COMMERCIAL SITE PLAN

SOUTH RIDGE CHURCH

T.M. NO. 44-119L

FALMOUTH ELECTION DISTRICT , STAFFORD COUNTY, VIRGINIA

OWNER / APPLICANT:

SOUTH RIDGE CHURCH INC.
C/O: JEFF GEYER
428 HARTWOOD ROAD
FREDERICKSBURG, VA 22407
PHONE: 469-713-7970

ENGINEER:

Freeland Engineering, PC
10814 Courthouse Road
Fredericksburg, Virginia 22408
Phone: 540.898.3092 Fax: 877.658.7735
www.FreelandEngineeringPC.com

SITE DATA:

OWNER:	SOUTH RIDGE CHURCH, INC
APPLICANT:	JEFFREY GEYER
ADDRESS:	428 HARTWOOD ROAD FREDERICKSBURG, VA 22406
PHONE:	469-713-7970
PLAN PREPARER:	FREELAND ENGINEERING, PC
ADDRESS:	10814 COURTHOUSE ROAD FREDERICKSBURG, VA 22408
PHONE:	540-898-3092
TAX MAP:	44-119L
PARCEL AREA:	2.88 AC AND 7.25 AC = 10.13 AC. = 441,262.80 S.F.
PROPOSED BUILDING:	10,963 S.F.
ZONING DISTRICT:	M-1 (LIGHT INDUSTRIAL)
SETBACKS:	FRONT: 40' SIDE: 15' REAR: 15'
MAX BLDG HEIGHT:	< 55'
MIN. LOT AREA:	2.45 AC
CURRENT USE:	VACANT
PROPOSED USE:	CHURCH BUILDING
SITE ADDRESS:	2020 INTERNATIONAL PARKWAY FREDERICKSBURG, VA 22406
FLOODPLAIN ON SITE:	Y
FIRM #:	5101540182E (DATED: 02/04/2005)
ZONE:	'X'
WETLANDS ON SITE: N	SOURCE: NO PERMIT REQUIRED: N
RPA ON SITE:	Y
VAHUS:	RA46
WATERSHED NAME:	RAPPAHANNOCK RIVER-HAZEL RUN

FLOOR AREA RATIO: STRUCTURE AREA / LOT AREA = 10,963 / 106,722 = 0.1%

IMPERVIOUS SURFACES:

STRUCTURES =	10,963 S.F.	
DRIVEWAY, S/W,	=	4,697 S.F.
PARKING LOT	=	35,480 S.F.
TOTAL IMP. AREA	=	51,140 S.F.

IMPERVIOUS SURFACE RATIO: IMPERVIOUS AREA / SITE AREA = 51,140 S.F. / 106,722 = 0.48%

OPEN SPACE RATIO: 106,722 - 51,140 = 55,582 S.F. = 1.27 ACRES = 1.27/2.45 = 0.52 OF ALL AREA

DISTURBED AREA: 75,359 S.F. OR 1.735 AC.

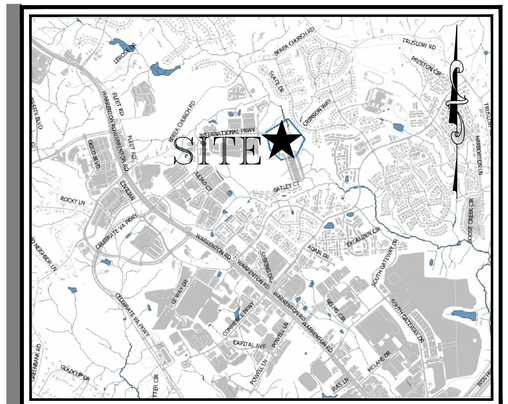
PARKING REQUIRED: 3 SPACE PER 10 SEATS AT THE CHURCH AUDITORIUM/190 SEATS
REQUIRED SPACES 180/10 X 3 = 54 REQUIRED

1 HANDICAP SPACE REQUIRED PER 25 SPACES --> 3 HANDICAP SPACE REQUIRED
54 SPACES AND 4 HANDICAP SPACE PROVIDED

LOADING SPACES REQUIRED: 1 SPACE PER 10,000 S.F. --> LOADING ZONE NOT REQUIRED- 20'X25' DESIGNATED AS LOADING SPACE PROVIDED

MOST VEHICLE TRIP GENERATED ON SUNDAYS FOR PRAYER: < 60 VEHICLE TRIP/DAY

NOTE: ANY AND ALL ASPHALT, CONCRETE OR OTHER DRIVING SURFACES, WHERE NEW OR REPLACED MUST BE ABLE TO SUPPORT A TOTAL IMPOSED LOAD OF FIRE APPARATUS WEIGHING AT LEAST 75,000 LBS.



CAROLINE COUNTY, VIRGINIA
VICINITY MAP
SCALE: 1"=2000'

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
10/2/2020
PROFESSIONAL ENGINEER

PLAN DATE: OCTOBER 2, 2020

CERTIFICATE OF TITLE:

I HEREBY CERTIFY THAT THE 2.88 ACRES AND 7.25 ACRES OF LAND SHOWN HEREON AS TM 56-A-138 NOW OR FORMERLY IN THE NAME OF BRANDYWINE CORPOREX PLAZA II, L.P., AS RECORDED AMONG THE LAND RECORDS OF STAFFORD COUNTY, VIRGINIA AT INSTRUMENT NO. 060002841.

RAYMOND P. FREELAND, PE — 10/2/2020 DATE

RESOURCE PROTECTION AREA (RPA) NOTE:

PART OF THE SITE IS LOCATED IN THE RPA

WATER & SANITARY SEWAGE USAGE

FACILITY TO BE SERVED	DESIGN UNITS	SIZE OF FACILITY(S.F.)	FLOW GPD
OFFICE BUILDING	200 GPD/ 1000 S.F.	10,935 S.F.	2,200 GPD
		TOTAL	2,200 GPD

SHEET	DESCRIPTION
1	COVER SHEET
2	EXISTING CONDITIONS
3	SITE PLAN
4	GRADING PLAN
5	POST DEVELOPMENT STORM PIPE ANALYSIS
6	STORM SEWER PLAN & PROFILE
7	STORM SEWER PLAN & PROFILE
8	SANITARY SEWER PLAN & PROFILE
9	E&S PHASE I
10	E&S PHASE II
11	EROSION AND SEDIMENT CONTROL NOTES & DETAILS
12	EXISTING WATERSHED ANALYSIS
13	PRE DEVELOPMENT HYDROGRAPHS
14	POST DEVELOPMENT HYDROGRAPHS
15	COMBINED PEAK FLOWS & ROUTING HYDROGRAPHS
16	VRRM & SOILS MAP
17	LANDSCAPING PLAN
18	LANDSCAPING NOTES & DETAILS
19	NOTES & DETAILS
20	NOTES & DETAILS
SPF	PHOTOMETRICS

APPROVAL BLOCK

FIRE MARSHAL — DATE

HEALTH — DATE

UTILITIES — DATE

E&S, STORM WATER MANAGEMENT — DATE

VIRGINIA DEPARTMENT OF TRANSPORT — DATE

AGENT — DATE

NOTES:

1. THIS TOPOGRAPHIC BASESHEET HAS BEEN COMPLETED WITHOUT THE BENEFIT OF A CURRENT TITLE REPORT. THEREFORE, EASEMENTS, RIGHT-OF WAYS AND RESTRICTIVE COVENANTS OF RECORD MAY NOT NECESSARILY BE SHOWN.

2. THE PROPERTY SHOWN HEREON IS LOCATED ON THE STAFFORD COUNTY TAX ASSESSMENT MAP AS TAX MAP NO. 44–119L. THE PROPERTY APPEARS TO BE ZONED M–1 (INDUSTRIAL LIGHT) PER THE COUNTY REAL ESTATE ASSESSMENT OFFICE, AS A PRE–REQUISITE TO ANY FUTURE ENGINEERING OR DESIGN TASKS ASSOCIATED WITH THIS SURVEY – THE CURRENT ZONING AND PUBLISHED SETBACKS SHOULD BE VERIFIED.

3. THE PROPERTY SHOWN HEREON IS NOW OR FORMERLY IN THE NAME OF BRANDYWINE CORPOREX PLAZA II, L.P., AS RECORDED AMONG THE LAND RECORDS OF STAFFORD COUNTY, VIRGINIA AT INSTRUMENT NO. 060002841.

4. THE CURRENT ADDRESS FOR THIS PROPERTY IS 2020 INTERNATIONAL PARKWAY, FREDERICKSBURG, VIRGINIA 22406.

5. THE BOUNDARY INFORMATION AS SHOWN HEREON IS BASED ON DEEDS AND PLATS OF RECORD AND DOES NOT REPRESENT A CURRENT FIELD RUN BOUNDARY SURVEY PERFORMED BY THIS FIRM.

6. THE NORTH ORIENTATION SHOWN HEREON HAS BEEN TIED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83) VIRGINIA STATE GRID NORTH.

7. THE PLAT SHOWN HEREON IS REFERENCED TO THE VIRGINIA COORDINATE SYSTEM OF 1983 AS COMPUTED FROM A FIELD SURVEY WHICH TIES THIS BOUNDARY BY A RTK SMARTNET GPS VIRTUAL REFERENCE STATION.

THE GRID FACTOR (ELEVATION FACTOR X SCALE FACTOR) THAT HAS BEEN APPLIED TO THE FIELD DISTANCE TO DERIVE THE REFERENCED COORDINATES IS 0.99994549. UNLESS OTHERWISE STATED, THE PLAT DISTANCES SHOWN ARE INTENDED TO BE HORIZONTAL DISTANCES MEASURED AT THE MEAN ELEVATION OF THE SITE OR DEVELOPMENT.

THE BEARINGS SHOWN ARE REFERENCED TO THE VCS 1983 GRID NORTH. THE FOOT DEFINITION USED FOR CONVERSION OF THE MONUMENT COORDINATES IS THE "U.S. SURVEY FOOT" OR 1 FOOT = 1,200/3,937 METER.

GEODETIC CONTROL MONUMENTS EXISTING OR PLACED WITHIN THE BOUNDARIES OF THIS DEVELOPMENT OR SITE SHALL NOT BE DISTURBED. THE LANDOWNER ASSUMES THE RESPONSIBILITY FOR REPLACEMENT OF ANY DISTURBED MONUMENT.

8. A PORTION OF THE PROPERTY SHOWN HEREON IS LOCATED IN FLOOD ZONE "X" (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) AND A PORTION OF THE PROPERTY IS LOCATED IN FLOOD ZONE "X" (SHADED) (AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD) AND A PORTION OF THE PROPERTY LIES WITHIN FLOOD ZONE "AE" (BASE FLOOD ELEVATIONS DETERMINED) AS SHOWN ON F.E.M.A. MAP NO. 51015401B2E, DATED FEBRUARY 4, 2005.

9. THE TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED ON A CURRENT FIELD RUN SURVEY PERFORMED BY THIS FIRM.

10. THE VERTICAL ORIENTATION AS SHOWN HEREON HAS BEEN TIED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

11. THE CONTOURS AS SHOWN HEREON ARE SHOWN AT 2' (TWO) CONTOUR INTERVALS.

12. GEOTECHNICAL, SUBSURFACE, FIELD REVIEW, RESEARCH, AGENCY OF GOVERNMENT RECORDS REVIEW, OR OTHER INVESTIGATIONS HAVE NOT BEEN MADE FOR THE PURPOSE OF LOCATING, OR DETERMINING THE EXISTENCE OF HAZARDOUS MATERIALS ON SITE IN PERFORMANCE OF THIS SURVEY.

13. NO CERTIFICATION IS MADE AS TO THE LOCATION OF UNDERGROUND UTILITIES SUCH AS, BUT NOT LIMITED TO, ELECTRIC, GAS, TELEPHONE, CABLE TELEVISION, WATER, SANITARY AND STORM SEWERS, ETC. ONLY ABOVE GROUND READILY OBSERVABLE VISIBLE FEATURES AS SHOWN HEREON ARE HEREBY CERTIFIED.

14. THE BUILDING RESTRICTION LINES AS SHOWN HEREON HAVE BEEN PROVIDED FROM INFORMATION OBTAINED WITHIN THE COUNTY ZONING ORDINANCE AND SHOULD BE VERIFIED BY THE DESIGN ENGINEER.

AS–BUILT INFORMATION

STORM SEWER

EX 1 — EX. STORM MANHOLE TOP = 279.20'
EX. INV. OUT = 274.03' (18" RCP TO EX. 2)

EX 1 → EX 2 — 37.57' – STORM SEWER 18" RCP – @1.14%

EX 2 — EX. STORM MANHOLE TOP = 279.55'
EX. INV. IN. = 273.60' (18" RCP FROM EX. 1)
EX. INV. OUT = 273.30' (24" RCP TO EX. 3)

EX 2 → EX 3 — 305.82' – STORM SEWER 24" RCP – @1.50%

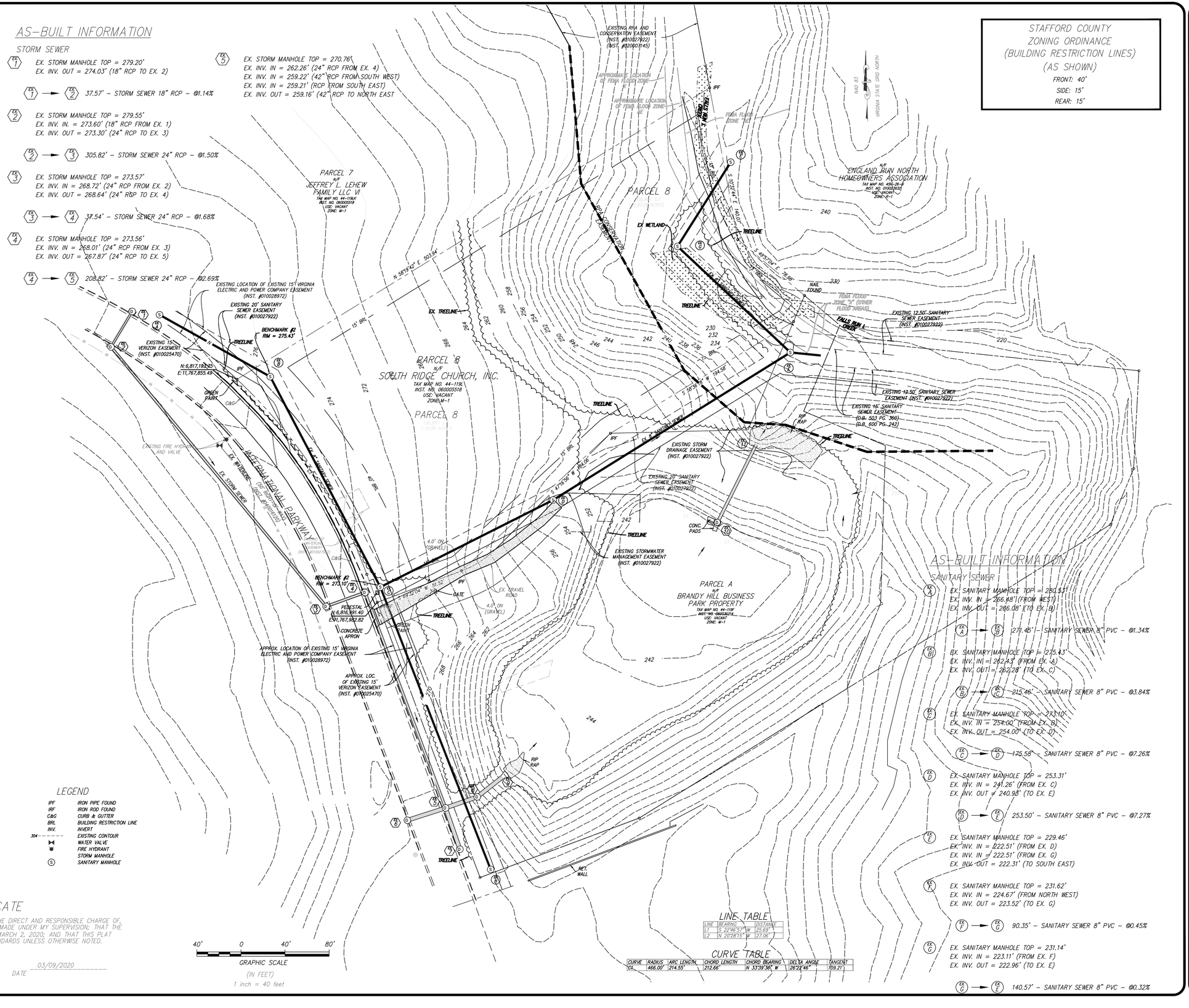
EX 3 — EX. STORM MANHOLE TOP = 273.57'
EX. INV. IN = 268.72' (24" RCP FROM EX. 2)
EX. INV. OUT = 268.64' (24" RCP TO EX. 4)

EX 3 → EX 4 — 37.54' – STORM SEWER 24" RCP – @1.68%

EX 4 — EX. STORM MANHOLE TOP = 273.56'
EX. INV. IN = 268.01' (24" RCP FROM EX. 3)
EX. INV. OUT = 267.87' (24" RCP TO EX. 5)

EX 4 → EX 5 — 208.82' – STORM SEWER 24" RCP – @2.69%

EX 5 — EX. STORM MANHOLE TOP = 270.76'
EX. INV. IN = 262.26' (24" RCP FROM EX. 4)
EX. INV. IN = 259.22' (42" RCP FROM SOUTH WEST)
EX. INV. IN = 259.21' (RCP FROM SOUTH EAST)
EX. INV. OUT = 259.16' (42" RCP TO NORTH EAST



LEGEND

IPF	IRON PIPE FOUND
IRF	IRON ROD FOUND
C&G	CURB & GUTTER
BRL	BUILDING RESTRICTION LINE
INV.	INVERT
304	EXISTING CONTOUR
	WATER VALVE
	FIRE HYDRANT
	STORM MANHOLE
S	SANITARY MANHOLE

SURVEYOR'S CERTIFICATE

THIS TOPOGRAPHIC SURVEY WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF, BRUCE A. REESE, FROM AN ACTUAL GROUND SURVEY MADE UNDER MY SUPERVISION; THAT THE IMAGERY AND/OR ORIGINAL DATA WAS OBTAINED ON MARCH 2, 2020; AND THAT THIS PLAT INCLUDING METADATA MEETS MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED.

BRUCE A. REESE
L.S. #3313

03/09/2020
DATE

DATE	REVISION

Freeland Engineering, PC
rfreeland@FreelandEngineeringPC.com
10814 Courthouse Road
Fredericksburg, Virginia 22408
Phone: 540.898.3092
Fax: 877.658.7735
www.FreelandEngineeringPC.com

EXISTING CONDITIONS

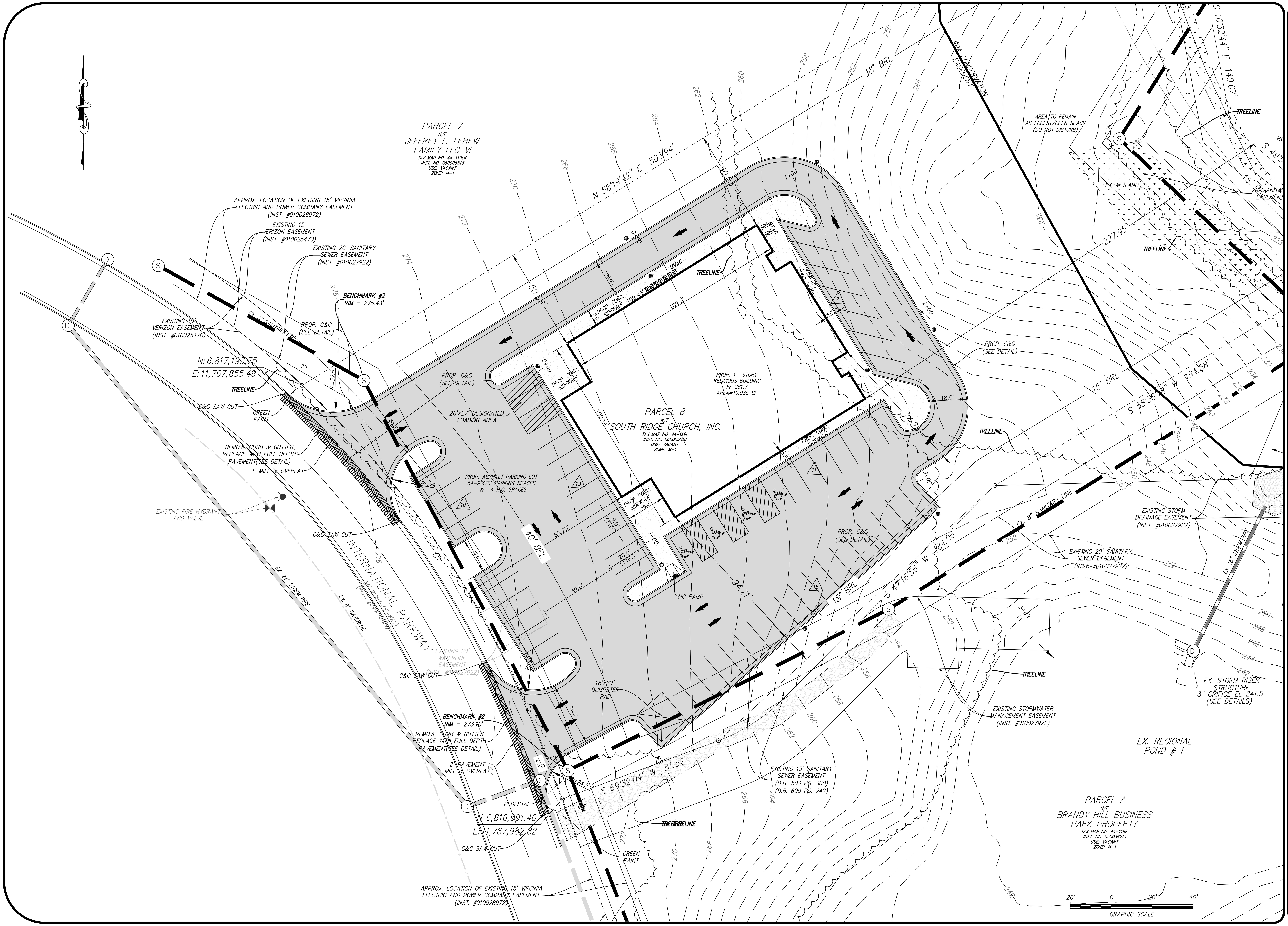
SOUTH RIDGE CHURCH

FALMOUTH ELECTION DISTRICT
STAFFORD COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
09/29/2020
PROFESSIONAL ENGINEER
SEAL

County Plan Number:

Drawn By:	SAR
Designed By:	SAR
Checked By:	RPF
Date:	09/29/2020
Scale:	1"= 40'
Sheet:	2 of 20
PROJECT #	4762



PARCEL 7
N/F
JEFFREY L. LEHEW FAMILY LLC VI
TAX MAP NO. 44-119LK
INST. NO. 060005518
USE: VACANT
ZONE: M-1
APPROX. LOCATION OF EXISTING 15' VIRGINIA ELECTRIC AND POWER COMPANY EASEMENT (INST. #010028972)
EXISTING 15' VERIZON EASEMENT (INST. #010025470)
EXISTING 20' SANITARY SEWER EASEMENT (INST. #010027922)
BENCHMARK #2 RIM = 275.43'
EXISTING 15' VERIZON EASEMENT (INST. #010025470)
EX. 8" SANITARY LINE
PROP. C&G (SEE DETAIL)
N:6,817,193.75
E:11,767,855.49
IPF
TREELINE
C&G SAW CUT
GREEN PAINT
REMOVE CURB & GUTTER REPLACE WITH FULL DEPTH PAVEMENT(SEE DETAIL)
1' MILL & OVERLAY
EXISTING FIRE HYDRANT AND VALVE
C&G SAW CUT
INTERNATIONAL PARKWAY
EX. 24" STORM PIPE
EX. 6" WATERLINE
EXISTING 20' WATERLINE EASEMENT
C&G SAW CUT
BENCHMARK #2 RIM = 273.10'
REMOVE CURB & GUTTER REPLACE WITH FULL DEPTH PAVEMENT(SEE DETAIL)
2' PAVEMENT MILL & OVERLAY
PEDESTAL
N:6,816,991.40
E:11,767,982.82
C&G SAW CUT
GREEN PAINT
APPROX. LOCATION OF EXISTING 15' VIRGINIA ELECTRIC AND POWER COMPANY EASEMENT (INST. #010028972)
N 58°19'42" E 503.94'
15' BRL
40' BRL
PROP. C&G (SEE DETAIL)
20'X27' DESIGNATED LOADING AREA
PROP. CONC. SIDEWALK
PROP. ASPHALT PARKING LOT 54-9'X20' PARKING SPACES & 4 H.C. SPACES
HVAC
TREELINE
PROP. 1- STORY RELIGIOUS BUILDING FF 261.7 AREA=10,935 SF
PARCEL 8
N/F
SOUTH RIDGE CHURCH, INC.
TAX MAP NO. 44-119L
INST. NO. 060005518
USE: VACANT
ZONE: M-1
PROP. CONC. SIDEWALK
HC RAMP
PROP. C&G (SEE DETAIL)
18'X20' DUMPSTER PAD
S 47°16'56" W 184.06'
S 69°32'04" W 81.52'
S 58°36'58" W 194.68'
15' BRL
20' CONSERVATION EASEMENT
AREA TO REMAIN AS FOREST/OPEN SPACE (DO NOT DISTURB)
EX. WETLAND
TREELINE
S 10°32'44" E 140.07'
PROP. C&G (SEE DETAIL)
TREELINE
EX. 8" SANITARY LINE
EXISTING STORM DRAINAGE EASEMENT (INST. #010027922)
EXISTING 20' SANITARY SEWER EASEMENT (INST. #010027922)
EX. 15" STORM PIPE
EX. STORM RISER STRUCTURE 3" ORIFICE EL 241.5 (SEE DETAILS)
TREELINE
EXISTING STORMWATER MANAGEMENT EASEMENT (INST. #010027922)
EX. REGIONAL POND # 1
EXISTING 15' SANITARY SEWER EASEMENT (D.B. 503 PG. 360) (D.B. 600 PG. 242)
PARCEL A
N/F
BRANDY HILL BUSINESS PARK PROPERTY
TAX MAP NO. 44-119F
INST. NO. 050036214
USE: VACANT
ZONE: M-1
GRAPHIC SCALE

REVISION | DATE

Freeland Engineering, PC
rfreeland@FreelandEngineeringPC.com
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SITE PLAN

SOUTH RIDGE CHURCH

FALMOUTH ELECTION DISTRICT
STAFFORD COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
09/29/2020
PROFESSIONAL ENGINEER
SEAL

County Plan Number:

Drawn By:	SAR
Designed By:	SAR
Checked By:	RPF
Date:	09/29/2020
Scale:	1"= 20'

DISTURBED AREA = 1.73 AC.
PARCEL 7
N/F
JEFFREY L. LEHEW
FAMILY LLC VI
TAX MAP NO. 44-119LK
INST. NO. 060005518
USE: VACANT
ZONE: M-1
2:1 FILL SLOPE
TO THE WALL
N 58°19'42" E 503.94'
15' BRL
RPA CONSERVATION EASEMENT
AREA TO REMAIN AS FOREST/OPEN SPACE (DO NOT DISTURB)
S 10°32'44" E 140.07'
TREELINE
N/F
ENGLAND RUN NORTH
HOMEOWNERS ASSOCIATION
S 49°57'04" E 78.98'
EX. WETLAND
20' SANITARY EASEMENT
APPROX. LOCATION OF EXISTING 15' VIRGINIA ELECTRIC AND POWER COMPANY EASEMENT (INST. #010028972)
EXISTING 15' VERIZON EASEMENT (INST. #010025470)
EXISTING 20' SANITARY SEWER EASEMENT (INST. #010027922)
LIMITS OF DISTURBANCE
BENCHMARK #2
RIM = 275.43'
EXISTING 15' VERIZON EASEMENT (INST. #010025470)
PROP. C&G (SEE DETAIL)
N:6,817,193.75
E:11,767,855.49
C&G SAW CUT
GREEN PAINT
REMOVE CURB & GUTTER REPLACE WITH FULL DEPTH PAVEMENT(SEE DETAIL)
1' MILL & OVERLAY
EXISTING FIRE HYDRANT AND VALVE
6"X4" TEE
4" GATE VALVE
INTERNATIONAL PARKWAY
EX. 24" STORM PIPE
EX. 6" WATERLINE
PROP. 1- STORY RELIGIOUS BUILDING
FF 261.7
AREA=10,935 SF
PARCEL 8
N/F
SOUTH RIDGE CHURCH, INC.
TAX MAP NO. 44-119L
USE: VACANT
ZONE: M-1
20'X22' DESIGNATED LOADING AREA
PROP. ASPHALT PARKING LOT 54-9'X20' PARKING SPACES & 4 H.C. SPACES
40' BRL
HC RAMP
18'X DUMPSTER PAD
1" WATER METER
PROP. CONC. SIDEWALK
S 58°36' W 194.68'
EX. 8" SANITARY LINE
20' SANITARY EASEMENT
EXISTING STORM DRAINAGE EASEMENT (INST. #010027922)
EXISTING 20' SANITARY SEWER EASEMENT (INST. #010027922)
VDOT STANDARD END WALL (101.01)
CLASS II DRY RIP-RAP OUTLET PROTECTION (LXWXD) =8'X5'X2' SEE DETAIL
EX. 15" STORM PIPE
EX. STORM RISER STRUCTURE
3" ORIFICE EL 241.5
(SEE DETAILS)
EXISTING STORMWATER MANAGEMENT EASEMENT (INST. #010027922)
EX. REGIONAL POND # 1
BENCHMARK #2
RIM = 273.10'
REMOVE CURB & GUTTER REPLACE WITH FULL DEPTH PAVEMENT(SEE DETAIL)
2' PAVEMENT MILL & OVERLAY
S 69°32'04" W 81.52'
EXISTING 15' SANITARY SEWER EASEMENT (D.B. 503 PG. 360) (D.B. 600 PG. 242)
N:6,816,991.4
E:11,767,982.82
PARCEL A
N/F
BRANDY HILL BUSINESS PARK PROPERTY
TAX MAP NO. 44-119F
USE: VACANT
ZONE: M-1
20' 0 20' 40'
GRAPHIC SCALE
APPROX. LOCATION OF EXISTING 15' VIRGINIA

REVISION	DATE

Freeland Engineering, PC
rfreeland@FreelandEngineeringPC.com
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Fredericksburg, Virginia 22408
Phone: 540.898.3092
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GRADING PLAN

SOUTH RIDGE CHURCH

FALMOUTH ELECTION DISTRICT
STAFFORD COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
09/29/2020
PROFESSIONAL ENGINEER
SEAL

County Plan Number:

Drawn By:	SAR
Designed By:	SAR
Checked By:	RPF
Date:	09/29/2020
Scale:	1"=20'
Sheet:	4 of 20

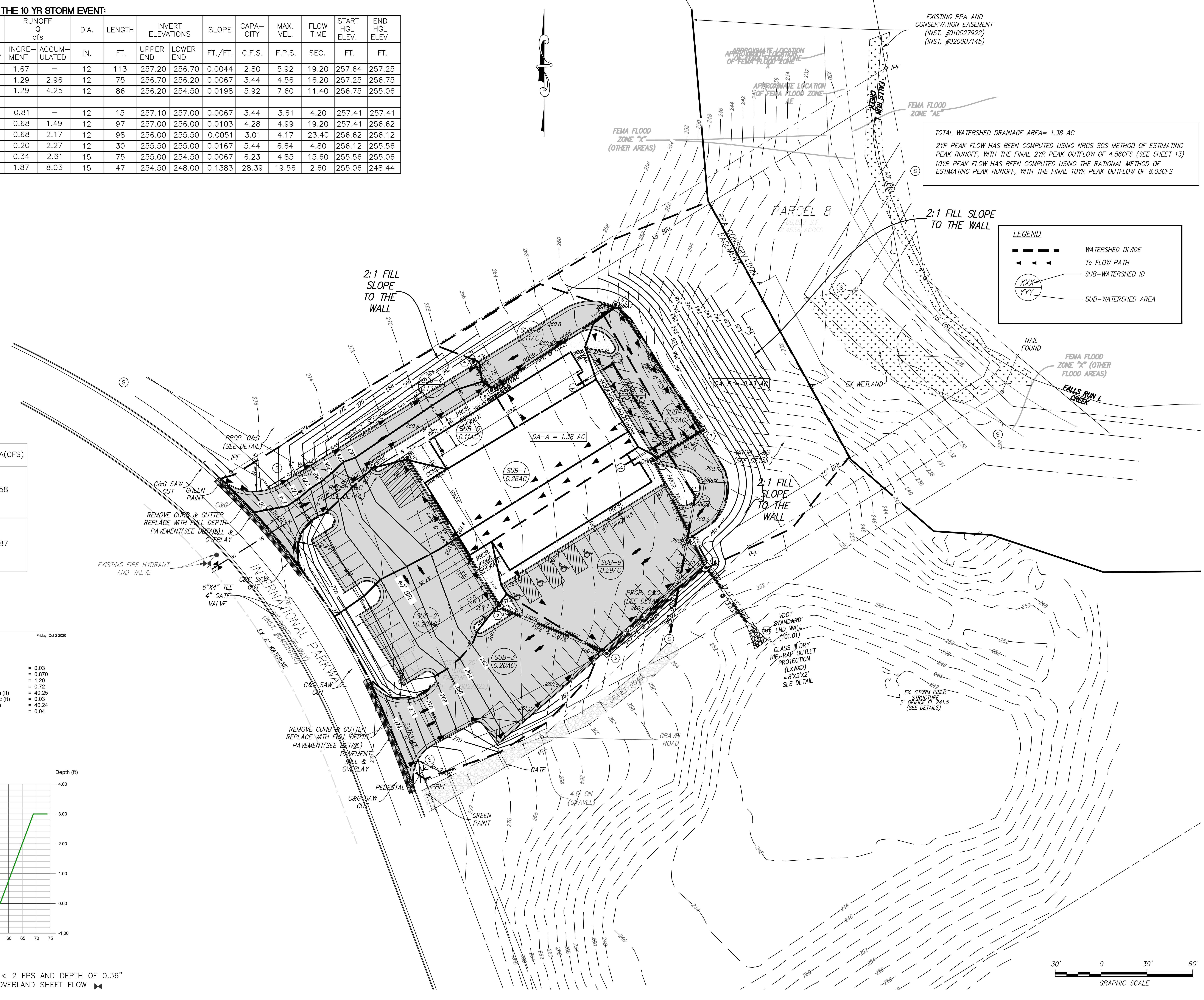
PROJECT # 4762

PROPOSED STORM SEWER COMPUTATIONS FOR THE 10 YR STORM EVENT:

		AREA DRAIN. "A"	RUN–OFF COEF.	CA	INLET TIME	RAIN–FALL	RUNOFF Q cfs		DIA.	LENGTH	INVERT ELEVATIONS		SLOPE	CAPA–CITY	MAX. VEL.	FLOW TIME	START HGL ELEV.	END HGL ELEV.
FROM POINT	TO POINT	ACRES	C	INCRE–MENT	MIN–UTES	IN./HR.	INCRE–MENT	ACCUM–ULATED	IN.	FT.	UPPER END	LOWER END	FT./FT.	C.F.S.	F.P.S.	SEC.	FT.	FT.
1	2	0.26	0.95	0.25	5	6.78	1.67	–	12	113	257.20	256.70	0.0044	2.80	5.92	19.20	257.64	257.25
2	3	0.20	0.95	0.19	5	6.78	1.29	2.96	12	75	256.70	256.20	0.0067	3.44	4.56	16.20	257.25	256.75
3	9	0.20	0.95	0.19	5	6.78	1.29	4.25	12	86	256.20	254.50	0.0198	5.92	7.60	11.40	256.75	255.06
4	5	0.13	0.95	0.12	5	6.78	0.81	–	12	15	257.10	257.00	0.0067	3.44	3.61	4.20	257.41	257.41
5	6	0.11	0.95	0.10	5	6.78	0.68	1.49	12	97	257.00	256.00	0.0103	4.28	4.99	19.20	257.41	256.62
6	7	0.11	0.95	0.10	5	6.78	0.68	2.17	12	98	256.00	255.50	0.0051	3.01	4.17	23.40	256.62	256.12
7	8	0.03	0.95	0.03	5	6.78	0.20	2.27	12	30	255.50	255.00	0.0167	5.44	6.64	4.80	256.12	255.56
8	9	0.05	0.95	0.05	5	6.78	0.34	2.61	15	75	255.00	254.50	0.0067	6.23	4.85	15.60	255.56	255.06
9	OUT	0.29	0.95	0.28	5	6.78	1.87	8.03	15	47	254.50	248.00	0.1383	28.39	19.56	2.60	255.06	248.44

NOTE

1. TIME OF CONCENTRATION ASSUMED TO BE 5 MINS.



DA-B 10YR STORM EVENT PEAK FLOW

	AREA(AC)	RUNOFF COEF "C"	RAIN FALL IN/HR	Q=CIA(CFS)
PRE–	0.43	0.2	6.78	0.58
POST–	0.43	0.3	6.78	0.87

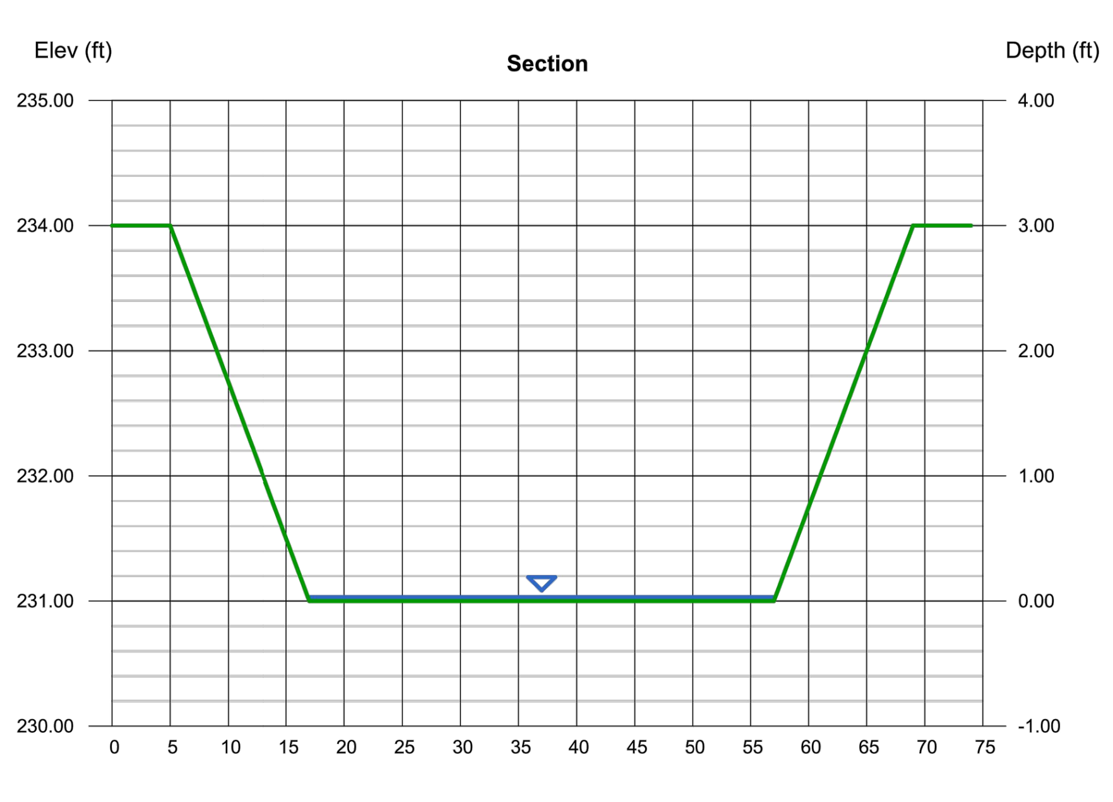
CHANNEL SECTION A-A

Channel Report DA-B

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. — Friday, Oct 2 2020

SOUTH RIDGE CHURCH SHEET FLOW ANALYSIS

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 40.00	Depth (ft)	= 0.03
Side Slopes (z:1)	= 4.00, 4.00	Q (cfs)	= 0.870
Total Depth (ft)	= 3.00	Area (sqft)	= 1.20
Invert Elev (ft)	= 231.00	Velocity (ft/s)	= 0.72
Slope (%)	= 2.00	Wetted Perim (ft)	= 40.25
N-Value	= 0.024	Crit Depth, Yc (ft)	= 0.03
		Top Width (ft)	= 40.24
Calculations		EGL (ft)	= 0.04
Compute by:	Known Q		
Known Q (cfs)	= 0.87		



WATER QUANTITY NARRATIVE:

IT WAS DEMONSTRATED WITH FLOW VELOCITY < 2 FPS AND DEPTH OF 0.36" THAT THE PEAK FLOW CAN BE CONSIDERED OVERLAND SHEET FLOW

REVISION	DATE

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POST DEVELOPMENT STORM ANALYSIS

SOUTH RIDGE CHURCH

FALMOUTH ELECTION DISTRICT
STAFFORD COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
09/29/2020
PROFESSIONAL ENGINEER
SEAL

County Plan Number:

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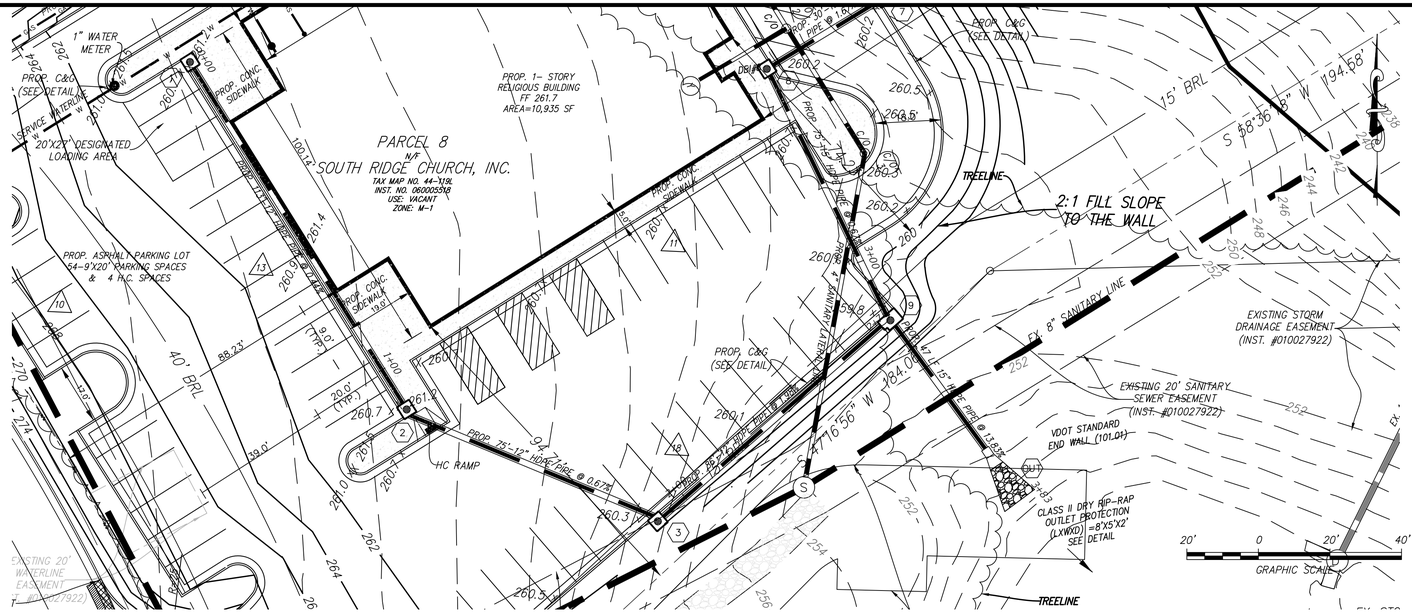

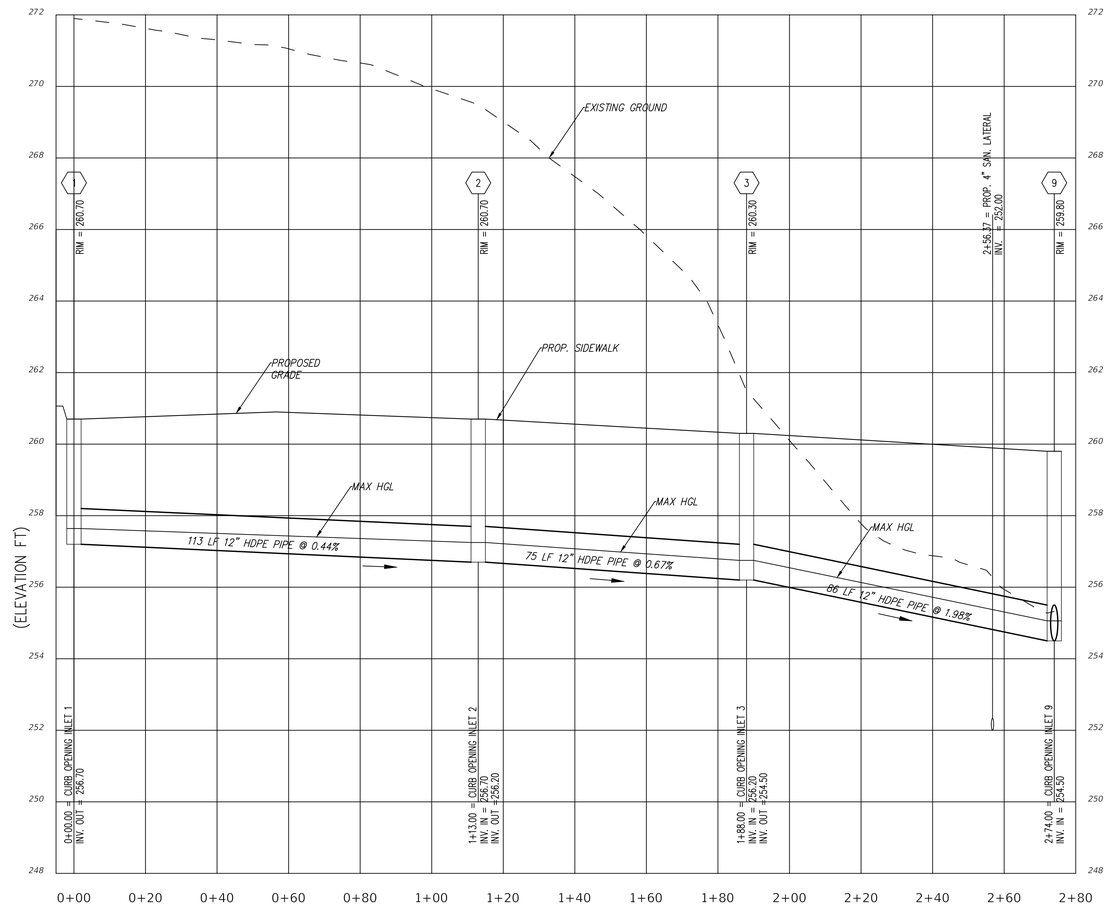

PROPOSED CURB INLET OPENNING COMPUTATIONS FOR THE 10 YR STORM EVENT:

	CURB THROAT LENGTH	MAX RIM ELEV.	CATCH BASIN INVERT ELEV.	PEAK LATERAL FLOW	PEAK FLOW INTERCEPTED	PEAK FLOW BYPASSING	INLET EFFICIENCY	MAX GUTTER SPREAD	MAX GUTTER WATER DEPTH
INLET ID	FT.	FT.	FT.	CFS	CFS	CFS	(PERCENT)	FT.	FT.
1	4	260.70	257.00	1.69	1.11	0.58	65.67	7.95	0.24
2	4	260.70	256.70	1.26	0.94	0.33	74.12	6.88	0.22
3	4	260.30	256.20	1.29	1.04	0.46	69.50	7.54	0.23
4	4	260.60	257.10	0.82	0.70	0.12	85.44	5.43	0.19
5	4	260.60	257.00	0.68	0.85	0.17	79.51	6.34	0.21
6	4	260.50	256.00	0.68	0.61	0.07	89.30	4.90	0.18
7	4	260.20	255.50	0.22	0.22	0.00	98.29	1.84	0.07
8	4	260.20	255.00	0.32	0.32	0.00	98.29	2.67	0.11
9	6	259.80	254.50	1.87	N/A	N/A	N/A	11.31	0.48

NOTE:
1. ALL CURB OPENINGS ARE VDOT TYPE DI-3B.

REVISION | DATE

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STORM SEWER PLAN & PROFILE

SOUTH RIDGE CHURCH

FALMOUTH ELECTION DISTRICT
STAFFORD COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
09/29/2020
PROFESSIONAL ENGINEER
SEAL

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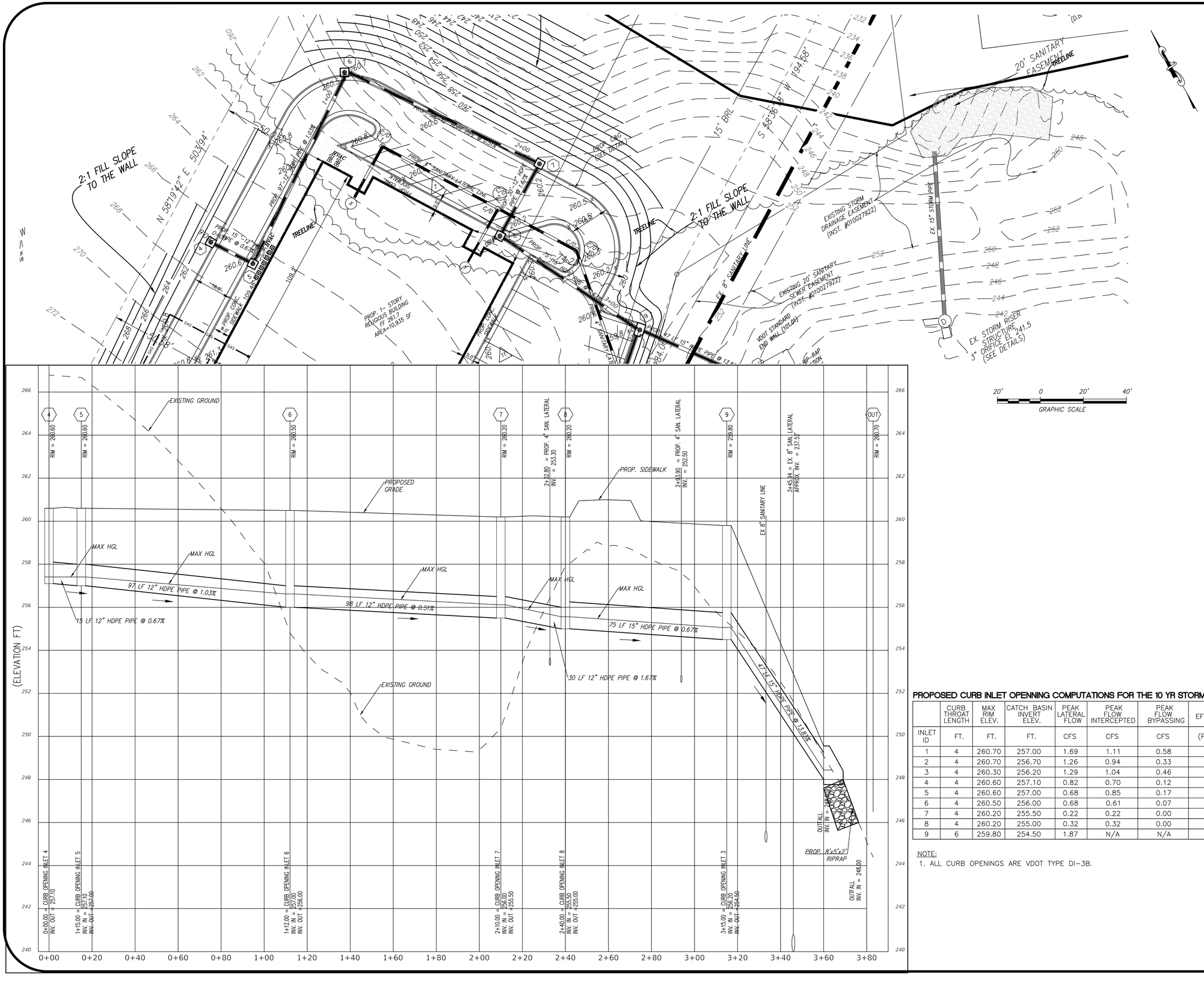

PROPOSED CURB INLET OPENNING COMPUTATIONS FOR THE 10 YR STORM EVENT:

INLET ID	CURB THROAT LENGTH	MAX RIM ELEV.	CATCH BASIN INVERT ELEV.	PEAK LATERAL FLOW	PEAK FLOW INTERCEPTED	PEAK FLOW BYPASSING	INLET EFFICIENCY	MAX GUTTER SPREAD	MAX GUTTER WATER DEPTH
	FT.	FT.	FT.	CFS	CFS	CFS	(PERCENT)	FT.	FT.
1	4	260.70	257.00	1.69	1.11	0.58	65.67	7.95	0.24
2	4	260.70	256.70	1.26	0.94	0.33	74.12	6.88	0.22
3	4	260.30	256.20	1.29	1.04	0.46	69.50	7.54	0.23
4	4	260.60	257.10	0.82	0.70	0.12	85.44	5.43	0.19
5	4	260.60	257.00	0.68	0.85	0.17	79.51	6.34	0.21
6	4	260.50	256.00	0.68	0.61	0.07	89.30	4.90	0.18
7	4	260.20	255.50	0.22	0.22	0.00	98.29	1.84	0.07
8	4	260.20	255.00	0.32	0.32	0.00	98.29	2.67	0.11
9	6	259.80	254.50	1.87	N/A	N/A	N/A	11.31	0.48

NOTE:
1. ALL CURB OPENINGS ARE VDOT TYPE DI-3B.

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DATE	REVISION

STORM SEWER PLAN & PROFILE

SOUTH RIDGE CHURCH

FALMOUTH ELECTION DISTRICT
STAFFORD COUNTY, VA

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
09/29/2020
PROFESSIONAL ENGINEER
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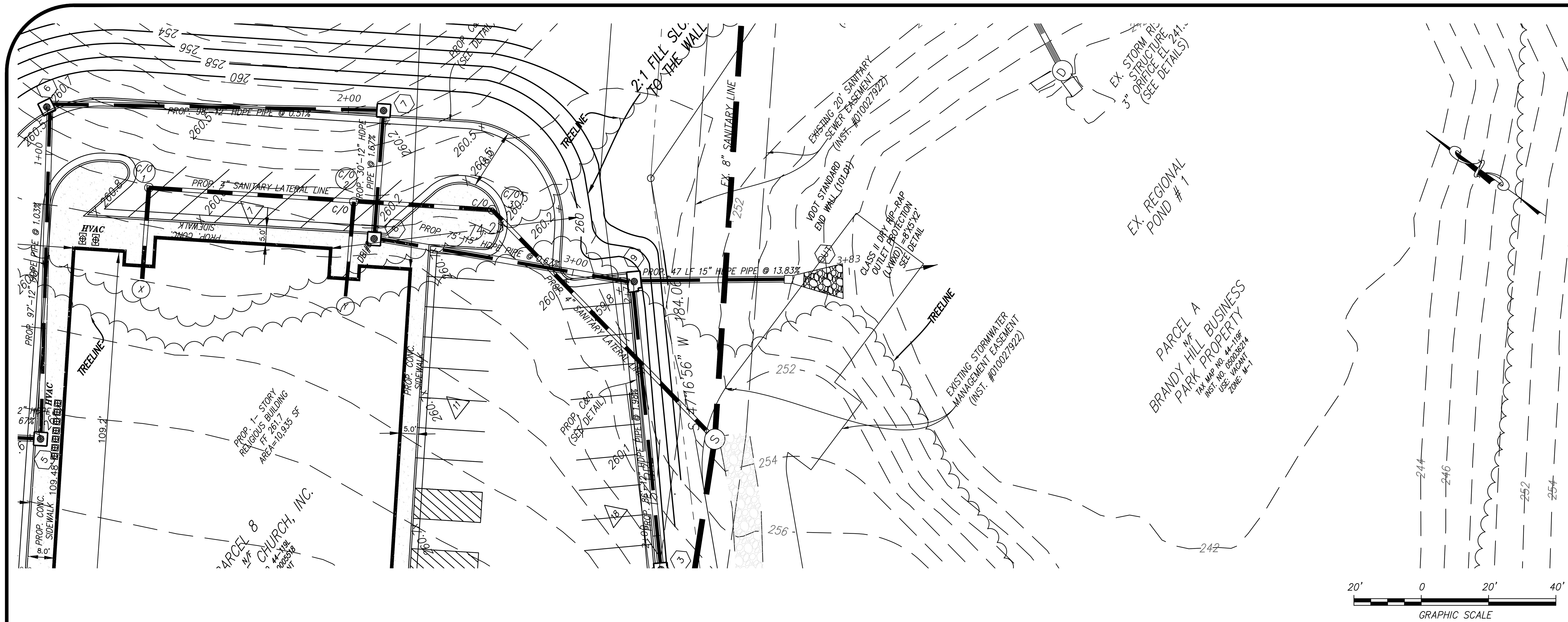

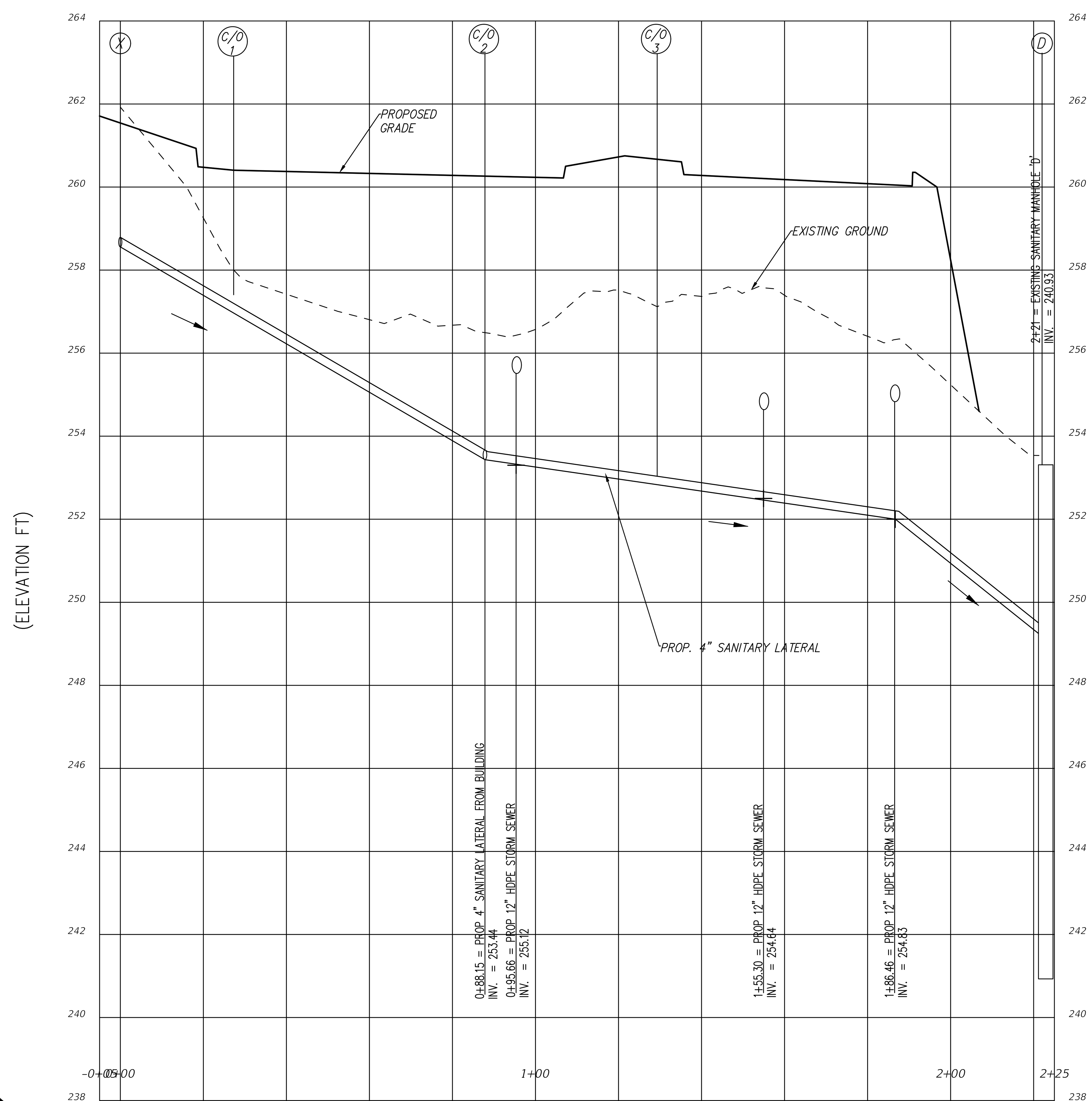

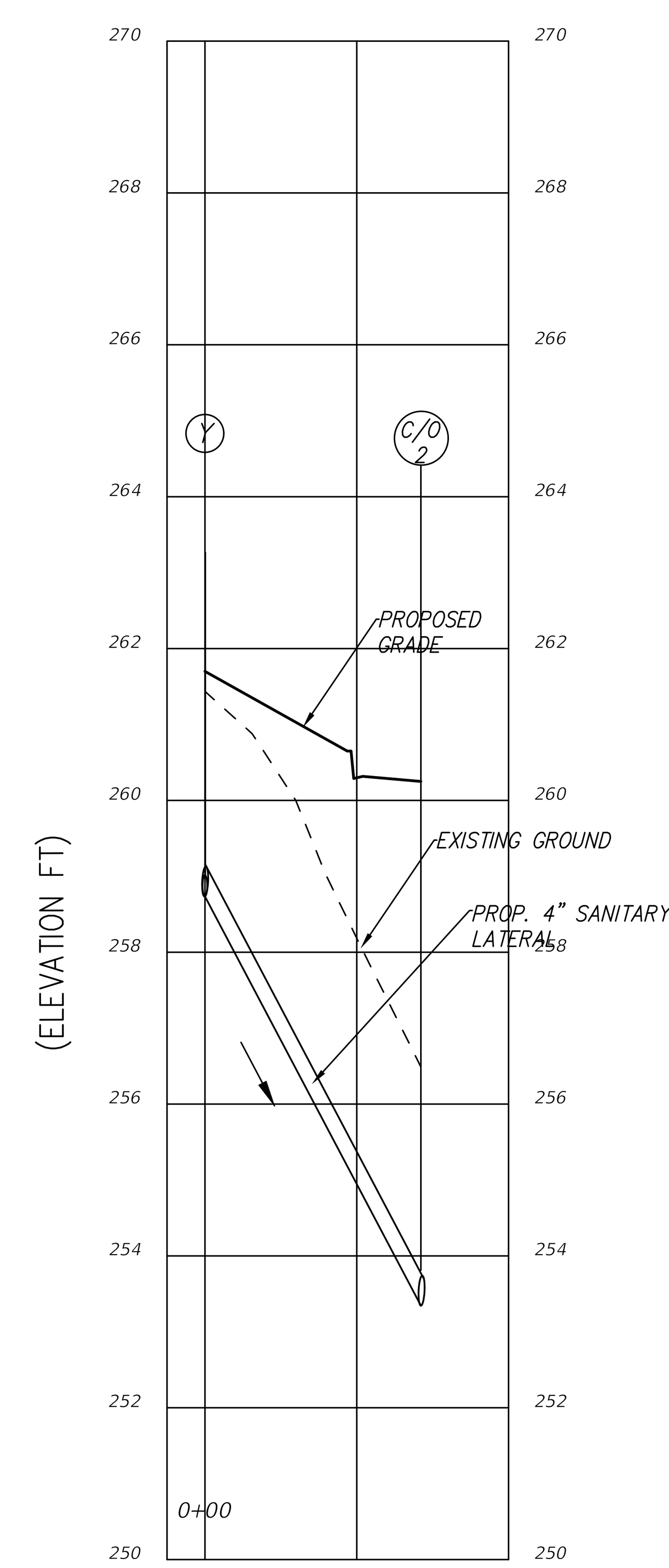

SANITARY SEWER PLAN & PROFILE

SOUTH RIDGE CHURCH

FALMOUTH ELECTION DISTRICT
STAFFORD COUNTY, VA

REVISION	DATE

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COMMONWEALTH OF VIRGINIA
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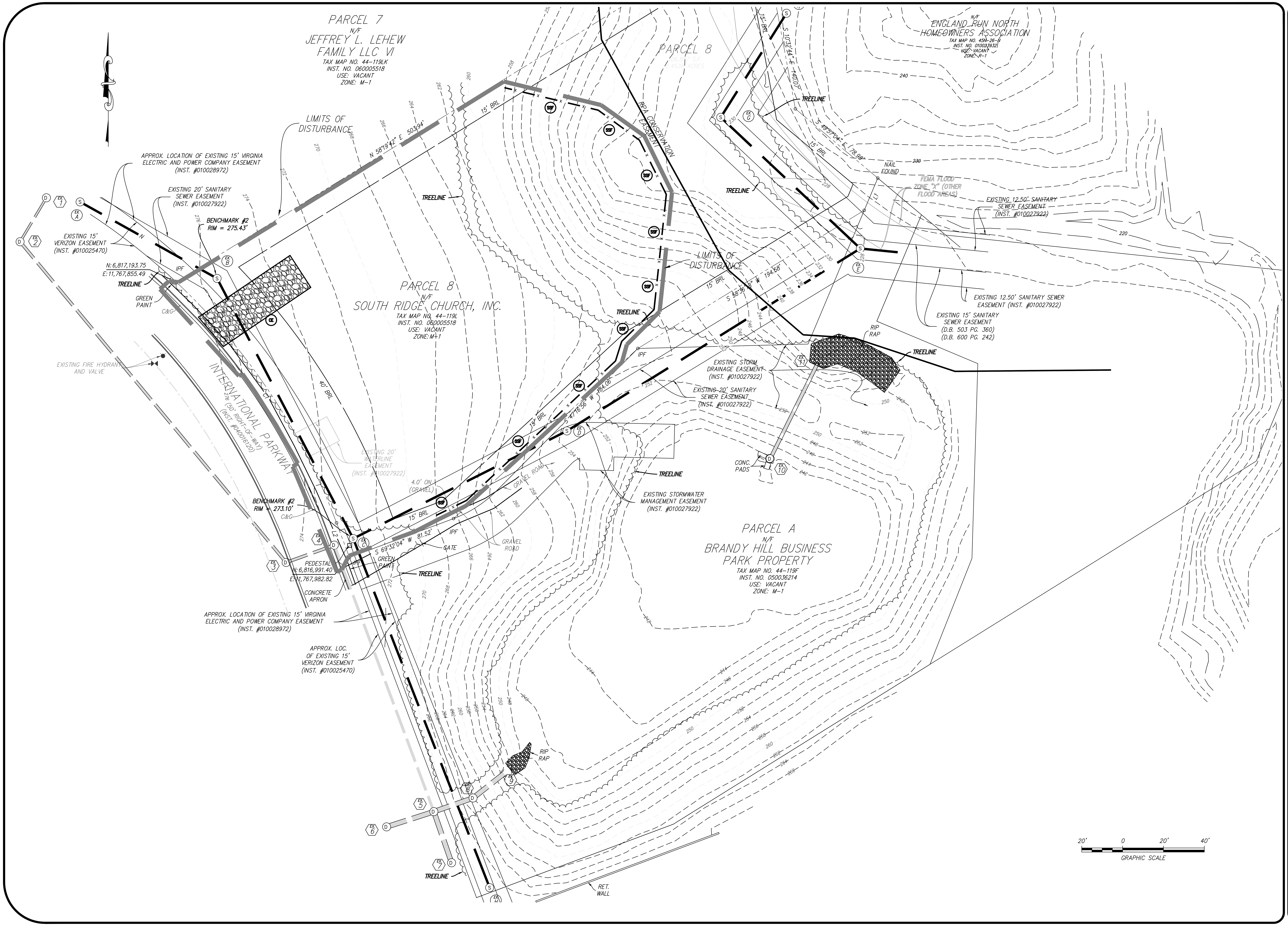
PARCEL 7
N/F
JEFFREY L. LEHEW
FAMILY LLC VI
TAX MAP NO. 44-119LK
INST. NO. 060005518
USE: VACANT
ZONE: M-1
PARCEL 8
ENGLAND RUN NORTH
HOMEOWNERS ASSOCIATION
TAX MAP NO. 45N-26-N
INST. NO. 010023932
USE: VACANT
ZONE: R-1
LIMITS OF DISTURBANCE
N 58°19'42" E 503.94'
15' BRL
RPA CONSERVATION EASEMENT
TREELINE
APPROX. LOCATION OF EXISTING 15' VIRGINIA ELECTRIC AND POWER COMPANY EASEMENT (INST. #010028972)
EXISTING 20' SANITARY SEWER EASEMENT (INST. #010027922)
BENCHMARK #2 RIM = 275.43'
EXISTING 15' VERIZON EASEMENT (INST. #010025470)
N:6,817,193.75
E:11,767,855.49
IPF
GREEN PAINT
C&G
NAIL FOUND
FEMA FLOOD ZONE "X" (OTHER FLOOD AREAS)
EXISTING 12.50' SANITARY SEWER EASEMENT (INST. #010027922)
EXISTING 12.50' SANITARY SEWER EASEMENT (INST. #010027922)
EXISTING 15' SANITARY SEWER EASEMENT (D.B. 503 PG. 360) (D.B. 600 PG. 242)
S 48°36' W 194.58'
PARCEL 8
N/F
SOUTH RIDGE CHURCH, INC.
TAX MAP NO. 44-119L
INST. NO. 060005518
USE: VACANT
ZONE: M-1
RIP RAP
EXISTING FIRE HYDRANT AND VALVE
INTERNATIONAL PARKWAY
(50' RIGHT-OF-WAY)
(INST. #040016120)
40' BRL
EXISTING STORM DRAINAGE EASEMENT (INST. #010027922)
EXISTING 20' SANITARY SEWER EASEMENT (INST. #010027922)
S 47°16'56" W 184.06'
EXISTING 20' WATERLINE EASEMENT (INST. #010027922)
4.0' ON (GRAVEL)
CONC. PADS
EXISTING STORMWATER MANAGEMENT EASEMENT (INST. #010027922)
BENCHMARK #2 RIM = 273.10'
S 69°32'04" W 81.52'
GATE
GRAVEL ROAD
PARCEL A
N/F
BRANDY HILL BUSINESS PARK PROPERTY
TAX MAP NO. 44-119F
INST. NO. 050036214
USE: VACANT
ZONE: M-1
PEDESTAL
N:6,816,991.40
E:11,767,982.82
CONCRETE APRON
APPROX. LOCATION OF EXISTING 15' VIRGINIA ELECTRIC AND POWER COMPANY EASEMENT (INST. #010028972)
APPROX. LOC. OF EXISTING 15' VERIZON EASEMENT (INST. #010025470)
RET. WALL
GRAPHIC SCALE
20' 0 20' 40'

REVISION | DATE

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E&S PHASE I
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FALMOUTH ELECTION DISTRICT
STAFFORD COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
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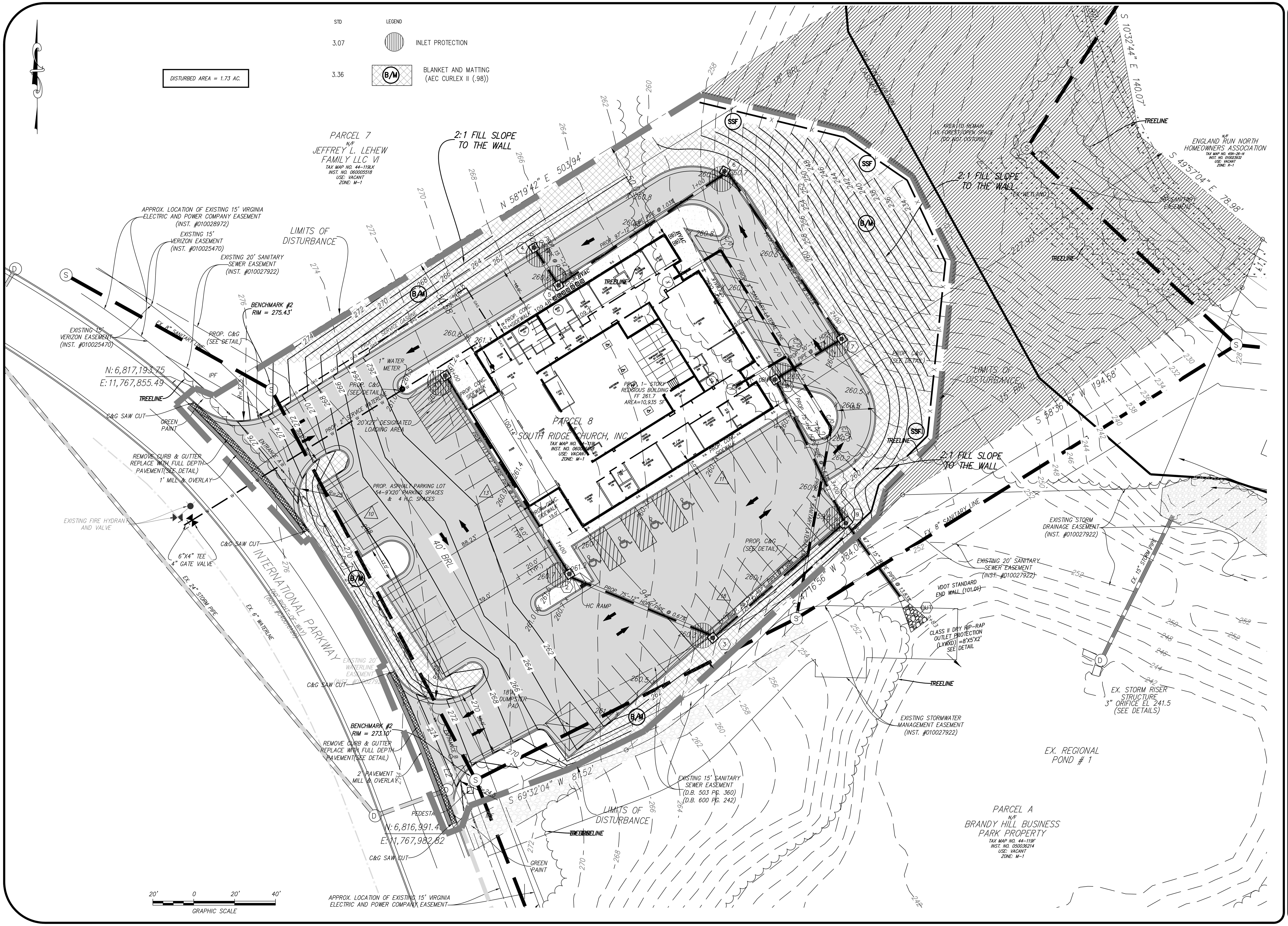

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PROJECT # 4762

EROSION & SEDIMENT CONTROL REGULATIONS MINIMUM STANDARDS

1. SOIL STABILIZATION:
PERMANENT OR TEMPORARY 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 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.

2. SOIL STOCKPILE STABILIZATION:
DURING CONSTRUCTION, SOIL STOCKPILES AND BORROW AREAS SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. TEMPORARY PROTECTION AND PERMANENT STABILIZATION SHALL BE APPLIED TO ALL SOIL STOCKPILES ON SITE AND BORROW AREAS OR SOIL INTENTIONALLY TRANSPORTED FROM THE SITE.

3. PERMANENT STABILIZATION:
A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT, IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION.

4. INSTALLATION PRIOR TO LAND DISTURBANCE:
SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND-DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE.

5. STABILIZATION OF EARTHEN STRUCTURES:
STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.

6. SEDIMENT TRAPS AND SEDIMENT BASINS:
SEDIMENT TRAPS AND SEDIMENT BASINS SHALL BE DESIGNED AND CONSTRUCTED BASED UPON THE TOTAL DRAINAGE AREA TO BE SERVED BY THE TRAP OR BASIN.

A. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT TRAP SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA AND THE TRAP SHALL ONLY CONTROL DRAINAGE AREAS LESS THAN THREE ACRES.

B. SURFACE RUNOFF FROM DISTURBED AREAS THAT IS COMPRISED OF FLOW FROM DRAINAGE AREAS GREATER THAN OR EQUAL TO THREE ACRES SHALL BE CONTROLLED BY A SEDIMENT BASIN. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT BASIN SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA. THE OUTFALL SYSTEM SHALL, AT A MINIMUM, MAINTAIN THE STRUCTURAL INTEGRITY OF THE BASIN DURING A 25-YEAR STORM OF 24-HOUR DURATION. RUNOFF COEFFICIENTS USED IN RUNOFF CALCULATIONS SHALL CORRESPOND TO A BARE EARTH CONDITION OR THOSE CONDITIONS EXPECTED TO EXIST WHILE THE SEDIMENT BASIN IS UTILIZED.

7. CUT AND FILL SLOPES DESIGN & CONSTRUCTION:
CUT AND FILL SLOPES SHALL BE DESIGNED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZING MEASURES UNTIL THE PROBLEM IS CORRECTED.

8. CONCENTRATED RUNOFF DOWN SLOPES:
CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAIN STRUCTURE.

9. SLOPE MAINTENANCE:
WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.

10. STORM SEWER INLET PROTECTION:
ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.

11. STORMWATER CONVEYANCE PROTECTION:
BEFORE NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS OR PIPES ARE MADE OPERATIONAL, ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.

12. WORK IN LIVE WATERCOURSE:
WHEN WORK IN A LIVE WATERCOURSE IS PERFORMED:
A. PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENCROACHMENT, CONTROL SEDIMENT TRANSPORT, AND STABILIZE THE WORK AREA TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION.
B. NONERODIBLE MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS.
C. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NONERODIBLE COVER MATERIALS.

13. CROSSING LIVE WATERCOURSE:
WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES MORE THAN TWICE IN ANY SIX-MONTH PERIOD, A TEMPORARY VEHICULAR STREAM CROSSING CONSTRUCTED OF NONERODIBLE MATERIAL SHALL BE PROVIDED.

14. REGULATION OF WATERCOURSE CROSSING:
ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE MET.

15. STABILIZATION OF WATERCOURSE:
THE BED AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.

16. UNDERGROUND UTILITY LINE INSTALLATION:
UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA:

A. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME.
B. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
C. EFFLUENT FROM DEWATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF-SITE PROPERTY.
D. MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION.
E. RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THESE REGULATIONS.
F. APPLICABLE SAFETY REGULATIONS SHALL BE COMPLIED WITH.

17. VEHICULAR SEDIMENT TRACKING:
WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED OR PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRACKING ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PAVED OR PUBLIC ROAD SURFACE, THE ROAD SURFACE SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER. THIS PROVISION SHALL APPLY TO INDIVIDUAL DEVELOPMENT LOTS AS WELL AS TO LARGER LAND-DISTURBING ACTIVITIES.

18. REMOVAL OF TEMPORARY MEASURES:
ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE LOCAL PROGRAM AUTHORITY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.

19. STORMWATER MANAGEMENT:
PROPERTIES AND WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION, EROSION AND DAMAGE DUE TO INCREASES IN VOLUME, VELOCITY AND PEAK FLOW RATE OF STORMWATER RUNOFF FOR THE STATED FREQUENCY STORM OF 24-HOUR DURATION IN ACCORDANCE WITH APPLICABLE STATE AND LOCAL REGULATIONS.

EROSION AND SEDIMENT CONTROL NARRATIVE

GENERAL:
EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROVIDED IN ACCORDANCE WITH CURRENT VIRGINIA EROSION AND SEDIMENT CONTROL LAW AND REGULATIONS (VESCLR) AND THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, 1992 EDITION (VESCH). IN THE EVENT OF A DISCREPANCY BETWEEN THESE PLANS AND STATE REGULATIONS, THE STATE REGULATIONS SHALL CONTROL.

EROSION WILL BE CONTROLLED ON THE SITE BY MINIMIZING THE TIME THAT THE EARTH IS DENUDED AND SUBJECT TO THE EROSIVE EFFECTS OF RAINFALL AND RUNOFF. CONSTRUCTION SHALL BE SEQUENCED TO MINIMIZE DISTURBANCE WITHIN THE SITE. RUNOFF IS TO BE DIVERTED AROUND THE DISTURBED AREAS AND NO DISTURBED AREA IS TO REMAIN DENUDED FOR MORE THAN 7 DAYS. ALL RUNOFF FROM DISTURBED AREAS SHALL BE DIRECTED TO SEDIMENT FILTERING DEVICES.

PROJECT DESCRIPTION:
THE PURPOSE OF THIS PROJECT IS THE CONSTRUCTION OF A RELIGIOUS PLACE OF WORSHIP AND 2 PAVED ENTRANCES. THE LIMITS OF DISTURBANCE WILL BE APPROXIMATELY 1.74 ACRES ONSITE WITH SEVERAL ACTIVITIES TAKING PLACE WITHIN OFFSITE EASEMENTS AND WITHIN THE RIGHT OF WAY. THE CONTRACTOR SHALL STABILIZE THE SLOPES DURING CONSTRUCTION WITH THE NECESSARY EROSION AND SEDIMENT CONTROL DEVICES METHODS AS PER THE COUNTY REGULATIONS AND APPROVAL UNTIL FINAL STABILIZATION APPROVED BY THE COUNTY.

EXISTING SITE CONDITIONS:
2 WATERSHEDS THAT MAINLY DRAIN THE SITE. WATERSHED "ADD DA" CONSIST OF 1.38 ACRES THAT DRAIN TOWARD THE SOUTH IN A SERIES OF STORM SEWERS OF VARYING SLOPES. GROUND COVER CONSIST OF GRASS OPEN SPACE IN THE UPPER AREA AND FOREST AND NATIVE TREES IN THE LOWER AREA. A BYPASS WATERSHED DRAINS NORTHEAST TOWARD THE FALLS RUN. THE ENTIRE DRAINAGE AREA EVENTUALLY DRAINS TOWARD THE HAZEL RUN AND THEN THE RAPPAHANNOCK RIVER. VEGETATION CONSISTS OF PRIMARILY PINE/OAK FOREST, GRASSLANDS.

ADJACENT AREAS:
THE SITE IS BORDERED BY INTERNATIONAL PARKWAY RD. FROM THE SOUTH WEST, BRANDY HILL BUSINESS PARK PROPERTY FROM THE SOUTH EAST AND THE ENGLAND RUN HOMEOWNERS ASSOCIATION ON THE NORTH-EAST.

OFF-SITE LAND DISTURBANCE:
THERE WILL BE NO OFFSITE LAND DISTURBANCE WITH THIS PLAN OTHER THAN CONSTRUCTING AN ENTRANCE TO ACCESS THE PROPERTY FROM THE INTERNATIONAL PARKWAY ROAD. SHOULD THE NEED ARISE FOR ADDITIONAL DISTURBANCE NOT PROPOSED WITH THIS PLAN, THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY, PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF SITE BORROW OR WASTE AREAS).

SOILS:
SOILS LOCATED ON THE PROJECT ARE PRIMARILY THE APPLING FINE SANDY LOAM (2-6% SLOPES); APPLING CLAY LOAM (6-15% SLOPES) SEVERELY ERODED; & CAROLINE FINE SANDY LOAM (10-18% SLOPES) ERODED. EROSION POTENTIAL IS CONSIDERED MEDIUM WITH FAIR SOIL DRAINAGE. THE SUB-SOIL HAS A PERMEABILITY RATE OF 0.6-2 IN/HR. DEPTH TO HARD ROCK BETWEEN 1-3 FEET.

CRITICAL AREAS:
THERE IS AN RPA BUT NO WETLANDS ON THE SITE. CARE HAS BEEN TAKEN NOT TO DISTURB THE RPA LOCATED ON THE SITE.

EROSION AND SEDIMENT CONTROL MEASURES:
EROSION WILL BE CONTROLLED ON THE SITE BY MINIMIZING THE TIME THAT THE EARTH IS DENUDED AND SUBJECT TO THE EROSIVE EFFECTS OF RAINFALL AND RUNOFF. CONSTRUCTION SHALL BE SEQUENCED TO MINIMIZE DISTURBANCE WITHIN THE SITE. TO THE EXTENT PRACTICAL, RUNOFF IS TO BE DIVERTED AROUND THE DISTURBED AREAS AND NO DISTURBED AREA IS TO REMAIN DENUDED FOR MORE THAN 7 DAYS. ALL RUNOFF FROM DISTURBED AREAS SHALL BE DIRECTED TO SEDIMENT FILTERING DEVICES.

WITHIN THE LIMITS OF CONSTRUCTION, SEDIMENT SHALL BE CONTROLLED BY SILT FENCE, SUPER SILT FENCE, SEDIMENT TRAP BASIN AND STORM SEWER INLET PROTECTION.

DUST SHALL BE CONTROLLED BY IRRIGATING DENUDED SURFACES WITH WATER. A SPRAY VEHICLE SHALL BE KEPT OF SITE DURING PRIMARY EARTH MOVING OPERATIONS.

STOCKPILES:
SILT FENCE SHALL BE PLACED AROUND THE DOWNSLOPE PERIMETER OF ANY STOCKPILES PRIOR TO COMMENCEMENT OF STOCKPILING. TEMPORARY AND/OR PERMANENT SEEDING SHALL BE UTILIZED AS SPECIFIED ON THIS SHEET AND IN ACCORDANCE WITH VA EROSION AND SEDIMENT CONTROL REGULATIONS.

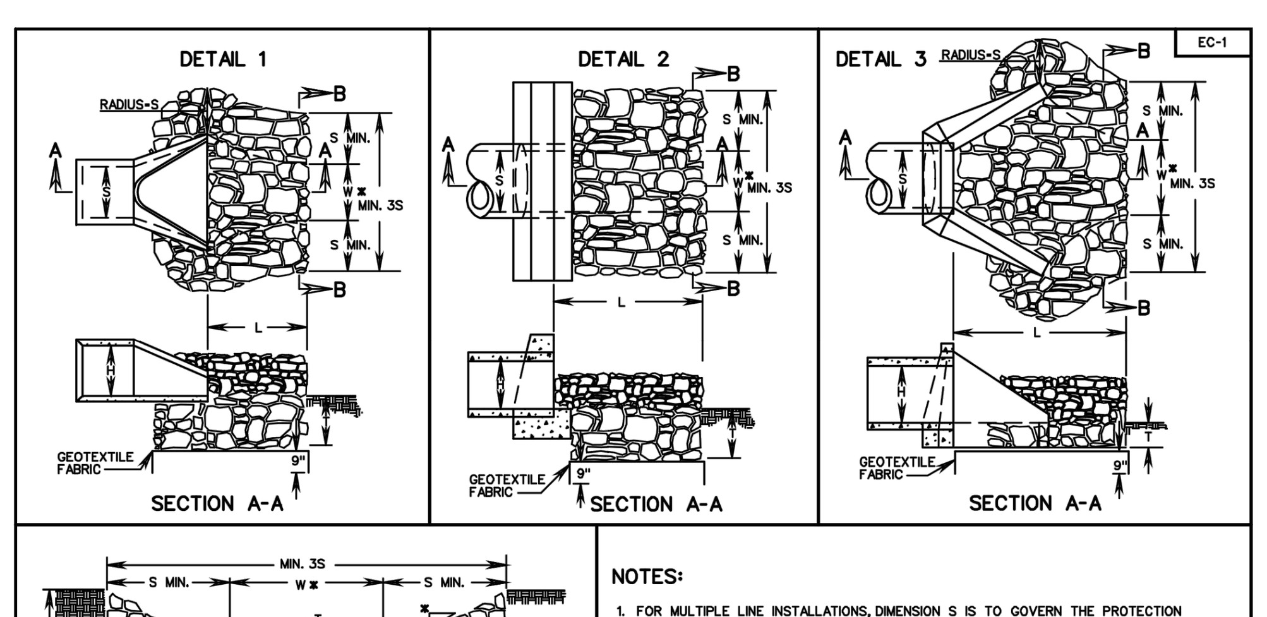
PERMANENT STABILIZATION:
ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE STABILIZED WITH TEMPORARY SEEDING IMMEDIATELY FOLLOWING FINISH GRADING. SEEDING SHALL BE DONE IN ACCORDANCE WITH STD. & SPEC. 3.31, TEMPORARY SEEDING, OF THE VA EROSION AND SEDIMENT CONTROL HANDBOOK - TABLE 3.31-B FOR GENERAL SLOPES. MULCH (IN ACCORDANCE WITH VA ESC STD. 3.35 - TABLE 3.35-A) SHALL BE USED WITH ALL SEEDING OPERATIONS. IN ALL SEEDING OPERATIONS, SEED, FERTILIZER AND LIME WILL BE APPLIED PRIOR TO MULCH. SOIL TESTING SHALL BE UTILIZED TO DETERMINE THE NEED FOR, AND AMOUNTS OF, FERTILIZER AND LIME. FERTILIZER AND LIME SHALL BE APPLIED IN ACCORDANCE WITH VA ESC STD. 3.32 - TABLE 3.32-D. IF FINAL CONSTRUCTION DOES NOT COMMENCE WITHIN ONE (1) YEAR, PERMANENT SEEDING SHALL BE APPLIED IN ACCORDANCE WITH STD & SPEC 3.32.-MINIMUM CARE LAWN.

STORMWATER RUNOFF CONSIDERATIONS:
STORMWATER MANAGEMENT WILL BE PROVIDED THROUGH THE INSTALLATION OF AN ABOVE GROUND DETENTION FACILITY. SEE PLANS FOR DETAILS.

MAINTENANCE:
ALL MEASURES ARE TO BE INSPECTED DAILY, AND AFTER EACH RAINFALL, BY THE SITE SUPERINTENDENT. ANY DAMAGED MEASURES SHALL BE REPAIRED BY THE CLOSE OF THE DAY. ADDITIONAL MAINTENANCE/CLEANOUT SHALL BE AS FOLLOWS:

SEDIMENT BASINS & SILT FENCE - SEDIMENT SHALL BE REMOVED ONCE DEPTH REACHES 6" INCHES FOR THE SEDIMENT BASINS AND HALF OF THE HEIGHT OF BARRIER ON THE SILT FENCE.

INLET PROTECTION - SEDIMENT SHALL BE REMOVED ONCE DEPTH REACHES HALF OF THE HEIGHT OF BARRIER



TYPE OF OUTLET PROTECTION MATERIAL		MAXIMUM OUTLET VELOCITY (FOR DESIGN STORM)	MINIMUM "T"
CLASS 1	EC-3 TYPE B	6 fps	NA
CLASS 2	CLASS AI DRY RIPRAP	8 fps	20"
CLASS 3	CLASS I DRY RIPRAP	14 fps	26"
CLASS 4	CLASS II DRY RIPRAP	19 fps	38"

NOTES:
1. FOR MULTIPLE LINE INSTALLATIONS, DIMENSION S IS TO GOVERN THE PROTECTION OUTSIDE THE CHANNEL WIDTH (W).
2. ON ANY INSTALLATION REQUIRING CULVERT OUTLET PROTECTION WHERE NO ENDWALL OR ENDSECTION IS SPECIFIED ON THE PLANS, CONSTRUCTION IS TO BE IN ACCORDANCE WITH DETAIL 2 SHOWN ABOVE.
3. GEOTEXTILE FABRIC TO BE INSTALLED UNDER CLASS 2, 3, AND 4 MATERIALS IN ACCORDANCE WITH THE SPECIFICATIONS.
4. S = DIAMETER OF CIRCULAR CULVERT OR SPAN FOR BOX, ELLIPTICAL OR ARCH CULVERT. H = DIAMETER OF CIRCULAR CULVERT OR RISE/HEIGHT FOR BOX, ELLIPTICAL OR ARCH CULVERT.
5. PLAN AND SECTION DETAILS DEPICT CLASS 2, 3, AND 4 MATERIALS. FOR CLASS 1 INSTALLATION DETAILS SEE EC-3 TYPE B STANDARD DRAWING.
* USE TYPICAL SECTION SHOWN ON PLANS FOR SIDE SLOPE, BOTTOM WIDTH AND DEPTH OF CHANNEL OR MATCH EXISTING DITCH OR NATURAL GROUND.

OUTLET PROTECTION MINUMUM LENGTH (L)	
TYPE A INSTALLATION	3H
TYPE B INSTALLATION	5H

SPECIFICATION REFERENCE 204 245 303 414

CULVERT OUTLET PROTECTION
VIRGINIA DEPARTMENT OF TRANSPORTATION
REV. 9/06 114.01

SEQUENCE OF OPERATIONS/CONSTRUCTION

THE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THE E&S CONTROL PLANS ARE INTENDED TO PROVIDE A GENERAL PLAN FOR CONTROLLING EROSION AND SILTATION WITHIN THE PROJECT LIMITS. THE E&S CONTROL PLAN IS BASED ON FIELD CONDITIONS AT THE TIME OF PLAN DEVELOPMENT AND THE ASSUMED SEQUENCE OF CONSTRUCTION. THE CONTRACTOR, IN CONJUNCTION WITH THE PROJECT ENGINEER AND/OR ENVIRONMENTAL MONITOR, COULD ADJUST THE LOCATION, QUANTITY AND TYPE OF EROSION AND SILTATION CONTROL ITEMS REQUIRED IF NECESSARY WITH THE APPROVAL OF THE COUNTY INSPECTOR BASED ON THE ACTUAL FIELD CONDITIONS ENCOUNTERED AT THE TIME OF CONSTRUCTION AND THE SELECTED SEQUENCE OF CONSTRUCTION.

PHASE I
1. PRIOR TO CONSTRUCTION, CONTRACTOR TO MEET WITH COUNTY INSPECTOR AND ALL PRIVATE AND PUBLIC AGENCIES REPRESENTATIVES THAT COULD BE INVOLVED IN THIS CONSTRUCTION ACTIVITY FOR INITIAL APPROVAL, RELOCATING, CONNECTING, AND ANY IMPACT TO EXISTING UTILITIES, DISCUSS CONSTRUCTION SCHEDULE, SAFETY, TRAFFIC CONTROL AND INITIAL E&S INSTALLATION.
2. INSTALL TRAFFIC CONTROL SAFETY DEVICES AND OPERATE AS NECESSARY, CONSTRUCT ENTRANCE, SEDIMENT BASIN, LEVEL SPREADERS, DIVERSION DITCH, SILT FENCE AND SUPER SILT FENCE, PROVIDE E&S PROTECTION FOR EXISTING DRAINAGE STRUCTURES.
3. CLEAR ONLY AS NECESSARY TO INSTALL THE MEASURES AS SHOWN ON E&S PLAN.
4. GET COUNTY INSPECTOR APPROVAL TO GO TO PHASE II.

PHASE II
5. CLEAR AND GRUB WITHIN THE LIMITS OF DISTURBANCE.
6. COMMENCE CUT AND FILL OPERATIONS. PROVIDE DUST CONTROL MEASURES AS NEEDED. REQUEST RELOCATE EXISTING UTILITIES THAT NEED TO BE RE SWM AREAS SHALL BE MARKED AND PROTECTED FROM CONSTRUCTION EQUIPMENT.
7. TEMPORARY SEEDING OF DISTURBED AREAS NOT INTENDED FOR IMMEDIATE CONSTRUCTION UPON COMPLETION OF GRADING ACTIVITIES.
8. AS SITE REACHES GRADE, BEGIN INSTALLATION OF SANITARY, STORM SEWER AND OTHER UTILITIES, WORKING FROM DETENTION SYSTEM UPSTREAM. INSTALL INLET PROTECTION AS CONSTRUCTION PROGRESSES.
5. COMMENCE CONSTRUCTION OF BUILDING FOUNDATIONS THEN UTILITY INSTALLATIONS.
6. STABILIZE AREAS TO BE PAVED WITH SUB-BASE STONE.
7. INSTALL UTILITY AS CONSTRUCTION ALLOWS.
8. PERFORM FINISH GRADING AND PROVIDE PERMANENT SEEDING OF REMAINING DISTURBED AREAS.
9. INSTALL PAVEMENT.
10. INSTALL LANDSCAPING AND FENCING.
11. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE LOCAL PROGRAM AUTHORITY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.

VEGETATIVE PRACTICES

TOPSOILING (STOCKPILE) - (TS) - VA ESC STD 3.30
TOPSOIL AND EXCAVATED MATERIAL WILL BE STRIPPED FROM AREAS TO BE GRADED AND STOCKPILED FOR LATER USE. STOCKPILE LOCATION, AS SHOWN ON THE PLAN, IS APPROXIMATE AND COULD BE ADJUSTED WITHIN THE PROPOSED DISTURBED AREA AND SHALL BE STABILIZED WITH TEMPORARY VEGETATION. SILT FENCE SHALL BE INSTALLED ALONG THE DOWN SLOPE PERIMETER OF ALL STOCKPILES. EXCESS MATERIALS CAN BE TRANSPORTED OF SITE, IF NECESSARY, WITH APPROVED RECEIVING LOCATION BY THE COUNTY.

PROPOSED LANDSCAPE AREAS SHALL RECEIVE TOPSOIL APPLICATION (4" MIN). ANY TOPSOIL REMAINING AFTER LANDSCAPING APPLICATION MAY BE BERMED ON SITE AS DIRECTED BY ENGINEER OR REMOVED FROM SITE TO A PERMITTED RECEIVING LOCATION.

TEMPORARY SEEDING (TS) - VA ESC STD 3.31
WHERE EXPOSED SOIL SURFACES WILL NOT BE FINISH GRADED FOR A PERIOD LONGER THAN 30 DAYS (SEE MS-1 AND MS-2). A PERMANENT VEGETATIVE COVER SHALL BE APPLIED TO AREAS THAT WILL BE LEFT DORMANT FOR A PERIOD OF MORE THAN ONE YEAR. AREAS WHICH FAIL TO ESTABLISH VEGETATIVE COVER ADEQUATE TO PREVENT RILL EROSION WILL BE RESEEDED AS SOON AS SUCH AREAS ARE IDENTIFIED.

MULCHING (MU) - VA ESC STD 3.35
APPLICATION OF PLANT RESIDUE OR OTHER SUITABE MATERIAL TO THE SOIL SURFACE TO PREVENT EROSION AND TO FOSTER GROWTH OF VEGETATION.

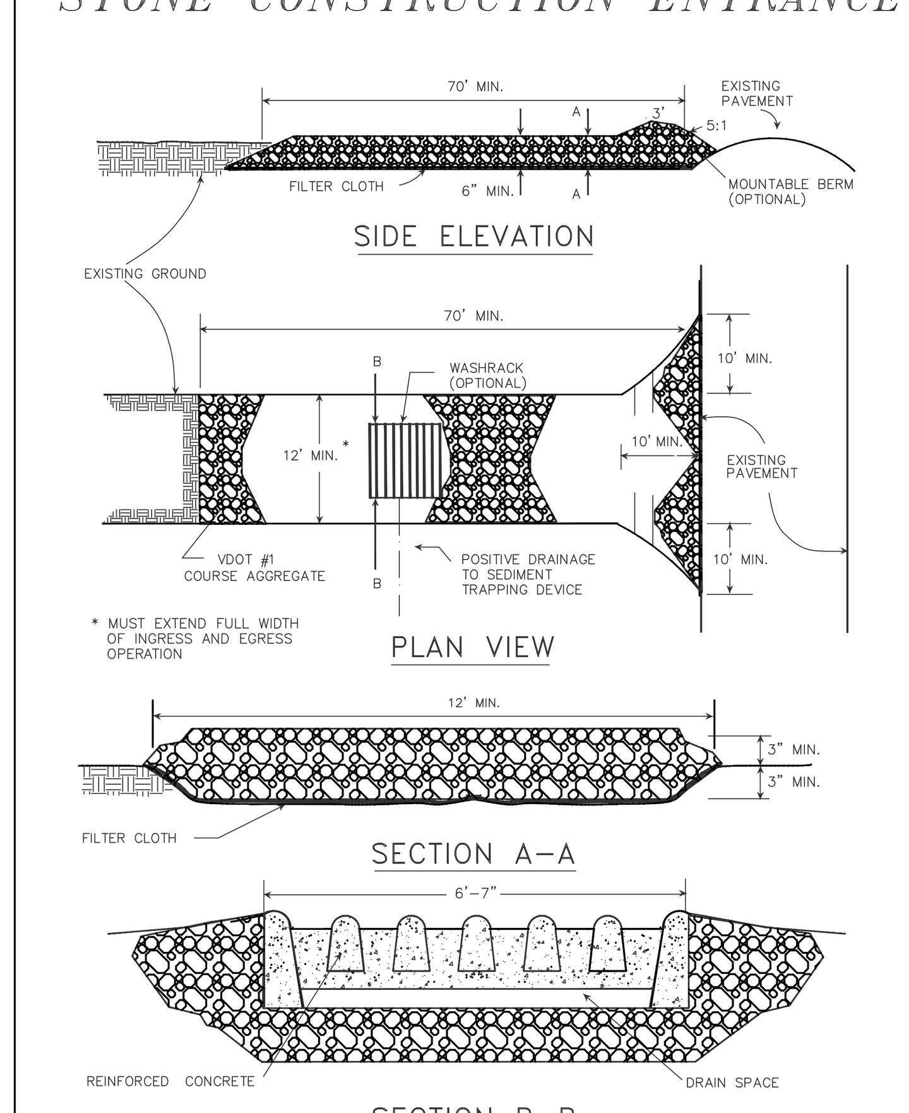
STRUCTURAL PRACTICES

CONSTRUCTION ENTRANCE (CE) - VA ESC STD 3.02
A STABILIZED STONE PAD WITH A FILTER FABRIC UNDERLINER LOCATED AT POINTS OF VEHICULAR INGRESS AND EGRESS TO THE CONSTRUCTION SITE FOR THE PURPOSES OF REDUCING THE AMOUNT OF MUD TRANSPORTED ONTO PAVED PUBLIC ROADS.

SILT FENCE (SF) - VA ESC STD 3.05
A TEMPORARY SEDIMENT BARRIER CONSISTING OF A SYNTHETIC FILTER FABRIC STRETCHED ACROSS AND ATTACHED TO SUPPORTING POSTS AND ENTRENCHED.

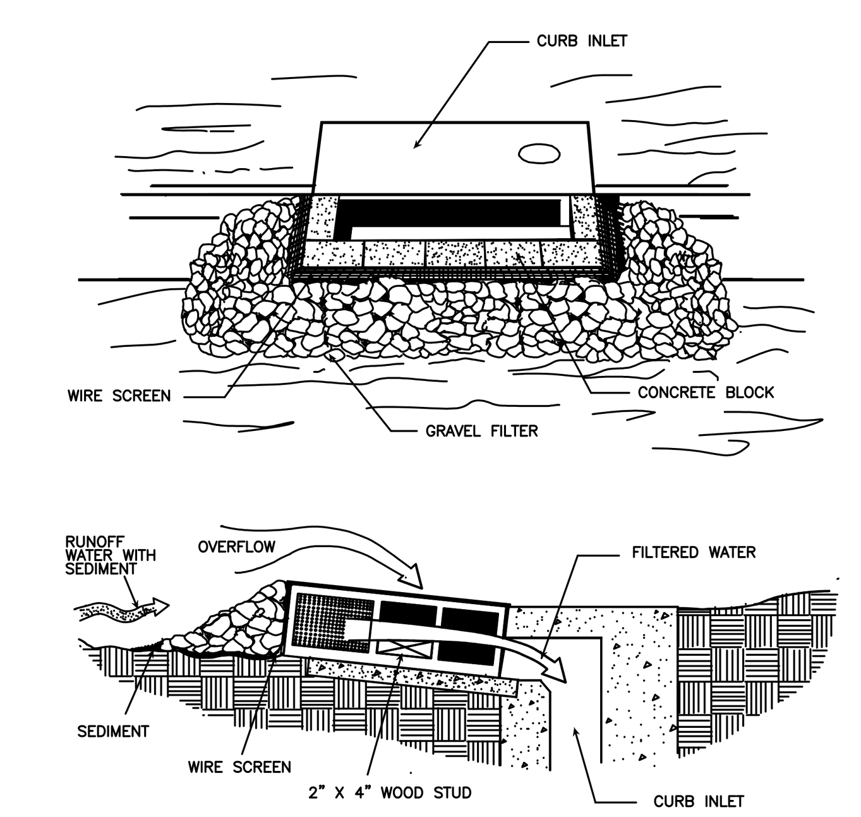
STORM DRAIN INLET PROTECTION (IP) - VA ESC STD 3.07
A SEDIMENT FILTER OR EXCAVATED IMPOUNDING AREA AROUND A STORM DRAIN DROP INLET OR CURB INLET FOR THE PURPOSE OF PREVENTING SEDIMENT FROM ENTERING STORM DRAINAGE SYSTEM PRIOR TO PERMANENT STABILIZATION OF DISTURBED AREA.

STONE CONSTRUCTION ENTRANCE



SOURCE: ADAPTED from 1983 Maryland Standards for Soil erosion and Sediment Control, and Va. DSWC Plate 3.02-1

BLOCK & GRAVEL CURB INLET SEDIMENT FILTER



SPECIAL APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE AN OVERFLOW CAPABILITY IS NECESSARY TO PREVENT EXCESSIVE PONDING IN FRONT OF THE STRUCTURE.

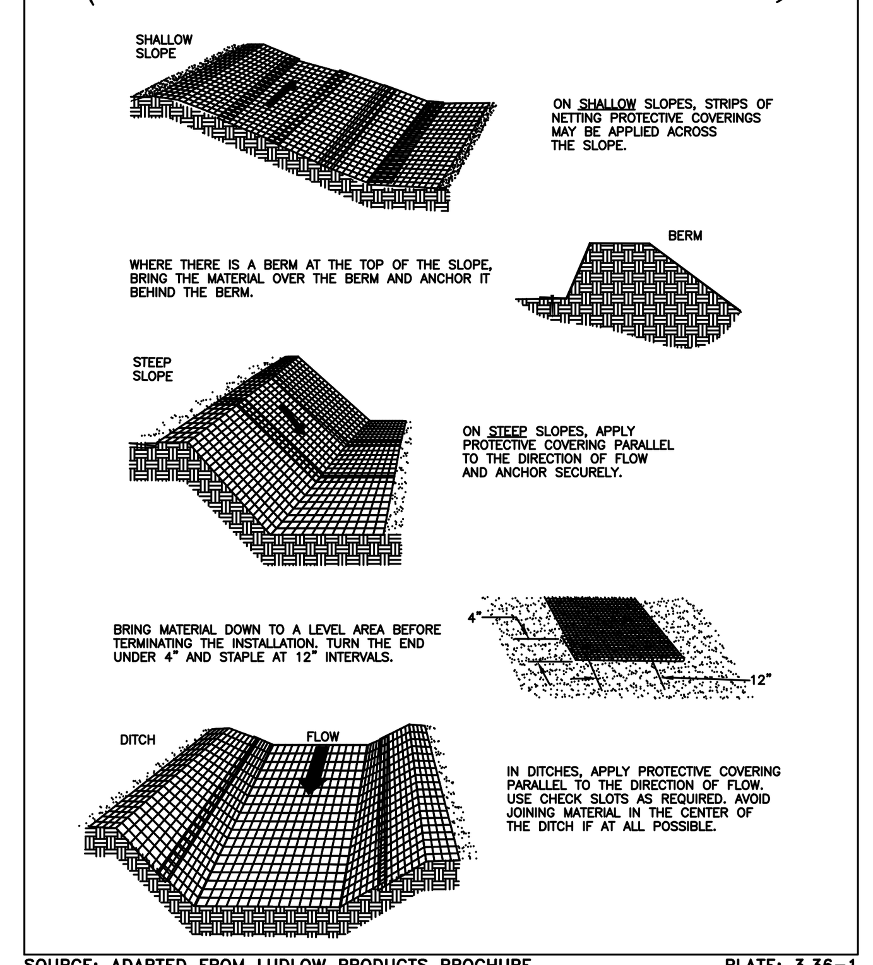
* GRAVEL SHALL BE VDOT #3, #357 OR #5 COARSE AGGREGATE

SOURCE: VA. DSWC PLATE 3.07-8

EARTHEN EMBANKMENT NOTES

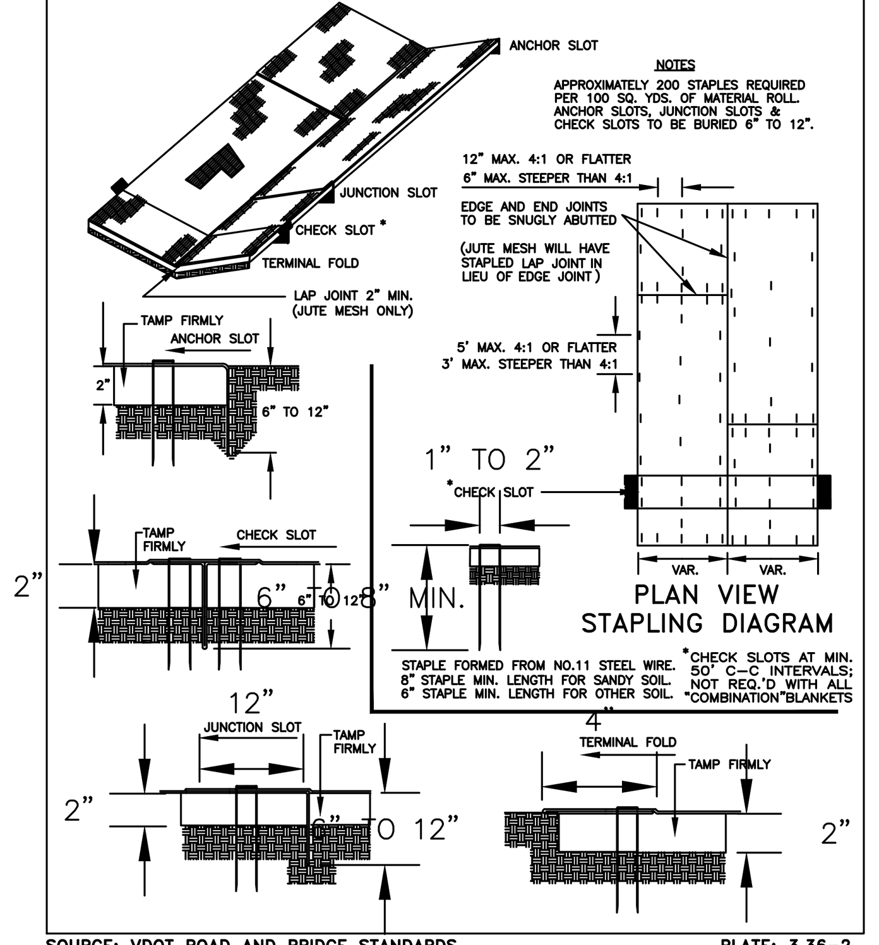
1. CONSTRUCTION OF EMBANKEMENT AS PER VA DEQ STORMWATER DESIGN SPECIFICATION VERSION 1.0 MARCH 1, 2011 APPENDIX A WITH SITE PREPARATION, FILL MATERIAL, AND COMPACTION.
2. UTILIZE THE HOMOGENEOUS EMBANKMENT USING THE TOE DRAIN WHICH CONSIST OF TRANSITION FILTER, ROCK AND GRAVEL DRAIN, AND CUT OFF TRENCH.
3. THE TOP SURFACE SHALL HAVE TOP SOIL AND SHALL BE STABILIZED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK LATEST EDITION.

TYPICAL ORIENTATION OF TREATMENT - 1 (SOIL STABILIZATION BLANKET)



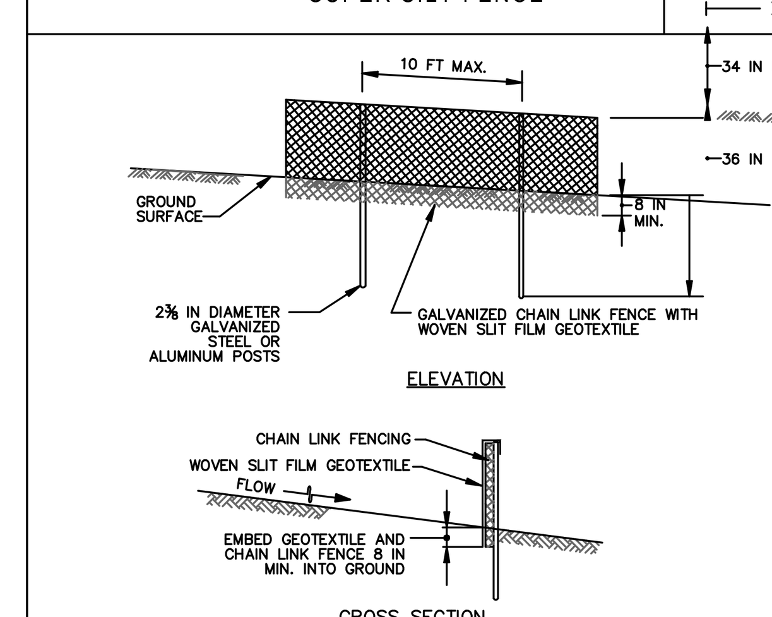
SOURCE: ADAPTED FROM LUDLOW PRODUCTS BROCHURE PLATE: 3.36-1

TYPICAL TREATMENT - 1 (SOIL STABILIZATION BLANKET) INSTALLATION CRITERIA



SOURCE: VDOT ROAD AND BRIDGE STANDARDS PLATE: 3.36-2

SUPER SILT FENCE | STANDARD SYMBOL —X—



CONSTRUCTION SPECIFICATIONS

1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011

REVISION	DATE

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www.FreelandEngineeringPC.com

EROSION AND SEDIMENT CONTROL NOTES & DETAILS

SOUTH RIDGE CHURCH

FALMOUTH ELECTION DISTRICT
STAFFORED COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
09/29/2020
PROFESSIONAL ENGINEER

SEAL

County Plan Number:

Drawn By:	SAR
Designed By:	SAR
Checked By:	RPF
Date:	09/29/2020
Scale:	NTS
Sheet:	11 of 20

PROJECT # 4762

ADD DA
1.42
AC

EX DA
17.42
AC

WATERSHED ADDITIONAL BOUNDARY

WATERSHED BOUNDARY

WATERSHED BOUNDARY

SHEET FLOW

SHALLOW CONCENTRATED FLOW

42" OUTLET PIPE TYPE RCP

30" OUTLET PIPE TYPE RCP

OUTLET RISER STRUCTURE

INTERNATIONAL PKWY

INTERNATIONAL PKWY

BRANDYWINE CT

LIMESTONE WAY

LIMESTONE WAY

LIMESTONE WAY

CRIMSON WAY

APRIL LN

MARBLE CT

SHASTA PL

SHASTA PL

BATLAY CT

BATLAY CT

FALLS RUN CREEK

100' 0 100' 200'
GRAPHIC SCALE

DATE | REVISION

Freeland Engineering, PC
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EXISTING WATERSHED ANALYSIS

SOUTH RIDGE CHURCH

FALMOUTH ELECTION DISTRICT
STAFFORED COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
09/29/2020
PROFESSIONAL ENGINEER
SEAL

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Drawn By:	SAR
Designed By:	SAR
Checked By:	RPF
Date:	09/29/2020
Scale:	1"=100'
Sheet:	12 of 18

PROJECT # 4762

PRE DEVELOPMENT PEAK FLOW FOR THE 2 & 10YR-24HR STORM FLOOD IMPACT AT POINT OF DISCHARGE & HYDROGRAPHS

WATERSHED (EX DA) = 17.42 AC.

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	--------	3.986	--------	--------	20.90	--------	--------	70.93	PRE DEVELOPMENT

2- YEAR PEAK FLOW & HYDROGRAPH

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	3.986	2	728	22,679	------	------	------	PRE DEVELOPMENT

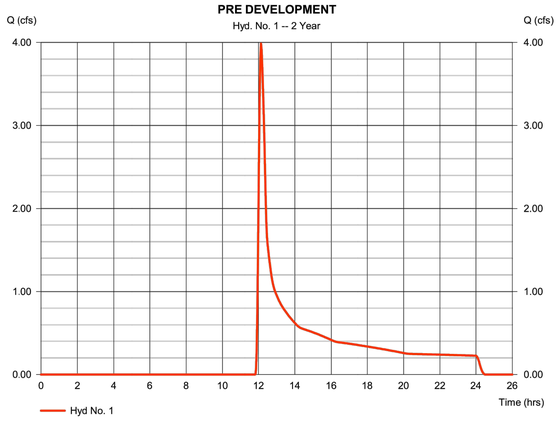
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 — Wednesday, 08 / 19 / 2020

Hyd. No. 1

PRE DEVELOPMENT

Hydrograph type	= SCS Runoff	Peak discharge	= 3.986 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 22,679 cuft
Drainage area	= 17.420 ac	Curve number	= 58
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.60 min
Total precip.	= 3.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



10- YEAR PEAK FLOW & HYDROGRAPH

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	20.90	2	726	74,604	------	------	------	PRE DEVELOPMENT

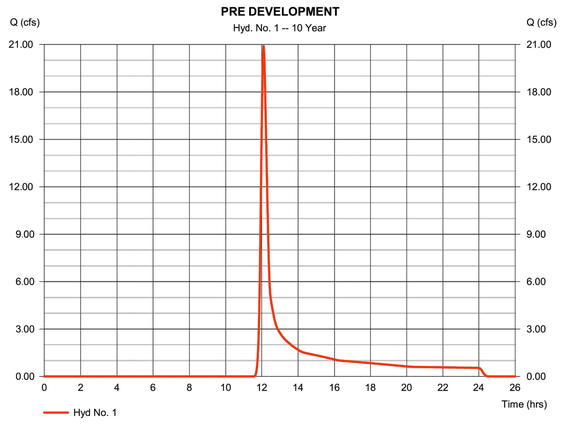
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 — Wednesday, 08 / 19 / 2020

Hyd. No. 1

PRE DEVELOPMENT

Hydrograph type	= SCS Runoff	Peak discharge	= 20.90 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 74,604 cuft
Drainage area	= 17.420 ac	Curve number	= 58
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.60 min
Total precip.	= 5.02 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



REVISION

DATE

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PRE DEVELOPMENT HYDROGRAPHS

SOUTH RIDGE CHURCH

FALMOUTH ELECTION DISTRICT
STAFFORD COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
09/29/2020
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Sheet:	13 of 20

PROJECT # 4762

2 & 10 YR-24HR STORM EVENT POST DEVELOPMENT HYDROGRAPH

2- YR STORM EVENT HYDROGRAPHS

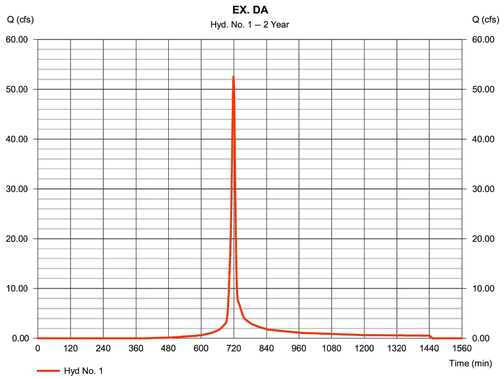
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 — Wednesday, 08 / 19 / 2020

Hyd. No. 1

EX. DA

Hydrograph type	= SCS Runoff	Peak discharge	= 52.52 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 121,175 cuft
Drainage area	= 17.420 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.00 min
Total precip.	= 3.11 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



2 YEAR -24HR STORM EVENT POST DEVELOPMENT HYGROGRAPH (EXISTING DRAINAGE AREA)

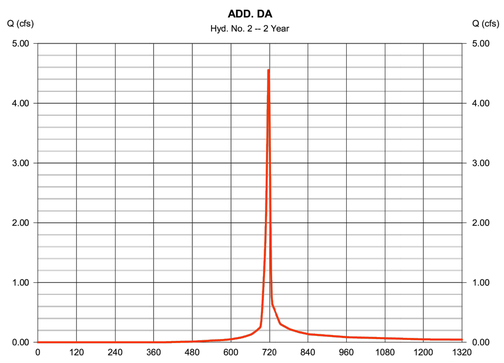
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 — Wednesday, 08 / 19 / 2020

Hyd. No. 2

ADD. DA

Hydrograph type	= SCS Runoff	Peak discharge	= 4.556 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 9,326 cuft
Drainage area	= 1.430 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.11 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



2 YEAR -24HR STORM EVENT POST DEVELOPMENT HYGROGRAPH (ADDITIONAL DRAINAGE AREA)

HYDROGRAPH SUMMARY

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	52.52	-------	-------	92.83	-------	-------	183.31	EX. DA
2	SCS Runoff	------	-------	4.556	-------	-------	8.021	-------	-------	15.79	ADD. DA

10- YR STORM EVENT HYDROGRAPHS

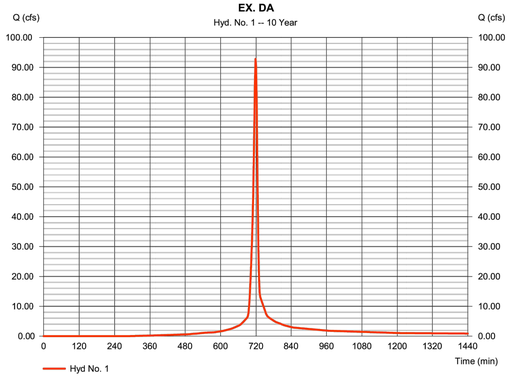
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 — Wednesday, 08 / 19 / 2020

Hyd. No. 1

EX. DA

Hydrograph type	= SCS Runoff	Peak discharge	= 92.83 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 219,413 cuft
Drainage area	= 17.420 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.00 min
Total precip.	= 4.79 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



10 YEAR -24HR STORM EVENT POST DEVELOPMENT HYGROGRAPH (EXISTING DRAINAGE AREA)

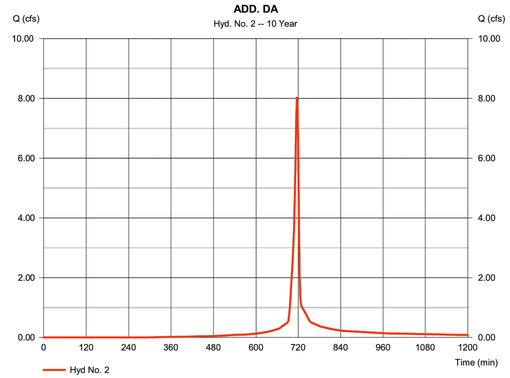
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 — Wednesday, 08 / 19 / 2020

Hyd. No. 2

ADD. DA

Hydrograph type	= SCS Runoff	Peak discharge	= 8.021 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 16,886 cuft
Drainage area	= 1.430 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.79 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



10 YEAR -24HR STORM EVENT POST DEVELOPMENT HYGROGRAPH (ADDITIONAL DRAINAGE AREA)

REVISION

DATE

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POST DEVELOPMENT HYDROGRAPHS

SOUTH RIDGE CHURCH

FALMOUTH ELECTION DISTRICT
STAFFORED COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
09/29/2020
PROFESSIONAL ENGINEER
SEAL

County Plan Number:

Drawn By:	SAR
Designed By:	SAR
Checked By:	RPF
Date:	09/29/2020
Scale:	NTS

Sheet: 14 of 20

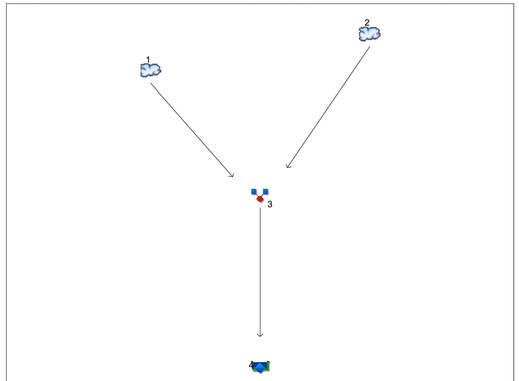
PROJECT # 4762

COMBINED PEAK FLOW FOR THE 2&10 YR-24HR STORM EVENT FLOOD IMPACT AT POINT OF DISCHARGE & HYDROGRAPHS

WATERSHED (EX. DA & ADD. DA) COMBINED AND ROUTED THROUGH EXISTING POND 1

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021



Legend

Hyd.	Origin	Description
1	SCS Runoff	EX. DA
2	SCS Runoff	ADD. DA
3	Combine	COMBINED
4	Reservoir	POND NO.1

Project: COMBINED WITH SOUTHRIDGE CHURCH.gpw | Wednesday, 08 / 19 / 2020

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-------	--------	52.52	-------	-------	92.83	-------	-------	183.31	EX. DA
2	SCS Runoff	-------	--------	4.556	-------	-------	8.021	-------	-------	15.79	ADD. DA
3	Combine	1, 2	--------	56.99	-------	-------	100.60	-------	-------	198.46	COMBINED
4	Reservoir	3	--------	2.918	-------	-------	11.86	-------	-------	64.34	POND NO.1

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	183.31	2	718	451,856	------	------	------	EX. DA
2	SCS Runoff	15.79	2	716	34,774	------	------	------	ADD. DA
3	Combine	198.46	2	718	486,631	1, 2	------	------	COMBINED
4	Reservoir	64.34	2	728	486,617	3	248.80	237,618	POND NO.1

PRE VS. POST- DEVELOPMENT RUNOFF CALCULATION FOR THE 10 YEAR 24 HOUR STORM EVENT AT DISCHARGE POINT

PRE-DEVELOPMENT PEAK FLOW(CFS)	COMBINED POST-DEVELOPMENT PEAK FLOW (CFS)	PRE VS. POST
20.90	11.86	POST < PRE

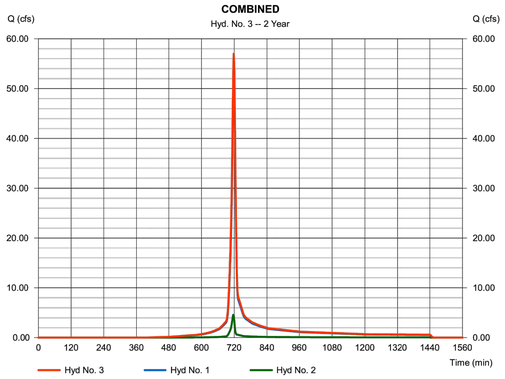
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 — Wednesday, 08 / 19 / 2020

Hyd. No. 3

COMBINED

Hydrograph type	= Combine	Peak discharge	= 56.99 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 130,501 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 18.850 ac



2- YEAR PEAK FLOW & HYGROGRAPH

Hydrograph Report

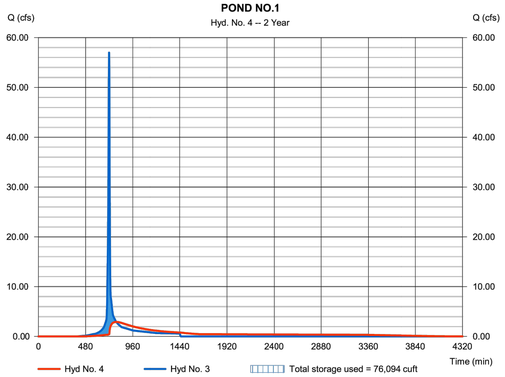
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 — Wednesday, 08 / 19 / 2020

Hyd. No. 4

POND NO.1

Hydrograph type	= Reservoir	Peak discharge	= 2.918 cfs
Storm frequency	= 2 yrs	Time to peak	= 792 min
Time interval	= 2 min	Hyd. volume	= 130,487 cuft
Inflow hyd. No.	= 3 - COMBINED	Max. Elevation	= 244.81 ft
Reservoir name	= <New Pond>	Max. Storage	= 76,094 cuft

Storage Indication method used.



2 YEAR -24HR STORM EVENT POST DEVELOPMENT COMIBINED ROUTING HYGROGRAPH

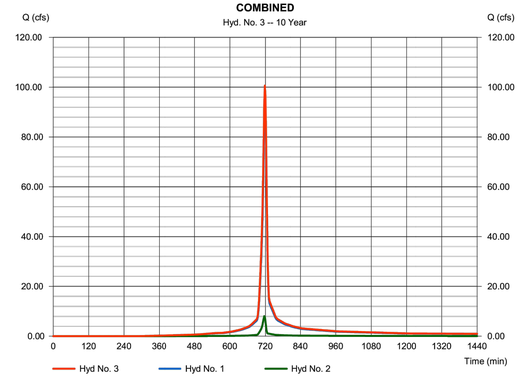
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 — Wednesday, 08 / 19 / 2020

Hyd. No. 3

COMBINED

Hydrograph type	= Combine	Peak discharge	= 100.60 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 236,299 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 18.850 ac



10- YEAR COMBINED PEAK FLOW & HYGROGRAPH

Hydrograph Report

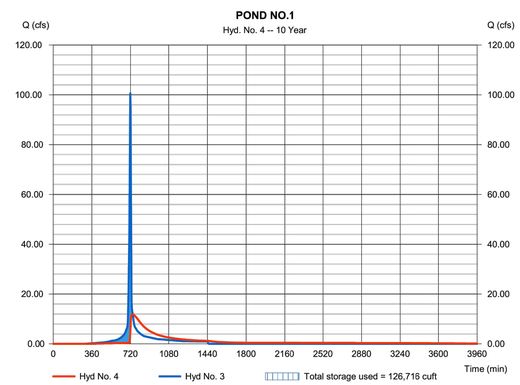
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 — Wednesday, 08 / 19 / 2020

Hyd. No. 4

POND NO.1

Hydrograph type	= Reservoir	Peak discharge	= 11.86 cfs
Storm frequency	= 10 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 236,286 cuft
Inflow hyd. No.	= 3 - COMBINED	Max. Elevation	= 246.25 ft
Reservoir name	= <New Pond>	Max. Storage	= 126,716 cuft

Storage Indication method used.



10 YEAR -24HR STORM EVENT POST DEVELOPMENT COMIBINED ROUTING HYGROGRAPH

REVISION | DATE

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COMBINED PEAK FLOWS & ROUTING HYDROGRAPHS

SOUTH RIDGE CHURCH

FALMOUTH ELECTION DISTRICT
STAFFORED COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
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Sheet: 15 of 20

PROJECT # 4762

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AlB	Appling fine sandy loam, 2 to 6 percent slopes	B	0.9	46.7%
ApC3	Appling clay loam, 6 to 15 percent slopes, severely eroded	B	0.6	30.0%
CaD2	Caroline fine sandy loam, 10 to 18 percent slopes, eroded	C	0.4	23.4%
Totals for Area of Interest			**1.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Rating Polygons: A, A/D, B, B/D, C, C/D, D, Not rated or not available
- Soil Rating Lines: A, A/D, B, B/D, C, C/D, D, Not rated or not available
- Soil Rating Points: A, A/D, B, B/D, C, C/D, D, Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Stafford and King George Counties, Virginia
Survey Area Data: Version 15, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 3, 2019—Aug 1, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Eco-Cap

April 23, 2020

Sinan Rayyan PE
Freeland Engineering

Eco-Cap, LLC - Kinloch Farm Nutrient Bank - Availability Letter

Project Reference: "South Ridge Church - Stafford County"

This letter is to confirm the availability of Nutrient Credits sufficient to meet your project requirements at the Kinloch Farm Nutrient Bank located in Essex County, Virginia. The Kinloch Farm Nutrient Bank received approval from the Virginia Department of Environmental Quality on May 31st, 2018 with an initial release of 26.82 lbs. The nutrient reductions resulting from this activity will generate nonpoint source Nutrient "Credits" which are transferable to those entities requiring nutrient reductions in accordance with the Chesapeake Bay Watershed Nutrient Credit Exchange Program (VA Code § 62. 1-44. 19:14) and the Virginia Stormwater Credit Program (VA Code § 62. 1-44. 15:35).

Currently the facility has **13.91** Credits available and will be able to meet your removal requirement of approximately **2.85** Credits.

Feel free to contact me if you require further assistance.

Casey J. Jensen
President
Eco-Cap, LLC

Manager
Kinloch Nutrient Bank

Phone: (804) 836-6636 **Email:** ecocapva@gmail.com **Website:** ecocapva.us

DRAINAGE NOTE FOR WATER QUALITY:

THE OWNER INTENDS TO PURCHASE NUTRIENT CREDIT OF 2.85LB PER VRRM COMPUTATIONS ATTACHED.

DEQ Virginia Runoff Reduction Method New Development Compliance Spreadsheet - Version 3.0

○ 2011 BMP Standards and Specifications ◉ 2013 Draft BMP Standards and Specifications

Project Name: SOUTH RIDGE CHURCH
Date: 9/1/2020

CLEAR ALL (Ctrl+Shift+R)

data input cells
constant values
calculation cells
final results

BMP Design Specifications List: 2013 Draft Stds & Specs

Site Information

Post-Development Project (Treatment Volume and Loads)

Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested		0.61			0.61 *
Managed Turf (acres) -- disturbed, graded for yards or other turf to be		0.10			0.10
Impervious Cover (acres)		1.39	0.35		1.74
					2.45

** Forest/Open Space areas must be protected in accordance with the Virginia Runoff Reduction Method*

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

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	**2.85**

LAND COVER SUMMARY -- POST DEVELOPMENT

Land Cover Summary

Forest/Open Space Cover (acres)	0.61
Weighted Rv (forest)	0.03
% Forest	25%
Managed Turf Cover (acres)	0.10
Weighted Rv (turf)	0.20
% Managed Turf	4%
Impervious Cover (acres)	1.74
Rv (impervious)	0.95
% Impervious	71%
Site Area (acres)	**2.45**
Site Rv	**0.69**

Treatment Volume and Nutrient Loads

Treatment Volume (acre-ft)	0.1409
Treatment Volume (cubic feet)	6,139
TP Load (lb/yr)	3.86
TN Load (lb/yr) (Informational Purposes Only)	27.60

PROJECT & STORMWATER MANAGEMENT WATER QUANTITY NARRATIVE:

THE SITE HAS A LOT SIZE OF 2.45 AC. THE AREA CONSIST MAINLY OF OPEN SPACE WITH PASTURE & NATIVE TREES WITH GROUND SLOPES AVERAGING BETWEEN 2-18%. THE PROPERTY IS BOUNDED BY INTERNATIONAL PARKWAY RD. FROM THE SOUTH WEST, BRANDY HILL BUSINESS PARK PROPERTY FROM THE SOUTH EAST AND THE ENGLAND RUN HOMEOWNERS ASSOCIATION ON THE NORTH-EAST.

THE PROPERTY IS MAINLY TO BE DEVELOPED INTO A PLACE OF RELIGIOUS WORSHIP WITH TWO PAVED ENTRANCES AND A PAVED PARKING LOT.

RUNOFF FROM THE EXISTING SITE DRAINS DIRECTLY INTO THE FALLS RUN. CREEK, BUT PROPOSED DEVELOPMENT WHICH PART 0.43 AC DA-B FLOW DIRECTLY INTO THE FALLS RUN IN AN OVERLAND SHEET FLOW; WHILE THE OTHER PART DRAINS INTO A STORM SYSTEM THEN INTO REGIONAL POND (POND 1) AND THEN FINALLY INTO THE FALLS RUN.

THE PEAK FLOW RATE FOR THE 2, AND 10 YEAR-24 HOUR STORM EVENTS WERE COMPUTED USING THE SCS METHODOLGY IN THE AUTODESK HYDROGRAPH HYDRAFLOW PROGRAM, TO DETERMINE THE PEAK DISCHARGE AND ROUTING CALCULATION; FOR THE STAFFORD COUNTY ID FROM ATLAS 14 FOR PRECIPITATION.

THE PEAK FLOW WAS DIRECTED TOWARDS THE SWM POND 1 THROUGH MANMADE CONVEYANCE SYSTEM, THE EXISTING POND THEN RELEASES THE POST DEVELOPMENT PEAK FLOW RATE OF LESS THAN THE PRE DEVELOPMENT PEAK FLOW RATE.. PLEASE REFER TO ROUTING AND HYDROGRAPH USING HYDRA FLOW ON SHEETS 12 - 14.

SINCE ALL OF THE PROPOSED FLOW HAS BEEN RELEASED AS SHEET FLOW INTO EITHER WIDE DRAIANGE WAY OR A MANMADE STORMWATER CONVEYANCE SYSTEMS SUCH AS THE EXISTING SWM POND # 1 AND THE PEAK DISCHARGE FOR THE POST DEVELOPMENT WAS EQUAL OR LESS THAN THE PRE DEVELOPMENT. WE BELIEVE WE MET THE REQUIREMENT IN ACCORDANCE WITH THE CODE 9VAC25-870.66.B&C FOR CHANNEL AND FLOOD PROTECTION.

SCS CURVE NUMBER 'CN' RANGE USED IN HYDROLOGIC ANALYSIS REF. TR-55 FOR HYDROLOGIC SOIL GROUP B & C

PRE-DEVELOPMENT = 55-61 GOOD CONDITION FROM FOREST TO PASTURE/GRASS/RANGE AND DEPENDING ON ANY EXISTING % IMPERVIOUS SURFACES
POST-DEVELOPMENT = 88-91 URBAN DISTRICTS (INDUSTRIAL) WITH % IMPERVIOUS SURFACES IMPOSED FOR POST DEVELOPMENT

REVISION | DATE

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VRRM & SOILS MAP

SOUTH RIDGE CHURCH

FALMOUTH ELECTION DISTRICT
STAFFORD COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
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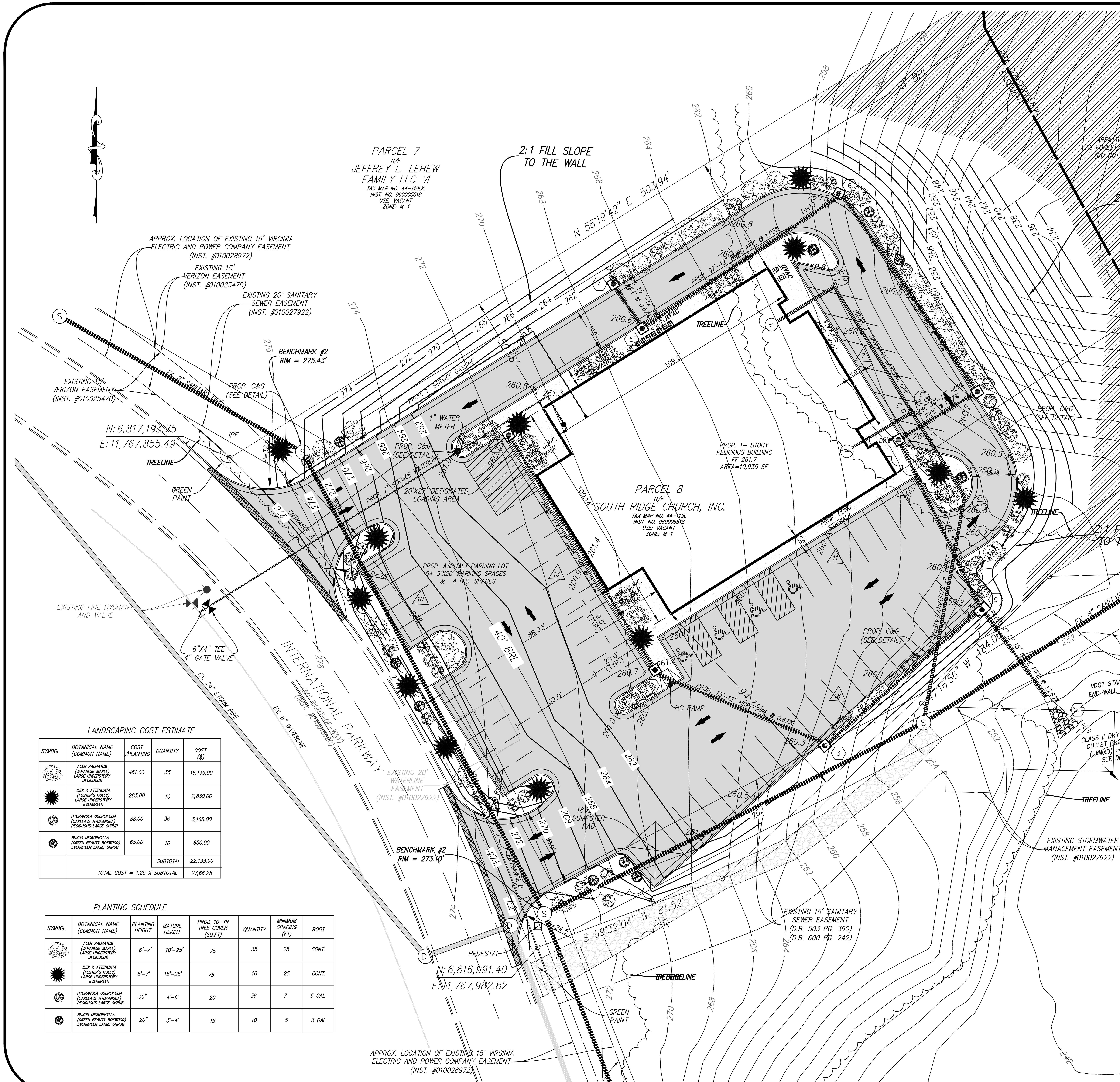
PROJECT # 4762



LANDSCAPING COST ESTIMATE

SYMBOL	BOTANICAL NAME (COMMON NAME)	COST /PLANTING	QUANTITY	COST ($)
	ACER PALMATUM (JAPANESE MAPLE) LARGE UNDERSTORY DECIDUOUS	461.00	35	16,135.00
	ILEX X ATTENUATA (FOSTER'S HOLLY) LARGE UNDERSTORY EVERGREEN	283.00	10	2,830.00
	HYDRANGEA QUERCIFOLIA (OAKLEAVE HYDRANGEA) DECIDUOUS LARGE SHRUB	88.00	36	3,168.00
	BUXUS MICROPHYLLA (GREEN BEAUTY BOXWOOD) EVERGREEN LARGE SHRUB	65.00	10	650.00
			SUBTOTAL	22,133.00
	TOTAL COST = 1.25 X SUBTOTAL			27,66.25

PLANTING SCHEDULE

SYMBOL	BOTANICAL NAME (COMMON NAME)	PLANTING HEIGHT	MATURE HEIGHT	PROJ. 10-YR TREE COVER (SQ.FT)	QUANTITY	MINIMUM SPACING (FT)	ROOT
	ACER PALMATUM (JAPANESE MAPLE) LARGE UNDERSTORY DECIDUOUS	6'-7'	10'-25'	75	35	25	CONT.
	ILEX X ATTENUATA (FOSTER'S HOLLY) LARGE UNDERSTORY EVERGREEN	6'-7'	15'-25'	75	10	25	CONT.
	HYDRANGEA QUERCIFOLIA (OAKLEAVE HYDRANGEA) DECIDUOUS LARGE SHRUB	30"	4'-6'	20	36	7	5 GAL
	BUXUS MICROPHYLLA (GREEN BEAUTY BOXWOOD) EVERGREEN LARGE SHRUB	20"	3'-4'	15	10	5	3 GAL

LANDSCAPING SCHEDULE:

SCHEDULE FOR SECTION 120.1

PARKING LOT, INTERIOR

VARIABLES:
1. TOTAL SQUARE FOOTAGE OF PARKING LOT: 34,069 SQ. FEET
2. MINIMUM PLANTING AREA REQUIRED: (#1* X 0.05) = 1,703 SQ. FEET
3. ADDITIONAL SQUARE FOOTAGE REQUIRED TO MEET LANDSCAPE ISLAND SPACING/PLACEMENT: 0 SQ. FEET
4. AMOUNT OF PLANTING AREA UTILIZING IMP: 0 SQ. FEET

5. TOTAL PLANTING AREA REQUIRED: (#2 + #3*) – #4* = 1,703 SQ. FEET

6. TOTAL PLANT UNITS REQUIRED: (#5 / 150) X 12 = 136 P.U.
   6A. TOTAL TREES REQUIRED: (#5 / 150) = 12 TREES (MINIMUM 1 TREE/ 150 SQ. FT. PLANTING AREA)

CALCULATION OF INDIVIDUALS: (PERCENTAGES ARE EXPRESSED IN DECIMAL FORMAT)
A. NUMBER OF PROPOSED LARGE DECIDUOUS TREES: 0 (PLANTS) X 10 = 0 P.U.
B. NUMBER OF PROPOSED LARGE EVERGREEN TREES: 0 (PLANTS) X 10 = 0 P.U.
C. NUMBER OF PROPOSED UNDERSTORY TREES: 17 (PLANTS)
   1) NUMBER OF DECIDUOUS UNDERSTORY TREES REQUIRED: (C X 0.8) = 13.6 = 14 (PLANTS) X 7 = 98 P.U.
   2)NUMBER OF EVERGREEN UNDERSTORY TREES REQUIRED: (C X 0.2) = 3.4 = 4 (PLANTS) X 7 = 28 P.U.
D. NUMBER OF PROPOSED LARGE SHRUBS: 6 (PLANTS)
   1) NUMBER OF DECIDUOUS LARGE SHRUBS REQUIRED: (6 X 0.8) = 4.2 = 5 (PLANTS) X 3 = 15 P.U.
   2)NUMBER OF EVERGREEN LARGE SHRUBS REQUIRED: (6 X 0.2) = 1.2 = 2 (PLANTS) X 3 = 6 P.U.
E. NUMBER OF PROPOSED SMALL SHRUBS/ORNAMENTAL GRASSES: 0 (PLANTS)
   1) NUMBER OF DECIDUOUS SMALL SHRUBS/ORNAMENTAL GRASSES REQUIRED: (EX 0.8) = 0 (PLANTS) = 0 P.U.
   2) NUMBER OF EVERGREEN SMALL SHRUBS REQUIRED: (EX 0.2) = 0 (PLANTS)= 0 P.U.

F. TOTAL PLANT UNITS PROPOSED: 147 P.U.

NOTES:
(1)* REFERS TO CORRESPONDING "VARIABLES" LINE ITEMS.
(2)PLANT UNIT (P.U.) CALCULATION RESULTS SHALL BE ROUNDED UP TO THE NEXT WHOLE NUMBER.
(3)THE "TOTAL PLANT UNITS PROPOSED" SHOWN ON LINE ITEM F FROM THE ABOVE "CALCULATION OF INDIVIDUALS" SHALL BE EQUAL TO OR GREATER THAN LINE ITEM #6 FROM THE ABOVE "VARIABLES".

SCHEDULE FOR SECTION 120.2

PARKING LOT, PERIMETER

VARIABLES:
1. TOTAL LINEAR FEET OF PARKING LOT PERIMETER: 972 FEET
2. LINEAR FEET OF PARKING LOT PERIMETER USED FOR VEHICULAR ACCESS: 140 FEET
3. LINEAR FEET OF PARKING LOT PERIMETER UTILIZING IMP: FEET

4. NET LINEAR FEET OF PARKING LOT PERIMETER: (#1* – #2*) – #3* = 832 FEET

5. TOTAL PLANT UNITS REQUIRED: (#4 / 100) X 35 = 292 P.U.

CALCULATION OF INDIVIDUALS: (PERCENTAGES ARE EXPRESSED IN DECIMAL FORMAT)
A. NUMBER OF PROPOSED LARGE DECIDUOUS TREES: 0 (PLANTS) X IO = 0 P.U.
B. NUMBER OF PROPOSED LARGE EVERGREEN TREES: 0 (PLANTS) 0 X 10 = 0 P.U.
C. NUMBER OF PROPOSED UNDERSTORY TREES: = 26 (PLANTS)
   1) NUMBER OF DECIDUOUS UNDERSTORY TREES REQUIRED: (26 X 0.8) = 20.8 = 21 (PLANTS) X 7 = 147 P.U.
   2)NUMBER OF EVERGREEN UNDERSTORY TREES REQUIRED: (26 X 0.2) = 5.2 = 6 (PLANTS) X 7 = 42 P.U.
   NUMBER OF PROPOSED LARGE SHRUBS: 38 (PLANTS)
   3)NUMBER OF DECIDUOUS LARGE SHRUBS REQUIRED: (38 X 0.8) = 30.4 = 31 (PLANTS) X 3 = 91 P.U.
   4)NUMBER OF EVERGREEN LARGE SHRUBS REQUIRED: (38 X 0.2) = 7.6 = 8 (PLANTS) X 3 = 24 P.U.
D. NUMBER OF PROPOSED SMALL SHRUBS/ORNAMENTAL GRASSES: (PLANTS)
   1) NUMBER OF DECIDUOUS SMALL SHRUBS/ORNAMENTAL GRASSES REQUIRED: (EX 0.8) = (PLANTS) = P.U.
   2)NUMBER OF EVERGREEN SMALL SHRUBS REQUIRED: (EX 0.2) = (PLANTS)= P.U.

F. TOTAL PLANT UNITS PROPOSED: 304 P.U.

NOTES:
(1) * REFERS TO CORRESPONDING "VARIABLES" LINE ITEMS.
(2)PLANT UNIT (P.U.) CALCULATION RESULTS SHALL BE ROUNDED UP TO THE NEXT WHOLE NUMBER.
(3)THE "TOTAL PLANT UNITS PROPOSED" SHOWN ON LINE ITEM F FROM THE ABOVE "CALCULATION OFLNDIVIDUALS" SHALL BE EQUAL TO OR GREATER THAN LINE ITEM #5 FROM THE ABOVE "VARIABLES".

REVISION	DATE

Freeland Engineering, PC
rfreeland@FreelandEngineeringPC.com
10814 Courthouse Road
Fredericksburg, Virginia 22408
Phone: 540.898.3092
Fax: 877.658.7735
www.FreelandEngineeringPC.com

LANDSCAPING PLAN AND SCHEDULE

SOUTH RIDGE CHURCH

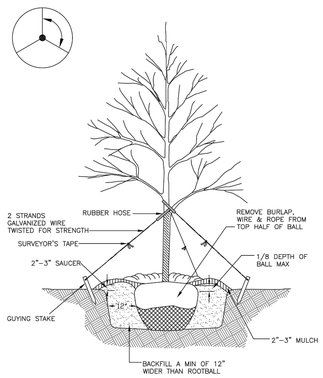
FALMOUTH ELECTION DISTRICT
STAFFORD COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
09/01/2020
PROFESSIONAL ENGINEER
SEAL

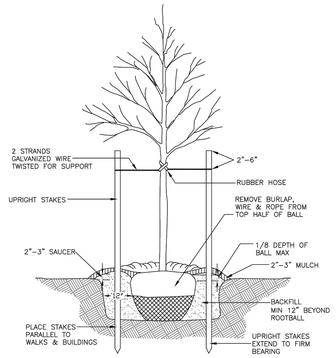
County Plan Number:

Drawn By: SAR
Designed By: SAR
Checked By: RPF
Date: 09/29/2020
Scale: 1"=20'

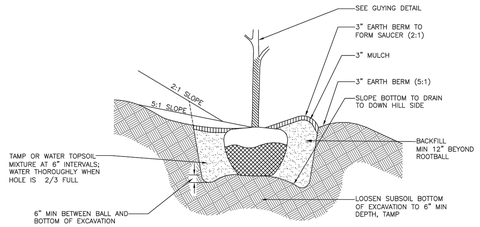
TYPICAL TREE GUYING DETAIL

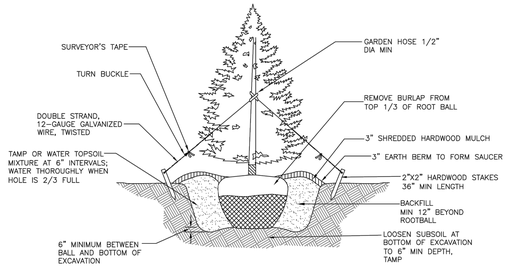


TYPICAL UPRIGHT PLANTING AND STAKING DETAIL

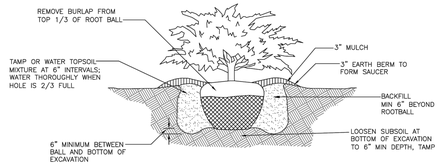


SLOPE PLANTING DETAIL

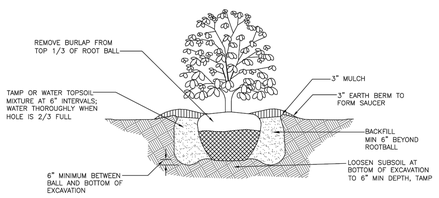




EVERGREEN TREE PLANTING DETAIL



EVERGREEN SHRUB PLANTING DETAIL



DECIDUOUS TREE PLANTING DETAIL

LANDSAPING NOTES

1. CONTRACTOR SHALL FURNISH AND INSTALL ALL PLANTS AS SHOWN ON THE APPROVED LANDSCAPE PLAN, IN ACCORDANCE WITH THE TYPE, SIZES, QUANTITIES, AND SPECIFICATIONS LISTED IN THE PLANT SCHEDULE.
2. TOTAL NUMBER OF PLANTS SHALL BE DRAWN ON THE LANDSCAPE PLAN. IF THE ACTUAL TOTAL IS DIFFERENT FROM THE APPROVED LANDSCAPE PLAN, THE CONTRACTOR SHALL NOTIFY THE OWNER AND/OR OWNERS REPRESENTATIVE AND APPROVED BY THE COUNTY.
3. ALL PLANTS SHALL BE NURSERY GROWN AND SHALL BE HARDY UNDER CLIMATE CONDITIONS IN THE LOCALITY OF THE PROJECT.
4. PLANT DIMENSIONS SHALL BE IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE STANDARDIZED LANDSCAPE SPECIFICATIONS FOR THE COMMONWEALTH OF VIRGINIA, WHICH REFERENCES THE AMERICAN STANDARD FOR NURSERY STOCK (ASNS).
5. BALLED AND BURLAPPED PLANTS SHALL BE DUG WITH FIRM, NATURAL BALLS OF EARTH AND SHALL BE PRUNED, STORED, AND DUG IN ACCORDANCE WITH CURRENT ASNS STANDARDS. NO BALLED AND BURLAPPED PLANTS SHALL BE PLANTED IF THE BALL IS EITHER CRACKED OR BROKEN DURING THE PROCESS OF PLANTING.
6. ALL PLANTS SHALL HAVE A NORMAL HABIT OF GROWTH AND SHALL BE SOUND, HEALTHY, VIGOROUS, WELL ROOTED, AND FREE FROM DISEASE AND INSECT INFESTATION. ANY TREE WITH WEAK, THIN TRUNKS NOT CAPABLE OF SUPPORTING ITSELF WILL NOT BE ACCEPTABLE. THE MINIMUM ACCEPTABLE SIZE OF ALL PLANTS MEASURED BEFORE PRUNING WITH THE BRANCHES IN NORMAL POSITION SHALL CONFORM TO DIMENSIONS AS SHOWN ON THE APPROVED LANDSCAPE PLAN. LARGER PLANTS OF EQUAL QUALITY MAY BE ACCEPTED AT NO ADDITIONAL COST TO THE OWNER.
7. SUBSTITUTION OF PLANTS SHALL NOT BE PERMITTED UNLESS AUTHORIZED BY THE OWNER AND/OR OWNER'S REPRESENTATIVE AND APPROVED BY THE COUNTY.
8. THE CONTRACTOR SHALL LAY OUT, WITH IDENTIFIABLE STAKES, THE LOCATION OF ALL TREES, OUTLINES OF PLANTING BEDS, AND UNDERGROUND UTILITIES AS INDICATED ON THE APPROVED LANDSCAPE PLAN. IN THE EVENT THAT ROCK, UTILITY LINES, OR ANY UNDERGROUND OBSTRUCTIONS ARE ENCOUNTERED DURING THESE OPERATIONS, OR IN THE EXCAVATION OF ANY PLANT PITS, ALTERNATE LOCATIONS MAY BE SELECTED BY THE OWNER AND/OR OWNER'S REPRESENTATIVE AND APPROVED BY COUNTY WITH NO ADDITIONAL COST TO THE OWNER.
9. PLANTING SOIL SHALL BE NATIVE TOPSOIL.
10. MULCH SHALL BE APPLIED IMMEDIATELY AFTER PLANTING OPERATIONS. MULCH SHALL BE STRAW BALE OR HAY BALE; FREE OF DEBRIS, WEEDS, SPORES OR OTHER FOREIGN MATERIAL, WELL ROTTED AND OF SUCH CHARACTER AS TO NOT BE EASILY REMOVED BY THE ELEMENTS.
11. PRIOR TO INSTALLATION, THE CONTRACTOR SHALL NOTIFY THE OWNER AND/OR OWNERS REPRESENTATIVE OF ALL SOIL OR DRAINAGE CONDITIONS THAT ARE DETRIMENTAL TO THE GROWTH OF PLANTS. THE CONTRACTOR SHALL STATE THE CONDITIONS AND SUBMIT A PROPOSAL, IN WRITING, CORRECTING THE CONDITIONS, INCLUDING ANY CHANGE IN COST, FOR REVIEW AND ACCEPTANCE BY THE OWNER.
12. A CONTAINER GROWN PLANT SHALL BE DEFINED AS A PLANT TRANSPLANTED INTO A CONTAINER AND GROWN IN THAT CONTAINER SUFFICIENTLY LONG FOR THE NEW FIBROUS ROOTS TO HAVE DEVELOPED SO THAT THE CONTAINER MASS WILL RETAIN ITS SHAPE AND HOLD TOGETHER WHEN REMOVED FROM THE CONTAINER. ALL CONTAINER GROWN PLANTS SHALL BE SOUND, HEALTHY, VIGOROUS, WELL ROOTED, FREE FROM DISEASE AND INSECT INFESTATION, AND ESTABLISHED IN THE CONTAINER IN WHICH THEY ARE SOLD. THEY SHALL HAVE TOPS THAT ARE OF GOOD QUALITY AND ARE IN HEALTHY CONDITION. NO ROOT BOUND CONTAINER GROWN PLANTS WILL BE PERMITTED. NO CONTAINER GROWN PLANT SHALL BE PLANTED IF THE ROOT MASS IS BROKEN EITHER BEFORE OR DURING THE PROCESS OF PLANTING.
13. ALL PLANT PITS SHALL BE CIRCULAR IN OUTLINE. ALL EXCAVATIONS SHALL HAVE VERTICAL SIDES. THE DEPTHS AND WIDTHS FOR EXCAVATION OF PLANT PITS SHALL BE THE DEPTHS AND WIDTHS AS SPECIFIED IN THE LANDSCAPE PLAN. LOOSEN SUBGRADE 6"BELOW BOTTOM OF THE PIT. SUBGRADE SOILS SHALL BE SEPARATED FROM THE UPPER TOPSOIL PORTIONS AND REMOVED IMMEDIATELY WHEREVER ENCOUNTERED DURING PLANTING OPERATIONS. EXCESS SOILS SHALL BE REMOVED AND LEGALLY DISPOSED.
14. IN GENERAL, SET PLANTS AT SAME RELATION TO FINISHED GRADE AS THE BORE TO THE GROUND FROM WHICH THEY WERE DUG. PREPARE PLANTING PITS AS SPECIFIED AND AS SHOWN ON THE LANDSCAPE PLAN, PRIOR TO INSERTING PLANTS. USE TOPSOIL MIXTURE TO BACKFILL APPROXIMATELY 2/3 FULL. WATER THOROUGHLY BEFORE INSTALLING REMAINDER OF THE SOIL TO THE TOP OF THE PIT. SET TREES PLUMB AND BRACE RIGIDLY IN POSITION UNTIL THE PLANTING SOIL HAS BEEN TAMPED SOLIDLY AROUND THE BALL AND THE ROOTS.
15. GUYING AND STAKING SHALL BE REQUIRED FOR ALL TREES IN ACCORDANCE WITH THE LANDSCAPE PLAN AND MUST BE COMPLETED WITHIN 24 HOURS AFTER PLANTING.
16. MAINTENANCE OF NEW PLANTS SHALL CONSIST OF PRUNING, WATERING, CULTIVATING, WEEDING, MULCHING, TIGHTENING, AND RESETTING PLANTS TO PROPER GRADES OR UPRIGHT POSITION. RESTORATION OF THE PLANTING SAUCER AND FURNISHING AND APPLYING SUCH SPRAYS ARE NECESSARY TO KEEP THE PLANT FREE FROM DISEASE AND INSECT INFESTATION. MAINTENANCE SHALL BE PROVIDED UNTIL TIME OF PROVISIONAL ACCEPTANCE.
17. PLANTINGS AND PLANTING AREAS SHALL BE PROTECTED AT ALL TIMES AGAINST TRESPASSING AND DAMAGE OF ANY KIND FOR THE DURATION OF THE MAINTENANCE PERIOD. IF ANY PLANTS BECOME DAMAGED, THEY SHALL BE TREATED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. NO WORK SHALL BE DONE WITHIN, ADJACENT TO, OR OVER ANY PLANT OR PLANTING AREA WITHOUT PROPER SAFEGUARDS AND PROTECTION.
18. ALL PLANTS SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR FROM THE DATE OF PROVISIONAL ACCEPTANCE. THE CONTRACTOR SHALL PROVIDE, IN WRITING, SPECIFIC MAINTENANCE RECOMMENDATIONS TO THE OWNER FOR ALL PLANTS TO REMAIN IN GOOD, HEALTHY, AND FLOURISHING CONDITION.
19. FOR PLANTS THAT HAVE BEEN PROPERLY MAINTAINED BY THE OWNER DURING THE ONE-YEAR GUARANTEE PERIOD, THE CONTRACTOR SHALL REPLACE, WITHOUT COST TO THE OWNER, ALL DEAD OR SEVERELY DAMAGED PLANTS AS DETERMINED BY A CERTIFIED AGENT. THE REPLACEMENT PLANTS SHALL BE SOUND, HEALTHY, VIGOROUS, WELL ROOTED, FREE FROM DISEASE AND INSECT INFESTATION, AND SHALL CLOSELY MATCH SURROUNDING PLANTS OF THE SAME SIZE AND SPECIES. REQUIREMENTS SHALL BE SUBJECT TO ALL REQUIREMENTS STATED IN THIS SPECIFICATION.
20. THE GUARANTEE OF ALL REPLACEMENT PLANTS SHALL EXTEND FOR AN ADDITIONAL PERIOD OF ONE YEAR FROM THE DATE OF THEIR ACCEPTANCE AFTER REPLACEMENT. IN THE EVENT THAT A REPLACEMENT IS NOT ACCEPTABLE DURING OR AT THE END OF THE SAID EXTENDED GUARANTEE PERIOD, THE OWNER MAY ELECT A SUBSTITUTION OR A CREDIT FOR EACH ITEM.
21. NO PLANTS SHALL IMPEDE THE SIGHT DISTANCE FOR INGRESS & EGRESS TO THE SITE.
22. PERFORMANCE BOND MAY BE REQUIRED BY STAFFORD COUNTY [ORD. 28-86(C)(5)].

Freeland Engineering, PC
rfreeland@FreelandEngineeringPC.com
10814 Courthouse Road
Fredericksburg, Virginia 22408
Phone: 540.898.3092
Fax: 877.658.7735
www.FreelandEngineeringPC.com

DATE	REVISION

LANDSCAPING NOTES & DETAILS

SOUTH RIDGE CHURCH

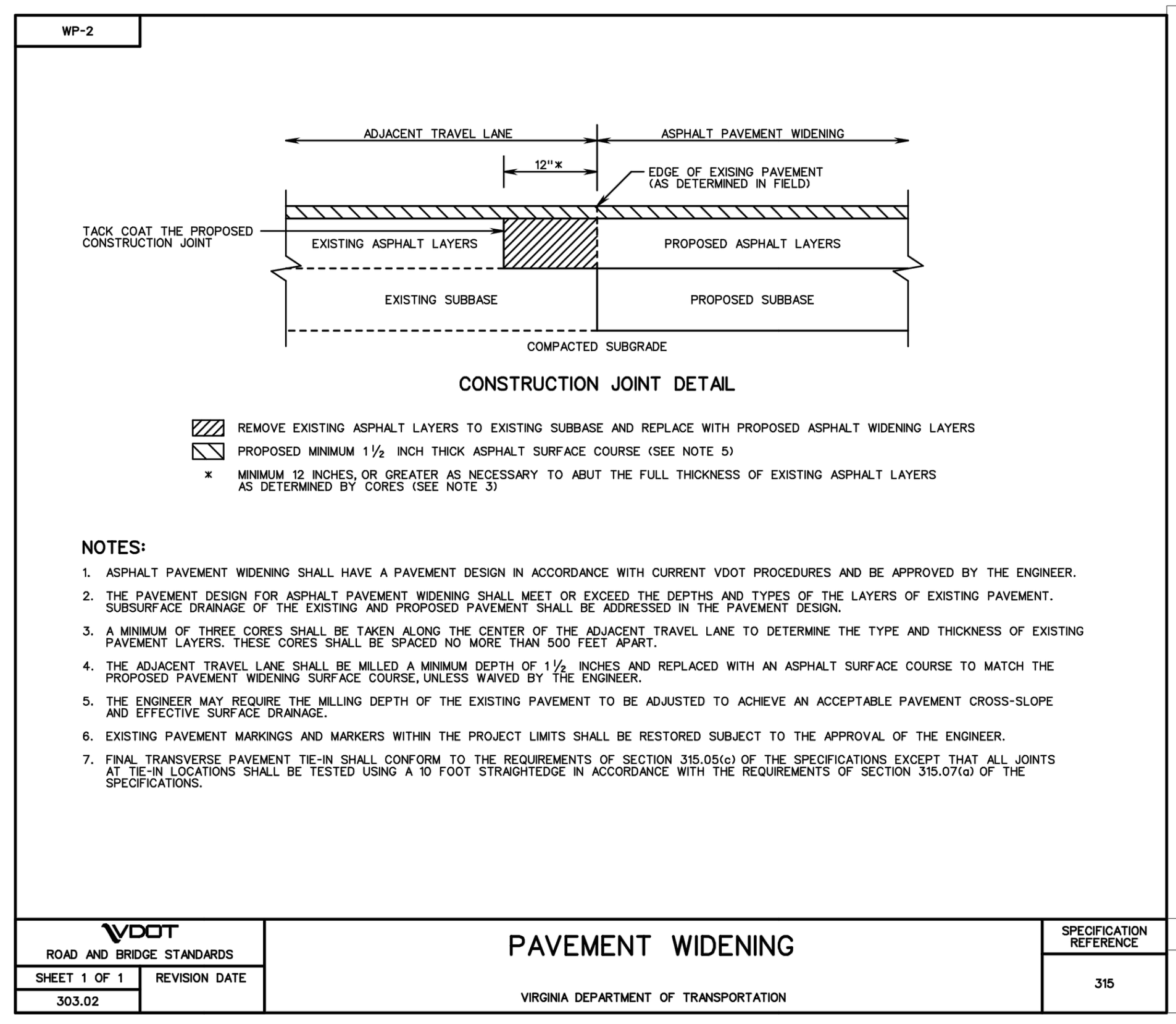
FALMOUTH ELECTION DISTRICT
STAFFORD COUNTY, VIRGINIA

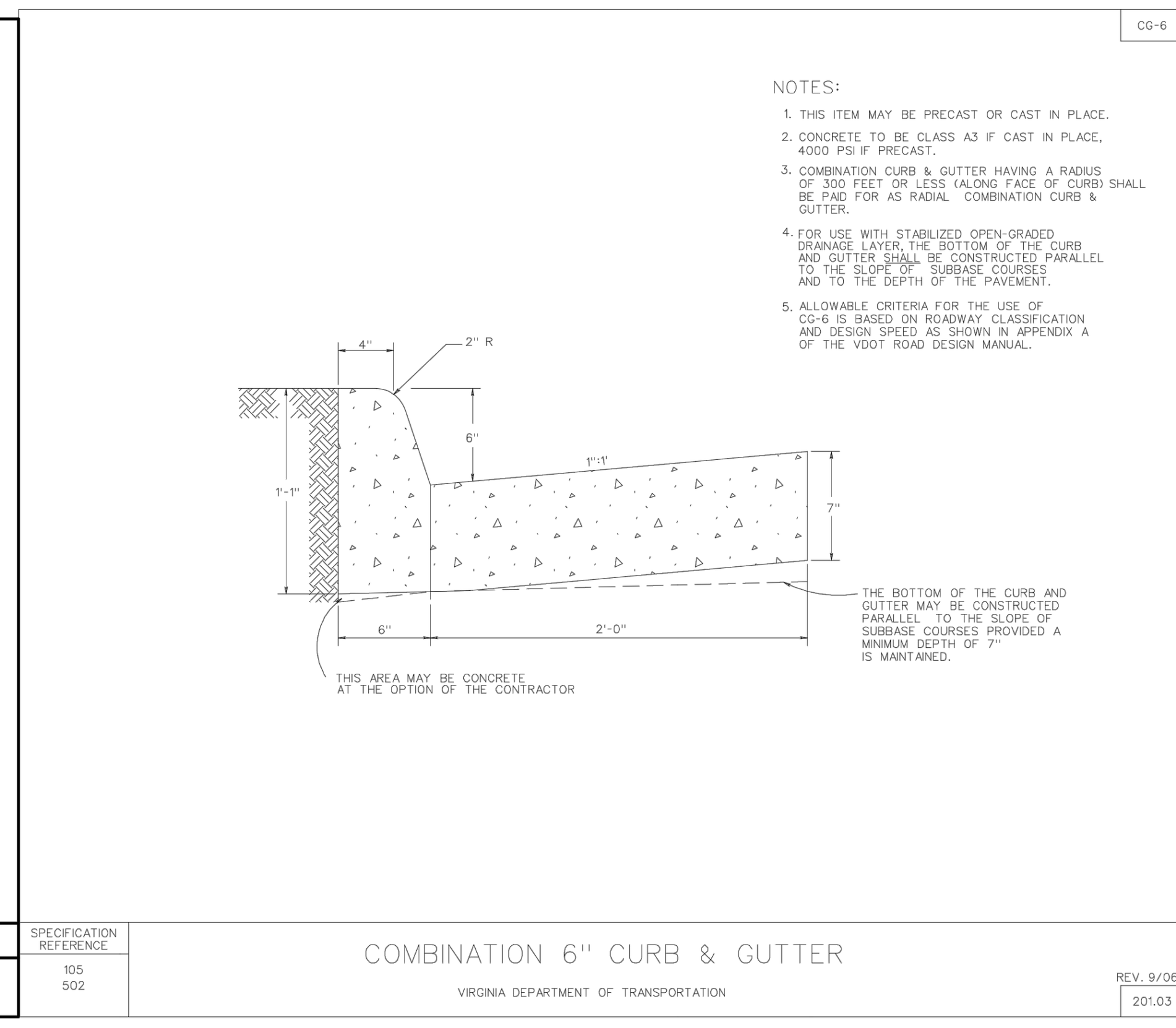
COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
09/29/2020
PROFESSIONAL ENGINEER
SEAL

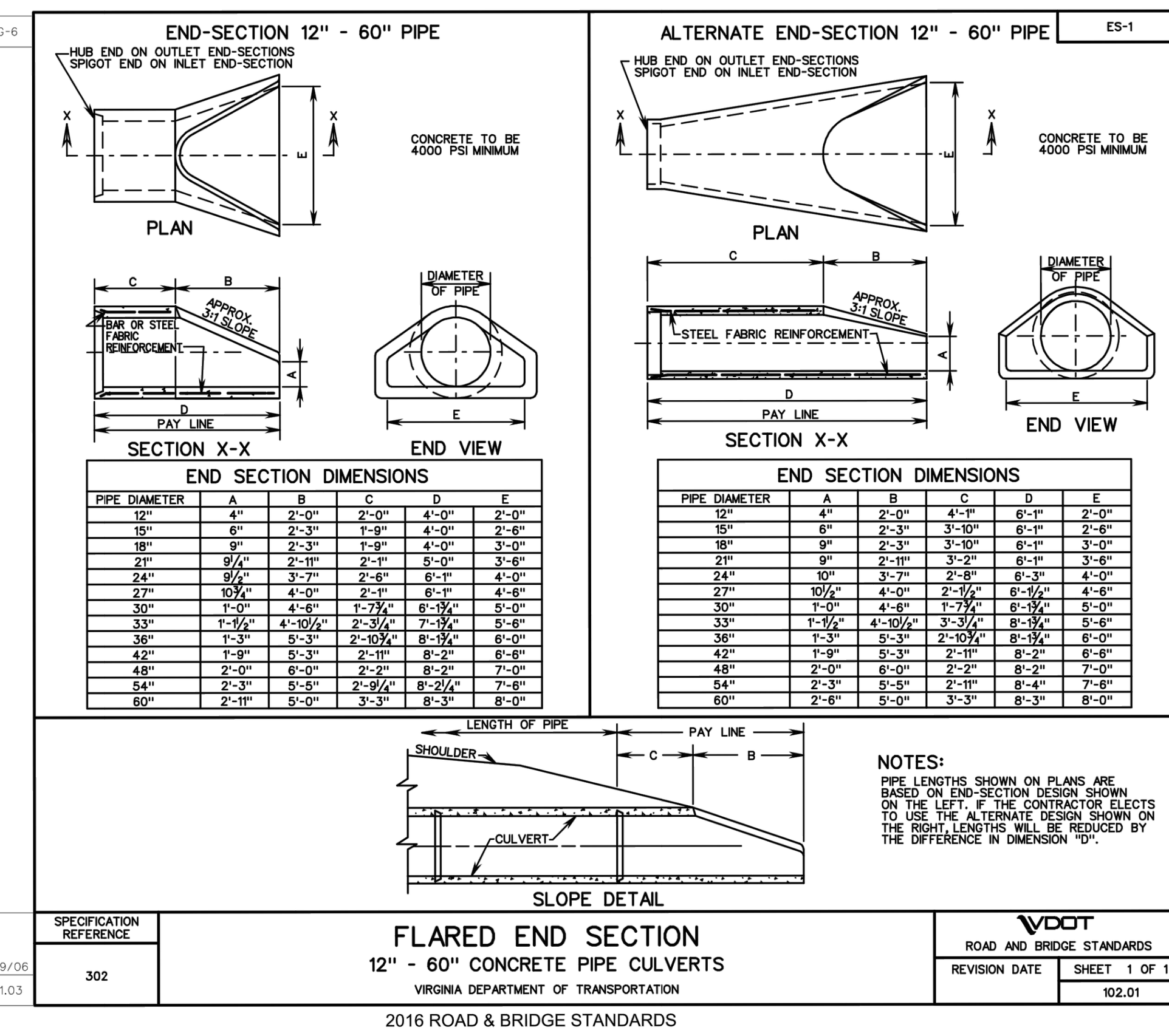
County Plan Number:

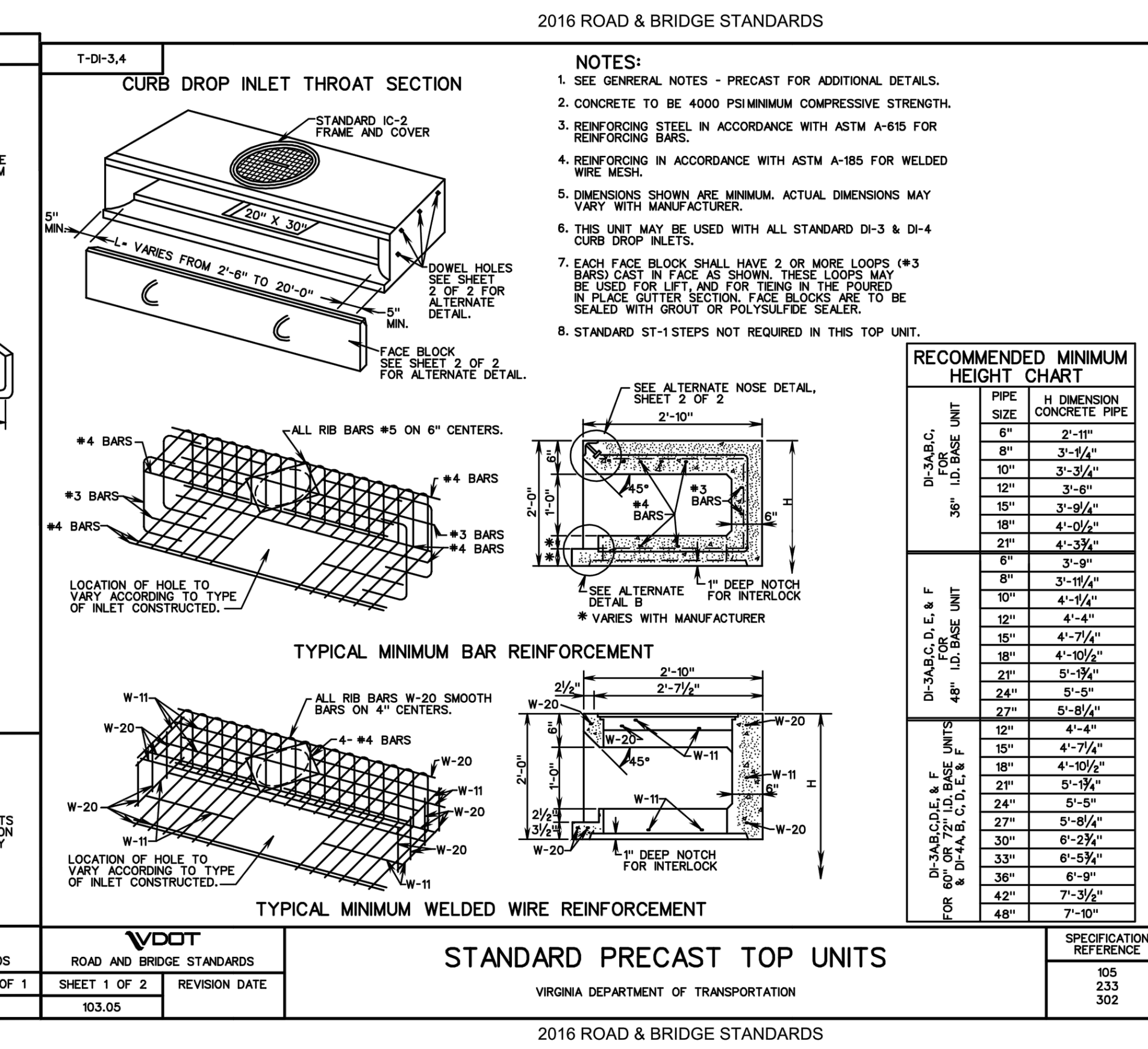
Drawn By:	SAR
Designed By:	SAR
Checked By:	RPF
Date:	09/29/2020
Scale:	NTS

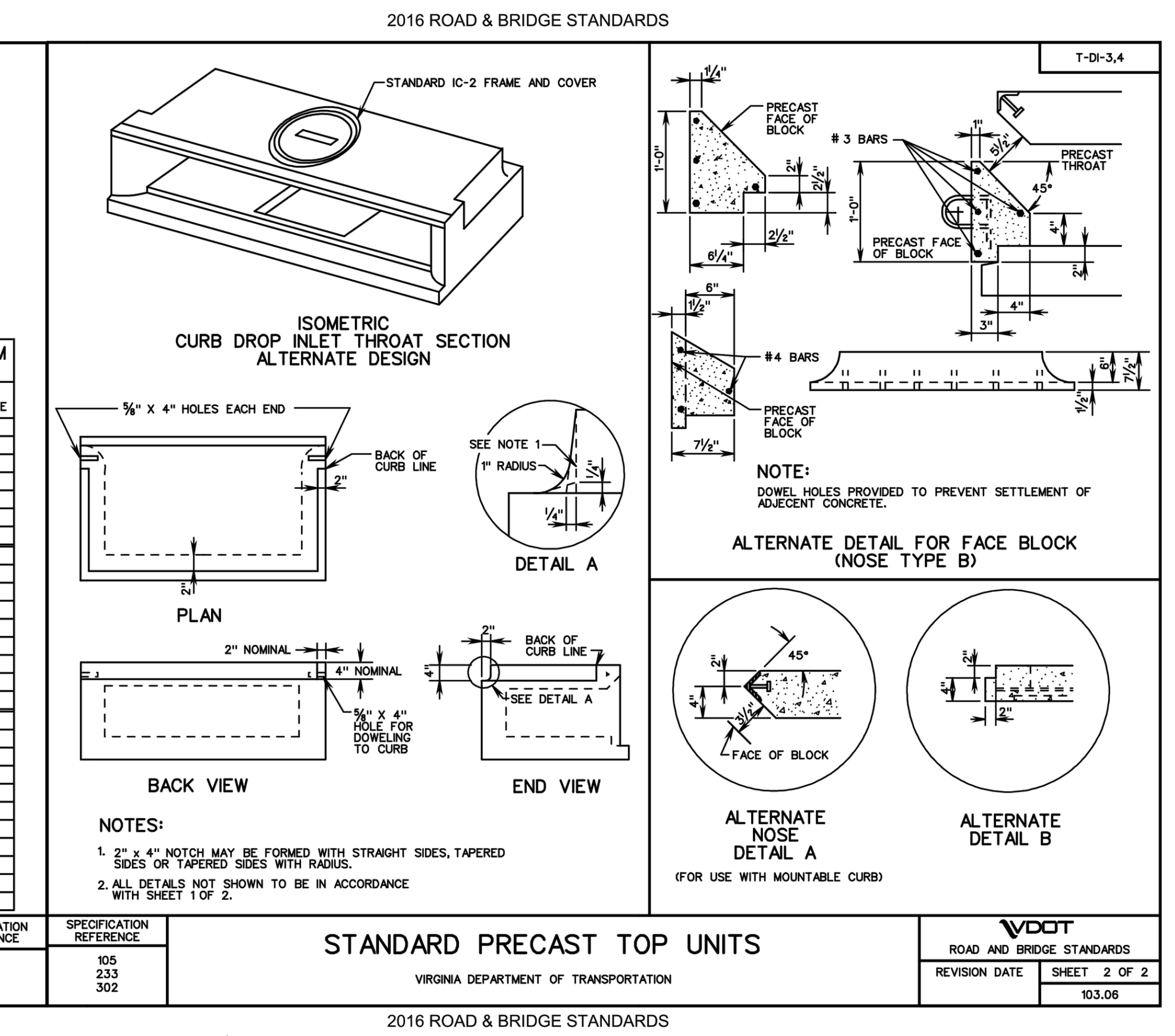
Sheet: 18 of 20
PROJECT # 4762

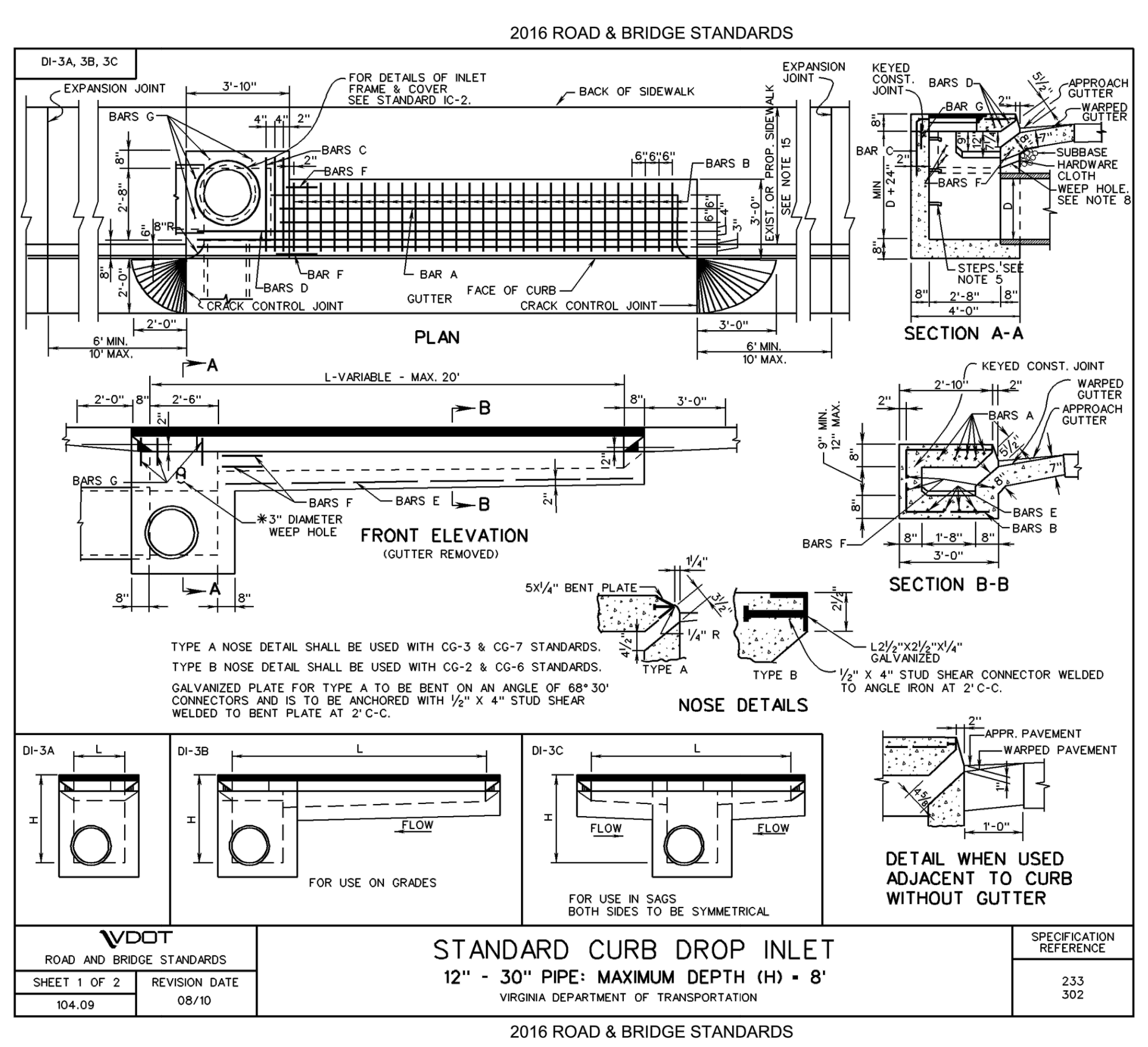


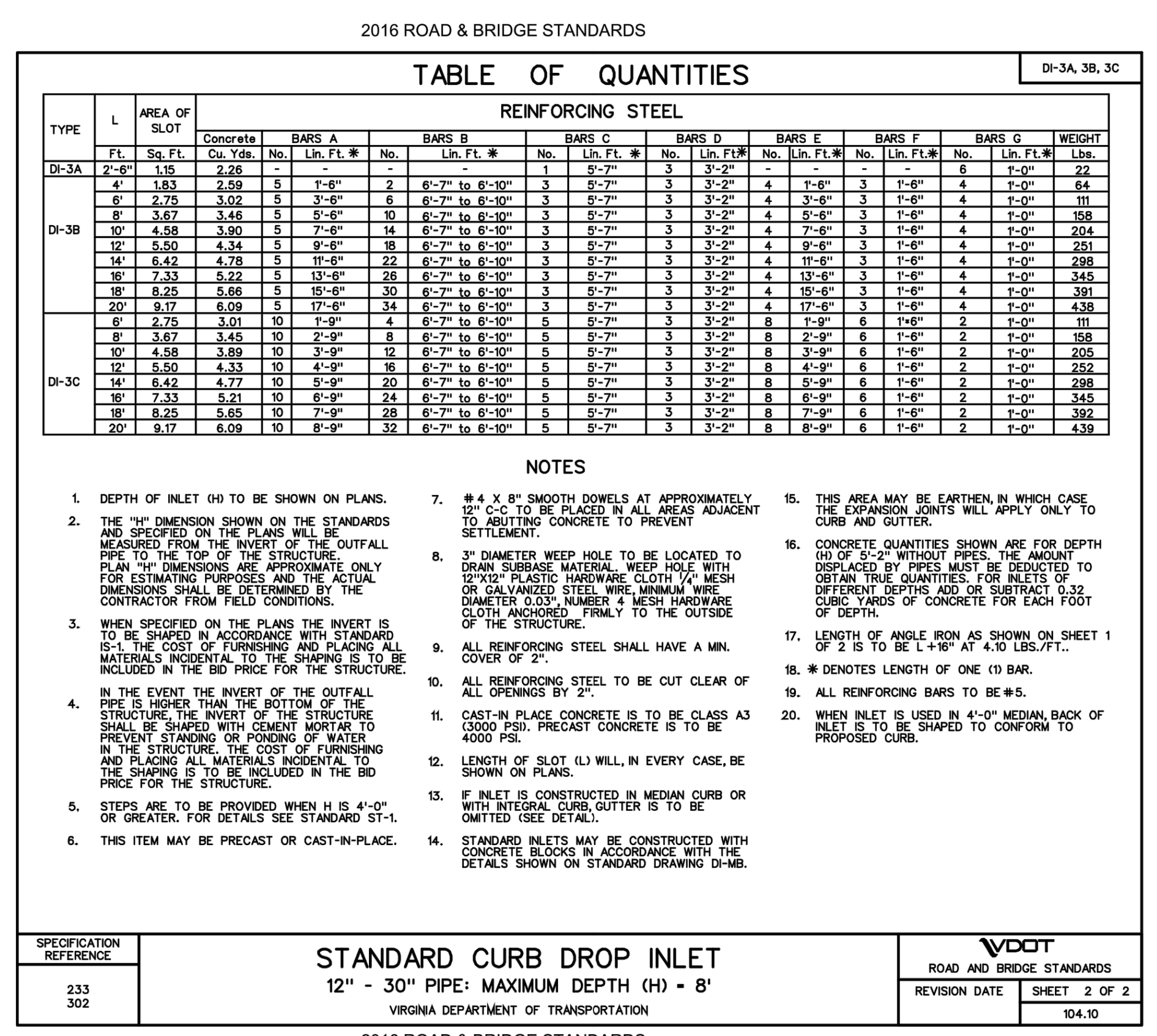


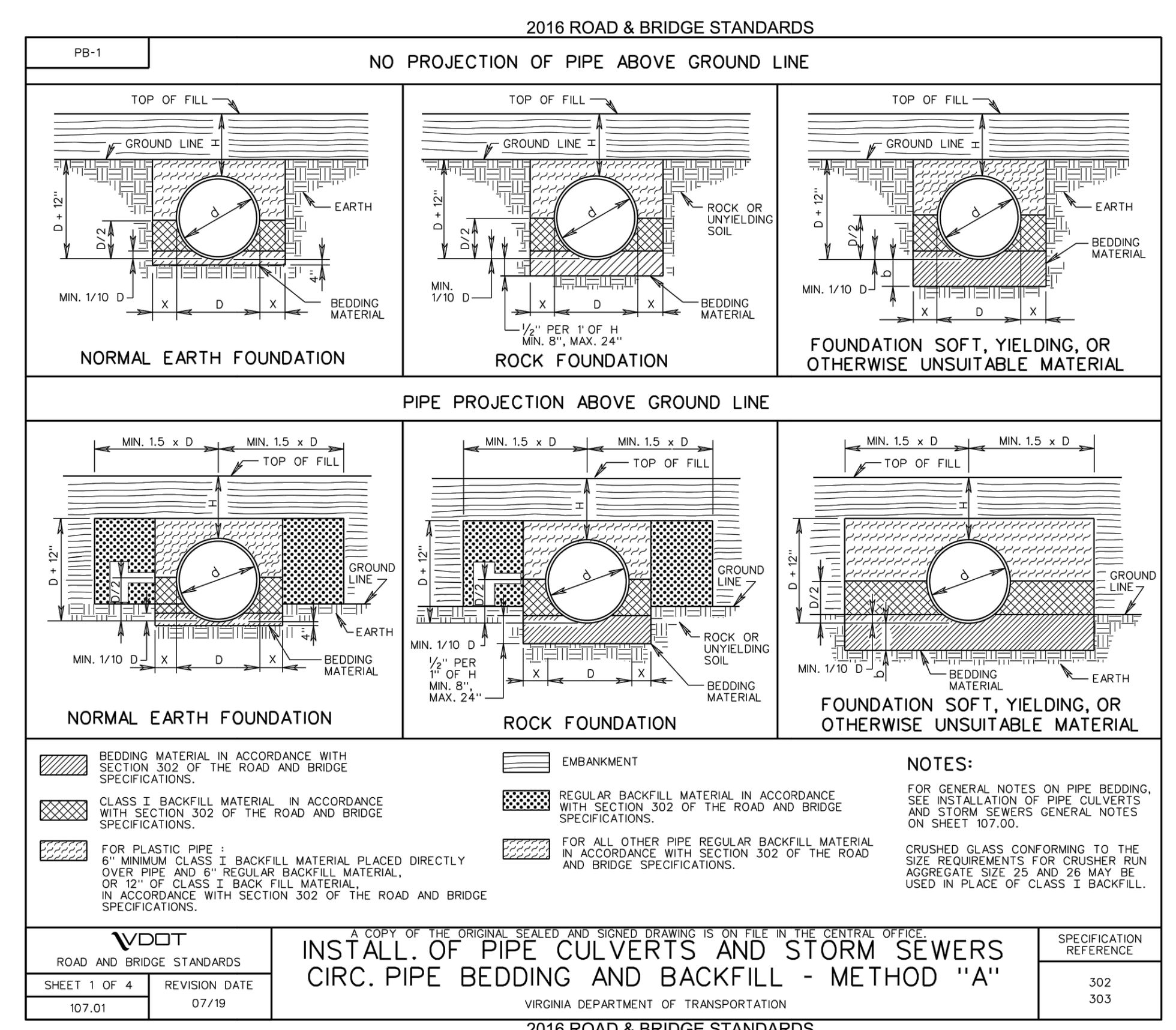


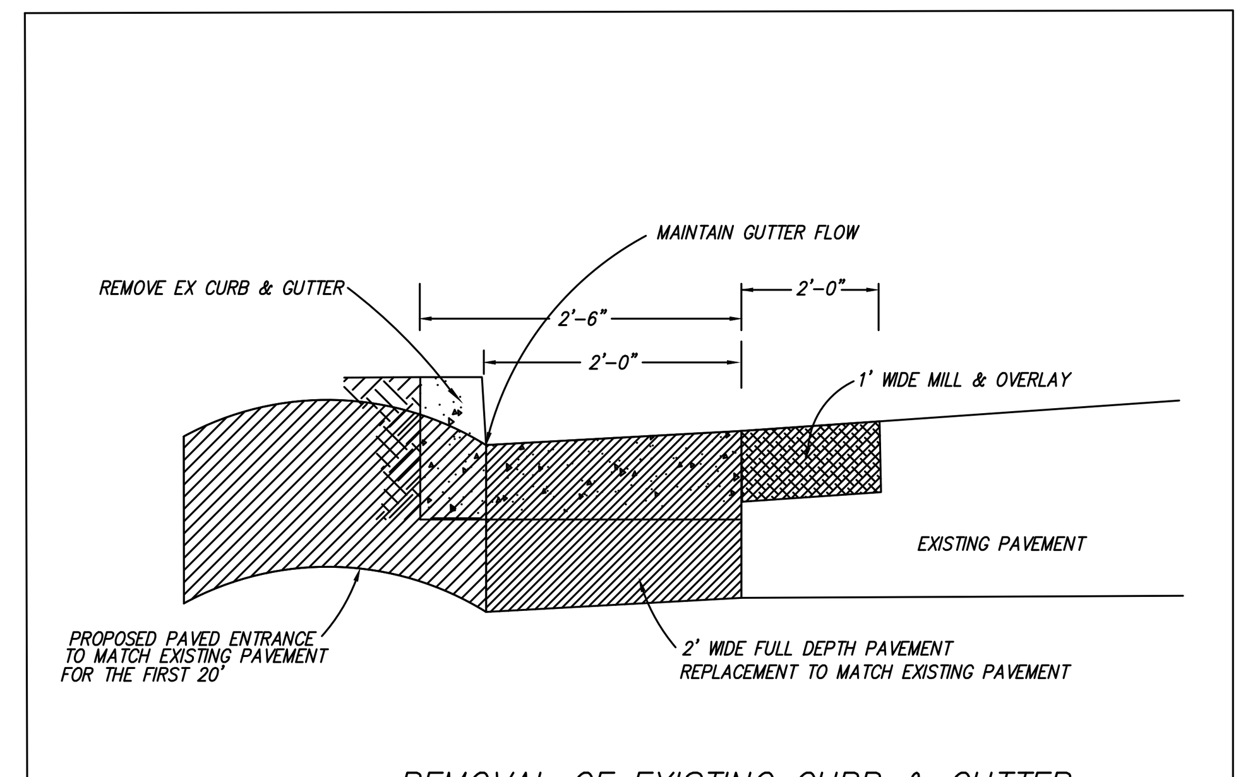












REMOVAL OF EXISTING CURB & GUTTER & PAVEMENT REPLACEMENT N.T.S.

WATER METER SIZING FORM
STAFFORD COUNTY, VIRGINIA DEPARTMENT OF UTILITIES
(P) 540-658-8616 (F) 540-658-4599

Project Name: SOUTH RIDGE CHURCH	Project Address: 2020 INTERNATIONAL PARKWAY FREDERICKSBURG, VA 22406
Project Engineer: RAYMOND P. FREELAND, PE — Tax Parcel:	Site Plan/Project Number: RAYMOND P. FREELAND, PE
Form Completed By: RAYMOND P. FREELAND, PE Address: 10814 COURTHOUSE ROAD FREDERICKSBURG VA 22408	Company: FREELAND ENGINEERING PC Telephone: 540-898-3092 Fax: 877-658-7735 Email: rfreeland@freelandengineeringpc.com

I certify that the information on this form is true and correct.

Owner Name (Print) JEFF GEYER Telephone: 469-713-7970

Signature: Jeff Geyer Date: 10-02-2020

Email: jeff.geyer@southridge.us

Failure to return this form will delay processing of your permit application. This form is provided as a means to properly size the water meter(s) serving your property. Please complete this form and fax or email it to attention of:

Aref Etemadi at aetemadi@staffordcountyva.gov or
Claudia Wright at cwright@staffordcountyva.gov

Utilities Department staff will review the form to determine the adequacy of the water meter for the intended use.

A separate form is required for each individual building or space in a building served by a single water meter.

Fill out either Part A or B

For part A enter the number of fixtures. Multiply by the fixture value @ 35psi and enter the result in the fixture valve columns. Sum the results and enter on the combined fixture valve total.

Appendix 1

Part A

Fixture		Fixture Value @ 35 psi		No. of Fixtures		Fixture Value
Bathtub		8	x		=	
Bedpan Washers		10	x		=	
Combination Sink and Tray		3	x		=	
Dental Unit		1	x		=	
Dental Lavatory		2	x		=	
Drinking Fountain	Cooler	1	x		=	
	Public	2	x	2	=	4
Kitchen Sink	½" Connection	3	x	4	=	12
	¾" Connection	7	x		=	
Lavatory	⅜" Connection	2	x	9	=	18
	½" Connection	4	x		=	
Laundry Tray	½" Connection	3	x		=	
	¾" Connection	7	x		=	
Shower Head (Shower Only)		4	x		=	
Service Sink	½" Connection	3	x		=	
	¾" Connection	7	x		=	
Urinal	-Pedestal Flush Valve	35	x		=	
	-Wall Flush Valve	12	x		=	
	-Trough (2 Ft. Unit)	2	x	2	=	4
Wash Sink (Each Set of Faucets)		4	x		=	
Water Closet	Flush Valve	35	x	10	=	350
	Tank Type	3	x		=	
Dishwasher	½" Connection	5	x		=	
	¾" Connection	10	x		=	
Washing Machine	½" Connection	5	x	1	=	5
	¾" Connection	12	x		=	
	1" Connection	25	x		=	
Hose Connection (Wash Down)	½"	6	x		=	
	¾"	10	x		=	
Hose (50 Ft. Wash Down)	½"	6	x		=	
	⅝"	9	x		=	
	¾"	12	x		=	

Combined Fixture Value Total = 393

OR

Part B

(1) Domestic Demand (Verification by County Staff) = ________ gpm

(2) Fixed Load = ________ gpm

(3) Irrigation Demand (From Data Supplied by Site Engineer) = ________ gpm

(4) Total Demand = ________ gpm

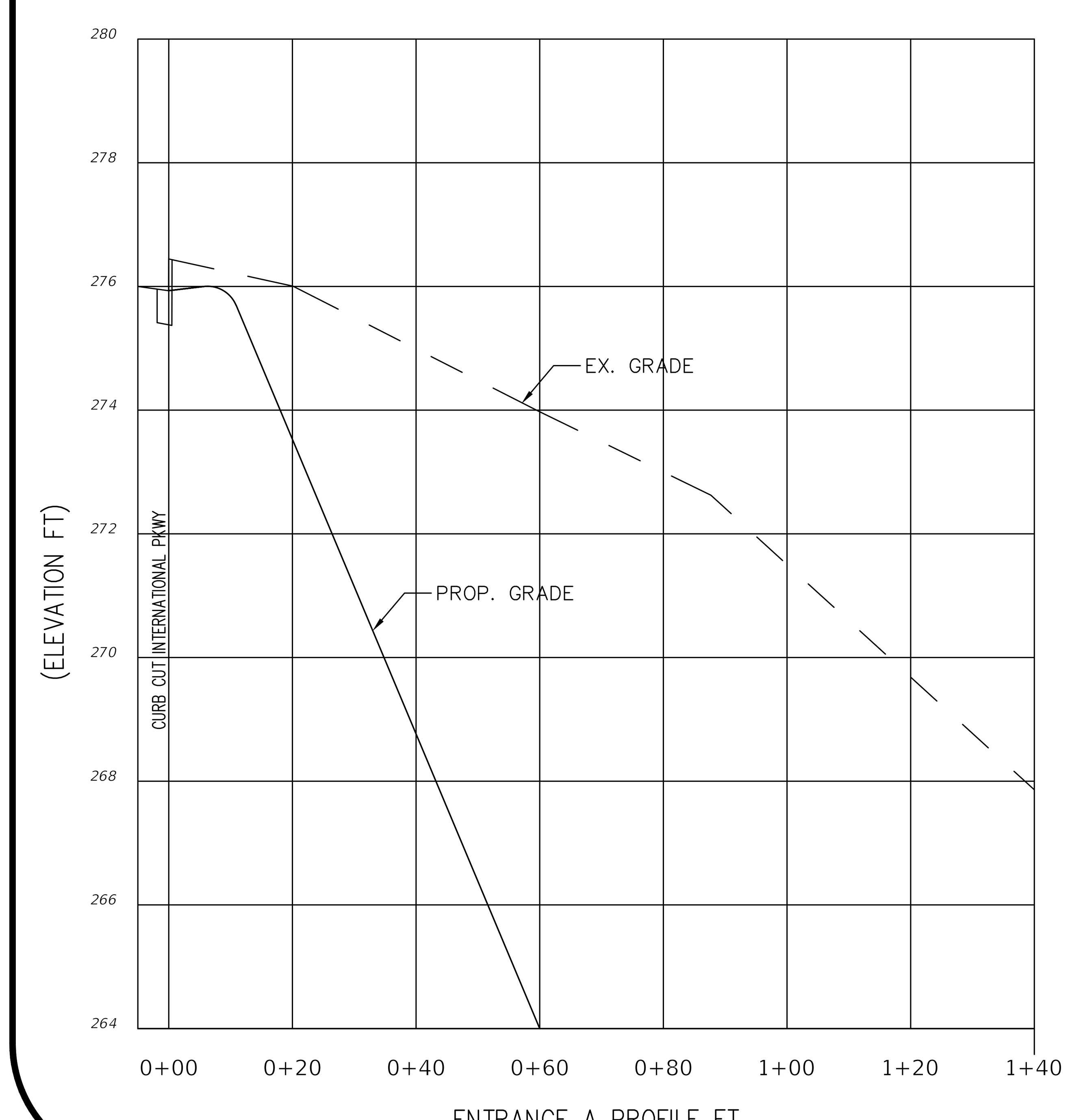
(5) Meter Size based on Total Demand (Verification by County Staff) ________

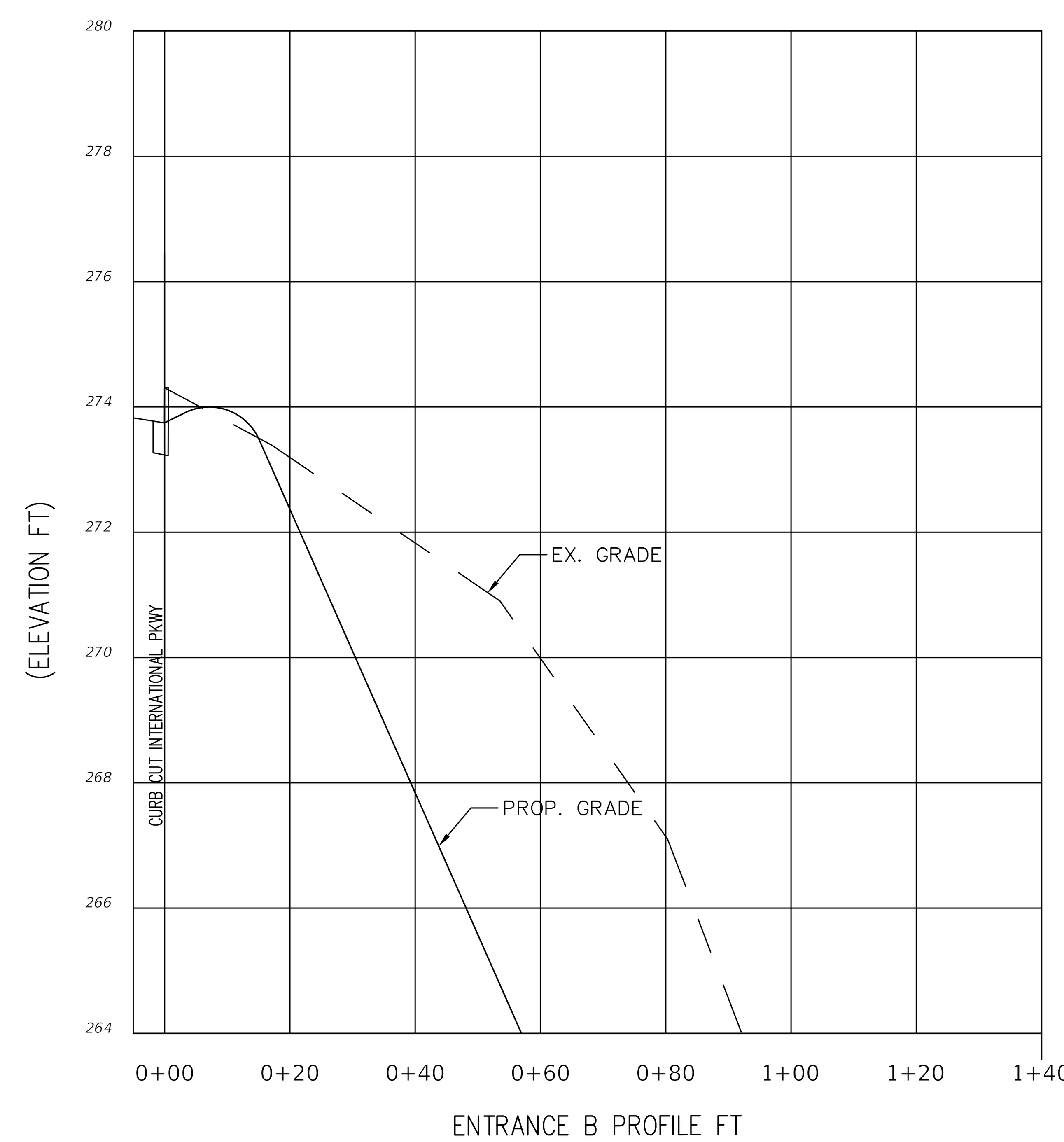
COUNTY USE ONLY:

Ex Meter Size ________ Account ________ Required Meter Size ________

Sized By: ________ Date ________

Appendix 1





E&S AND SWM FACILITY BOND ESTIMATE:

ITEM	QUANTITY	COST/ITEM	COST
SUPER SILT FENCE	500 FT	$16/FT	$8,000.00
CONST. ENTRANCE	EACH	$3,337	$3,337.00
OUTLET PROTECTION	8'X5'X2'	$75/SY	$700.0.00
BLANKET & MATTTING	2,000SY	$2/SY	$4,000.00
		SUB	$16,037.00
TOTAL BOND EST. = SUB + 25%			$20,046.00

WASTE STREAM CALCULATIONS

STEP 1:

USE	FLOOR AREA (SQUARE FEET)	ANNUAL WASTE GENERATION RATE (TONS/SQ FT)	ANNUAL WASTE GENERATION RATE (TONS)
CHURCH	10,935 S.F. x	0.0013	= 14.20 TONS

SANITARY SEWER CONSTRUCTION NOTES:

1. ALL SEWER PIPE AND FITTINGS 4" THROUGH 15" DIAMETER SHALL MEET ASTM D3034, SDR 35, MINIMUM. ALL SEWER PIPE AND FITTINGS 18" THROUGH 40" DIAMETER, SHALL MEET ASTM F679.
2. ALL SEWER LINES UNDER PAVEMENT SHALL HAVE A MINIMUM OF 48" COVER. ALL SEWER LINES INSTALLED IN EASEMENTS WITH NO VEHICULAR TRAFFIC SHALL HAVE A MINIMUM OF 36" COVER.
3. A CLEANOUT COVER ASSEMBLY IN CONFORMANCE WITH DETAIL 3.3.3–3A OR 3.3.3–3B SHALL BE INSTALLED ON EACH SEWER LATERAL CLEANOUT.
4. THERE SHALL BE A 10' HORIZONTAL SEPARATION BETWEEN WATER LINES AND SEWER LINES, AND A VERTICAL SEPARATION OF 18" BETWEEN THE BOTTOM OF THE WATER MAIN AND THE TOP OF THE SEWER. THIS APPLIES TO HOUSE SEWER LATERALS ALSO.
5. ALL WATERLINE AND SEWER SELECT BACKFILL, STRUCTURAL BACKFILL, AND PIPE BEDDING MATERIAL SHALL BE COMPACTED TO 95% VTM–1 MAXIMUM DRY DENSITY. ALL CONTROLLED FILL IN TRENCHES UNDER PAVEMENT SHALL BE COMPACTED TO 95% VTM–1 MAXIMUM DRY DENSITY.
6. WATER AND SANITARY SEWER DESIGN ELEMENTS, DETAILS AND PRODUCTS SHOWN ON THIS PLAN ARE VALID FOR A PERIOD OF 12 MONTHS AFTER PLAN APPROVAL, AFTER WHICH TIME CURRENT WATER AND SEWER STANDARDS WILL APPLY.
7. WATER AND SANITARY SEWER INFRASTRUCTURE IS SUBJECT TO COMPREHENSIVE INSPECTION AT TENTATIVE ACCEPTANCE, 12 MONTH ANNIVERSARY, AND FINAL ACCEPTANCE.

REVISION | DATE

Freeland Engineering, PC
rfreeland@FreelandEngineeringPC.com
10814 Courthouse Road
Fredericksburg, Virginia 22408
Phone: 540.898.3092
Fax: 877.658.7735
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NOTES & DETAILS
SOUTH RIDGE CHURCH
FALMOUTH ELECTION DISTRICT
STAFFORD COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
09/29/2020
PROFESSIONAL ENGINEER
SEAL

County Plan Number:

Drawn By:	SAR
Designed By:	SAR
Checked By:	RPF
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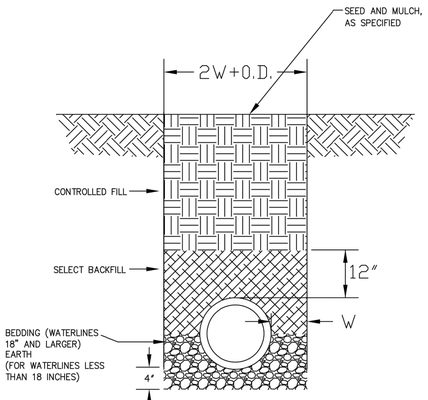
Sheet:	19 of 20

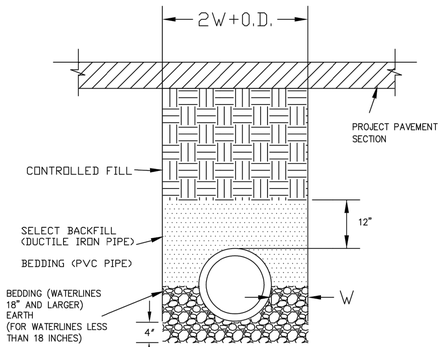
PROJECT # 4762



NOTES:
1. DIMENSION "W" SHALL BE A MINIMUM OF 6 INCHES AND A MAXIMUM OF 12 INCHES.
2. CONTROLLED FILL TO EXTEND TO GRADE.
3. SELECT BACKFILL TO EXTEND 12 INCHES OVER CROWN OF DUCTILE IRON PIPE AND PVC PIPE SMALLER THAN 18 INCHES.
4. BEDDING TO EXTEND 12" OVER CROWN OF PVC PIPE, 18"AND LARGER.
5. BEDDING SHALL BE PLACED FOR A MINIMUM OF 4" BELOW BOTTOM OF PIPE TO THE SPRING LINE OF THE PIPE, 18"AND LARGER.
6. ALL PIPES SMALLER THAN 18 INCHES SHALL BE IN HANDSHAPED UNDISTURBED OR RECOMMENDED EARTH TO THE SPRING LINE. REMOVE ROCKS & STONES A MIN. OF 6-INCHES BELOW WATER MAIN.
7. ANY OVEREXCAVATION TO BE BACKFILLED WITH SELECT BACKFILL.
8. ALL PIPE SHALL BE MARKED WITH TRACER WIRE ATTACHED TO THE PIPE AND 3-INCH MARKING TAPE, 2-INCHES ABOVE THE PIPE.
9. REFER TO WATER AND SEWER DESIGN AND CONSTRUCTION STANDARDS AND/OR PROJECT SPECIFICATIONS FOR MATERIALS AND COMPACTION REQUIREMENTS.

SEPT 2016 | 1.5.2-2

STAFFORD COUNTY DEPARTMENT OF UTILITIES | TRENCH FOR WATERLINES AND FORCE MAINS IN NON-PAVED AREAS



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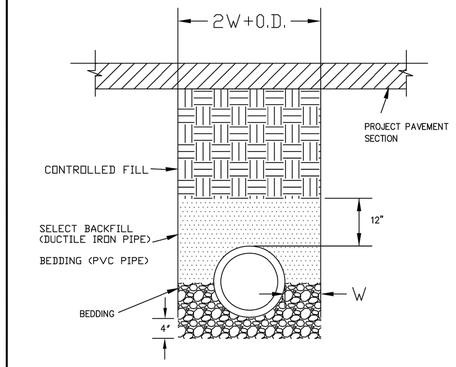
3. SELECT BACKFILL TO EXTEND 12 INCHES OVER CROWN OF DUCTILE IRON PIPE AND PVC PIPE SMALLER THAN 18 INCHES.
4. BEDDING TO EXTEND 12" OVER CROWN OF PVC PIPE, 18"AND LARGER.
5. BEDDING SHALL BE PLACED FOR A MINIMUM OF 4" BELOW BOTTOM OF PIPE TO THE SPRING LINE OF THE PIPE, 18"AND LARGER.
6. ALL PIPES SMALLER THAN 18 INCHES SHALL BE IN HANDSHAPED UNDISTURBED OR RECOMMENDED EARTH TO THE SPRING LINE.
7. ANY OVEREXCAVATION TO BE BACKFILLED WITH SELECT BACKFILL.
8. ALL PIPE SHALL BE MARKED WITH TRACER WIRE ATTACHED TO THE PIPE AND 3-INCH MARKING TAPE, 2-INCHES ABOVE THE PIPE.
9. REFER TO WATER AND SEWER DESIGN AND CONSTRUCTION STANDARDS AND/OR PROJECT SPECIFICATIONS FOR MATERIALS AND COMPACTION REQUIREMENTS.

SEPT 2016 | 1.5.2-3

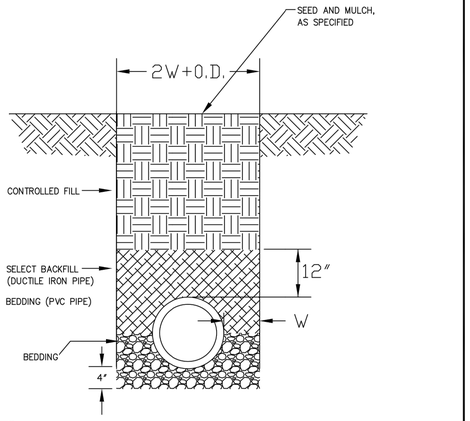
STAFFORD COUNTY DEPARTMENT OF UTILITIES | TRENCH FOR WATERLINES AND FORCE MAINS BENEATH PAVEMENT



NOTES:
1. DIMENSION "W" SHALL BE A MINIMUM OF 6 INCHES AND A MAXIMUM OF 12 INCHES.
2. CONTROLLED FILL TO EXTEND TO GRADE.
3. SELECT BACKFILL TO EXTEND 12 INCHES OVER CROWN OF DUCTILE IRON PIPE.
4. BEDDING TO EXTEND 12" OVER CROWN OF PVC PIPE.
5. BEDDING SHALL BE PLACED FOR A MINIMUM OF 4" BELOW BOTTOM OF PIPE TO THE SPRING LINE OF THE PIPE, 18"AND LARGER.
6. ANY OVEREXCAVATION TO BE BACKFILLED WITH SELECT BACKFILL.
7. REFER TO WATER AND SEWER DESIGN AND CONSTRUCTION STANDARDS AND/OR PROJECT SPECIFICATIONS FOR MATERIALS AND COMPACTION REQUIREMENTS.

OCTOBER 2015 | 1.5.2-6

STAFFORD COUNTY DEPARTMENT OF UTILITIES | TRENCH FOR SEWERS BENEATH PAVEMENT



NOTES:
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2. CONTROLLED FILL TO EXTEND TO GRADE.
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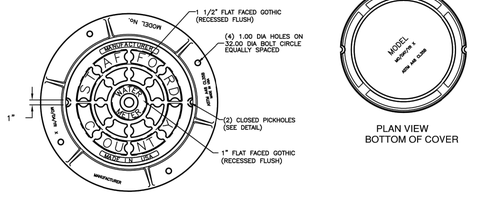
6. ANY OVEREXCAVATION TO BE BACKFILLED WITH SELECT BACKFILL.
7. REFER TO WATER AND SEWER DESIGN AND CONSTRUCTION STANDARDS AND/OR PROJECT SPECIFICATIONS FOR MATERIALS AND COMPACTION REQUIREMENTS.

OCTOBER 2015 | 1.5.2-5

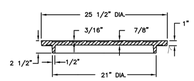
STAFFORD COUNTY DEPARTMENT OF UTILITIES | TRENCH FOR SEWERS IN NON-PAVED AREAS



PLAN VIEW TOP

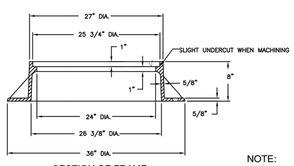
PLAN VIEW
BOTTOM OF COVER

WEIGHT: FRAME, 215 LBS
COVER, 125 LBS
TOTAL, 340 LBS



SECTION OF COVER

PICKHOLE DETAIL



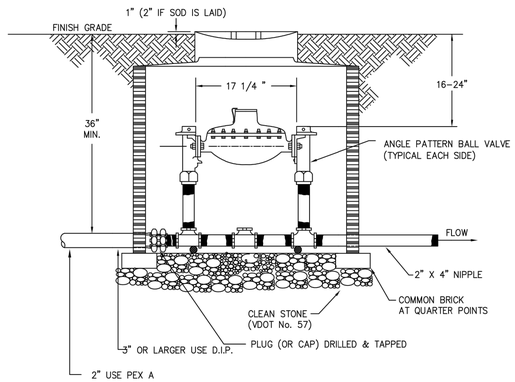
SECTION OF FRAME

√ MACHINED SURFACE

NOTE:
FOR REQUIREMENTS ON SECURING FRAME TO CONE, SEE DETAIL 3.2.1-4

JULY 2016 | 2.2.2-3

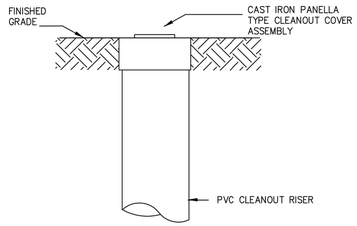
STAFFORD COUNTY DEPARTMENT OF UTILITIES | TRAFFIC RATED WATER METER FRAME & COVER



NOTES:
1. ONE PIECE BARREL 36" X 36" HI-DENSITY POLYETHELENE.
2. LID SHALL BE EQUIPPED WITH PENTAGON NUT AND 1 3/4" HOLE.
3. USE SERVICE SADDLE FOR CONNECTION TO MAIN (BOTH PVC AND DIP).
4. GATE VALVE AND VALVE BOX REQUIRED ON 2" AND LARGER SERVICE LINES. USE 2" BRASS OR DUCTILE IRON NIPPLES BETWEEN SERVICE SADDLE AND GATE VALVE.
5. SCHEDULE 80 PLASTIC PIPE (2) EACH 16" LONG TO BE USED IN BRACE PIPE EYELETS.
6. IF AN APPROVED BACKFLOW DEVICE IS NOT INSTALLED ON THE SERVICE LINE IMMEDIATELY INSIDE THE BUILDING, DOUBLE CHECK VALVES SHALL BE SUBSTITUTED FOR THE ANGLE PATTERN BALL VALVE ON THE DOWNSTREAM SIDE OF THE METER & ADDED TO THE BYPASS.
7. THE GRADE AT THE TOP OF THE BARREL SHALL CONFORM TO THE GENERAL CONTOUR OF FINISH YARD GRADE. NO MOUNDS OR DEPRESSIONS AROUND THE BARREL WILL BE PERMITED.

SEPT 2016 | 2.2.2-4

STAFFORD COUNTY DEPARTMENT OF UTILITIES | WATER METER SETTING UP TO AND INCLUDING 2" METER CONNECTIONS

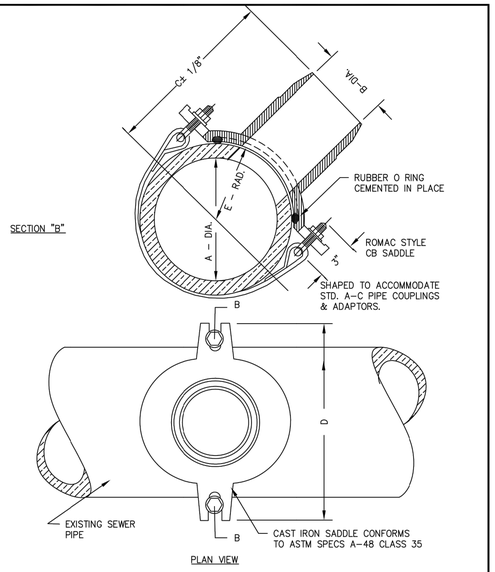


ASSEMBLY NOTE:

LUBRICATE CAP THREADS WITH ANTI-SIEZE LUBRICANT

APRIL 2010 | 3.3.3-3C

STAFFORD COUNTY DEPARTMENT OF UTILITIES | PANELLA-TYPE CLEANOUT CAP ASSEMBLY FOR 4" CLEANOUTS IN INTERIOR YARD AREAS



PLAN VIEW

OCTOBER 2016 | 3.3.3-4

STAFFORD COUNTY DEPARTMENT OF UTILITIES | SEWER HOUSE TAP FOR EXISTING MAIN

REVISION | DATE

Freeland Engineering, PC
rfreeland@FreelandEngineeringPC.com
10814 Courthouse Road
Fredericksburg, Virginia 22408
Phone: 540.898.3092
Fax: 877.658.7735
www.FreelandEngineeringPC.com

NOTES & DETAILS

SOUTH RIDGE CHURCH

FALMOUTH ELECTION DISTRICT
STAFFORED COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
RAYMOND P. FREELAND
Lic. No. 040752
09/29/2020
PROFESSIONAL ENGINEER
SEAL

County Plan Number:

Drawn By:	SAR
Designed By:	SAR
Checked By:	RPF
Date:	09/29/2020
Scale:	NTS
Sheet:	20 of 20

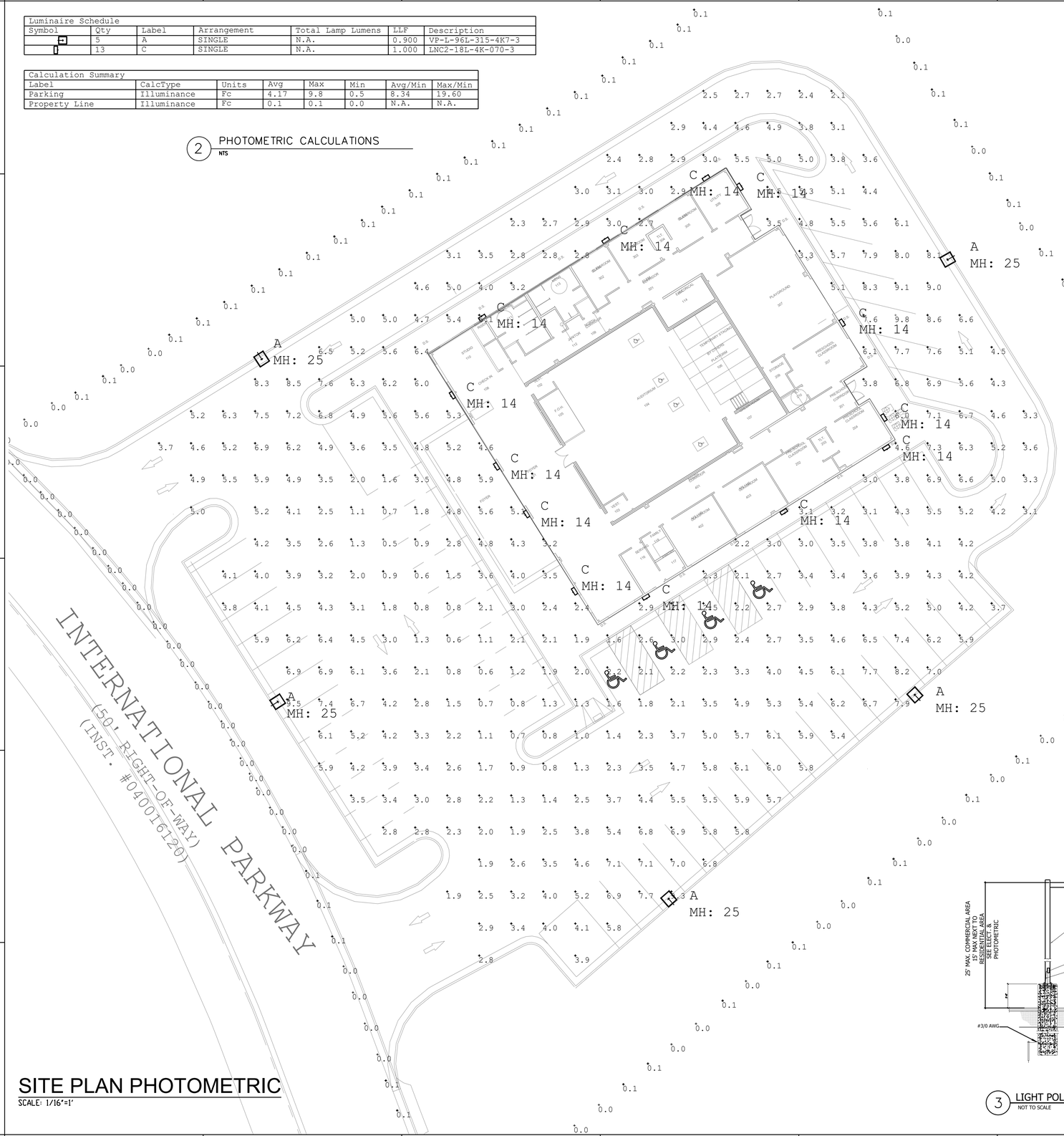
PROJECT # 4762

Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
	5	A	SINGLE	N.A.	0.900	VP-L-96L-315-4K7-3
	13	C	SINGLE	N.A.	1.000	LNC2-18L-4K-070-3

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Parking	Illuminance	Fc	4.17	9.8	0.5	8.34	19.60
Property Line	Illuminance	Fc	0.1	0.1	0.0	N.A.	N.A.

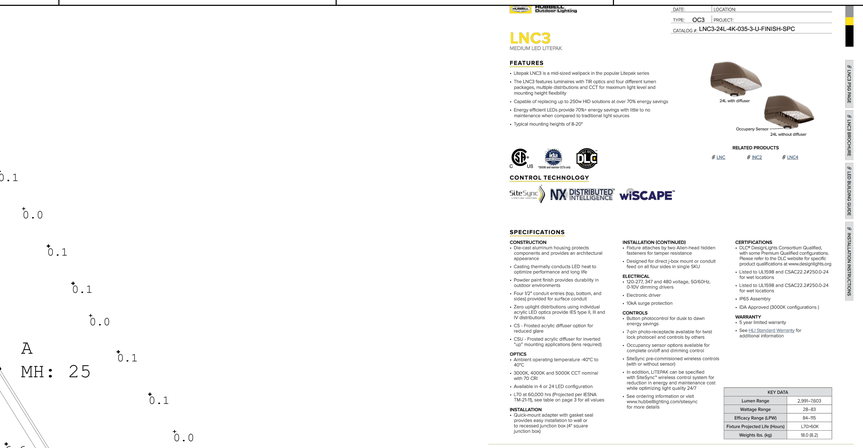
2 PHOTOMETRIC CALCULATIONS

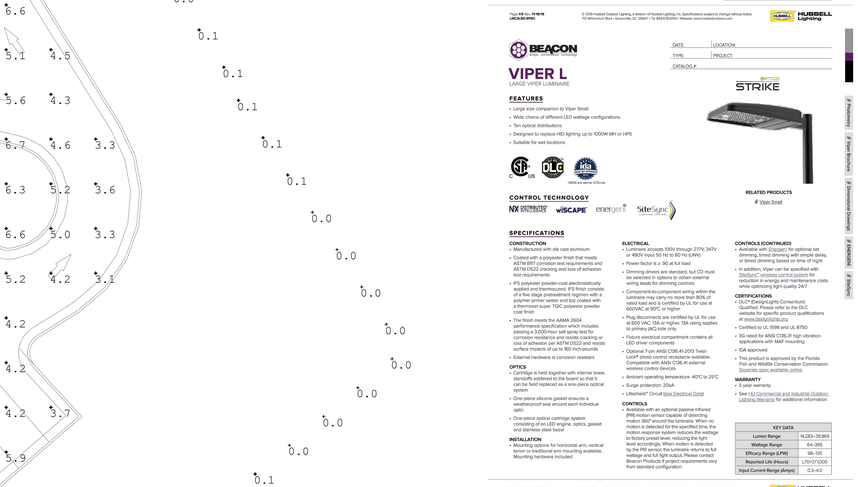
NTS

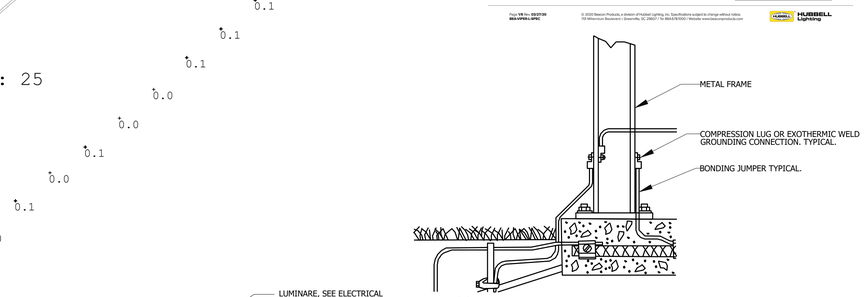


SITE PLAN PHOTOMETRIC

SCALE: 1/16'=1'

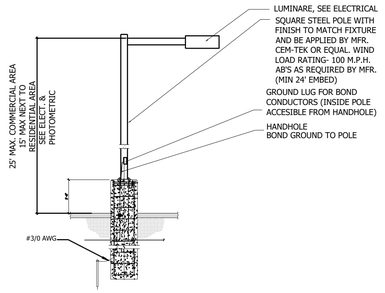






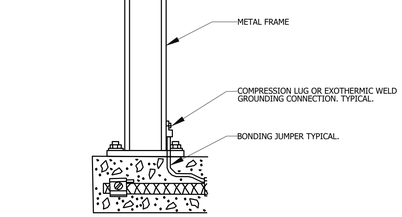
4 BUILDLING STRUCTURE GROUNDING

NOT TO SCALE



3 LIGHT POLE BASE

NOT TO SCALE



5 CANOPY COLUMN GROUNDING

NOT TO SCALE

COMMONWEALTH OF VIRGINIA
GUIDO INOA ALVAREZ
Lic. No. 0402051423
PROFESSIONAL ENGINEER

REVISIONS		
No.	Description	Date

Job Number: 2002-00
Date: 02/12/20
Drawn By: Author
Checked By: TJR
CAD File:

SITE PLAN PHOTOMETRIC

SOUTHRIDGE
(LOT #) INTERNATIONAL PARKWAY
FREDRICKSBURG, VA 22406

BRADFIELD RICHARDS RHODES & ASSOCIATES ARCHITECTS, Inc.
1040 CROWN POINTE PKWY.
SUITE FIVE HUNDRED FIFTY
ATLANTA, GEORGIA 30338
TEL. 678.990.5656
FAX 678.990.5858

SPF