Sat Flow, veh/h	1449	153	1585	768	89	52	1781	3460	158	1781	3554	1585
Grp Volume(v), veh/h	127	0	59	176	0	0	75	1017	1071	13	2479	0
Grp Sat Flow(s),veh/h/ln	1602	0	1585	909	0	0	1781	1777	1842	1781	1777	1585
Q Serve(g_s), s	0.0	0.0	4.6	18.7	0.0	0.0	6.1	63.7	66.0	1.1	94.0	0.0
Cycle Q Clear(g_c), s	10.1	0.0	4.6	28.8	0.0	0.0	6.1	63.7	66.0	1.1	94.0	0.0
Prop In Lane	0.91		1.00	0.85		0.06	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	367	0	317	227	0	0	95	1203	1247	25	2267	
V/C Ratio(X)	0.35	0.00	0.19	0.78	0.00	0.00	0.79	0.85	0.86	0.52	1.09	
Avail Cap(c_a), veh/h	367	0	317	227	0	0	248	1203	1247	248	2267	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.2	0.0	49.0	63.6	0.0	0.0	68.9	18.0	18.3	72.2	26.7	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.3	15.4	0.0	0.0	13.5	5.7	6.2	15.8	49.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	1.9	7.6	0.0	0.0	3.1	24.9	26.8	0.6	51.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.7	0.0	49.2	79.0	0.0	0.0	82.4	23.7	24.5	88.0	76.6	0.0
LnGrp LOS	D	A	D	E	A	A	F	C	C	F	F	
Approach Vol, veh/h		186			176			2163			2492	A
Approach Delay, s/veh		50.9			79.0			26.1			76.7	
Approach LOS		D			E			C			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	106.8		34.0	12.4	101.0		34.0				
Change Period (Y+Rc), s	4.5	7.0		4.5	4.5	7.0		4.5				
Max Green Setting (Gmax), s	20.5	94.0		29.5	20.5	94.0		29.5				
Max Q Clear Time (g_c+I1), s	3.1	68.0		12.1	8.1	96.0		30.8				
Green Ext Time (p_c), s	0.0	18.3		0.8	0.1	0.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		54.0	
HCM 6th LOS		D	

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	1017	76	67	1282	46	150	157	54	57	153	248
Future Volume (veh/h)	72	1017	76	67	1282	46	150	157	54	57	153	248
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	78	1105	83	73	1393	50	163	171	59	62	166	270
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	1414	106	93	1466	53	201	434	150	377	178	289
Arrive On Green	0.06	0.42	0.42	0.05	0.42	0.42	0.07	0.33	0.33	0.04	0.28	0.28
Sat Flow, veh/h	1781	3350	252	1781	3499	125	1781	1329	459	1781	641	1042
Grp Volume(v), veh/h	78	586	602	73	706	737	163	0	230	62	0	436
Grp Sat Flow(s),veh/h/ln	1781	1777	1825	1781	1777	1848	1781	0	1788	1781	0	1683
Q Serve(g_s), s	6.1	40.1	40.1	5.7	54.1	54.3	9.1	0.0	14.0	3.5	0.0	35.6
Cycle Q Clear(g_c), s	6.1	40.1	40.1	5.7	54.1	54.3	9.1	0.0	14.0	3.5	0.0	35.6
Prop In Lane	1.00		0.14	1.00		0.07	1.00		0.26	1.00		0.62
Lane Grp Cap(c), veh/h	99	750	770	93	744	774	201	0	584	377	0	467
V/C Ratio(X)	0.79	0.78	0.78	0.79	0.95	0.95	0.81	0.00	0.39	0.16	0.00	0.93
Avail Cap(c_a), veh/h	190	769	790	190	769	800	201	0	584	540	0	585
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	65.8	35.1	35.1	66.0	39.5	39.6	37.3	0.0	36.7	34.6	0.0	49.7
Incr Delay (d2), s/veh	13.1	5.1	5.0	13.5	20.7	20.6	21.5	0.0	0.4	0.2	0.0	19.6
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(50%),veh/ln	3.1	17.7	18.2	2.9	26.8	28.0	5.1	0.0	6.2	1.5	0.0	17.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.9	40.2	40.1	79.5	60.2	60.2	58.8	0.0	37.1	34.8	0.0	69.3
LnGrp LOS	E	D	D	E	E	E	E	A	D	C	A	E
Approach Vol, veh/h		1266			1516			393			498	
Approach Delay, s/veh		42.6			61.2			46.1			65.0	
Approach LOS		D			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.3	66.5	10.1	52.0	12.8	66.0	17.0	45.1
Change Period (Y+Rc), s	5.0	7.0	5.0	6.0	5.0	7.0	7.0	6.0
Max Green Setting (Gmax), s	15.0	61.0	18.0	43.0	15.0	61.0	10.0	49.0
Max Q Clear Time (g_c+I1), s	7.7	42.1	5.5	16.0	8.1	56.3	11.1	37.6
Green Ext Time (p_c), s	0.1	5.0	0.1	0.9	0.1	2.7	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	53.7
HCM 6th LOS	D

Intersection: 1: Nashville Hwy & Columbia Rock Rd

Movement	EB	NB	NB
Directions Served	LR	LT	T
Maximum Queue (ft)	50	778	796
Average Queue (ft)	26	652	664
95th Queue (ft)	55	860	894
Link Distance (ft)	545	776	776
Upstream Blk Time (%)		1	2
Queuing Penalty (veh)		12	22
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Nashville Hwy & W Burt Dr

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	252	95	116	134	582	582	29	658	653	140
Average Queue (ft)	142	58	91	79	362	318	9	511	501	56
95th Queue (ft)	262	119	117	126	610	602	28	637	646	169
Link Distance (ft)	317		317		567	567		776	776	
Upstream Blk Time (%)					4	5				
Queuing Penalty (veh)					0	0				
Storage Bay Dist (ft)		75		110			110			115
Storage Blk Time (%)	13	22			34			30	27	
Queuing Penalty (veh)	7	25			23			4	29	

Intersection: 8: Theta Pike & Columbia Rock Rd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	53	29
Average Queue (ft)	22	17
95th Queue (ft)	55	39
Link Distance (ft)	395	239
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 12: Theta Pike & US 43 Bypass

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	174	394	367	134	678	645	99	310	175	444
Average Queue (ft)	90	307	296	90	577	532	70	170	84	331
95th Queue (ft)	175	454	393	128	746	712	115	322	206	493
Link Distance (ft)		879	879		663	663		310		429
Upstream Blk Time (%)					3	0		2		5
Queuing Penalty (veh)					0	0		0		0
Storage Bay Dist (ft)	150			110			75		150	
Storage Blk Time (%)		35		0	51		22	38	0	43
Queuing Penalty (veh)		25		0	34		45	57	0	25

Intersection: 19:

Movement	WB
Directions Served	LR
Maximum Queue (ft)	30
Average Queue (ft)	24
95th Queue (ft)	43
Link Distance (ft)	288
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 310

APPENDIX G
TURN LANE ANALYSIS

Left Turn Deceleration Lane Analysis

Source: NCHRP Report 457: Evaluating Intersection Improvements: An Engineering Study Guide

85th Percentile Speed assumed to be 4 mph over the posted speed limit of 35 mph. (39 mph)

Theta Pike Site Access
2025 Future Projected Peak Hour Traffic Volumes

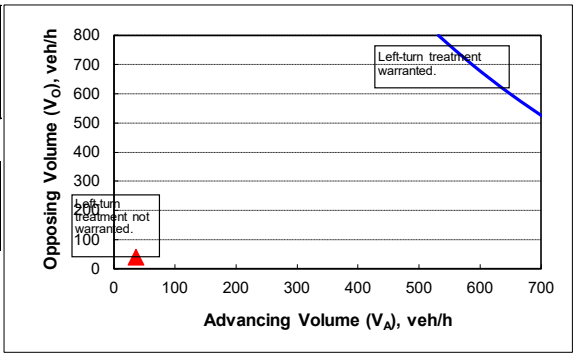
AM Peak Hour

INPUT

Variable	Value
85th percentile speed, mph:	39
Percent of left-turns in advancing volume (V_A), %:	2%
Advancing volume (V_A), veh/h:	36
Opposing volume (V_O), veh/h:	41

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1197
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



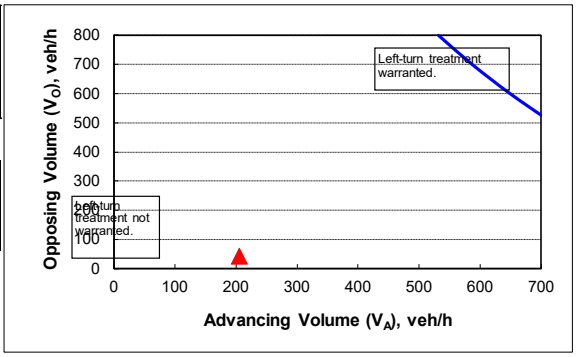
PM Peak Hour

INPUT

Variable	Value
85th percentile speed, mph:	39
Percent of left-turns in advancing volume (V_A), %:	2%
Advancing volume (V_A), veh/h:	205
Opposing volume (V_O), veh/h:	42

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1195
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



Right Turn Deceleration Lane Analysis

Source: NCHRP Report 457: Evaluating Intersection Improvements: An Engineering Study Guide

Major Road Speed assumed to be 4 mph over the posted speed limit of 35 mph. (39 mph)

Theta Pike Site Access
2025 Future Projected Peak Hour Traffic Volumes

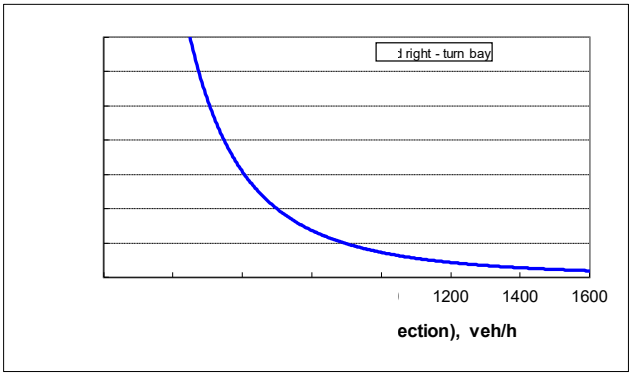
AM Peak Hour

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	39
Major-road volume (one direction), veh/h:	57
Right-turn volume, veh/h:	16

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	47548
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

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	39
Major-road volume (one direction), veh/h:	93
Right-turn volume, veh/h:	51

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	11928
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.