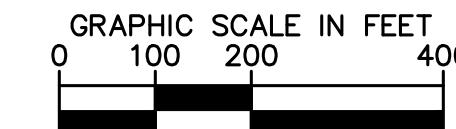
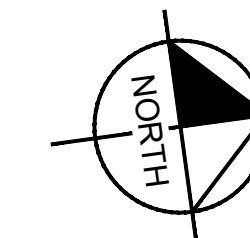
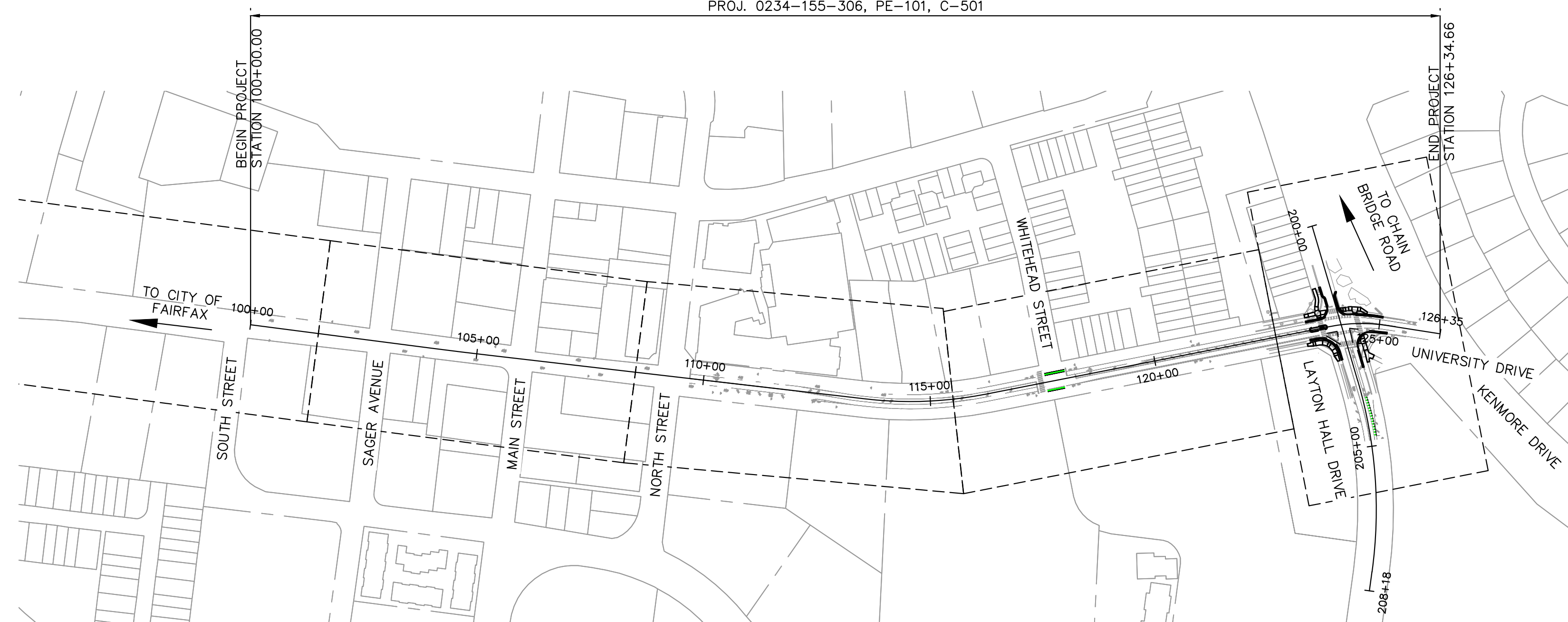


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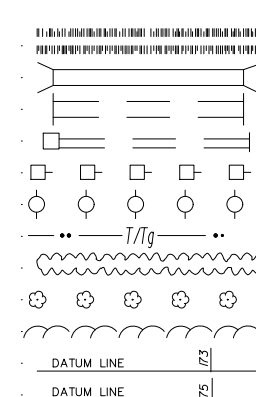
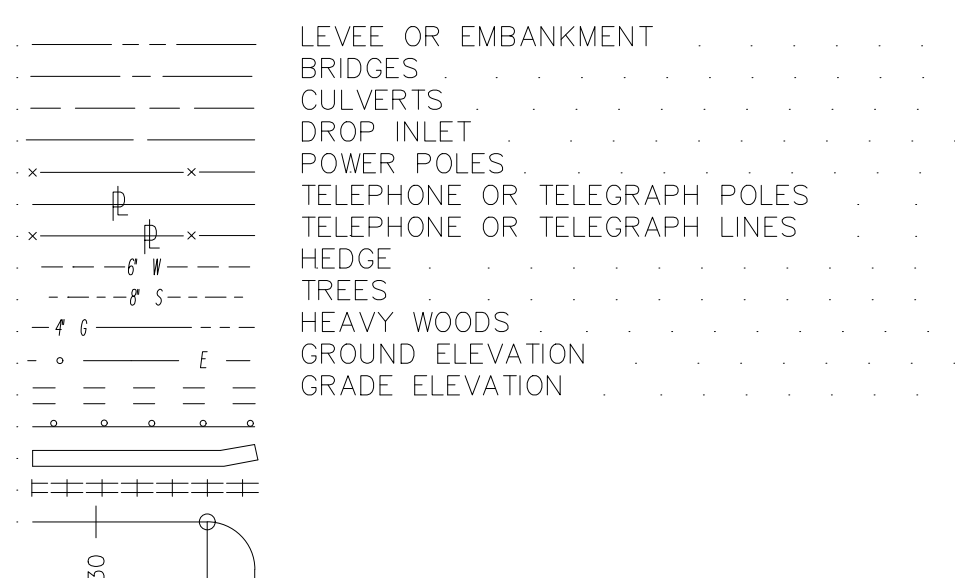


UPC# 121556
VDOT# EN22-151-221
INTERMEDIATE SUBMISSION

PROJ. 0234-155-306, PE-101, C-501



STATE LINE
COUNTY LINE
CITY/TOWN OR VILLAGE
RIGHT OF WAY LINE
FENCE LINE
UNFENCED PROPERTY LINE
FENCED PROPERTY LINE
WATER LINE
SANITARY SEWER LINE
GAS LINE
ELECTRIC UNDERGROUND CABLE
TRAVELED WAY
GUARD RAIL
RETAINING WALL
RAILROADS
BASE OR SURVEY LINE

[illegible]

STATE	FEDERAL AID	STATE		SHEET NO.
	PROJECT	ROUTE	PROJECT	
VA.		6627	EN22-151-221 SEE TABULATIONS BELOW FOR SECTION NUMBERS	1

FUNCTIONAL CLASSIFICATION AND TRAFFIC DATA		
URBAN MAJOR COLLECTOR—25 MPH DESIGN SPEED		
	UNIVERSITY DRIVE (ROUTE 6627) FROM: MAIN STREET TO: WHITEHEAD STREET	UNIVERSITY DRIVE (ROUTE 6627) FROM: WHITEHEAD STREET TO: LAYTON HALL DRIVE
ADT (2022)	6034	5779
ADT (2033)	6372	6103
DHV	615	601
D (%)	53%	50%
T (%)	3%	3%
V (MPH)	25	25

LOCALLY ADMINISTERED PROJECTS	
CITY OF FAIRFAX NAME OF LOCALITY	
DAVID SUMMERS, PE RECOMMENDED FOR APPROVAL FOR RIGHT OF WAY ACQUISITION	
DATE	DIRECTOR OF PUBLIC WORKS TITLE OF POSITION
DAVID SUMMERS, PE RECOMMENDED FOR APPROVAL FOR CONSTRUCTION	
DATE	DIRECTOR OF PUBLIC WORKS TITLE OF POSITION

RECOMMENDED FOR APPROVAL FOR RIGHT OF WAY ACQUISITION	
DATE	DISTRICT PLANNING AND INVESTMENT MANAGER
DATE	DISTRICT PROJECT DEVELOPMENT ENGINEER
APPROVED FOR RIGHT OF WAY ACQUISITION	
DATE	DISTRICT ADMINISTRATOR

RECOMMENDED FOR APPROVAL FOR CONSTRUCTION	
DATE	DISTRICT PLANNING AND INVESTMENT MANAGER
DATE	DISTRICT PROJECT DEVELOPMENT ENGINEER
APPROVED FOR CONSTRUCTION	
DATE	DISTRICT ADMINISTRATOR

PROJECT
EN22-151-221

SHEET NO. /

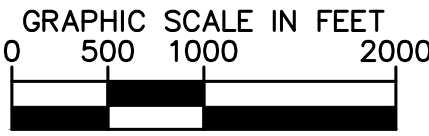
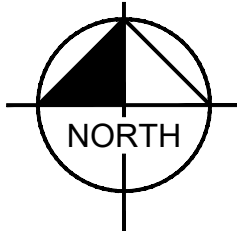
Plotted By: Waring, Megan K:\NVA_TPTD\110557034 - University Drive Bike Lanes\CAD\PlanSheets\1 VDOT TTLESHEET.dwg

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LOCATION MAP



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Seal

Revisions	Date

DESIGNED BY: ATS
DRAWN BY: NS
CHECKED BY: MEW

CITY OF FAIRFAX, VA
DEPARTMENT OF PUBLIC WORKS

UNIVERSITY DRIVE
BIKE LANES

UPC # 121556

SCALE

SHEET

1A

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INDEX OF SHEETS

SHEET NO.	DESCRIPTION	STATION RANGE
1	TITLE SHEET	
1A	LOCATION MAP	
1B	INDEX OF SHEETS	
1D	CONSTRUCTION ALIGNMENT DATA	
1E	TRAFFIC MANAGEMENT PLAN	
2A	TYPICAL SECTIONS	
2B(1) – 2B(2)	GRADING DETAILS	UNIVERSITY DRIVE STA. 122+50 TO STA. 126+35
2C	EXISTING CONDITIONS AND DEMOLITION PLAN	
3	ROADWAY PLAN	UNIVERSITY DRIVE STA. 122+50 TO STA. 126+35
3A	EROSION AND SEDIMENT CONTROL PHASE 1	UNIVERSITY DRIVE STA. 122+50 TO STA. 126+35
3B	EROSION AND SEDIMENT CONTROL PHASE 2	UNIVERSITY DRIVE STA. 122+50 TO STA. 126+35
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5(1) – 5(5)	SIGNING AND PAVEMENT MARKING	
6(1) – 6(2)	SIGHT DISTANCE EXHIBITS	
7(1) – 7(2)	AUTO TURN EXHIBITS	



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SHEET

1B

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CONSTRUCTION ALIGNMENT DATA SHEET



CITY OF FAIRFAX

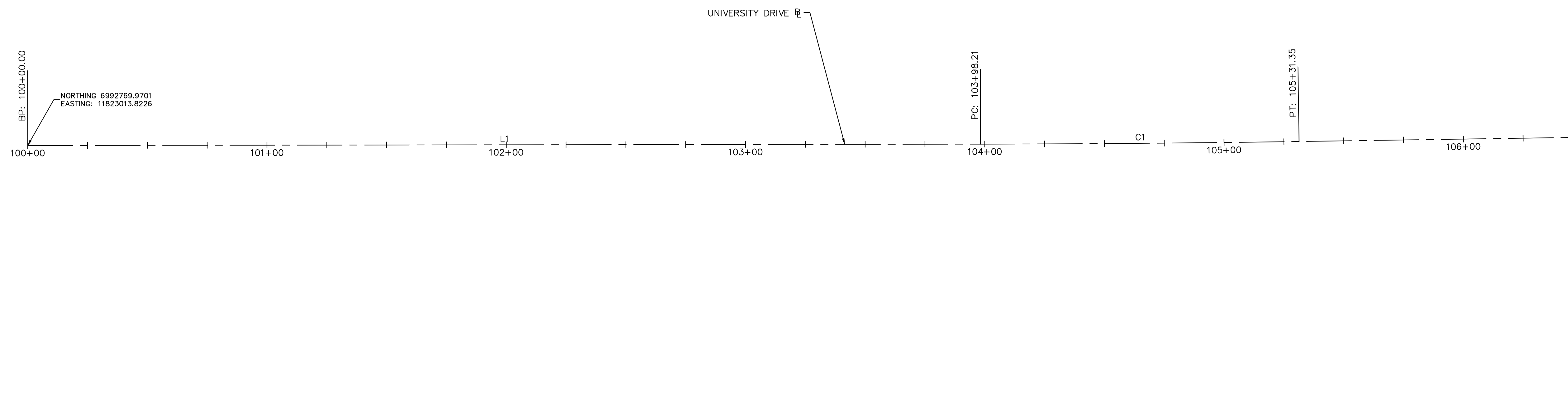
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MATCHLINE STA 106+50: SEE SHEET 1D(2)

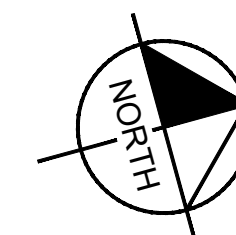
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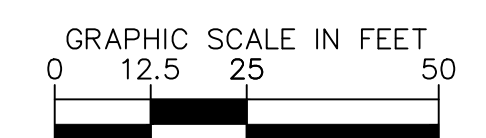
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NO.	DELTA OR BRG	RADIUS	LENGTH	PC	PT	PI NORTHING	PI EASTING	TANGENT START NORTHING	TANGENT START EASTING	TANGENT END NORTHING	TANGENT END EASTING
C1	Δ=0° 45' 46"	10000.0'	133.14'			6993218.5127	11823135.6072				
C2	Δ=17° 43' 03"	850.0'	262.84'			6994212.1027	11823391.2246				
C3	Δ=19° 59' 48"	350.0'	122.15'			6995176.2001	11823335.8024				
L1	N 15°11'25" E		398.21'	100+00.00	103+98.21			6992769.9701	11823013.8226	6993154.2659	11823118.1634
L2	N 14°25'39" E		826.89'	105+31.35	113+58.24			6993282.9861	11823152.1940	6994083.8010	11823358.2169
L3	N 3°17'24" W		771.51'	116+21.09	123+92.59			6994344.3640	11823383.6214	6995114.5979	11823339.3437
L4	N 16°42'24" E		119.92'	125+14.75	126+34.66			6995235.2994	11823353.5405	6995350.1543	11823388.0129

TRAVERSE DATA			
NO.	NORTHING	EASTING	ELEVATION
9	6995323.7680	11823346.0480	
10	6995097.0190	11823387.8270	360.7820

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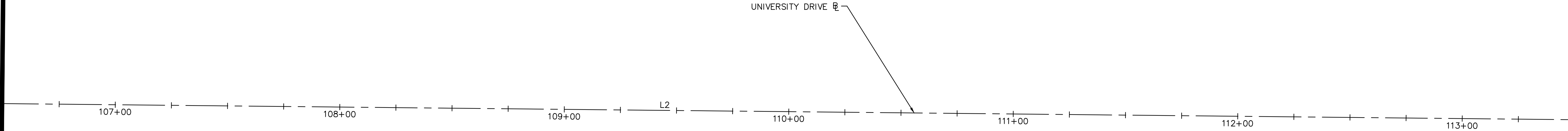
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 $1D(1)$

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CONSTRUCTION ALIGNMENT DATA SHEET

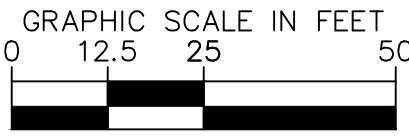
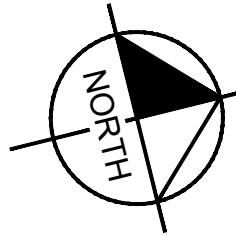
MATCHLINE STA 106+50.00: SEE SHEET 1D(1)



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UNIVERSITY DRIVE
BIKE LANES

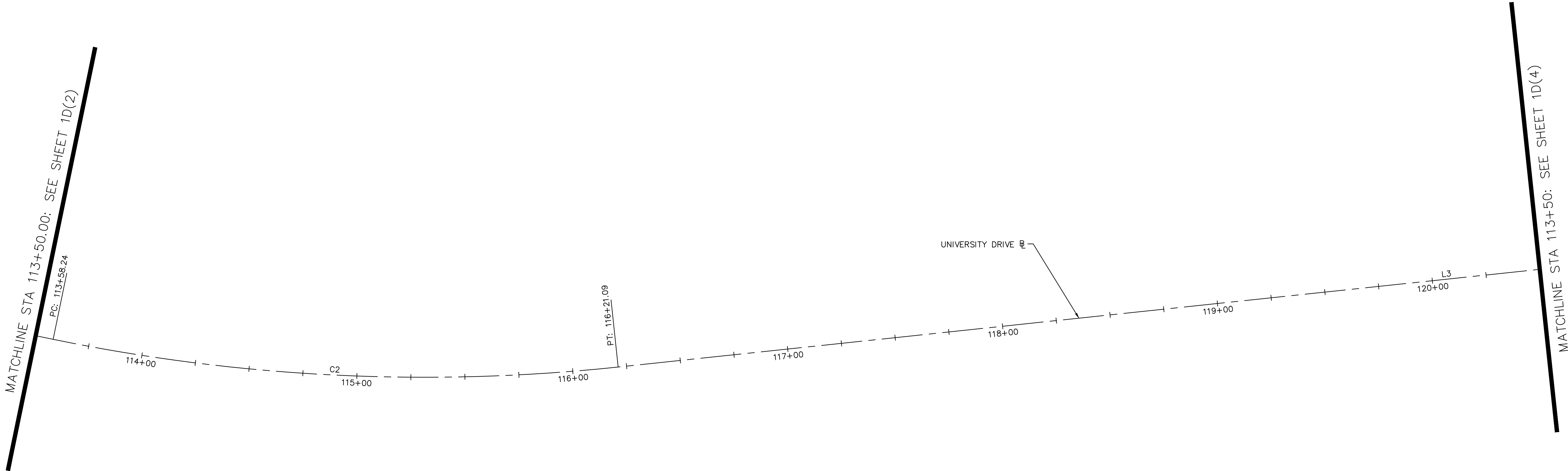
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1D(2)

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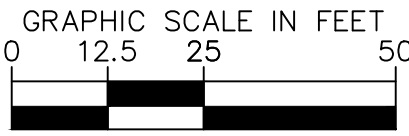
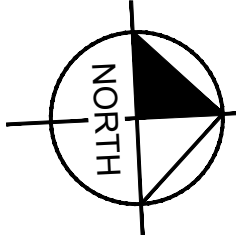
CONSTRUCTION ALIGNMENT DATA SHEET



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UNIVERSITY DRIVE
BIKE LANES

UPC # 121556

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1D(3)

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CONSTRUCTION ALIGNMENT DATA SHEET



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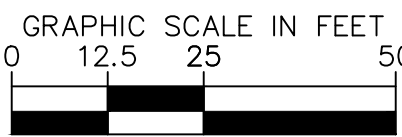
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UNIVERSITY DRIVE
BIKE LANES

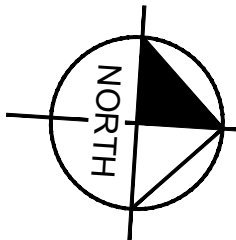
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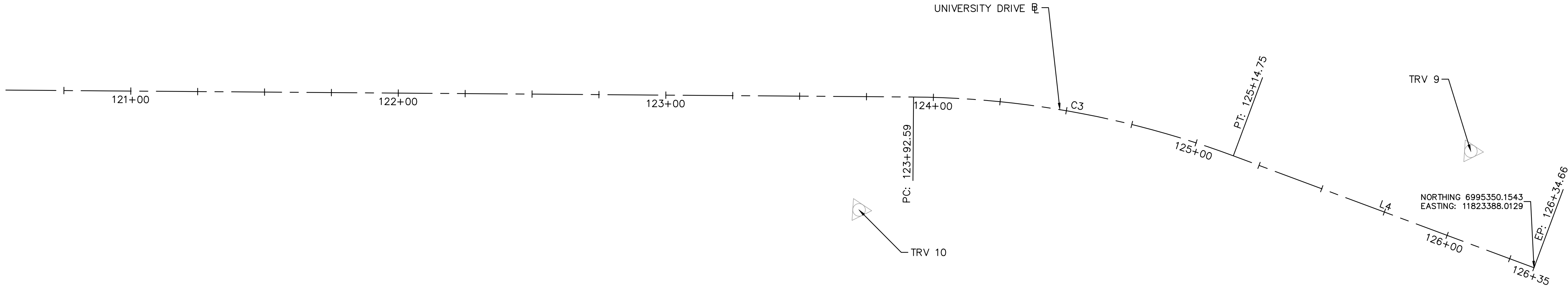
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TRANSPORTATION MANAGEMENT PLAN AND SEQUENCE OF CONSTRUCTION (TMP/SOC)

TEMPORARY TRAFFIC CONTROL PLAN

1. TMP/SOC TYPE A PROJECT INFORMATION:

- A. IDENTIFY THE PROJECT'S TMP TYPE:
THIS PROJECT'S TMP/SOC PLAN HAS BEEN DESIGNED IN CONFORMANCE WITH A TYPE A TMP/SOC PLAN.
- B. IDENTIFY THE WORK ZONE LOCATION, LENGTH, AND WIDTHS:
THE PROJECT IS LOCATED ALONG UNIVERSITY DRIVE BETWEEN SOUTH STREET AND KENMORE DRIVE IN THE CITY OF FAIRFAX. PROJECT LOCATION IS SHOWN ON SHEET 1.
- C. NOTE THE HOURS THE CONSTRUCTION AREA WILL BE ACTIVE:
CONSTRUCTION AREA SHALL BE CONSIDERED ACTIVE WHEN ANY IMPACT TO TRAFFIC OCCURS (1ST CONE IN ROAD)
CONSTRUCTION AREA HOURS HAVE THE FOLLOWING LIMITATIONS:

	LANE CLOSURES (MAJOR COLLECTOR)			
	MONDAY TO THURSDAY	FRIDAY	SATURDAY	SUNDAY
DAY TIME	9:00AM to 3:30PM	9:00AM to 2:00PM	*NOT ALLOWED	*NOT ALLOWED
NIGHT TIME	*NOT ALLOWED	*NOT ALLOWED	*NOT ALLOWED	*NOT ALLOWED

* NIGHT TIME AND WEEKEND WORK SHALL NOT BE ALLOWED UNLESS APPROVED BY VDOT AND THE CITY OF FAIRFAX. NO LANE CLOSURES WILL BE ALLOWED FROM NOON ON THE DAY BEFORE A HOLIDAY UNTIL NOON ON THE WORKDAY FOLLOWING THE HOLIDAY. HOLIDAYS INCLUDE ALL STATE AND FEDERAL HOLIDAYS.

DESIGNATION OF PEAK HOUR TIMES:
PEAK HOURS ARE 6:00AM THROUGH 9:00AM AND 3:30PM THROUGH 6:30PM.

- D. THE TMP/SOC PLAN, DURING CONSTRUCTION, SHALL BE IN ACCORDANCE WITH SECTIONS 512, 701, 703 & 704 OF THE DEPARTMENTS 2020 ROAD AND BRIDGE SPECIFICATIONS, 2016 ROAD AND BRIDGE STANDARDS (REVISED SEPTEMBER 2022, 2009 MUTCD, 2011 VIRGINIA SUPPLEMENT TO THE MUTCD (REVISED 2013), 2011 VIRGINIA WORK AREA PROTECTION MANUAL (2.1 REVISION DATE – NOVEMBER 1,2020), AND IIM–LD–241.5 OF THE INSTRUCTIONAL AND INFORMATIONAL MEMORANDA.
- E. NOTE ANY EXISTING ENTRANCES, EXISTING INTERSECTIONS, OR EXISTING PEDESTRIAN ACCESS POINTS THAT WILL BE AFFECTED BY THE CONSTRUCTION AREA OR BY THE TRAFFIC CONTROL DEVICES:

MAJOR TYPES OF TRAVELERS: THE TRAFFIC ON THE ROADWAY AND SIDEWALKS PRIMARILY CONSIST OF PEDESTRIANS, CYCLISTS, PASSENGER VEHICLES AND CITY BUSES.

EXISTING ENTRANCES:
THERE ARE SEVERAL EXISTING COMMERCIAL ENTRANCES ALONG UNIVERSITY DRIVE BETWEEN SAGAR AVENUE AND WHITEHEAD STREET THAT WILL BE AFFECTED BY THE WORK ZONE. THESE ENTRANCES SHALL REMAIN OPEN FOR THE DURATION OF CONSTRUCTION UNLESS OTHERWISE NOTED ON THE PLANS. THE CONTRACTOR SHALL ENSURE THAT ACCESS TO PRIVATE AND COMMERCIAL PROPERTIES IS MAINTAINED AT ALL TIMES. WITHIN THE PROJECT LIMITS.

EXISTING INTERSECTIONS:
THE UNIVERSITY DRIVE AND SOUTH STREET INTERSECTION IS AT APPROXIMATE STATION 100+00. THE UNIVERSITY DRIVE AND SAGAR AVENUE INTERSECTION IS AT APPROXIMATE STATION 103+00. THE UNIVERSITY DRIVE AND MAIN STREET INTERSECTION IS AT APPROXIMATE STATION 106+00. THE UNIVERSITY DRIVE AND NORTH STREET INTERSECTION IS AT APPROXIMATE STATION 109+50. THE UNIVERSITY DRIVE AND WHITEHEAD STREET INTERSECTION IS AT APPROXIMATE STATION 118+50. THE UNIVERSITY DRIVE AND LAYTON HALL DRIVE INTERSECTION IS AT APPROXIMATE STATION 124+50. ALL INTERSECTIONS ARE TO REMAIN OPEN AND FUNCTIONAL DURING CONSTRUCTION.

EXISTING BUS STOP:
THERE ARE 10 EXISTING BUS STOPS FOR THE CITY OF FAIRFAX TRANSIT SERVICES ALONG UNIVERSITY DRIVE. ALL OF THE BUS STOPS ARE TO REMAIN OPEN AND FUNCTIONAL DURING CONSTRUCTION.

- F. DESIGNATE A PERSON ASSIGNED TO THE PROJECT WHO WILL HAVE THE PRIMARY RESPONSIBILITY, WITH SUFFICIENT AUTHORITY, FOR IMPLEMENTING THE TMP/SOC AND OTHER SAFETY AND MOBILITY ASPECTS OF THE PERMIT WORK. THIS PERSON SHALL COORDINATE WITH THE CITY OF FAIRFAX'S CONSTRUCTION INSPECTOR FOR THE DURATION OF CONSTRUCTION.

ENSURE THAT PERSONNEL ASSIGNED TO THE PROJECT ARE TRAINED IN TRAFFIC CONTROL TO A LEVEL COMMENSURATE WITH THEIR RESPONSIBILITIES IN ACCORDANCE WITH VDOT'S WORK ZONE TRAFFIC CONTROL TRAINING GUIDELINES.

NOTIFY THE CITY OF FAIRFAX WITH DATES, TIMES, AND DURATIONS OF ANY WORK REQUIRING LANE SHIFTS, LANE CLOSURES, AND/OR PHASE CHANGES A MINIMUM OF TWO WORKING DAYS PRIOR TO IMPLEMENTING THIS ACTIVITY.

CONTACT VDOT A MINIMUM OF TWO DAYS BEFORE, AND THE VDOT TRAFFIC OPERATIONS CENTER (VDOT TOC) 15–45 MINUTES PRIOR TO COMMENCING ANY WORK REQUIRING LANE CLOSURES OR SHOULDER CLOSURES. CONTACT VDOT TOC AGAIN 15–45 MINUTES AFTER THE WORK HAS BEEN COMPLETED AND LANE OR SHOULDER CLOSURES HAVE BEEN REMOVED.

PERFORM REVIEWS OF THE CONSTRUCTION AREA TO ENSURE COMPLIANCE WITH CONTRACT DOCUMENTS AT REGULARLY SCHEDULED INTERVALS AT THE DIRECTION OF THE CITY OF FAIRFAX. CONTRACTOR SHALL MAINTAIN AN APPROVED COPY OF THE TEMPORARY TRAFFIC CONTROL PLAN AT THE WORK SITE AT ALL TIMES.

COORDINATE WITH THE CITY OF FAIRFAX POLICE DEPARTMENT FOR ANY LANE CLOSURES AND ANY DETOURS OF ANY NATURE.

- G. IDENTIFY THE MAJOR TYPES OF TRAVELERS:
THE TRAFFIC ON THE ROADWAY CONSISTS PRIMARILY OF COMMUTER TRAFFIC WITH SOME PEDESTRIANS.
2. THIS TMP/SOC PLAN IS INTENDED AS A GUIDE. IT IS NOT TO ENUMERATE EVERY DETAIL WHICH MUST BE CONSIDERED IN THE CONSTRUCTION OF EACH PHASE, BUT ONLY TO SHOW THE GENERAL HANDLING OF EXISTING TRAFFIC. IF THE CONTRACTOR TO DEVIATE FROM THE APPROVED TMP, A NEW OR REVISED TMP MUST BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.
3. CONTRACTOR TO MAINTAIN AT LEAST ONE LANE OF TRAFFIC IN EACH DIRECTION DURING CONSTRUCTION OF THIS PROJECT WITH A MINIMUM CLEAR ROADWAY WIDTH NO LESS THAN EXISTING CONDITIONS UNLESS OTHERWISE APPROVED BY THE ENGINEER.

4. CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE FOR THE DURATION OF THE PROJECT. CONTRACTOR SHALL ADD ANY ADDITIONAL TEMPORARY MEASURES NECESSARY TO FACILITATE PROPER, POSITIVE DRAINAGE FOR THE DURATION OF CONSTRUCTION.
5. WHERE GROUP 2 CHANNELIZING DEVICES ARE USED TO SEPARATE THE CONSTRUCTION AREA AND TRAFFIC, A MINIMUM CLEAR ZONE AREA AS DEFINED IN THE VIRGINIA WORK AREA PROTECTION MANUAL (VWAPM) IS TO BE MAINTAINED.

THE CONTRACTOR IS TO COORDINATE WITH THE CITY OF FAIRFAX FOR LOCATION(S) OF THE CONSTRUCTION STAGING AREA. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS AS NECESSARY.

GENERAL CONSTRUCTION NOTES

1. ALL WORK SHALL COMPLY WITH THE VIRGINIA WORK AREA PROTECTION MANUAL REVISION 2.1–NOVEMBER 1, 2020.
2. THE CONTRACTOR TO MAKE ANY NECESSARY ADJUSTMENTS DURING BOTH WORK AND NON–WORK HOURS TO ENSURE THE PROTECTION AND SAFETY OF THE ADJACENT PROPERTY OWNERS, PEDESTRIANS, VEHICULAR TRAFFIC, AND THE GENERAL PUBLIC FROM ANY CONSTRUCTION RELATED ACTIVITY, CONSTRUCTION EQUIPMENT, AND THE CONSTRUCTION SITE ITSELF. ADJUSTMENTS SHOULD BE RECORDED INTO THE WORK ZONE CHECKLIST.
3. TEMPORARY CLOSURES OF PEDESTRIAN ACCESS SHALL BE LIMITED AND ADMINISTERED AS DIRECTED BY THE CITY. CLOSURES OF PEDESTRIAN ACCESS SHOULD INCLUDE TYPE III BARRICADES TO PREVENT ENTRY INTO THE WORK ZONE.
4. CONTRACTOR SHALL PROVIDE MINIMUM 9' LANES AT ALL TIMES DURING CONSTRUCTION.
5. UNLESS OTHERWISE APPROVED OR DIRECTED BY THE ENGINEER THE CONTRACTOR SHALL PLAN AND PROSECUTE THE WORK IN ACCORDANCE WITH THE SEQUENCE OF CONSTRUCTION ON THIS SHEET.

SEQUENCE OF CONSTRUCTION

SEQUENCE BELOW DETAILS THE STEPS FOR THE INTERSECTION MODIFICATION AT THE INTERSECTION OF UNIVERSITY DRIVE AND LAYTON HALL DRIVE FROM STATION APPROXIMATELY 123+25 TO 125+25

1. CONTRACTOR SET UP ALL EROSION AND SEDIMENT CONTROL DEVICES PER PLAN.
2. REMOVE EXISTING MEDIAN ISLANDS AND INSTALL PEDESTRIAN REFUGE.
3. FOR THE CURB RAMPS, THE CONTRACTOR SHOULD FOLLOW THE FOLLOWING STEPS.
- 3.1. SAWCUT AS NOTED ON SHEET 3 AND REMOVE THE PAVEMENT, BASE AGGREGATE, CURB, AND GUTTER. EXCAVATE, BACKFILL, AND COMPACT WITH NEW BASE AGGREGATE UP TO THE BOTTOM OF THE PROPOSED CONCRETE PAVEMENT GRADE.
4. INSTALL THE PROPOSED SIGNS AND PAVEMENT MARKINGS PER SHEET SERIES 6.
5. REMOVE EROSION AND SEDIMENT CONTROL ITEMS ONCE DIRECTED BY THE CITY. REMOVE TRAFFIC CONTROL DEVICES ONCE DIRECTED BY THE CITY.

PUBLIC COMMUNICATIONS PLAN

NOTIFICATION OF CONSTRUCTION START/END DATES AND WORK ZONE INFORMATION WILL BE ENTERED INTO THE VA–TRAFFIC SYSTEM BY VDOT.

TRAFFIC OPERATIONS PLAN

1. THE CONTRACTOR SHALL UPDATE THE LANE CLOSURE ADVISORY MANAGEMENT SYSTEM (LCAMS) ONE WEEK IN ADVANCE (USUALLY THE WEDNESDAY PRIOR TO THE REQUESTED OPERATION), IN ORDER TO PLACE LANE CLOSURE INFORMATION ON THE 511 SYSTEM AND VA–TRAFFIC.

THE CONTRACTOR SHALL COORDINATE WITH THE CITY OF FAIRFAX ON THEIR PROJECTED WORK SCHEDULE TO ASSIST THE PROJECT TEAM IN DEVELOPING A PUBLIC COMMUNICATIONS PLAN.

2. THE FOLLOWING IS A LIST OF LOCAL EMERGENCY CONTACT AGENCIES:

- A. VIRGINIA STATE POLICE – (703) 323–4522
- B. CITY OF FAIRFAX POLICE DEPARTMENT – (703) 385–7924
- C. HAZ–MAT CENTER (IF SPILL INVOLVED) 911

3. PROCEDURES TO RESPOND TO TRAFFIC INCIDENTS THAT MAY OCCUR IN THE WORK ZONE:

- A. CONTRACTOR TO NOTIFY CITY OF FAIRFAX POLICE AND CITY OF FAIRFAX INSPECTOR IN CHARGE.
- B. DEPENDING UPON SEVERITY OF INCIDENT, CONTRACTOR MAY HAVE TO SHUT DOWN WORK.
- C. UPON ARRIVAL ON SCENE, CITY OF FAIRFAX POLICE WILL DETERMINE RESPONSE NECESSARY TO ALLOW TRAVELING PUBLIC AROUND INCIDENT.
- D. INSPECTOR TO NOTIFY CONSTRUCTION MANAGER OF INCIDENT AND TAKE PICTURES AS NECESSARY, ESPECIALLY PICTURES OF CONTRACTOR'S WORK ZONE TO VERIFY THE PROPER SETUP.

4. PROCESS OF NOTIFICATION OF INCIDENT TO FOLLOW IS:

CONTACT NUMBERS

CITY PROJECT MANAGER	(TBD)
CITY CONSTRUCTION MANAGER	(TBD)
CITY CONSTRUCTION INSPECTOR	(TBD)
EMERGENCY CALL	911
NON–EMERGENCY NUMBERS:	
CITY OF FAIRFAX SHERIFF'S OFFICE	(703) 246–2328
VIRGINIA STATE POLICE	(703) 771–2533



CITY OF FAIRFAX

DEPARTMENT OF
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DRAWN BY: NS
CHECKED BY: MEW

CITY OF FAIRFAX, VA

DEPARTMENT OF PUBLIC WORKS

UNIVERSITY DRIVE
BIKE LANES

UPC # 121556

SCALE

N/A

SHEET

1E(1)

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ADVANCED WORK ZONE TRAFFIC CONTROL
CERTIFICATION #040122102
EXPIRATION DATE: 04/30/2026

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TEMPORARY TRAFFIC CONTROL DETAILS

Page 6H-54

September 2019

Typical Traffic Control Lane Closure on a Two-Lane Roadway Using Flaggers (Figure TTC-23.2)

NOTES

Guidance:

1. Sign spacing distance should be 350'-500' where the posted speed limit is 45 mph or less, and 500'-800' where the posted speed limit is greater than 45 mph.
2. Care should be exercised when establishing the limits of the work zone to insure maximum possible sight distance in advance of the flagger station and transition, based on the posted speed limit and at least equal to or greater than the values in Table 6H-3. Generally speaking, motorists should have a clear line of sight from the graphic flagger symbol sign to the flagger.
3. To maintain efficient traffic flow in a flagging operation on a two-lane roadway, the maximum time motorists should be stopped at a flagger station is 8 minutes for high volume roadways (average daily traffic of 500 or more vehicles per day) to a maximum of 12 minutes for low volume roadways (less than 500 vehicles per day). For additional information see Section 6E.07.

Standard:

4. Portable Temporary Rumble Strips (PTRS) shall be used as noted in Section 6E.99.
5. Flagging stations shall be located far enough in advance of the work space to permit approaching traffic to reduce speed and/or stop before passing the work space and allow sufficient distance for departing traffic in the left lane to return to the right lane before reaching opposing traffic (see Table 6H-3 on Page 6H-5).
6. All flaggers shall be state certified and have their certification card in their possession when performing flagging duties (see Section 6E.01, Qualifications for Flaggers).
7. Cone spacing shall be based on the posted speed and the values in Table 6H-4 on Page 6H-6.
8. A shadow vehicle with at least one high intensity amber rotating, flashing, or oscillating light shall be parked 80'-120' in advance of the first work crew.

Option:

8. A SLOW (W21-V10) sign may be required in this area to give advance warning of the operation ahead by slowing approaching traffic prior to reaching the flagger station or queued traffic.

Guidance:

9. If the queue of traffic reaches the BE PREPARED TO STOP (W3-4) sign then the signs, and if used the PTRS, should be readjusted at greater distances.
10. When a highway-rail crossing exists within or upstream of the transition area and it is anticipated that queues resulting from the lane closure might extend through the highway-rail grade crossing, the temporary traffic control cone should be extended so that the transition area precedes the highway-rail crossing (see Figure TTC-56 for additional information on highway-rail crossings).

Standard:

11. At night, flagger stations shall be illuminated, except in emergencies (see Section 6E.08).

Option:

12. Cones may be eliminated when using a pilot vehicle operation or when the total roadway width is 20 feet or less.
13. For low-volume situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger, positioned to be visible to road users approaching from both directions, may be used (see Chapter 6E).

Standard:

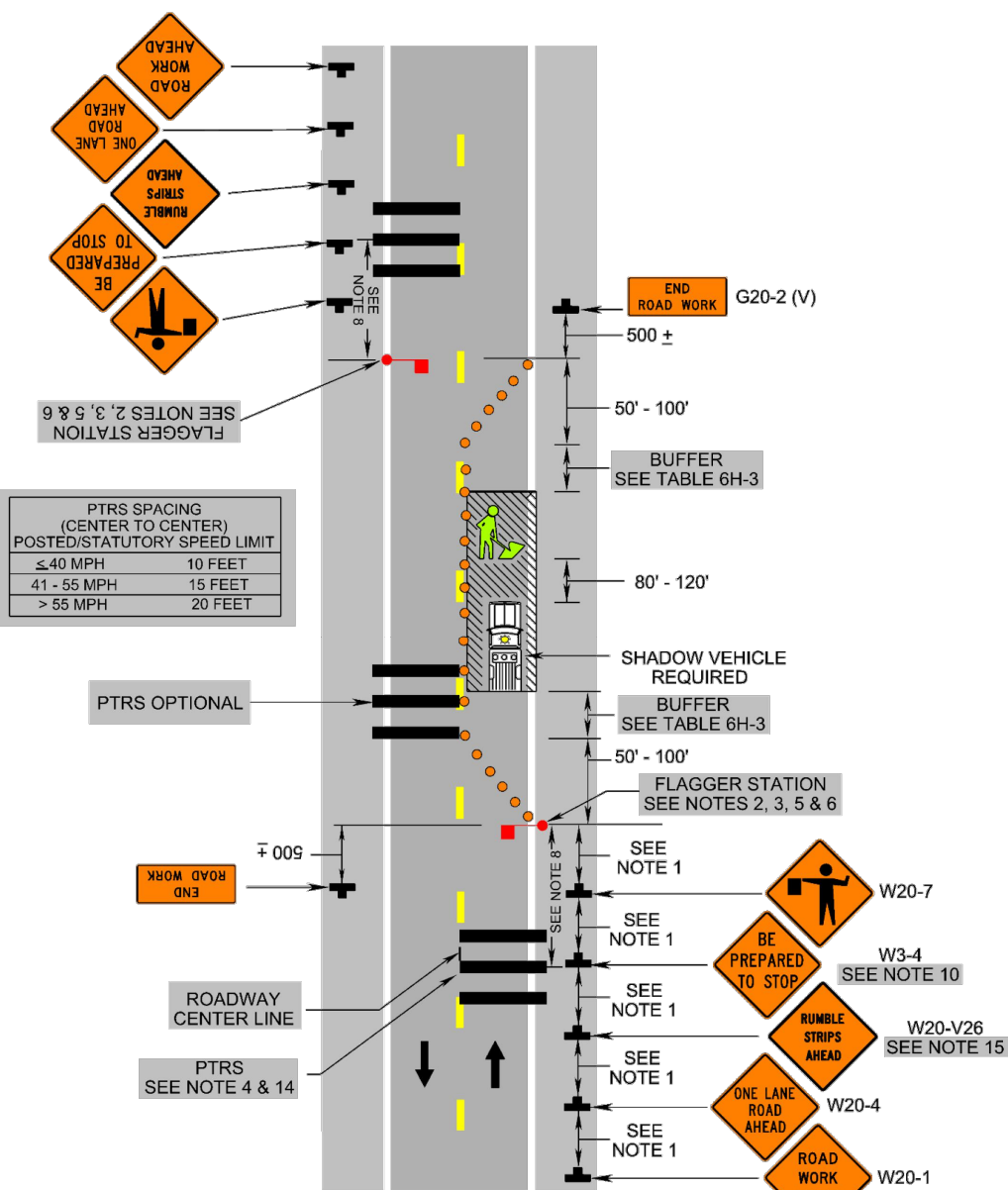
14. When used, three portable temporary rumble (PTRS) strips shall be installed across the entire travel lane adjacent to the BE PREPARED TO STOP (W3-4) sign. The portable temporary rumble strips shall be monitored and adjusted as necessary during the work shift to ensure proper placement on the roadway. When the PTRS are installed, the RUMBLE STRIPS AHEAD (W20-V20) sign shall also be utilized.

1: Revision 1 - 4/1/2015
2: Revision 2 - 9/1/2019

September 2019

Page 6H-55

Lane Closure on a Two-Lane Roadway Using Flaggers (Figure TTC-23.2)



1: Revision 1 - 4/1/2015
2: Revision 2 - 9/1/2019
3: Revision 2.1 - 11/1/2020

Page 6H-64

September 2019

Typical Traffic Control Lane Closure Operation in an Intersection (Figure TTC-28.2)

NOTES

Guidance:

1. The control of traffic through the intersection in order of preference should be:
 - a. Obtain the services of law enforcement personnel.
 - b. Detour the effective routes to other roads and streets as approved and directed by the District Traffic Engineer.
 - c. Place a state certified flagger on each leg of the intersection controlling a single lane of traffic.Appropriate signing as shown should be used for law enforcement and flagging operations. For detour signs see Figure TTC-34.
2. Sign spacing distance should be 350'-500' where the posted speed limit is 45 mph or less, 500'-800' where the posted speed limit is greater than 45 mph.
3. To maintain efficient traffic flow in a flagging operation on a two-lane roadway the maximum time motorists should be stopped at a flagger station is 8 minutes for high volume roadways (average daily traffic of 500 or more vehicles per day) to a maximum of 12 minutes for low volume roadways (less than 500 vehicles per day). For additional information see Section 6E.07.

Standard:

4. Channelizing device spacing shall be on 20' centers or less.

5. PTRS shall be used as noted in Section 6E.99.

Guidance:

6. If room permits, a shadow vehicle with at least one rotating amber light or high intensity amber flashing or oscillating light should be parked 80'-120' in advance of the first work crew.

Standard:

7. For emergency situations (any non-planned operation) of 30 minutes or less duration, two rotating amber lights or high intensity amber flashing or oscillating lights mounted on the vehicle and visible for 360° shall be required in addition to the channelizing devices shown around the vehicle. Also, vehicle hazard warning signals shall be used.

Guidance:

8. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure TTC-36.

Support:

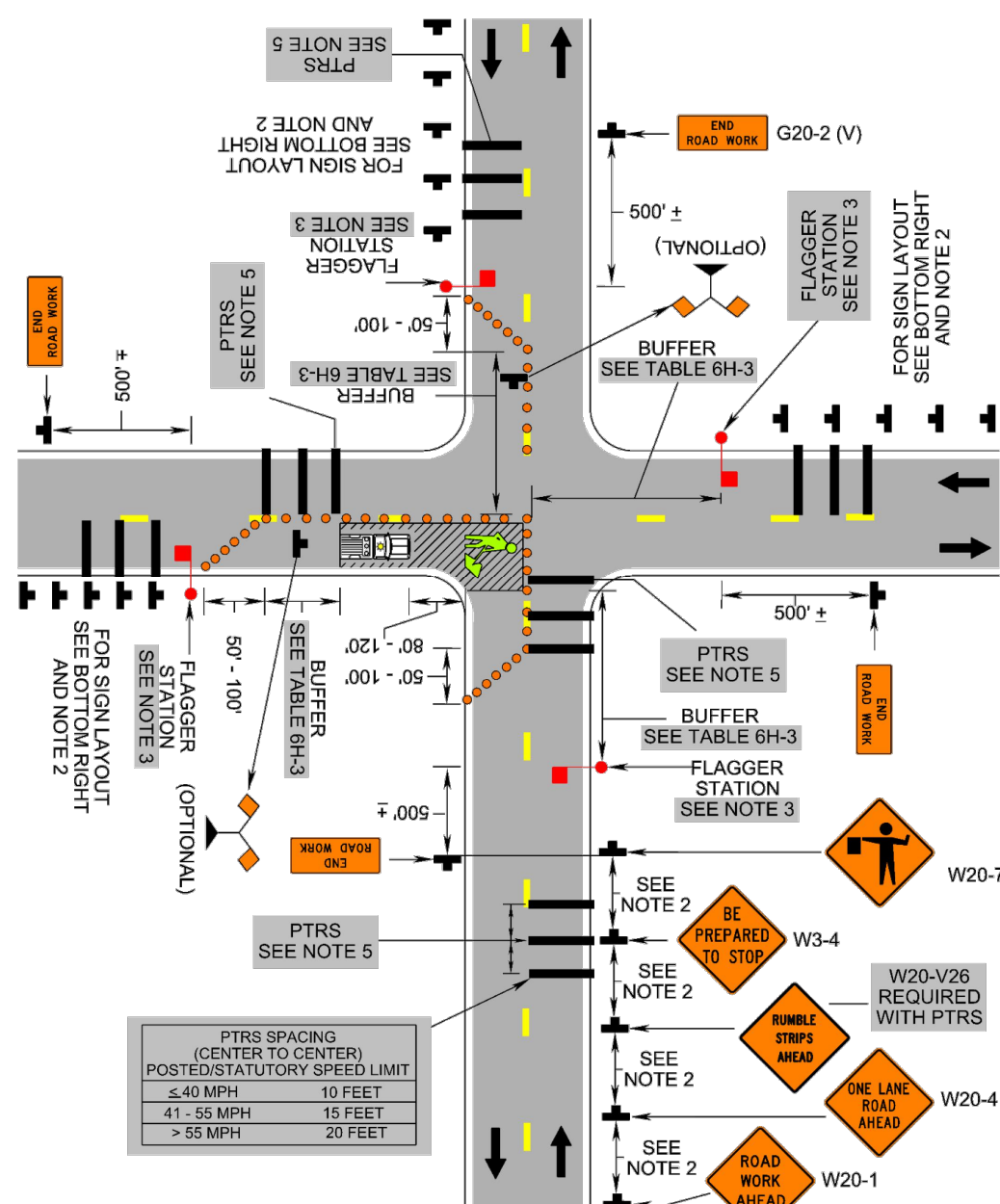
9. Turns can be prohibited as required by vehicular traffic conditions. Unless the streets are wide, it might be physically impossible to make certain turns, especially for large vehicles.

1: Revision 1 - 4/1/2015
2: Revision 2 - 9/1/2019

September 2019

Page 6H-65

Lane Closure Operation in an Intersection (Figure TTC-28.2)



2: Revision 2 - 9/1/2019

Page 6H-80

September 2019

Typical Traffic Control Crosswalk Closure and Pedestrian Detour Operation (Figure TTC-36.2)

NOTES

Standard:

1. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.
2. Curb parking shall be prohibited for at least 50 feet in advance of the midblock crosswalk.

Guidance:

3. Audible information devices should be considered where midblock closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians who have visual disabilities.
4. Pedestrian traffic signal displays controlling closed crosswalks should be covered or deactivated.
5. Temporary markings should be considered for operations exceeding three days in duration.

Option:

6. Only the TTC devices related to pedestrians are shown. Other devices, such as lane closure signing or ROAD NARROWS (W5-1) signs, may be used to control vehicular traffic.
7. For nighttime closures, Type A Flashing warning lights may be used on barricades supporting signs and closing sidewalks.

Standard:

8. In order to maintain the systematic use of the fluorescent yellow-green background for school warning signs in a jurisdiction, the fluorescent yellow-green background for school warning signs shall be used in TTC zones.
9. All sidewalk closures shall be closed with Type 3 Barricade. The SIDEWALK CLOSED (R9-9) sign and the SIDEWALK CROSS HERE (R9-11) sign shall be installed above the Type 3 Barricade. The KEEP RIGHT sign can cover the top rail of the Type 3 Barricade.

Support:

10. Refer to Sections 3B-16 through 3B-18 of the 2009 MUTCD and the Virginia Supplement to the MUTCD for crosswalk lines, yield lines and other related TTC devices that may be used to control vehicular traffic at midblock crosswalks.

Standard:

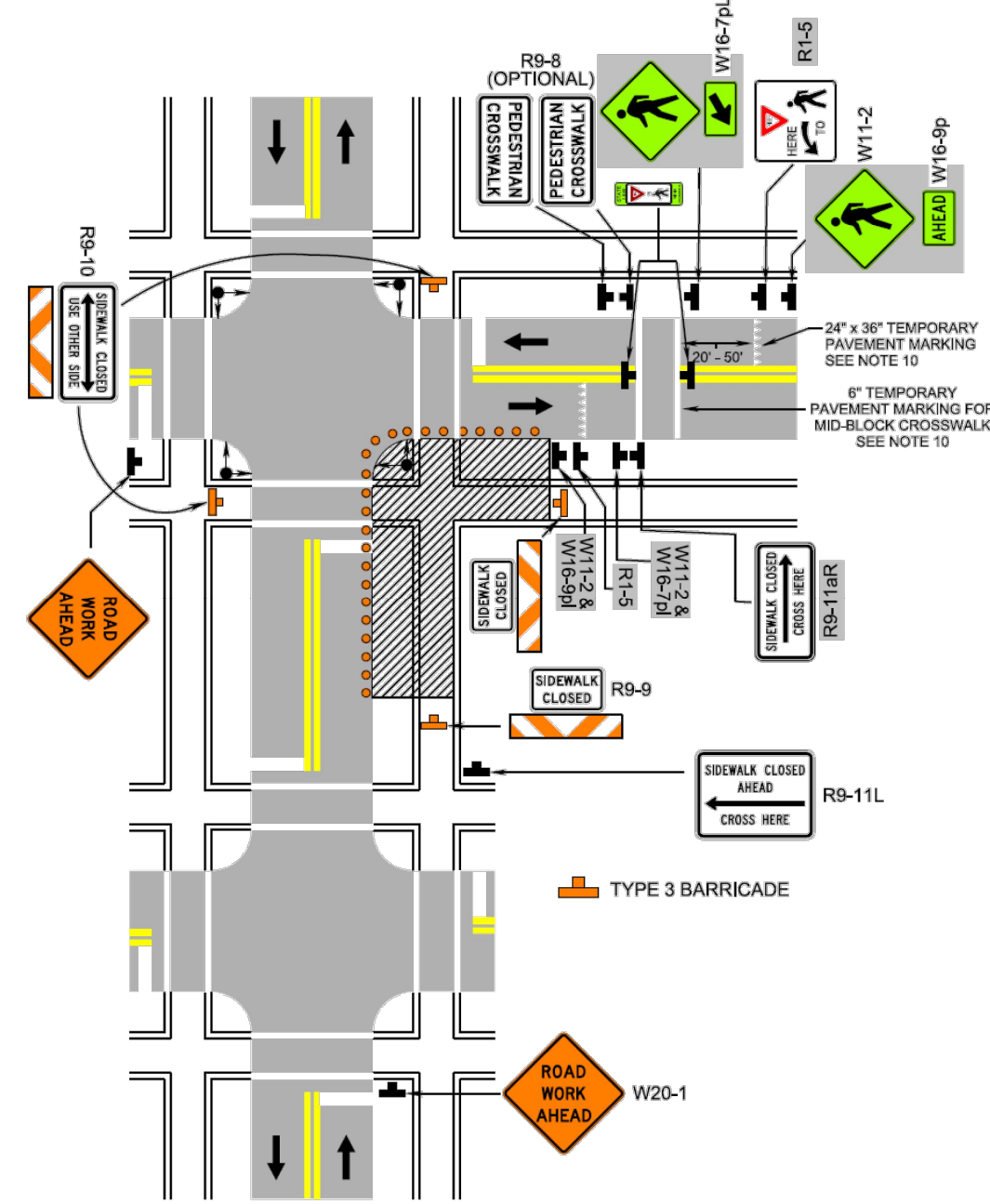
11. The YIELD HERE TO PEDESTRIANS (R1-5) sign shall be placed at the Yield Line.
12. Fluorescent yellow-green PEDESTRIAN TRAFFIC (W11-2) symbol sign, AHEAD (W16-9p) plaque and ARROW (W16-7p) plaque shall be used to identify the work zone crosswalk.

1: Revision 1 - 4/1/2015
2: Revision 2 - 9/1/2019

September 2019

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Crosswalk Closure and Pedestrian Detour Operation (Figure TTC-36.2)



1: Revision 1 - 4/1/2015
2: Revision 2 - 7/1/2018



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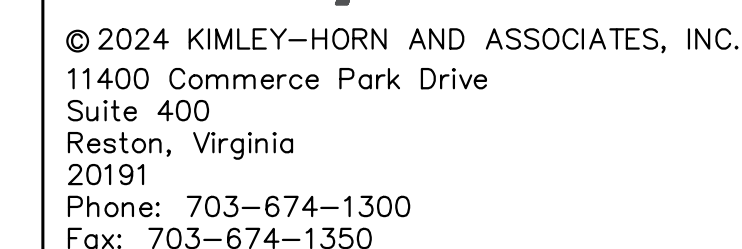
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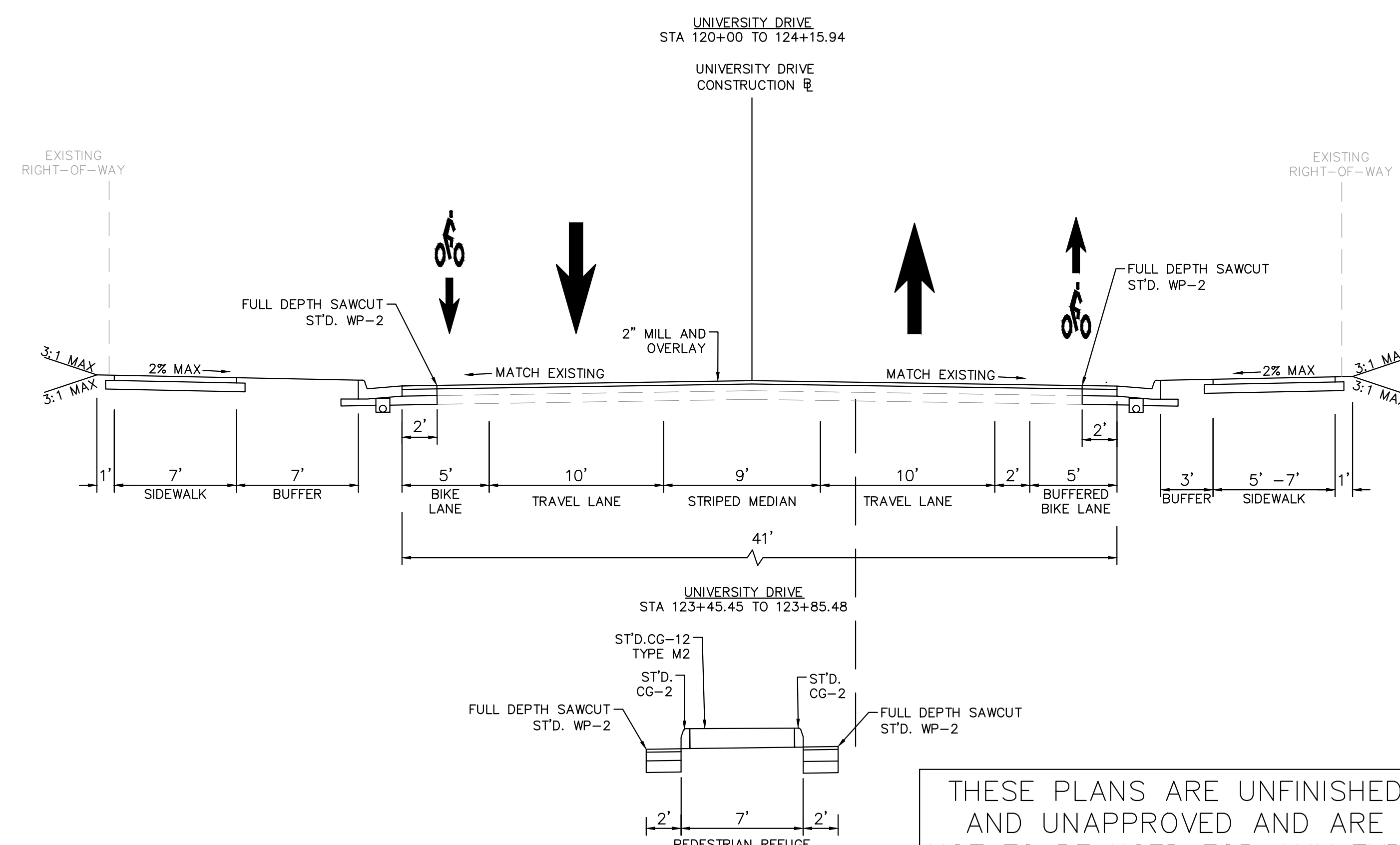
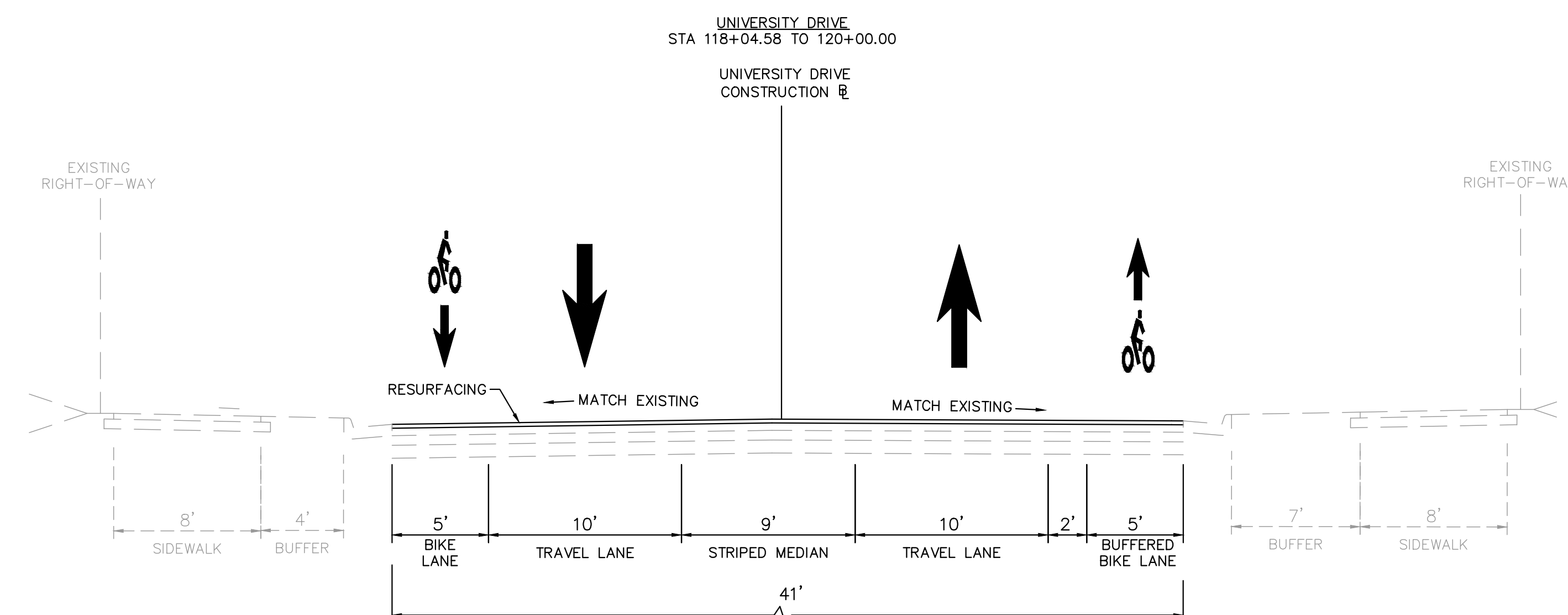
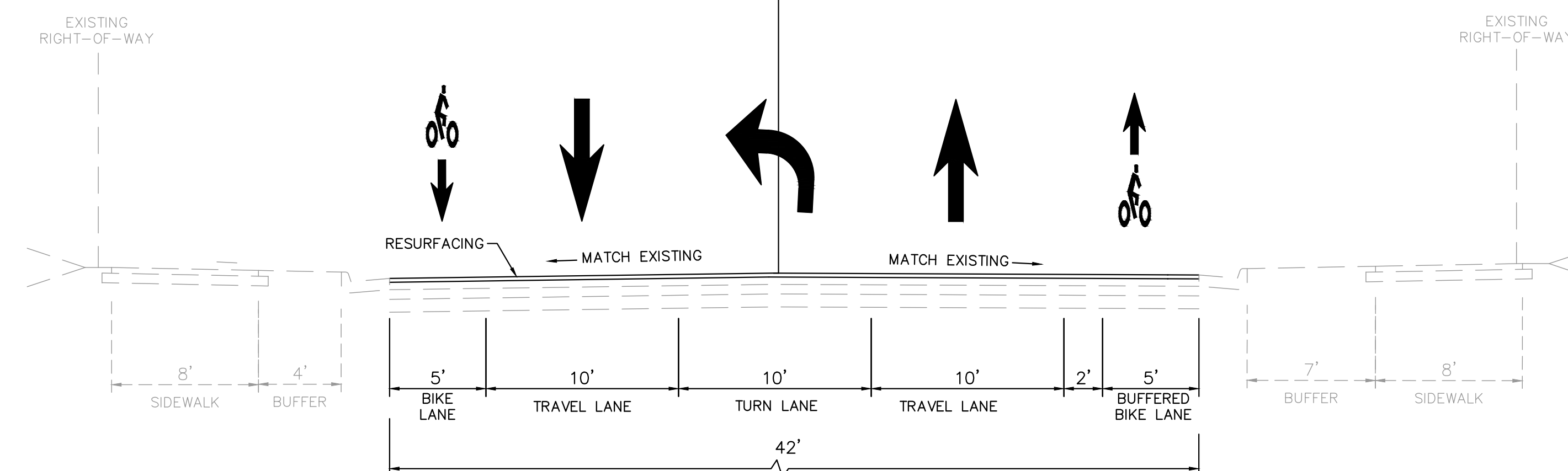


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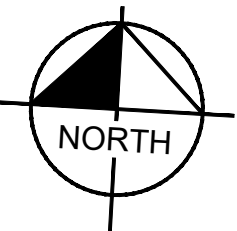
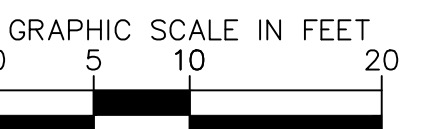
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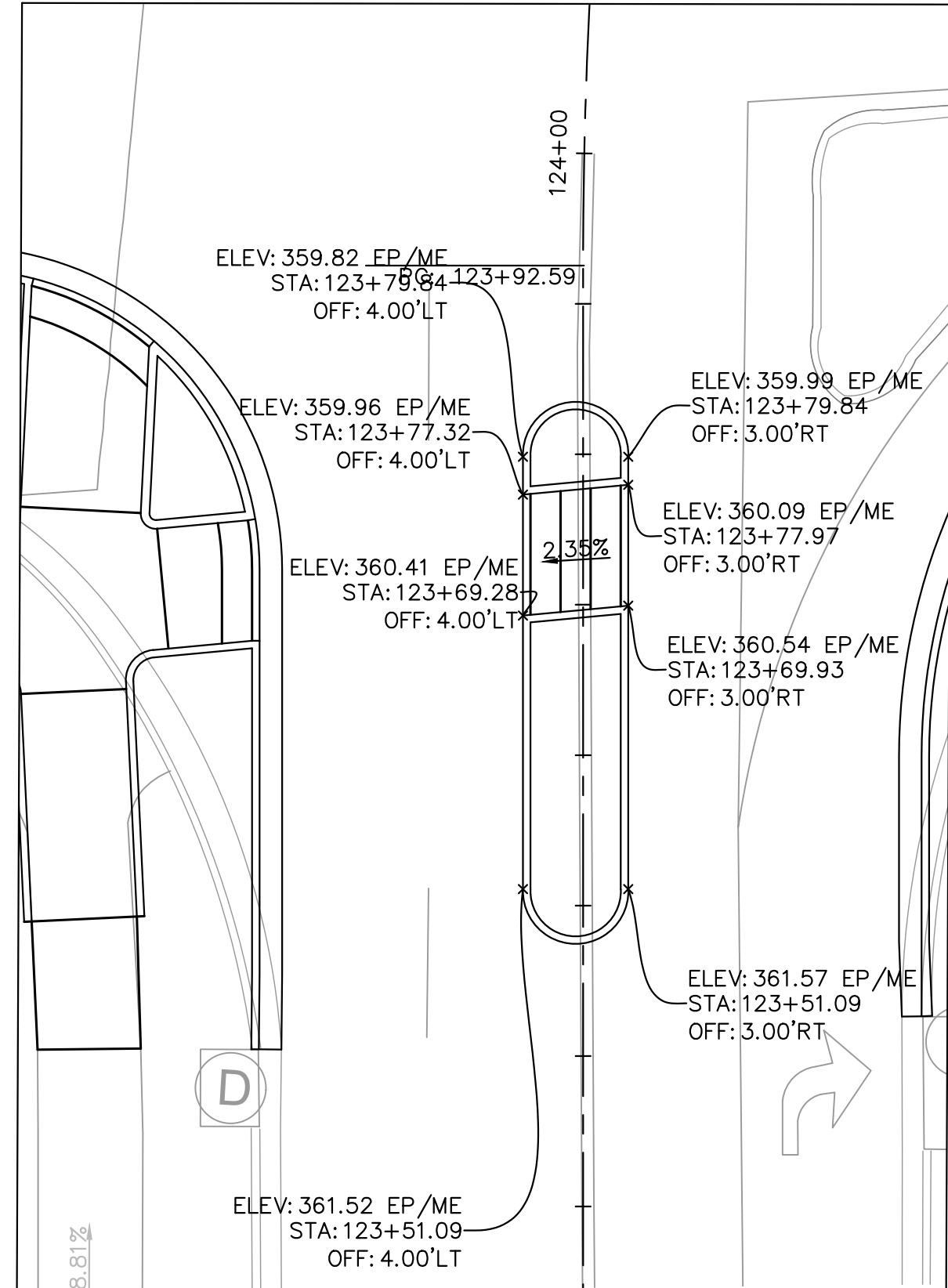
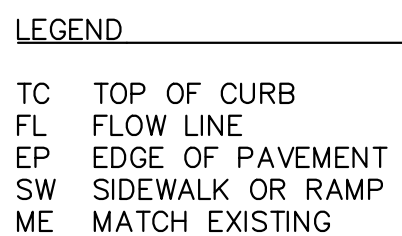


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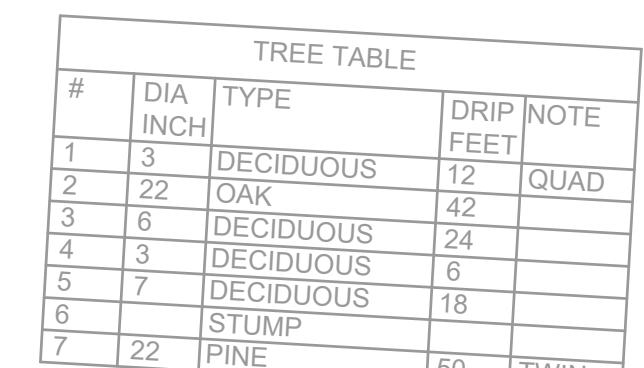
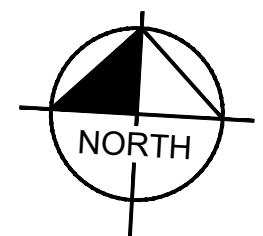
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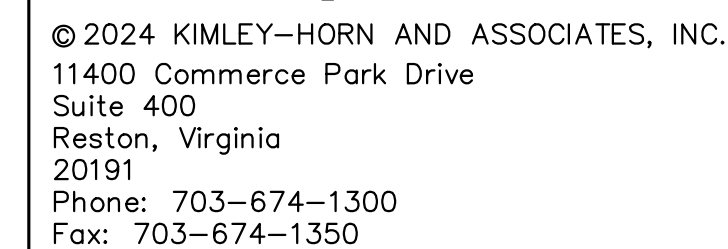


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LEGEND

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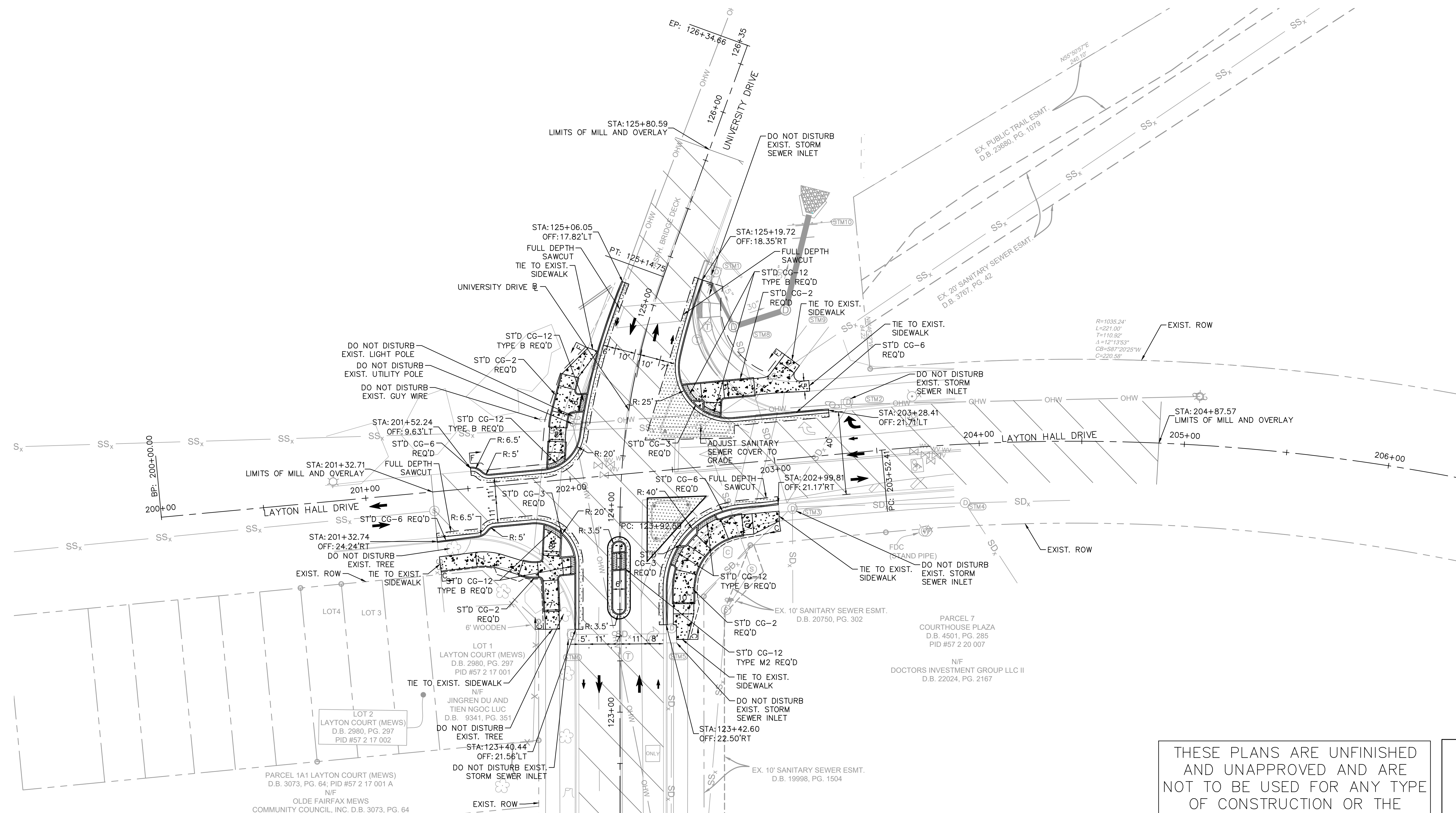
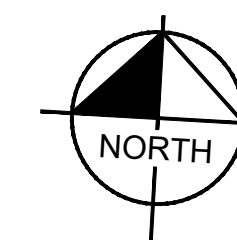
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GRAPHIC SCALE IN FEET

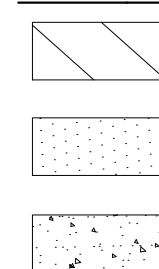
A horizontal line with vertical tick marks at 0, 12.5, 25, and 50 feet. The segment between 12.5 and 25 feet is shaded black.

SHEET

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LEGEND



F _____ LIMITS OF CONSTRUCTION IN FILL

C _____ LIMITS OF CONSTRUCTION IN CUT

STM1 Curb Drop Inlet
Top = 355.60'
Inv. In = 348.81' (FROM #3)
Inv. Out = 348.67' (BOX CULVERT)

(STM2) Curb Drop Inlet
Top = 361.25'
Inv. Out = 355.50' (STM3)
50' = 15" Conc. Pipe Class III Reg. (4' Cover)

(STM2) - (STM3)
Silt Tight Joint Type, 2 Std. ES-1 Req'd
Inv(In)=355.50', Inv(Out)=355.23'
Curb Drop Inlet
Top = 360.43'

Inv. In = 356.26' (S)
 (STM3) Inv. In = 355.23' (STM2)
 Inv. In = 352.99' (STM5)
 Inv. In = 355.48' (STM4)
 Inv. Out = 352.23' (STM1)

(STM3) - (STM1) 121' - 36" Conc. Pipe Class III Req. (1' Cover
Silt Tight Joint Type, 2 Std. ES-1 Req'd
Inv(In)=348.81'. Inv(Out)=352.23'

(STM4)

Manhole
Top = 364.29'
Inv. In = 358.69' (E)
Inv. In = 358.65' (S.E.)
Inv. Out = 358.58' (STM3)

(STM4) – (STM.3)

84' - 21" Conc. Pipe Class III Req. (3' Cover)
Silt Tight Joint Type, 2 Std. ES-1 Req'd
Inv(In)=358.58', Inv(Out)=355.48'

(STM5)

Curb Drop Inlet
Top = 362.18'
Inv. In = 357.83' (STM6)
Inv. In = 357.53' (STM7)
Inv. Out = 356.75' (STM3)

(STM5) – (STM3)

83' - 21" Conc. Pipe Class III Req. (4' Cover)
Silt Tight Joint Type, 2 Std. ES-1 Req'd
Inv(In)=356.75', Inv(Out)=352.99'

(STM6)

Curb Drop Inlet
Top = 362.50'
Inv. Out = 358.28' (STM5)

(STM6) – (STM5)

49' - 15" Conc. Pipe Class III Req. (3' Cover)
Silt Tight Joint Type, 2 Std. ES-1 Req'd
Inv(In)=358.28', Inv(Out)=357.83'

(STM7)

Curb Drop Inlet
Top = 381.74'
Inv. In = 377.34' (W)
Inv. Out = 376.84' (STM 5)

⑤STM7 – ⑤STM5

246' - 18" Conc. Pipe Class III Req. (3' Cover)
Silt Tight Joint Type, 2 Std. ES-1 Req'd
Inv(In)=376.84', Inv(Out)=357.53'

STM8

Curb Drop Inlet
Top = 364.25'
Inv. Out = 358.61' (STM9)

STM9

Curb Drop Inlet
Top = 371.48'
Inv. Out = 364.84' (STM10)

STM1

Outfall
Top = 371.23'
Inv. Out = 365.53' (BOX CULVERT)

EROSION AND SEDIMENT CONTROL PLAN PHASE 1



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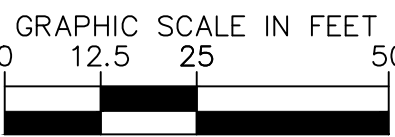
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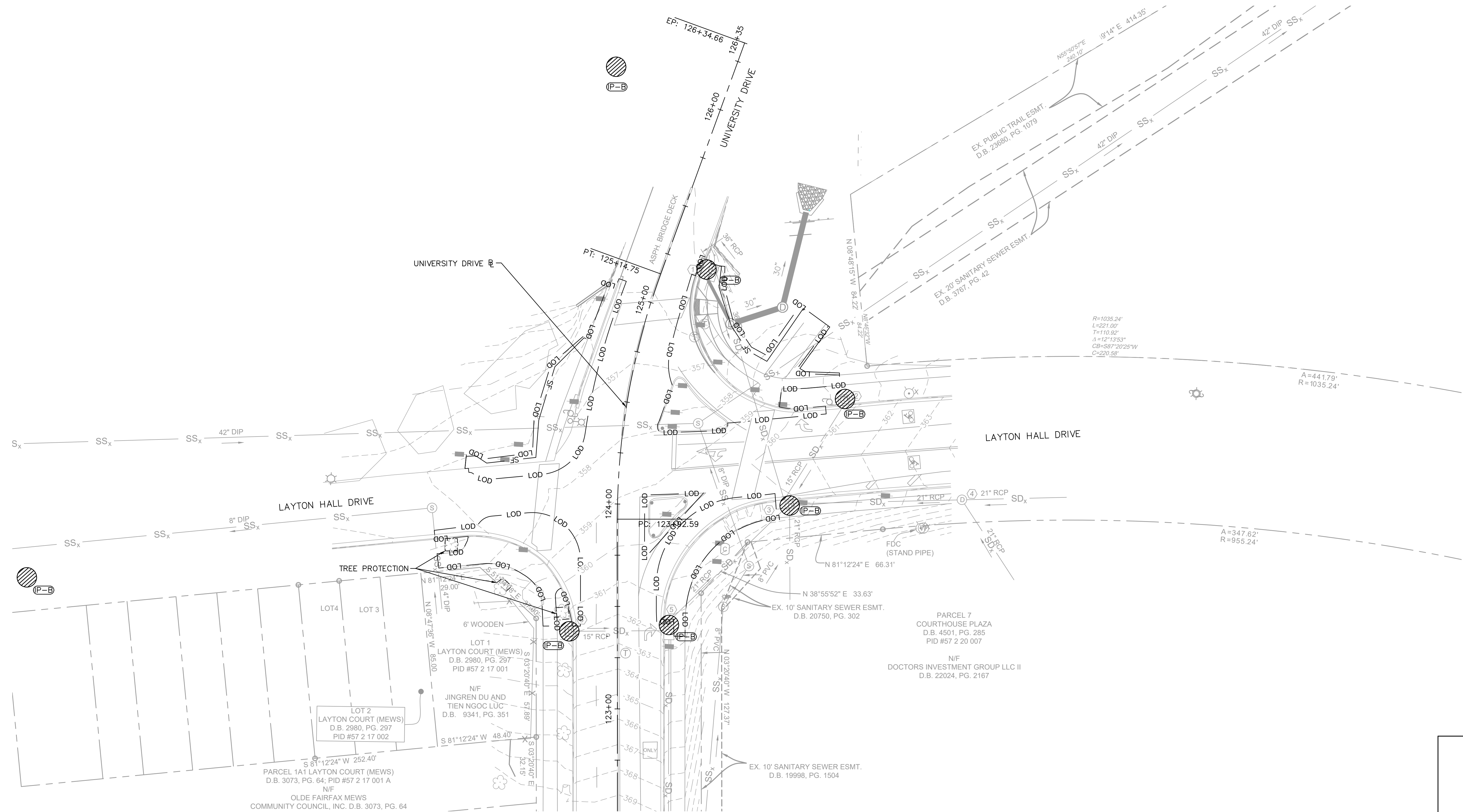
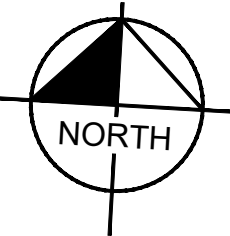
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3A

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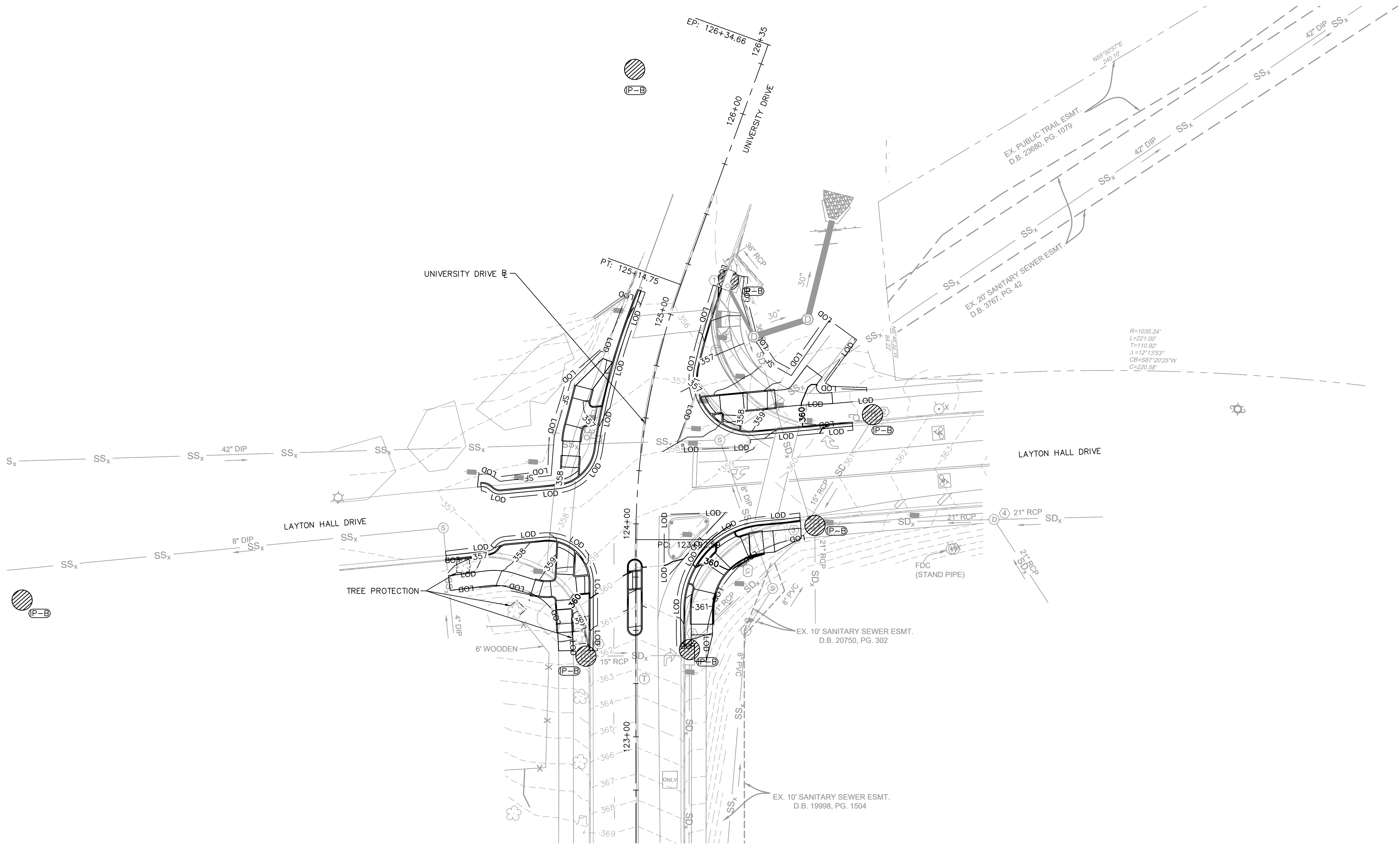


LEGEND

- INLET PROTECTION (NO. 3.07)
- SF SILT FENCE (NO. 3.05)
- TP TREE PROTECTION (NO. 3.38)
- LOD LIMITS OF DISTURBANCE
- LIMITS OF CONSTRUCTION IN FILL
- LIMITS OF CONSTRUCTION IN CUT
- STD. EC-6 TYPE B REQ'D

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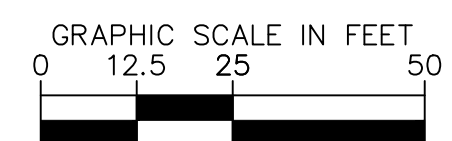
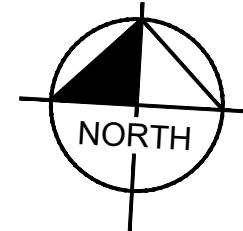
EROSION AND SEDIMENT CONTROL PLAN PHASE 2



LEGEND

- INLET PROTECTION (NO. 3.07)
- SF SILT FENCE (NO. 3.05)
- TP TREE PROTECTION (NO. 3.38)
- LOD LIMITS OF DISTURBANCE
- LIMITS OF CONSTRUCTION IN FILL
- LIMITS OF CONSTRUCTION IN CUT
- STD. EC-6 TYPE B REQ'D

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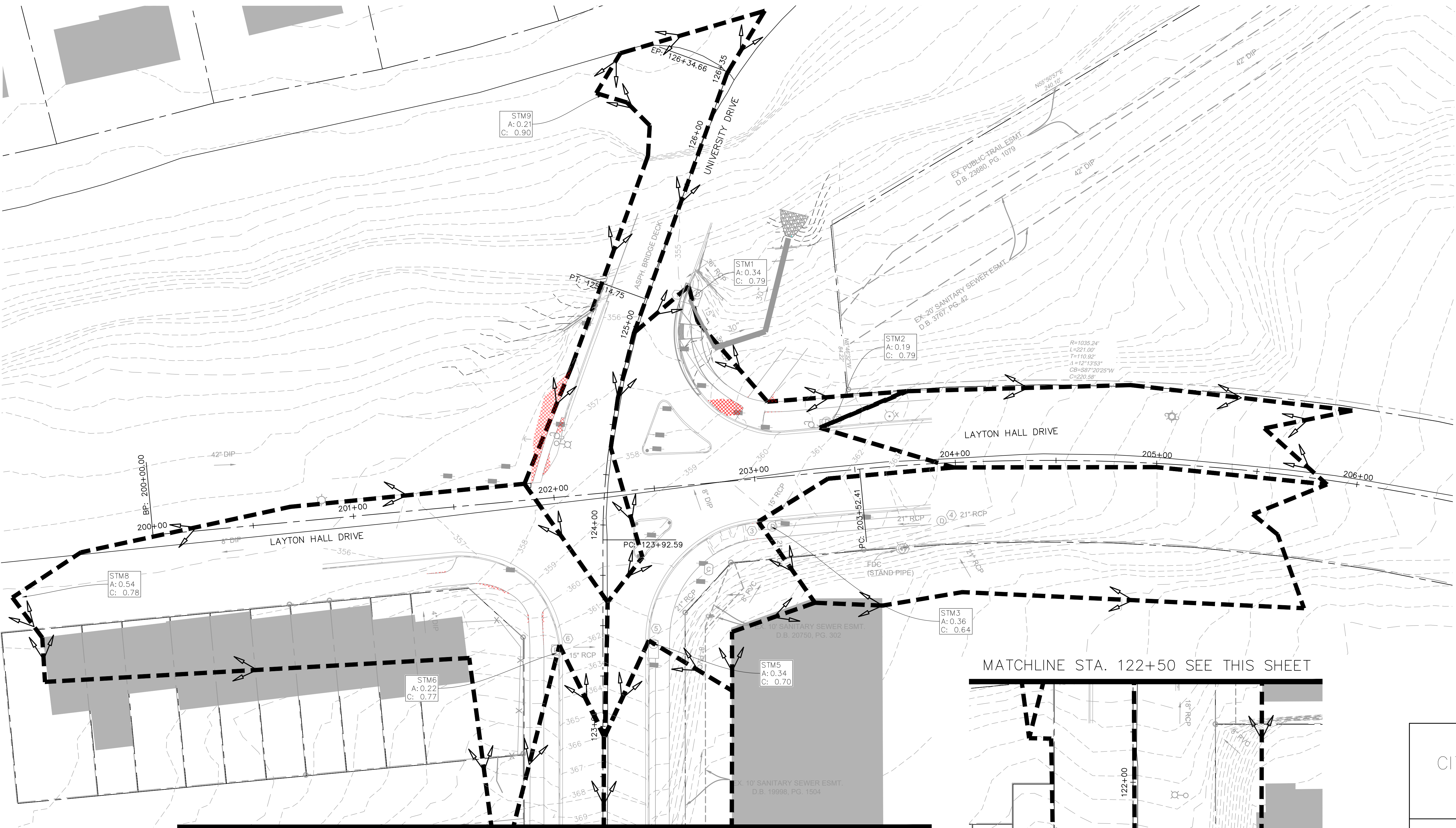
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UNIVERSITY DRIVE
BIKE LANES

UPC # 121556

SCALE SHEET
3B

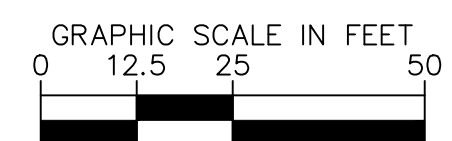
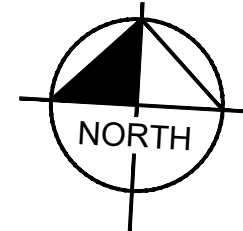
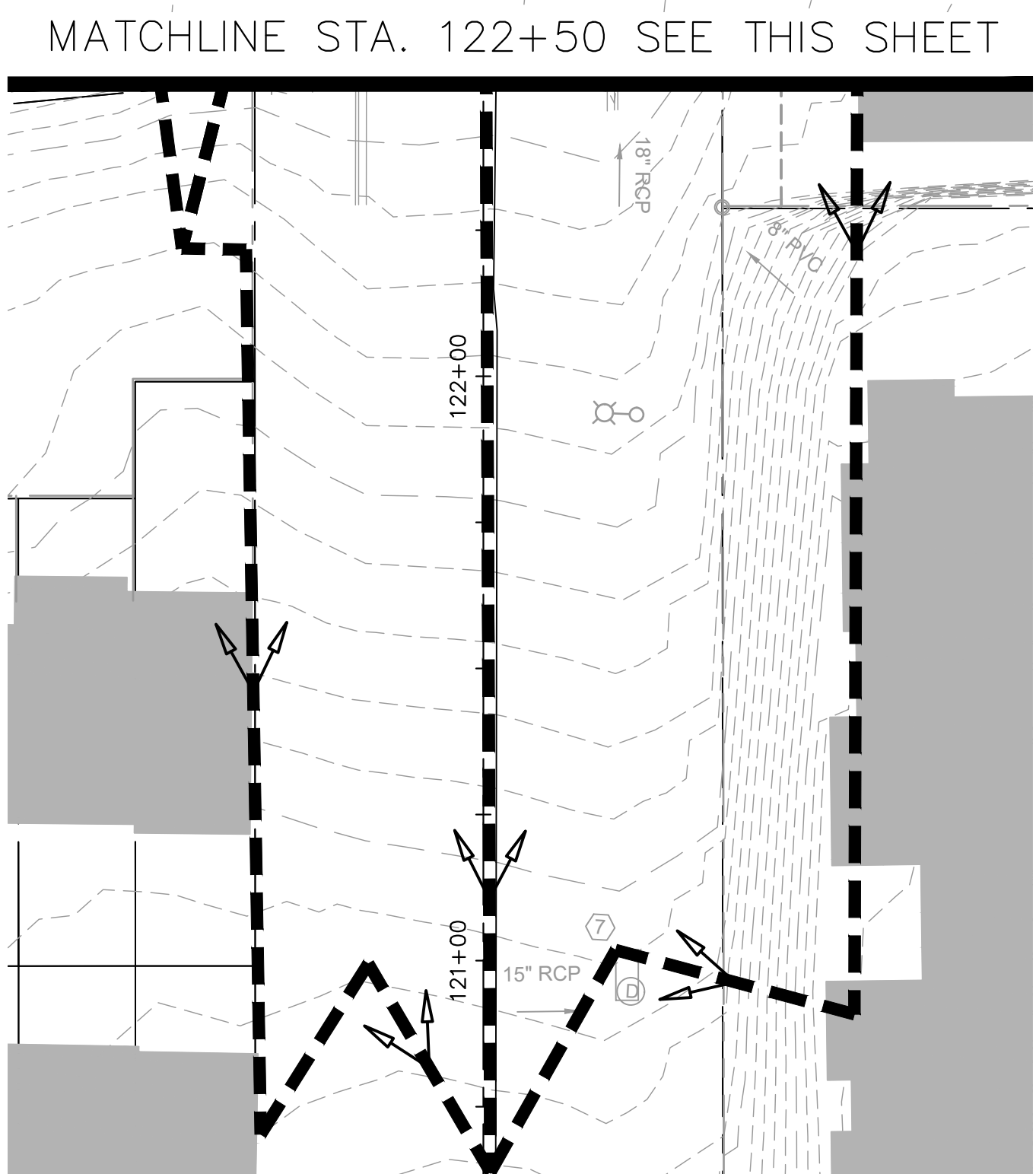
EXISTING DRAINAGE AREAS



LEGEND

- DRAINAGE DIVIDE BOUNDARY
- EXISTING CONTOUR (1FT INTERVAL)
- EXISTING MANAGED TURF

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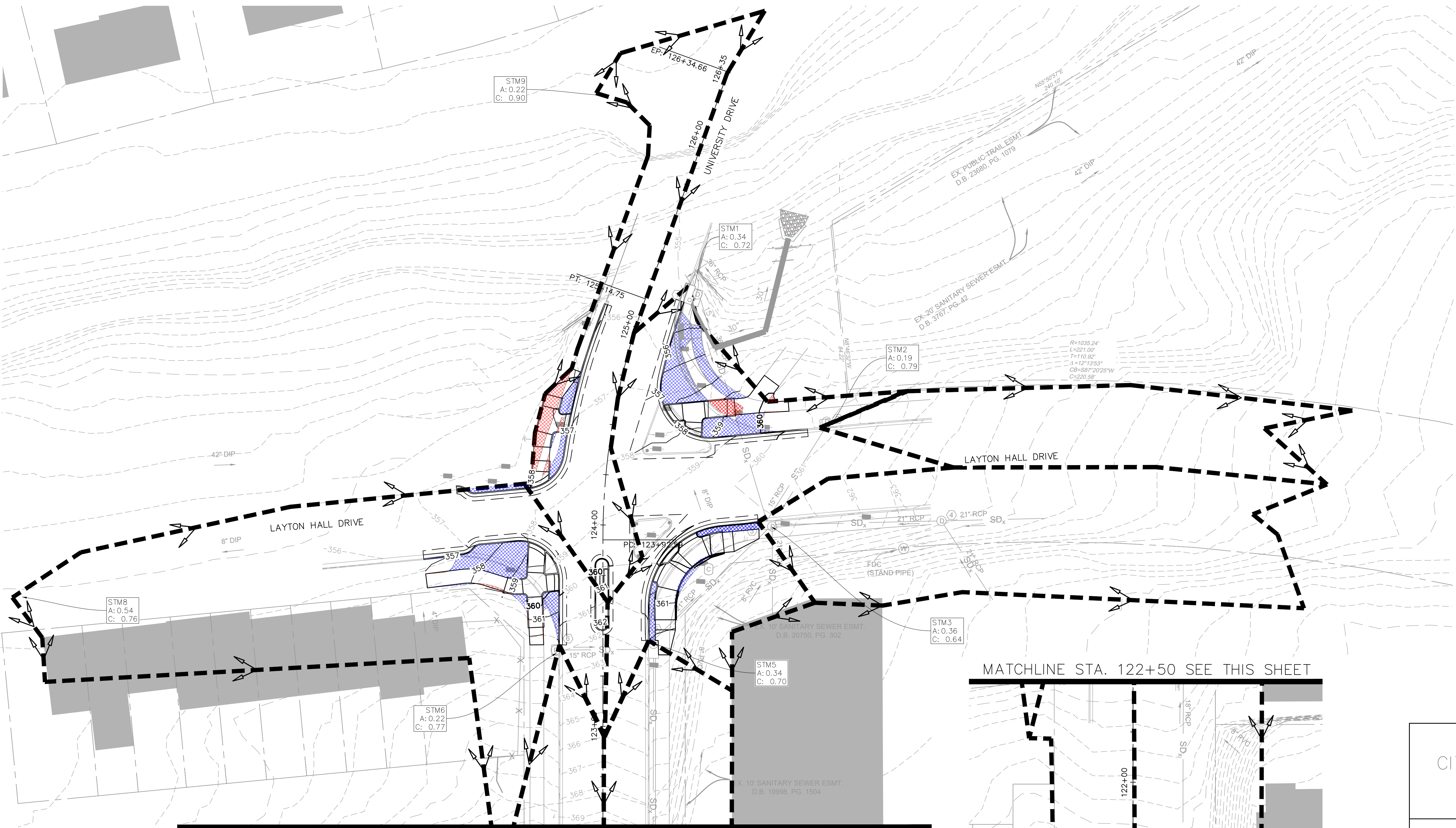
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SCALE

SHEET

4A

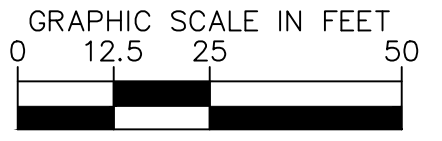
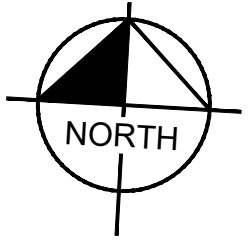
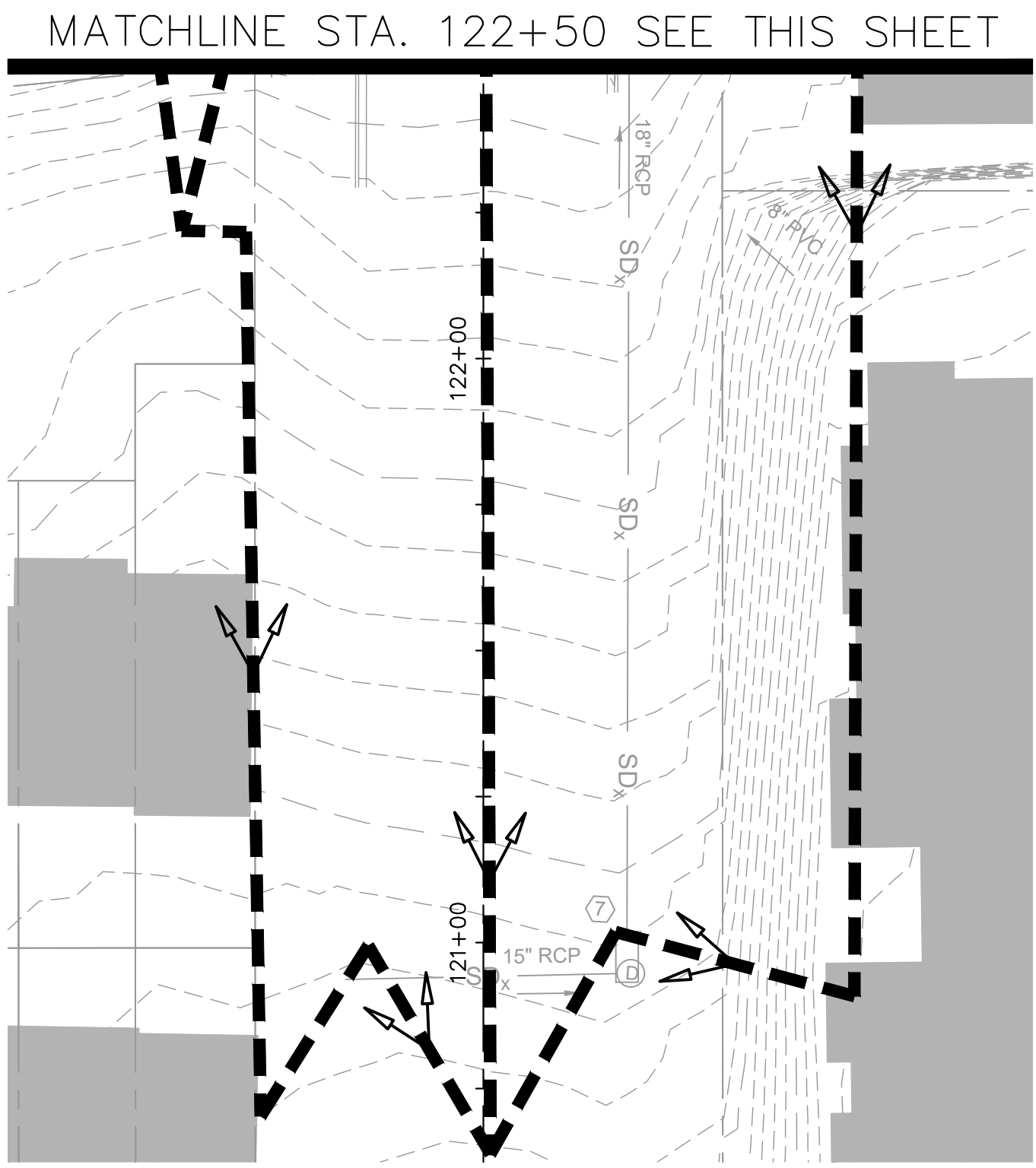
PROPOSED DRAINAGE AREAS



LEGEND

- DRAINAGE DIVIDE BOUNDARY
- PROPOSED CONTOUR (1FT INTERVAL)
- EXISTING CONTOUR (1FT INTERVAL)
- EXISTING MANAGED TURF
- PROPOSED MANAGED TURF

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BIKE LANES

UPC # 121556

SCALE
GRAPHIC SCALE IN FEET
0 12.5 25 50

SHEET
4B

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OUTFALL MAP



SCOPE OF WORK
THIS PROJECT INCLUDES RECONSTRUCTION OF PEDESTRIAN RAMPS AND CONSTRUCTION OF A PEDESTRIAN REFUGE AT THE INTERSECTION OF UNIVERSITY DRIVE AND LAYTON HALL DRIVE, ALONG WITH RESURFACING AND RESTRIPIPING OF UNIVERSITY DRIVE BETWEEN SOUTH STREET AND KENMORE DRIVE TO PROVIDE BIKE LANES. DISTURBED AREA CONSISTS ONLY OF THE PROJECT AREA IMMEDIATELY SURROUNDING THE UNIVERSITY DRIVE AND LAYTON HALL DRIVE INTERSECTION, THEREFORE ONLY THIS AREA IS CONSIDERED IN STORMWATER ANALYSIS.

EXISTING SITE CONDITIONS
THE PROJECT SITE CONSISTS OF AN URBAN FOUR-LEG INTERSECTION WITH PEDESTRIAN CURB RAMPS OF VARIOUS TYPES AND CONDITION. TWO RIGHT TURN SLIP LANES ARE INCLUDED IN THIS INTERSECTION. MANAGED TURF AND LIMITED LANDSCAPING SURROUND THE INTERSECTION.

VSMP PERMIT
BASED ON THE NATURE OF THE PROPOSED WORK AND THE RESULTING IMPACTS, A VSMP PERMIT IS NOT REQUIRED, AS LESS THAN ONE ACRE OF AREA (0.06 ACRES) IS PROPOSED TO BE DISTURBED AS PART OF THE PROJECT.

STORMWATER MANAGEMENT NARRATIVE
THE PROPOSED IMPROVEMENTS UTILIZE TECHNICAL CRITERIA OF PART IIB (9VAC25-870-62) FOR DETERMINING ITS POST-DEVELOPMENT STORMWATER MANAGEMENT DESIGN. USING THE DEQ RUNOFF REDUCTION SPREADSHEET FOR REDEVELOPMENT (VERSION 4.1), THE TOTAL PHOSPHORUS LOAD REDUCTION REQUIRED WAS FOUND TO BE 0.01 LB/YR, AND THE POST-REDEVELOPMENT TREATMENT VOLUME WAS FOUND TO BE 80 CF AS SHOWN ON SHEET 4A(2). THE PROJECT DISTURBED AREA IS 0.06 ACRES. IN THE EXISTING CONDITION, 0.05 ACRES ARE IMPERVIOUS AND 0.01 ACRES ARE MANAGED TURF. IN THE PROPOSED CONDITION, 0.05 ACRES ARE MANAGED TURF AND 0.01 ACRES ARE IMPERVIOUS. THE PROJECT REDUCES IMPERVIOUS AREA WITHIN THE DISTURBED AREA BY 0.04 ACRES. THE WATER QUALITY REQUIREMENT WILL BE MET THROUGH THE INSTALLATION OF A HYDRODYNAMIC SEPARATOR IN THE EXISTING STRUCTURE AT OUTFALL #1.

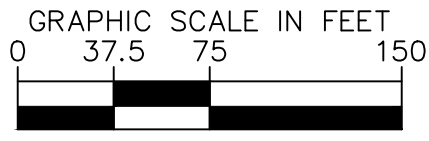
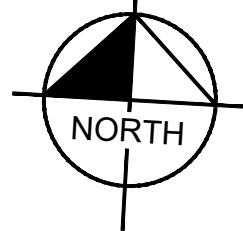
ADEQUATE OUTFALL COMPUTATIONS AND NARRATIVE

ADEQUATE OUTFALL COMPUTATIONS							
	PRE-DEV C	POST-DEV C	INTENSITY (IN/HR)	AREA (AC)	10-YR PRE-DEV RUNOFF (CFS)	10-YR POST-DEV RUNOFF (CFS)	CHANGE IN RUNOFF (CFS)
OUTFALL #1	0.87	0.87	6.77	16.31	96.06	96.06	0.00
OUTFALL #2	0.78	0.78	6.77	0.54	2.85	2.85	0.00
OUTFALL #3	0.89	0.89	6.77	1.27	1.27	1.27	0.00

THE PROPOSED PROJECT WILL NOT RESULT IN A NET INCREASE OR DECREASE OF RUNOFF DURING THE 10-YEAR STORM FOR ANY OF THE AFFECTED OUTFALLS. ADDITIONALLY, A 10-YEAR STORM EVENT WAS USED TO CALCULATE SPREADS AS DEPICTED ON SHEET 4A(1), WHICH HAVE BEEN REDUCED AT ALL OF THE EXISTING INLETS IN THE PROJECT AREA. STORMWATER WILL BE CONTAINED WITHIN THE EXISTING PIPES AND STORM SEWER SYSTEM WITHOUT DOWN-GRADIENT EROSION OR FLOODING, THEREFORE SATISFYING MINIMUM STANDARD 19 SUBSECTION B.

- LEGEND**
- OUTFALL BOUNDARY
 - EXISTING CONTOUR (1FT INTERVAL)
 - PROPOSED CONTOUR (1FT INTERVAL)
 - PROJECT AREA
 - IMPERVIOUS AREA

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Revisions	Date

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DRAWN BY: NS
CHECKED BY: MEW

CITY OF FAIRFAX, VA
DEPARTMENT OF PUBLIC WORKS

UNIVERSITY DRIVE
BIKE LANES

UPC # 121556

SCALE

SHEET

4C

D-204	Rev. 6-85		PROJ # <u>EN22-151-221</u>		PROJ <u>University Drive Bike Lanes</u>		DATE <u>March 28, 2024</u>		DESIGNED/CHECKED <u>Nasima Sadr/Derik Doughty, P.E.</u>																											Sag Inlets Only		
INLET			STATION	DRAINAGE AREA (AC)	C	CA	sum CA	I (IN/HR)	Q INCR (CFS)	Q _b , CARRYOVER (CFS)	Q _T , GUTTER FLOW (CFS)	S _i , GUTTER SLOPE (FT/FT)	S _X , CROSS SLOPE (FT/FT)	T, SPREAD (FT)	W (FT)	W/T	S _w , (FT/FT)	S _w /S _X	E ₀	a = 12W(S _w - S _X)*Local Depression	S' _w = a/(12w)	S _e = S _X + S' _w (E ₀), (FT/FT)	COMPUTED LENGTH, L _T , (FT)	L, SPECIFIED LENGTH (FT)	L/L _T	E	Q _i , INTERCEPTED (CFS)	Q _b , CARRYOVER (CFS)	d (FT)	h (FT)	d/h	T, SPREAD @ SAG (FT)						
NUMBER	TYPE	LENGTH (FT)																																				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)						
INLETS - ON GRADE																																						
STM1	Existing	8	108+00	0.34	0.79	0.269	0.269	4.0	1.074	0.243	1.317	0.0102	0.0485	4.72	2.0	0.42	0.0833	1.72	0.82	2.84	0.118	0.145	7	8	1.14	1.00	1.32	0.000	0.299									
STM2	Existing	4	108+75	0.19	0.79	0.150	0.150	4.0	0.600	0.000	0.600	0.0487	0.0383	1.84	2.0	1.09	0.0833	2.18	1.00	3.08	0.128	0.167	8	4	0.50	0.71	0.43	0.172	0.153									
STM3	Existing	8	111+25	0.36	0.64	0.230	0.230	4.0	0.922	0.000	0.922	0.0510	0.0328	2.03	2.0	0.99	0.0833	2.54	1.00	3.21	0.134	0.167	9	8	0.89	0.98	0.90	0.018	0.168									
STM5	Existing	8	118+50	0.34	0.70	0.238	0.238	4.0	0.952	0.000	0.952	0.0777	0.0296	1.93	2.0	1.04	0.0833	2.82	1.00	3.29	0.137	0.167	10	8	0.80	0.94	0.90	0.053	0.161									
STM6	Existing	8	122+25	0.22	0.77	0.169	0.169	4.0	0.678	0.000	0.678	0.0863	0.0299	1.66	2.0	1.20	0.0833	2.79	1.00	3.28	0.137	0.167	9	8	0.89	0.98	0.66	0.013	0.139									
STM8	Existing	8	122+50	0.54	0.78	0.421	0.421	4.0	1.685	0.013	1.698	0.0107	0.0363	0.56	2.0	3.57	0.0833	2.30	1.00	3.13	0.130	0.167	7	8	1.14	1.00	1.70	0.000	0.047									
STM9	Existing	4	106+20	0.22	0.79	0.174	0.174	4.0	0.695	0.000	0.695	0.0200	0.0200	0.19	2.0	10.58	0.0																					

LD-204 Stormwater Inlet Computations - Proposed																																			
LD-204 Rev. 6-85			PROJ # EN22-151-221			PROJ University Drive Bike Lanes			DATE March 29, 2024 DESIGNED/CHECKED Nasima Sadr/Derik Doughty, P.E.																										
INLET			STATION	DRAINAGE AREA (AC)	C	CA	sum CA	I (IN/HR)	Q INCR (CFS)	Q _b , CARRYOVER (CFS)	Q _r , GUTTER FLOW (CFS)	S, GUTTER SLOPE (FT/FT)	S _x , CROSS SLOPE (FT/FT)	T, SPREAD (FT)	W (FT)	W/T	S _{wr} , (FT/FT)	S _w /S _x	E ₀	a = 12W(S _w - S _x)+Local Depression	S' _w = a/(12w)	S _e = S _x + S' _w (E ₀), (FT/FT)	COMPUTED LENGTH, L _r , (FT)	L, SPECIFIED LENGTH (FT)	L/L _r	E	Q _i , INTERCEPTED (CFS)	Q _b , CARRYOVER (CFS)	d (FT)	h (FT)	d/h	T, SPREAD @ SAG (FT)	Sag Inlets Only		
NUMBER	TYPE	LENGTH (FT)																																	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)			
INLETS - ON GRADE																																			
STM1	Existing	8	108+00	0.34	0.72	0.245	0.245	4.0	0.979	0.243	1.222	0.0102	0.0485	4.72	2.0	0.42	0.0833	1.72	0.82	2.84	0.118	0.145	7	8	1.14	1.00	1.22	0.000	0.299						
STM2	Existing	4	108+75	0.19	0.79	0.150	0.150	4.0	0.600	0.000	0.600	0.0487	0.0383	1.84	2.0	1.09	0.0833	2.18	1.00	3.08	0.128	0.167	8	4	0.50	0.71	0.43	0.172	0.153						
STM3	Existing	8	111+25	0.36	0.64	0.230	0.230	4.0	0.922	0.000	0.922	0.0510	0.0328	2.03	2.0	0.99	0.0833	2.54	1.00	3.21	0.134	0.167	9	8	0.89	0.98	0.90	0.018	0.168						
STM5	Existing	8	118+50	0.34	0.70	0.238	0.238	4.0	0.952	0.000	0.952	0.0777	0.0296	1.93	2.0	1.04	0.0833	2.82	1.00	3.29	0.137	0.167	10	8	0.80	0.94	0.90	0.053	0.161						
STM6	Existing	8	122+25	0.22	0.77	0.169	0.169	4.0	0.678	0.000	0.678	0.0863	0.0299	1.66	2.0	1.20	0.0833	2.79	1.00	3.28	0.137	0.167	9	8	0.89	0.98	0.66	0.013	0.139						
STM8	Existing	8	122+50	0.54	0.76	0.410	0.410	4.0	1.642	0.013	1.655	0.0107	0.0363	0.56	2.0	3.57	0.0833	2.30	1.00	3.13	0.130	0.167	7	8	1.14	1.00	1.65	0.000	0.047						
STM9	Existing	4	106+20	0.22	0.90	0.198	0.198	4.0	0.792	0.000	0.792	0.0200	0.0200	0.19	2.0	10.58	0.0833	4.17	1.00	3.52	0.147	0.167	7	4	0.57	0.78	0.62	0.172	0.016						

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SCALE

N/A

SHEET

4D(1)

DRAINAGE CALCULATIONS

VIRGINIA RUNOFF REDUCTION METHOD RE-DEVELOPMENT COMPLIANCE SPREADSHEET

DEQ Virginia Runoff Reduction Method Re-Development Compliance Spreadsheet - Version 4.1

Project Name: University Drive Bike Lanes
Date: 5/6/2024
Linear Development Project? Yes

CLEAR ALL
(Ctrl+Shift+R)

data input cells
constant values
calculation cells
final results

Site Information

Post-Development Project (Treatment Volume and Loads)
Enter Total Disturbed Area (acres) → 0.06

Check: TRUE
BMP Design Specifications List: 2024 Stds & Specs
Linear project? Yes
Land cover areas entered correctly? ✓
Total disturbed area entered? ✓

Maximum reduction required: 20%
The site's net increase in impervious cover (acres) is: 0
Post-Development TP Load Reduction for Site (lb/yr): 0.01

Pre-ReDevelopment Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest (acres) – undisturbed, protected forest or reforested land					0.00
Mixed Open (acres) – undisturbed/frequently maintained grass or shrub land					0.00
Managed Turf (acres) – disturbed, graded for yards or other turf to be mowed/managed				0.01	0.01
Impervious Cover (acres)				0.05	0.05
					0.06

Post-Development Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) – undisturbed, protected forest or reforested land					0.00
Mixed Open (acres) – undisturbed/frequently maintained grass or shrub land					0.00
Managed Turf (acres) – disturbed, graded for yards or other turf to be mowed/managed				0.05	0.05
Impervious Cover (acres)				0.01	0.01
Area Check	OK	OK	OK	OK	0.06

Post-Development Requirement for Site Area
TP Load Reduction Required (lb/yr) 0.01
Linear Project TP Load Reduction Required (lb/yr): 0.01

Nitrogen Loads (Informational Purposes Only)
Pre-ReDevelopment TN Load (lb/yr) 0.71
Final Post-Development TN Load 0.57

LAND COVER SUMMARY – PRE-REDEVELOPMENT

Land Cover Summary-Pre		
Pre-ReDevelopment	Listed	Adjusted ¹
Forest Cover (acres)	0.00	0.00
Weighted Rv(forest)	0.00	0.00
Weighted Loading Rate(forest)	0.00	0.00
% Forest	0%	0%
Mixed Open Cover (acres)	0.00	0.00
Weighted Rv(mixed)	0.00	0.00
Weighted Loading Rate(mixed)	0.00	0.00
% Mixed Open	0%	0%
Managed Turf Cover (acres)	0.01	0.01
Weighted Rv(turf)	0.25	0.25
Weighted Loading Rate(turf)	0.85	0.85
% Managed Turf	17%	17%
Impervious Cover (acres)	0.05	0.05
Rv(impervious)	0.95	0.95
Weighted Loading Rate(impervious)	0.86	0.86
% Impervious	83%	83%
Total Site Area (acres)	0.06	0.06
Site Rv	0.83	0.83

Treatment Volume and Nutrient Load

Pre-ReDevelopment Treatment Volume (acre-ft)	0.0042	0.0042
Pre-ReDevelopment Treatment Volume (cubic feet)	182	182
Pre-ReDevelopment TP Load (lb/yr)	0.05	0.05
Pre-ReDevelopment TP Load per acre (lb/acre/yr)	0.86	0.86
Baseline TP Load (lb/yr) (0.26 lb/acre/yr applied to pre-redevelopment area excluding pervious land proposed for new impervious cover)		0.02

LAND COVER SUMMARY – POST DEVELOPMENT

Land Cover Summary-Post (Final)		
Post ReDev. & New Impervious		
Forest Cover (acres)	0.00	
Weighted Rv(forest)	0.00	
Wgt. Ld. Rate(forest)	0.00	
% Forest	0%	
Mixed Open Cover (acres)	0.00	
Weighted Rv(mixed)	0.00	
Wgt. Ld. Rate(mixed)	0.00	
% Mixed Open	0%	
Managed Turf Cover (acres)	0.05	
Weighted Rv(turf)	0.25	
Wgt. Ld. Rate(turf)	0.85	
% Managed Turf	93%	
Impervious Cover (acres)	0.01	
Rv(impervious)	0.95	
Wgt. Ld. Rate(imperv.)	0.86	
% Impervious	17%	
Total ReDev. Site Area (acres)	0.06	
ReDev Site Rv	0.37	

Treatment Volume and Nutrient Load

Post-ReDevelopment Treatment Volume (acre-ft)	0.0018	
Post-ReDevelopment Treatment Volume (cubic feet)	80	
Post-ReDevelopment TP Load (lb/yr)	0.05	
Post-ReDevelopment TP Load per acre (lb/acre/yr)	0.85	
Max. Reduction Required (Below Pre-ReDevelopment Load)	20%	
TP Load Reduction Required for Redeveloped Area (lb/yr)	0.01	

LAND COVER SUMMARY-Post
Post-Development New Impervious
New Impervious Cover (acres) 0.00
Rv(impervious) --

Post-Development Treatment Volume (acre-ft) --
Post-Development Treatment Volume (cubic feet) --
Post-Development TP Load (lb/yr) --

TP Load Reduction Required for New Impervious Area (lb/yr) 0

VRRM BEST MANAGEMENT PRACTICES

Drainage Area A

VRRM 4.1, 2024

Drainage Area A Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv	Composite Loading P
Forest (acres)					0.00	0.00	0.00
Mixed Open (acres)					0.00	0.00	0.00
Managed Turf (acres)				0.02	0.02	0.25	0.85
Impervious Cover (acres)				0.01	0.01	0.95	0.86
Total					0.03		

CLEAR BMP AREAS

Total Phosphorus Available for Removal in D.A. A (lb/yr) 0.03
Post Development Treatment Volume in D.A. A (ft³) 53

Stormwater Best Management Practices (RR = Runoff Reduction)
--Select from dropdown lists--

Practice	Runoff Reduction Credit (%)	Mixed Open Credit Area (acres)	Managed Turf Credit Area (acres)	Impervious Cover Credit Area (acres)	Volume from Upstream Practice (ft ³)	Runoff Reduction (ft ³)	Remaining Runoff Volume (ft ³)	Total BMP Treatment Volume (ft ³)	Phosphorus Removal Efficiency (%)	Phosphorus Load from Upstream Practices (lb)	Untreated Phosphorus Load to Practice (lb)	Phosphorus Removed By Practice (lb)	Remaining Phosphorus Load (lb)	Downstream Practice to be Employed
16. Manufactured Treatment Devices (no RR)														
16.a. Manufactured Treatment Device-Hydrodynamic	0		0.02	0.01	0	0	53	53	20	0.00	0.03	0.01	0.02	
16.b. Manufactured Treatment Device-Filtering	0				0	0	0	0	20	0.00	0.00	0.00	0.00	
16.c. Manufactured Treatment Device-Generic	0				0	0	0	0	20	0.00	0.00	0.00	0.00	

TOTAL IMPERVIOUS COVER TREATED (ac) 0.01
TOTAL MIXED OPEN TREATED (ac) 0.00
TOTAL MANAGED TURF AREA TREATED (ac) 0.02

AREA CHECK: OK
AREA CHECK: OK
AREA CHECK: OK

TOTAL PHOSPHORUS REMOVAL REQUIRED ON SITE (lb/yr) 0.00

TOTAL PHOSPHORUS AVAILABLE FOR REMOVAL IN D.A. A (lb/yr) 0.03
TOTAL PHOSPHORUS REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr) 0.01
TOTAL PHOSPHORUS REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr) 0.00
TOTAL PHOSPHORUS LOAD REDUCTION ACHIEVED IN D.A. A (lb/yr) 0.01
TOTAL PHOSPHORUS REMAINING AFTER APPLYING BMP LOAD REDUCTIONS IN D.A. A (lb/yr) 0.02

SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS

NITROGEN REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr) 0.00
NITROGEN REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr) 0.00
TOTAL NITROGEN REMOVED IN D.A. A (lb/yr) 0.00

Site Results (Water Quality Compliance) VRRM 4.1, 2024

Area Checks

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	AREA CHECK
FOREST (ac)	0.00	0.00	0.00	0.00	0.00	OK
MIXED OPEN (ac)	0.00	0.00	0.00	0.00	0.00	OK
MIXED OPEN AREA TREATED(ac)	0.00	0.00	0.00	0.00	0.00	OK
MANAGED TURF AREA (ac)	0.02	0.00	0.00	0.00	0.00	OK
MANAGED TURF AREA TREATED (ac)	0.02	0.00	0.00	0.00	0.00	OK
IMPERVIOUS COVER (ac)	0.01	0.00	0.00	0.00	0.00	OK
IMPERVIOUS COVER TREATED (ac)	0.01	0.00	0.00	0.00	0.00	OK
AREA CHECK	OK	OK	OK	OK	OK	

Site Treatment Volume (ft³) 80

Runoff Reduction Volume and TP By Drainage Area

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	TOTAL
RUNOFF REDUCTION VOLUME ACHIEVED (ft ³)	0	0	0	0	0	0
TP LOAD AVAILABLE FOR REMOVAL (lb/yr)	0.03	0.00	0.00	0.00	0.00	0.03
TP LOAD REDUCTION ACHIEVED (lb/yr)	0.01	0.00	0.00	0.00	0.00	0.01
TP LOAD REMAINING (lb/yr)	0.02	0.00	0.00	0.00	0.00	0.02

NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	TOTAL
	0.00	0.00	0.00	0.00	0.00	0.00

Total Phosphorus

FINAL POST-DEVELOPMENT TP LOAD (lb/yr) --
TP LOAD REDUCTION REQUIRED (lb/yr) --
TP LOAD REDUCTION ACHIEVED (lb/yr) --
TP LOAD REMAINING (lb/yr) --
REMAINING TP LOAD REDUCTION REQUIRED (lb/yr): --

LINEAR PROJECT:
0.05
0.01
0.01
0.05
0.00
**No further TP load reduction required (Required - Achieved < 0.005 lb/yr)

Total Nitrogen (For Informational Purposes)
POST-DEVELOPMENT LOAD (lb/yr) 0.57
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr) 0.00
REMAINING POST-DEVELOPMENT NITROGEN LOAD (lb/yr) 0.57



CITY OF FAIRFAX

DEPARTMENT OF
PUBLIC WORKS

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Seal

Revisions

Date

DESIGNED BY: ATS

DRAWN BY: NS

CHECKED BY: MEW

CITY OF FAIRFAX, VA

DEPARTMENT OF PUBLIC WORKS

UNIVERSITY DRIVE
BIKE LANES

UPC # 121556

SCALE

N/A

SHEET

4D(2)

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DRAINAGE CALCULATIONS

EXISTING STORM DRAIN DESIGN CALCULATIONS



Storm Drain Design Calculations

Project: University Drive Bike Lanes
Project #: EN22-151-221
Date: 4/17/2024
Locality: City of Fairfax
10 -year storm
Manning n = 0.013

FROM POINT	TO POINT	DRAINAGE AREA	RUNOFF COEFFICIENT	CA		INLET TIME	RAINFALL	RUNOFF	INVERT ELEVATIONS		LENGTH	SLOPE	SIZE	PIPE CAPACITY	Q / Q _f	VELOCITY	FLOW TIME	
				inlet	accum				upper end	lower end							incr	accum
		acres	C			min	in/hr	cfs	ft	ft	ft	%	in	cfs	%	fps	min	
STM 6	STM 5	0.22	0.77	0.169	0.169	5.00	6.77	1.16	358.28	357.83	49	0.90%	15	6.21	19%	3.87	0.21	5.00
STM 2	STM 3	0.19	0.79	0.150	0.150	5.00	6.77	1.02	355.50	355.23	57	0.50%	15	4.45	23%	2.94	0.32	5.00
STM 3	STM 1	0.36	0.79	0.284	0.280	5.00	6.65	5.28	348.81	348.67	121	0.10%	36	22.67	23%	2.61	0.77	5.37
STM 5	STM 3	0.34	0.70	0.238	0.407	5.00	6.70	2.75	356.75	352.99	83	4.50%	21	33.66	8%	8.44	0.16	5.21

EXISTING HYDRAULIC GRADE LINE CALCULATIONS



Hydraulic Grade Line Calculations

Project: University Drive Bike Lanes
Project #: EN22-151-221
Date: 4/17/2024
Locality: City of Fairfax
10 -year storm

INLET	0.8D + INV (OUT)	ACTUAL OUTLET WSE	DESIGN OUTLET WSE	D _o	Q _o	L _o	S _{f_o}	H _f	JUNCTION LOSS											FINAL H	INLET WSE	F/L ELEV	
									V _o	H _o	Q _i	V _i	Q _i V _i	<div>$\frac{V_i^2}{2g}$</div>	H _i	Angle	H _Δ	H _t	1.3 H _t				0.5 H _t
(1)			(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)		(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
STM 3	351.07	351.07	351.07	36	5.28	121	0.0001	0.01	2.61	0.03	2.75	8.44	23.21	1.11	0.39	60	0.62	1.03	1.34	1.34	1.35	352.42	361.56
STM 5	354.39	352.42	354.39	21	2.75	83	0.0003	0.03	8.44	0.28	1.16	3.87	4.49	0.23	0.08	40	0.10	0.46	0.60	0.60	0.62	355.01	360.68
STM 6	358.83	355.01	358.83	15	1.16	49	0.0003	0.02	3.87	0.06	0.00	0.00	0.00	0.00	0.00	0	0.00	0.06	0.08	0.08	0.09	358.92	362.02
STM 2	356.23	352.42	356.23	15	1.02	57	0.0002	0.01	2.94	0.03	0.00	0.00	0.00	0.00	0.00	0	0.00	0.03	0.04	0.04	0.06	356.29	360.68

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DESIGNED BY: ATS
DRAWN BY: NS
CHECKED BY: MEW

CITY OF FAIRFAX, VA
DEPARTMENT OF PUBLIC WORKS

UNIVERSITY DRIVE
BIKE LANES

UPC # 121556

SCALE
N/A
SHEET
4D(3)

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DRAINAGE CALCULATIONS

PROPOSED STORM DRAIN DESIGN CALCULATIONS



Storm Drain Design Calculations

Project: University Drive Bike Lanes
Project #: EN22-151-221
Date: 4/17/2024
Locality: City of Fairfax
10 -year storm
Manning n = 0.013

FROM POINT	TO POINT	DRAINAGE AREA	RUNOFF COEFFICIENT	CA		INLET TIME	RAINFALL	RUNOFF	INVERT ELEVATIONS		LENGTH	SLOPE	SIZE	PIPE CAPACITY	Q / Q _f	VELOCITY	FLOW TIME	
				inlet	accum				upper end	lower end							incr	accum
		acres	C			min	in/hr	cfs	ft	ft	ft	%	in	cfs	%	fps	min	
STM 6	STM 5	0.22	0.77	0.169	0.169	5.00	6.77	1.16	358.28	357.83	49	0.90%	15	6.21	19%	3.87	0.21	5.00
STM 2	STM 3	0.19	0.79	0.150	0.150	5.00	6.77	1.02	355.50	355.23	57	0.50%	15	4.45	23%	2.94	0.32	5.00
STM 3	STM 1	0.36	0.72	0.259	0.260	5.00	6.65	5.28	348.81	348.67	121	0.10%	36	22.67	23%	2.61	0.77	5.37
STM 5	STM 3	0.34	0.70	0.238	0.407	5.00	6.70	2.75	356.75	352.99	83	4.50%	21	33.66	8%	8.44	0.16	5.21

PROPOSED HYDRAULIC GRADE LINE CALCULATIONS



Hydraulic Grade Line Calculations

Project: University Drive Bike Lanes
Project #: EN22-151-221
Date: 4/17/2024
Locality: City of Fairfax
10 -year storm

INLET	0.8D + INV (OUT)	ACTUAL OUTLET WSE	DESIGN OUTLET WSE	D _o	Q _o	L _o	S _{f_o}	H _f	JUNCTION LOSS											FINAL H	INLET WSE	F/L ELEV	
									V _o	H _o	Q _i	V _i	Q _i V _i	<div>$\frac{V_i^2}{2g}$</div>	H _i	Angle	H _Δ	H _t	1.3 H _t				0.5 H _t
(1)			(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)		(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
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STM 5	354.39	352.42	354.39	21	2.75	83	0.0003	0.03	8.44	0.28	1.16	3.87	4.49	0.23	0.08	40	0.10	0.46	0.60	0.60	0.62	355.01	360.68
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STM 2	356.23	352.42	356.23	15	1.02	57	0.0002	0.01	2.94	0.03	0.00	0.00	0.00	0.00	0.00	0	0.00	0.03	0.04	0.04	0.06	356.29	360.68



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Revisions	Date

DESIGNED BY: ATS
DRAWN BY: NS
CHECKED BY: MEW

CITY OF FAIRFAX, VA
DEPARTMENT OF PUBLIC WORKS

UNIVERSITY DRIVE
BIKE LANES

UPC # 121556

SCALE
N/A
SHEET
4D(4)

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SIGNING AND MARKING DETAILS

PROPOSED SIGNS

#	1	2	3	4	5	6	7	8	9	10	11	12
SHEET	6(2)	6(1)–6(3)	6(2),6(3)	6(1), 6(3)	6(1)	6(3)	6(1)	6(1), 6(3)	6(1), 6(3)	6(1)	6(2)	6(2)
SIGN												
MUTCD # SIZE	R1–1 36"X36"	R3–17 24"X18"	M4–14 24"X12"	R3–17BP 24"X12"	R4–4 36"X30"	W11–2 30"X30"	W16–7P(R) 24"X12"	W16–7P(L) 24"X12"	R4–11 30"X30"	R10–15 30"x30"	R3–9B 24"X36"	R3–7 36"X36"

SIGNING GENERAL NOTES:

- 1.ALL SIGNS AND PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF EACH OF THE FOLLOWING MANUALS OR THE MOST RECENT REVISION THEREOF:

A. MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)
B. THE VIRGINIA SUPPLEMENT TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES
C. THE VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE SPECIFICATIONS
D. THE VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE STANDARDS
2. ALL SIGNS AS NECESSARY OR DIRECTED BY VDOT SHALL BE INSTALLED IN ACCORDANCE WITH ST'D STP–1 WITH BREAKAWAY METAL POST. ALL SIGNS, AS NECESSARY OR DIRECTED BY FAIRFAX COUNTY, DESIGNATED TO BE RELOCATED, SHALL BE REINSTALLED IN SUCH A MANNER THAT THE RELOCATED SIGN COMPLIES WITH ST'D STP–1
3. THE CONTRACTOR SHALL STAKE ALL THE PROPOSED SIGN LOCATIONS AND RELOCATIONS FOR REVIEW AND APPROVAL BY VDOT PRIOR TO ANY INSTALLATION OR RELOCATION.
4. PROPOSED SIGN LOCATIONS ARE APPROXIMATE AND SHALL BE MODIFIED IN THE FIELD TO AVOID CONFLICTS WITH UNDERGROUND UTILITIES OR OTHER OBSTRUCTIONS AND TO COMPLY WITH STANDARDS REFERENCED IN SIGNAGE GENERAL NOTE 1. CONTRACTOR IS RESPONSIBLE FOR ANY DISRUPTIONS IN UTILITY SERVICE DUE TO DIGGING FOR SIGNAGE STRUCTURE. IF PROPOSED SIGNAGE WILL IMPACT UTILITY SERVICE, IT SHALL BE RELOCATED WITH THE APPROVAL OF FAIRFAX COUNTY AT NO ADDITIONAL COST.
5. CONTRACTOR MUST PROVIDE SHOP DRAWINGS FOR ALL NONSTANDARD SIGNS TO BE APPROVED BY VDOT. CONTRACTOR SHALL DESIGN SIGNS IN ACCORDANCE WITH THE CURRENT VDOT ROAD AND BRIDGE STANDARDS AND ANY SUBSEQUENT REVISIONS.
6. UNLESS OTHERWISE INDICATED ON PLANS, ALL BREAKAWAY SIGN STRUCTURES SHALL BE LOCATED WITHIN 25 FEET OF THE SIGN'S CURRENT FIELD LOCATION OR AS DIRECTED BY VDOT.
7. THE CONTRACTOR IS TO COORDINATE WITH VDOT FOR THE HANDLING OF ALL SALVAGED MATERIALS (SIGN PANELS, FRAMING MEMBERS AND MISCELLANEOUS HARDWARE).
8. THE VDOT NORTHERN VIRGINIA DISTRICT CAN BE CONTACTED AT 800–367–7623.

PAVEMENT MARKING GENERAL NOTES:

- 1.ALL SIGNS AND PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF EACH OF THE FOLLOWING MANUALS OR THE MOST RECENT REVISION THEREOF:

A. MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)
B. THE VIRGINIA SUPPLEMENT TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES
C. THE VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE SPECIFICATIONS
D. THE VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE STANDARDS
2. ALL PAVEMENT MARKINGS SHALL BE TYPE B, CLASS I, UNLESS OTHERWISE NOTED IN THE PAVEMENT MARKING LEGEND AND IN ACCORDANCE WITH VDOT ROAD AND BRIDGE STANDARDS AND VDOT ROAD AND BRIDGE SPECIFICATIONS.
3. ANY EXISTING PAVEMENT MARKINGS THAT CONFLICT WITH THE PROPOSED PAVEMENT MARKINGS SHALL BE COMPLETELY ERADICATED AND MILLED TO 2" DEPTH TO THE NEAREST LANE DIVIDE, AND REPLACED WITH SLURRY SEAL.
4. LIMITS OF PROPOSED PAVEMENT MARKINGS AND RAISED MARKERS ARE APPROXIMATE AND SHALL BE MODIFIED IN THE FIELD TO ENSURE THAT PROPOSED PAVEMENT MARKINGS AND RAISED MARKERS CONTINUE UNTIL EXISTING PAVEMENT MARKINGS CAN BE MATCHED.
5. ELONGATED ARROWS SHALL BE IN ACCORDANCE WITH MUTCD AND VDOT ROAD AND BRIDGE SPECIFICATIONS.
6. ANY CHANGES TO THE PAVEMENT MARKING PLAN AS SHOWN SHALL BE APPROVED BY VDOT
7. REFER TO APPROVED TRAFFIC SIGNAL PLAN FOR PROPER LOCATION OF STOP LINES AND CROSSWALKS WHEN APPLICABLE.
8. STOP BARS SHALL BE 24" IN WIDTH AND SHALL BE LOCATED AS SHOWN ON THE SIGNING AND MARKING PLANS.



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DEPARTMENT OF
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Revisions	Date
_____	_____
_____	_____
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_____	_____

DESIGNED BY: ATS
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CITY OF FAIRFAX, VA

DEPARTMENT OF PUBLIC WORKS

UNIVERSITY DRIVE
BIKE LANES

UPC # 121556

SCALE

N/A

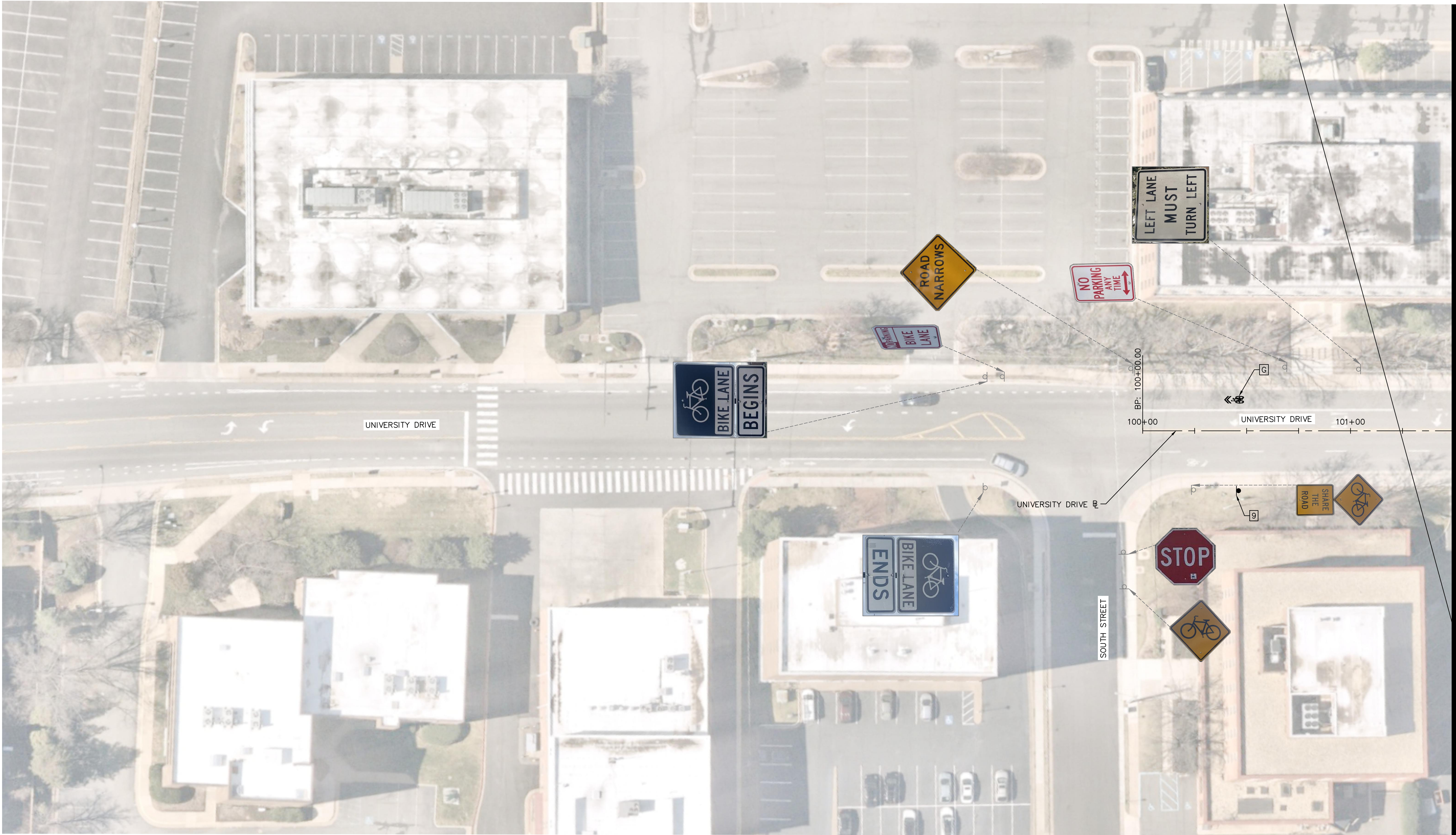
SHEET

5(1)

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SIGNING AND MARKING PLAN



MATCHLINE STA. 101+50 SEE SHEET 5(3)



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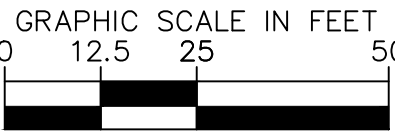
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CITY OF FAIRFAX, VA
DEPARTMENT OF PUBLIC WORKS

UNIVERSITY DRIVE
BIKE LANES

UPC # 121556

SCALE



SHEET

5(2)

- LEGEND**
- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING
4" WIDTH, SOLID
 - TYPE B, CLASS I, YELLOW PAVEMENT LINE MARKING
4" WIDTH, SOLID
 - NOT USED

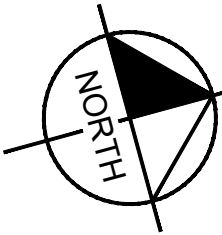
- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING
4" WIDTH, 2' LINE WITH 6' SPACE
- TYPE B, CLASS I, WHITE PAVEMENT BIKE DETECTION
MARKING
- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING
24" WIDTH, SOLID

- TYPE B, CLASS I, WHITE PAVEMENT ARROW MARKING,
MESSAGE MARKING, OR BIKE MARKING
- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING
4" WIDTH, 10' LINE WITH 30' SPACE
- TYPE B, CLASS I, YELLOW DOUBLE PAVEMENT LINE
MARKING 4" WIDTH, WITH 4" SPACING

- TYPE B, CLASS I, YELLOW PAVEMENT LINE MARKING
24" WIDTH, SOLID
- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING 6"
WIDTH, SOLID
- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING 6"
WIDTH, 2' LINE WITH 6' SPACING

- TYPE B, CLASS I, YELLOW DOUBLE PAVEMENT LINE
MARKING, 4" WIDTH, 4" SPACING, SOLID OUTSIDE LINE,
10' LINE WITH 30' SPACING INSIDE LINE
- BIKE LANE CONFLICT ZONE STRIPING

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MATCHLINE STA. 101+50 SEE SHEET 5(2)



MATCHLINE STA. 108+50 SEE SHEET 5(4)



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Revisions	Date

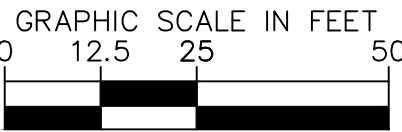
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DRAWN BY: NS
CHECKED BY: MEW

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UNIVERSITY DRIVE
BIKE LANES

UPC # 121556

SCALE



SHEET

5(3)

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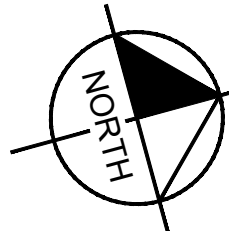
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 - NOT USED

- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING 4" WIDTH, 2' LINE WITH 6' SPACE
- TYPE B, CLASS I, WHITE PAVEMENT BIKE DETECTION MARKING
- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING 24" WIDTH, SOLID

- TYPE B, CLASS I, WHITE PAVEMENT ARROW MARKING, MESSAGE MARKING, OR BIKE MARKING
- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING 4" WIDTH, 10' LINE WITH 30' SPACE
- TYPE B, CLASS I, YELLOW DOUBLE PAVEMENT LINE MARKING 4" WIDTH, WITH 4" SPACING

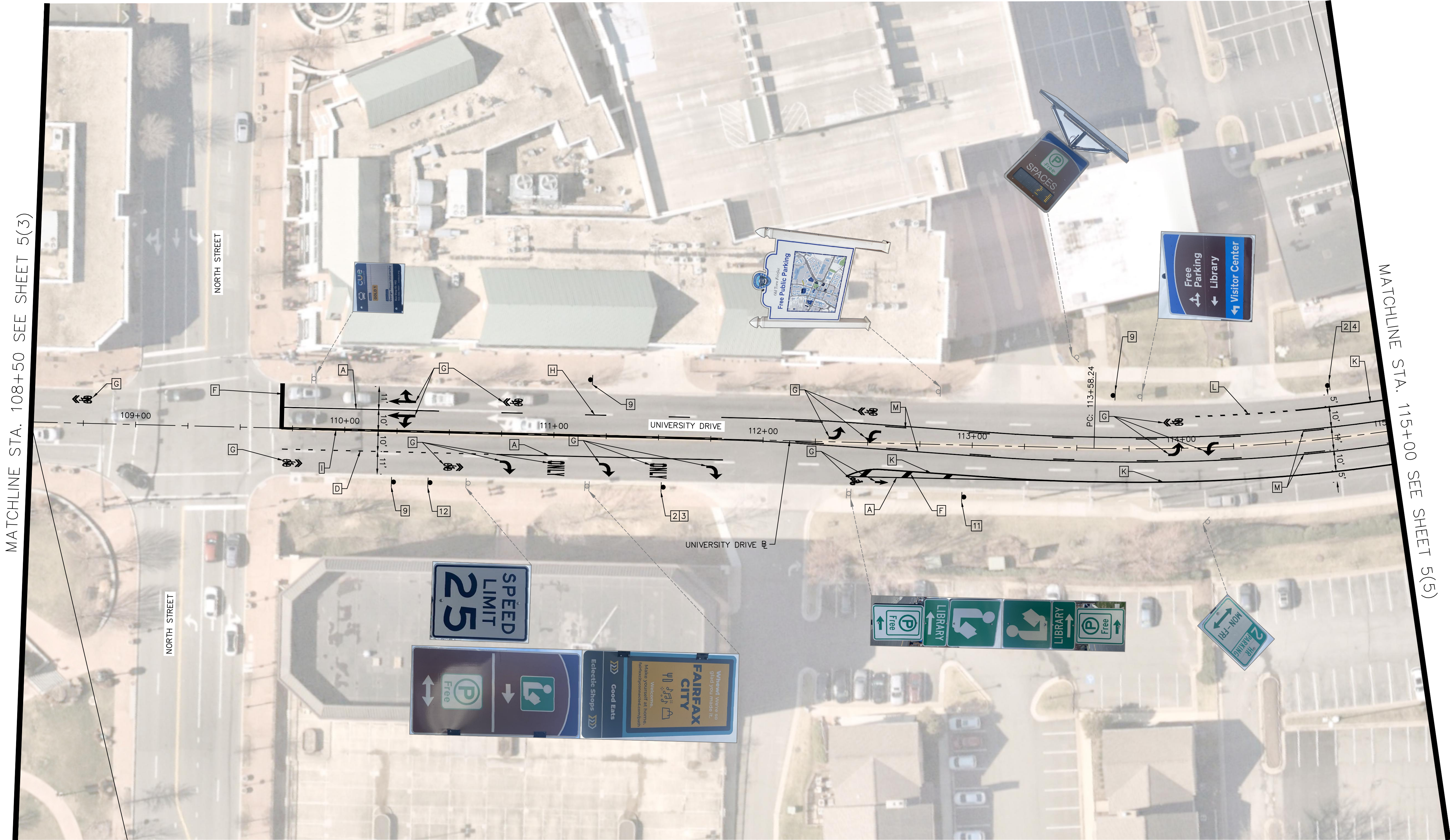
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- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING 6" WIDTH, SOLID
- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING 6" WIDTH, 2' LINE WITH 6' SPACING

- TYPE B, CLASS I, YELLOW DOUBLE PAVEMENT LINE MARKING, 4" WIDTH, 4" SPACING, SOLID OUTSIDE LINE, 10' LINE WITH 30' SPACING INSIDE LINE
- BIKE LANE CONFLICT ZONE STRIPING



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SIGNING AND MARKING PLAN



MATCHLINE STA. 108+50 SEE SHEET 5(3)

MATCHLINE STA. 115+00 SEE SHEET 5(5)



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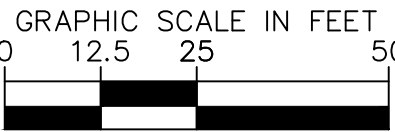
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DRAWN BY: NS
CHECKED BY: MEW

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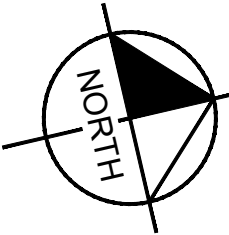
SHEET

5(4)

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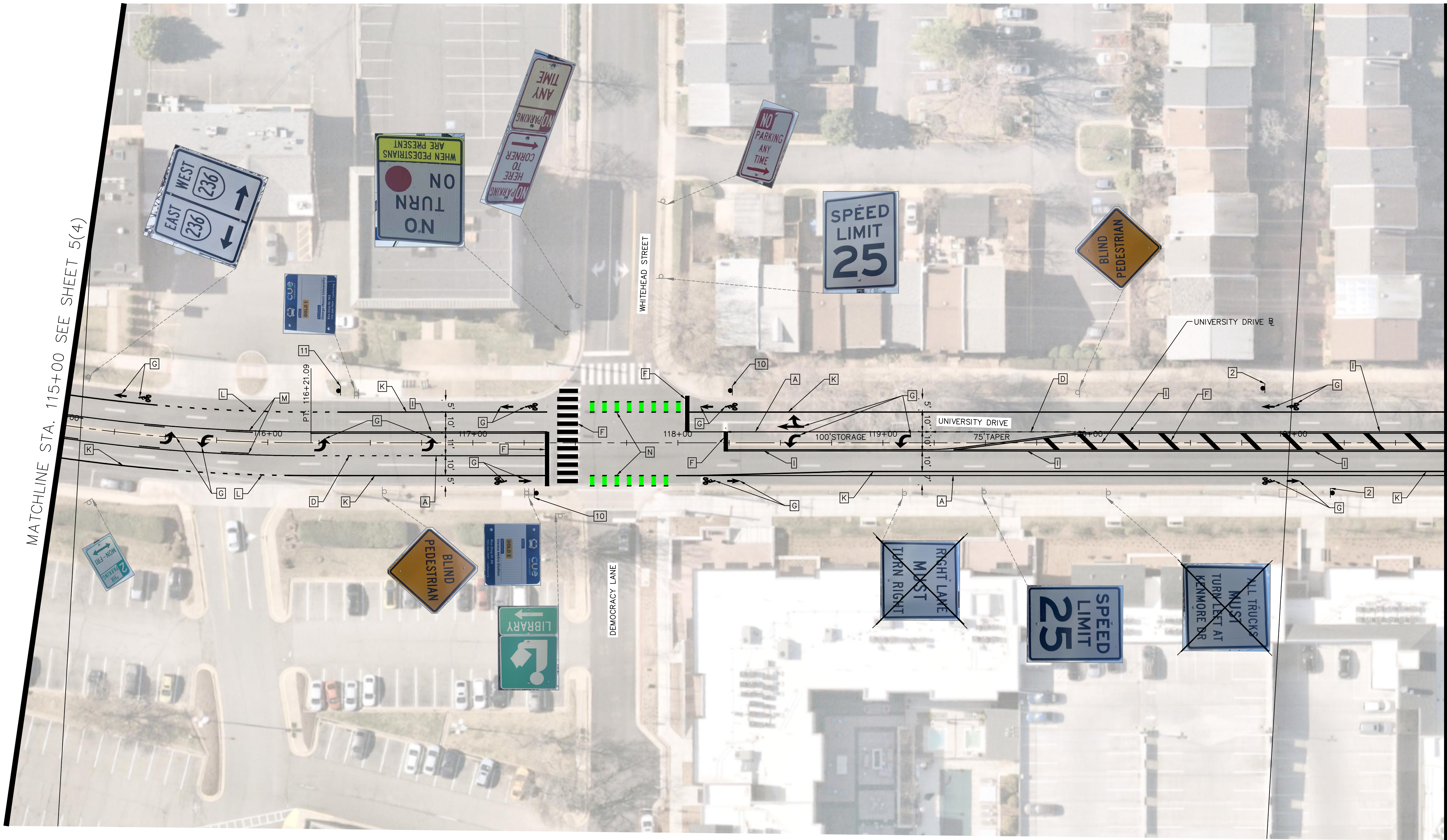
LEGEND

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SIGNING AND MARKING PLAN



MATCHLINE STA. 115+00 SEE SHEET 5(4)

MATCHLINE STA. 121+75 SEE SHEET 5(6)



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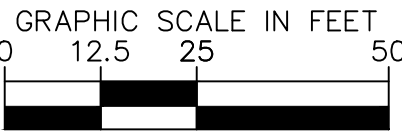
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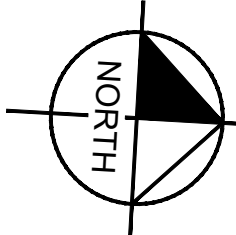
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5(5)

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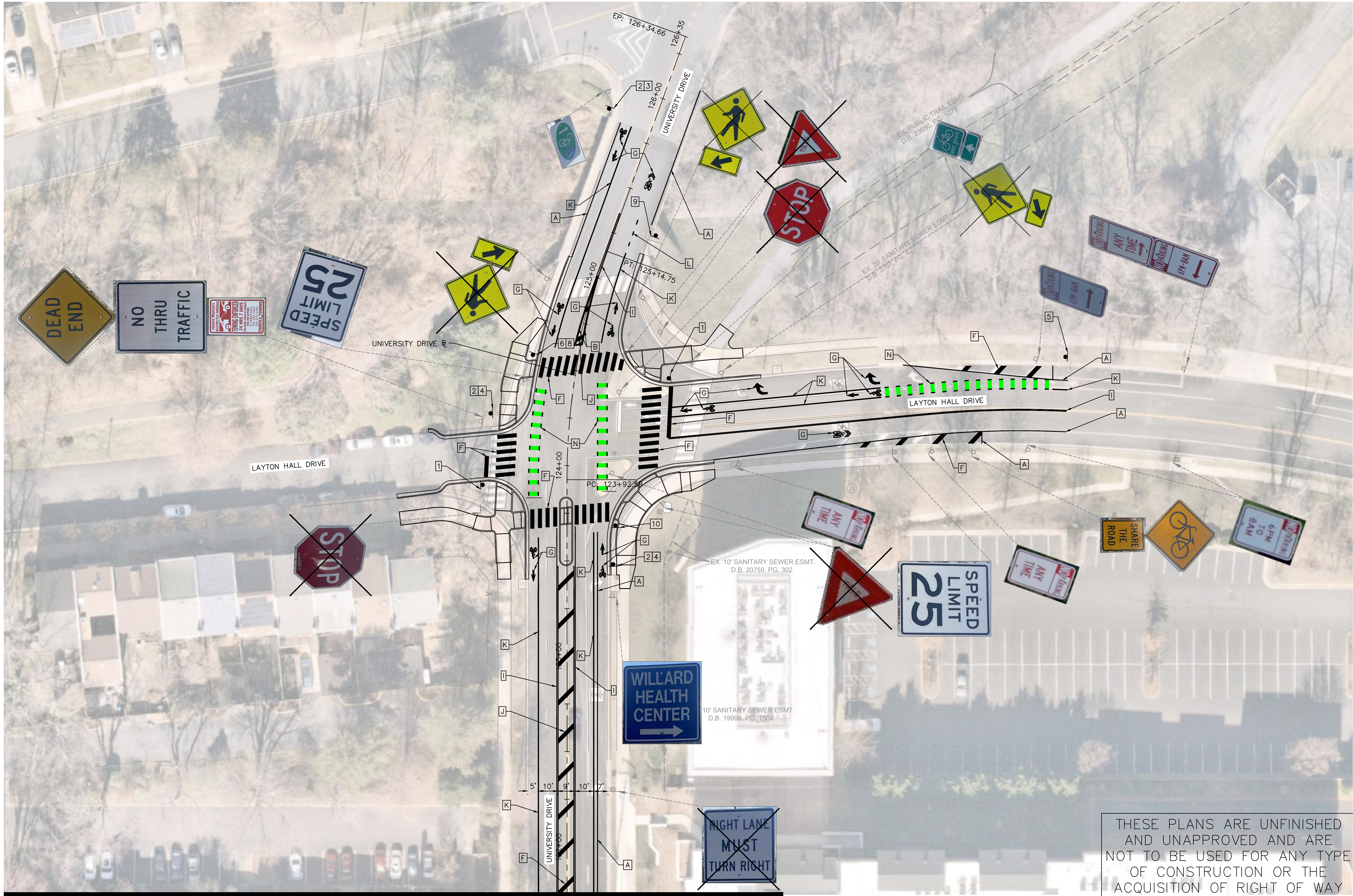
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- | | | | | |
|--|---|--|---|---|
| TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING
4" WIDTH, SOLID | TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING
4" WIDTH, 2' LINE WITH 6" SPACE | TYPE B, CLASS I, WHITE PAVEMENT ARROW MARKING,
MESSAGE MARKING, OR BIKE MARKING | TYPE B, CLASS I, YELLOW PAVEMENT LINE MARKING
24" WIDTH, SOLID | TYPE B, CLASS I, YELLOW DOUBLE PAVEMENT LINE
MARKING, 4" WIDTH, 4" SPACING, SOLID OUTSIDE LINE,
10' LINE WITH 30' SPACING INSIDE LINE |
| TYPE B, CLASS I, YELLOW PAVEMENT LINE MARKING
4" WIDTH, SOLID | TYPE B, CLASS I, WHITE PAVEMENT BIKE DETECTION
MARKING | TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING
4" WIDTH, 10' LINE WITH 30' SPACE | TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING 6"
WIDTH, SOLID | BIKE LANE CONFLICT ZONE STRIPING |
| NOT USED | TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING
24" WIDTH, SOLID | TYPE B, CLASS I, YELLOW DOUBLE PAVEMENT LINE
MARKING 4" WIDTH, WITH 4" SPACING | TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING 6"
WIDTH, 2' LINE WITH 6" SPACING | |



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SIGNING AND MARKING DETAILS



LEGEND

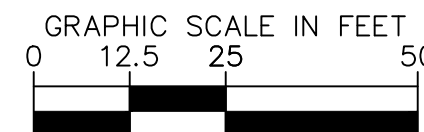
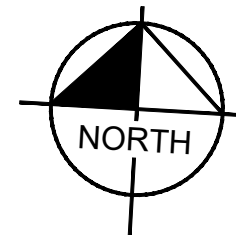
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- NOT USED

- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING 4" WIDTH, 2' LINE WITH 6' SPACE
- TYPE B, CLASS I, WHITE PAVEMENT BIKE DETECTION MARKING
- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING 24" WIDTH, SOLID

- TYPE B, CLASS I, WHITE PAVEMENT ARROW MARKING, MESSAGE MARKING, OR BIKE MARKING
- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING 4" WIDTH, 10' LINE WITH 30' SPACE
- TYPE B, CLASS I, WHITE DOUBLE PAVEMENT LINE MARKING 4" WIDTH, WITH 4" SPACING

- TYPE B, CLASS I, YELLOW PAVEMENT LINE MARKING 24" WIDTH, SOLID
- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING 6" WIDTH, SOLID
- TYPE B, CLASS I, WHITE PAVEMENT LINE MARKING 6" WIDTH, 2' LINE WITH 6' SPACING

- TYPE B, CLASS I, YELLOW DOUBLE PAVEMENT LINE MARKING, 4" WIDTH, 4" SPACING, SOLID OUTSIDE LINE, 10' LINE WITH 30' SPACING INSIDE LINE
- BIKE LANE CONFLICT ZONE STRIPING



SCALE

SHEET

5(6)



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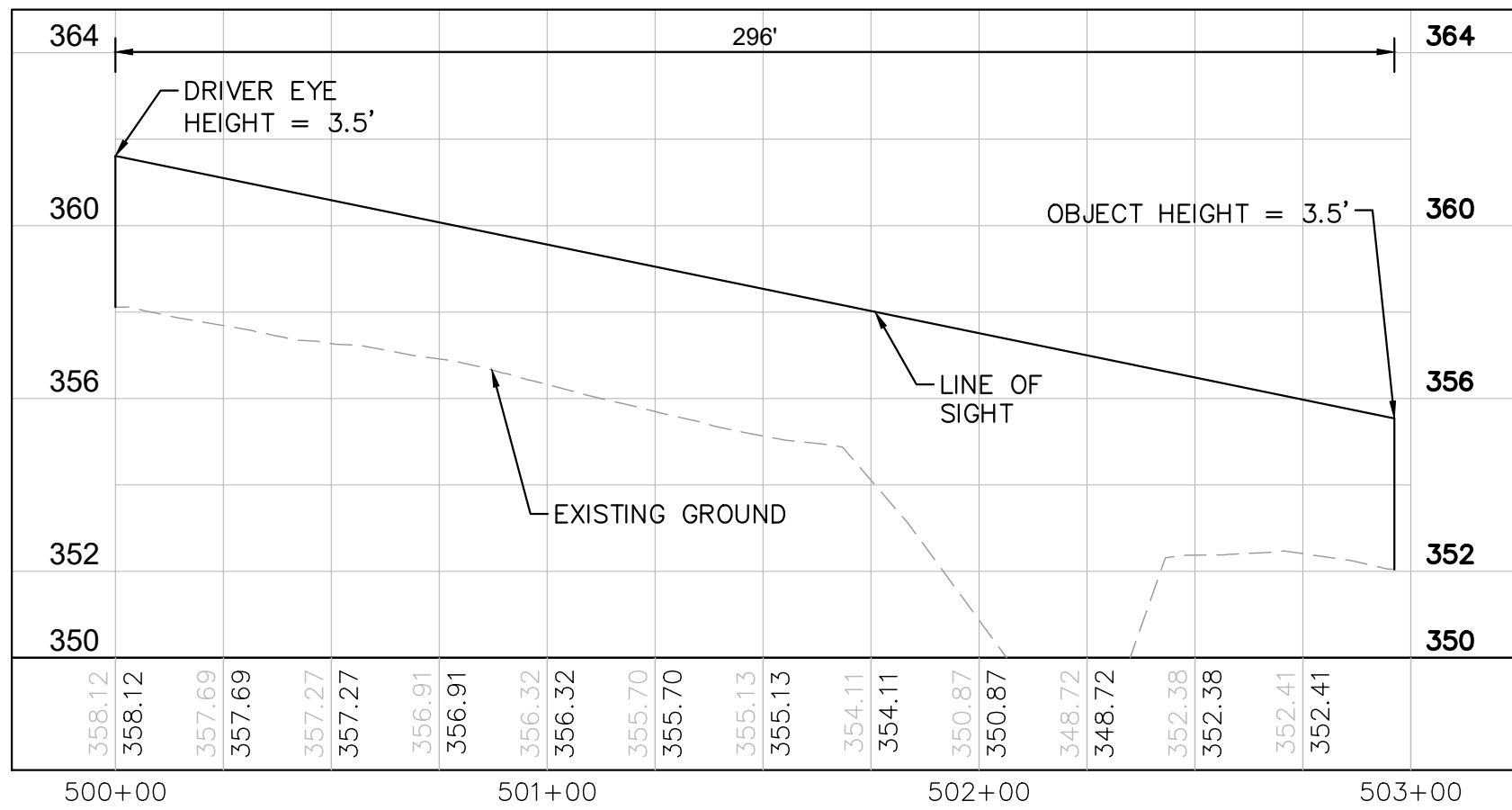
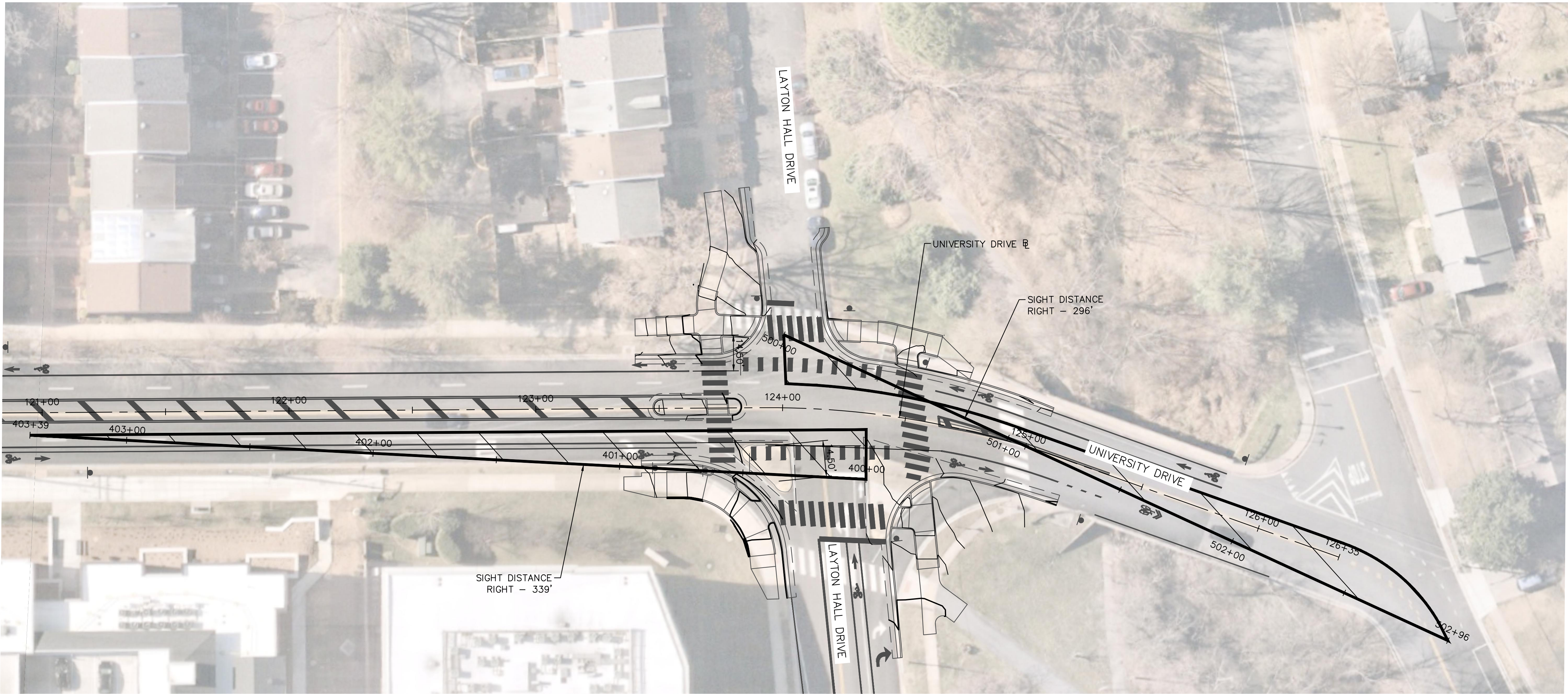
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CHECKED BY: MEW

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BIKE LANES

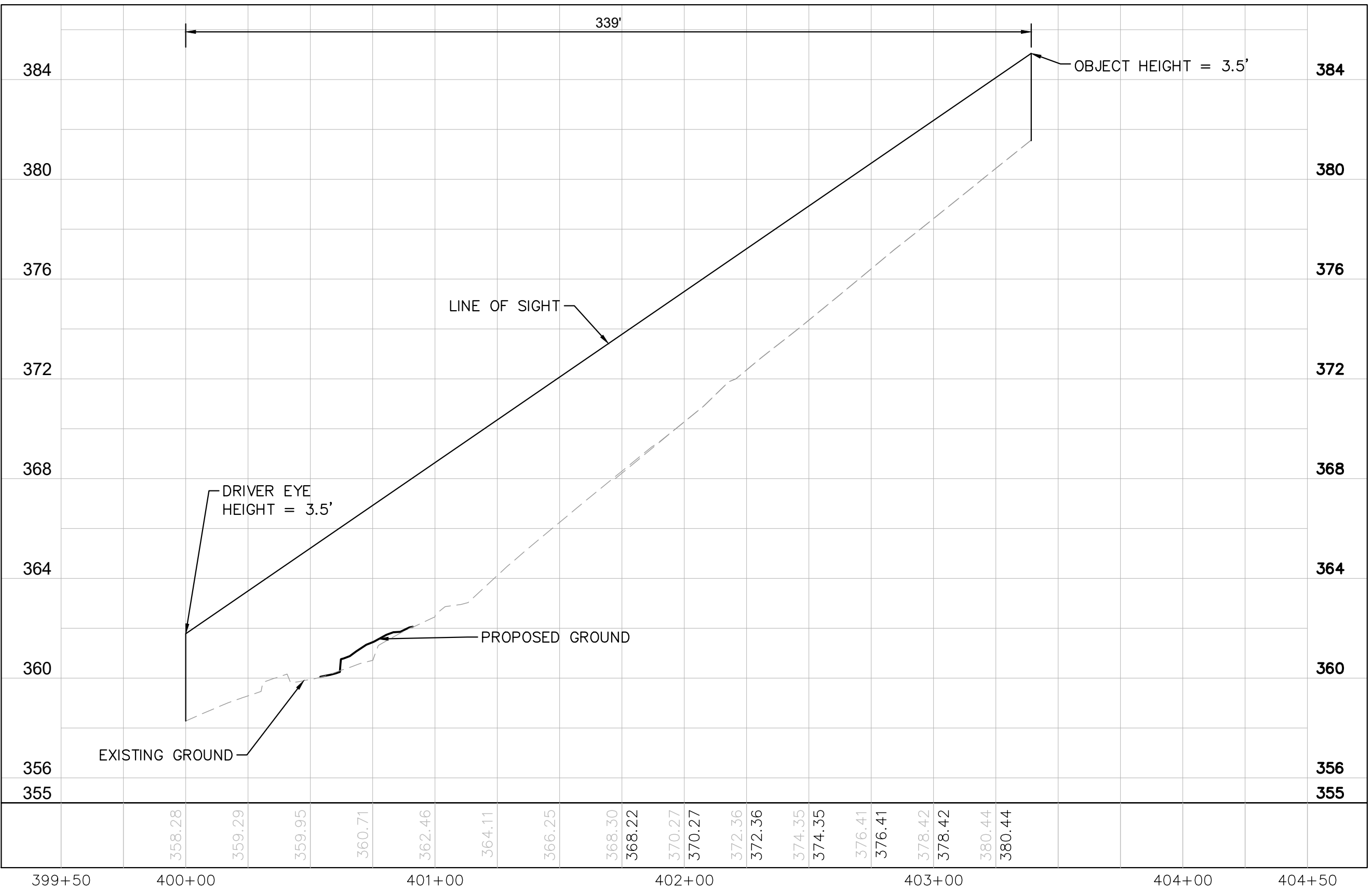
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SIGHT DISTANCE EXHIBITS



ISD2 RIGHT TURN MOVEMENT

SCALE: 1" = 40' H
1" = 4' V



ISD1 RIGHT TURN MOVEMENT

SCALE: 1" = 40' H
1" = 4' V

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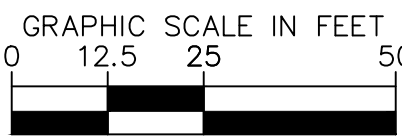
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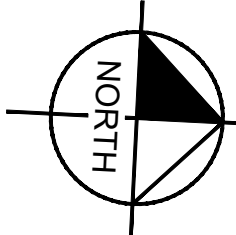
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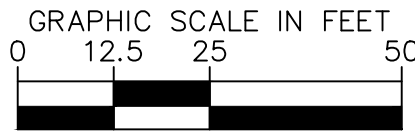


SHEET

6(1)



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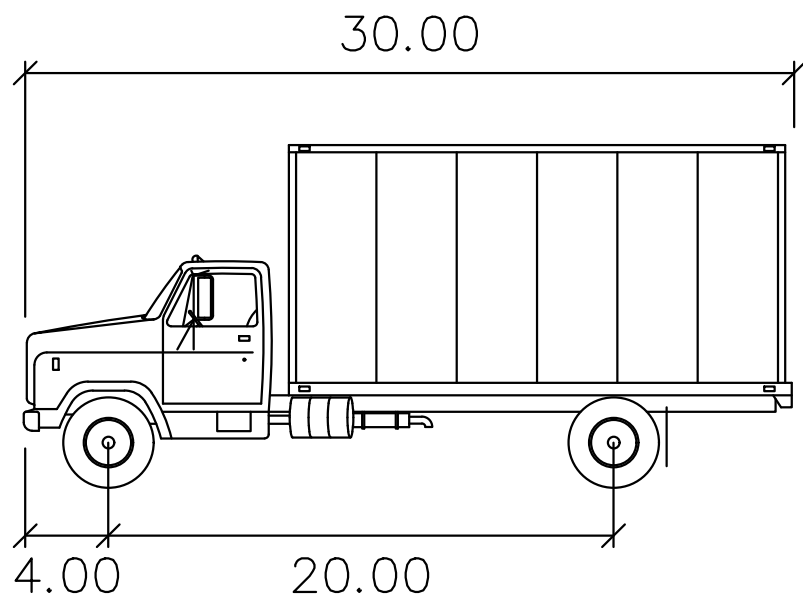
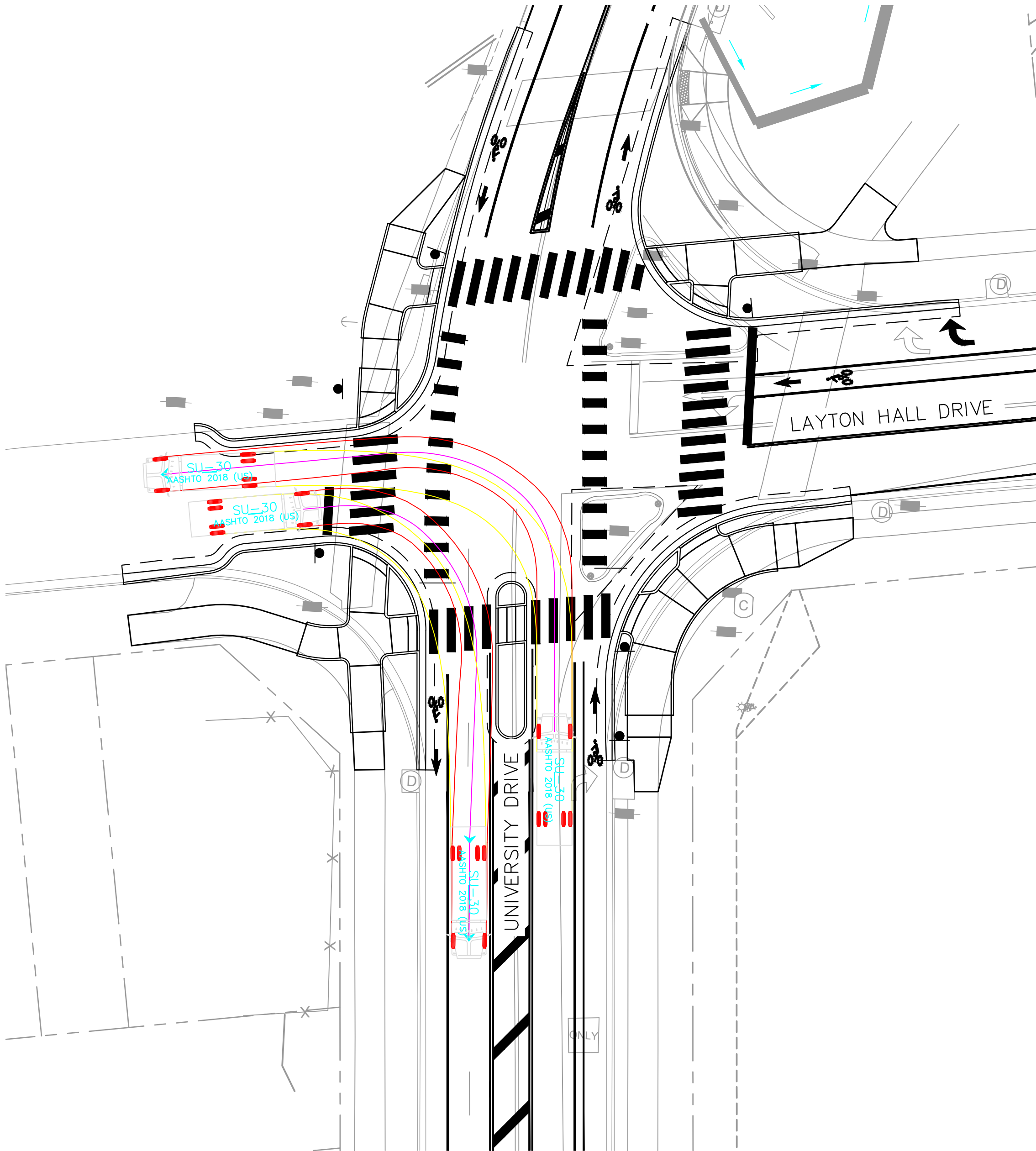
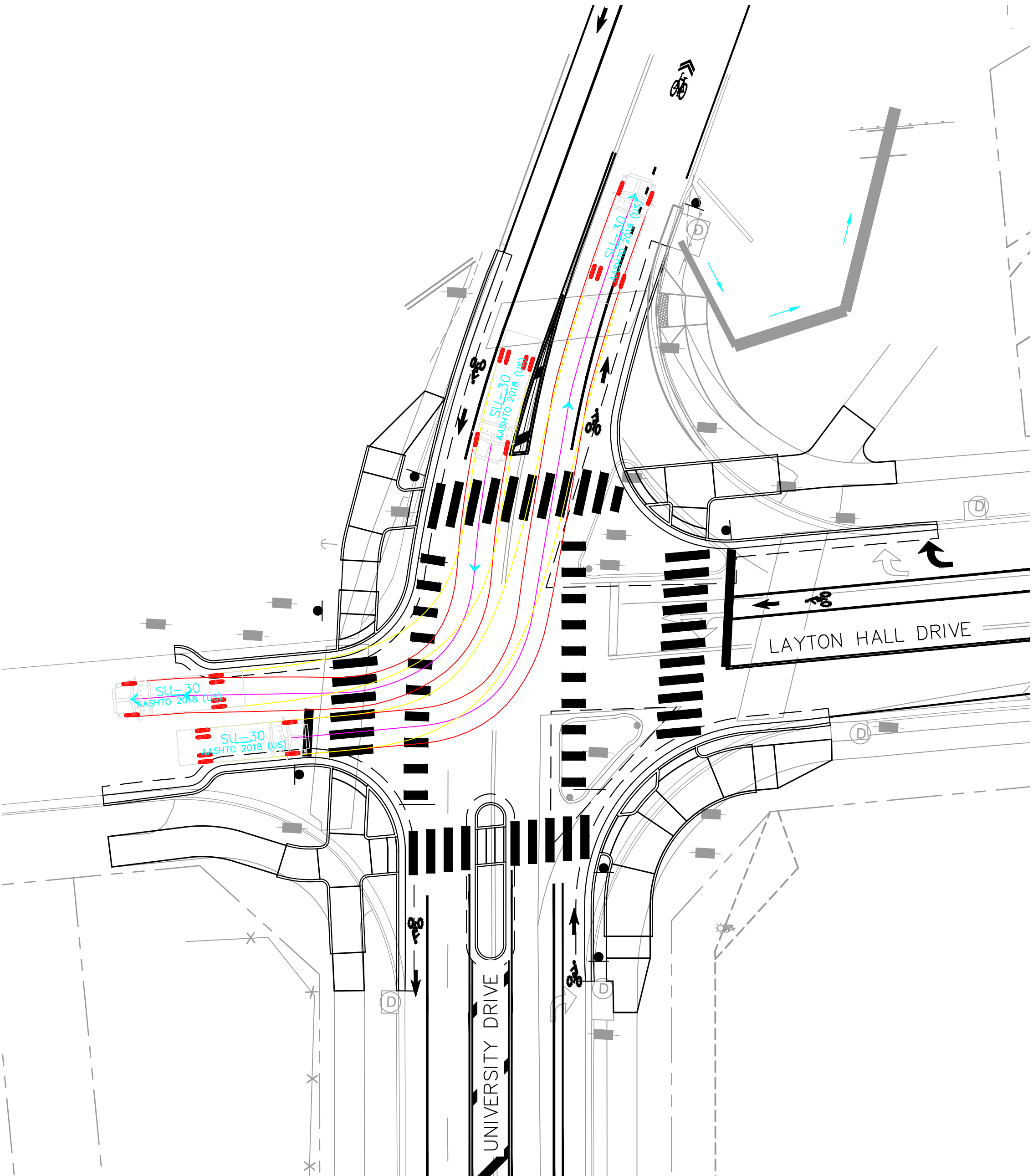
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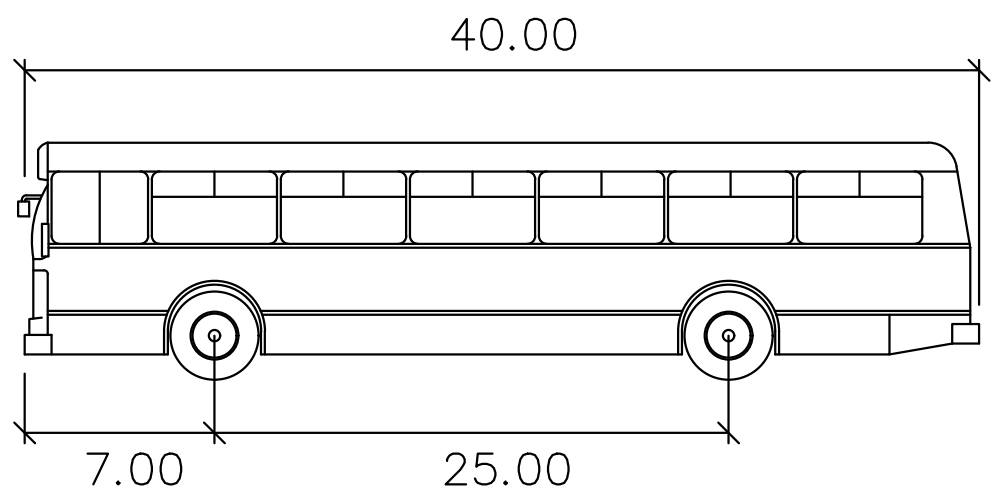
6(2)

AUTO TURN EXHIBIT



SU-30

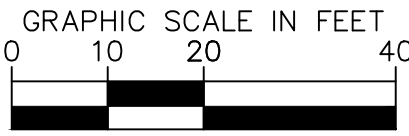
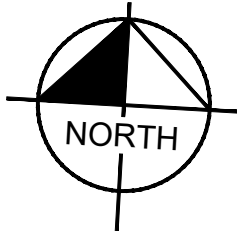
	feet
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



CITY-BUS

Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 41.4

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SCALE

SHEET

7(1)

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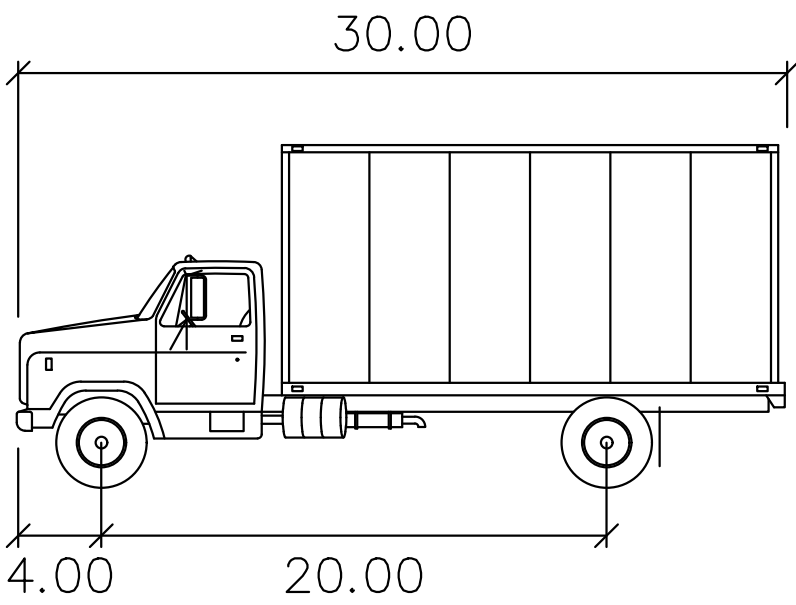
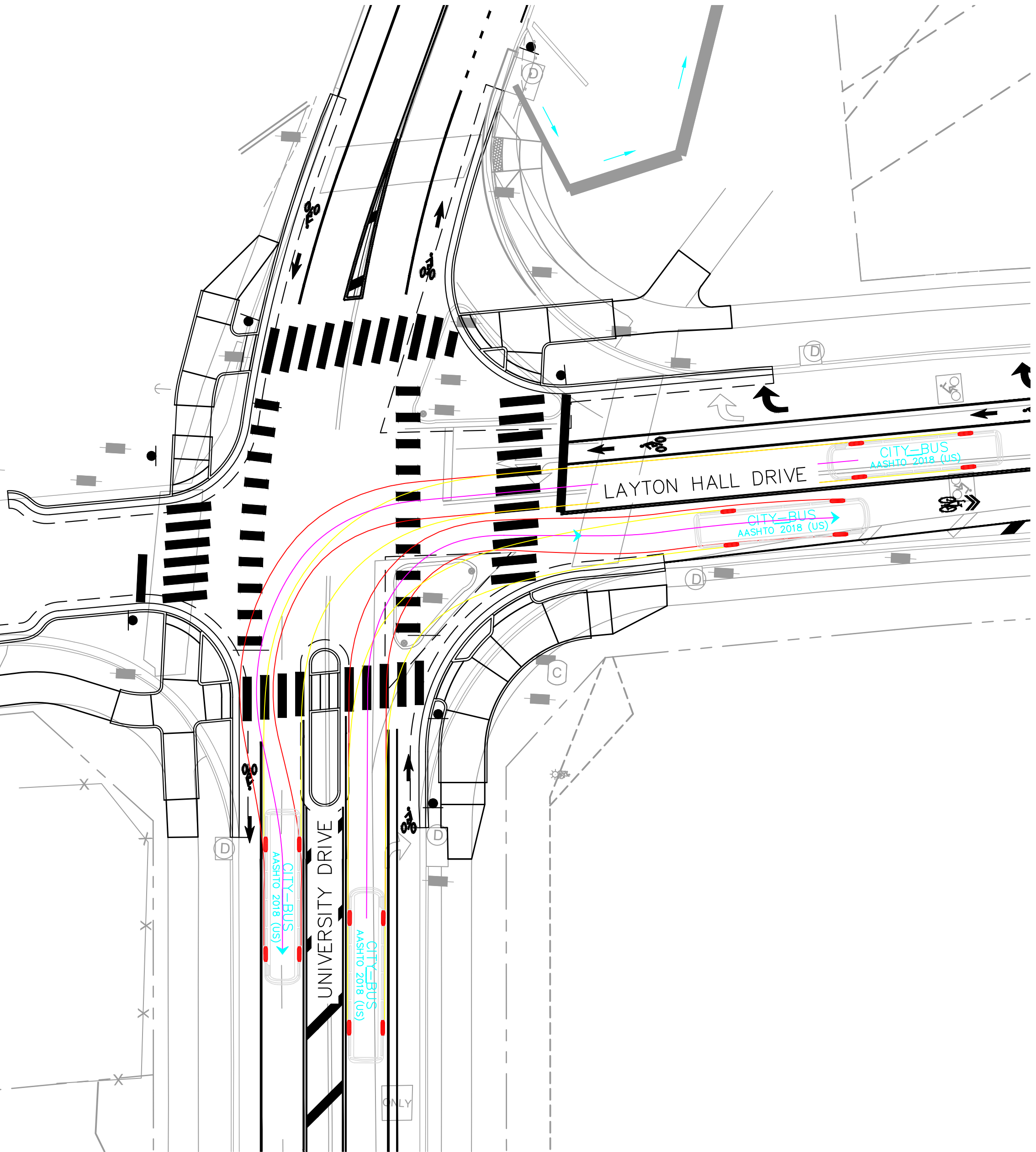
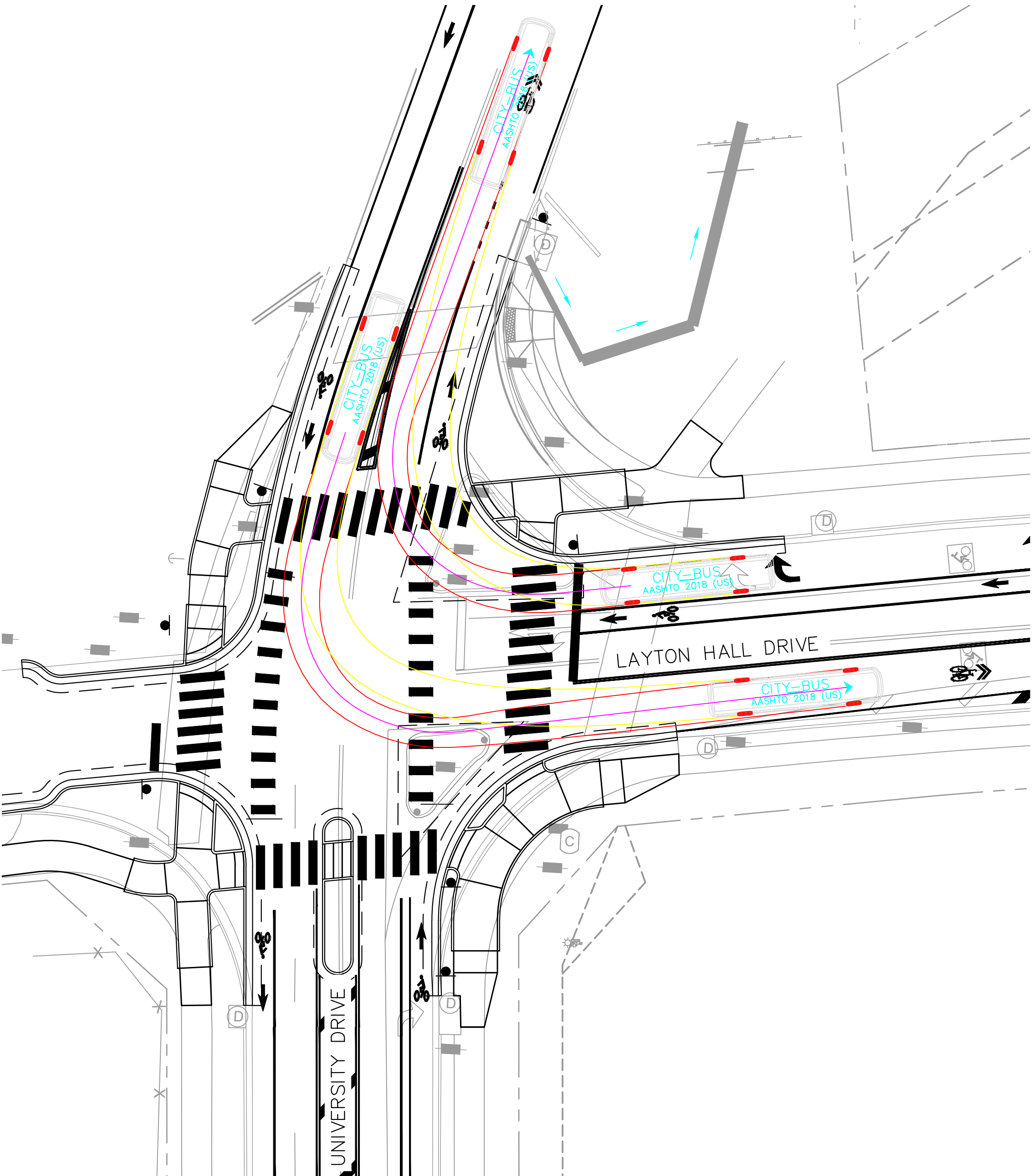


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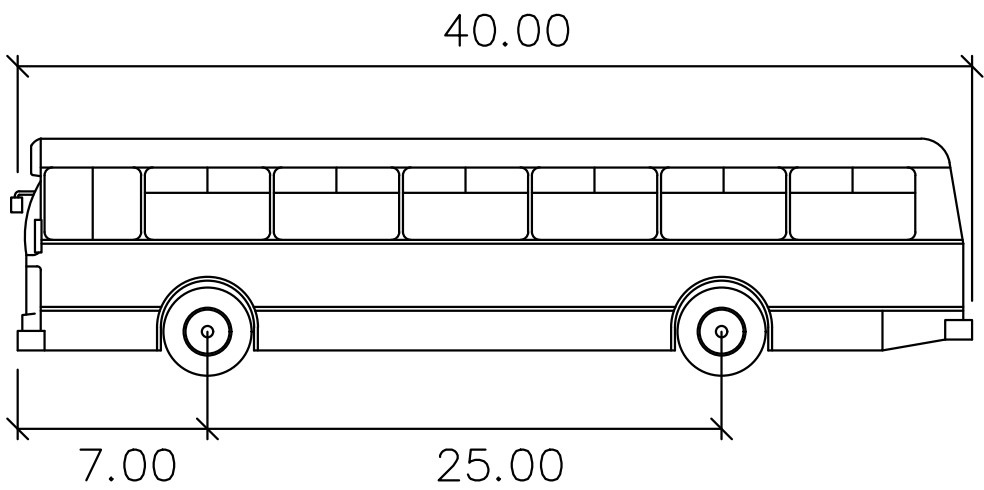
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DRAWN BY: NS
CHECKED BY: MEW

AUTO TURN EXHIBIT



SU-30

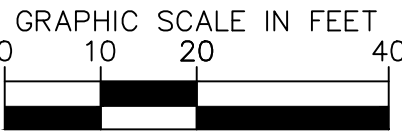
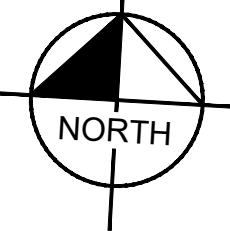
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Width	: 8.00	
Track	: 8.00	
Lock to Lock Time	: 6.0	
Steering Angle	: 31.8	



CITY-BUS

feet	
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 41.4

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SCALE

SHEET

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