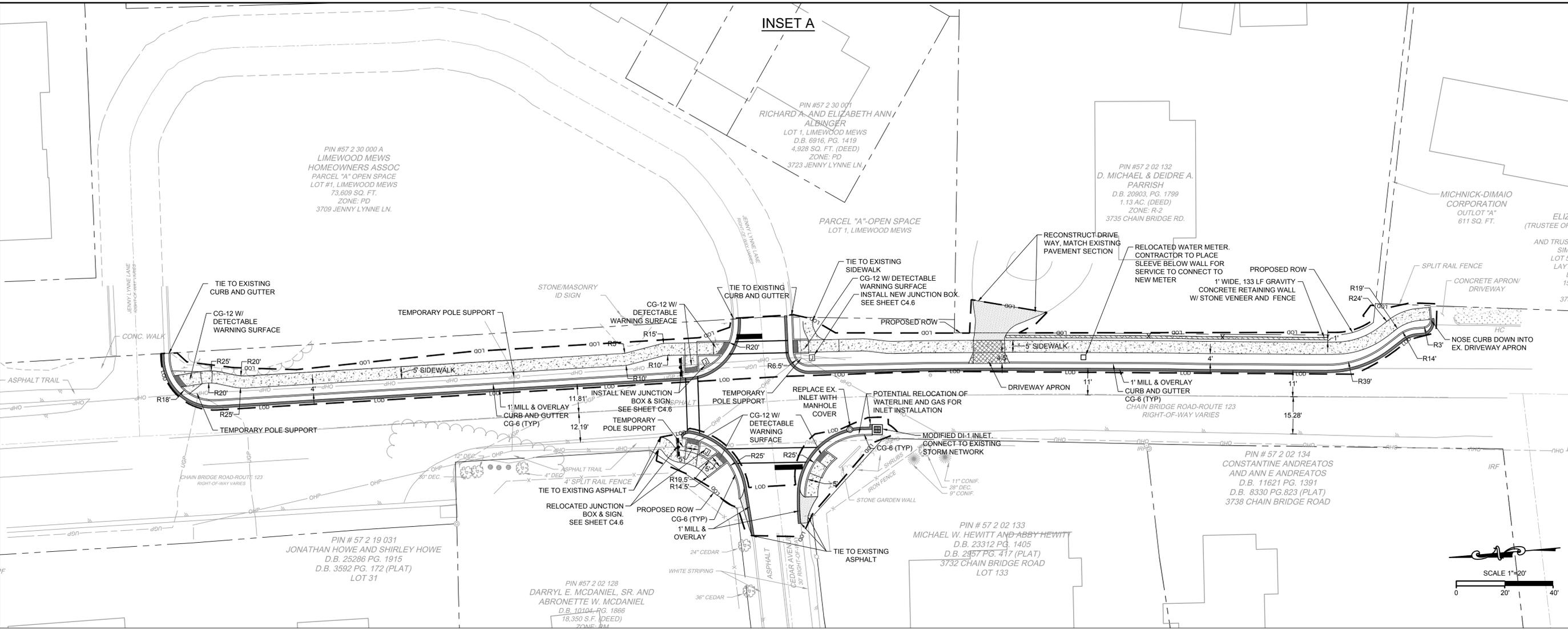
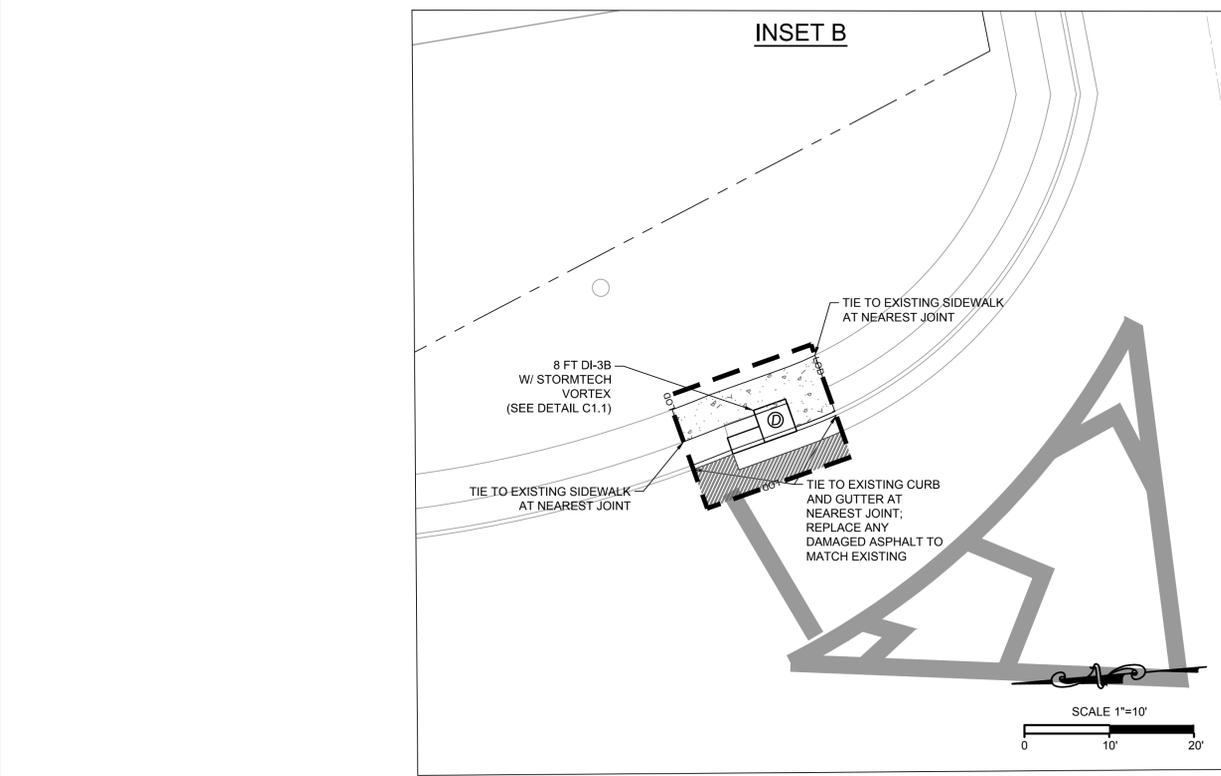


NOT FOR CONSTRUCTION



INSET A



INSET B

LEGEND		
	LOD	LIMITS OF CONSTRUCTION
		FENCE
		PROPOSED SIDEWALK
		PROPOSED RETAINING WALL
		EDGE MILLING
		DRIVEWAY RESTORATION / FULL DEPTH PAVEMENT

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REVISION DESCRIPTION	DATE
60% SUBMISSION	3/27/2020

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	CHECKED BY	LTF
	SCALE	SEE PLAN

TIMMONS GROUP

CHAIN BRIDGE ROAD SIDEWALK EXTENSION
 CITY OF FAIRFAX, VIRGINIA

SITE LAYOUT

JOB NO. 35061.023
 SHEET NO. C4.0

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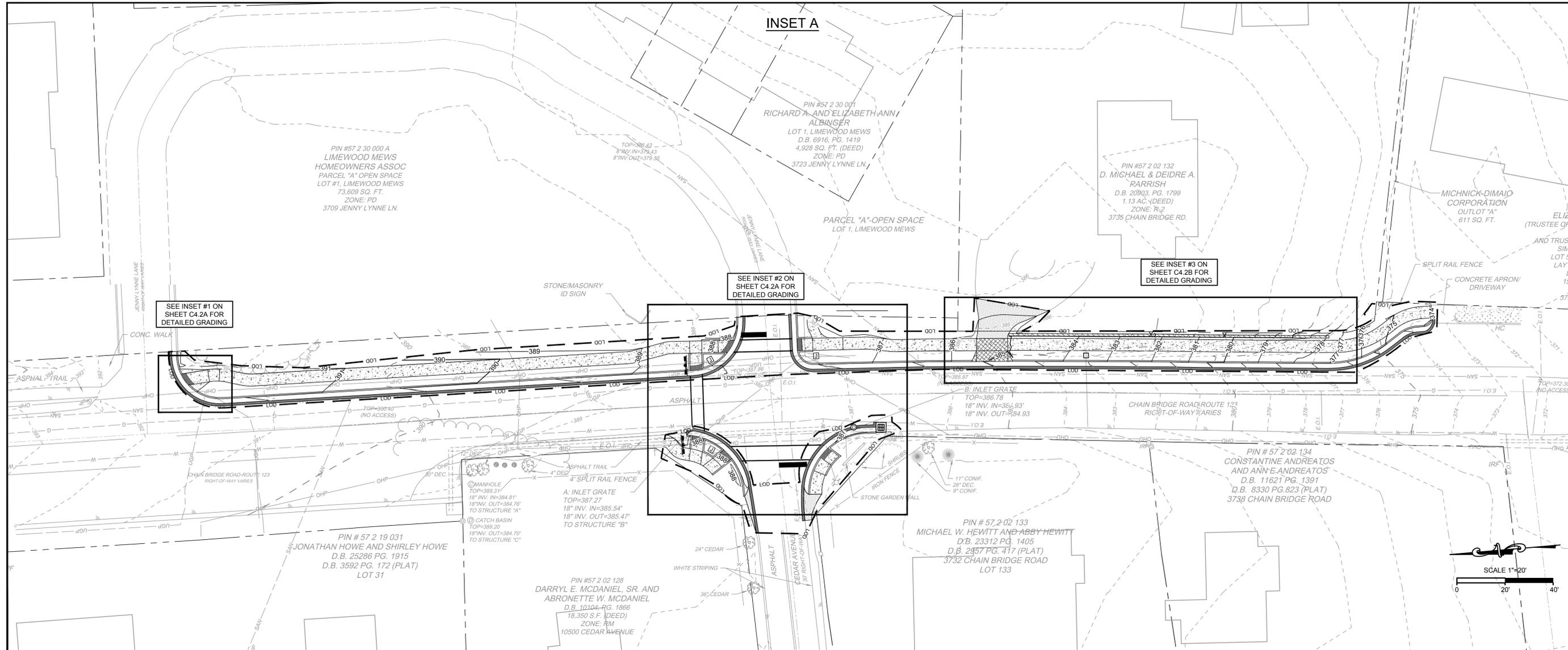
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TIMMONS GROUP
 CHAIN BRIDGE ROAD SIDEWALK EXTENSION
 CITY OF FAIRFAX, VIRGINIA
 GRADING PLAN
 JOB NO. 35061.023
 SHEET NO. C4.1

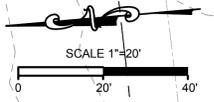


INSET A

SEE INSET #1 ON SHEET C4.2A FOR DETAILED GRADING

SEE INSET #2 ON SHEET C4.2A FOR DETAILED GRADING

SEE INSET #3 ON SHEET C4.2B FOR DETAILED GRADING

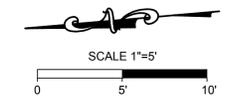


LEGEND

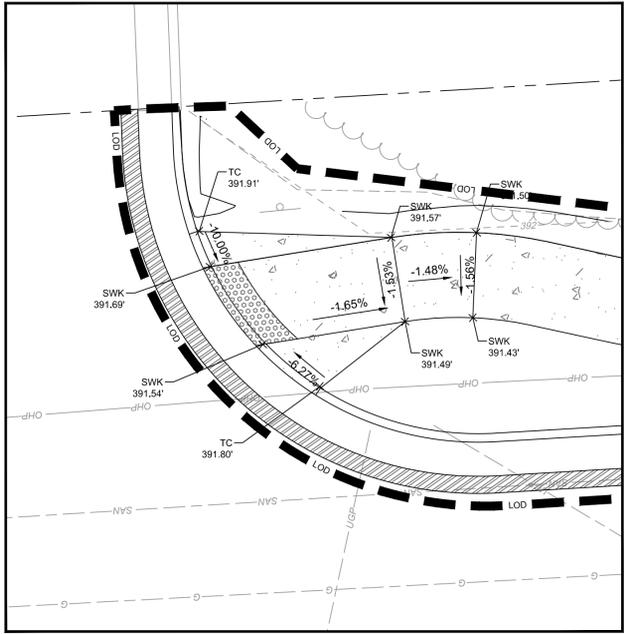
---	LOD	---	LIMITS OF CONSTRUCTION
X	X	X	FENCE
[Pattern]		[Pattern]	PROPOSED SIDEWALK
[Pattern]		[Pattern]	PROPOSED RETAINING WALL
[Pattern]		[Pattern]	EDGE MILLING
[Pattern]		[Pattern]	DRIVEWAY RESTORATION / FULL DEPTH PAVEMENT

LEGEND

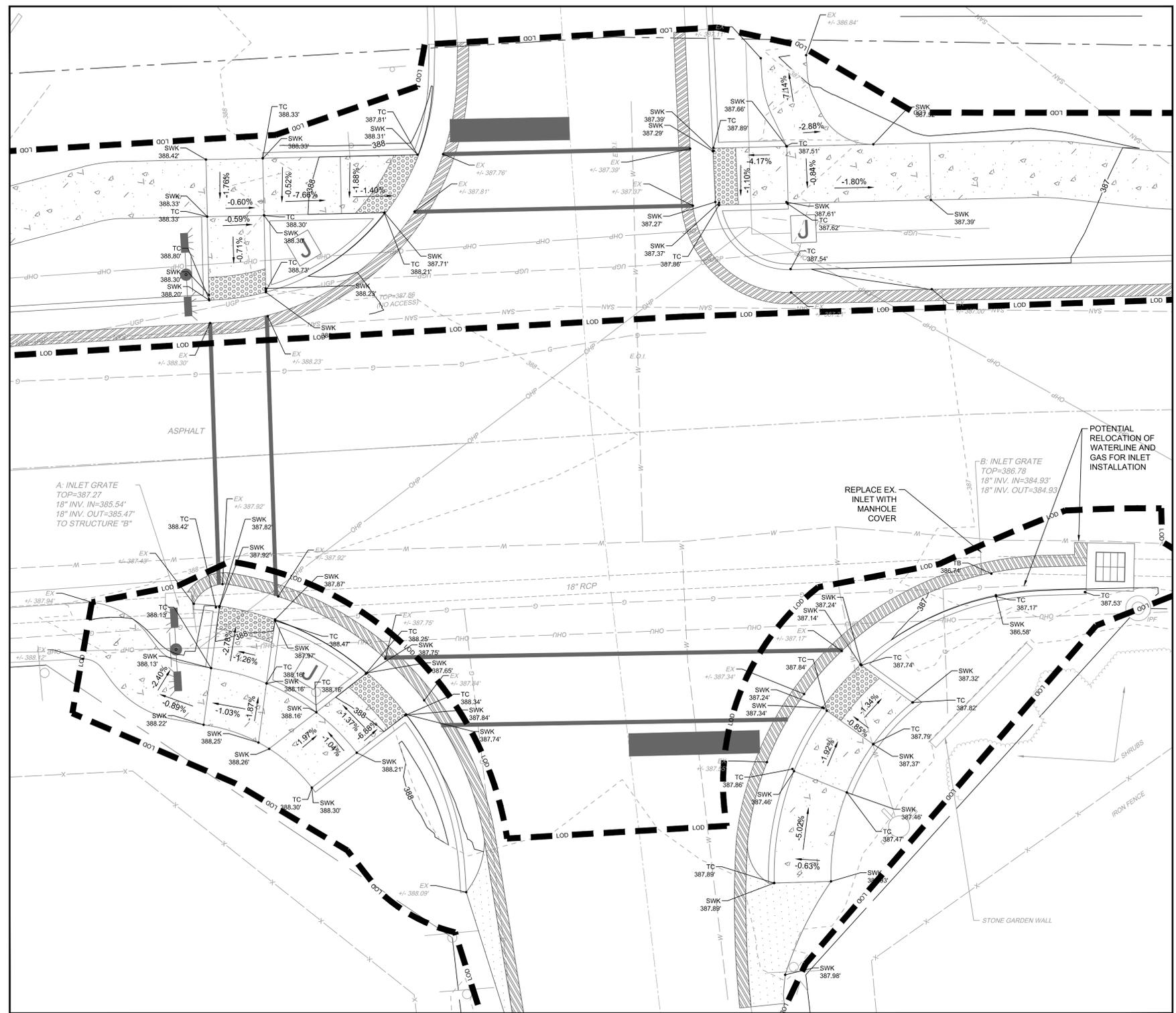
[Symbol]	SANITARY MANHOLE
[Symbol]	STORM MANHOLE
[Symbol]	STORM GRATE
[Symbol]	END OF INFORMATION
[Symbol]	REINFORCED CONC. PIPE
[Symbol]	SPOT ELEVATION
[Symbol]	HEADER CURB
[Symbol]	GRASS AREA/ISLAND
[Symbol]	CONCRETE WALK
[Symbol]	WATER METER
[Symbol]	WATER VALVE
[Symbol]	CROSS WALK SIGN/BOX
[Symbol]	POWER POLE
[Symbol]	GUY ANCHOR
[Symbol]	IRON PIPE FOUND
[Symbol]	HEADER CURB
[Symbol]	EDGE OF PAVEMENT
[Symbol]	UNDERGROUND WATERLINE MARKING
[Symbol]	UNDERGROUND SANITARY SEWER MARKING
[Symbol]	OVERHEAD POWER LINE
[Symbol]	UNDERGROUND POWER LINE GAS MARKING
[Symbol]	ROAD STRIPING



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INSET #1



INSET #2

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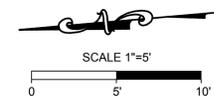
DATE 3/27/2020
 DATE 10.23.18
 DRAWN BY PVN
 DESIGNED BY PVN
 CHECKED BY LTF
 SCALE SEE PLAN

TIMMONS GROUP

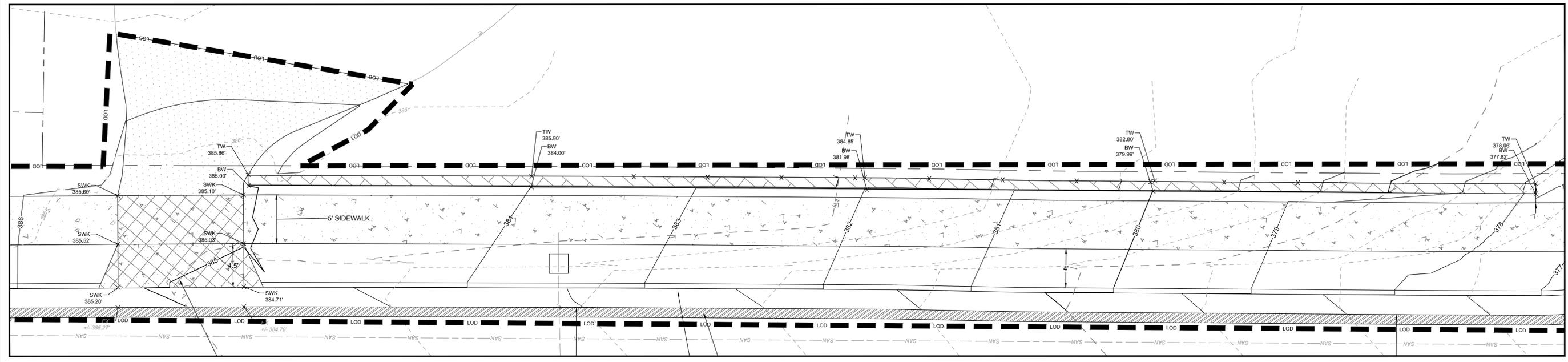
CHAIN BRIDGE ROAD SIDEWALK EXTENSION CITY OF FAIRFAX, VIRGINIA DETAILED GRADING PLAN

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 SHEET NO. C4.2A

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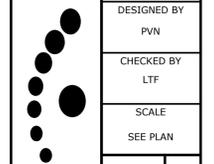
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TIMMONS GROUP
CITY OF FAIRFAX, VIRGINIA
CHAIN BRIDGE ROAD SIDEWALK EXTENSION
LAYOUT PLAN

JOB NO.	35061.023
SHEET NO.	C4.2B

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SCALE
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TIMMONS GROUP

CHAIN BRIDGE ROAD SIDEWALK EXTENSION
CITY OF FAIRFAX, VIRGINIA

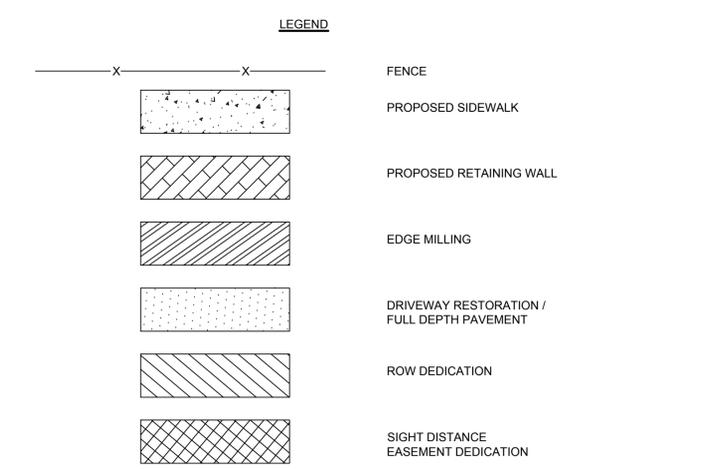
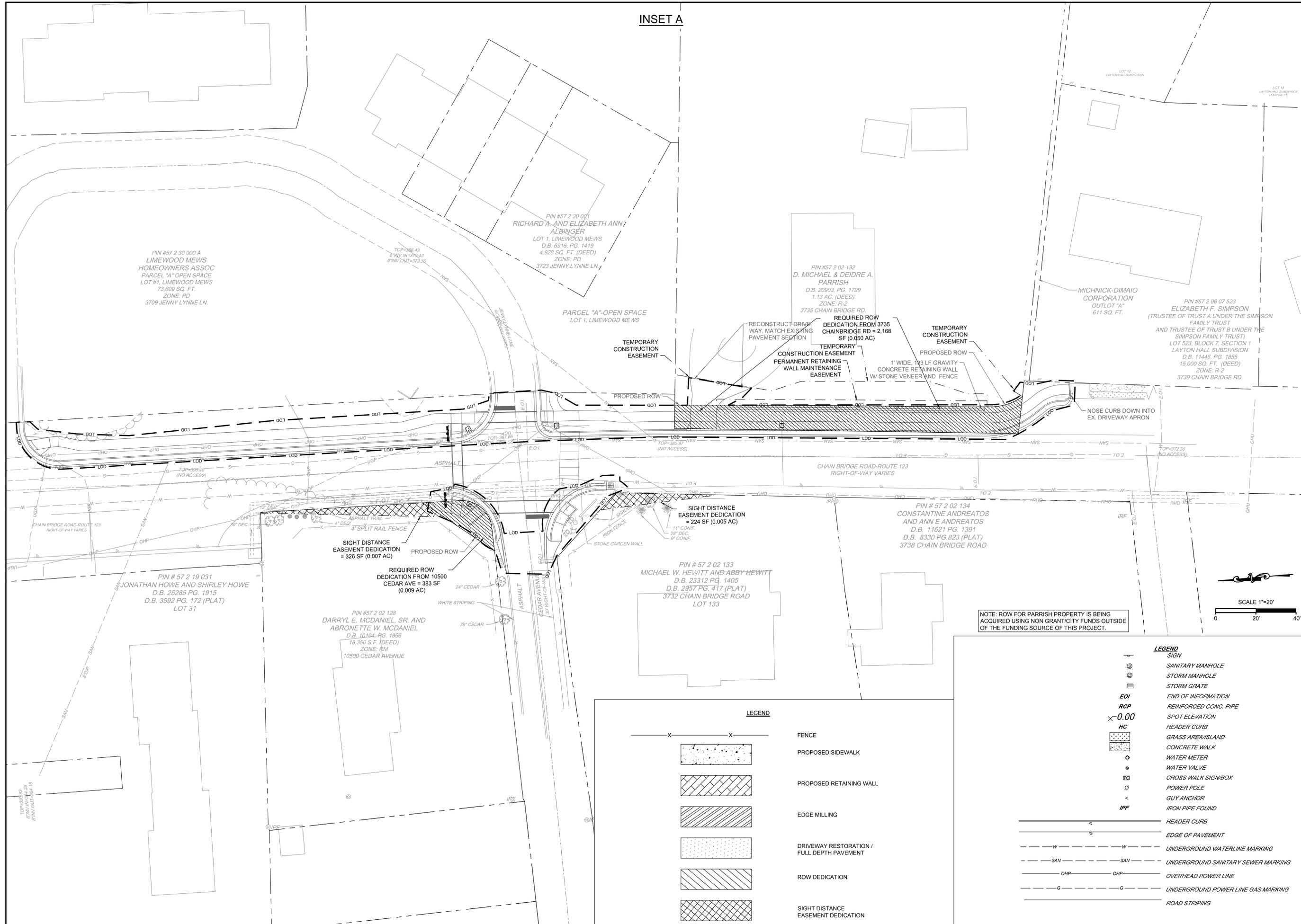
ROW DEDICATION

JOB NO.
35061.023

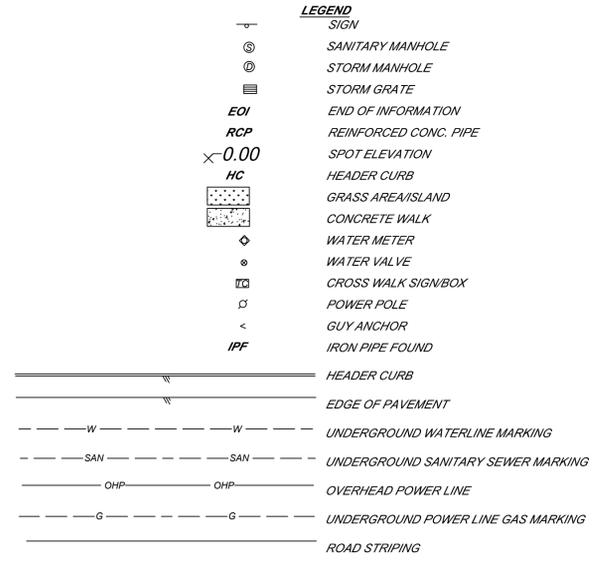
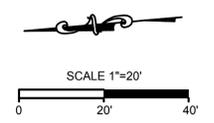
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C4.3

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INSET A



NOTE: ROW FOR PARRISH PROPERTY IS BEING ACQUIRED USING NON GRANT/CITY FUNDS OUTSIDE OF THE FUNDING SOURCE OF THIS PROJECT.



PIN #57 2 30 000 A
LIMEWOOD MEWS
HOMEOWNERS ASSOC
PARCEL "A" OPEN SPACE
LOT #1, LIMEWOOD MEWS
73,609 SQ. FT.
ZONE: PD
3709 JENNY LYNNE LN.

PIN #57 2 30 001
RICHARD A. AND ELIZABETH ANN
ALBINGER
LOT 1, LIMEWOOD MEWS
D.B. 8916, PG. 1419
4,928 SQ. FT. (DEED)
ZONE: PD
3723 JENNY LYNNE LN.

PIN #57 2 02 132
D. MICHAEL & DEIDRE A.
PARRISH
D.B. 20803, PG. 1799
1.13 AC. (DEED)
ZONE: R-2
3735 CHAIN BRIDGE RD.

MICHNICK-DIMAIO
CORPORATION
OUTLOT "A"
611 SQ. FT.

PIN #57 2 06 07 523
ELIZABETH F. SIMPSON
(TRUSTEE OF TRUST A UNDER THE SIMPSON
FAMILY TRUST
AND TRUSTEE OF TRUST B UNDER THE
SIMPSON FAMILY TRUST)
LOT 523, BLOCK 7, SECTION 1
LAYTON HALL SUBDIVISION
D.B. 11446, PG. 1855
15,000 SQ. FT. (DEED)
ZONE: R-2
3739 CHAIN BRIDGE RD.

PIN # 57 2 02 134
CONSTANTINE ANDREATOS
AND ANN E ANDREATOS
D.B. 11621 PG. 1391
D.B. 8330 PG. 823 (PLAT)
3738 CHAIN BRIDGE ROAD

PIN # 57 2 02 133
MICHAEL W. HEWITT AND ABBY HEWITT
D.B. 23312 PG. 1405
D.B. 2957 PG. 417 (PLAT)
3732 CHAIN BRIDGE ROAD
LOT 133

PIN #57 2 02 128
DARRYL E. MCDANIEL, SR. AND
ABRONETTE W. MCDANIEL
D.B. 10104, PG. 1866
18,350 S.F. (DEED)
ZONE: RM
10500 CEDAR AVENUE

PIN # 57 2 19 031
JONATHAN HOWE AND SHIRLEY HOWE
D.B. 25286 PG. 1915
D.B. 3592 PG. 172 (PLAT)
LOT 31

TOP=384.83
8" INV. IN=378.43
8" INV. OUT=373.35

TOP=388.43
8" INV. IN=378.43
8" INV. OUT=373.35

TOP=385.97
(NO ACCESS)

TOP=372.30
(NO ACCESS)

TOP=390.10
(NO ACCESS)

SIGHT DISTANCE
EASEMENT DEDICATION
= 326 SF (0.007 AC)

SIGHT DISTANCE
EASEMENT DEDICATION
= 224 SF (0.005 AC)

REQUIRED ROW
DEDICATION FROM 10500
CEDAR AVE = 383 SF
(0.009 AC)

CHAIN BRIDGE ROAD-ROUTE 123
RIGHT-OF-WAY VARIES

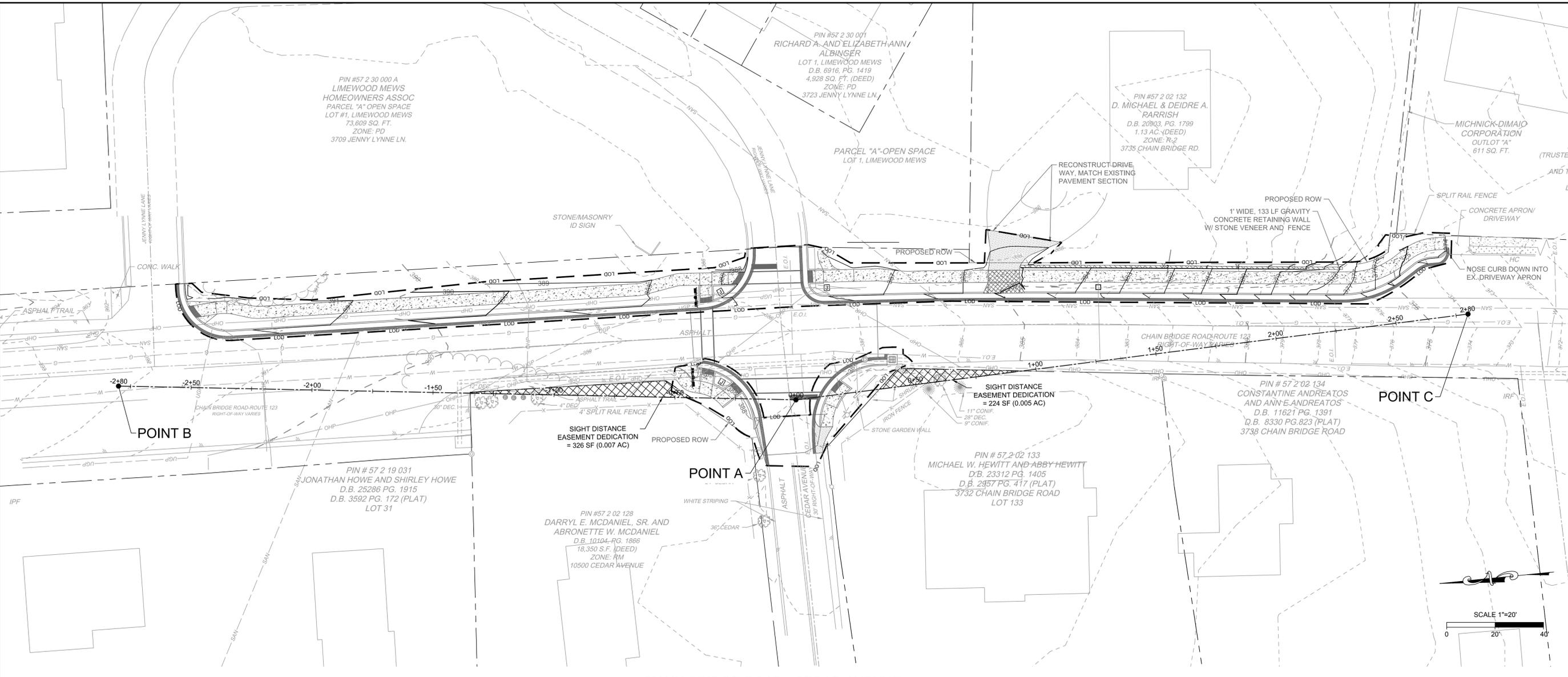
CHAIN BRIDGE ROAD-ROUTE 123
RIGHT-OF-WAY VARIES

24" CEDAR

38" CEDAR

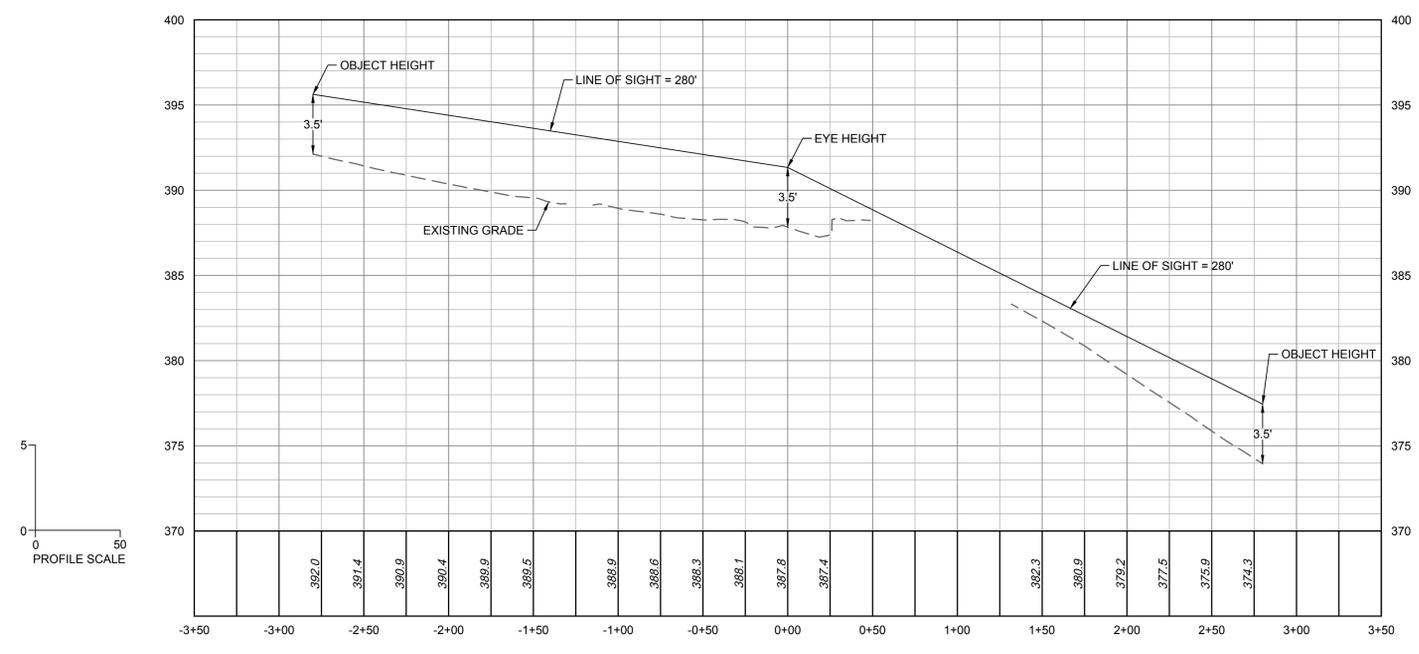
ASPHALT

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CHAIN BRIDGE ROAD / CEDAR AVENUE INTERSECTION SIGHT DISTANCE

POSTED SPEED = 25 MPH
SDR = 280'
SDL = 280'



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SCALE	SEE PLAN

TIMMONS GROUP
CITY OF FAIRFAX, VIRGINIA
CHAIN BRIDGE ROAD SIDEWALK EXTENSION
CHAIN BRIDGE ROAD SIGHT DISTANCE PLAN AND PROFILE

JOB NO.
35061.023
SHEET NO.
C4.4

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TIMMONS GROUP

CHAIN BRIDGE ROAD SIDEWALK EXTENSION

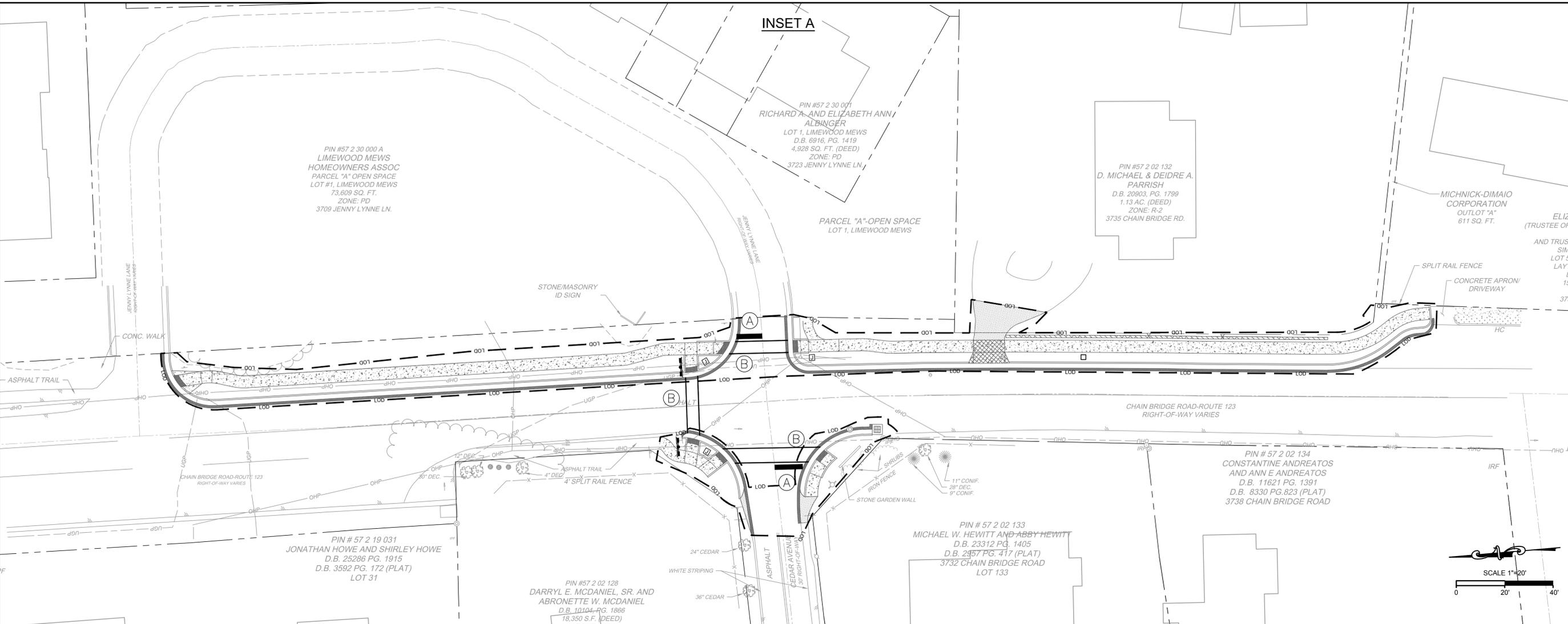
CITY OF FAIRFAX, VIRGINIA

SIGNAGE AND PAVEMENT MARKING PLAN

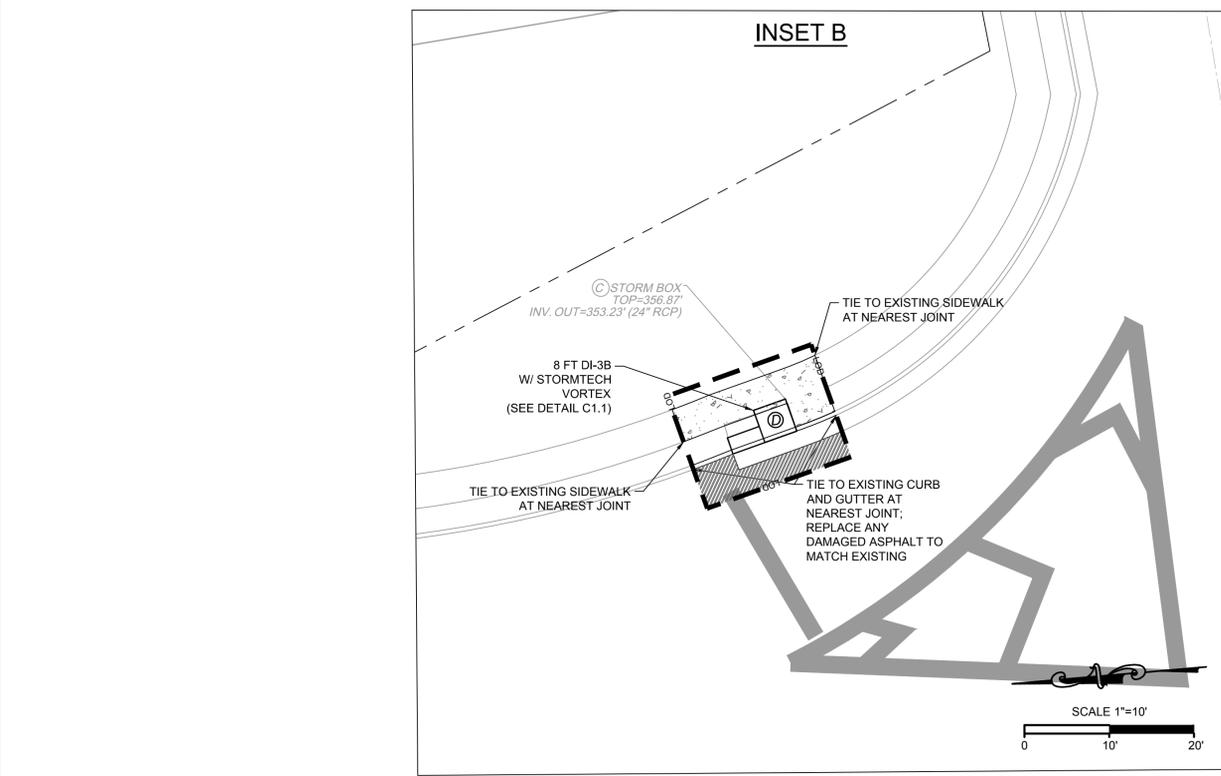
JOB NO.
35061.023

SHEET NO.
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INSET A



INSET B

PAVEMENT MARKING LEGEND

- (A) TYPE B, CLASS 1, WHITE, SOLID 24" WIDE
- (B) TYPE B, CLASS 1 WHITE, 6" WIDTH PEDESTRIAN CROSSWALK

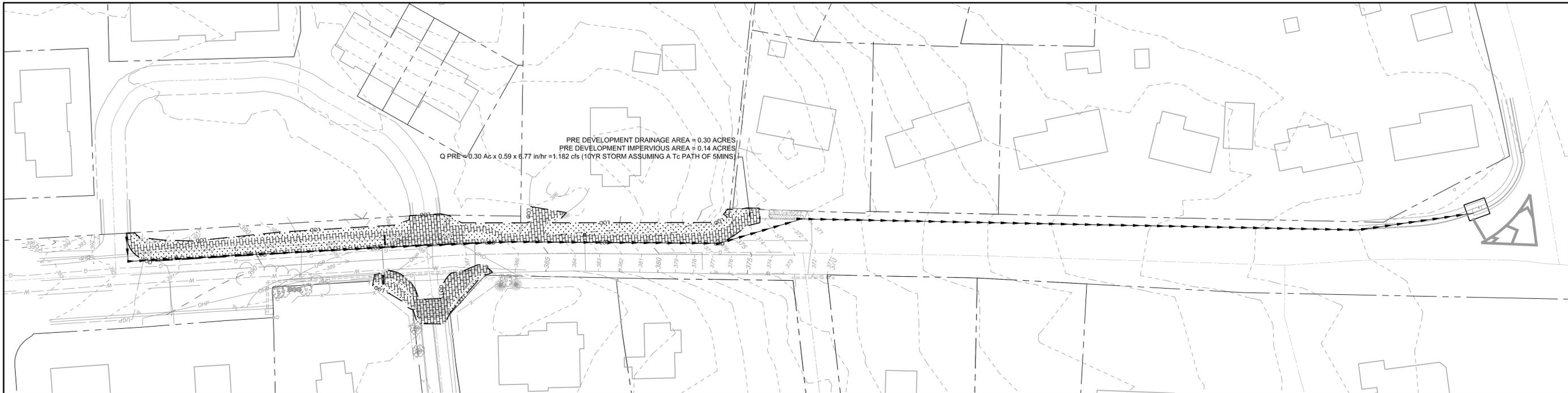
PAVEMENT MARKING AND SIGNING NOTES

1. ALL PERMANENT MARKINGS SHALL BE TYPE B, CLASS 1 UNLESS OTHERWISE DIRECTED BY VDOT TRAFFIC ENGINEERING.
2. ALL PAVEMENT MARKINGS MUST HAVE A PERSON WITH A PAVEMENT MARKING CERTIFICATION ISSUED BY THE VDOT MATERIALS DIVISION ON SITE DURING PAVEMENT MARKING OPERATIONS. A COMPLETED CERTIFIED DELIVERY TICKET AND A C-85 MUST BE SUBMITTED TO THE VDOT RESIDENCY PERMIT INSPECTOR.
3. FOR ALL PROPOSED SIGNS, THE BOTTOM OF SIGN HEIGHT MUST BE AT LEAST 7' ABOVE GROUND.
4. ALL EXISTING SIGNAGE SHOULD BE RELOCATED AND RE-SET IN THE SAME LOCATION AND SAME OFFSET AS CURRENTLY PROVIDED.
5. SIGNS SHALL BE POSTED ON 2" QUICK PUNCH BRAND POSTS.
6. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL STOP SIGNS, DIRECTIONAL SIGNS, AND STRIPING SHOWN ON THE PLANS.

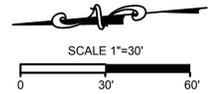
LEGEND

	LOD	LIMITS OF CONSTRUCTION
	FENCE	
	PROPOSED SIDEWALK	
	PROPOSED RETAINING WALL	
	EDGE MILLING	
	DRIVEWAY RESTORATION / FULL DEPTH PAVEMENT	

NOT FOR CONSTRUCTION

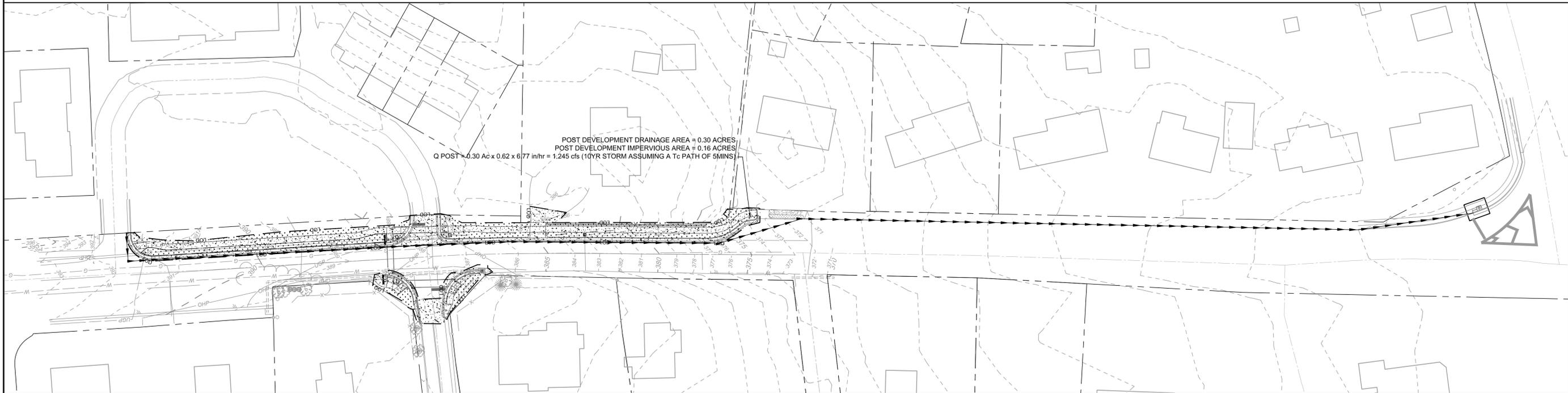


PRE-DEVELOPMENT OVERALL DRAINAGE AREA TO POI #1



SWM NARRATIVE

THIS PLAN PROPOSES INSTALLATION OF SIDEWALK AND ADA ACCESSIBLE RAMPS ALONG CHAIN BRIDGE ROAD. THE POST-DEVELOPED CONDITION INCREASES THE IMPERVIOUS SURFACES BY 0.015 AC (670 SF) AND DOES NOT ENCRoACH ON THE 100-FOOT RPA BUFFER AREA. THIS INCREASE IN IMPERVIOUS SURFACE INCREASES THE PREDEVELOPED RUNOFF TO THE POI BY 0.06 CFS FOR THE 10-YEAR STORM. DUE TO THE VERY MINISCULE INCREASE IN IMPERVIOUS AREA, THE RESULTING FLOW IS CONSIDERED NEGLIGIBLE AND THEREFORE WILL NOT CAUSE FLOODING OR CHANNEL DEGRADATION DOWNSTREAM.



POST-DEVELOPMENT OVERALL DRAINAGE AREA TO POI #1

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DATE	10.23.18
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DESIGNED BY	PVN
CHECKED BY	LTF
SCALE	SEE PLAN

TIMMONS GROUP
 CHAIN BRIDGE ROAD SIDEWALK EXTENSION
 CITY OF FAIRFAX, VIRGINIA
 PRE & POST-DEVELOPED DRAINAGE

JOB NO.	35061.023
SHEET NO.	C5.0

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2011 BMP Standards and Specifications | 2013 Draft BMP Standards and Specifications

Project Name: **Chain Bridge Rd Sidewalk**
 Date: **3/20/2020**
 Linear Development Project? **No**

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) → **0.30**

Maximum reduction required:	10%
The site's net increase in impervious cover (acres) is:	0.015380624
Post-Development TP Load Reduction for Site (lb/yr):	0.07

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, protected forest/open space or reforested					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be			0.15		0.15
Impervious Cover (acres)			0.14		0.14
Totals					0.30

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			0.14		0.14
Impervious Cover (acres)			0.16		0.16
Area Check	OK.	OK.	OK.	OK.	0.30

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)	0.15	0.14
Weighted Rv (turf)	0.22	0.22
% Managed Turf	52%	49%
Impervious Cover (acres)	0.14	0.14
Rv(impervious)	0.95	0.95
% Impervious	48%	51%
Total Site Area (acres)	0.30	0.28
Site Rv	0.57	0.59

Treatment Volume and Nutrient Load

	Pre-ReDevelopment	Post-Development
Pre-ReDevelopment Treatment Volume (acre-ft)	0.0142	0.0140
Pre-ReDevelopment Treatment Volume (cubic feet)	620	608
Pre-ReDevelopment TP Load (lb/yr)	0.39	0.38
Pre-ReDevelopment TP Load per acre (lb/acre/yr)	1.30	1.35
Baseline TP Load (lb/yr) (0.41 lbs/acre/yr applied to pre-redevelopment area excluding pervious land proposed for new impervious cover)		0.12

¹ Adjusted Land Cover Summary:
 Pre ReDevelopment land cover minus pervious land cover (forest/open space or managed turf) acreage proposed for new impervious cover.
 Adjusted total acreage is consistent with Post-ReDevelopment acreage (minus acreage of new impervious cover).
 Column 1 shows load reduction requirement for new impervious cover (based on new development load limit, 0.41 lbs/acre/year).

LAND COVER SUMMARY -- POST DEVELOPMENT

Land Cover Summary-Post (Final)		Land Cover Summary-Post		Land Cover Summary-Post			
Post ReDev. & New Impervious		Post-ReDevelopment		Post-Development New Impervious			
Forest/Open Space Cover (acres)	0.00	Forest/Open Space Cover (acres)	0.00				
Weighted Rv(forest)	0.00	Weighted Rv(forest)	0.00				
% Forest	0%	% Forest	0%				
Managed Turf Cover (acres)	0.14	Managed Turf Cover (acres)	0.14				
Weighted Rv (turf)	0.22	Weighted Rv (turf)	0.22				
% Managed Turf	47%	% Managed Turf	49%				
Impervious Cover (acres)	0.16	ReDev. Impervious Cover (acres)	0.14			New Impervious Cover (acres)	0.02
Rv(impervious)	0.95	Rv(impervious)	0.95			Rv(impervious)	0.95
% Impervious	53%	% Impervious	51%				
Final Site Area (acres)	0.30	Total ReDev. Site Area (acres)	0.28				
Final Post Dev Site Rv	0.61	ReDev Site Rv	0.59				

Treatment Volume and Nutrient Load

	Final Post-Development	Post-ReDevelopment	Post-Development		
Final Post-Development Treatment Volume (acre-ft)	0.0152	Post-ReDevelopment Treatment Volume (acre-ft)	0.0140	Post-Development Treatment Volume (acre-ft)	0.0012
Final Post-Development Treatment Volume (cubic feet)	661	Post-ReDevelopment Treatment Volume (cubic feet)	608	Post-Development Treatment Volume (cubic feet)	53
Final Post-Development TP Load (lb/yr)	0.42	Post-ReDevelopment Load (TP) (lb/yr)*	0.38	Post-Development TP Load (lb/yr)	0.03
Final Post-Development TP Load per acre (lb/acre/yr)	1.39	Post-ReDevelopment TP Load per acre (lb/acre/yr)	1.35		
		Max. Reduction Required (Below Pre-Development Load)	10%		
		TP Load Reduction Required for Redeveloped Area (lb/yr)	0.04	TP Load Reduction Required for New Impervious Area (lb/yr)	0.03

BMP NARRATIVE:

THIS PROJECT CONSISTS OF CONSTRUCTION OF A SIDEWALK AND ADA ACCESSIBLE RAMPS ALONG CHAIN BRIDGE ROAD. THE PROJECT IS INCLUDED IN A DRAINAGE AREA THAT IS SERVED BY AN EXISTING STORM SEWER SYSTEM TO THE SOUTH OF THE PROJECT AREA. THE PROPOSED LIMITS OF DISTURBANCE IS 0.30 ACRES OF WHICH 0.16 ACRES IS IMPERVIOUS SURFACE.

THE BMP REQUIREMENTS HAVE BEEN ANALYZED IN ACCORDANCE WITH THE VIRGINIA RUNOFF REDUCTION COMPLIANCE SPREADSHEET FOR RE-DEVELOPMENT (LATEST VERSION 3.0). THE TOTAL PHOSPHORUS LOAD REDUCTION REQUIRED IS 0.07 LBS/YR. THE STORM TECH VORTEX FILTERING MANUFACTURED TREATMENT DEVICE INSTALLED TO TREAT RUNOFF FROM THE SITE HAS A PHOSPOROUS REMOVAL EFFICIENCY OF 20% AND REMOVES 0.07 LBS/YR. THE PROPOSED DEVICE MEETS THE TREATMENT TARGET. CALCULATIONS ARE SHOWN ON THE FOLLOWING SHEETS.

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YOUR VISION ACHIEVED THROUGH OURS.

DATE: 3/27/2020
 DATE: 10.23.18
 DRAWN BY: PVN
 DESIGNED BY: PVN
 CHECKED BY: LTF
 SCALE: SEE PLAN

TIMMONS GROUP
 CHAIN BRIDGE ROAD SIDEWALK EXTENSION
 CITY OF FAIRFAX, VIRGINIA
 BMP CALCULATIONS

JOB NO. 35061.023
 SHEET NO. C5.1

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Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	0.07
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Nitrogen Loads (Informational Purposes Only)

Pre-ReDevelopment TN Load (lb/yr)	2.79	Final Post-Development TN Load (Post-ReDevelopment & New Impervious) (lb/yr)	2.97
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Drainage Area A

Drainage Area A Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)					0.00	0.00
Managed Turf (acres)			0.14		0.14	0.22
Impervious Cover (acres)			0.16		0.16	0.95
Total					0.30	

CLEAR BMP AREAS

Total Phosphorus Available for Removal in D.A. A (lb/yr)	0.42
Post Development Treatment Volume in D.A. A (ft ³)	661

Stormwater Best Management Practices (RR = Runoff Reduction)

14. Manufactured Treatment Devices (no RR) --Select from dropdown lists--

Device	RR	Area (ac)	Volume (ft ³)	TP (lb/yr)	Nitrogen (lb/yr)	Phosphorus (lb/yr)	Other
14.a. Manufactured Treatment Device-Hydrodynamic	0		0	0	0	0	0.00
14.b. Manufactured Treatment Device-Filtering	0	0.12	0.13	0	0	0	0.34
14.c. Manufactured Treatment Device-Generic	0		0	0	0	0	0.00

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)	0.16	0.00	0.00	0.00	0.00	OK.
IMPERVIOUS COVER TREATED (ac)	0.13	0.00	0.00	0.00	0.00	OK.
MANAGED TURF AREA (ac)	0.14	0.00	0.00	0.00	0.00	OK.
MANAGED TURF AREA TREATED (ac)	0.12	0.00	0.00	0.00	0.00	OK.
AREA CHECK	OK.	OK.	OK.	OK.	OK.	

Site Treatment Volume (ft³) **661**

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)	0.42	0.00	0.00	0.00	0.00	0.42
TP LOAD REDUCTION ACHIEVED (lb/yr)	0.07	0.00	0.00	0.00	0.00	0.07
TP LOAD REMAINING (lb/yr)	0.35	0.00	0.00	0.00	0.00	0.35
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)	0.42
TP LOAD REDUCTION REQUIRED (lb/yr)	0.07
TP LOAD REDUCTION ACHIEVED (lb/yr)	0.07
TP LOAD REMAINING (lb/yr)	0.35

REMAINING TP LOAD REDUCTION REQUIRED (lb/yr): **0.00** **
 **No further TP load reduction required

Total Nitrogen (For Information Purposes)

POST-DEVELOPMENT LOAD (lb/yr)	2.97
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	0.00
REMAINING POST-DEVELOPMENT NITROGEN LOAD (lb/yr)	2.97

Runoff Volume and Curve Number Calculations

Enter design storm rainfall depths (in):

1-year storm	2-year storm	10-year storm
2.59	3.13	4.03

Use NOAA Atlas 14 (<http://hdsc.nws.noaa.gov/hdsc/pfds/>)

***Notes (see below):**

- The curve numbers and runoff volumes computed in this spreadsheet for each drainage area are limited in their applicability for determining and demonstrating compliance with water quantity requirements. See VRRM User's Guide and Documentation for additional information.
- Runoff Volume (RV) for pre- and post-development drainage areas must be in volumetric units (e.g., acre-feet or cubic feet) when using the Energy Balance Equation. Runoff measured in watershed-inches and shown in the spreadsheet as RV(watershed-inch) can only be used in the Energy Balance Equation when the pre- and post-development drainage areas are equal. Otherwise RV(watershed-inch) must be multiplied by the drainage area.
- Adjusted CNs are based on runoff reduction volumes as calculated in D.A. tabs. An alternative CN adjustment calculation for Vegetated Roofs is included in BMP specification No. 5.

Drainage Area Curve Numbers and Runoff Depths*

Curve numbers (CN, CNadj) and runoff depths (RV_{Developed}) are computed with and without reduction practices.

Drainage Area A		A Soils	B Soils	C Soils	D Soils	Total Area (acres):	Runoff Reduction Volume (ft ³):
Forest/Open Space -- undisturbed, protected forest/open space or reforested land	Area (acres)	0.00	0.00	0.00	0.00	0.30	0
	CN	30	55	70	77		
Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed	Area (acres)	0.00	0.00	0.14	0.00		
	CN	39	61	74	80		
Impervious Cover	Area (acres)	0.00	0.00	0.16	0.00		
	CN	98	98	98	98		
		CN (D.A. A)					
		87					
		1-year storm	2-year storm	10-year storm			
RV _{Developed} (watershed-inch) with no Runoff Reduction*		1.39	1.85	2.66			
RV _{Developed} (watershed-inch) with Runoff Reduction*		1.39	1.85	2.66			
Adjusted CN*		87	87	87			

*See Notes above

INLET COMPUTATIONS:

INLET	DRAIN AREA	RUNOFF COEFF	SUM CA	RAINFALL IN/HR	INCR Q	CARRY OVER CFS	GUTTER FLOW Q(T)	GUTTER SLOPE FT/FT	CROSS SLOPE FT/FT	SPR-EAD T	W	WT	Sw	Sw/Sx	CHART #10	Se=	Lt(15)	Q	Ob	T	REM					
NO.	TYPE	LEN (FT)	ACRES	CA	IN/HR	CFS	Q(T)	FT/FT	FT/FT	FT	FT	FT	FT/FT	FT/FT	Eo	a	Sw=	h	INTCED	d	SPREAD @SAG					
1	DI-3B	8.00	0.88	0.74	0.65	4.00	2.60	0.00	2.60	0.0234	0.0234	6.1	2.0	0.33	0.0833	3.6	0.77	3.6	0.143	0.134	13.2	0.61	0.81	2.12	0.48	

WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Site Conditions: Existing Proposed **Project:** Chain Bridge Road
 Subarea Number: Pre-Development - Onsite

On-Site Land Use: Existing Proposed **By:** BP
Date: 3/1/2020

RUNOFF CURVE NUMBER

Soil Group	Land Use or Zoning	Area (acres)	RCN	RCN x Area
C	Grass Good Condition	0.15	74	11.47
IMP	Asphalt Parking lot	0.14	98	13.95
Total Area	0.30 ac	0.000 sq. mi	Weighted RCN =	85.49

TIME OF CONCENTRATION

ID	Type of Flow	n	Length (ft)	Slope (ft/ft)	Area (sf)	Wet P (ft)	Velocity (fps)	Tc (hrs)
A	Sheet Flow (P ₂ = 3.05 in.)							
T _c = 0.007 (nL) ^{0.8} / (P ₂) ^{0.5} S ^{0.4}								
Shallow Concentrated Flow Fig. 3.1, TR-55 T _c =L/3600V								
Channel Flow T _c =L/3600V								
Total T _c (hr): 0.08 Total T _c (min): 5 Assumed 5 Min Tc								

WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Site Conditions: Existing Proposed **Project:** Chain Bridge Road
 Subarea Number: Post-Development - Onsite

On-Site Land Use: Existing Proposed **By:** BP
Date: 3/1/2020

RUNOFF CURVE NUMBER

Soil Group	Land Use or Zoning	Area (acres)	RCN	RCN x Area
C	Grass Good Condition	0.14	74	10.33
IMP	Asphalt Parking lot	0.16	98	15.46
Total Area	0.30 ac	0.000 sq. mi	Weighted RCN =	86.73

TIME OF CONCENTRATION

ID	Type of Flow	n	Length (ft)	Slope (ft/ft)	Area (sf)	Wet P (ft)	Velocity (fps)	Tc (hrs)
A	Sheet Flow (P ₂ = 3.05 in.)							
T _c = 0.007 (nL) ^{0.8} / (P ₂) ^{0.5} S ^{0.4}								
Shallow Concentrated Flow Fig. 3.1, TR-55 T _c =L/3600V								
Channel Flow T _c =L/3600V								
Total T _c (hr): 0.08 Total T _c (min): 5 Assumed 5 Min Tc								

WORKSHEET FOR SCS GRAPHICAL PEAK DISCHARGE

Project: Chain Bridge Road
 Subarea Number: BP
 By: BP
 Date: 3/1/2020

Pre Developed Divide

Project Data Summary	Drainage Area	0.30 acres	0.000 square mi
Runoff Curve Number	85.5		
Time of Concentration	0.08 hours		
Rainfall Distribution Assumed Type II			

Proposed Bypass Left	Storm 1	Storm 2	Storm 3	Storm 4
Frequency	yr	1	10	
P ₂₄ -hour rainfall	in	2.59	4.03	
Initial Abstraction, I _a	in	0.339	0.339	
Compute I _a /P		0.13	0.08	
Unit Peak Discharge, q _u	csf/in	995.24	1000.00	
Runoff, q	in	1.28	2.53	
Peak Discharge, Q	csf	0.59	1.17	

Post Developed Divide

Project Data Summary	Drainage Area	0.30 acres	0.000 square mi
Runoff Curve Number	86.7		
Time of Concentration	0.08 hours		
Rainfall Distribution Assumed Type II			

Proposed Bypass Left	Storm 1	Storm 2	Storm 3	Storm 4
Frequency	yr	1	10	
P ₂₄ -hour rainfall	in	2.59	4.03	
Initial Abstraction, I _a	in	0.306	0.306	
Compute I _a /P		0.12	0.08	
Unit Peak Discharge, q _u	csf/in	995.47	1000.00	
Runoff, q	in	1.37	2.64	
Peak Discharge, Q	csf	0.63	1.23	

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DATE: 3/27/2020
 DATE: 10.23.18
 DRAWN BY: PVN
 DESIGNED BY: PVN
 CHECKED BY: LTF
 SCALE: SEE PLAN

TIMMONS GROUP
 CHAIN BRIDGE ROAD SIDEWALK EXTENSION
 CITY OF FAIRFAX, VIRGINIA
 BMP CALCULATIONS

JOB NO. 35061.023
 SHEET NO. C5.2

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Description

The Dual-Vortex Separator (DVS) is a hydrodynamic stormwater treatment device used to remove pollutants from urban runoff. Impervious surfaces and other urban and suburban landscapes generate a variety of contaminants that can enter stormwater and pollute downstream receiving waters. The DVS is designed to capture and retain sediment as well as floating trash, debris and oils. The concentration of metals and other constituents associated with sediment or floating pollutants may also be reduced.

Function

Stormwater runoff enters the DVS unit through an inlet pipe. Influent flow is split evenly between two vortex tubes by a V-shaped weir. The shape and diameter of the vortex tubes promotes circular motion of the incoming stormwater at increased velocities to enhance particle settling through centrifugal force. The system is also designed with an extended flow path to maximize hydraulic residence time which allows increased time to settle out solids. Settled pollutants are collected in an isolated storage area at the bottom of the structure, while floating trash, debris and petroleum hydrocarbons are retained behind baffles that contain the vortex chambers. During peak runoff events, flow in excess of design treatment flow overtops the bypass weir and exits the system without entering the treatment chambers to interrupt the treatment process or re-entrain captured pollutants. Treatment and bypass flows exit the system through an outlet pipe that is plumbed at the same elevation as the inlet pipe.

Configuration

The internal components of the DVS system are fabricated from stainless steel and mounted in a manhole or vault structure. The system is typically delivered as a complete unit for installation by the contractor. Installation includes excavation, preparation of the base rock, setting the unit, plumbing the inlet and outlet piping, backfill and placement of the finished surface at grade. Access to the installed system is allowed through ductile iron casting or hatch covers. The number of access points provided is dependent on the size and configuration of the system.

Maintenance Overview

State and local regulations require all stormwater management systems to be inspected on a regular basis and maintained as necessary to ensure performance and protect downstream receiving waters. Without maintenance, excessive pollutant buildup can limit system performance by reducing the operating capacity and increase the potential for scouring of pollutants during periods of high flow.

Inspection Equipment

The following equipment is helpful when conducting DVS inspections:

- Recording device (pen and paper form, voice recorder, iPad, etc.)
- Suitable clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)
- Traffic control equipment (cones, barricades, signage, flagging, etc.)
- Manhole hook or pry bar
- Flashlight
- Tape measure
- Measuring stick or sludge sampler
- Long-handled net (optional)
- Replacement sorbent pads

Inspection Procedures

Inspection is essential to consistent system performance and is easily completed. Inspection is typically conducted a minimum of twice per year but since pollutant transport and deposition varies from site to site, a site-specific maintenance frequency should be established during the first two or three years of operation.

DVS inspections are visual and are conducted without entering the unit. To complete an inspection, safety measures including traffic control should be deployed before the access covers are removed. Once the covers have been removed, the following items should be checked and recorded (see form provided on page 5) to determine whether maintenance is required:

- Inspect the internal components and note whether there are any broken or missing parts. In the unlikely event that internal parts are broken or missing, contact Oldcastle Infrastructure at (800) 579-8819 to determine appropriate corrective action.
- Note whether the inlet or outlet pipe is blocked or obstructed.
- Observe, quantify and record the accumulation of floating trash and debris in the baffled chambers around the vortex tubes. The significance of accumulated floating trash and debris is a matter of judgement. A long-handled net may be used to retrieve the bulk of trash and debris at the time of inspection if full maintenance due to accumulation of oils or sediment is not yet warranted.
- Observe, quantify and record the accumulation of oils in the baffled chambers around the vortex tubes. If sorbent pads have been used to absorb free oil and grease, observe and record their condition. Unless the sorbent pads are tethered to the internal baffles, spent pads may be netted and replaced at the time of inspection. The significance of accumulated floating oils is a matter of judgement. However, if there is evidence of an oil or fuel spill, immediate maintenance is warranted.
- Finally, observe, quantify and record the accumulation of sediment in the sediment storage sump. A calibrated dipstick, tape measure or sludge sampler may be used to determine the amount of accumulated sediment. The depth of sediment may be determined by calculating the difference between the measurement from the rim of the DVS to the top of the accumulated sediment and the measurement from the rim of the DVS to the bottom of the DVS structure. Finding the top of the accumulated sediment takes some practice and a light touch, but increasing resistance as the measuring device is lowered toward the bottom of the unit indicates the top of the accumulated sediment.

Maintenance

Maintenance should be scheduled if any of the following conditions are identified during inspection:

- Internal components are broken or missing.
- Inlet or outlet piping is obstructed.
- The accumulation of floating trash and debris that cannot be retrieved with a net and/or oil in the baffled chambers around the vortex tubes is significant.
- Tethered sorbent pads, if used, are dirty or saturated.
- The sediment level in the sediment storage sump is greater than 12 inches. The capacity of the sediment sump is 18 inches of sediment depth for all DVS models. Sediment depths greater than 18 inches will begin to affect the performance of the system.

Maintenance Equipment

The following equipment is helpful when conducting DVS maintenance:

- Suitable clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)
- Traffic control equipment (cones, barricades, signage, flagging, etc.)
- Manhole hook or pry bar
- Confined space entry equipment, if needed
- Flashlight
- Tape measure
- Sorbent pads
- Vacuum truck

Maintenance Procedures

Maintenance should be conducted during dry weather when no flow is entering the system. All maintenance, except possibly the attachment of sorbent pads (if required), may be conducted without entering the DVS structure. Once safety measures such as traffic control are deployed, the access covers may be removed and the following activities may be conducted to complete maintenance:

- Remove floating trash, debris and oils from the water surface using an extension on the end of the boom hose of the vacuum truck. Continue using the vacuum truck to completely dewater the structure through the vortex tubes and evacuate all accumulated sediment from the sediment sump. Some jetting may be required to fully evacuate sediment from the sump. This is easily achieved by inserting a jet hose through the vortex tube opposite the tube used for vacuum hose access.
- If sorbent pads are required and are tethered to the structure, only personnel that are OSHA Confined Space Entry trained and certified may enter the structure to remove and replace the spent pads.
- The structure does not need to be refilled with water after maintenance is complete. The system will fill with water when the next storm event occurs.
- All material removed from the DVS during maintenance must be disposed of in accordance with local regulations. In most cases, the material may be handled in the same manner as disposal of material removed from sumped catch basins or manholes.

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REVISION DESCRIPTION	DATE
60% SUBMISSION	3/27/2020
DATE	10.23.18
DRAWN BY	PVN
DESIGNED BY	PVN
CHECKED BY	LTF
SCALE	SEE PLAN

TIMMONS GROUP
 CHAIN BRIDGE ROAD SIDEWALK EXTENSION
 CITY OF FAIRFAX, VIRGINIA

BMP INSPECTION AND MAINTENANCE

JOB NO.
35061.023
 SHEET NO.
C5.3

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CHAIN BRIDGE ROAD TRANSPORTATION MANAGEMENT PLAN

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TEMPORARY TRAFFIC CONTROL MEASURES TO BE EMPLOYED IF WORK CAN TAKE PLACE OUTSIDE OF TRAFFIC AND A 10' LANE CAN BE MAINTAINED AT ALL TIMES

GENERAL:

1. THIS PROJECT IS CLASSIFIED AS TYPE A.
2. THE TOTAL LENGTH OF THE PROJECT IS ABOUT 543'.
3. THE PURPOSE OF THIS PROJECT IS TO PROVIDE A SIDEWALK AND HANDICAP ACCESSIBLE RAMP ON THE EAST SIDE OF CHAIN BRIDGE ROAD NEAR 3735 CHAIN BRIDGE ROAD AND TO REALIGN THE EXISTING SIDEWALK AND ADD ADDITIONAL HANDICAP ACCESSIBLE RAMPS ON THE WEST SIDE OF CHAIN BRIDGE ROAD AND AT THE INTERSECTION OF CHAIN BRIDGE ROAD AND CEDAR AVENUE.
4. THE TRAFFIC CONTROL MEASURES DISCUSSED BELOW WILL PERTAIN TO MILLING/OVERLAY WORK IN THE RIGHT-OF-WAY AND SHOULDER WORK.
5. TRAFFIC ALONG THESE ROADS CONSISTS OF COMMUTERS AND LOCAL RESIDENTS.
6. THE EXISTING SPEED LIMIT ALONG CHAIN BRIDGE ROAD IS 25 MPH. ALL EXISTING SPEED LIMITS WILL BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION.

TEMPORARY TRAFFIC CONTROL (TTC) / MAINTENANCE OF TRAFFIC (MOT):

1. LANE CLOSURES, SHOULDER CLOSURES, AND FLAGGING OPERATIONS ARE ANTICIPATED FOR THIS PROJECT AND WILL BE IN ACCORDANCE WITH THE VIRGINIA WORK AREA PROTECTION MANUAL, 2011 EDITION. THE FOLLOWING TEMPORARY TRAFFIC MEASURES MAY BE USED:

1.1. **SIDEWALK AND RETAINING WALL SHOULDER WORK:** TYPICAL TRAFFIC CONTROL SHOULDER OPERATION WITH MINOR ENCRoACHMENT (FIGURE TTC-5.1 - SHOULDER OPERATION WITH MINOR ENCRoACHMENT).

1.2. **OVERLAY OF EXISTING PAVEMENT AREAS:** TYPICAL TRAFFIC CONTROL LANE CLOSURE ON A TWO-LANE ROADWAY USING FLAGGERS (FIGURE TTC-23.1 - LANE CLOSURE ON A TWO-LANE ROADWAY USING FLAGGERS).

2. AS NOTED ABOVE, DIFFERENT TTC MEASURES MAY BE EMPLOYED DEPENDING ON THE WORK BEING PERFORMED. LANE CLOSURES SHALL BE MINIMIZED ALONG RAILROAD AVENUE.

3. NEGATIVE IMPACTS TO THE TRAVELING PUBLIC SHALL BE MINIMIZED IN EVERY WAY POSSIBLE. AS SUCH, DURING PEAK TIMES AND HOLIDAYS, ONE LANE OF TRAFFIC SHALL BE MAINTAINED IN BOTH DIRECTIONS. SEE THE "GENERAL NOTES" PORTION OF THIS PLAN SHEET FOR MORE INFORMATION.

4. ACCESS TO ADJACENT PROPERTIES SHALL BE MAINTAINED AT ALL TIMES.

PUBLIC COMMUNICATION PLAN:

1. IF ANY MAJOR TRAFFIC CHANGES ARE TO TAKE PLACE (LANE CLOSURES, ETC.), THE PROJECT ADMINISTRATOR SHALL ENSURE THAT THE LOCAL NEWSPAPERS AND RADIO STATIONS ARE INFORMED 72 HOURS IN ADVANCE OF THE CHANGE.
2. PORTABLE CHANGEABLE MESSAGE BOARDS (PCMBs) SHALL BE USED TO NOTIFY THE TRAVELING PUBLIC OF ANY SUCH MAJOR TRAFFIC CHANGES 72 HOURS IN ADVANCE OF THE CHANGE.

TRANSPORTATION OPERATION PLAN:

1. THE PROJECT PERSONNEL SHALL NOTIFY THE "NORTHERN REGION OPERATION TRAFFIC OPERATIONS CENTER" (NROTCC) WHEN A LANE CLOSURE IS IMPLEMENTED, AND AGAIN WHEN IT IS REMOVED.

2. THE FOLLOWING IS A LIST OF LOCAL EMERGENCY NUMBERS:

FIRE: 911
 COUNTY POLICE: 911
 STATE POLICE: 911
 PROJECT PERSONNEL:
 COUNTY CONTACT: NOVA DISTRICT VDOT, (703) 877-3450
 ENGINEER CONTACT: LUKE FETCHO, TIMMONS GROUP: 703-554-6712

3. ANY TRAFFIC INCIDENT THAT OCCURS DURING THE LIFE OF THIS PROJECT WILL BE DISCUSSED BY THE CONTRACTOR, VDOT PERSONNEL, AND CITY OF FAIRFAX PROJECT PERSONNEL TO DETERMINE WHETHER ANY CHANGES NEED TO BE MADE TO THE TRAFFIC CONTROL ON THE PROJECT.

PEDESTRIAN MANAGEMENT:

1. PEDESTRIAN WALKWAYS SHALL BE CLOSED AS NECESSARY TO ENSURE A SAFE ENVIRONMENT FOR PEDESTRIANS DURING CONSTRUCTION. CLOSED WALKWAYS SHALL BE MARKED WITH SIGNS AND OPTIC-ORANGE SAFETY FENCE (AS NECESSARY)

GENERAL NOTES:

1. ANY REQUIRED LANE CLOSURES MUST BE APPROVED IN ADVANCE BY THE VDOT NORTHERN VIRGINIA DISTRICT OFFICE. (703-877-3450)
2. WORK HOURS WITHIN THE CITY OF FAIRFAX RIGHT-OF-WAY SHALL BE LIMITED TO THE HOURS OF 9:30 AM TO 3:00 PM MONDAY-THURSDAY AND 9:30 AM TO 2:00 PM ON FRIDAYS, UNLESS OTHERWISE DIRECTED BY VDOT.
3. TRAFFIC SHALL NOT BE STOPPED FOR LONGER THAN FIVE MINUTES AT ANY TIME UNLESS OTHERWISE APPROVED BY THE TRANSPORTATION DEPT.
4. ALL AREAS EXCAVATED DEEPER THAN 1' BELOW EXISTING PAVEMENT SURFACE AND WITHIN THE CLEAR ZONE, AT THE CONCLUSION OF EACH WORKDAY, SHALL BE BACK FILLED TO FORM AN APPROXIMATE 6:1 WEDGE AGAINST THE PAVEMENT SURFACE FOR THE SAFETY AND PROTECTION OF VEHICULAR TRAFFIC. ALL COST PLACING, MAINTAINING AND REMOVING THE 6:1 WEDGE SHALL BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS IN THE CONTRACT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
5. LANE CLOSURES WILL NOT BE PERMITTED ON HOLIDAYS OR WEEKENDS UNLESS OTHERWISE APPROVED IN ADVANCE BY THE TRANSPORTATION DEPARTMENT.
6. ANY CONTRACT ITEM(S) NOT SPECIFICALLY NOTED IN THE MAINTENANCE OF TRAFFIC MAY BE SCHEDULED FOR CONSTRUCTION AT THE CONTRACTOR'S OPTION, AS APPROVED BY THE ENGINEER AND VDOT.
7. ACCESS TO ADJACENT PROPERTIES AND CONNECTING STREETS SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
8. THE FINAL SURFACE COURSE IS NOT TO BE PLACED UNTIL SUCH TIME THAT PERMANENT PAVEMENT MARKINGS CAN BE PLACED.
9. ALL TRAFFIC CONTROL SHALL BE SET UP AND SPACED ACCORDING TO THE VIRGINIA WORK AREA PROTECTION MANUAL, 2011 EDITION.
10. CONTRACTOR SHALL PROVIDE ADDITIONAL TRAFFIC CONTROL AS DIRECTED BY THE VIRGINIA DEPARTMENT OF TRANSPORTATION SHOULD FIELD CONDITIONS WARRANT.
11. CONTRACTOR MAY REDUCE LANE WIDTHS TO 10' DURING CONSTRUCTION. ANY TEMPORARY PAVEMENT MARKINGS THAT ARE REQUIRED ARE THE RESPONSIBILITY OF THE CONTRACTOR.
12. CONTRACTOR IS RESPONSIBLE FOR PLACEMENT AND MAINTENANCE OF ALL TEMPORARY PAVEMENT MARKINGS THAT ARE REQUIRED OR IMPLIED IN THE TTC DIAGRAMS. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL TRAFFIC CONTROL DEVICES, SIGNAGE, EQUIPMENT, PERSONNEL, INCLUDING CERTIFIED TRAFFIC CONTROL PERSONNEL, ETC. TO CONTROL TRAFFIC DURING CONSTRUCTION WITHIN CITY OF FAIRFAX MAINTAINED RIGHT-OF-WAY. ALL TRAFFIC CONTROL SHALL BE IN STRICT ACCORDANCE WITH THE STANDARDS, GUIDELINES, POLICIES, AND OBJECTIVES OF THE LATEST EDITION OF THE VIRGINIA WORK AREA PROTECTION MANUAL, MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), AND ALL VDOT PERMITS.
13. AT NO TIME SHALL CONSTRUCTION TAKE PLACE ON BOTH THE RIGHT AND LEFT SIDES OF VEHICLES UNLESS SPECIFIED BY VDOT AND THE ENGINEER.
14. FOR ANY NOTES OR FIGURES REFERENCED ON TTC DIAGRAMS AT RIGHT THAT ARE NOT AVAILABLE IN THESE PLANS, PLEASE REFER TO THE 2011 EDITION OF THE WORK AREA PROTECTION MANUAL.

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Typical Traffic Control Shoulder Operation with Minor Encroachment (Figure TTC-5.1)

NOTES

- Standard**
1. For required sign assemblies for multi-lane roadways see Note 1, TTC-4.
- Guidance**
2. Sign spacing should be 1300'-1500' for Limited Access highways. For all other roadways, the sign spacing should be 500'-800' where the posted speed limit is greater than 45 mph, and 350'-500' where the posted speed limit is 45 mph or less.
 3. When work takes up part of a lane on a high volume roadway, vehicular traffic volumes, vehicle mix, speed and capacity should be analyzed to determine whether the affected lane should be closed. Unless the lane encroachment analysis permits a remaining lane width of 10 feet, the lane should be closed. If the closure operation is on a Limited Access highway, the minimum lane width is 11 feet.
- Option:**
4. The ROAD WORK AHEAD (W20-1) sign on an intersecting roadway may be omitted where drivers emerging from that roadway will encounter another advance warning sign prior to this activity area.

- Standards:**
5. A shadow vehicle with either an arrow board operating in the caution mode, or at least one high-intensity amber rotating, flashing, or oscillating light shall be parked 80' - 120' in advance of the first work crew.
 6. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity amber rotating, flashing, or oscillating lights. Vehicle hazard warning signals can be used to supplement high-intensity amber rotating, flashing, or oscillating lights.
 7. Taper length (L) and channelizing device spacing shall be as follows:

Taper Length (L)				
Speed Limit (mph)	9	10	11	12
25	95	105	115	125
30	135	150	165	180
35	185	205	225	245
40	240	270	295	320
45	405	450	495	540
50	450	500	550	600
55	495	550	605	660
60	540	600	660	720
65	585	650	715	780
70	630	700	770	840

Channelizing Device Spacing	
Location	Speed Limit (mph)
Transition Spacing	0 - 35 40'
Travelway Spacing	40' 80'
Construction Access*	80' 120'

* Spacing may be increased to this distance, but shall not exceed one access per 1/4 mile.

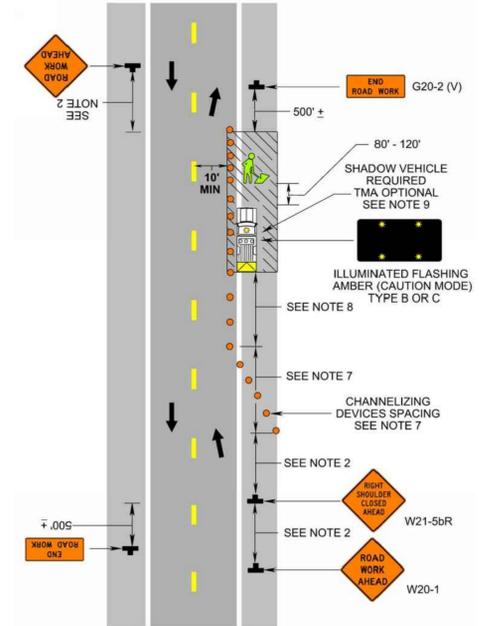
On roadways with paved shoulders having a width of 8 feet or more, channelizing devices shall be used to close the shoulder in advance of the merging taper to direct vehicular traffic to remain within the traveled way.

8. The buffer space length shall be as shown in Table 6H-3 on Page 6H-5 for the posted speed limit.
9. A truck-mounted attenuator (TMA) shall be used on Limited Access highways and multi-lane roadways with posted speed limit equal to or greater than 45 mph.
10. When a side road intersects the highway within the temporary traffic control zone, additional traffic control devices shall be placed as needed.

1: Revision 1 - 4/1/2015

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Shoulder Operation with Minor Encroachment (Figure TTC-5.1)



TEMPORARY TRAFFIC CONTROL MEASURES TO BE EMPLOYED IF WORK CAN NOT TAKE PLACE OUTSIDE OF TRAFFIC AND A 10' LANE CAN NOT BE MAINTAINED AT ALL TIMES

Page 6H-52 April 2015

Typical Traffic Control Lane Closure on a Two-Lane Roadway Using Flaggers (Figure TTC-23.1)

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.
- Option:**
3. Where Right-of-Way or geometric conditions prevent the use of 48" x 48" signs, 36" x 36" signs may be used.

- Standard:**
4. 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).
 5. 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).
 6. Cone spacing shall be based on the posted speed and the values in Table 6H-4 on Page 6H-6.
 7. 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 supplemental flagger 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.
 9. If the queue of traffic reaches the BE PREPARED TO STOP (W3-4) sign then the signs, and if used the portable temporary rumble strips (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 zone should be extended so that the transition area precedes the highway-rail crossing (see Figure TTC-36 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 6F).

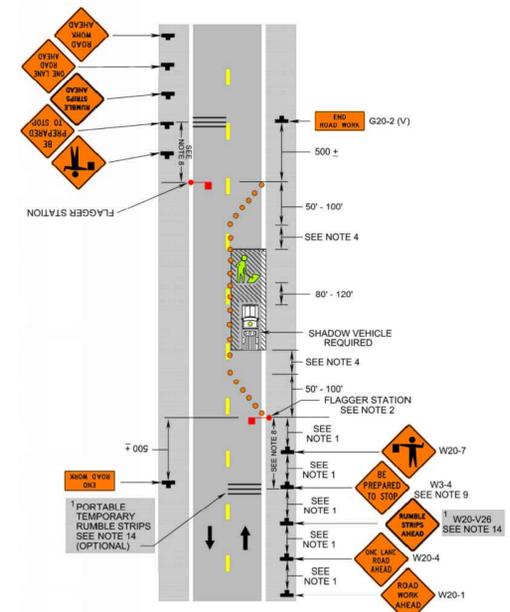
- Standard:**
14. When approved for use, three portable temporary rumble (PTRS) strips shall be installed across the entire travel lane adjacent to the BE PREPARED TO STOP (W3-4) sign. The portable temporary rumble strips shall be monitored and adjusted as necessary during the work shift to ensure proper placement on the roadway. When the PTRS are installed, the RUMBLE STRIPS AHEAD (W20-V26) sign shall also be utilized.

Posted Speed	0 - 35 mph	36 - 55 mph
PTRS Spacing (Center to Center)	5 Feet	8 Feet

1: Revision 1 - 4/1/2015

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Lane Closure on a Two-Lane Roadway Using Flaggers (Figure TTC-23.1)



1: Revision 1 - 4/1/2015

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 DESIGNED BY: PVN
 CHECKED BY: LTF
 SCALE: SEE PLAN

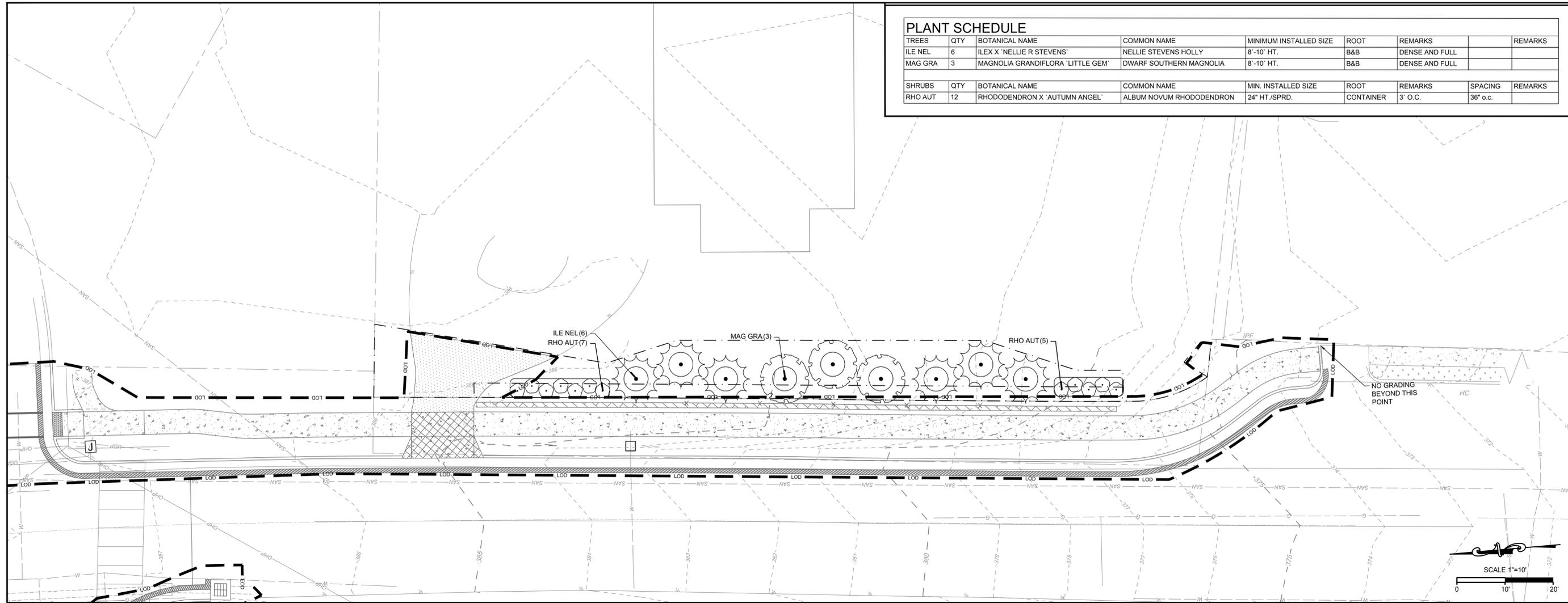
TIMMONS GROUP
 CHAIN BRIDGE ROAD SIDEWALK EXTENSION
 CITY OF FAIRFAX, VIRGINIA
 MAINTENANCE OF TRAFFIC PLAN

JOB NO. 35061.023
 SHEET NO. C6.0

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NOT FOR CONSTRUCTION

PLANT SCHEDULE								
TREES	QTY	BOTANICAL NAME	COMMON NAME	MINIMUM INSTALLED SIZE	ROOT	REMARKS		REMARKS
ILE NEL	6	ILEX X 'NELLIE R STEVENS'	NELLIE STEVENS HOLLY	8'-10' HT.	B&B	DENSE AND FULL		
MAG GRA	3	MAGNOLIA GRANDIFLORA 'LITTLE GEM'	DWARF SOUTHERN MAGNOLIA	8'-10' HT.	B&B	DENSE AND FULL		
SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	ROOT	REMARKS	SPACING	REMARKS
RHO AUT	12	RHODODENDRON X 'AUTUMN ANGEL'	ALBUM NOVUM RHODODENDRON	24" HT./SPRD.	CONTAINER	3' O.C.	36" o.c.	



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REVISION DESCRIPTION

DATE	DESCRIPTION
06.15.17	

DATE: 06.15.17
 DRAWN BY: BD
 DESIGNED BY: EM
 CHECKED BY: EM
 SCALE: SEE PLAN

TIMMONS GROUP

CHAIN BRIDGE ROAD SIDEWALK EXTENSION
 CITY OF FAIRFAX, VIRGINIA

LANDSCAPE PLAN

JOB NO. 35061.023
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