

TOWN OF VIENNA
DEPARTMENT OF PUBLIC WORKS
FAIRFAX COUNTY, VIRGINIA

GLEN AVE, SW
SIDEWALK IMPROVEMENT PLAN
95% DESIGN CONSTRUCTION DRAWINGS

NOTICE REQUIRED

CONTRACTORS SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATION OR BLASTING AT LEAST TWO WORKING DAYS, BUT NOT MORE THAN TEN WORKING DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION.

CONTACT "MISS UTILITY" AT
1-800-552-7001
FOR THESE UTILITIES

VIRGINIA ELECTRIC & POWER CO.
A.T.& T. CO.
COLUMBIA GAS TRANSMISSION CO.
FAIRFAX CO. SAN. SEWER DIV.
TRANSCO GAS PIPELINE CO.
COLUMBIA GAS OF VIRGINIA
CONTINENTAL TELEPHONE OF VIRGINIA

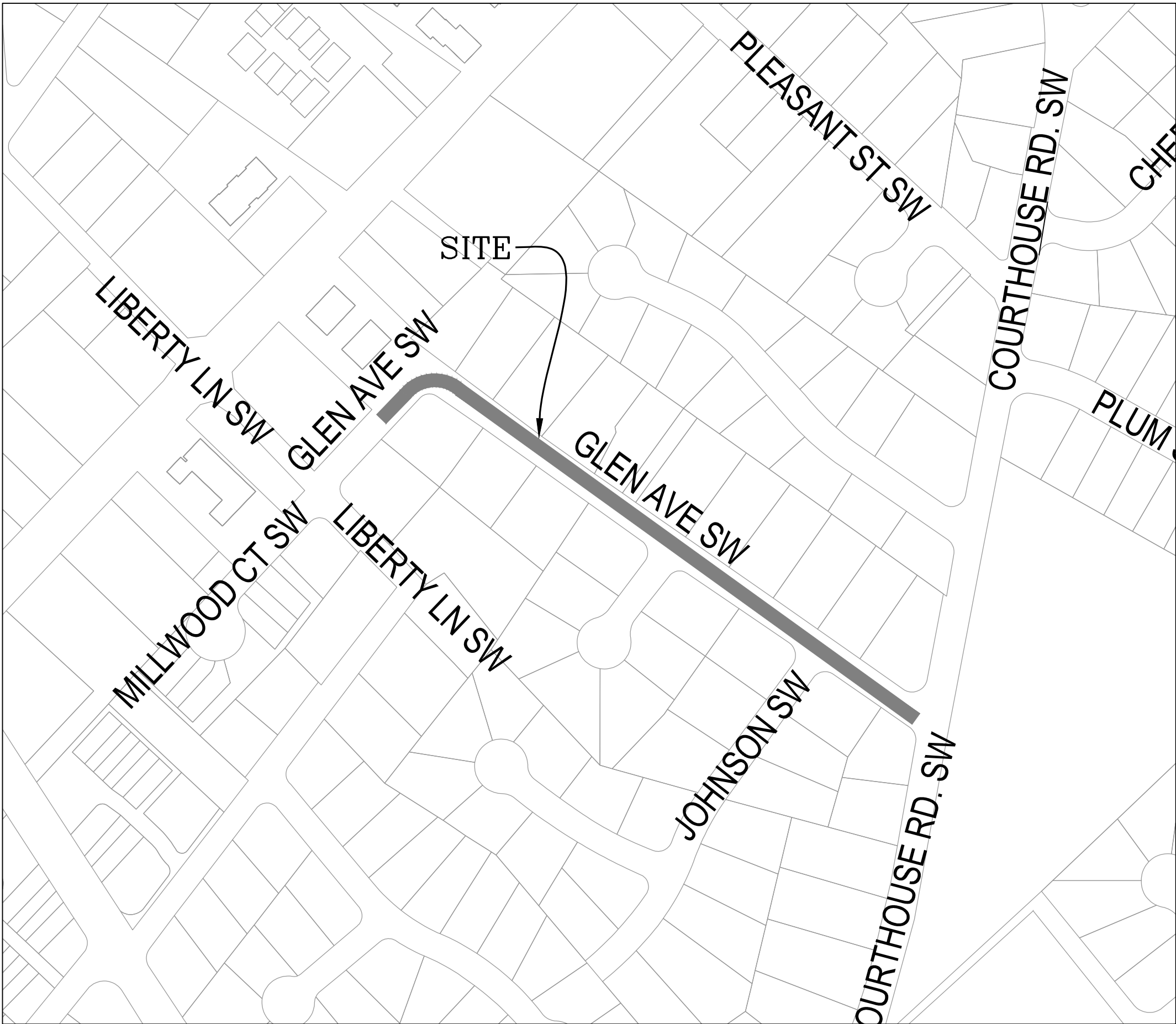
COLONIAL PIPELINE CO.
FAIRFAX CO. WATER AUTHORITY
WASHINGTON GAS LIGHT CO.
PRINCE WILLIAM ELEC. CO-OP.
PLANTATION PIPELINE CO.
C & P TELEPHONE CO.

CONTACT THESE UTILITIES

TRI-COUNTY ELEC. CO-OP 1-777-2151
FALLS CHURCH WATER SER. 1-241-5078

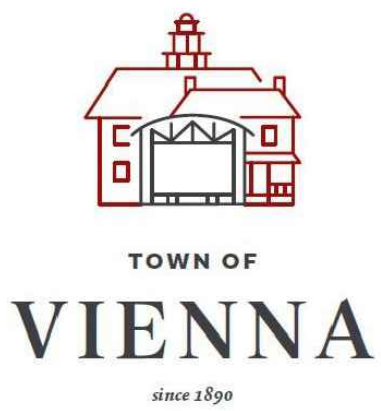
LOUDOUN WATER 571-291-7880
FAIRFAX CITY WATER SER. 385-7916

EMERGENCY DIAL 911
POLICE — FIRE — RESCUE
777-1021 777-2222



VICINITY MAP
SCALE : 1"= 200'

OWNER/DEVELOPER:



TOWN OF VIENNA
DEPARTMENT OF PUBLIC WORKS
127 CENTER ST. S.
VIENNA, VA 22180

SHEET INDEX

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- NOTES AND DETAILS
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- HYDROLOGY
- CONTROL STRUCTURE ROUTING COMPUTATIONS AND DETAILS

PLAN DATE

10/1/2023
08/14/2024
09/26/2024

Urban Ltd
7710 Little River Turnpike
Arlington, Virginia 22203
Tel: 703.642.8080
Fax: 703.642.8251
www.urban-ld.com

urban
Planners • Engineers • Landscape Architects • Land Surveyors

COMMONWEALTH OF VIRGINIA
C. RYAN CONNOR
Lic. No. 039531
09/26/2024
PROFESSIONAL ENGINEER

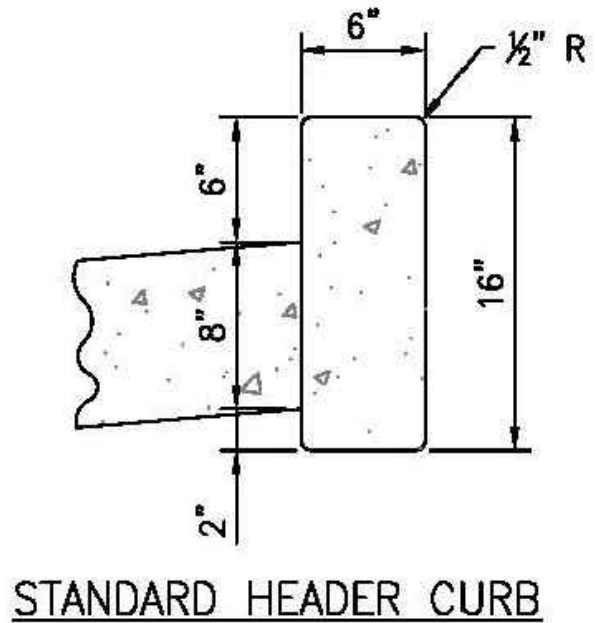
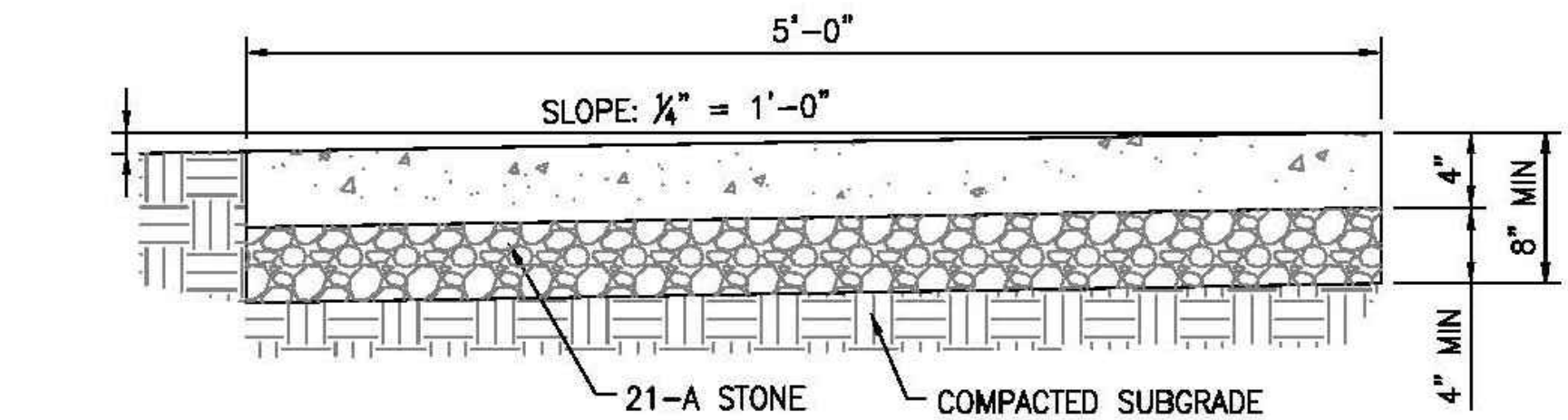
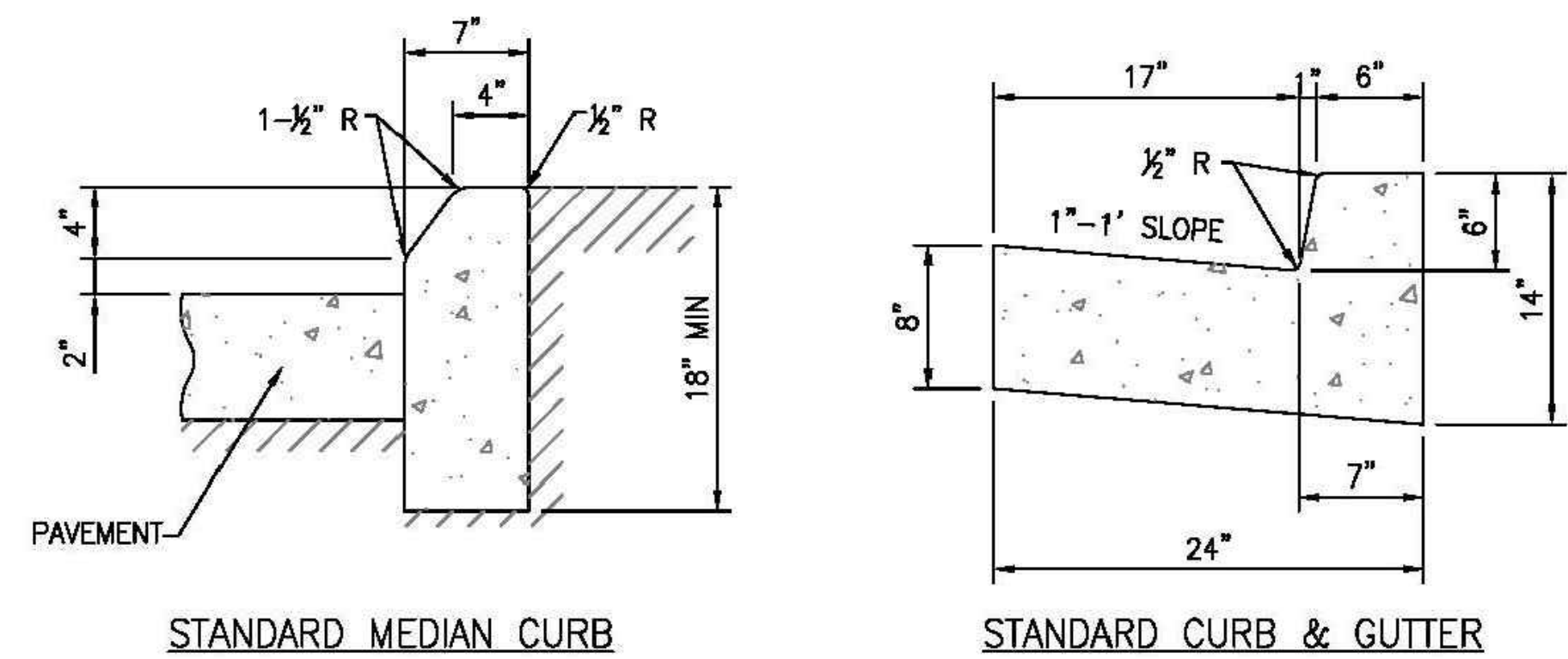
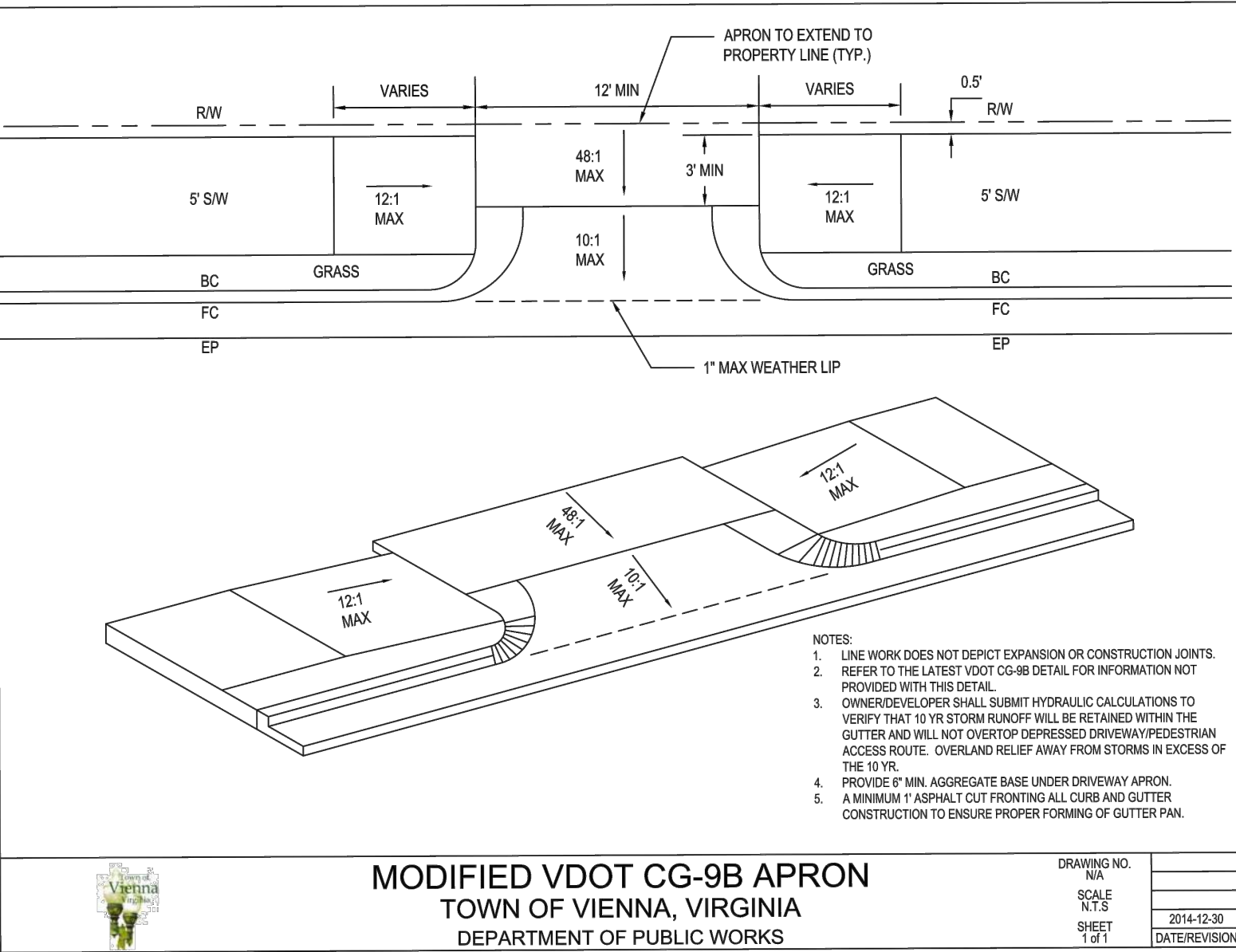
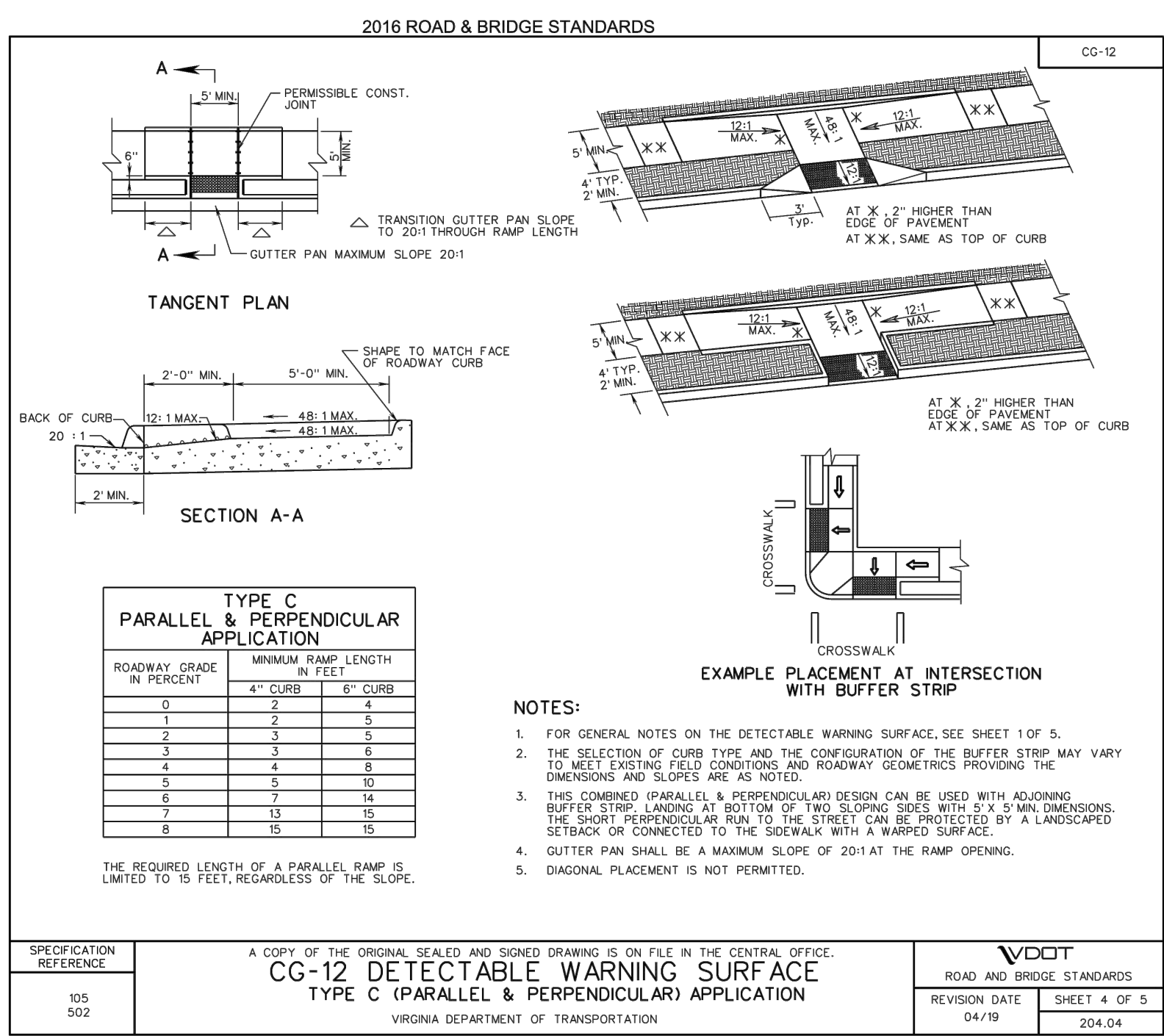
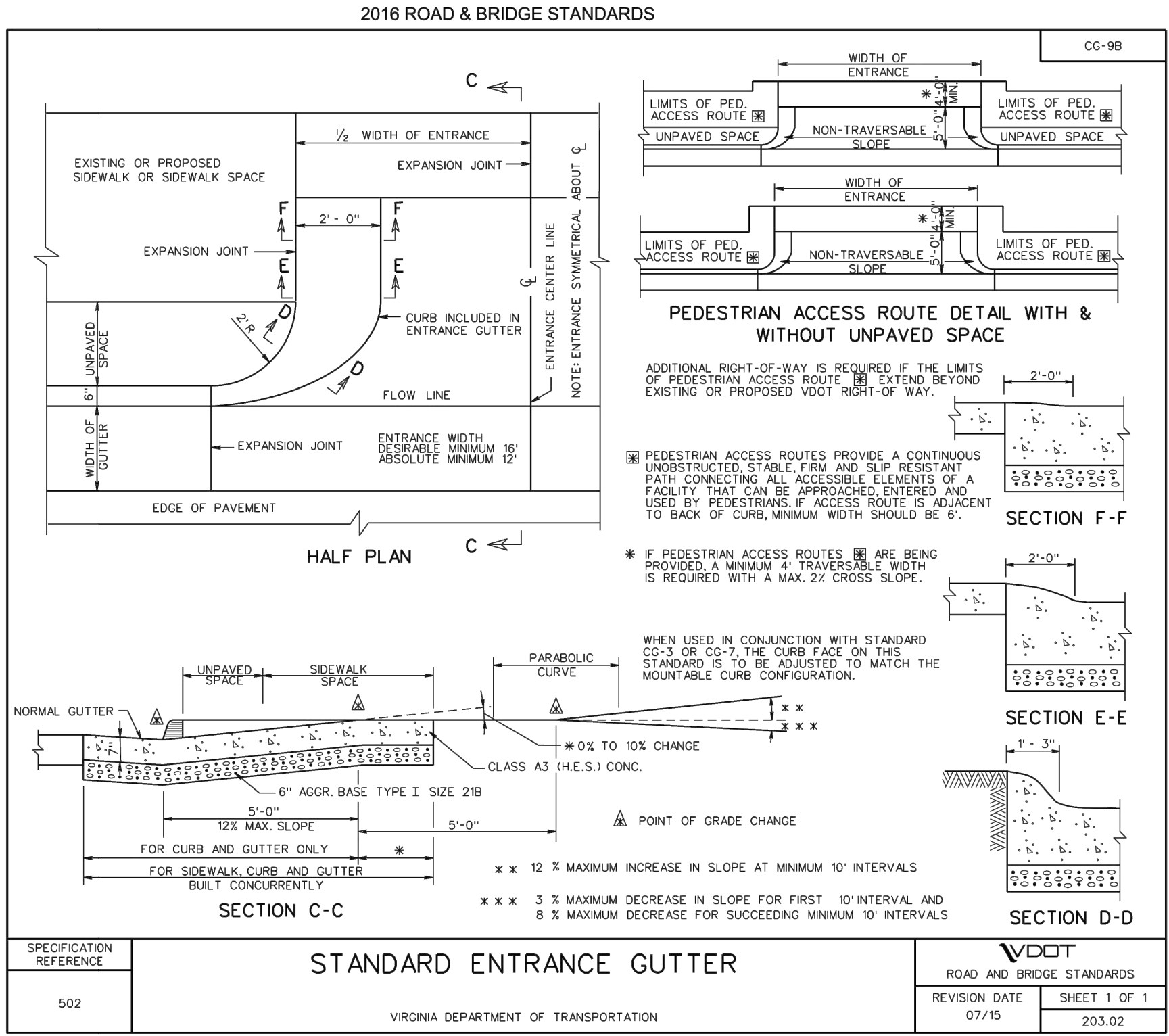
COVER SHEET
GLEN AVE, SW
SIDEWALK IMPROVEMENT PLAN
TOWN OF VIENNA
FAIRFAX COUNTY, VIRGINIA

SCALE: AS NOTED C.I. N/A DATE: AUG 2024

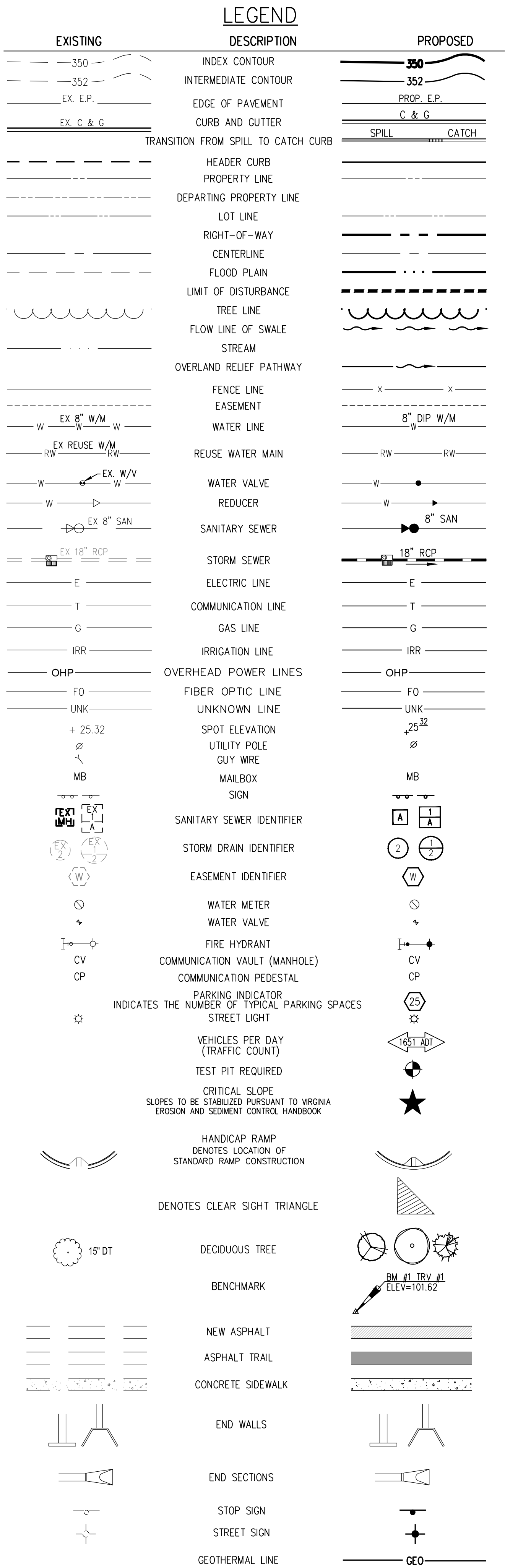
SHEET
1
OF
23

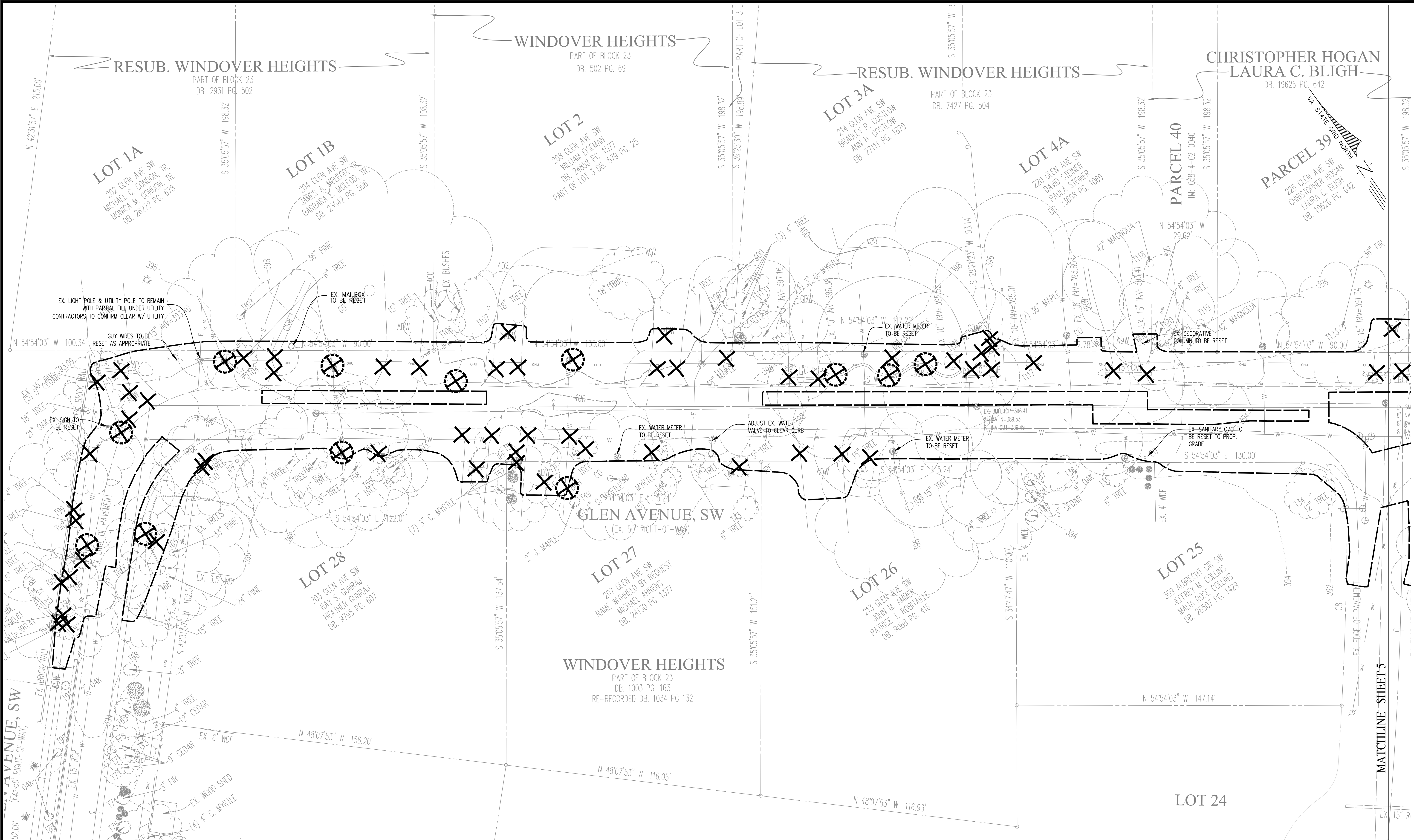
FILE No.
PP-2531

No.	DATE	DESCRIPTION	REVISIONS
3	09/26/24	95% PLAN UPDATE	
2	08/14/24	95% PLAN	
1	10/1/23	30% PLAN	



- NOTES:
- CONSTRUCTION JOINTS AT 10' ON CURB.
 - ALL CONCRETE SHALL BE CLASS A-3, AIR-ENTRAINED.
 - EXPANSION JOINTS IN HEADER CURB, CURB AND GUTTER TO BE 40' APART AND AT ALL POINTS AT THE P.C. & P.T. OF CURVES.
 - CONSTRUCTION JOINTS IN SIDEWALK TO BE 5' APART. EXPANSION JOINTS IN SIDEWALK TO BE 40' APART. IF SIDEWALK IS AT THE CURB, EXPANSION JOINTS TO MATCH JOINT IN CURB, ALSO EXPANSION JOINTS BETWEEN CURB AND SIDEWALK. DOWELS AND SLEEVES TO BE INSTALLED IN C&G JOINTS WHERE SUB-GRADE IS UNSTABLE.
 - EXPANSION JOINTS REQUIRED WHERE SIDEWALKS MEET DRIVEWAY APRONS.



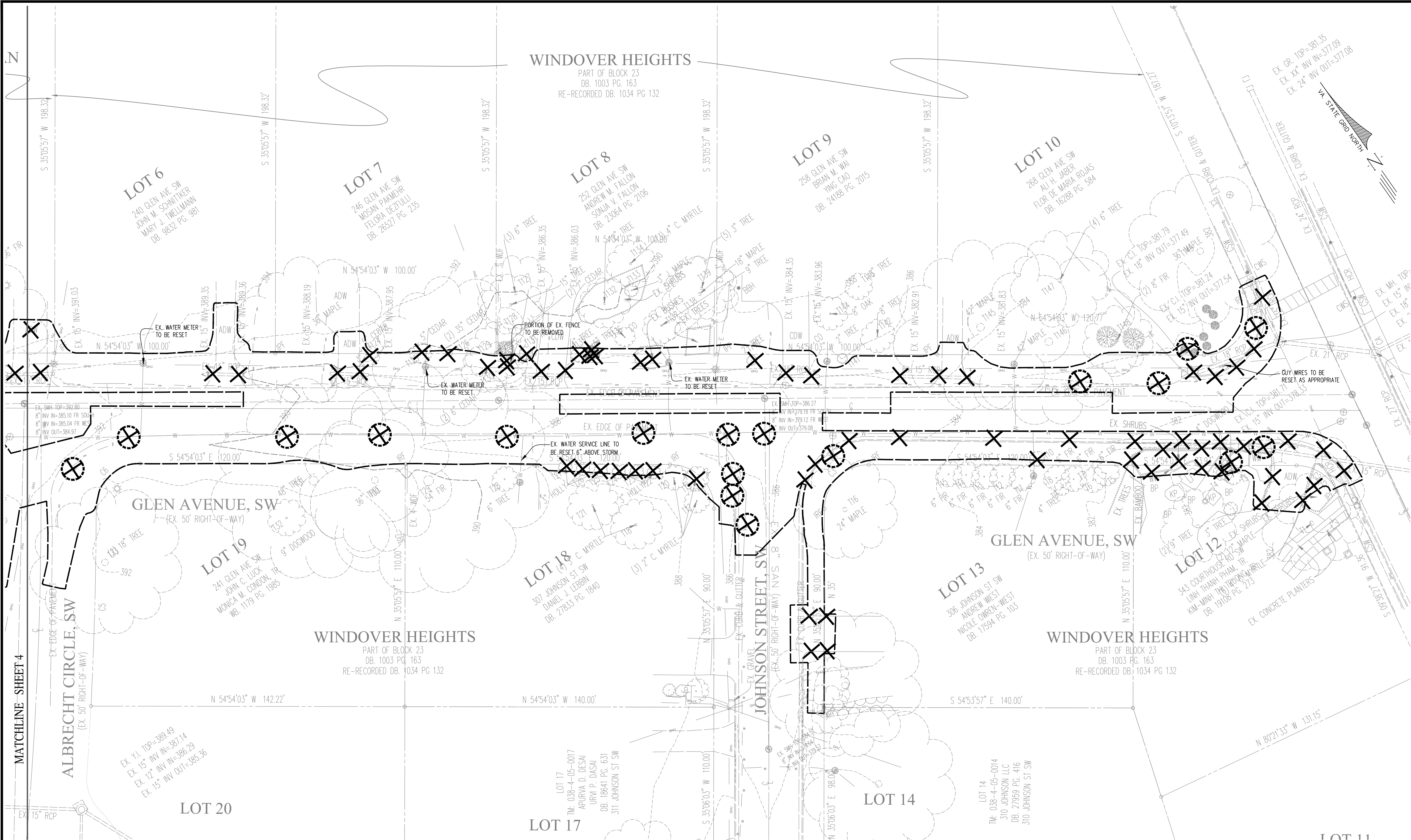


ELECTRICAL NOTE
CONTRACTOR TO COORDINATE WITH POWER COMPANY PRIOR TO DISTURBANCE IN VICINITY OF UGE (UNDERGROUND ELECTRICAL) LINES OR POLE.

ITEM TO BE REMOVED

ITEM TO BE RELOCATED
SEE SITE PLAN FOR
NEW LOCATION

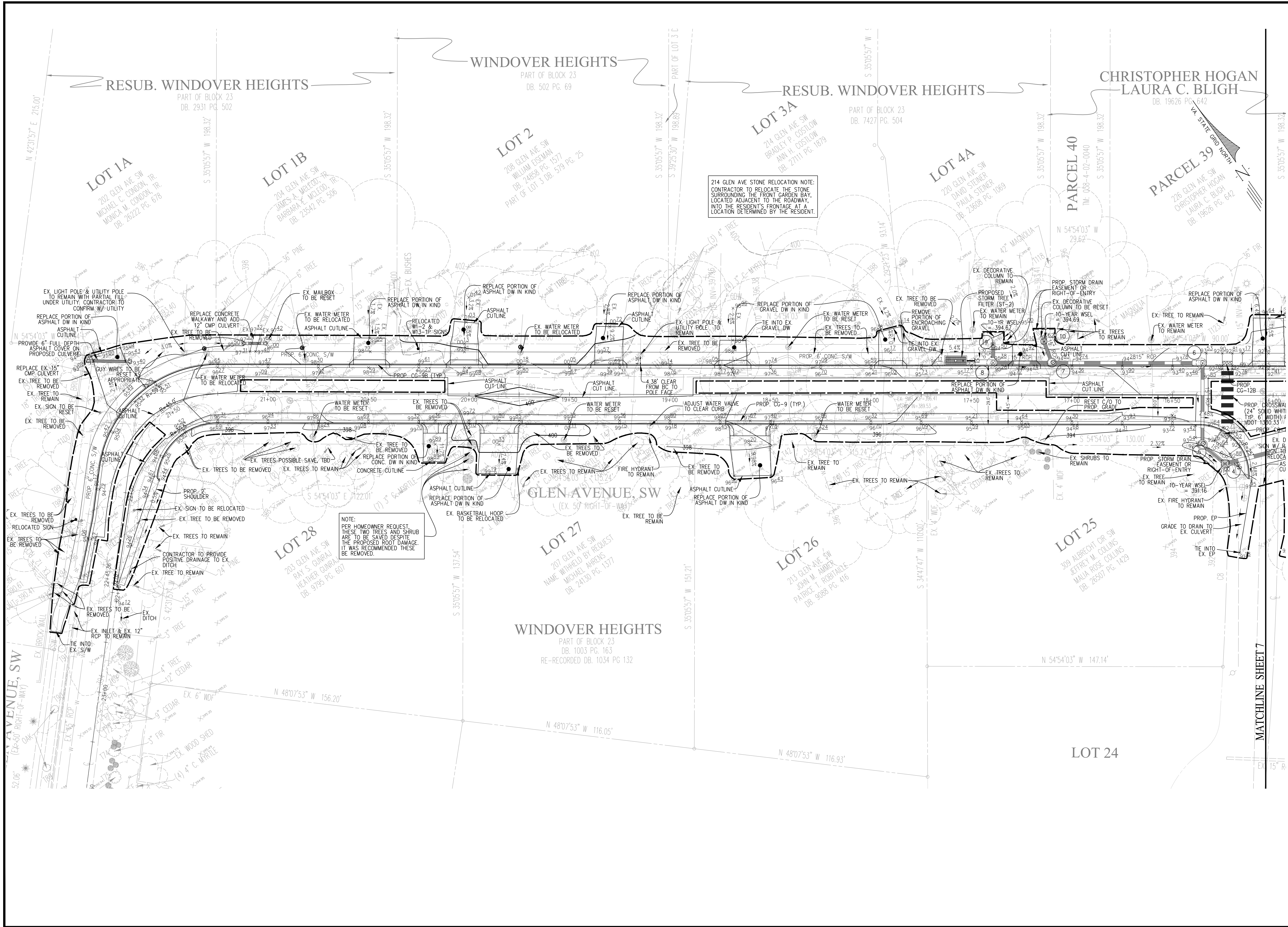
PLAN DATE		10/1/2023	
		08/14/2024	
		09/26/2024	
Urban Ltd		7712 N. Blue River Turnpike	
Amanahle, Virginia 23003		Tel. 703.642.8080	
Fax. 703.642.8251		www.urband.com	
Planners • Engineers • Landscape Architects • Land Surveyors			
COMMONWEALTH OF VIRGINIA			
C. RYAN CONNOR		Lic. No. 039531	
09/26/2024		PROFESSIONAL ENGINEER	
EXISTING CONDITIONS AND DEMOLITION PLAN			
GLEN AVE, SW			
SIDEWALK IMPROVEMENT PLAN			
TOWN OF VIENNA			
FAIRFAX COUNTY, VIRGINIA			
SCALE: 1"= 20'		DATE: AUG 2024	
SHEET 4 OF 23			
FILE No. PP-2531			
REVISIONS			
No.	DATE	DESCRIPTION	
3	09/26/24	95% PLAN UPDATE	
2	08/14/24	95% PLAN	
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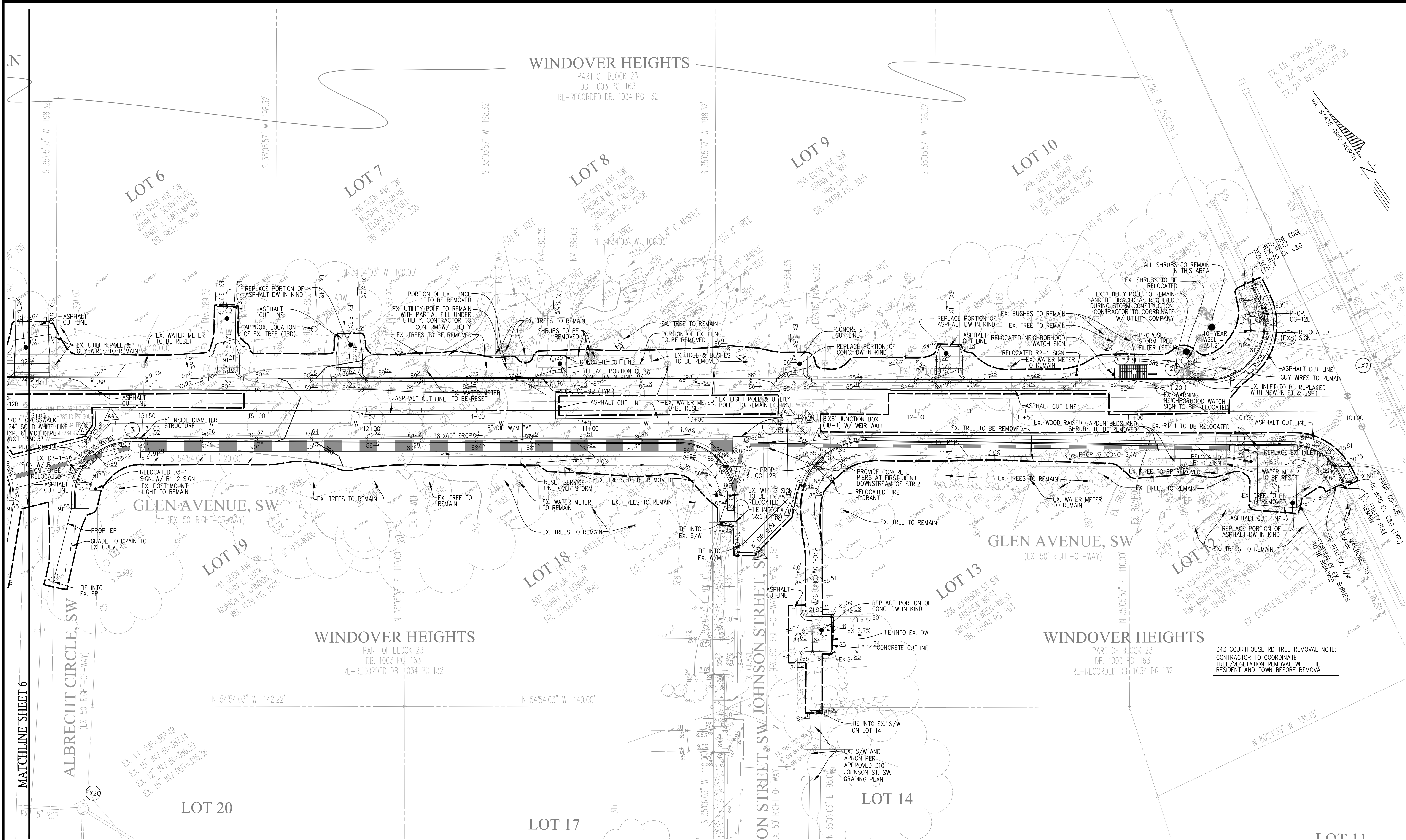
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LINES OR POLE.

✕ ITEM TO BE REMOVED
✕ ITEM TO BE RELOCATED
SEE SITE PLAN FOR
NEW LOCATION

EXISTING CONDITIONS AND DEMOLITION PLAN		GLEN AVE, SW SIDEWALK IMPROVEMENT PLAN		SHEET 5 OF 23	
TOWN OF VIENNA FAIRFAX COUNTY, VIRGINIA		C. RYAN CONNOR Lic. No. 039531 09/26/2024 PROFESSIONAL ENGINEER		FILE No. PP-2531	
SCALE: 1"= 20'		DATE: AUG 2024		C.I. = 2'	
CIVIL		PLANNERS - ENGINEERS - LANDSCAPE ARCHITECTS - LAND SURVEYORS		REVISIONS	
PLAN DATE 10-11-2023 08-14-2024 09-26-2024		Urban, Ltd. 7112 Linte River Turnpike Arlington, Virginia 22003 Tel. 703.642.8851 Fax 703.642.8851 www.urbanltd.com		No. DATE DESCRIPTION	
3		09/26/24		95% PLAN UPDATE	
2		08/14/24		95% PLAN	
1		10/11/23		30% PLAN	



PLAN DATE		01-1-2023
Urban Ltd		7712146 River Turnpike
Amanville, Virginia 23003		Tel. 703.643.8080
Fax. 703.643.8251		www.urbanltd.com
Urban Ltd		Planners-Engineers-Landscape Architects-Land Surveyors
SHEET		6
OF		23
FILE No.		PP-2531
SITING PLAN		GLEN AVE, SW
SIDEWALK IMPROVEMENT PLAN		TOWN OF VIENNA
FAIRFAX COUNTY, VIRGINIA		DATE: AUG 2024
SCALE: 1" = 20'		C.I. = 2'
COMMONWEALTH OF VIRGINIA		PROFESSIONAL ENGINEER
C. RYAN CONNOR		Lic. No. 039531
09/26/2024		
REVISIONS		
No.	DATE	DESCRIPTION
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2	06/14/24	95% PLAN
1	10/11/23	30% PLAN



PLAN DATE		REVISIONS	
10/1/2023	08/14/2024	3	09/26/24 95% PLAN UPDATE
	09/26/2024	2	09/14/24 95% PLAN
		1	10/11/23 30% PLAN
		No.	DATE

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SITE PLAN
GLEN AVE, SW
SIDEWALK IMPROVEMENT PLAN
TOWN OF VIENNA
FAIRFAX COUNTY, VIRGINIA

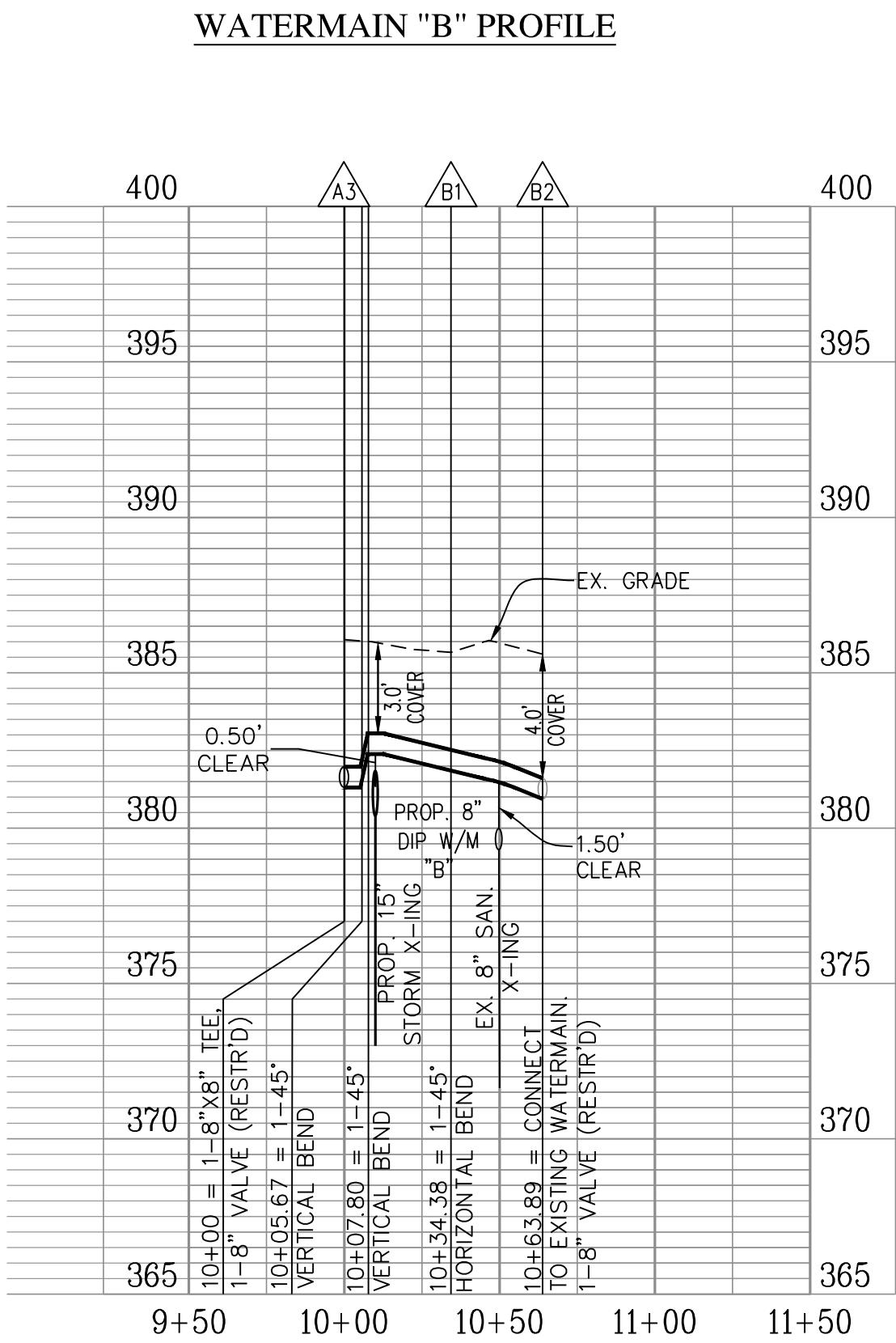
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C.I. = 2'

DATE: AUG 2024

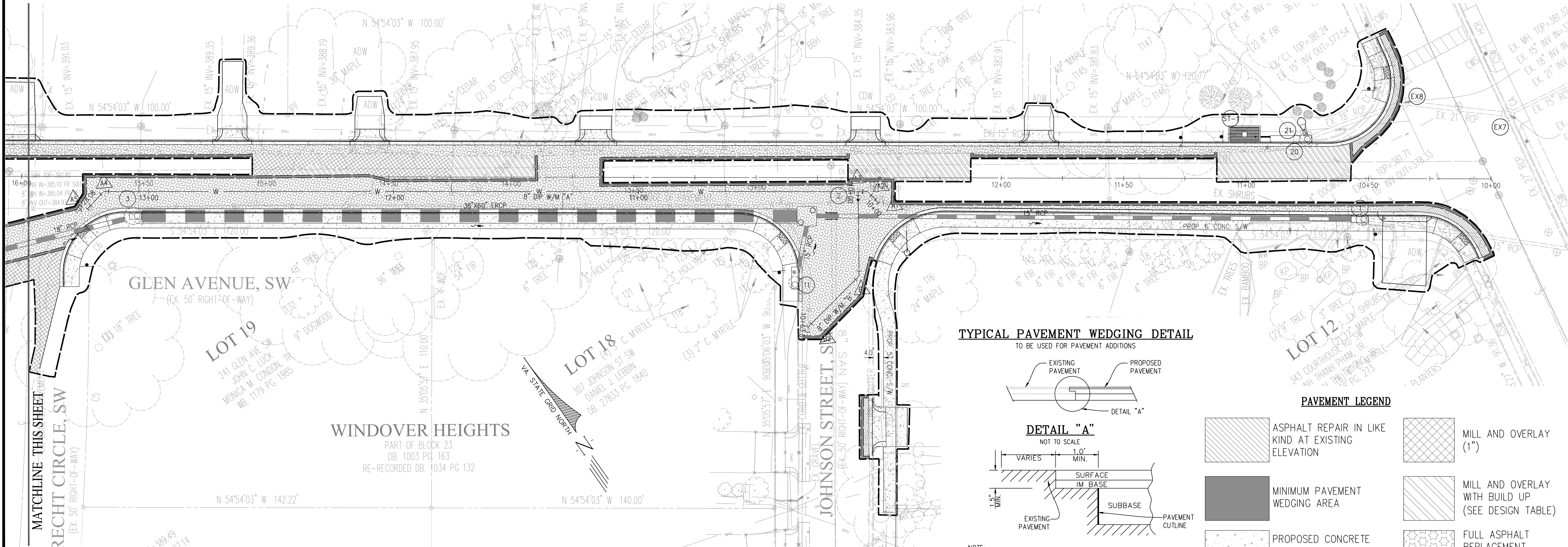
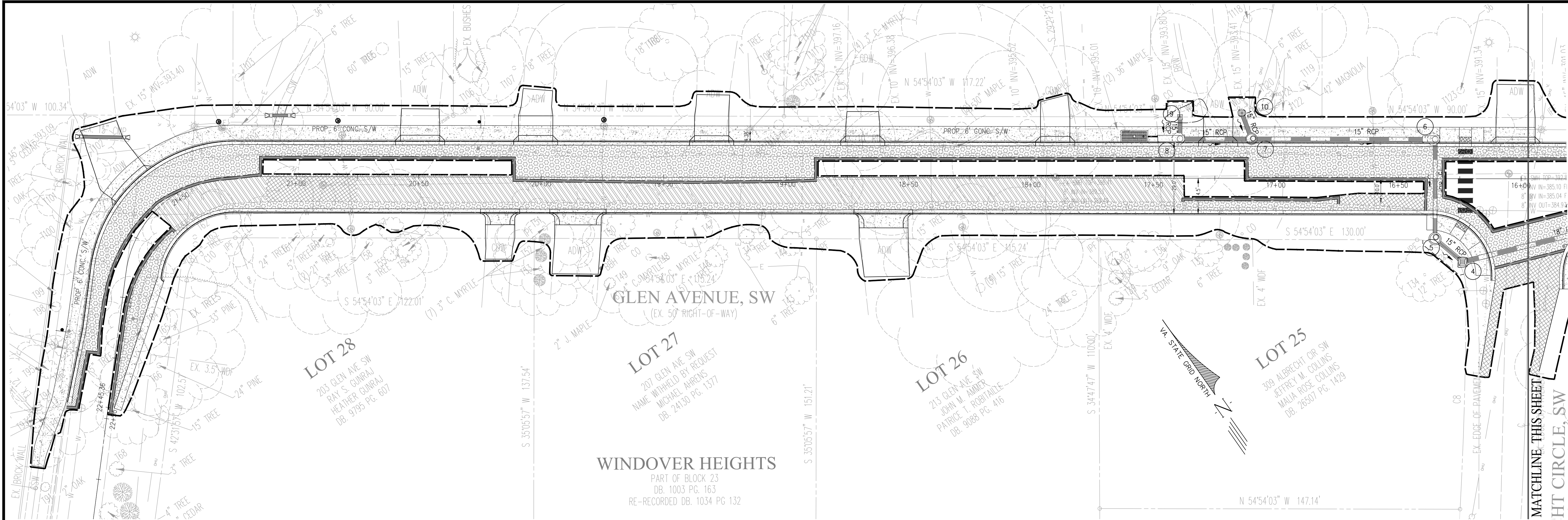
SHEET
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OF
23

FILE No.
PP-2531

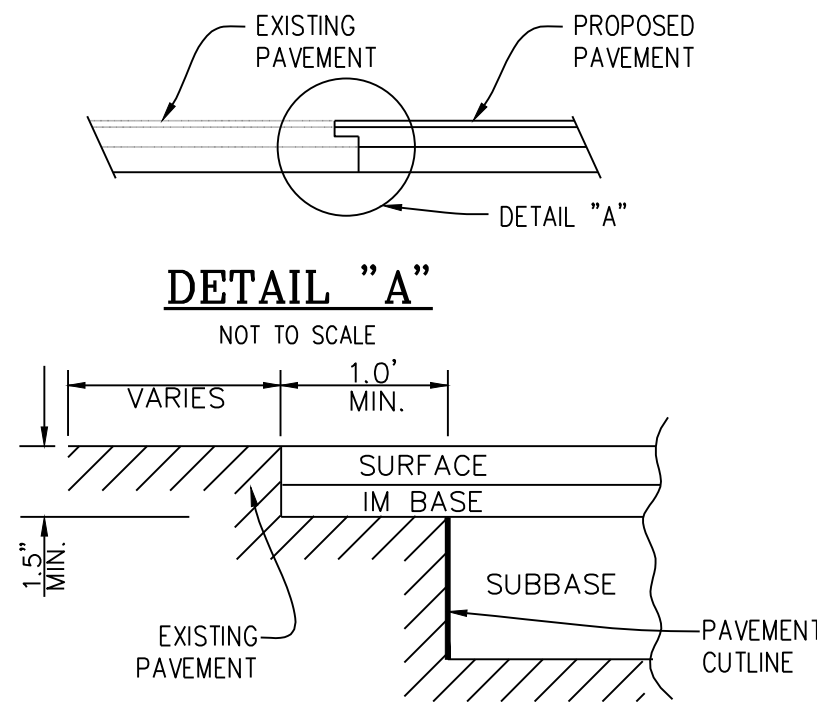
LEFT / SOUTHWEST BOUND LANE OF PROJECT														
	Existing Left EP Width	Existing Left EP Elevation	Proposed Left EP Width from Existing Left EP	Existing Left Xslope from Existing Crown	Proposed Left EP Width from Existing Crown	New Slope Crown to EP	Proposed Left Xslope	Proposed Left EP Elevation	Proposed Left EP Longitude Slope	Prop. TC Elevation (Ex Tc if curb exists)	TC to Back S/W Dist	Prop. Back S/W Elevation	Ex Grade at Back of S/W	Ex minus Prop.
Sta														
1025										381.40	6.50	381.54	381.60	0.06
1050										381.55	6.50	381.69	381.78	0.09
1075										382.02	6.50	382.16	382.25	0.09
1100										382.29	6.50	382.43	381.37	-1.06
1125										382.69	6.50	382.83	382.57	-0.26
1150										383.21	6.50	383.35	383.13	-0.22
1175										383.84	6.50	383.98	383.83	-0.15
1200										384.53	6.50	384.67	384.30	-0.37
1225										385.18	6.50	385.32	384.93	-0.39
1250										N/A	N/A	N/A	N/A	N/A
1275										N/A	N/A	N/A	N/A	N/A
1300										N/A	N/A	N/A	N/A	N/A
1325	9.47	387.05	1.97	-3.48%	11.44	no	-3.48%	386.98	1.98%	387.36	6.50	387.50	387.05	-0.45
1350	9.09	387.57	1.90	-3.08%	10.99	no	-3.08%	387.51	2.12%	387.89	6.50	388.03	387.61	-0.42
1375	9.51	388.00	1.86	-2.63%	11.37	no	-2.63%	387.95	1.76%	388.33	6.50	388.47	388.05	-0.42
1400	10.28	388.39	1.77	-2.33%	12.05	no	-2.33%	388.35	1.59%	388.73	6.50	388.87	388.66	-0.21
1425	9.47	388.74	1.73	-4.12%	11.20	-2.08%	-2.08%	388.90	1.92%	389.28	6.50	389.41	389.08	-0.33
1450	9.40	389.21	1.75	-3.62%	11.15	-2.08%	-2.08%	389.32	1.68%	389.70	6.50	389.83	390.30	0.47
1475	15.61	389.67	1.78	-1.60%	17.39	no	-1.60%	389.64	1.29%	390.02	6.50	390.16	390.56	0.40
1500	11.39	390.16	1.46	-4.21%	12.85	-2.08%	-2.08%	390.37	2.92%	390.75	6.50	389.89	390.52	-0.37
1525	12.80	390.78	1.11	-3.67%	13.91	-2.08%	-2.08%	390.96	2.35%	391.34	6.50	391.48	391.16	-0.32
1550	11.79	391.37	0.51	-3.48%	12.30	-2.08%	-2.08%	391.52	2.25%	391.91	6.50	392.04	391.52	-0.52
1575	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1625	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1650	10.21	393.39	1.54	-3.04%	11.75	no	-3.04%	393.34	2.32%	393.72	N/A	N/A	N/A	N/A
1675	9.90	393.98	2.64	-2.02%	12.54	no	-2.02%	393.93	2.33%	394.31	N/A	N/A	N/A	N/A
1700	9.98	394.38	3.26	-2.51%	13.24	no	-2.51%	394.30	1.49%	394.68	N/A	N/A	N/A	N/A
1725	9.44	394.75	3.44	-3.07%	12.88	no	-3.07%	394.64	1.38%	395.03	N/A	N/A	N/A	N/A
1750	8.76	395.15	3.37	-3.54%	12.13	-2.08%	-2.08%	395.21	2.25%	395.59	N/A	N/A	N/A	N/A
1775	8.86	395.63	3.38	-3.50%	12.24	-2.08%	-2.08%	395.69	1.91%	396.07	N/A	N/A	N/A	N/A
1800	8.61	396.14	3.49	-4.99%	12.10	-2.08%	-2.08%	396.32	2.53%	396.70	N/A	N/A	N/A	N/A
1825	8.80	396.67	3.38	-5.00%	12.18	-2.08%	-2.08%	396.86	2.15%	397.24	N/A	N/A	N/A	N/A
1850	9.59	397.27	3.04	-4.07%	12.63	-2.08%	-2.08%	397.40	2.16%	397.78	N/A	N/A	N/A	N/A
1875	10.30	397.90	2.68	-4.27%	12.98	-2.08%	-2.08%	398.07	2.69%	398.45	N/A	N/A	N/A	N/A
1900	9.42	398.50	2.57	-5.84%	11.99	-2.08%	-2.08%	398.80	2.92%	399.18	N/A	N/A	N/A	N/A
1925	9.22	399.15	2.62	-4.99%	11.64	-2.08%	-2.08%	399.36	2.25%	399.75	N/A	N/A	N/A	N/A
1950	9.24	399.61	2.40	-3.90%	11.64	-2.08%	-2.08%	399.73	1.46%	400.11	N/A	N/A	N/A	N/A
1975	9.29	399.79	2.57	-3.34%	11.86	-2.08%	-2.08%	399.85	0.50%	400.23	N/A	N/A	N/A	N/A
2000	9.34	399.60	2.75	-3.96%	12.09	-2.08%	-2.08%	399.72	-0.54%	400.10	N/A	N/A	N/A	N/A
2025	9.65	399.18	2.79	-4.15%	12.44	-2.08%	-2.08%	399.32	-1.59%	399.70	N/A	N/A	N/A	N/A
2050	10.08	398.61	2.73	-3.47%	12.81	-2.08%	-2.08%	398.69	-2.51%	399.08	N/A	N/A	N/A	N/A
2075	10.37	397.94	2.95	-2.60%	13.32	no	-2.60%	397.86	-3.32%	398.24	N/A	N/A	N/A	N/A
2100	11.19	397.03	3.00	-2.86%	14.19	no	-2.86%	396.94	-3.68%	397.33	N/A	N/A	N/A	N/A
2125	10.00	396.10	2.13	-4.60%	12.13	-2.08%	-2.08%	396.31	-2.55%	396.69	N/A	N/A	N/A	N/A
2150	12.17	395.36	0.77	-3.53%	12.94	-2.08%	-2.08%	395.52	-3.15%	395.90	N/A	N/A	N/A	N/A
2175	13.33	394.95	3.27	-2.18%	16.80	no	-2.18%	394.88	-2.57%	395.26	N/A	N/A	N/A	N/A
2200	10.87	394.57	7.45	-3.13%	18.32	no	-3.13%	394.34	-2.17%	394.72	N/A	N/A	N/A	N/A
2225	9.19	394.41	3.38	-4.57%	12.57	no	-4.57%	394.26	-0.33%	394.64	N/A	N/A	N/A	N/A
2245.36	8.60	394.18	0.00	-8.86%	8.60	no	-8.86%	394.18	-0.37%	394.56	N/A	N/A	N/A	N/A



SHEET 8 OF 23
FILE No. PP-2531



TYPICAL PAVEMENT WEDGING DETAIL
TO BE USED FOR PAVEMENT ADDITIONS



NOTE:
BOTTOM AND ALL SIDES OF CUT TO BE PREPARED WITH ASPHALT
PRIOR TO PLACING ASPHALT MIX.

PAVEMENT WEDGING REQUIRED AT ALL CUTLINES.

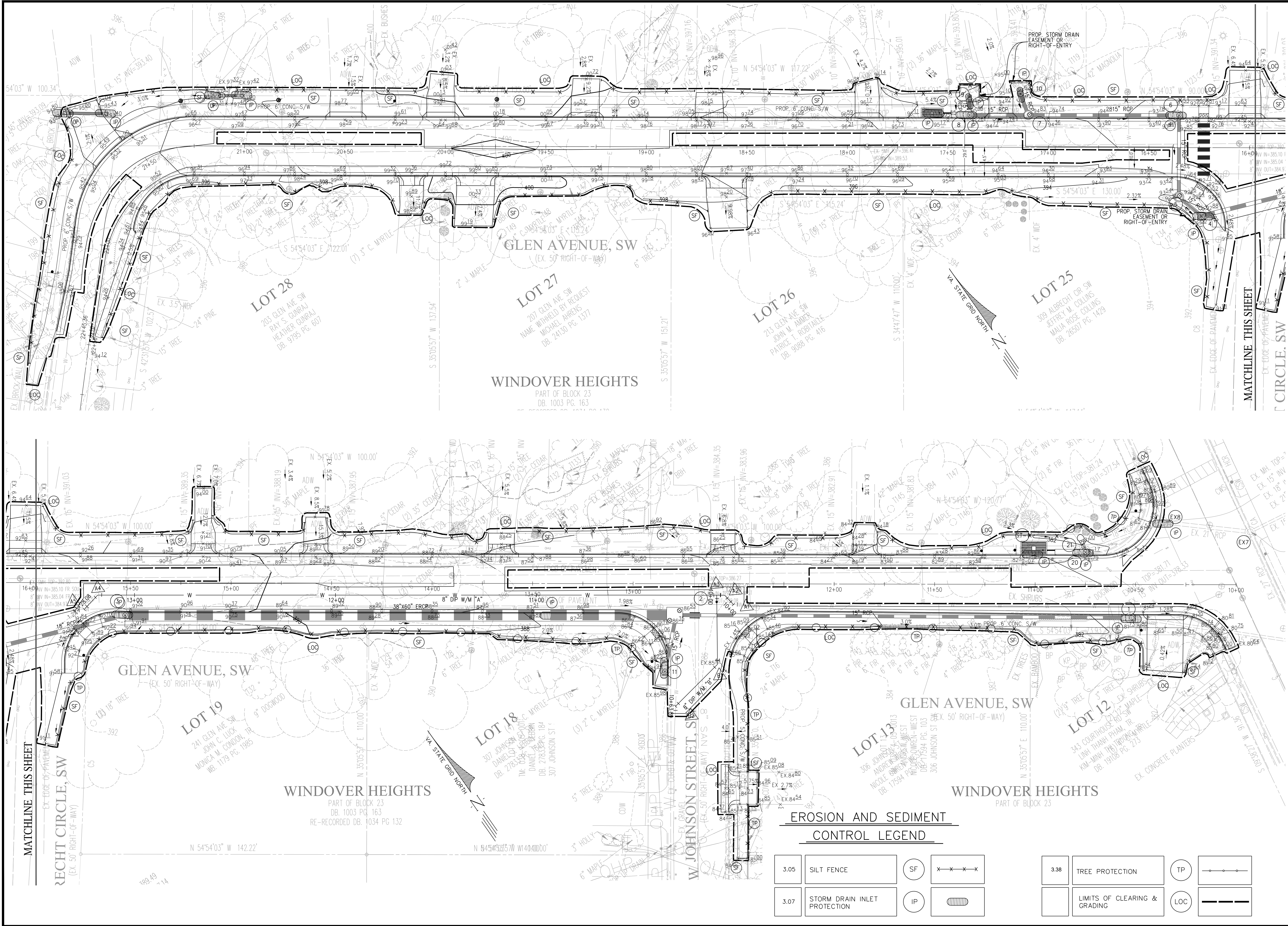
PAVEMENT LEGEND

- | | | | |
|--|--|--|--|
| | ASPHALT REPAIR IN LIKE KIND AT EXISTING ELEVATION | | MILL AND OVERLAY (1") |
| | MINIMUM PAVEMENT WEDGING AREA | | MILL AND OVERLAY WITH BUILD UP (SEE DESIGN TABLE) |
| | PROPOSED CONCRETE (CURB & GUTTER, CG-12, SIDEWALK ETC) | | FULL ASPHALT REPLACEMENT
SM-9.5A = 1.5"
IM-19.0 = 3.0"
21-A = 12.0" |

MATCHLINE THIS SHEET
HT CIRCLE, SW

MATCHLINE THIS SHEET
RECHT CIRCLE, SW
(EX. 50' RIGHT-OF-WAY)

PLAN DATE 01-1-2023 08-14-2024 09-26-2024		Urban Ltd 7712 Little River Turnpike Amanford, Virginia 23003 Tel. 703.642.8080 Fax. 703.642.8251 www.urban-ld.com	
3 09/26/24 95% PLAN UPDATE		REVISIONS	
2 08/14/24 95% PLAN		DESCRIPTION	
1 10/11/23 30% PLAN		DATE	
No.		DATE	
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		urban	
		Planners-Engineers-Landscape Architects-Land Surveyors	
		COMMONWEALTH OF VIRGINIA	
		C. RYAN CONNOR	
		Lic. No. 039531	
		09/26/2024	
		PROFESSIONAL ENGINEER	
PAVEMENT IMPROVEMENT PLAN		DATE: AUG 2024	
GLEN AVE, SW		SHEET	
SIDEWALK IMPROVEMENT PLAN		9	
TOWN OF VIENNA		OF	
FAIRFAX COUNTY, VIRGINIA		23	
SCALE: 1"=20'		FILE No.	
		PP-2531	



EROSION AND SEDIMENT
CONTROL LEGEND

3.05	SILT FENCE	SF	x x x x
3.07	STORM DRAIN INLET PROTECTION	IP	

3.38	TREE PROTECTION	TP	
	LIMITS OF CLEARING & GRADING	LOC	

PLAN DATE 01-1-2023 08-14-2024 09-26-2024		PLAN 3 09/26/24 95% PLAN UPDATE 2 08/14/24 95% PLAN 1 10/11/23 30% PLAN		REVISIONS	
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EROSION AND SEDIMENT CONTROL PH I & II					
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TOWN OF VIENNA					
FAIRFAX COUNTY, VIRGINIA					
SCALE: 1" = 20'		DATE: AUG 2024		SHEET 10 OF 23	
FILE No. PP-2531					

PROJECT DESCRIPTION

EXISTING SITE CONDITIONS

ADJACENT PROPERTIES

OFF-SITE AREAS

SOILS INFORMATION

CRITICAL EROSION AREAS

EROSION AND SEDIMENT CONTROL MEASURES

OVERALL MANAGEMENT STRATEGY

EROSION CONTROL PROGRAM (GENERAL GUIDELINES)

7. PERMANENT OR SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 30 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN 1 YEAR.

SEDIMENT CONTROL PROGRAM (PHASE I)

2. COMMENCE CONSTRUCTION OF ALL UTILITIES AND GRADING OF THE SITE.

SEDIMENT CONTROL PROGRAM (PHASE II)

- ## MAINTENANCE

PERMANENT STABILIZATION

STORMWATER MANAGEMENT

N/A

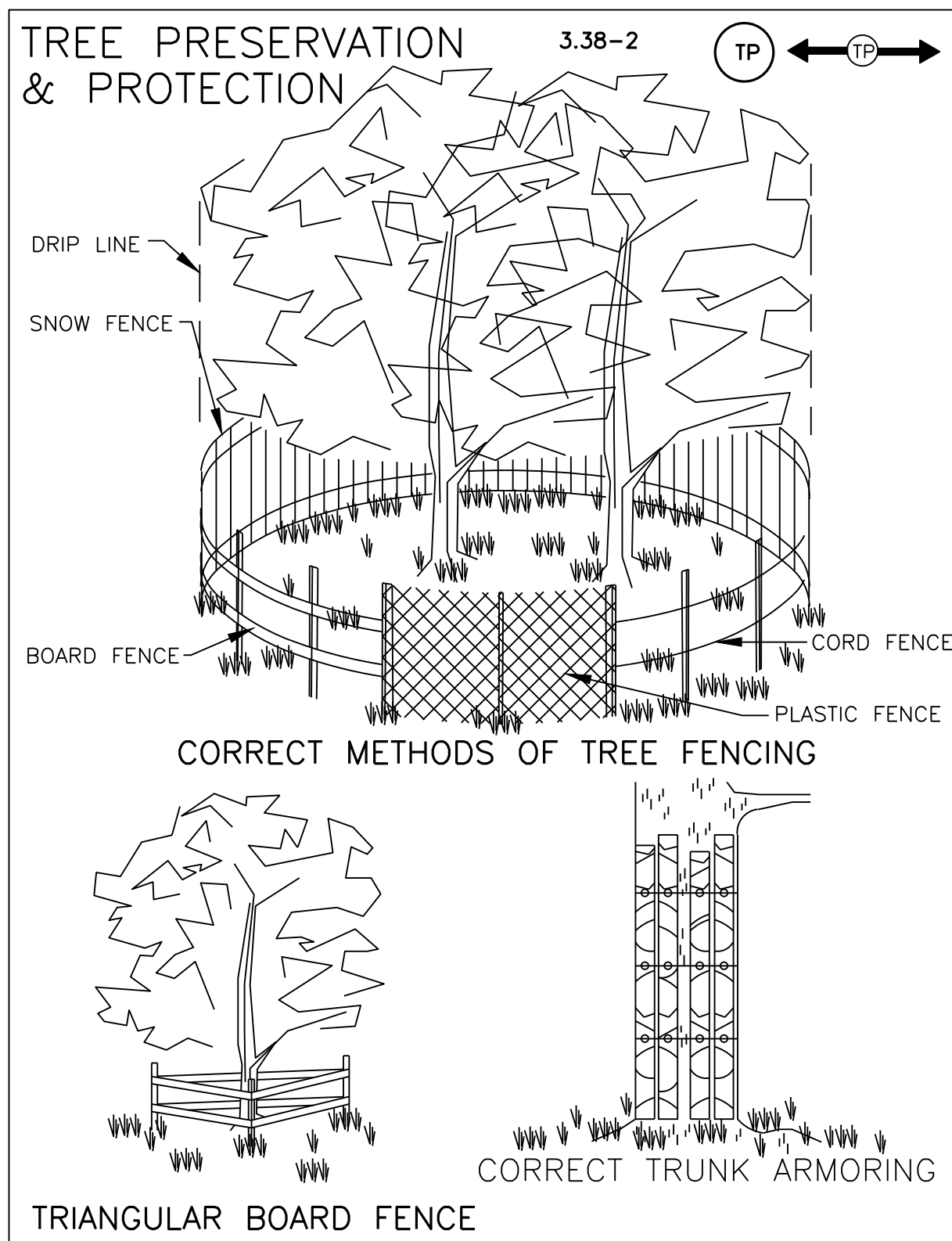
ADDITIONAL NOTES

1. THE TOWN INSPECTOR SHALL HAVE THE AUTHORITY TO DIRECT THE ADDITION OR DELETION OF EROSION AND SEDIMENT CONTROLS AS SITE CONDITIONS WARRANT.
2. EARTHEN STRUCTURES ARE TO BE STABILIZED IMMEDIATELY UPON COMPLETION.

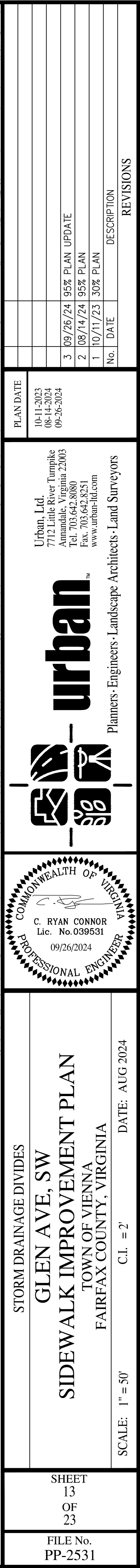
EROSION AND SEDIMENT CONTROL MEASURES:

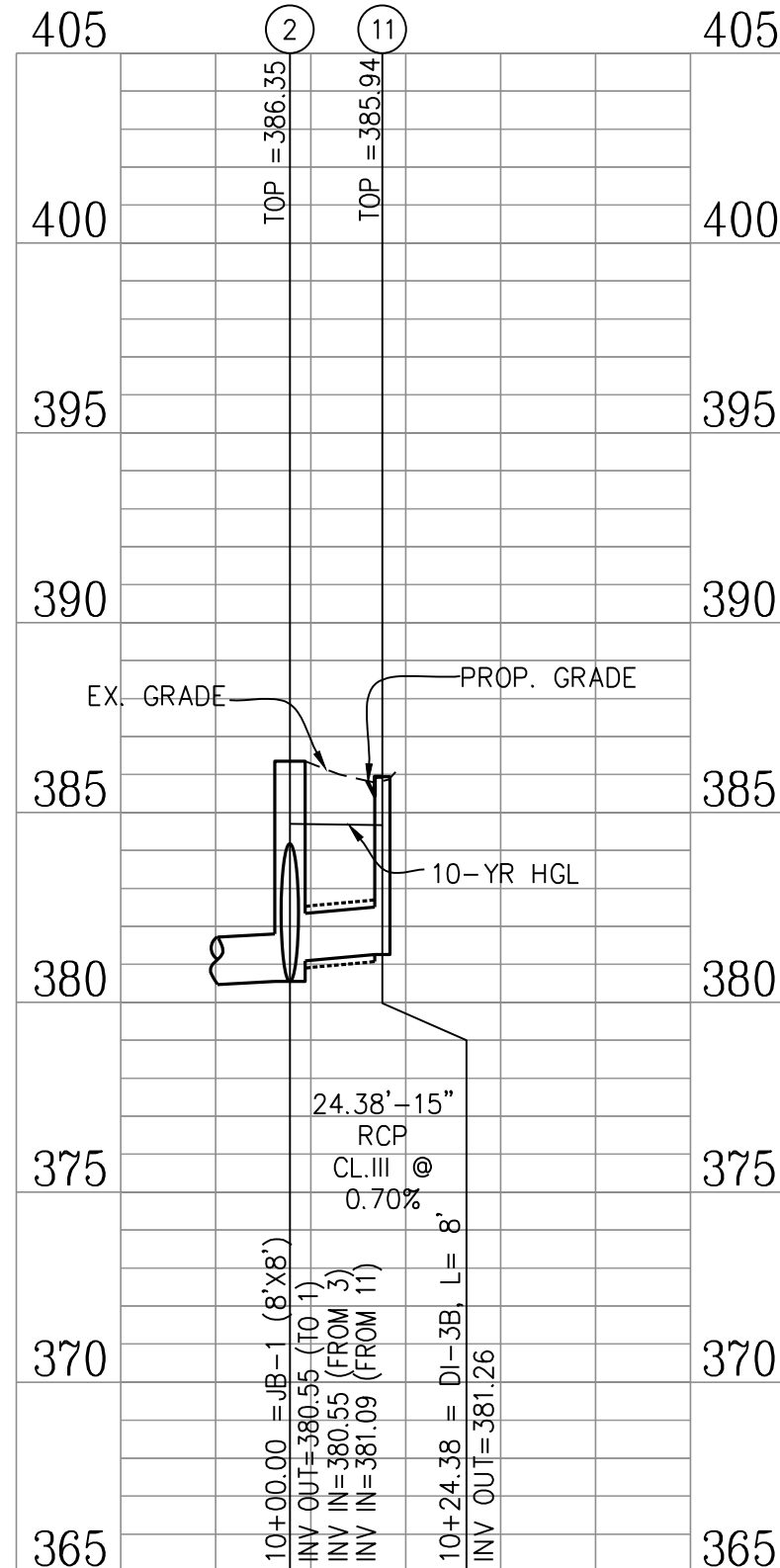
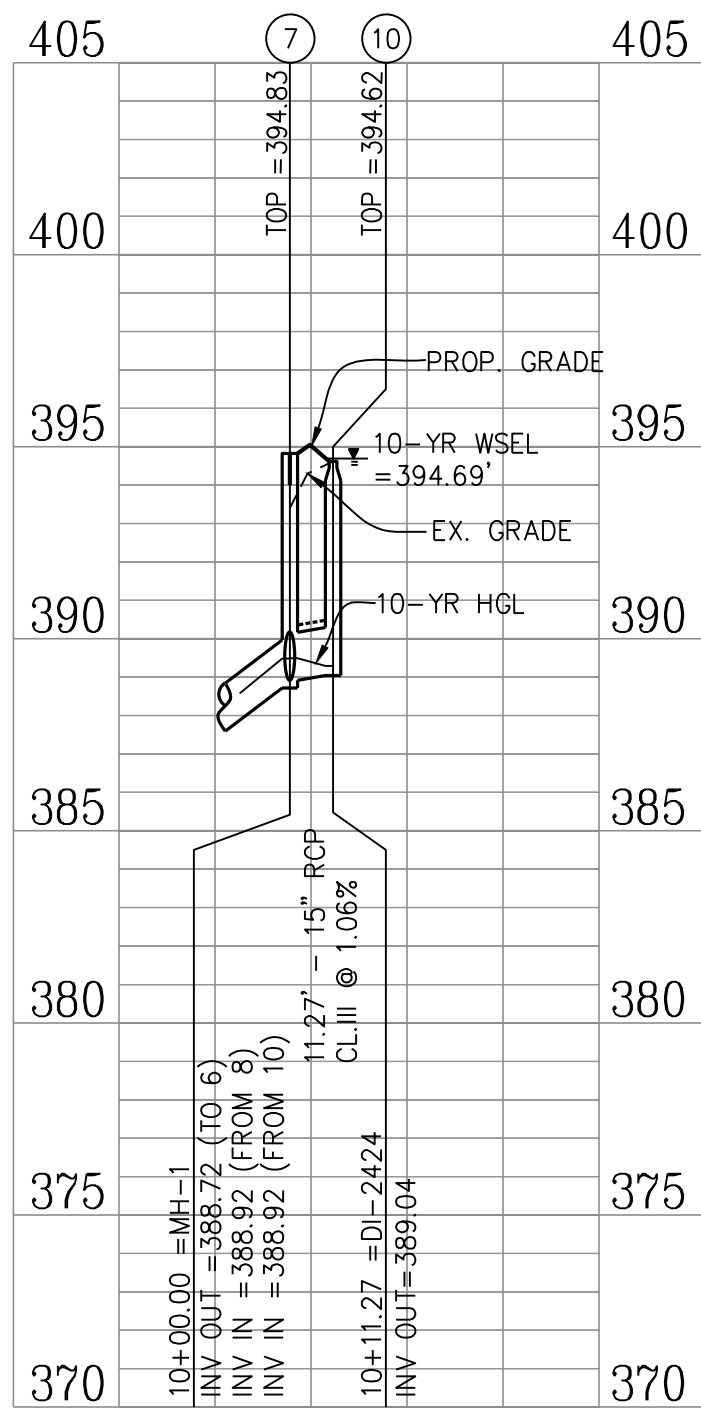
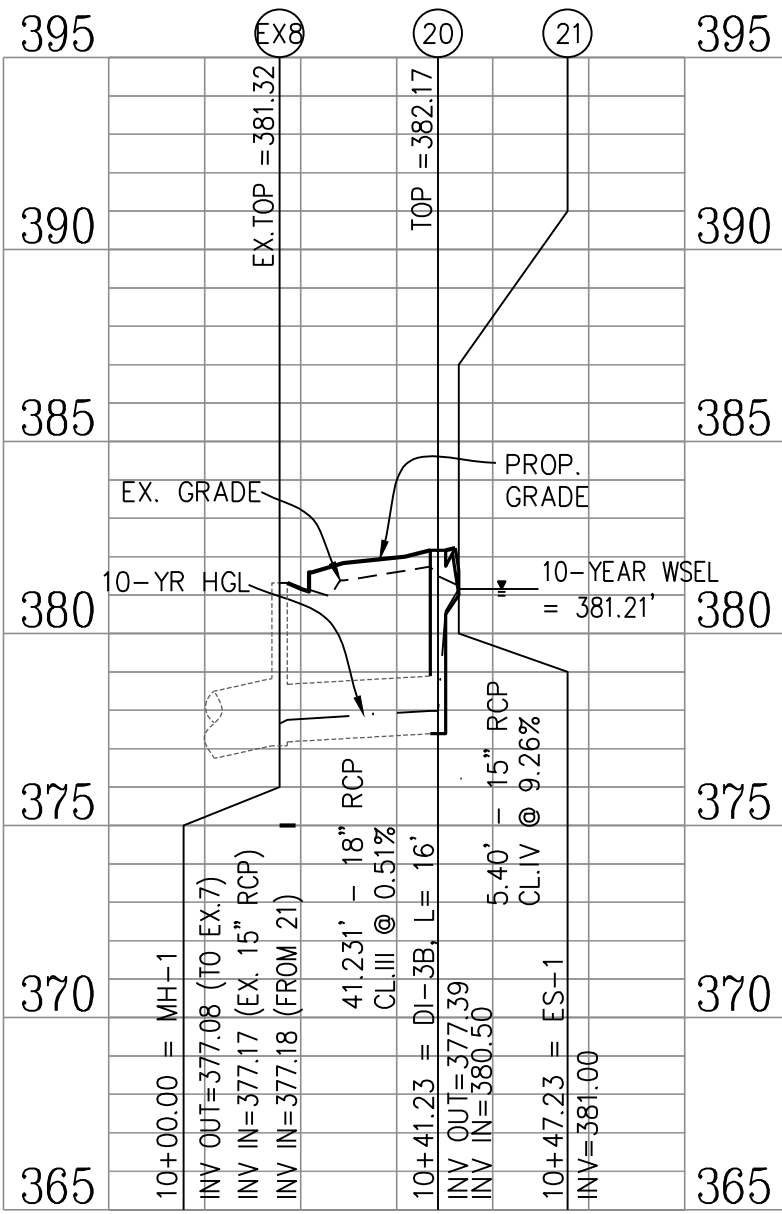
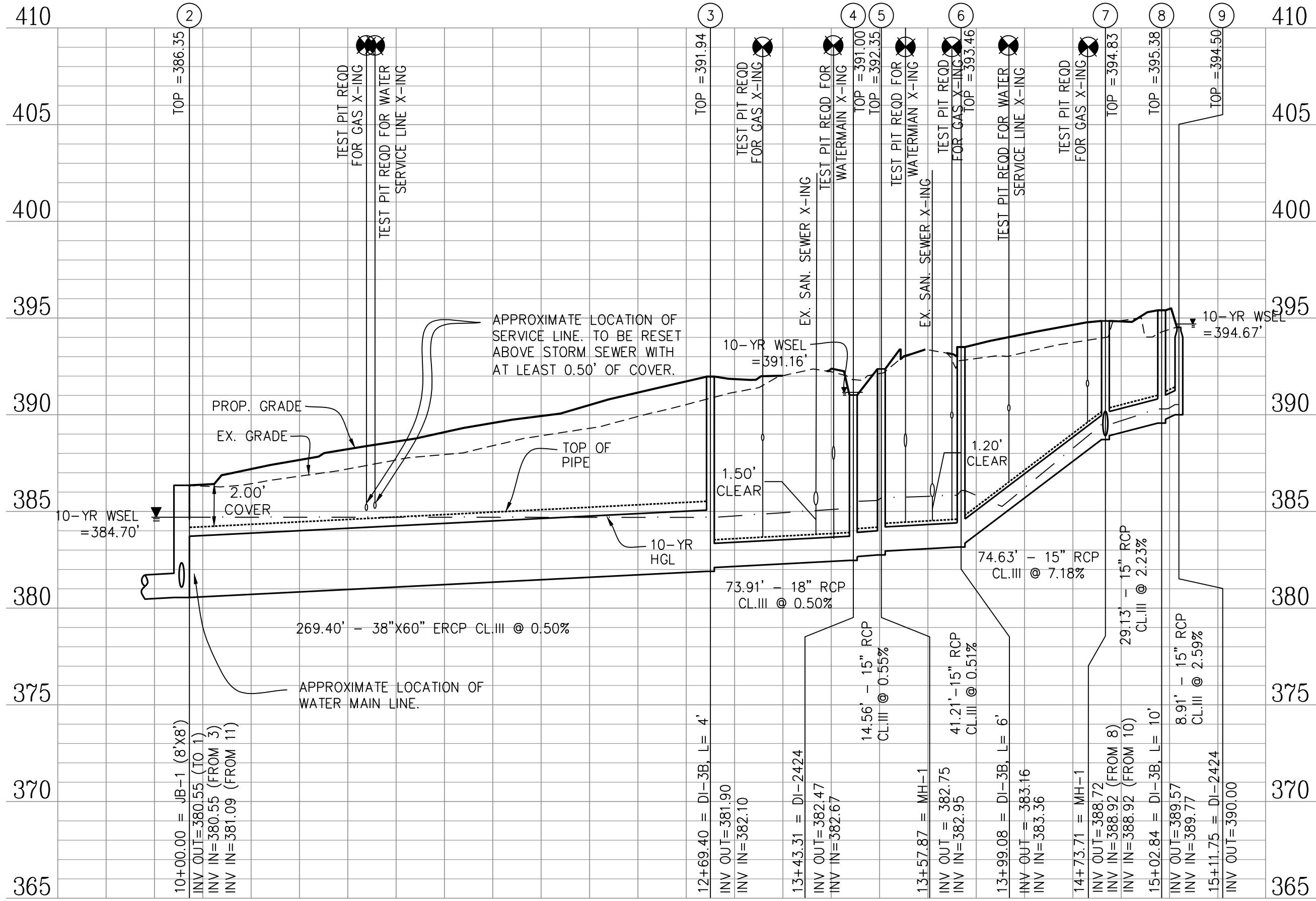
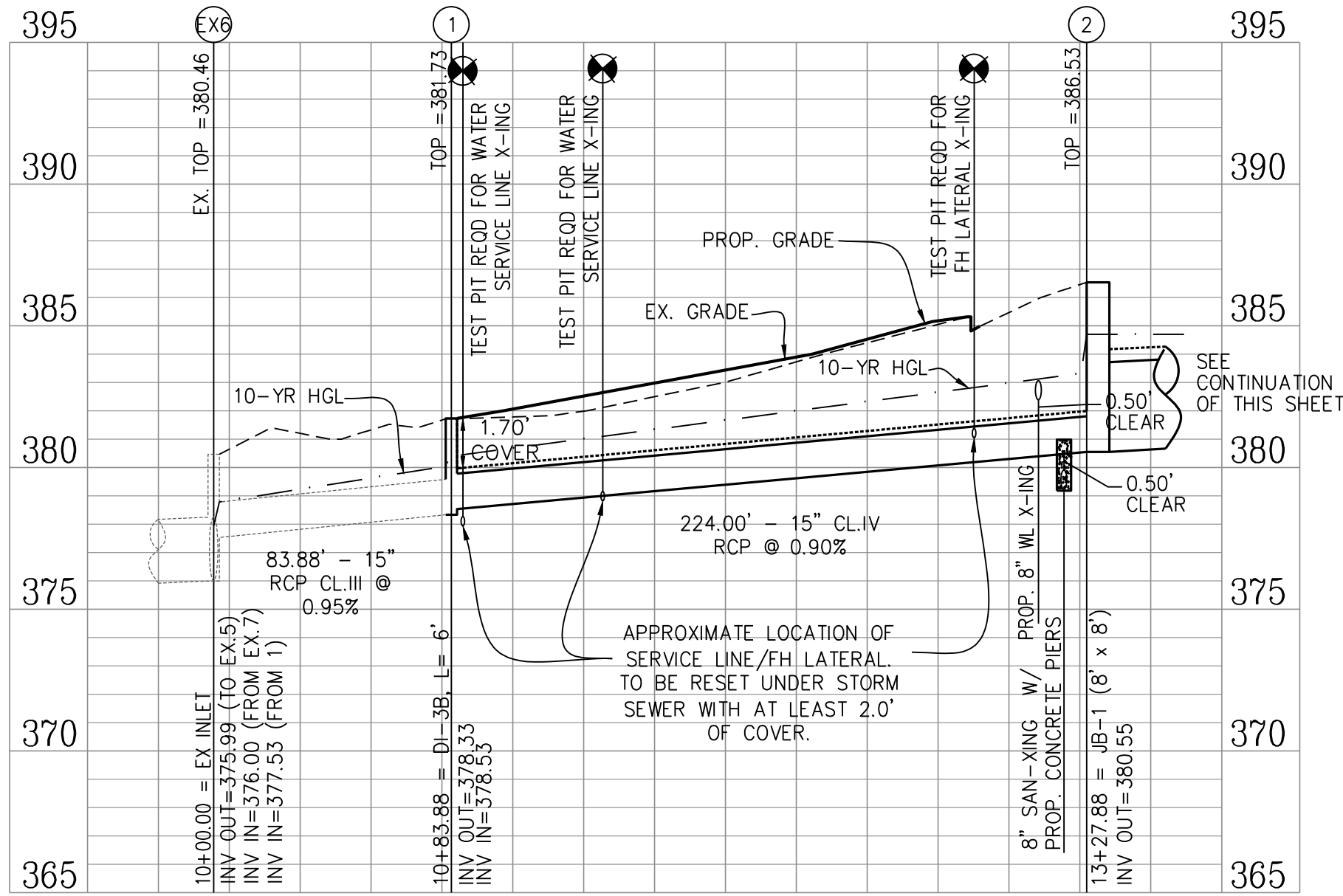
THE STRUCTURAL PRACTICES PROPOSED WITH THIS PLAN ARE AS FOLLOWS:

1. SILT FENCE - 3.05
A TEMPORARY SEDIMENT BARRIER CONSISTING OF A SYNTHETIC FILTER FABRIC STRETCHED ACROSS AND ATTACHED TO SUPPORTING POSTS AND ENTRENCHED.
2. STORM DRAIN INLET PROTECTION - 3.07
A SEDIMENT FILTER OR AN EXCAVATED IMPOUNDING AREA AROUND A STORM DRAIN DROP INLET OR CURB INLET.
3. TOPSOILING - 3.30
PRESERVING AND REUSING THE SURFACE LAYER OF SOIL FROM AREAS TO BE GRADED.
4. TEMPORARY SEEDING - 3.31
THE ESTABLISHMENT OF A TEMPORARY VEGETATIVE COVER ON DISTURBED AREAS BY SEEDING WITH APPROPRIATE RAPIDLY GROWING ANNUAL PLANTS.
5. SODDING - 3.33
STABILIZING FINE-GRADED DISTURBED AREAS BY ESTABLISHING PERMANENT GRASS STANDS WITH SOD
6. MULCHING - 3.35
APPLICATION OF PLANT RESIDUES OR OTHER SUITABLE MATERIALS TO THE SOIL SURFACE.
7. TREE PROTECTION - 3.38
PROTECTION OF DESIRABLE TREES FROM MECHANICAL AND OTHER INJURY DURING LAND DISTURBING AND CONSTRUCTION ACTIVITY.
8. DUST CONTROL - 3.39
REDUCING SURFACE AND AIR MOVEMENT OF DUST DURING LAND DISTURBING, DEMOLITION, AND CONSTRUCTION ACTIVITIES, BY SPRAYING FROM A WATER TRUCK OR OTHER APPROVED METHOD.



FILE No. PP-2531	SHEET 11 OF 23	EROSION AND SEDIMENT CONTROL NARRATIVE AND DETAILS	GLEN AVE, SW SIDEWALK IMPROVEMENT PLAN TOWN OF VIENNA FAIRFAX COUNTY, VIRGINIA	SCALE: N/A	C.L. N/A	DATE: AUG 2024			Urban, Ltd. 7712 Little River Turnpike Annandale, Virginia 22003 Tel. 703.422.8080 Fax. 703.422.8081 www.urban-ld.com	Planners: Engineers - Landscape Architects - Land Surveyors	PLAN DATE				
												10-11-2023			
												08-14-2024			
												09-26-2024			
												3 09/26/24	95% PLAN UPDATE		
												2 08/14/24	95% PLAN		
												1 10/11/23	30% PLAN		
	No.	DATE	DESCRIPTION	REVISIONS											





PLAN DATE
01-1-2023
08-14-2024
09-26-2024

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Planners-Engineers-Landscape Architects-Land Surveyors

COMMONWEALTH OF VIRGINIA
C. RYAN CONNOR
Lic. No. 039531
09/26/2024
PROFESSIONAL ENGINEER

STORM PROFILES
GLEN AVE, SW
SIDEWALK IMPROVEMENT PLAN
TOWN OF VIENNA
FAIRFAX COUNTY, VIRGINIA

DATE: AUG 2024

REVISIONS

3 09/26/24 95% PLAN UPDATE
2 08/14/24 95% PLAN
1 10/11/23 30% PLAN

FILE No.
PP-2531

SHEET
14
OF
23

SCALE: N/A

BMP SITE REQUIREMENT COMPUTATIONS

"SITE AREA" ONLY - DESCRIBED IN NARRATIVE ON THIS SHEET

Project Name:

Glen Ave

Date:

8/6/2024

CLEAR ALL
(Ctrl+Shift+R)

data input cells
constant values
calculation cells
final results

Linear Development Project?

No

Site Information

Post-Development Project (Treatment Volume and Loads)

Enter Total Disturbed Area (acres) →

1.46

Maximum reduction required:

20%

The site's net increase in impervious cover (acres) is:

0.36

Post-Development TP Load Reduction for Site (lb/yr):

0.97

Check:
BMP Design Specifications List: 2013 Draft Stds & Specs
Linear project?

No

Land cover areas entered correctly?

✓

Total disturbed area entered?

✓

Pre-ReDevelopment Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed forest/open space					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be				0.80	0.80
Impervious Cover (acres)				0.66	0.66
					1.46

Post-Development Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be				0.44	0.44
Impervious Cover (acres)				1.02	1.02
Area Check	OK.	OK.	OK.	OK.	1.46

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Total Phosphorus (TP) EMC (mg/L)	0.26
Total Nitrogen (TN) EMC (mg/L)	1.86
Target TP Load (lb/acre/yr)	0.41
Pj (unitless correction factor)	0.90

Runoff Coefficients (Rv)

	A Soils	B Soils	C Soils	D Soils
Forest/Open Space	0.02	0.03	0.04	0.05
Managed Turf	0.15	0.20	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

LAND COVER SUMMARY -- PRE-REDEVELOPMENT

Land Cover Summary-Pre		
Pre-ReDevelopment	Listed	Adjusted ¹
Forest/Open Space Cover (acres)	0.00	0.00
Weighted Rv (forest)	0.00	0.00
% Forest	0%	0%
Managed Turf Cover (acres)	0.80	0.44
Weighted Rv (turf)	0.25	0.25
% Managed Turf	55%	40%
Impervious Cover (acres)	0.66	0.66
Rv (impervious)	0.95	0.95
% Impervious	45%	60%
Total Site Area (acres)	1.46	1.10
Site Rv	0.57	0.67

Treatment Volume and Nutrient Load

Pre-ReDevelopment Treatment Volume (acre-ft)	0.0889	0.0614
Pre-ReDevelopment Treatment Volume (cubic feet)	3,002	2,675
Pre-ReDevelopment TP Load (lb/yr)	1.89	1.68
Pre-ReDevelopment TP Load per acre (lb/acre/yr)	1.29	1.53
Baseline TP Load (lb/yr) (0.41 lbs/acre/yr applied to pre-redevelopment area excluding previous land proposed for new impervious cover)		0.45

LAND COVER SUMMARY -- POST DEVELOPMENT

Land Cover Summary-Post (Final)		
Post ReDev. & New Impervious		
Forest/Open Space Cover (acres)	0.00	0.00
Weighted Rv (forest)	0.00	0%
% Forest	0%	
Managed Turf Cover (acres)	0.44	0.44
Weighted Rv (turf)	0.25	0.25
% Managed Turf	30%	40%
Impervious Cover (acres)	1.02	0.66
Rv (impervious)	0.95	0.95
% Impervious	70%	60%
Total ReDev. Site Area (acres)	1.46	1.10
Final Post Dev Site Rv	0.74	0.67

Treatment Volume and Nutrient Load

Final Post-Development Treatment Volume (acre-ft)	0.0899	0.0614
Final Post-Development Treatment Volume (cubic feet)	3,917	2,675
Final Post-Development TP Load (lb/yr)	2.46	1.68
Final Post-Development TP Load per acre (lb/acre/yr)	1.69	1.53
Max. Reduction Required (Below Pre-ReDevelopment Load)		20%
TP Load Reduction Required for Redeveloped Area (lb/yr)	0.34	
TP Load Reduction Required for New Impervious Area (lb/yr)		0.63

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	0.97
------------------------------------	------

Nitrogen Loads (Informational Purposes Only)

Pre-ReDevelopment TN Load (lb/yr)	13.49	Final Post-Development TN Load (Post-ReDevelopment & New Impervious) (lb/yr)	17.60
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NOTE: THE COMPUTATIONS SHOWN ON THIS SHEET WERE DETERMINED USING VERSION 3.0 OF THE VIRGINIA RUNOFF REDUCTION METHOD (VRRM) RE-DEVELOPMENT COMPLIANCE SPREADSHEET RELEASED AUGUST, 2017.

BMP NARRATIVE

THE "SITE AREA" UTILIZED IN THE WATER QUALITY REQUIREMENTS CONSISTS OF ONLY OF THE DISTURBED AREA. THE MAJORITY OF THIS SITE DRAINS TO A COMBINATION OF THE EXISTING INLETS AND PROPOSED INLETS THAT ULTIMATELY ENTER INTO THE EXISTING STORM SYSTEM WITHIN THE PUBLIC ROW TO THE WEST AND EAST OF THE SITE.

PER THE BMP CALCULATIONS ON THIS SHEET AND IN COMPLIANCE WITH VSPM (VRRM) WATER QUALITY CONTROL REQUIREMENTS PER TOWN OF VIENNA (TOV) SECTION 23-17, THE PHOSPHORUS REMOVAL REQUIREMENT OF 0.97 POUNDS/YEAR HAS BEEN MET/EXCEEDED UTILIZING TWO STORM TREE FILTER DEVICES (ST-1 AND ST-2). FOR THE RESULTANT TREATED AREA FOR EACH DEVICE, THE AREA THAT FALLS WITHIN THE "SITE AREA" AS WELL AS OFFSITE AREA IS UTILIZED. SEE THIS SHEET AND SHEETS 17-18 FOR COMPUTATIONS, MAPS, AND DETAILS FOR THE PROPOSED DEVICES.

NOTE: ALL SOILS TYPE D

TO STORM TREE FILTER (ST-1) - TOTAL AREA ("SITE AREA" + OFFSITE)

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)					0.00	0.00
Managed Turf (acres)				0.68	0.68	0.25
Impervious Cover (acres)				0.39	0.39	0.95
Total					1.07	

Total Phosphorus Available for Removal in D.A. A (lb/yr)	1.23
Post Development Treatment Volume in D.A. A (ft ³)	1,962

Stormwater Best Management Practices (RR = Runoff Reduction)

Practice	Runoff Reduction Credit (%)	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
14. Manufactured Treatment Devices (no RR)													
14.a. Manufactured Treatment Device-Hydrodynamic	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
14.b. Manufactured Treatment Device-Filtering	0	0.68	0.39	0	0	1,962	1,962	62	0.00	1.23	0.76	0.47	
14.c. Manufactured Treatment Device-Generic	0			0	0	0	0	20	0.00	0.00	0.00	0.00	

--Select from dropdown lists--

TO STORM TREE FILTER (ST-2) - TOTAL AREA ("SITE AREA" + OFFSITE)

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)					0.00	0.00
Managed Turf (acres)				0.17	0.17	0.25
Impervious Cover (acres)				0.22	0.22	0.95
Total					0.39	

otal Phosphorus Available for Removal in D.A. B (lb/yr)	0.57
Post Development Treatment Volume in D.A. B (ft ³)	913

Stormwater Best Management Practices (RR = Runoff Reduction)

Practice	Runoff Reduction Credit (%)	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
14. Manufactured Treatment Devices (no RR)													
14.a. Manufactured Treatment Device-Hydrodynamic	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
14.b. Manufactured Treatment Device-Filtering	0	0.17	0.22	0	0	913	913	62	0.00	0.57	0.36	0.22	
14.c. Manufactured Treatment Device-Generic	0			0	0	0	0	20	0.00	0.00	0.00	0.00	

--Select from dropdown lists--

Site Results (Water Quality Compliance)

Area Checks	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	AREA CHECK
FOREST/OPEN SPACE (ac)	0.00	0.00	0.00	0.00	0.00	OK.
IMPERVIOUS COVER (ac)	0.39	0.22	0.00	0.00	0.00	OK.
IMPERVIOUS COVER TREATED (ac)	0.39	0.22	0.00	0.00	0.00	OK.
MANAGED TURF AREA (ac)	0.68	0.17	0.00	0.00	0.00	OK.
MANAGED TURF AREA TREATED (ac)	0.68	0.17	0.00	0.00	0.00	OK.
AREA CHECK	OK.	OK.	OK.	OK.	OK.	

Site Treatment Volume (ft³)

5,345

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)	1.23	0.57	0.00	0.00	0.00	1.81
TP LOAD REDUCTION ACHIEVED (lb/yr)	0.74	0.34	0.00	0.00	0.00	1.08
TP LOAD REMAINING (lb/yr)	0.49	0.23	0.00	0.00	0.00	0.72
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	0.00	0.00	0.00	0.00	0.00	0.00

Total Phosphorus

FINAL POST-DEVELOPMENT TP LOAD (lb/yr)	2.46
TP LOAD REDUCTION REQUIRED (lb/yr)	0.97
TP LOAD REDUCTION ACHIEVED (lb/yr)	1.08
TP LOAD REMAINING (lb/yr):	1.38
REMAINING TP LOAD REDUCTION REQUIRED (lb/yr):	0.00 **
** TARGET TP REDUCTION EXCEEDED BY 0.11 LB/YEAR **	
TOTAL TP LOAD REDUCTION ACHIEVED UTILIZED BOTH "SITE AREA" AND OFFSITE AREA TO ST-1 AND ST-2.	
PROPOSED BMP DEVICES MEETS WATER QUALITY CRITERIA PER TOWN OF VIENNA CODE SECTION 23-17.	

Total Nitrogen (For Informational Purposes)

POST-DEVELOPMENT LOAD (lb/yr)	17.60
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	0.00
REMAINING POST-DEVELOPMENT NITROGEN LOAD (lb/yr)	17.60

PLAN DATE
10-1-2024
08-14-2024
09-26-2024

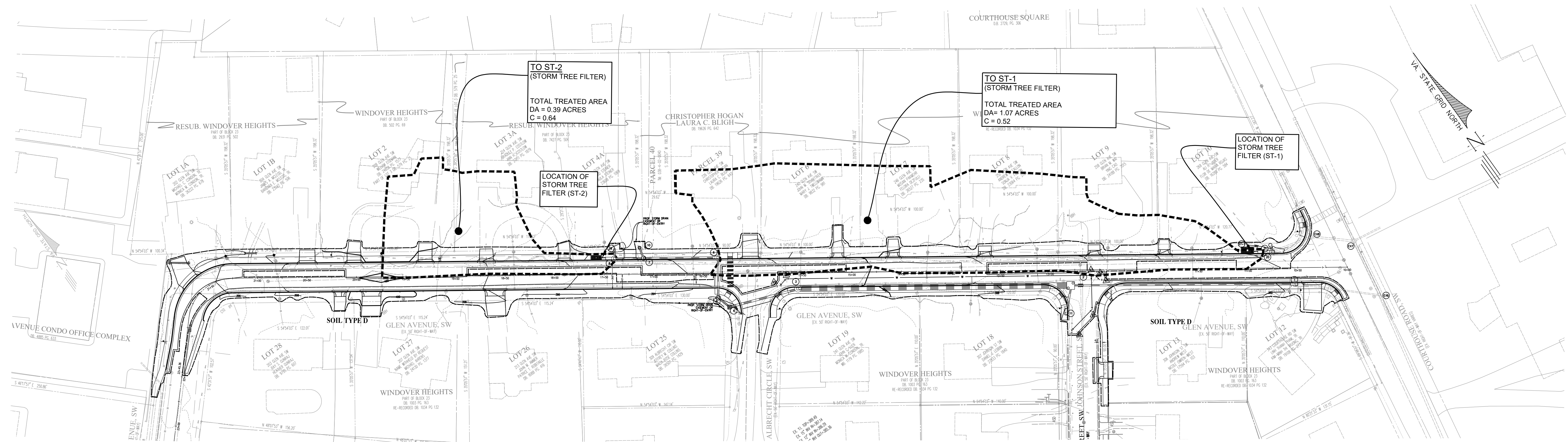
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3 09/26/24 95% PLAN UPDATE
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1 10/11/23 30% PLAN
No. DATE DESCRIPTION REVISIONS

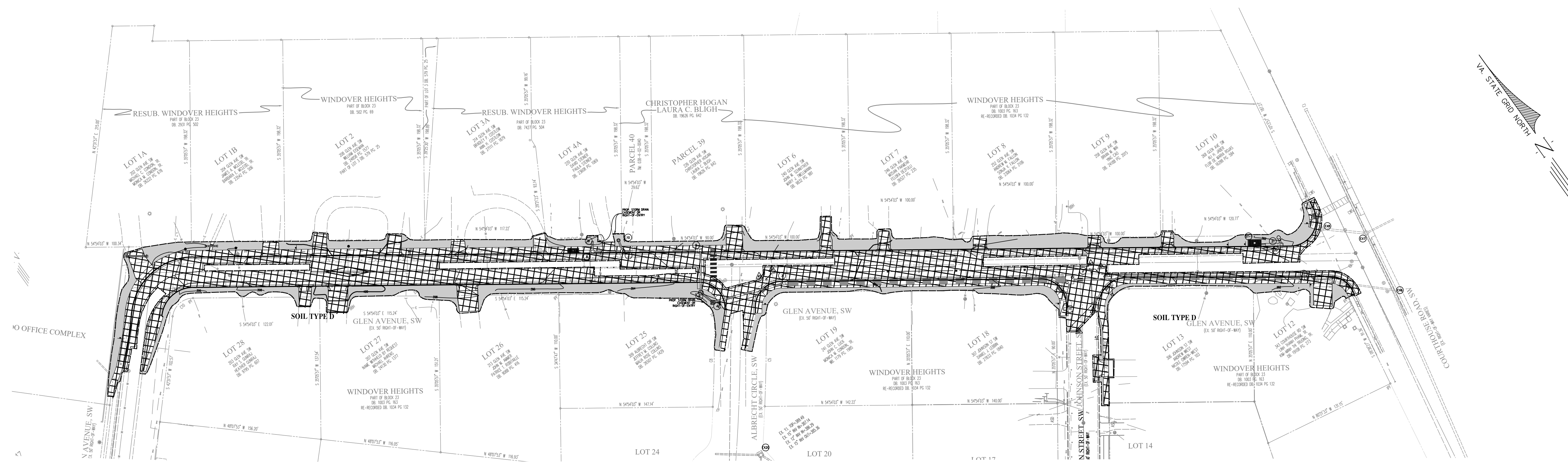
COMMONWEALTH OF VIRGINIA
C. RYAN CONNOR
Lic. No. 039531
09/26/2024
PROFESSIONAL ENGINEER

VRRM SPREADSHEET & WATER QUALITY NARRATIVE
GLEN AVE, SW
SIDEWALK IMPROVEMENT PLAN
TOWN OF VIENNA
FAIRFAX COUNTY, VIRGINIA
SCALE: N/A
DATE: AUG 2024
C.I. = 2'

SHEET
16
OF
23
FILE No.
PP-2531

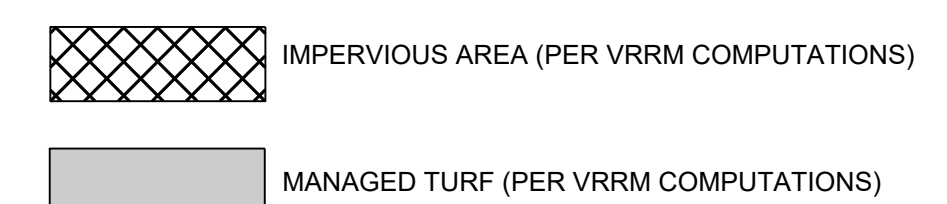


SCALE: 1" = 50'



SCALE: 1" = 50'

BMP DRAINAGE AREA MAP

[illegible]

PLAN DATE	10-11-2023 08-14-2024 09-26-2024
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DATE: AUG 2024
A
T PLAN

BMP MAPS
TEN AVE, SW
IMPROVEMENT
DOWN OF VIENNA
X COUNTY, VIRGINIA
C.I. = 2'

GL
SIDEWALK | TC
FAIRFAX
: AS SHOWN

		SCALE
SHEET 17 OF 23		
FILE No. PP-2531		

STORMTREE #1 & #2 (ST-1) (ST-2)

STORMTREE STANDARD CONSTRUCTION DETAIL

STORMTREE #1 (ST-1)

STORMTREE MODEL SIZING

MODEL	X	Y	MEDIA BAY	TREATMENT VOLUME RATE (ACRE)*	TREATMENT FLOW RATE (CFS)*	UNDERDRAIN PIPE (DIA)
ST-12X6F	13	7	12' X 6'	UP TO 0.43	0.225	6"

* BASED ON 3 OPEN SIDES; 4 OPEN SIDES TO HAVE GREATER FLOW/VOLUME TREATMENT RATES BASED ON C-0.95 OR CATCHMENTS WITH MAXIMUM IMPERVIOUS SURFACE
CONTACT STORMTREE FOR ADDITIONAL DIMENSIONS
SIZING TABLE INTENDED FOR PLANNING LEVEL USE ONLY; CONTACT STORMTREE PRIOR TO FINAL PLAN SUBMITTAL

NOTE: ST-12X6 STORMTREE IS SIZED TO HANDLE UP TO 0.43 AC OF DRAINAGE AREA PER MANUFACTURERS TREATMENT CALCULATIONS. PROPOSED IMPERVIOUS DRAINAGE AREA TO STORMTREE = 0.39 AC. THE PROPOSED STORMTREE ST-12X6 IS SIZED CORRECTLY TO HANDLE THE FLOW TO THE DEVICE.

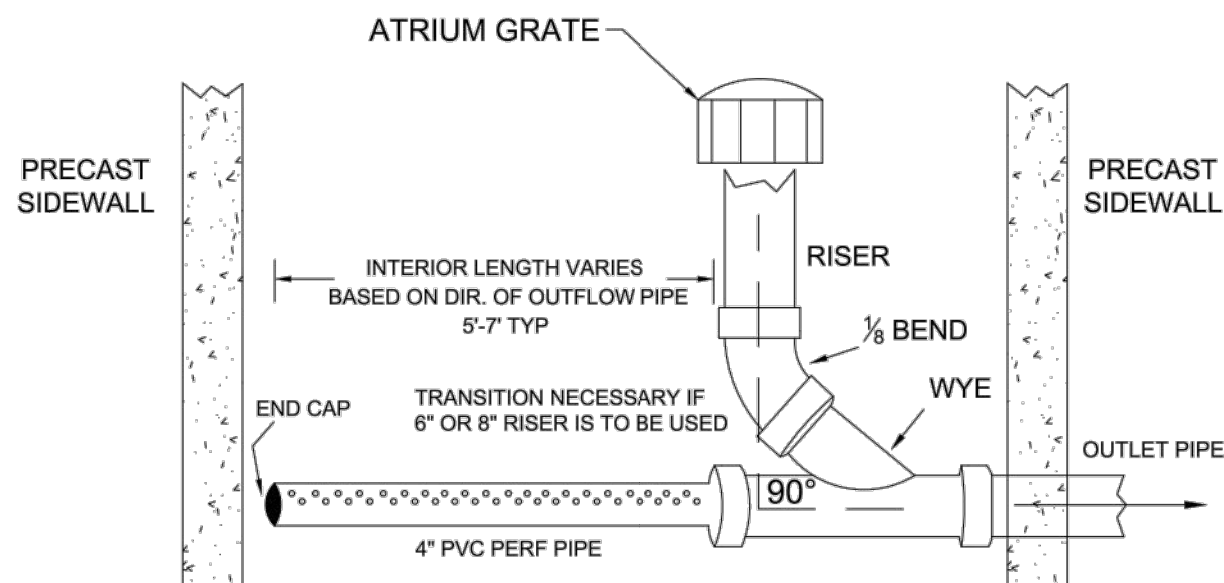
STORMTREE #2 (ST-2)

STORMTREE MODEL SIZING

MODEL	X	Y	MEDIA BAY	TREATMENT VOLUME RATE (ACRE)*	TREATMENT FLOW RATE (CFS)*	UNDERDRAIN PIPE (DIA)
ST-10X4F	11	5	10' X 4'	UP TO 0.24	0.128	6"

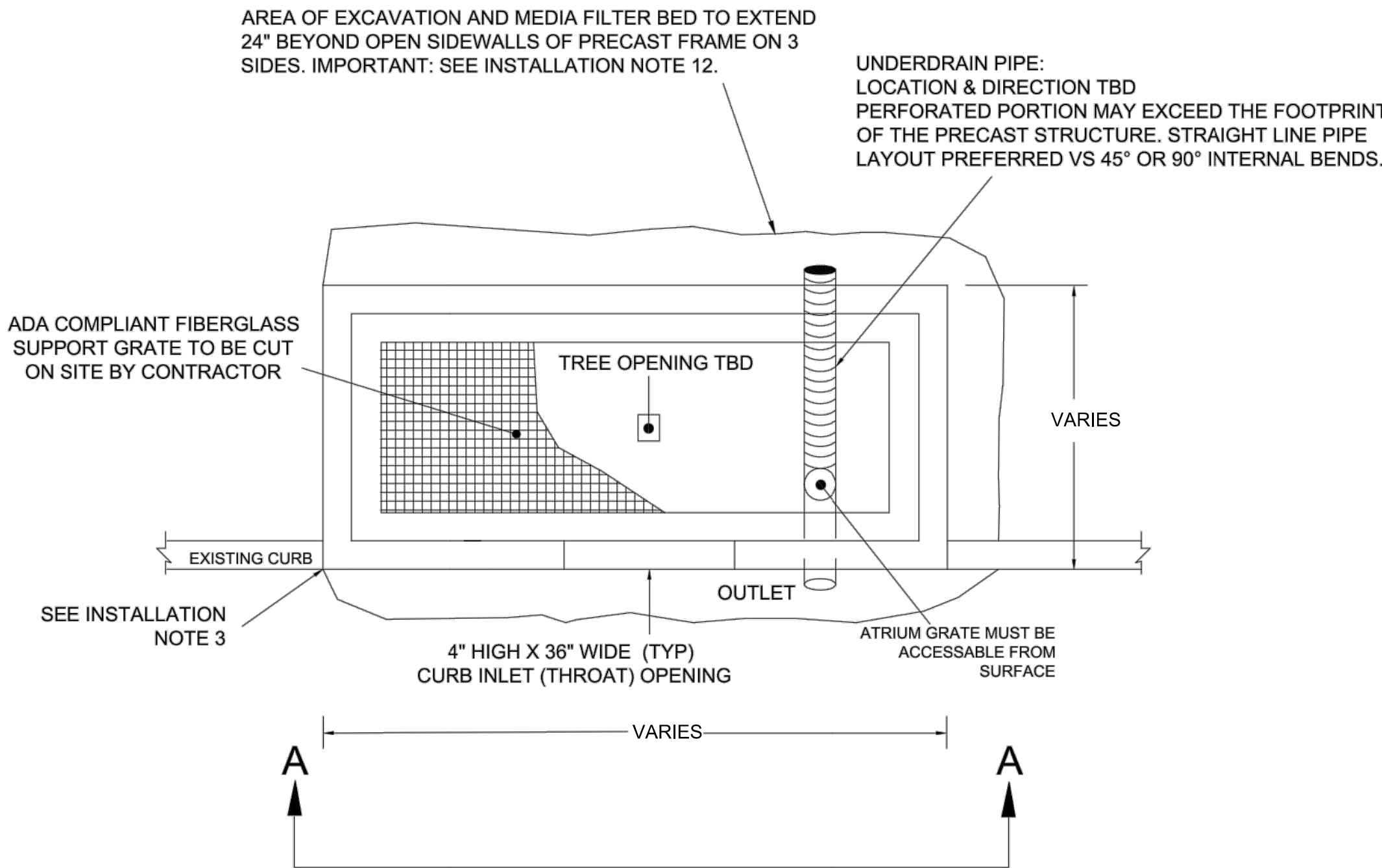
* BASED ON 3 OPEN SIDES; 4 OPEN SIDES TO HAVE GREATER FLOW/VOLUME TREATMENT RATES BASED ON C-0.95 OR CATCHMENTS WITH MAXIMUM IMPERVIOUS SURFACE
CONTACT STORMTREE FOR ADDITIONAL DIMENSIONS
SIZING TABLE INTENDED FOR PLANNING LEVEL USE ONLY; CONTACT STORMTREE PRIOR TO FINAL PLAN SUBMITTAL

NOTE: ST-10X4 STORMTREE IS SIZED TO HANDLE UP TO 0.24 AC OF DRAINAGE AREA PER MANUFACTURERS TREATMENT CALCULATIONS. PROPOSED IMPERVIOUS DRAINAGE AREA TO STORMTREE = 0.22 AC. THE PROPOSED STORMTREE ST-10X4 IS SIZED CORRECTLY TO HANDLE THE FLOW TO THE DEVICE.

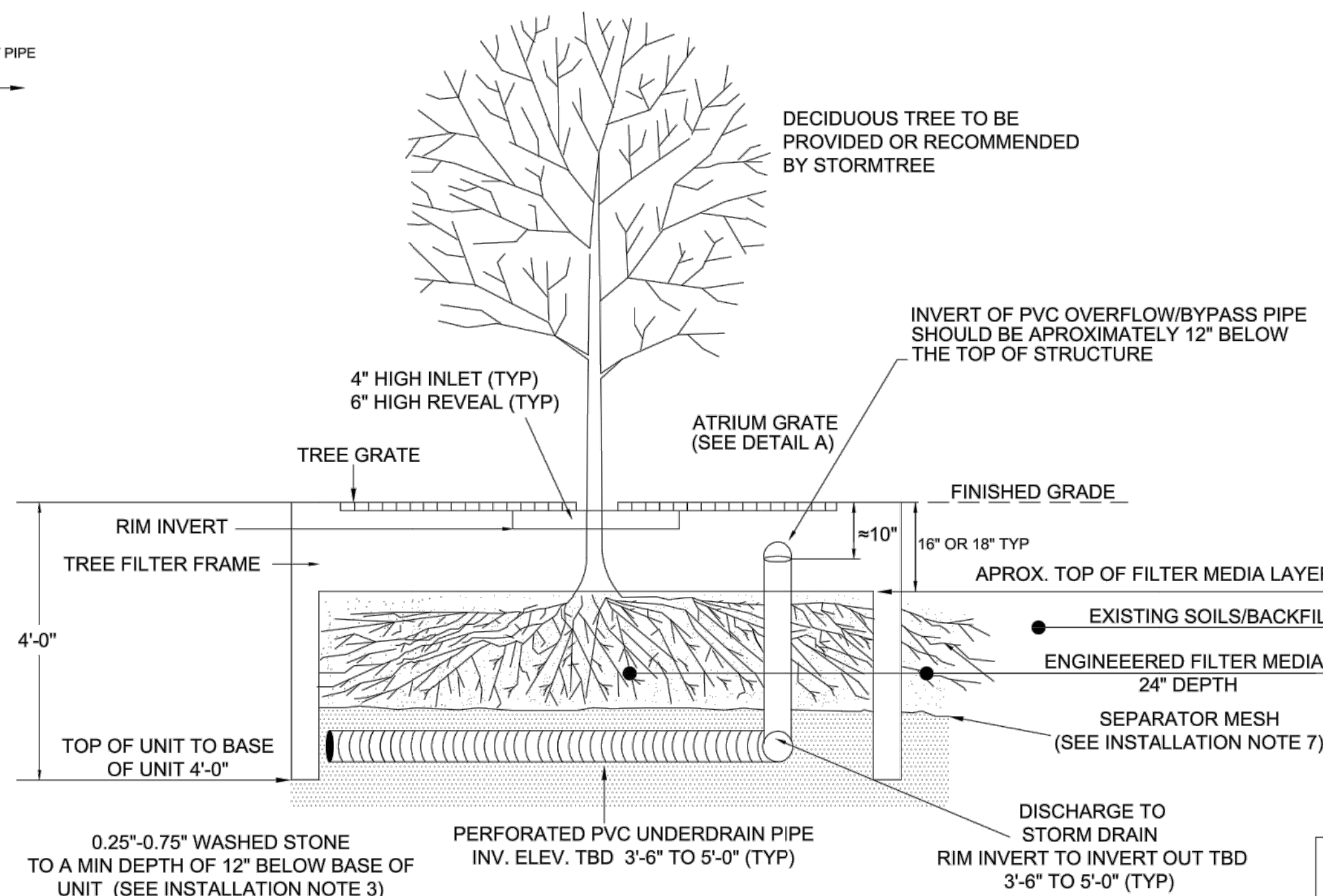


DETAIL "A"
PIPE AND FITTINGS
PROVIDED BY THE CONTRACTOR
(NTS)

THIS DESIGN, DRAWING, AND TECHNOLOGY IS PROPRIETARY AND THE PROPERTY OF STORMTREE. AND MAY NOT BE ALTERED OR REPRODUCED WITHOUT THE EXPRESSED CONSENT OF STORMTREE. US PATENT 8333885 AND OTHER PATENTS PENDING



PLAN VIEW
NOT TO SCALE



SECTION A-A
NOT TO SCALE

CONTRACTOR GENERAL NOTES:

USE OF THIS INFORMATION IS WITH THE PERMISSION OF STORMTREE. WITH THE UNDERSTANDING THAT NO CHANGES OR ALTERNATIONS ARE TO BE MADE TO THE DESIGN, FABRICATION, OR UTILITY OF THIS STORMTREE. TREE FILTER SYSTEM WITHOUT THE EXPRESSED PERMISSION OF STORMTREE. 401-626-8999; WWW.STORM-TREE.COM.

- 1) STORMTREE TO PROVIDE AND DELIVER TO THE SITE STORMTREE SYSTEM COMPONENTS TO INCLUDE ALL OF THE FOLLOWING (UNLESS PREVIOUSLY DISCUSSED), PRECAST TREE FRAME, FIBERGLASS SUPPORT GRATE, ENGINEERED MEDIA, MEDIA SEPARATOR MESH, AND RELATED HARDWARE NECESSARY FOR INSTALLATION.
- 2) CONTRACTOR TO PROVIDE WASHED STONE, AND ALL PIPING AND FITTINGS (OVERFLOW, NON-GASKETED FITTINGS ARE ACCEPTABLE.
- 3) CONTRACTOR TO PROVIDE ALL PIPING AND FITTINGS INTERIOR/EXTERIOR OF STORMTREE. SYSTEM TO BE CONNECTED TO EXISTING CATCH BASIN AND/OR OTHER RECEIVING FACILITY.
- 4) CONTRACTOR TO PROVIDE 0.25"-0.75" WASHED STONE.
- 5) CONTRACTOR TO PROVIDE ANY IMPERMEABLE LINERS AS REQUIRED.
- 6) DEPTH OF ALL FILTER MEDIA BED SHALL BE 24" DEEP. AREAL DIMENSIONS OF FILTER MEDIA BED SHALL BE 24" BEYOND ALL OPEN SIDEWALLS.
- 7) THE INTEGRATION OF ADJOINING FEATURES AND LAND SURFACES CONTIGUOUS TO THE STORMTREE SYSTEMS (E.G., LANDSCAPING, SIDEWALKS, CURBING, PAVEMENT, PAVERS, ETC.) ARE TO BE DISCUSSED IN ADVANCE WITH STORMTREE, THE ENGINEER AND ALL SITE SPECIFIC CONTRACTORS.
- 8) **IMPORTANT:** STORMTREE UNITS MUST BE "OFFLINE" OR PROTECTED FROM CONSTRUCTION DEBRIS, EROSION, EXCESSIVE SEDIMENT ENTRY, ETC. UNTIL SUCH TIME THAT THE SITE IS SECURED AND PAVED. ALL STANDARD EROSION CONTROL MEASURES MUST BE PUT IN PLACE (E.G., SEDIMENTATION FENCING, HAY BALES, ETC. STORMTREE STRONGLY RECOMMENDS PLACING A BARRIER SUCH AS METAL PLATES OR WOOD PLANKING/BOARDS ACROSS BOTH THE THROAT OPENING, AND THE TOP HORIZONTAL SURFACE OF THE UNIT.
- 9) SOME SLIGHT VARIATION IN PRECAST CONCRETE STRUCTURE DIMENSIONS ($\pm 0.50"$) MAY OCCUR DUE TO VARYING FORMING AND CASTING PRACTICES.

CONTRACTOR INSTALLATION NOTES:

THE FOLLOWING NOTES ARE SUBJECT TO CHANGE BASED ON VARIATIONS IN SITE CONDITIONS OR SPECIFIC INSTALLATION REQUIREMENTS. CONTRACTOR TO CONTACT STORMTREE FOR SITE SPECIFIC QUESTIONS.

- 1) EXCAVATION TO EXTEND APPROX. 12" BEYOND EXTERIOR SIDEWALLS ON 2 OR 3 SIDES
- 2) PROVIDE BASE OF BETWEEN 6" TO 12" OF WASHED STONE (DEPENDENT UPON FINAL GRADE, INVERTS, ETC.). GREATER DEPTHS OF STONE MAY BE ACCEPTABLE PROVIDED THAT NEARBY BUILDINGS WOULD NOT BE IMPACTED BY POSSIBLE SUBSURFACE WATER INTRUSION.
- 3) PRECAST UNIT TO BE SET, POSITIONED, AND ORIENTATED AS REQUIRED. PROPER ATTENTION BEING NOTED TO ENSURE THAT THE CORNER OF THE PRECAST STRUCTURE IS IN "SPOT ON" ALIGNMENT WITH EXISTING CURB TO MINIMIZE POTENTIAL FOR SNOW PLOW DAMAGE (IF APPLICABLE).
- 4) INTERIOR PIPING AND FITTINGS TO BE CONSTRUCTED AND POSITIONED PER DETAIL.
- 5) INLET AND OUTLET CONNECTIONS SHALL BE ALIGNED AND GROUTED/SEALED TO MEET THE APPROVED DRAWINGS WITH MODIFICATIONS NECESSARY TO MEET SITE CONDITIONS AND LOCAL REGULATIONS.
- 6) A MINIMUM 3" LAYER OF WASHED STONE SHALL BE PLACED AND OVERLAY THE PERFORATED UNDERDRAIN PIPE. GREATER DEPTHS OF STONE LAYER MAY BE UTILIZED DEPENDING ON ELEV. OF UNDERDRAIN PIPE AND/OR DISCHARGE PIPE.
- 7) SOIL SEPARATOR FABRIC TO BE CUT AND PLACED OVER THE TOP OF THE STONE LAYER (BOTH INTERIOR/EXTERIOR OF PRECAST UNIT), FABRIC TO COVER THE ENTIRE STONE SURFACE, OVERLAPPING AS NECESSARY.
- 8) ENGINEERED MEDIA TO BE BACKFILLED WITHIN THE INTERIOR OF THE UNIT AND EXTERIOR OF THE UNIT TO THE EXCAVATED SIDEWALLS. MEDIA TO BE INSTALLED IN APPROX. 6" LIFTS IN ALL AREAS TO AN ELEVATION OF APPROX. 16" BELOW THE TOP OF THE UNIT.
- 9) THE MEDIA LAYER WITHIN THE INTERIOR OF THE UNIT SHALL BE LIGHTLY COMPRESSED OR "WALKED". THE FINAL MEDIA DEPTH WITHIN THE INTERIOR OF THE SYSTEM SHOULD BE AT AN ELEVATION OF APPROXIMATELY 4" BELOW THE TOP OF THE WEIR WALL. THE MEDIA EXTERIOR OF THE UNIT SHALL BE COMPRESSED, PREFERABLY VIA VIBRATORY EQUIPMENT.
- 10) BACKFILL WITH EXISTING SOIL OR OTHER COMPACTIBLE BASE TO FINISHED GRADE.
- 11) **IMPORTANT:** IF MEDIA IS TO BE INSTALLED AT A LATER DATE FOLLOWING THE INSTALLATION AND FINAL GRADE SET OF THE PRECAST STRUCTURE, PLYWOOD SHEETING OR OTHER BARRIER MUST BE PLACED AROUND THE SIDEWALLS OF THE STRUCTURE TO PREVENT NATIVE SOIL AND/OR DEBRIS FROM ENTERING THE STRUCTURE. THE 24" AREA AROUND THE STRUCTURE MUST NOT BE BACKFILLED WITH NATIVE SOIL OR OTHER MATERIAL. PLEASE CONTACT STORMTREE FOR ADDITIONAL INFORMATION AND INSTRUCTION.
- 12) FIBERGLASS GRATING TO BE CUT AT TIME OF SYSTEM INSTALLATION OR FOLLOWING TREE INSTALLATION. STORMTREE TO PROVIDE GRATE CUTTING INSTRUCTIONS.
- 13) REFER TO LANDSCAPE NOTES FOR TREE INSTALLATION, MULCH PLACEMENT

GLEN AVENUE, SW

TOWN OF VIENNA

JULY 31, 2024

STORMTREE[®]



Thinking Outside the Concrete Box[™]

24 Corliss Street, Suite 9092, Providence, RI 02940 (401) 626-8999 www.storm-tree.com

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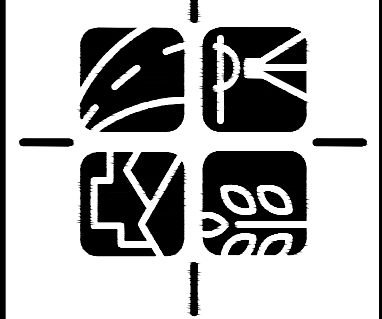
MAY, 2021

REVISIONS	DATE	DESCRIPTION
1	10/11/23	30% PLAN
2	06/14/24	95% PLAN
3	09/26/24	95% PLAN UPDATE

PLAN DATE	DATE	DESCRIPTION
01-1-2023	08-14-2024	09-26-2024

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COMMONWEALTH OF VIRGINIA
C. RYAN CONNOR
Lic. No. 039531
09/26/2024
PROFESSIONAL ENGINEER

BMP DETAILS (ST-1) (ST-2)
GLEN AVE, SW
SIDEWALK IMPROVEMENT PLAN
TOWN OF VIENNA
FAIRFAX COUNTY, VIRGINIA
SCALE: N/A
DATE: AUG 2024
C.I. N/A

SHEET
18
OF
23
FILE No.
PP-2531



Operation and Maintenance Plan
for
StormTree® Tree Filter System
(Base Models)

The following Operation and Maintenance (O&M) Plan was prepared by StormTree® to assist the designated owner/operator in providing for the successful long-term operation of the tree filter system. It is understood that the O&M Plan will become effective immediately following construction and system installation. Maintenance will be performed as described and required by the owner/operator, assignee, or other third-party entity.

Post Installation:

Following the installation of the tree filter (system), including backfilling the area surrounding the system to final grade, the system is considered to be “active” since water, sand, sediment, trash, etc. could potentially enter the system. Should the site not be secured, in that construction activities including grading, paving, or final landscaping have not been completed, the system could be impacted by large quantities of construction debris entering the system. This impact could compromise the system’s ability to function properly causing a reduction in infiltration efficiency and overall performance. It is **highly recommended** that the throat entry and grating surface be covered with wood sheeting, non-woven filter fabric or other materials to restrict the movement of water (and debris) from entering the system until the site is fully secured.

Watering:

The engineered media of a tree filter system is very porous and designed to provide high water conductivity (infiltration) but also sufficient organic material to maintain essential water holding capacity to allow for successful plant growth. Due to the inherent high infiltration capacity of the media, particular attention is required to the installation of plant material and irrigation needs.

The ideal season to install plant material (e.g., trees, shrubs) is Fall (September 1 thru November 1); Spring (April 1 thru June 1) is also a preferred season to install plant material. The acclimation of plant material is most successful during these two seasonal periods. Following plant installation, and at least one month thereafter, it is recommended that twice weekly (deep) watering take place, particularly during periods of drought or minimal rain events. Slow release watering bags are also very beneficial.

If possible, avoid installing plant material during the heat of summer, between approximately June 1 and August 31, due to the potential for placing tremendous stress on plant material following transplanting. Daily watering over a period of several weeks may be required to prevent mortality and allow for the establishment of a healthy root system.

General Maintenance:

Maintenance should optimally be performed on a twice-yearly basis: in fall after leaves have fallen; in spring, following all winter sanding operations. If winter sanding operations are not customarily performed as to impact the system, or minimal accumulation occurs, once yearly maintenance may only be necessary.

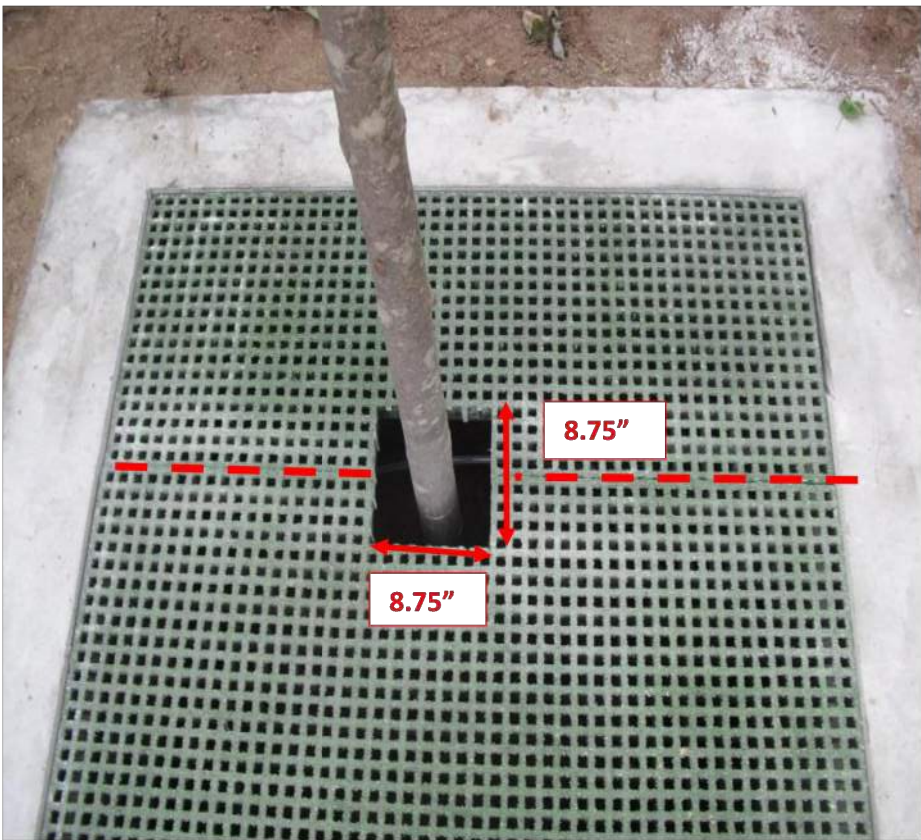
1. Remove any debris or trash from the concrete surface and/or grating.
2. Remove surface grating surrounding the tree and media bed; remove any visible debris and trash. Should any accumulated sands or sediment be observed on the media surface (including mulch layer), remove to ensure a loose and unobstructed media layer. If the system utilizes a fiberglass grate, refer to No. 5 for additional instructions.
3. Evacuate accumulated debris, sands and sediment within sump via vactor equipment. If hand tools are to be utilized, shovel out as necessary.
4. If overflow/bypass port and piping exist, remove any debris or obstruction surrounding the atrium grate or exposed inlet.
5. Fiberglass grate: Inspect the grate opening surrounding the tree trunk to determine if the exterior trunk is in contact with, or in close proximity to the grate. If so, with the use of a powered reciprocating saw, or other cutting device, increase the opening by removing portions of the grating material as necessary. Refer to the attached grate cutting specification for proper cutting technique.
6. Replace all grating and securely fasten any hardware. Sand and debris may have accumulated in the gap between the sides of the grate and the concrete ledge. Remove as necessary to allow for proper setting of the grate. **IMPORTANT: If the system utilizes a fiberglass grate, carefully return the grate to the notched ledge, paying careful attention to not allowing the grate to make contact with the trunk of the tree. Severe damage and death of the tree may result if the grate scrapes the tree’s bark. DO NOT attempt to drop the grate into place from a standing position.**
7. Complete any required maintenance logs or paperwork.
8. Properly dispose of sands, sediment, debris, and trash.

After several years of operation, depending upon the extent and frequency of winter sanding operations and system maintenance, the system may experience excessive sand loading. This condition may require more thorough cleaning, and possibly renovation to include the removal of the top 4 to 6 inches of surface material (media/mulch), and subsequent replenishing. Although not a proprietary product, the engineered media is a specially blended mixture of several components formulated to maintain a specific infiltration capacity. The mulch is typically a coarsely shredded or chipped, (preferably) hardwood which can be sourced at many box stores or agricultural suppliers.

Please consult StormTree directly regarding media addition/replacement.

For additional information please contact StormTree® (www.storm-tree.com) 401-626-8999.

ADA Compliant Fiberglass Grate Cutting Instructions



Top (Front) Side



Bottom (Reverse) Side

Assuming that the tree has been planted in final location. A circular or cut-off saw with commercial blade works well to crosscut (lateral with short side) the grate in two sections. Have the crosscut bisect the two sections in line with the opening (see red line in pic). If you look at the backside of the grate you will notice that it is made up of 1.25” (1D) square closed cells. When you crosscut the grate, try to cut one end along the closed cell so only one side will have open cuts.

When cutting the opening for the tree trunk, a sawzall/reciprocating saw works well. Once again, try making cuts to leave closed cells. If cut correctly, the sides that form the opening should be approximately 8.75” in length. It is important to try making cuts to form closed cells. Ragged cuts could damage the tree trunk. **It is also important that the trunk of the tree is centered within the cut opening to allow for expanded trunk growth to prevent premature chaffing.**



O&M Plan

Page 3

PLAN DATE		01-1-2023 08-14-2024 09-26-2024	
3		09/26/24	95% PLAN UPDATE
2		08/14/24	95% PLAN
1		10/11/23	30% PLAN
No.	DATE	DESCRIPTION	
		REVISIONS	

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BMP OPERATION AND MAINTENANCE PLAN

GLEN AVE, SW
SIDEWALK IMPROVEMENT PLAN
TOWN OF VIENNA
FAIRFAX COUNTY, VIRGINIA

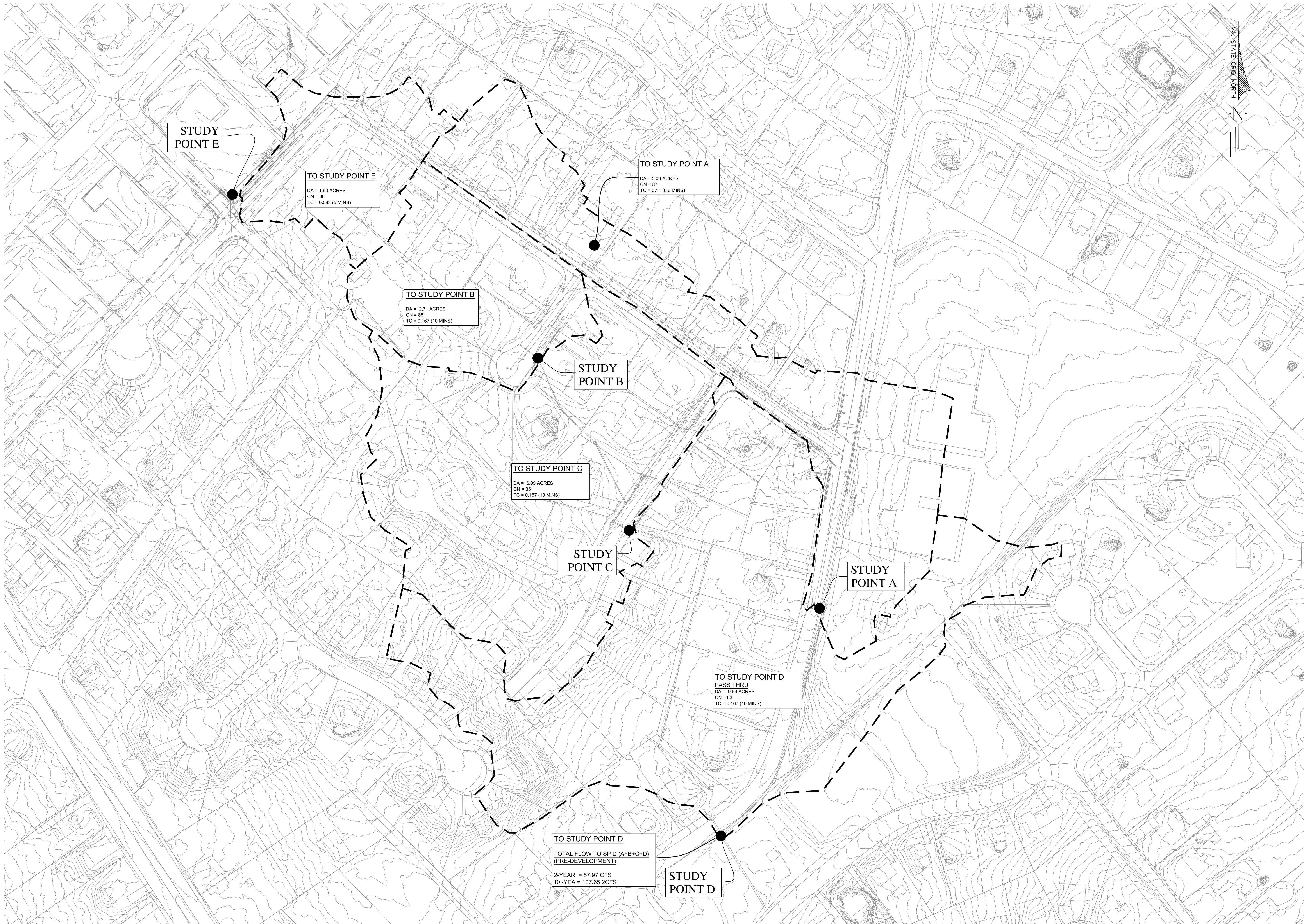
SCALE: N/A

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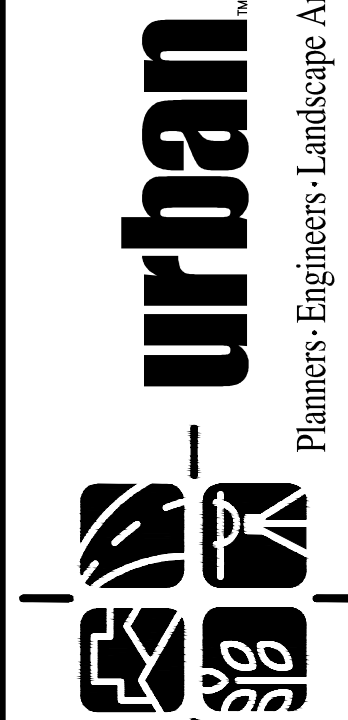
DATE: AUG 2024

SHEET
19
OF
23

FILE No.
PP-2531



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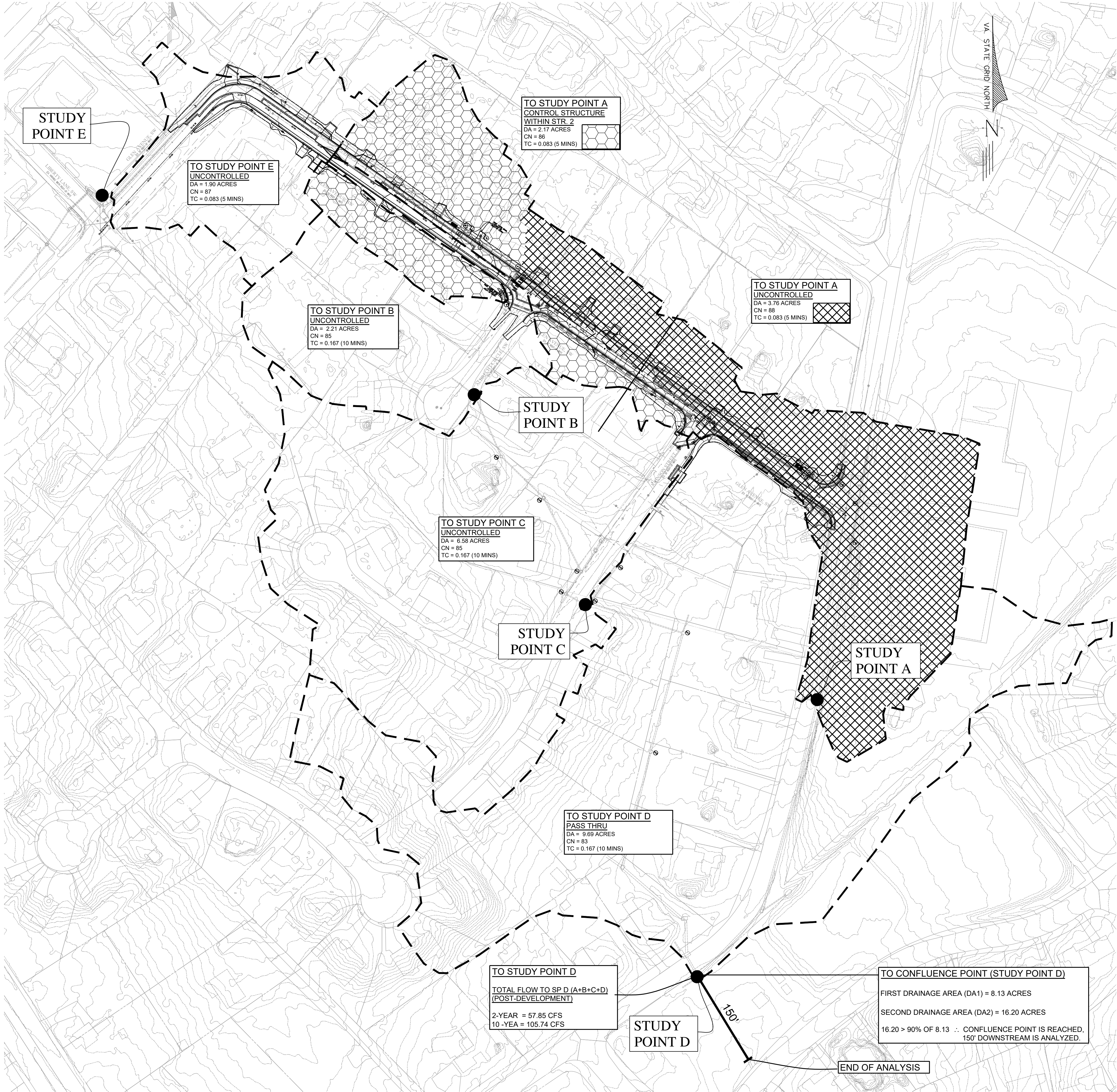
PRE-DEVELOPMENT STORMWATER MANAGEMENT MAP
GLEN AVE, SW
SIDEWALK IMPROVEMENT PLAN
TOWN OF VIENNA
FAIRFAX COUNTY, VIRGINIA

FILE No.
PP-2531

PLAN DATE
10/1/2023
08/14/2024
09/26/2024

No.	DATE	DESCRIPTION	REVISIONS
3	09/26/24	95% PLAN UPDATE	
2	08/14/24	95% PLAN	
1	10/1/23	30% PLAN	

SCALE: 1" = 80'
C.I. = 2'
DATE: AUG 2024



STORMWATER MANAGEMENT/OUTFALL
ANALYSIS NARRATIVE

WATER QUANTITY REQUIREMENTS NOTE:

PER TOWN OF VIENNA CODE OF ORDINANCES SECTION 23-17.A, WATER QUANTITY DESIGN CRITERIA SHALL COMPLY WITH THE CODE OF VIRGINIA CHAPTER 875 (VIRGINIA EROSION AND STORMWATER MANAGEMENT REGULATION) > 9VAC25-875-600 (WATER QUANTITY) AS WELL AS LIMITATION APPLIED IN THE FAIRFAX COUNTY PUBLIC FACILITIES MANUAL (PFM). IN THE NARRATIVE BELOW, ALL REQUIREMENTS WILL REFER TO 9VAC25-875-600 OR PFM SECTION 6-0203.

FOR WATER QUANTITY PURPOSES, SIMILARLY TO THE WATER QUALITY PURPOSES, THE "SITE AREA" IS APPROXIMATELY 1.35 ACRES AND CONSISTS OF ENTIRELY HYDROLOGIC GROUP D SOILS. AS SHOWN ON THE SWM MAP ON THIS SHEET, THE SUBJECT SITE CONSISTS OF FIVE (5) STUDY POINTS (A, B, C, D, AND E). STUDY POINTS A, B, AND C WERE DETERMINED AS THE POINTS OF DISCHARGE AT WHICH THE RUNOFF FROM THE SITE ENTERS THE EXISTING STORM SYSTEM TO THE EAST OF THE SITE. STUDY POINT D IS DETERMINED TO BE THE CONFLUENCE POINT OF WHERE THE INTERMITTENT STUDY POINTS (A, B, AND C) CONJOIN. THIS STUDY POINT (D) WILL BE UTILIZED AS THE FINAL STUDY POINT TO ANALYZE THE DETENTION REQUIREMENTS PER PFM 6-0203.4.B. AS WELL AS THE CHANNEL AND FLOOD PROTECTION REQUIREMENTS PER 9VAC25-875-600.B.1.0 AND 9VAC25-875-600.C.6. ADDITIONALLY, STUDY POINT E WILL BE ANALYZED TO SHOW THE PRE VS POST PEAK FLOW COMPARISON. SEE BELOW FOR THE FULL ANALYSIS OF BOTH CHANNEL AND FLOOD PROTECTION FOR THE STUDY POINTS STATED ABOVE.

STUDY POINT D (NET TOTAL PEAK FLOW OF STUDY POINTS A, B, AND C)

DETENTION (6-0203.A.B)

THE POST-DEVELOPMENT PEAK FLOW FOR THE 2- AND 10-YEAR 24-HOUR STORM EVENT SHALL BE RELEASED AT A RATE THAT IS EQUAL TO OR LESS THAN THE PRE-DEVELOPMENT PEAK FLOW FROM THE 2- AND 10-YEAR 24-HOUR STORM EVENT, PER SECTION NOTED ABOVE. UTILIZING THIS SECTION OF THE COUNTY CODE, THE 2- AND 10-YEAR POST-DEVELOPMENT PEAK FLOWS FROM STUDY POINT A SHALL BE LESS THAN OR EQUAL TO THE PRE-DEVELOPMENT PEAK FLOWS OF THE RESPECTIVE STUDY POINT. AS SHOWN IN THE DETENTION METHOD EQUATION TABLE ON THIS SHEET, THE 2- AND THE 10-YEAR COMBINED POST-DEVELOPMENT PEAK FLOWS MEET THE REQUIREMENTS OF THIS SECTION FOR STUDY POINT D.

CHANNEL PROTECTION (9VAC25-875-600.B.1.A) (9VAC25-875-600.B.4)

THIS APPLICATION PROPOSES A CONTROL STRUCTURE INSIDE THE MANHOLE AT STRUCTURE 2 WITHIN THE PROPOSED STORM SYSTEM. THE CONTROL STRUCTURE CONSISTS OF A WEIR WALL WITH AN ORIFICE THAT IS DETAILED ON SHEET XX. UTILIZING THE DETENTION CAPABILITIES OF THE CONTROL STRUCTURE, STUDY POINT D ACHIEVES THE DETENTION REQUIREMENTS FOR THE 2- AND 10-YEAR STORM LISTED ABOVE. THEREFORE, THE EXISTING MANMADE CONVEYANCE SYSTEM THAT THE PROPOSED SYSTEM ENTERS SHALL BE ANALYZED WHERE THE 2-YEAR FLOW DOES NOT CAUSE EROSION TO THE EXISTING SYSTEM. THIS ANALYSIS IS PROVIDED IN THE STORM COMPUTATIONS TO SHOW THAT EVEN THE 10-YEAR PEAK FLOW DOES NOT CAUSE EROSION TO THE SYSTEM.

FLOOD PROTECTION (9VAC25-875-600.C.1) (PFM 6-0203.2.A)

THE POINT OF DISCHARGE (STUDY POINT D) RELEASES STORMWATER INTO A STORMWATER CONVEYANCE SYSTEM THAT, FOLLOWING THE LAND-DISTURBING ACTIVITY, CONFINED THE POST-DEVELOPMENT PEAK FLOW RATE FROM THE 10-YEAR 24-HOUR STORM EVENT WITH THE STORMWATER CONVEYANCE SYSTEM. THE 10-YEAR STORM EVENT IS ANALYZED FOR CONFINED CONVEYANCE TO A POINT THAT IS AT LEAST 150' DOWNSTREAM OF A POINT WHERE THE RECEIVING PIPE IS JOINED BY ANOTHER THAT HAS A DRAINAGE AREA THAT IS AT LEAST 90 PERCENT OF THE SIZE OF THE FIRST DRAINAGE AREA.

AS SHOWN ON THIS SHEET AND THE COMPUTATIONS PROVIDED ON SHEET 15, IT IS VERIFIED THAT BOTH THE 2-YEAR AND 10-YEAR PEAK FLOWS DO NOT CAUSE EROSION TO THE EXISTING SYSTEM UP TO 150' DOWNSTREAM OF THE CONFLUENCE POINT, WHICH IN THIS SCENARIO IS THE SAME AS STUDY POINT D.

STUDY POINT E

THE PROPOSED APPLICATION PROVIDES A COMPARISON IN PEAK FLOWS FOR THE 2- AND 10-YEAR STORM EVENTS BETWEEN THE PRE-DEVELOPMENT AND POST-DEVELOPMENT CONDITIONS. AS SHOWN IN THE PRE- VS POST- TOTAL FLOW TABLE ON THIS SHEET, THE POST- DEVELOPMENT HAS A SLIGHT INCREASE IN RUNOFF FROM THE PRE-DEVELOPMENT CONDITION. IT IS THE OPINION OF THE SIGNING ENGINEER THAT THE TOTAL FLOW HAS BEEN REDUCED ENOUGH FROM THE EASTERN SIDE OF THE SITE (TO STUDY POINT D) TO COUNTERACT THE SLIGHT INCREASE IN RUNOFF AT STUDY POINT E. THEREFORE, WE BELIEVE THAT STUDY POINT E MEETS THE REQUIREMENTS STATED ABOVE.

PRE- VS POST- DEVELOPMENT
PEAK FLOW COMPARISON TABLE

- PER HYDROLOGY COMPUTATIONS ON SHEET 22

	TOTAL FLOW - SP A		TOTAL FLOW - SP B		TOTAL FLOW - SP C		TOTAL FLOW - SP D		TOTAL FLOW TO STUDY POINT D (A+B+C+D)	
	2-YEAR	10-YEAR	2-YEAR	10-YEAR	2-YEAR	10-YEAR	2-YEAR	10-YEAR	2-YEAR	10-YEAR
PRE	13.99	25.08	6.41	11.85	16.54	30.57	21.03	40.15	57.97	107.65
POST	17.71	31.58	5.23	9.67	15.57	28.78	21.03	40.15		
POST w/ Detention	16.02	27.14							57.85	105.74

MEETS DETENTION
REQUIREMENTS PER 124-4-4.D
(TOWN OF VIENNA CODE: SECTION 23-17)

	TOTAL FLOW - SP E	
	2-YEAR	10-YEAR
PRE	5.38	9.81
POST	5.61	10.06

"STUDY POINT E" RUNOFF ULTIMATELY CONVERGES WITH THE RUNOFF FROM "STUDY POINT D" TO THE SOUTHEAST OF THE SITE WITHIN THE ACCOTINK CREEK WATERSHED. THIS RESULTS IN A NET DECREASE IN RUNOFF ONCE THEY CONVERGE.

PLAN DATE
10-11-2023
09-26-2024

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SWM POST-DEVELOPMENT DIVIDES AND NARRATIVE
GLEN AVE, SW
SIDEWALK IMPROVEMENT PLAN
TOWN OF VIENNA
FAIRFAX COUNTY, VIRGINIA
SCALE: 1" = 80'
C.I. = 2'

SHEET
21
OF
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FILE No.
PP-2531

DATE: AUG 2024
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No. DATE DESCRIPTION

HYDROLOGY
PRE- VS POST- DEVELOPMENT

PRE-DEVELOPMENT

STUDY POINT A

Label: Total Area to SP A

Runoff Curve Number Data			
Soil/Surface Description	CN	Area (acres)	Adjusted CN
Managed Turf - D	80.000	2.940	80.000
Impervious - D	98.000	2.090	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	5.030	87.479

Label: Total Area to SP A		Segment #3: Length and Velocity	
Time of Concentration Results		Hydraulic Length	
Segment #1: TR-55 Sheet Flow		Velocity	
Hydraulic Length		Segment Time of Concentration	
Manning's n		Hydraulic Length	
Slope		Velocity	
2 Year 24 Hour Depth		Segment Time of Concentration	
Average Velocity		Time of Concentration (Composite)	
Segment Time of Concentration		Time of Concentration (Composite)	
Segment #2: TR-55 Shallow Concentrated Flow		Time of Concentration (Composite)	
Hydraulic Length		Time of Concentration (Composite)	
Is Paved?		Time of Concentration (Composite)	
Slope		Time of Concentration (Composite)	
Average Velocity		Time of Concentration (Composite)	
Segment Time of Concentration		Time of Concentration (Composite)	

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (cfs)
SP A	2 Yr	2	0.790	11.95000	13.99
SP A	10-yr	10	1.442	11.93333	25.08

POST-DEVELOPMENT

STUDY POINT A

Label: AREA TO CONTROL STRUCTURE to SP A

Runoff Curve Number Data			
Soil/Surface Description	CN	Area (acres)	Adjusted CN
Managed Turf - D	80.000	1.430	80.000
Impervious - D	98.000	0.740	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	2.170	86.138

- ASSUME 5 MINUTE TIME OF CONCENTRATION

Label: UNCONTROLLED AREA to SP A

Runoff Curve Number Data			
Soil/Surface Description	CN	Area (acres)	Adjusted CN
Managed Turf - D	80.000	2.020	80.000
Impervious - D	98.000	1.740	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	3.760	88.33

- ASSUME 5 MINUTE TIME OF CONCENTRATION

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (cfs)
UNCONTROLLED AREA to SP A	2 Yr	2	0.617	11.917	11.56
UNCONTROLLED AREA to SP A	10-yr	10	1.110	11.917	20.37
AREA TO CONTROL STRUCTURE (Str. 2)	2 Yr	2	0.327	11.917	6.15
AREA TO CONTROL STRUCTURE (Str. 2)	10-yr	10	0.604	11.917	11.21

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (cfs)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Oversized Pipe (IN)	2 Yr	2	0.327	11.917	6.15	(N/A)	(N/A)
Oversized Pipe (OUT)	2 Yr	2	0.327	12.017	4.97	382.65	0.025
Oversized Pipe (IN)	10-yr	10	0.604	11.917	11.21	(N/A)	(N/A)
Oversized Pipe (OUT)	10-yr	10	0.604	12.033	7.53	384.70	0.07

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (cfs)
STUDY POINT A	2 Yr	2	0.943	11.933	16.02
STUDY POINT A	10-yr	10	1.714	11.917	27.14

STUDY POINT B

Label: Total Area to SP B

Runoff Curve Number Data			
Soil/Surface Description	CN	Area (acres)	Adjusted CN
Managed Turf - D	80.000	2.010	80.000
Imp - D	98.000	0.700	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	2.710	84.649

- ASSUME 10 MINUTE TIME OF CONCENTRATION

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (cfs)
SP B	2 Yr	2	0.390	12.00000	6.41
SP B	10-yr	10	0.732	11.98333	11.85

STUDY POINT C

Label: Total Area to SP C

Runoff Curve Number Data			
Soil/Surface Description	CN	Area (acres)	Adjusted CN
Managed Turf - D	80.000	5.010	80.000
Imp - D	98.000	1.980	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	6.990	85.099

- ASSUME 10 MINUTE TIME OF CONCENTRATION

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (cfs)
SP C	2 Yr	2	1.007	12.00000	16.54
SP C	10-yr	10	1.888	11.98333	30.57

STUDY POINT B

Label: UNCONTROLLED AREA to SP B

Runoff Curve Number Data			
Soil/Surface Description	CN	Area (acres)	Adjusted CN
Managed Turf - D	80.000	1.550	80.000
Impervious - D	98.000	0.660	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	2.210	85.376

- ASSUME 10 MINUTE TIME OF CONCENTRATION

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (cfs)
STUDY POINT B	2 Yr	2	0.318	12.000	5.23
STUDY POINT B	10-yr	10	0.597	11.983	9.67

STUDY POINT C

Label: UNCONTROLLED AREA to SP C

Runoff Curve Number Data			
Soil/Surface Description	CN	Area (acres)	Adjusted CN
Managed Turf - D	80.000	4.700	80.000
Impervious - D	98.000	1.880	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	6.580	85.143

- ASSUME 10 MINUTE TIME OF CONCENTRATION

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (cfs)
STUDY POINT C	2 Yr	2	0.948	12.000	15.57
STUDY POINT C	10-yr	10	1.777	11.983	28.78

STUDY POINT D

Label: Total Area to SP D

Runoff Curve Number Data			
Soil/Surface Description	CN	Area (acres)	Adjusted CN
Managed Turf - D	80.000	8.140	80.000
Imp - D	98.000	1.550	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	9.690	82.879

- ASSUME 5 MINUTE TIME OF CONCENTRATION

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (cfs)
SP D	2 Yr	2	1.276	12.00000	21.03
SP D	10-yr	10	2.463	11.98333	40.15

STUDY POINT E

Label: Total Area to SP E

Runoff Curve Number Data			
Soil/Surface Description	CN	Area (acres)	Adjusted CN
Managed Turf - D	80.000	1.250	80.000
Imp - D	98.000	0.650	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	1.900	86.158

- ASSUME 5 MINUTE TIME OF CONCENTRATION

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (cfs)
SP E	2 Yr	2	0.286	11.91667	5.38
SP E	10-yr	10	0.529	11.91667	9.81

STUDY POINT D

- SAME COMPUTATIONS UTILIZED IN PRE-DEVELOPMENT CONIDTION

Label: Total Area to SP D

Runoff Curve Number Data			
Soil/Surface Description	CN	Area (acres)	Adjusted CN
Managed Turf - D	80.000	8.140	80.000
Imp - D	98.000	1.550	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	9.690	82.879

- ASSUME 5 MINUTE TIME OF CONCENTRATION

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (cfs)
SP D	2 Yr	2	1.276	12.00000	21.03
SP D	10-yr	10	2.463	11.98333	40.15

STUDY POINT E

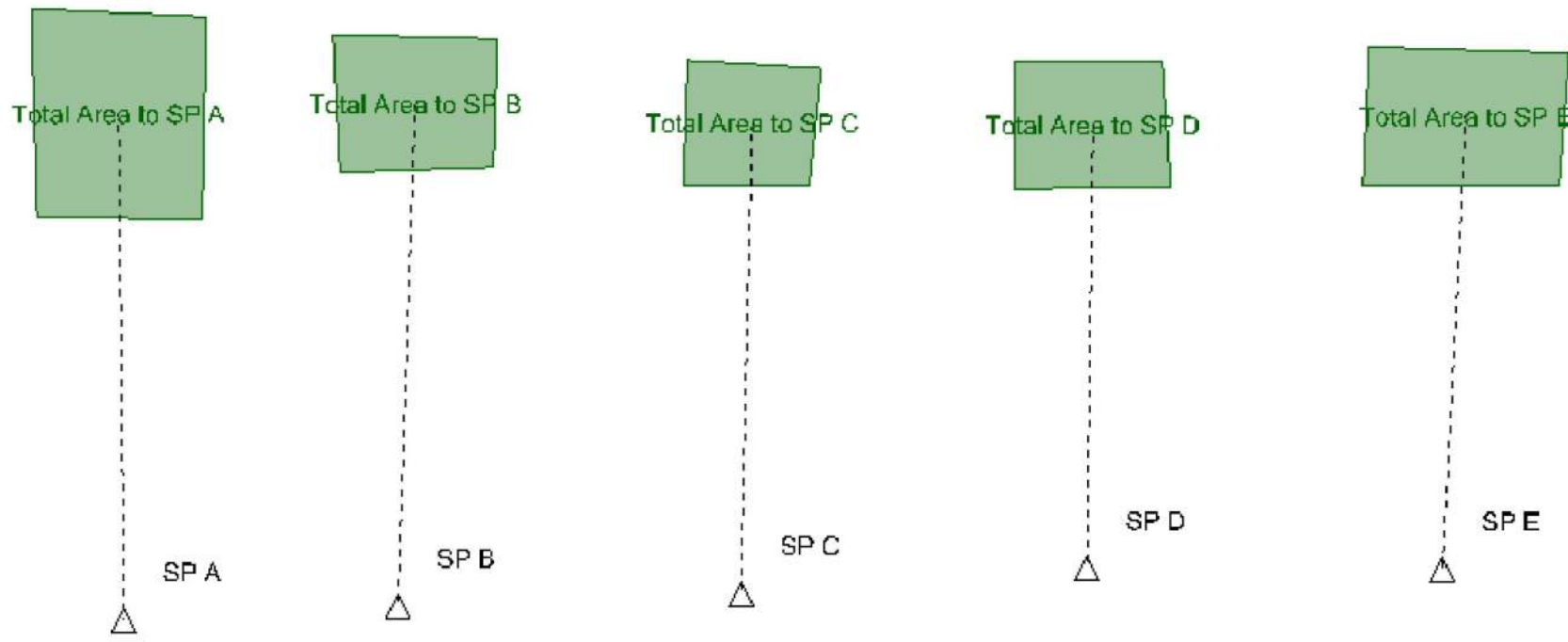
Label: UNCONTROLLED AREA to STUDY POINT E

Runoff Curve Number Data			
Soil/Surface Description	CN	Area (acres)	Adjusted CN
Managed Turf - D	80.000	1.170	80.000
Impervious - D	98.000	0.730	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	1.900	86.916

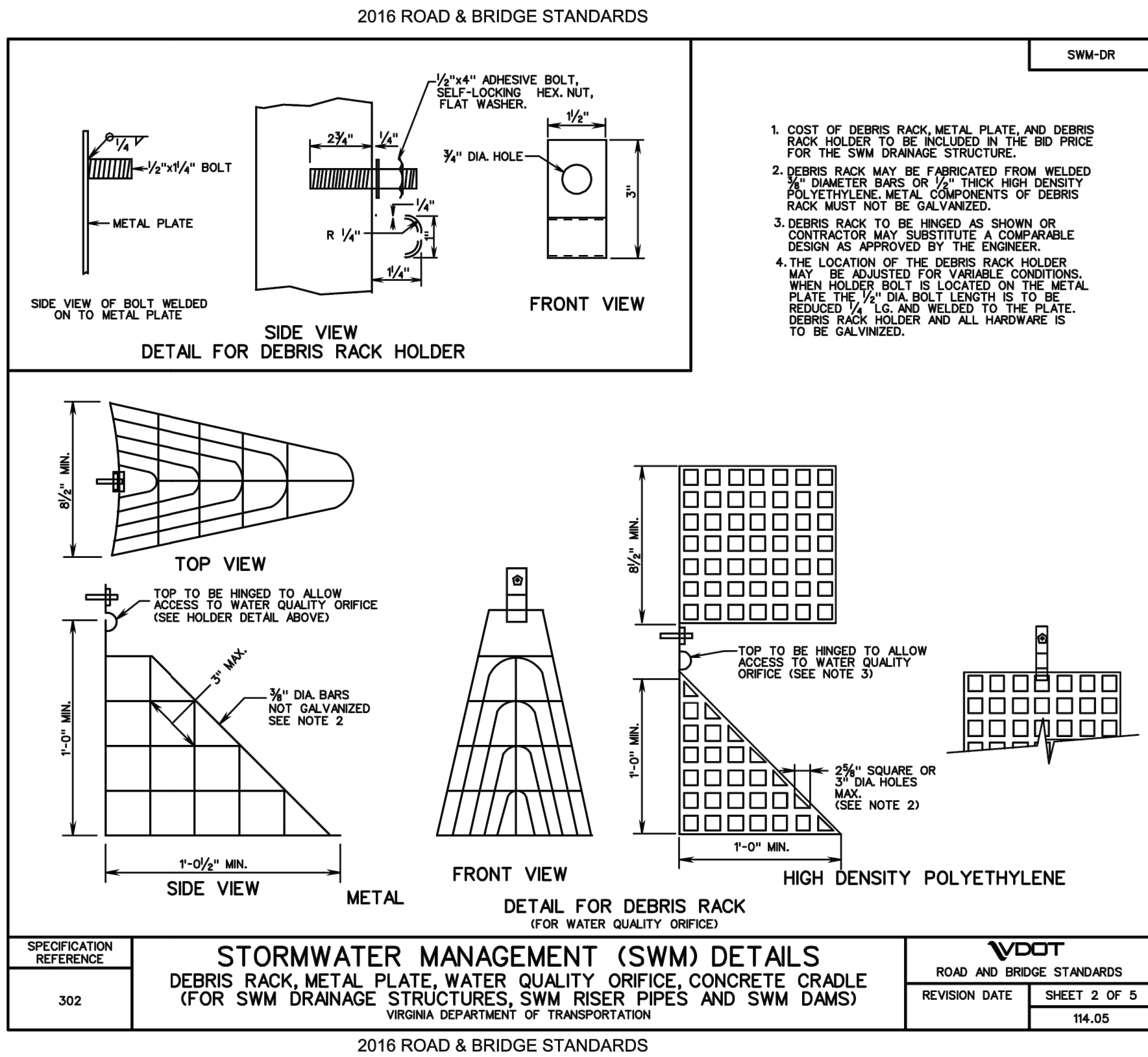
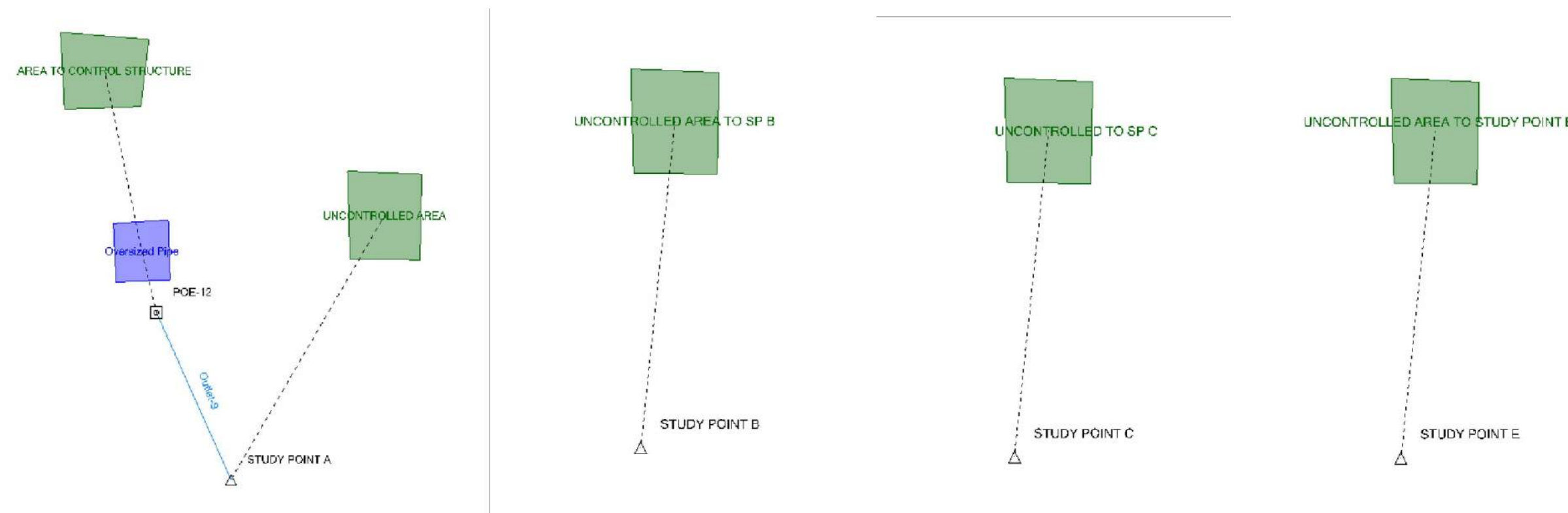
- ASSUME 5 MINUTE TIME OF CONCENTRATION

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (cfs)
STUDY POINT E	2 Yr	2	0.299	11.917	5.61
STUDY POINT E	10-yr	10	0.545	11.917	10.06

PRE-DEVELOPMENT PONDPACK MODEL SCHEMATIC



POST-DEVELOPMENT PONDPACK MODEL SCHEMATICS



PLAN DATE

10/11/2024

3

09/26/24

95% PLAN UPDATE

2

09/14/24

95% PLAN

1

10/11/23

30% PLAN

No.

DATE

DESCRIPTION

REVISIONS

Urban Ltd

7710 Little River Turnpike

Amanatide, Virginia 23003

Tel. 703.642.8080

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COMMONWEALTH OF VIRGINIA

C. RYAN CONNOR

Lic. No. 0395331

09/26/2024

PROFESSIONAL ENGINEER

HYDROLOGY

GLEN AVE, SW

SIDEWALK IMPROVEMENT PLAN

TOWN OF VIENNA

FAIRFAX COUNTY, VIRGINIA

SCALE: N/A

DATE: AUG 2024

C.I. = 2'

SHEET

22

OF

23

FILE No.

PP-2531

ELEVATION-VOLUME-FLOW
TABLE

Infiltration	
Infiltration Method (Computed)	No Infiltration
Initial Conditions	
Elevation (Water Surface, Initial)	380.55 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 cfs
Flow (Initial Infiltration)	0.00 cfs
Flow (Initial, Total)	0.00 cfs
Time Increment	0.017 hours

Elevation (ft)	Outflow (cfs)	Storage (ac-ft)	Area (acres)	Infiltration (cfs)	Flow (Total) (cfs)	2S/t + O (cfs)
380.55	0.00	0.000	0.000	0.00	0.00	0.00
380.65	0.03	0.000	0.000	0.00	0.03	0.05
380.75	0.11	0.000	0.000	0.00	0.11	0.23
380.85	0.22	0.000	0.000	0.00	0.22	0.57
380.95	0.37	0.000	0.000	0.00	0.37	1.07
381.05	0.55	0.001	0.000	0.00	0.55	1.77
381.15	0.77	0.001	0.000	0.00	0.77	2.68
381.25	1.03	0.002	0.000	0.00	1.03	3.83
381.35	1.32	0.003	0.000	0.00	1.32	5.20
381.45	1.63	0.004	0.000	0.00	1.63	6.82
381.55	2.01	0.005	0.000	0.00	2.01	8.71
381.65	2.49	0.006	0.000	0.00	2.49	10.94
381.75	2.77	0.007	0.000	0.00	2.77	13.21
381.85	3.04	0.009	0.000	0.00	3.04	15.72
381.95	3.31	0.010	0.000	0.00	3.31	18.46
382.05	3.57	0.012	0.000	0.00	3.57	21.39
382.15	3.82	0.014	0.000	0.00	3.82	24.48
382.25	4.07	0.016	0.000	0.00	4.07	27.69
382.35	4.30	0.018	0.000	0.00	4.30	31.01
382.45	4.53	0.021	0.000	0.00	4.53	34.42
382.55	4.76	0.023	0.000	0.00	4.76	37.90
382.65	4.98	0.025	0.000	0.00	4.98	41.46
382.75	5.20	0.027	0.000	0.00	5.20	45.06
382.85	5.75	0.030	0.000	0.00	5.75	49.05
382.95	6.20	0.032	0.000	0.00	6.20	52.97
383.05	6.33	0.035	0.000	0.00	6.33	56.59
383.15	6.44	0.037	0.000	0.00	6.44	60.23
383.25	6.54	0.039	0.000	0.00	6.54	63.85
383.35	6.63	0.042	0.000	0.00	6.63	67.45
383.45	6.71	0.044	0.000	0.00	6.71	71.04
383.55	6.78	0.047	0.000	0.00	6.78	74.60
383.65	6.85	0.049	0.000	0.00	6.85	78.13
383.75	6.92	0.051	0.000	0.00	6.92	81.61
383.85	6.99	0.054	0.000	0.00	6.99	85.04
383.95	7.06	0.056	0.000	0.00	7.06	88.40
384.05	7.13	0.058	0.000	0.00	7.13	91.69
384.15	7.19	0.060	0.000	0.00	7.19	94.88
384.25	7.26	0.062	0.000	0.00	7.26	97.98
384.35	7.32	0.064	0.000	0.00	7.32	100.94
384.45	7.38	0.066	0.000	0.00	7.38	103.77
384.55	7.45	0.068	0.000	0.00	7.45	106.41
384.65	7.51	0.070	0.000	0.00	7.51	108.83
384.75	7.55	0.071	0.000	0.00	7.55	110.99
384.85	7.63	0.073	0.000	0.00	7.63	112.93
384.95	7.69	0.074	0.000	0.00	7.69	114.63
385.05	7.76	0.075	0.000	0.00	7.76	116.10
385.15	7.82	0.075	0.000	0.00	7.82	117.35
385.25	7.88	0.076	0.000	0.00	7.88	118.39
385.35	7.94	0.077	0.000	0.00	7.94	119.24
385.45	8.00	0.077	0.000	0.00	8.00	119.90
385.55	8.05	0.077	0.000	0.00	8.05	120.40
385.65	8.11	0.078	0.000	0.00	8.11	120.74
385.75	8.17	0.078	0.000	0.00	8.17	120.95
385.85	8.23	0.078	0.000	0.00	8.23	121.07
385.90	8.25	0.078	0.000	0.00	8.25	121.10

PIPE VOLUME TABLE

48" PIPE (STR. 2-3 AND STR. 2-11)
(38"x60" ERCP EQUIVALENT)

Volume Results (Pipe)						
Pipe Storage Upstream Invert				381.90 ft		
Pipe Storage Downstream Invert				380.55 ft		
Pipe Storage Length				269.400 ft		
Pipe Storage Diameter				48.0 in		
Pipe Storage Number of Barrels				1		
Pipe Storage Slice Width				0.10 ft		
Pipe Storage Vertical Increment				0.10 ft		
Elevation (ft)	Perpendicular Downstream Depth (ft)	Perpendicular Downstream Area (ft²)	Wetted Length (ft)	Filled Length (ft)	Perpendicular Upstream Depth (ft)	Perpendicular Upstream Area (ft²)
380.55	0.00	0.00	0.000	0.000	0.00	0.000
380.65	0.10	0.08	19.956	0.000	0.00	0.000
380.75	0.20	0.23	39.911	0.000	0.00	0.000
380.85	0.30	0.43	59.867	0.000	0.00	0.000
380.95	0.40	0.65	79.822	0.000	0.00	0.000
381.05	0.50	0.91	99.778	0.000	0.00	0.001
381.15	0.60	1.18	119.733	0.000	0.00	0.001
381.25	0.70	1.48	139.689	0.000	0.00	0.002
381.35	0.80	1.79	159.644	0.000	0.00	0.003
381.45	0.90	2.11	179.600	0.000	0.00	0.004
381.55	1.00	2.46	199.556	0.000	0.00	0.005
381.65	1.10	2.81	219.511	0.000	0.00	0.006
381.75	1.20	3.17	239.467	0.000	0.00	0.007
381.85	1.30	3.54	259.422	0.000	0.00	0.009
381.95	1.40	3.92	269.400	0.000	0.05	0.010
382.05	1.50	4.30	269.400	0.000	0.15	0.012
382.15	1.60	4.69	269.400	0.000	0.25	0.014
382.25	1.70	5.09	269.400	0.000	0.35	0.016
382.35	1.80	5.48	269.400	0.000	0.45	0.018
382.45	1.90	5.88	269.400	0.000	0.55	0.021
382.55	2.00	6.28	269.400	0.000	0.65	0.023
382.65	2.10	6.68	269.400	0.000	0.75	0.025
382.75	2.20	7.08	269.400	0.000	0.85	0.027
382.85	2.30	7.48	269.400	0.000	0.95	0.030
382.95	2.40	7.87	269.400	0.000	1.05	0.032
383.05	2.50	8.26	269.400	0.000	1.15	0.035
383.15	2.60	8.64	269.400	0.000	1.25	0.037
383.25	2.70	9.02	269.400	0.000	1.35	0.039
383.35	2.80	9.39	269.400	0.000	1.45	0.042
383.45	2.90	9.76	269.400	0.000	1.55	0.044
383.55	3.00	10.11	269.400	0.000	1.65	0.047
383.65	3.10	10.45	269.400	0.000	1.75	0.049
383.75	3.20	10.78	269.400	0.000	1.85	0.051
383.85	3.30	11.09	269.400	0.000	1.95	0.054
383.95	3.40	11.38	269.400	0.000	2.05	0.056
384.05	3.50	11.66	269.400	0.000	2.15	0.058
384.15	3.60	11.91	269.400	0.000	2.25	0.060
384.25	3.70	12.14	269.400	0.000	2.35	0.062
384.35	3.80	12.33	269.400	0.000	2.45	0.064
384.45	3.90	12.48	269.400	0.000	2.55	0.066
384.55	4.00	12.57	269.400	0.010	2.65	0.068
384.65	4.00	12.57	269.400	19.966	2.75	0.070
384.75	4.00	12.57	269.400	39.921	2.85	0.071
384.85	4.00	12.57	269.400	59.877	2.95	0.073
384.95	4.00	12.57	269.400	79.832	3.05	0.074
385.05	4.00	12.57	269.400	99.788	3.15	0.075
385.15	4.00	12.57	269.400	119.743	3.25	0.075
385.25	4.00	12.57	269.400	139.699	3.35	0.076
385.35	4.00	12.57	269.400	159.654	3.45	0.077
385.45	4.00	12.57	269.400	179.610	3.55	0.077
385.55	4.00	12.57	269.400	199.566	3.65	0.077
385.65	4.00	12.57	269.400	219.521	3.75	0.078
385.75	4.00	12.57	269.400	239.477	3.85	0.078
385.85	4.00	12.57	269.400	259.432	3.95	0.078
385.90	4.00	12.57	269.400	269.400	4.00	0.078

OUTLET INPUT DATA

Requested Pond Water Surface Elevations					
Minimum (Headwater)				380.55 ft	
Increment (Headwater)				0.10 ft	
Maximum (Headwater)				385.90 ft	
Outlet Connectivity					
Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Area	Orifice - 1	Forward	Culvert - 1	380.55	385.90
Rectangular Weir	Weir - 1	Forward	Culvert - 1	382.75	385.90
Culvert-Circular	Culvert - 1	Forward	TW	380.55	385.90
Tailwater Settings	Tailwater			(N/A)	(N/A)
Structure ID: Culvert - 1					
Structure Type: Culvert-Circular					
Number of Barrels				1	
Diameter				15.0 in	
Length				387.860 ft	
Length (Computed Barrel)				387.872 ft	
Slope (Computed)				0.008 ft/ft	
Outlet Control Data					
Manning's n				0.013	
Ke				0.200	
Kb				0.023	
Kc				0.200	
Convergence Tolerance				0.00 ft	
Inlet Control Data					
Equation Form				Form 1	
K				0.0045	
M				2.0000	
C				0.0317	
Y				0.6900	
T1 ratio (HW/D)				1.091	
T2 ratio (HW/D)				1.193	
Slope Correction Factor				-0.500	
Use unsubmerged inlet control 0 equation below T1 elevation.					
Use submerged inlet control 0 equation above T2 elevation					
In transition zone between unsubmerged and submerged inlet control,					
interpolate between flows at T1 & T2...					
Elevation	381.91 ft		T1 Flow		4.80
Elevation	382.04 ft		T2 Flow		5.49
Structure ID: Orifice - 1					
Structure Type: Orifice-Area					
Number of Openings				1	
Elevation				380.55 ft	
Orifice Area				1.25 ft²	
Top Elevation				381.65 ft	
Datum Elevation				381.15 ft	
Orifice Coefficient				0.600	
Structure ID: Weir - 1					
Structure Type: Rectangular Weir					
Number of Openings				1	
Elevation				382.75 ft	
Weir Length				6.000 ft	
Weir Coefficient				3.00 (ft³/0.5)	
Structure ID: TW					
Structure Type: TW Setup, DS Channel					
Tailwater Type				Downstream Channel	
Catalog Conduit				Conduit Catalog - 1	
Channel Slope				0.014 ft/ft	
Channel Invert Elevation				375.99 ft	
Convergence Tolerances					
Maximum Iterations				30	
Tailwater Tolerance (Minimum)				0.01 ft	
Tailwater Tolerance (Maximum)				0.50 ft	
Headwater Tolerance (Minimum)				0.01 ft	
Headwater Tolerance (Maximum)				0.50 ft	
Flow Tolerance (Minimum)				0.001 ft³/s	
Flow Tolerance (Maximum)				10.000 ft³/s	