

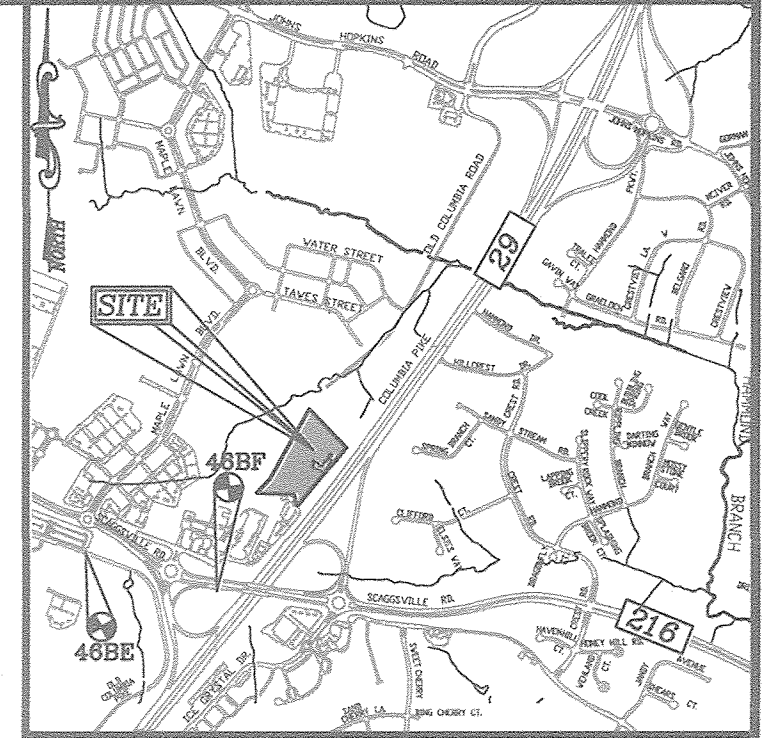
GENERAL NOTES

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY STANDARDS AND SPECIFICATIONS...
2. THE CONTRACTOR SHALL NOTIFY MISS UTILITIES AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK...
3. THE CONTRACTOR IS TO NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE DAYS BEFORE STARTING WORK ON THESE DRAWINGS...

SITE DEVELOPMENT PLAN
BUCH ROAD EXTENSION
PARCELS 126, PARCEL 364, AND PARCEL 505, LOT 496
HOWARD COUNTY, MARYLAND

BENCHMARKS

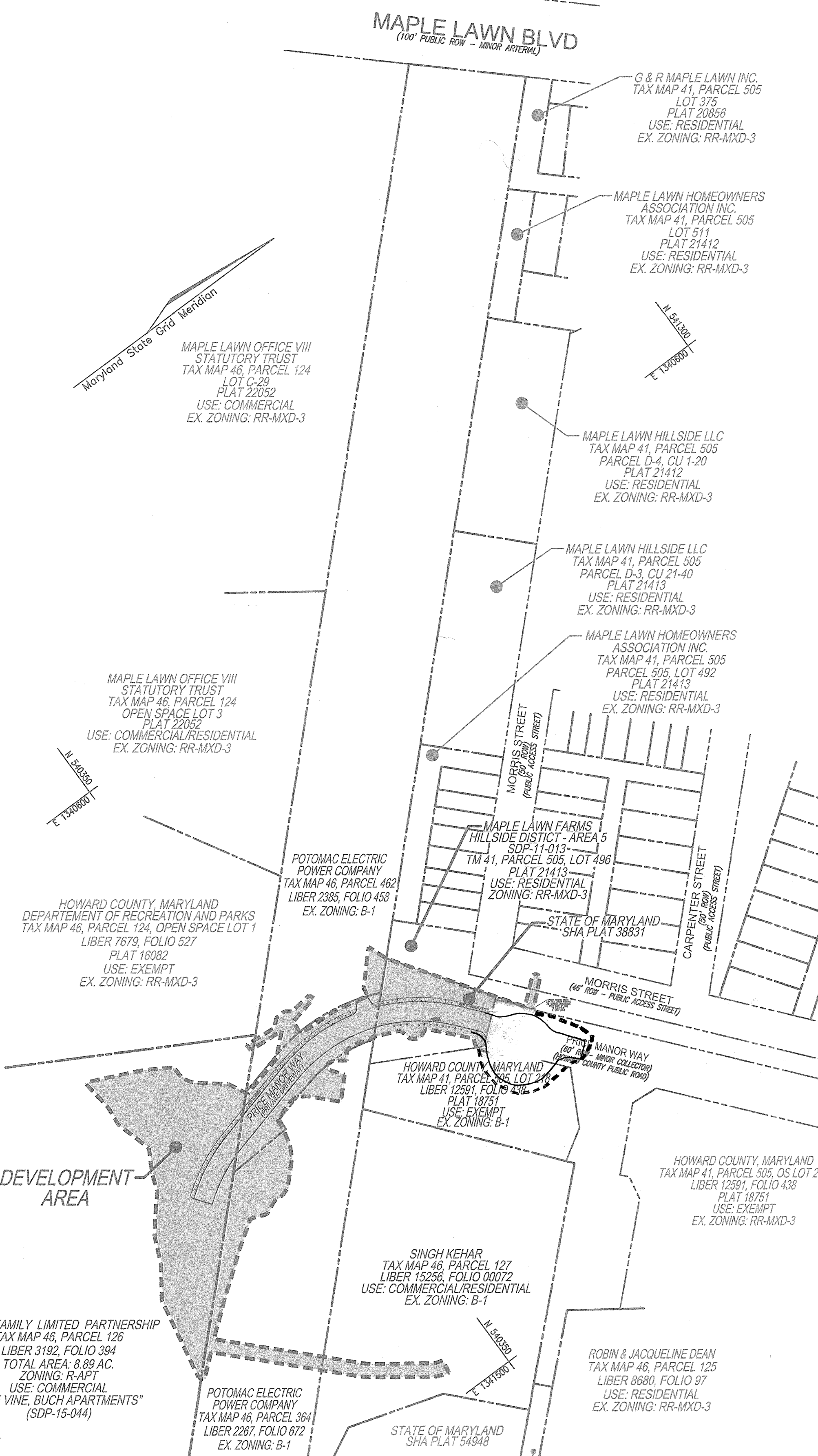
HOWARD COUNTY BENCHMARK -- 468E (CONC. MONUMENT)
N 538853.83 E 133864.54 ELEV. 443.345
LOCATION: OLD COLUMBIA PIKE AT SCAGGSVILLE PARK AND RIDE



VICINITY MAP

SCALE: 1"=200'
ADC MAP COORDINATES: 39/C-2

- 4. SITE ANALYSIS:
TOTAL PROJECT AREA: 1.85 AC. (INCLUDES TEMP. HAUL ROAD THROUGH PEPCO AND KEHAR PROPERTY)
PRESENT ZONING: R-APT & B-1
USE OF STRUCTURES: N/A
TOTAL BUILDING COVERAGE: 0 SF (0.00 AC. OR 0.00% OF GROSS AREA)
PAVED DRIVEWAY AREA: 13,801 SF (0.32 AC. OR 17.30% OF GROSS AREA)
PAVED PARKING LOT/AREA ON SITE: 0 SF
AREA OF LANDSCAPE ISLAND: 0 SF (0.00 AC. OR 0% OF GROSS AREA)
LIMIT OF DISTURBED AREA: 1.85 AC (INCLUDES TEMP. HAUL ROAD)
WETLANDS WITHIN LOD: 0.00 AC
WETLAND BUFFERS WITHIN LOD: 0.10 AC
STREAMS AND THEIR BUFFERS WITHIN LOD: 0.57 AC
AREA OF ON-SITE 100 YEAR FLOODPLAIN WITHIN LOD: 0.34 AC
AREA OF EXISTING FOREST WITHIN LOD: 0.00 AC
AREA OF SLOPE SLOPES (25% OR GREATER) WITHIN LOD: 0.09 AC (0.11 WITHIN PARCEL 126)
AREA OF EXISTING FOREST WITHIN LOD: 0.00 AC
AREA MANAGED BY ESDV (THIS PLAN): 0.21 AC
IMPERVIOUS AREA (MANAGED BY ESDV): 0.20 AC
GREEN AREA (MANAGED BY ESDV): 0.01 AC
CUT: 0 CY FILL: 4,975 CY

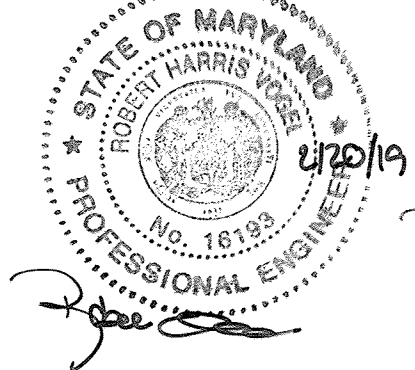


LEGEND:



SHEET INDEX

Table with columns: COVER SHEET, DESCRIPTION, SHEET NO. Includes entries for SITE LAYOUT AND STREET TREE PLAN, ROAD PROFILE AND SITE DETAILS, etc.



AS-BUILT CERTIFICATION FOR PSWM
I HEREBY CERTIFY THAT THE PLAN(S) SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE AS-BUILT PLANS AND...
P.E. NAME: Robert H. Vogel, P.E.# 16193, DATE: 2/20/19

OWNER/DEVELOPER

BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

Table with columns: NO., REVISION, DATE. Revision 1: REVISE TO ILLUSTRATE A CUL-DE-SAC AT THE TERMINUS OF PRICE MANOR WAY 10/31/17

SITE DEVELOPMENT PLAN

COVER SHEET

BUCH ROAD EXTENSION
10945 PRICE MANOR WAY

TAX MAP 46 BLOCK 4
5TH ELECTION DISTRICT
ZONED: R-APT & B-1
PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127
HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.

8407 MAIN STREET, ELLICOTT CITY, MD 21043
TEL: 410.461.7666
FAX: 410.461.8961



DESIGN BY: RHW/DZE
DRAWN BY: DZE/KJK
CHECKED BY: RHW
DATE: APRIL 2016
SCALE: AS SHOWN
W.O. NO.: 12-50.01
1 SHEET OF 19

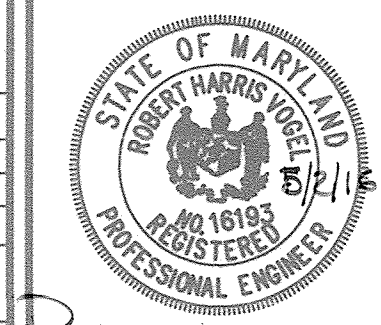
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Chief, Development Engineering Division: Andrew...
Chief, Division of Land Development: ...
Director: ...

U.S. ROUTE 29 (COLUMBIA PIKE)
STATE OF MARYLAND SHA PLAT 54948
SRC PLAT 38917 & 59734
TOTAL AREA: 8.89 AC.
ZONING: R-APT
USE: COMMERCIAL
'THE VINE, BUCH APARTMENTS' (SDP-15-044)

LOCATION MAP
SCALE: 1"=100'

NO AS-BUILT INFORMATION ON THIS SHEET

ADDRESS CHART and PERMIT INFORMATION CHART tables.



PROFESSIONAL CERTIFICATE
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND...
EXPIRATION DATE: 08-27-2018

AS-BUILT - AUG. 2018

LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING FENCE
- EXISTING TRENCH
- EXISTING LIMIT OF WETLANDS
- EXISTING WETLANDS
- LIMITS OF FLOODPLAIN
- PROPOSED PUBLIC WATER AND UTILITY EASEMENT
- PROPOSED STORMDRAIN
- PROPOSED STORMDRAIN INLET
- PROPOSED TRENCH
- PROPOSED CURB
- PROPOSED SIDEWALK
- PROPOSED P-3 PAVING SECTION (SEE TECH TO CONFIRM)
- STREET TREES
- MICRO-BIoretention (M-6)
- PROP. 100 YEAR FLOODPLAIN EASEMENT
- EX. DFRM 100 YR FLOODPLAIN EASEMENT
- EX. RIPRAP
- PROP. RIPRAP (REF. PLAN FOR TYPE)

PUBLIC WARNING SIGN NOTE:
 CONTRACTOR SHALL INSTALL A WARNING SIGN SOUTH OF TAVES STREET INTERSECTION ALONG PRICE MANOR WAY. CONTACT HOWARD COUNTY TRAFFIC BEFORE FABRICATING AND INSTALLING SIGN (410-313-5752) SIGN TO READ: "PUBLIC ROAD ENDS 400 FT"

GENERAL NOTES:

- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
- FINANCIAL SURETY IN THE AMOUNT OF \$1,200.00 FOR THE 4 REQUIRED PRIVATE STREET TREE PLANTINGS WILL BE INCLUDED AS PART OF THE BID COST ESTIMATE FOR THIS PROJECT.
- THE OWNER, TENANT OR THEIR AGENTS SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE REQUIRED LANDSCAPING, PLANT MATERIALS, BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.
- AT THE TIME OF INSTALLATION, ALL PLANTINGS LISTED HEREWITH AND APPROVED FOR THIS SITE SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL.

LANDSCAPE SCHEDULE NOTE:

- ALL PLANT MATERIALS SHALL BE FULL AND HEAVY, BE WELL FORMED AND SYMMETRICAL, CONFORM TO THE MOST CURRENT MAN SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH HOWARD COUNTY PLANTING SPECIFICATIONS.
- CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO DIGGING. FINAL LOCATION OF PLANT MATERIALS MAY NEED TO VARY TO MEET FINAL FIELD CONDITIONS. TREES SHALL NOT BE PLANTED IN THE BOTTOM OF DRAINAGE SWALES.
- CONTRACTOR SHALL VERIFY PLANT QUANTITIES PRIOR TO BIDDING; IF PLAN DIFFERS FROM LANDSCAPE SCHEDULE, THE PLAN SHALL GOVERN.

OWNER/DEVELOPER
 BUCH LLLP
 10945 PRICE MANOR WAY
 LAUREL, MD 20723
 301-359-3500

NO.	REVISION	DATE
1	REVISED TO ILLUSTRATE A CUL-DE-SAC AT THE TERMINUS OF PRICE MANOR WAY	10/31/17

SITE DEVELOPMENT PLAN
SITE LAYOUT AND STREET TREE PLAN
BUCH ROAD EXTENSION
 10945 PRICE MANOR WAY
 ZONED: R-APT & B-1 PARCEL 126, PARCEL 364
 (L. 3192 / F. 394) PARCEL 505 (LOT 496), PARCEL 127
 TAX MAP 46 BLOCK 4 HOWARD COUNTY, MARYLAND
 5TH ELECTION DISTRICT

ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 8407 MAIN STREET ELLICOTT CITY, MD 21043
 TEL: 410.461.7666 FAX: 410.461.8961

PROFESSIONAL CERTIFICATE
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. EXPIRATION DATE: 09-27-2018

DESIGN BY: RIV/DZE
 DRAWN BY: DZE/KG
 CHECKED BY: RIV
 DATE: APRIL 2016
 SCALE: AS SHOWN
 W.D. NO.: 12-50.01

2 SHEET OF 19

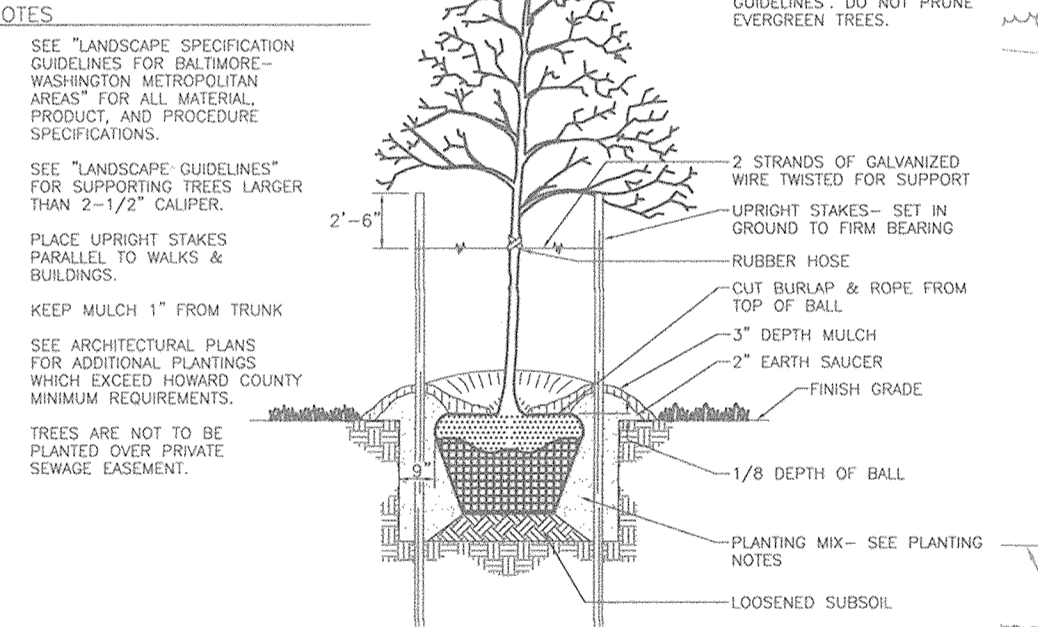
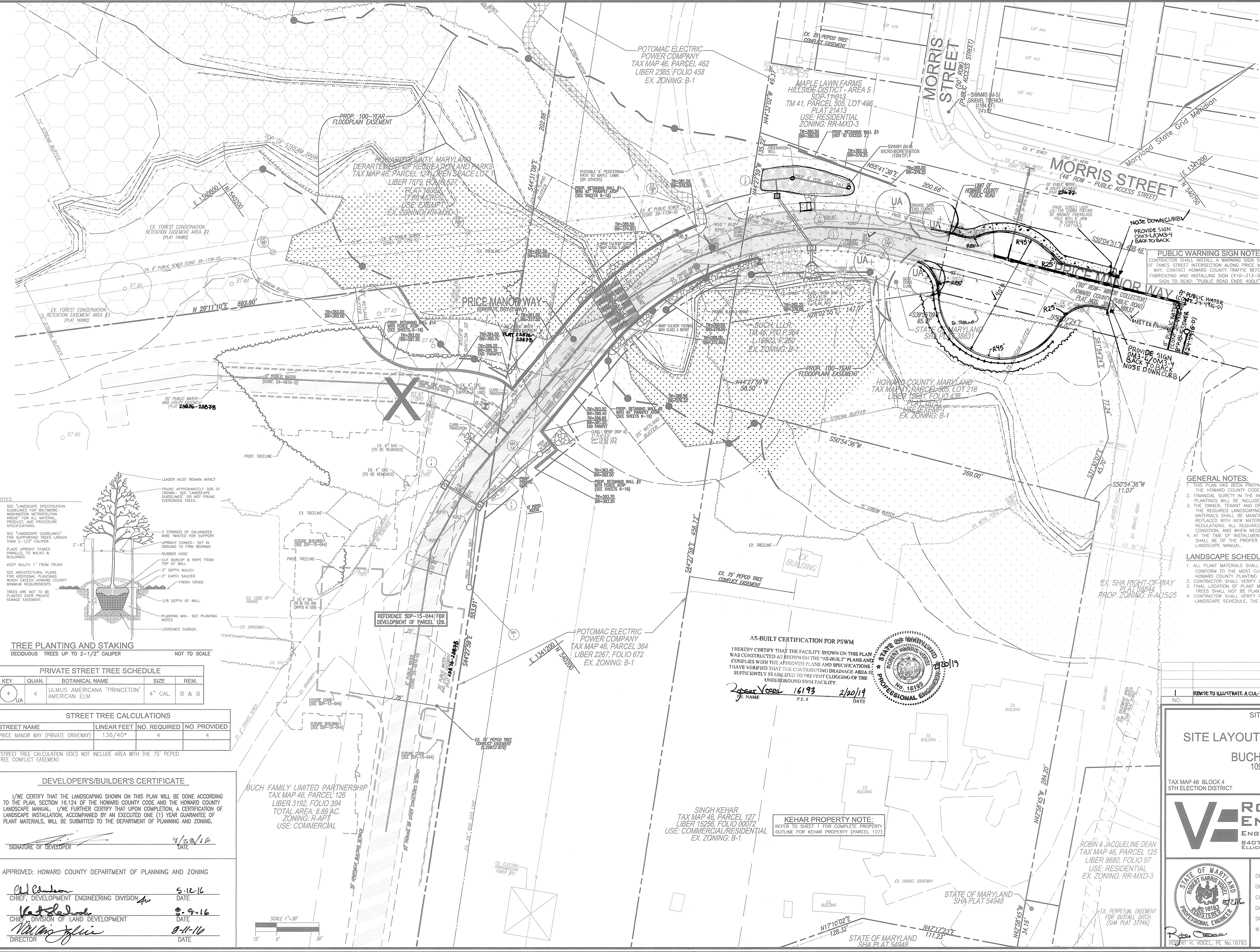
AS-BUILT CERTIFICATION FOR PSWM
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.

Robert Vogel 16193 P.E. DATE: 2/20/19



KEHAR PROPERTY NOTE:
 REFER TO SHEET 1 FOR COMPLETE PROPERTY OUTLINE FOR KEHAR PROPERTY (PARCEL 127)

SINGH KEHAR
 TAX MAP 46, PARCEL 127
 LIBER 15256, FOLIO 00072
 USE: COMMERCIAL/RESIDENTIAL
 EX. ZONING: B-1



PRIVATE STREET TREE SCHEDULE

KEY	QUAN.	BOTANICAL NAME	SIZE	REM.
UA	4	ULMUS AMERICANA 'PRINCETON' AMERICAN ELM	4" CAL.	B & B

STREET TREE CALCULATIONS

STREET NAME	LINEAR FEET	NO. REQUIRED	NO. PROVIDED
PRICE MANOR WAY (PRIVATE DRIVEWAY)	136/40*	4	4

*STREET TREE CALCULATION DOES NOT INCLUDE AREA WITH THE 75' PEPCO TREE CONFLICT EASEMENT.

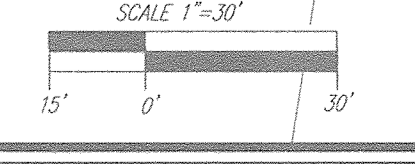
DEVELOPER'S/BUILDER'S CERTIFICATE

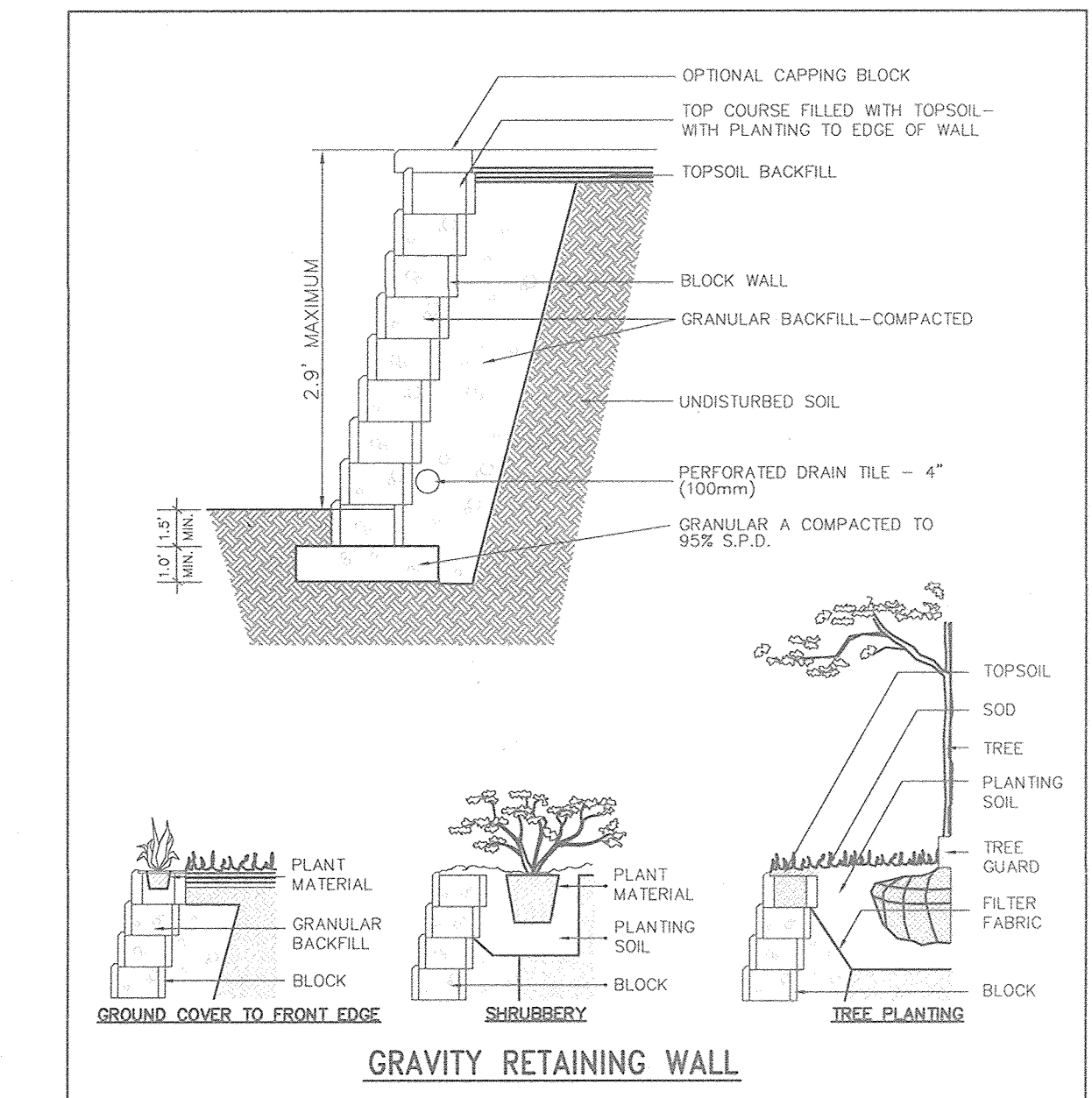
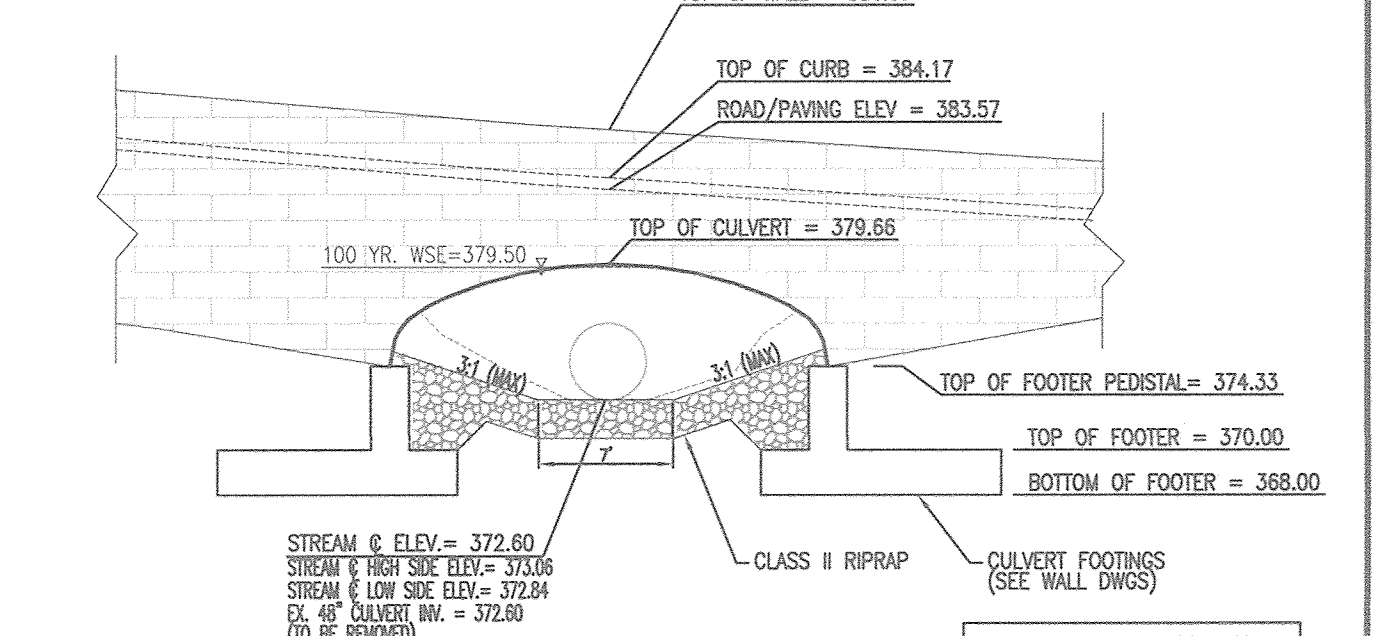
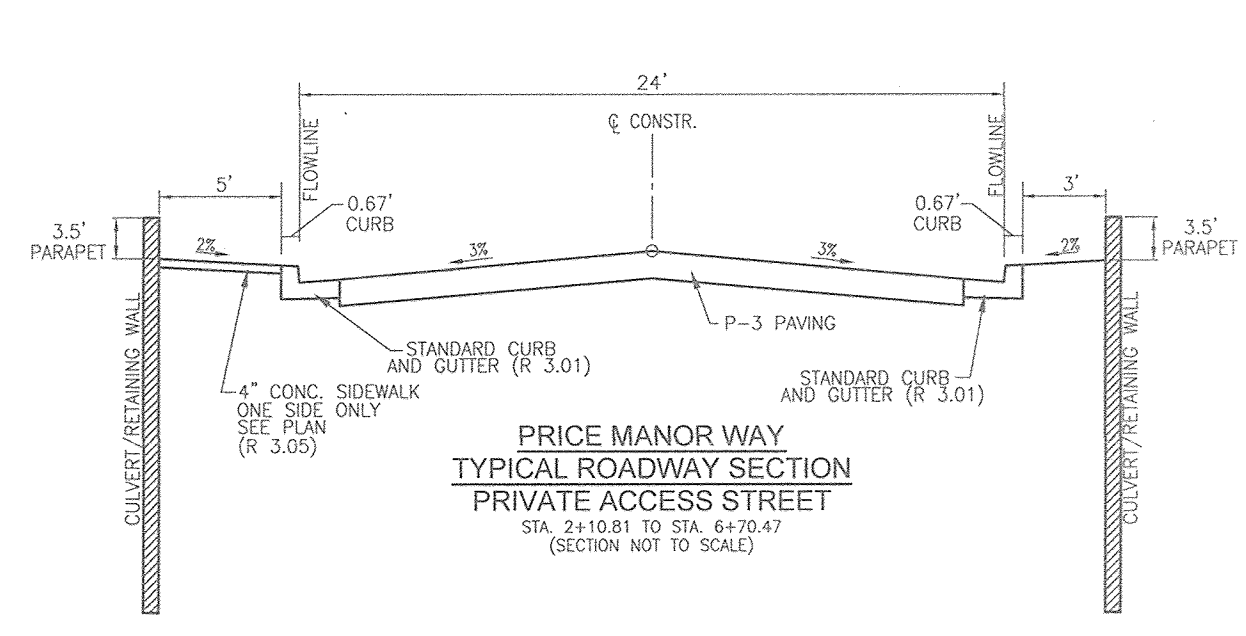
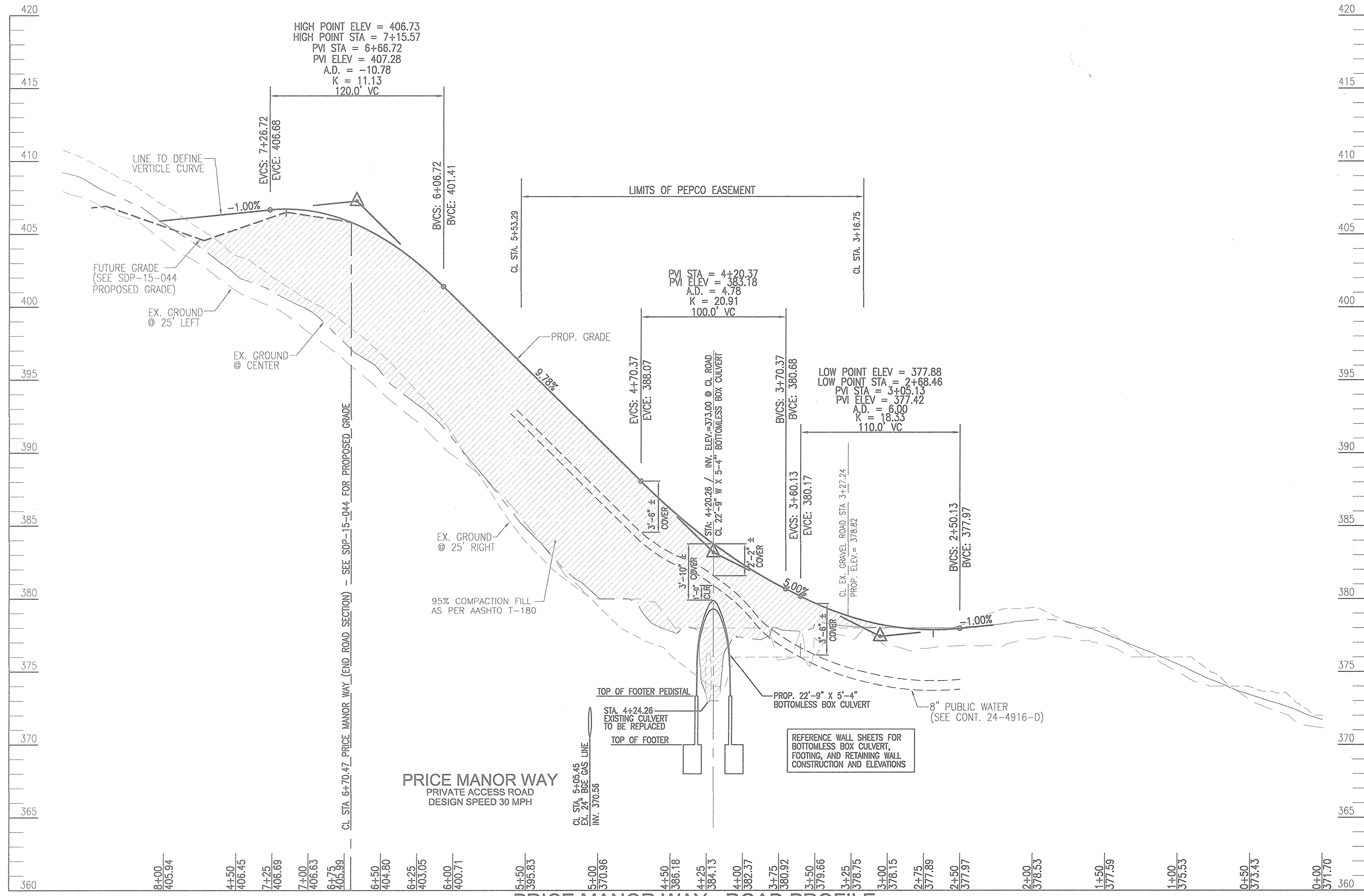
I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A CERTIFICATION OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE (1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

SIGNATURE OF DEVELOPER: [Signature] DATE: 4/20/19

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division: [Signature] DATE: 5-12-16
 Chief, Division of Land Development: [Signature] DATE: 8-9-16
 Director: [Signature] DATE: 8-11-16





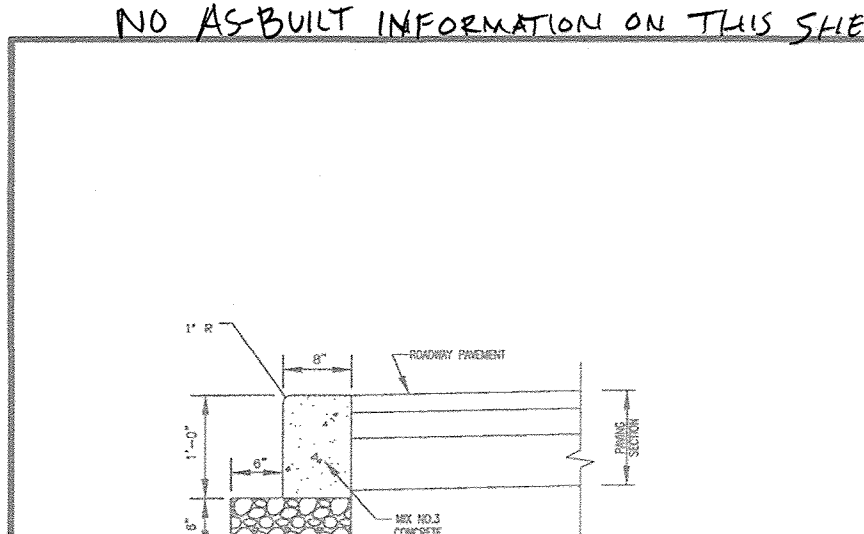
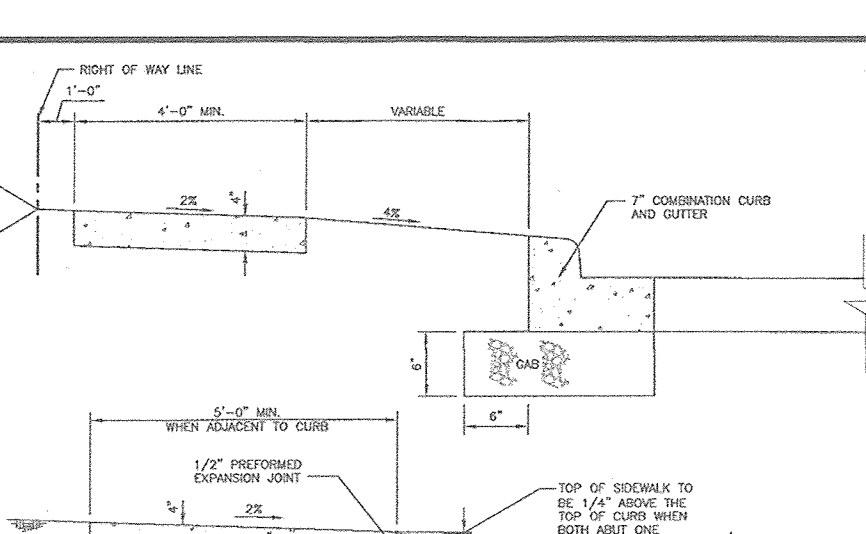
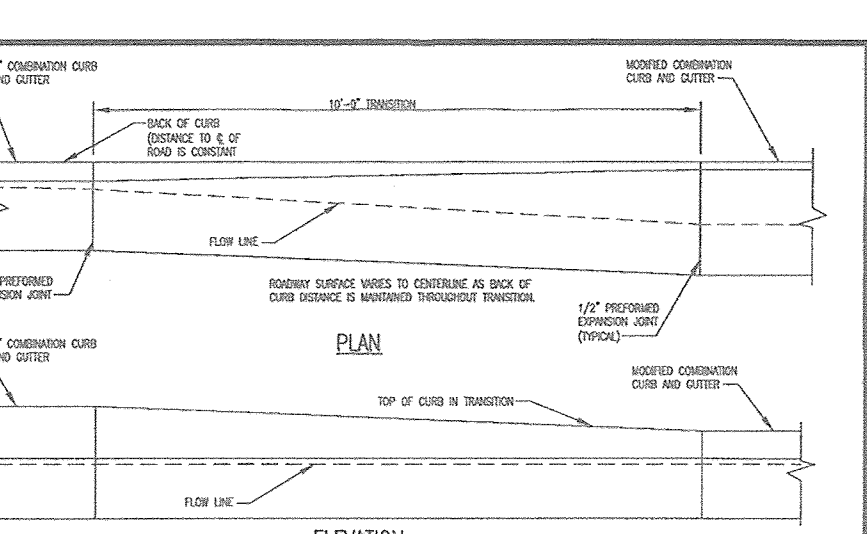
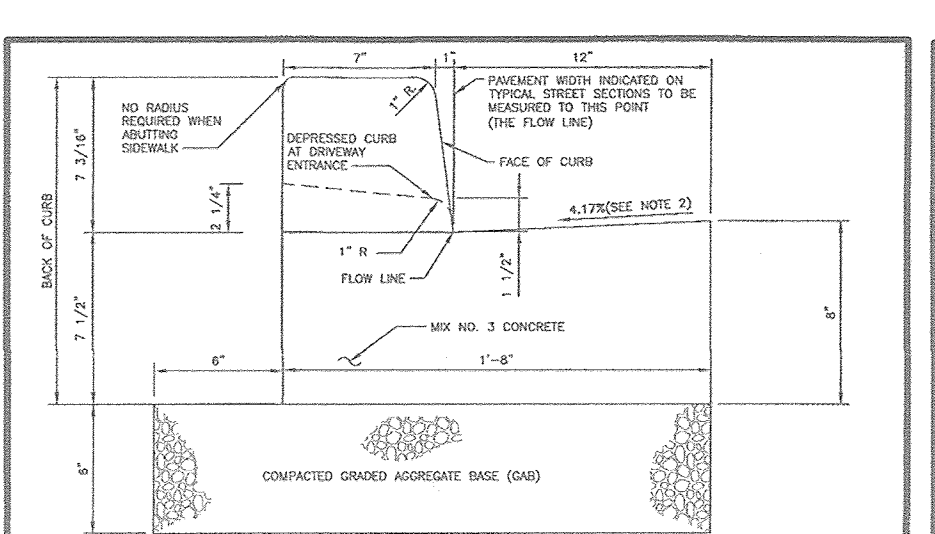
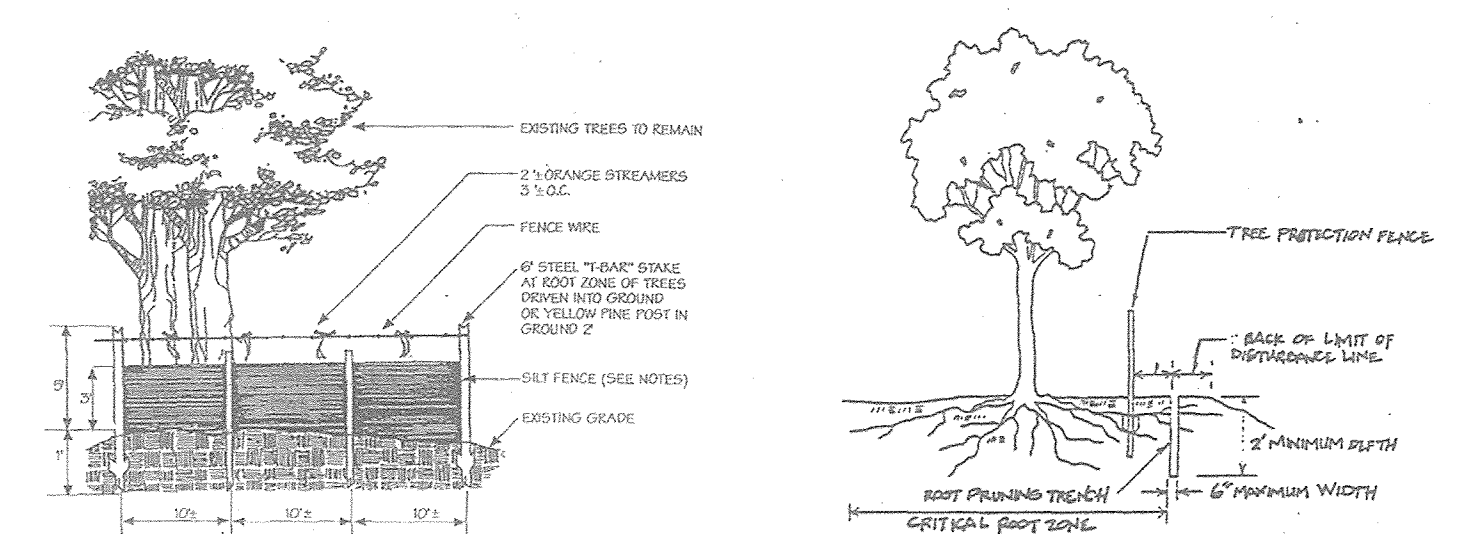
SPECIFICATIONS:
 1. EXCAVATE AREA TO LINE AND GRADES AS SHOWN ON CONSTRUCTION DRAWINGS
 2. SUBGRADE TO BE FIRM AND UNDISTURBED AND COMPACTED TO 95% S.P.D.
 3. BASE MATERIAL SHALL BE GRANULAR A COMPACTED TO 95% S.P.D. AND GRADED TO PROVIDE LEVEL HARD SURFACE ON WHICH TO PLACE THE FIRST COURSE OF UNITS, MIN. THICKNESS = 6\"/>

**PROF. CONTECH BOTTOMLESS ALCP BOX CULVERT (22'-9\"/>
 $Q_{10} = 481.97$ cfs (WITH EXISTING 48\"/>
 $Q_{10} = 493.81$ cfs (WITH REMOVAL OF 48\"/>**

SECTION	ROAD AND STREET CLASSIFICATION	PAVEMENT MATERIAL (INCHES)	1\"/>
P-1	PAVING: SIDE DRIVE, RESIDENTIAL WITH NO MORE THAN 2 HOIST TRUCKS PER DAY	1.5\"/>	
		1.5\"/>	
P-2	PAVING: SIDE DRIVE, RESIDENTIAL WITH NO MORE THAN 2 HOIST TRUCKS PER DAY	1.5\"/>	
		1.5\"/>	
P-3	PAVING: SIDE DRIVE, RESIDENTIAL WITH NO MORE THAN 2 HOIST TRUCKS PER DAY	1.5\"/>	
		1.5\"/>	
P-4	PAVING: SIDE DRIVE, RESIDENTIAL WITH NO MORE THAN 2 HOIST TRUCKS PER DAY	1.5\"/>	
		1.5\"/>	

PRICE MANOR WAY - ROAD PROFILE
 SCALE: HORIZONTAL - 1"=50'
 VERTICAL - 1"=5'

PAVING SECTION (GEOTECHNICAL ENGINEER TO CONFIRM PAVING SECTION PRIOR TO CONSTRUCTION)
 AS-BUILT CERTIFICATION FOR PSWM
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND SPECIFICATIONS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.



NOTES:
 1. Refer to the final plan for details.
 2. Refer to the final plan for details.
 3. Refer to the final plan for details.
 4. Refer to the final plan for details.
 5. Refer to the final plan for details.
 6. Refer to the final plan for details.
 7. Refer to the final plan for details.
 8. Refer to the final plan for details.

NOTE:
 1. A CURB AND GUTTER SHALL HAVE A CURB SIDE SLOPE OF 4:1 FROM THE FLOW LINE, AND SHALL NOT BE USED AS A DRAINAGE CHANNEL.
 2. CURB AND GUTTER SHALL BE CONSTRUCTED TO THE HIGH SIDE OF SUPERELEVATED SECTIONS.
 3. CURB AND GUTTER SHALL BE CONSTRUCTED TO THE LOW SIDE OF SUPERELEVATED SECTIONS.
 4. CURB AND GUTTER SHALL BE CONSTRUCTED TO THE HIGH SIDE OF SUPERELEVATED SECTIONS.
 5. CURB AND GUTTER SHALL BE CONSTRUCTED TO THE LOW SIDE OF SUPERELEVATED SECTIONS.

NOTES:
 1. SIDEWALK TO BE SLOPED IN 1/4\"/>

NOTES:
 1. SIDEWALK TO BE SLOPED IN 1/4\"/>

NOTES:
 1. SIDEWALK TO BE SLOPED IN 1/4\"/>

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division
 Chief, Division of Land Development
 Director

Howard County, Maryland
 Department of Public Works
 CURB AND GUTTER
 7\"/>

Howard County, Maryland
 Department of Public Works
 CURB AND GUTTER
 7\"/>

Howard County, Maryland
 Department of Public Works
 Concrete Sidewalk

Howard County, Maryland
 Department of Public Works
 Curb Flush

NO AS-BUILT INFORMATION ON THIS SHEET

OWNER/DEVELOPER
 BUCH LLLP
 10945 PRICE MANOR WAY
 LAUREL, MD 20723
 301-359-3500

TAX MAP 46 BLOCK 4
 5TH ELECTION DISTRICT

PARCEL 126, PARCEL 364,
 PARCEL 505 (LOT 498), PARCEL 127
 HOWARD COUNTY, MARYLAND

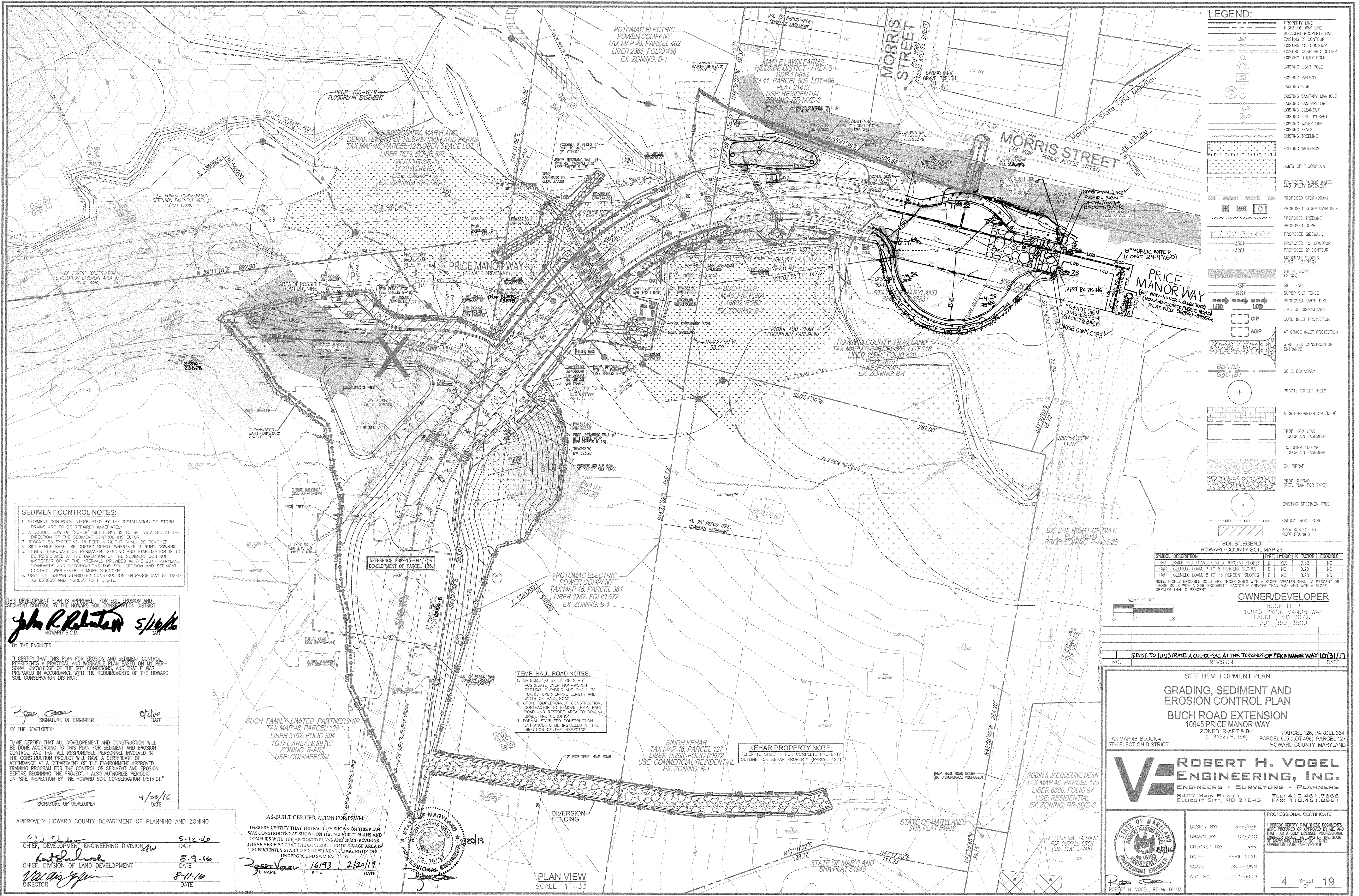
ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 8407 MAIN STREET
 ELICOTT CITY, MD 21043
 TEL: 410.461.7666
 FAX: 410.461.8961

DESIGN BY: RHW/DZE
 DRAWN BY: DZE/KG
 CHECKED BY: RHW
 DATE: APRIL, 2016
 SCALE: AS SHOWN
 W.O. NO.: 12-50.01

PROFESSIONAL CERTIFICATE
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
 EXPIRATION DATE: 09-27-2018

3 SHEET OF 19

AS-BUILT - AUG. 2018



LEGEND:

	PROPERTY LINE
	RIGHT-OF-WAY LINE
	ADJACENT PROPERTY LINE
	EXISTING 2' CONTOUR
	EXISTING 10' CONTOUR
	EXISTING CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING MAILBOX
	EXISTING SIGN
	EXISTING SANITARY MANHOLE
	EXISTING SANITARY LINE
	EXISTING CLEANOUT
	EXISTING FIRE HYDRANT
	EXISTING WATER LINE
	EXISTING FENCE
	EXISTING TREELINE
	EXISTING WETLANDS
	LIMITS OF FLOODPLAIN
	PROPOSED PUBLIC WATER AND UTILITY EASEMENT
	PROPOSED STORMDRAIN
	PROPOSED STORMDRAIN INLET
	PROPOSED TREELINE
	PROPOSED CURB
	PROPOSED SIDEWALK
	PROPOSED 10' CONTOUR
	PROPOSED 2' CONTOUR
	MODERATE SLOPES (1:30 - 24:60)
	STEEP SLOPES (>25%)
	SILT FENCE
	SUPER SILT FENCE
	PROPOSED EARTH DIKE
	LIMIT OF DISTURBANCE
	CURB INLET PROTECTION
	AT GRADE INLET PROTECTION
	STABILIZED CONSTRUCTION ENTRANCE
	SOILS BOUNDARY
	PRIVATE STREET TREES
	MICRO-BIORETENTION (M-B)
	PROP. 100 YEAR FLOODPLAIN EASEMENT
	EX. DIRM 100 YR FLOODPLAIN EASEMENT
	EX. RIPRAP
	PROP. RIPRAP (REF. PLAN FOR TYPE)
	EXISTING SPECIMEN TREE
	CRITICAL ROOT ZONE
	AREA SUBJECT TO ROOT PRUNING

SOILS LEGEND
HOWARD COUNTY SOIL MAP 23

SYMBOL	DESCRIPTION	TYPE	HYDRIC	K FACTOR	ERODIBLE
BaA	BALE SILT LOAM, 0 TO 3 PERCENT SLOPES	D	YES	0.32	NO
GcB	GLENELO LOAM, 3 TO 8 PERCENT SLOPES	B	NO	0.20	NO
GcC	GLENELO LOAM, 8 TO 15 PERCENT SLOPES	B	NO	0.20	NO

NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT.

OWNER/DEVELOPER
BUCH LLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

- SEDIMENT CONTROL NOTES:**
1. SEDIMENT CONTROLS INTERRUPTED BY THE INSTALLATION OF STORM DRAINS ARE TO BE REPAIRED IMMEDIATELY.
 2. A DOUBLE ROW OF "SUPER" SILT FENCE IS TO BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.
 3. STOCKPILES EXCEEDING 15 FEET IN HEIGHT SHALL BE BENCHED.
 4. SILT FENCE SHALL BE CURLED UPHILL WHEREVER IT RUNS DOWNHILL.
 5. EITHER TEMPORARY OR PERMANENT SEEDING AND STABILIZATION IS TO BE PERFORMED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR OR AT THE INTERVALS PROVIDED IN THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, WHICHEVER IS MORE STRINGENT.
 6. ONLY THE SHOWN STABILIZED CONSTRUCTION ENTRANCE MAY BE USED AS EGRESS AND INGRESS TO THE SITE.

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
John R. Robinson 5/16/16
HOWARD S.C.D. DATE

BY THE ENGINEER:
I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

[Signature] 8/2/16
SIGNATURE OF ENGINEER DATE

BY THE DEVELOPER:
I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
[Signature] 5-12-16
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE
[Signature] 8-9-16
CHIEF, DIVISION OF LAND DEVELOPMENT DATE
[Signature] 8-11-16
DIRECTOR DATE

AS-BUILT CERTIFICATION FOR PSWM
I HEREBY CERTIFY THAT THIS FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.
[Signature] 16193 2/20/19
P.E. NAME P.E. # DATE

- TEMP. HAUL ROAD NOTES:**
1. MATERIAL TO BE 6" OF 2"-3" AGGREGATE OVER NON-WOVEN GEOTEXTILE FABRIC AND SHALL BE PLACED OVER ENTIRE LENGTH AND WIDTH OF HAUL ROAD.
 2. UPON COMPLETION OF CONSTRUCTION, CONTRACTOR TO REMOVE TEMP. HAUL ROAD AND RESTORE AREA TO ORIGINAL GRADE AND CONDITION.
 3. FORMAL STABILIZED CONSTRUCTION ENTRANCE TO BE INSTALLED AT THE DIRECTION OF THE INSPECTOR.

KEHAR PROPERTY NOTE:
REFER TO SHEET 1 FOR COMPLETE PROPERTY OUTLINE FOR KEHAR PROPERTY (PARCEL 127)

SINGH KEHAR
TAX MAP 46, PARCEL 127
LIBER 15256, FOLIO 00072
USE: COMMERCIAL/RESIDENTIAL
EX. ZONING: B-1

POTOMAC ELECTRIC POWER COMPANY
TAX MAP 46, PARCEL 364
LIBER 2267, FOLIO 672
EX. ZONING: B-1

REFERENCE SDP-15-044 FOR DEVELOPMENT OF PARCEL 126.

BUCH FAMILY LIMITED PARTNERSHIP
TAX MAP 46, PARCEL 126
LIBER 3192, FOLIO 394
TOTAL AREA: 8.09 AC.
ZONING: R-10T
USE: COMMERCIAL



PLAN VIEW
SCALE: 1" = 30'

SCALE 1"=30'

REVISION TO ILLUSTRATE A CUL-DE-SAC AT THE TERMINUS OF PRICE MANOR WAY 10/31/17

SITE DEVELOPMENT PLAN
GRADING, SEDIMENT AND EROSION CONTROL PLAN
BUCH ROAD EXTENSION
10945 PRICE MANOR WAY

TAX MAP 46 BLOCK 4 5TH ELECTION DISTRICT	ZONED: R-APT & B-1 (L. 3192 / F. 394)	PARCEL 126, PARCEL 364 PARCEL 505 (LOT 496), PARCEL 127 HOWARD COUNTY, MARYLAND
---	--	---

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET
ELICOTT CITY, MD 21043
TEL: 410.461.7666
FAX: 410.461.8961

DESIGN BY: RHW/DZE
DRAWN BY: DZE/KG
CHECKED BY: RHW
DATE: APRIL 2016
SCALE: AS SHOWN
W.O. NO.: 12-50.01

PROFESSIONAL CERTIFICATE
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A LICENSED PROFESSIONAL ENGINEER UNDER THE JURISDICTION OF THE STATE OF MARYLAND. MY LICENSE NUMBER IS 18193 AND MY EXPIRATION DATE IS 07-31-2018.

4 SHEET OF 19

MGWC 1.1: DEWATERING BASINS

Temporary measure for filtering sediment-laden water

DESCRIPTION

The work should consist of installing dewatering basins jointly with channel diversion measures to filter sediment-laden water from in-stream construction sites before the water re-enters the downstream reach.

EFFECTIVE USES & LIMITATIONS

Undersized dewatering basins will not adequately filter sediment-laden water from the construction site.

MATERIAL SPECIFICATIONS

Materials for dewatering basins should meet the following requirements:

- **Riprap:** Riprap should be washed and have a diameter ranging from 4 to 6 inches (10 to 15 centimeters).
- **Filter Cloth:** Filter cloth should be a woven or non-woven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The fabric should be inert to commonly encountered chemicals, hydro-carbons, ultraviolet light, and mildew and should be rot resistant.
- **Straw Bales/Silt Fence:** Straw bales should meet the criteria as specified in the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control.

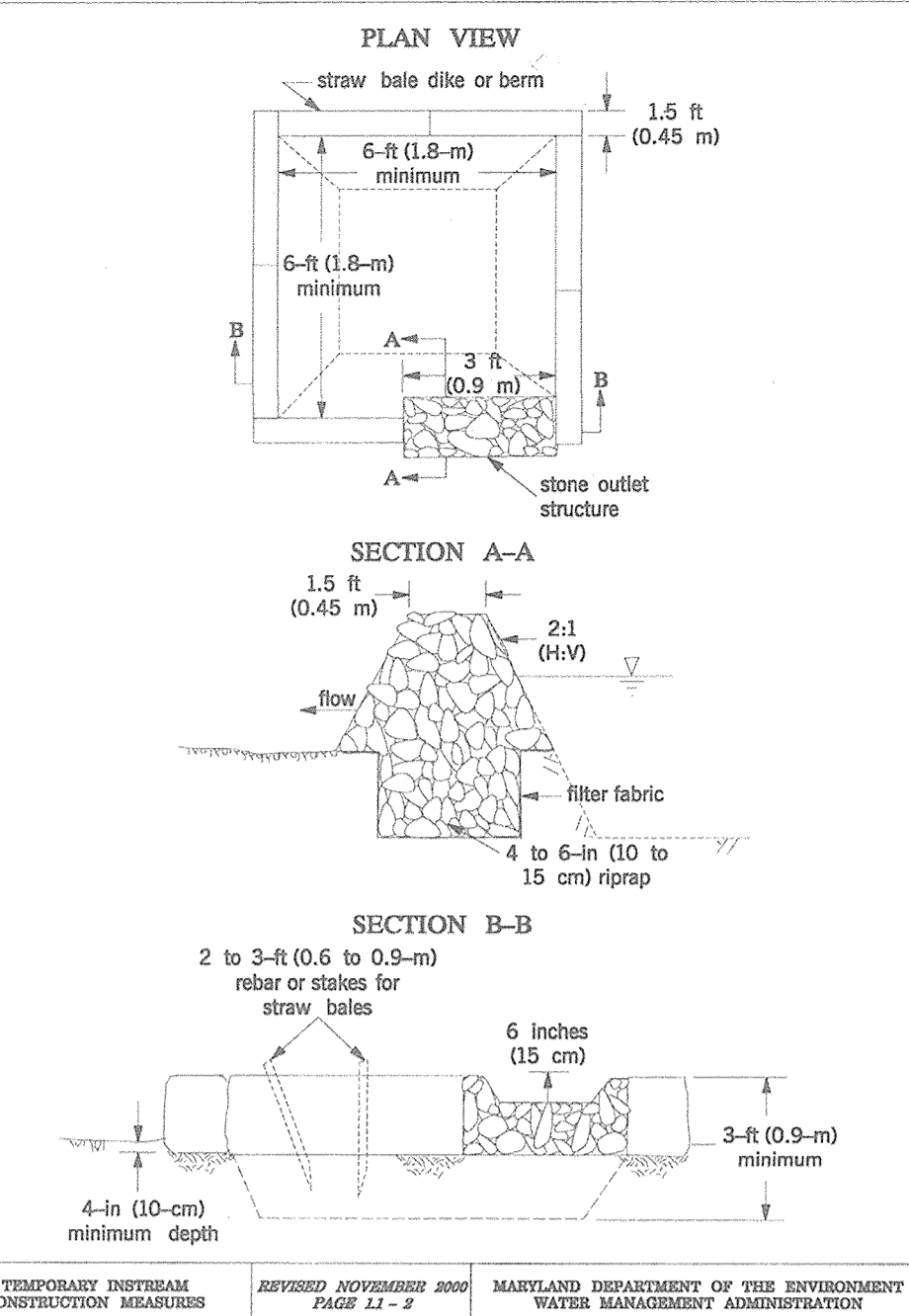
INSTALLATION GUIDELINES

Due to the danger of overtopping by events greater than the design flow, dewatering basins require a vegetative buffer strip to filter sediment-laden overflow. A 50-foot (15-meter) minimum grass-covered buffer width is required for slopes less than 20 degrees (1:2.7) when right-of-way is not limited. For slopes greater than 20 degrees, basins should have a 100-foot (30-meter) minimum buffer width when practical.

All erosion and sediment control devices should be installed as the first order of business according to a plan approved by the Water Management Administration (WMA) or local authority. Dewatering basins should be constructed as follows (refer to Detail 1.1):

1. Excavated subsoil and topsoil should be stored separately and replaced in their natural order. Additionally, the excavated sediments should be prevented from entering the waterway by using sediment perimeter controls or other measures.
2. The dewatering basin should have a minimum depth of 3 feet (1 meter) where basin depth is measured from the top of the straw bales to the bottom of the excavation.
3. Once the dewatering basin becomes filled to one-half of the excavated depth, accumulated sediment should be removed and disposed of in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
4. Sediment control devices should remain in place until all disturbed areas are stabilized and the inspecting authority approves their removal. All disturbed ground contours should be returned to their original condition unless otherwise approved by the WMA or local authority.

**Maryland's Guidelines To Waterway Construction
DETAIL 1.1: DEWATERING BASINS**



MGWC 1.4: DIVERSION PIPE

Temporary measure for diverting in-channel construction sites

DESCRIPTION

The work should consist of installing flow diversion pipes in combination with sandbag or stone diversions when construction activities occur within the stream channel.

EFFECTIVE USES & LIMITATIONS

Diversion pipes with an insufficient flow capacity can cause the channel diversion to fail thereby resulting in severe erosion of the disturbed channel section under construction. Therefore, in-channel construction activities should occur only during periods of low flow.

MATERIAL SPECIFICATIONS

Materials for stream diversions should meet the following requirements:

- **Riprap:** Stone should be washed and have a minimum diameter of 6 inches (15 centimeters).
- **Sandbags:** Sandbags should consist of materials which are resistant to ultra-violet radiation, tearing, and puncture and should be woven tightly enough to prevent leakage of fill material (i.e., sand, fine gravel, etc.).
- **Sheeting:** Sheeting should consist of polyethylene or other material which is impervious and resistant to puncture and tearing.

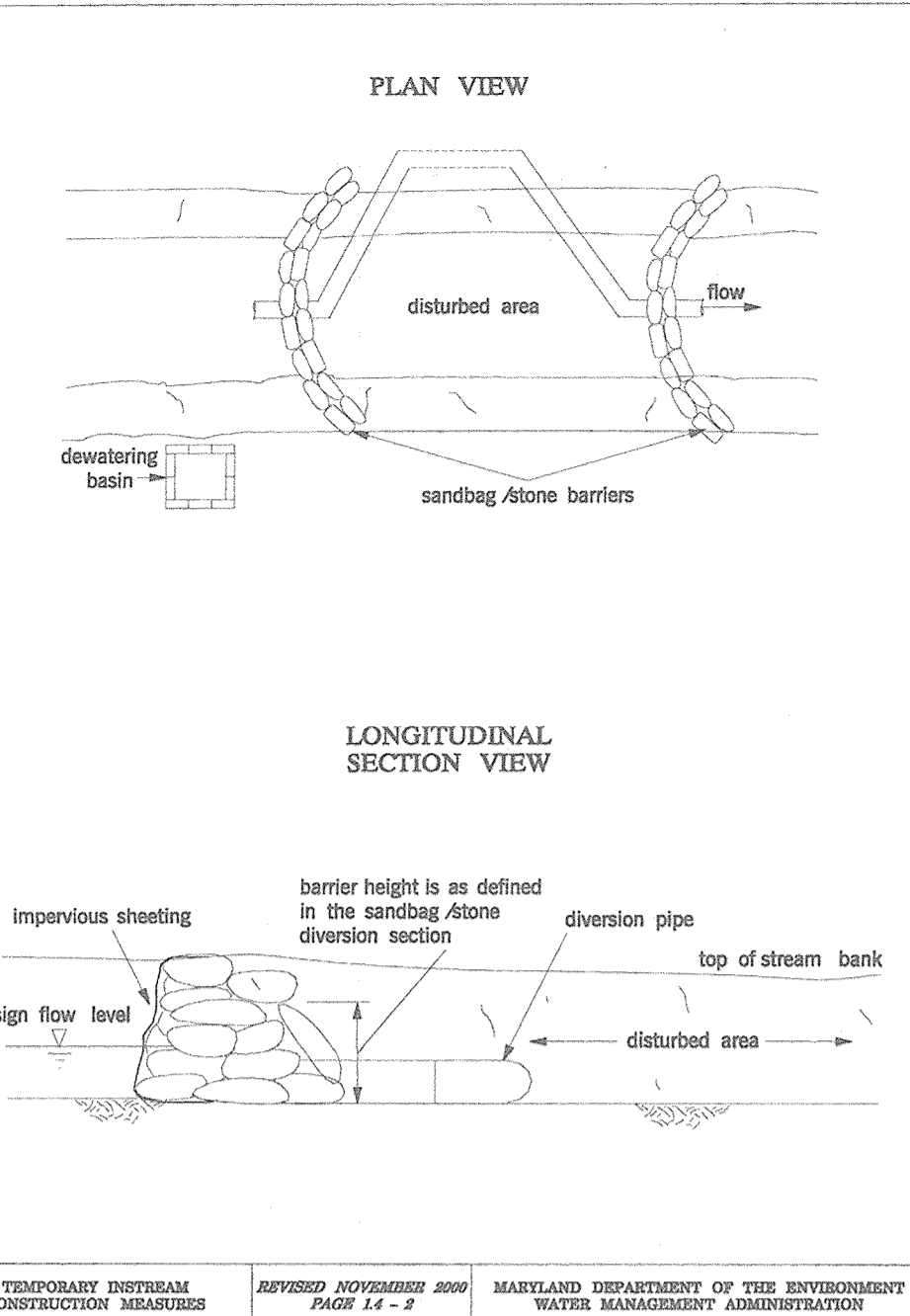
INSTALLATION GUIDELINES

All erosion and sediment control devices including mandatory dewatering basins should be installed as the first order of business according to a plan approved by the WMA or local authority. Installation should proceed from upstream to downstream during low flow conditions. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.

Diversion pipes with sandbag or stone barriers should be completed as follows (refer to Detail 1.4):

1. Sandbag/stone barriers should be sized and installed as detailed in MGWC 1.5: Sandbag/Stone Diversion. The materials should be sized to withstand baseflow velocities.
2. All excavated material should be deposited and stabilized in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
3. Sediment-laden water from the construction area should be pumped to a dewatering basin.
4. The diversion pipe should have a minimum capacity sufficient to convey the 2-year flow for projects with a duration of two weeks or greater. For projects of shorter duration, the capacity of the pipe can be reduced accordingly.
5. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.
6. Sediment control devices are to remain in place until all disturbed areas are stabilized and the inspecting authority approves their removal.

**Maryland's Guidelines To Waterway Construction
DETAIL 1.4: DIVERSION PIPE**



MGWC 1.5: SANDBAG/STONE CHANNEL DIVERSION

Temporary measure for diverting in-channel construction sites

DESCRIPTION

The work should consist of installing sandbag or stone flow diversions for the purpose of erosion control when construction activities occur within the stream channel.

EFFECTIVE USES & LIMITATIONS

Diversions are used to isolate work areas from flow during the construction of in-stream projects. Diversions which have an insufficient flow capacity can fail and severely erode the disturbed channel section under construction. Therefore, in-channel construction activities should occur only during periods of low rainfall. This temporary measure may not be practical in large channels.

MATERIAL SPECIFICATIONS

Materials for sandbag and stone stream diversions should meet the following requirements:

- **Riprap:** Riprap should be washed and have a minimum diameter of 6 inches (0.15 meters).
- **Sandbags:** Sandbags should consist of materials which are resistant to ultra-violet radiation, tearing, and puncture and should be woven tightly enough to prevent leakage of the fill material (i.e., sand, fine gravel, etc.).
- **Sheeting:** Sheeting should consist of polyethylene or other materials which are impervious and resistant to puncture and tearing.

INSTALLATION GUIDELINES

All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. Installation should proceed from upstream to downstream during periods of low flow. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.

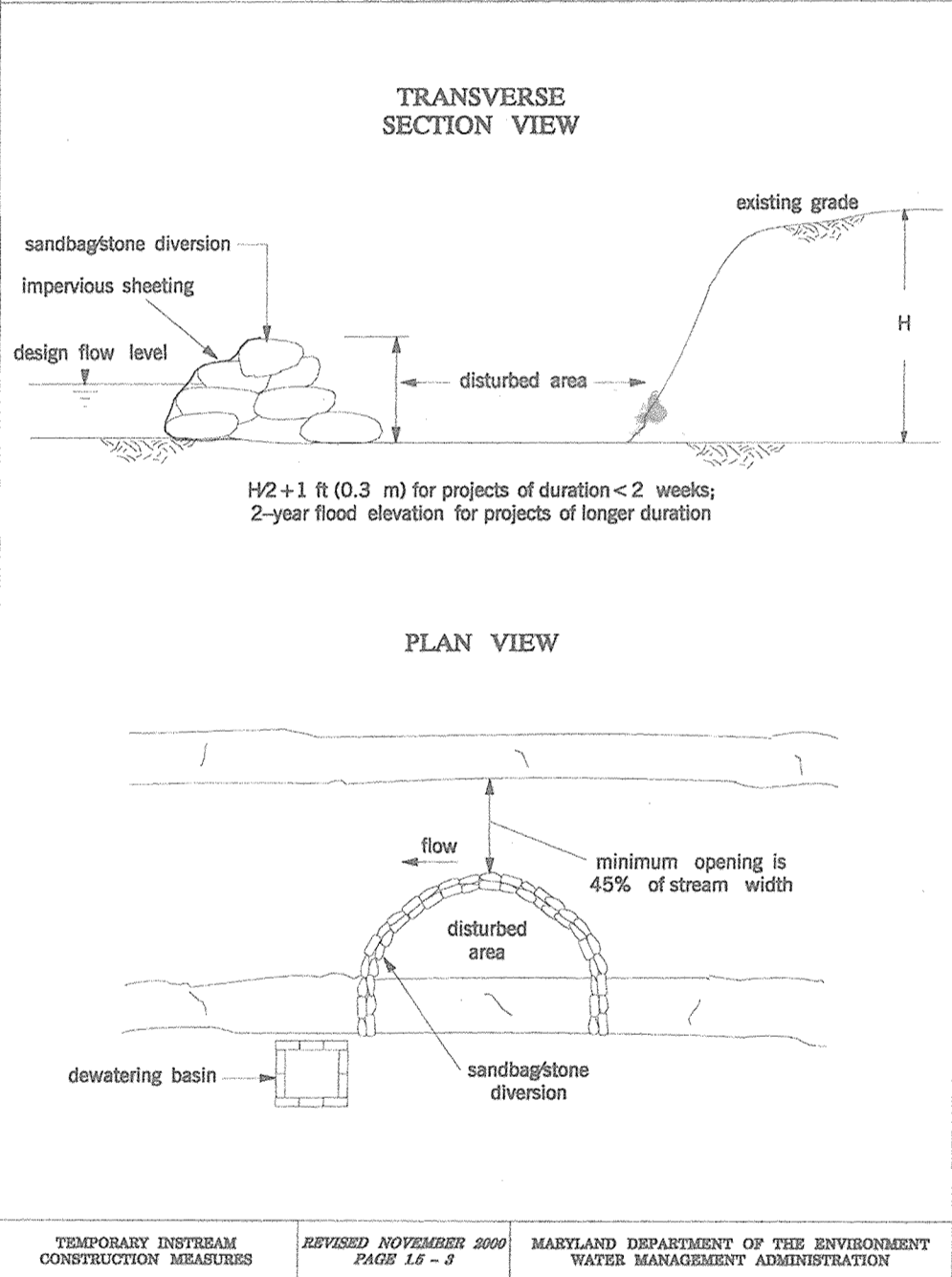
Sandbag/stone diversions can be used independently or as components of other stream diversion techniques. Installation of this measure should proceed as follows (refer to Detail 1.5):

1. The diversion structure should be installed from upstream to downstream.
2. The height of the sandbag/stone diversion should be a function of the duration of the project in the stream reach. For projects with a duration less than 2 weeks, the height of the diversion should be one-half the streambank height, measured from the channel bed, plus 1 foot (0.3 meters) or bankfull height, whichever is greater. For projects of longer duration, the top of the sandbag or stone diversion should correspond to bankfull height. For diversion structures utilizing sandbags, the stream bed should be hand prepared prior to placement of the base layer of sandbags in order to ensure a water tight fit. Additionally, it may be necessary to prepare the bank in a similar fashion.
3. All excavated material should be deposited and stabilized in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
4. Sediment-laden water from the construction area should be pumped to a dewatering basin.

MGWC 1.5: SANDBAG/STONE CHANNEL DIVERSION

5. Sheeting on the diversion should be positioned such that the upstream portion covers the downstream portion with at least a 18-inch (0.45 meters) overlap.
6. Sandbag or stone diversions should not obstruct more than 45% of the stream width. Additionally, bank stabilization measures should be placed in the constricted section if accelerated erosion and bank scour are observed during the construction time or if project time is expected to last more than 2 weeks.
7. Prior to removal of these temporary structures, any accumulated sediment should be removed, deposited and stabilized in an approved area outside the 100-year floodplain unless authorized by the WMA.
8. Sediment control devices are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspecting authority approves their removal.

**Maryland's Guidelines To Waterway Construction
DETAIL 1.5: SANDBAG/STONE DIVERSION**



**BEST MANAGEMENT PRACTICES FOR WORKING IN
NONTIDAL WETLANDS, WETLAND BUFFERS,
WATERWAYS, AND 100-YEAR FLOODPLAINS**

- 1) NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS SHALL BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
- 2) PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
- 3) DO NOT USE THE EXCAVATED MATERIAL AS BACKFILL IF IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE. IF ADDITIONAL BACKFILL IS REQUIRED, USE CLEAN MATERIAL, FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE.
- 4) PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
- 5) REPAIR AND MAINTAIN ANY SERVICABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, OR WATERWAYS, OR PERMANENT MODIFICATION OF THE 100-YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.
- 6) RECTIFY ANY NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, OR 100-YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
- 7) ALL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS (LOLIUM MULTIFLORUM), MILLET (SETARIA ITALICA), BARLEY (HORDEUM SP.), OATS (Avena SP.), AND/OR RYE (SECALE CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION, KENTUCKY 31 RESCUE SHALL NOT BE UTILIZED IN WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDED AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
- 8) AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST-CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
- 9) TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM:
USE I WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.
USE II WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD OCTOBER 1 THROUGH APRIL 30, INCLUSIVE, DURING ANY YEAR.
USE IV WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH MAY 31, INCLUSIVE, DURING ANY YEAR.
- 10) STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
- 11) CULVERTS SHALL BE CONSTRUCTED AND ANY RIPRAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.

OWNER/DEVELOPER

BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

NO.	REVISION	DATE
SITE DEVELOPMENT PLAN WATERWAY CONSTRUCTION NOTES AND DETAILS BUCH ROAD EXTENSION 10945 PRICE MANOR WAY ZONED: R-APT & B-1 PARCEL 126, PARCEL 364, (L. 3192 / F. 394) PARCEL 505 (LOT 496), PARCEL 127 5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND		
ROBERT H. VOGEL ENGINEERING, INC. ENGINEERS • SURVEYORS • PLANNERS 8407 MAIN STREET TEL: 410.461.7666 ELICOTT CITY, MD 21043 FAX: 410.461.8961		
I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.		
DESIGN BY:	RHV/DZE	
DRAWN BY:	DZE/KG	
CHECKED BY:	RHV	
DATE:	APRIL 2016	
SCALE:	AS SHOWN	
W.O. NO.:	12-50.01	
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A duly licensed PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. EXPIRATION DATE: 08-27-2018		PROFESSIONAL CERTIFICATE 6 SHEET OF 19

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION 40
 DATE: 5-12-16

CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 5-9-16

DIRECTOR
 DATE: 8-11-16

BY THE DEVELOPER:

I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

SIGNATURE OF DEVELOPER
 DATE: 4/28/16

BY THE ENGINEER:

I/WE CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

SIGNATURE OF ENGINEER
 DATE: 5/12/16

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

JOHN K. BLUNT
 HOWARD S.C.D.
 DATE: 5/16/16

AS-BUILT CERTIFICATION FOR PSWM

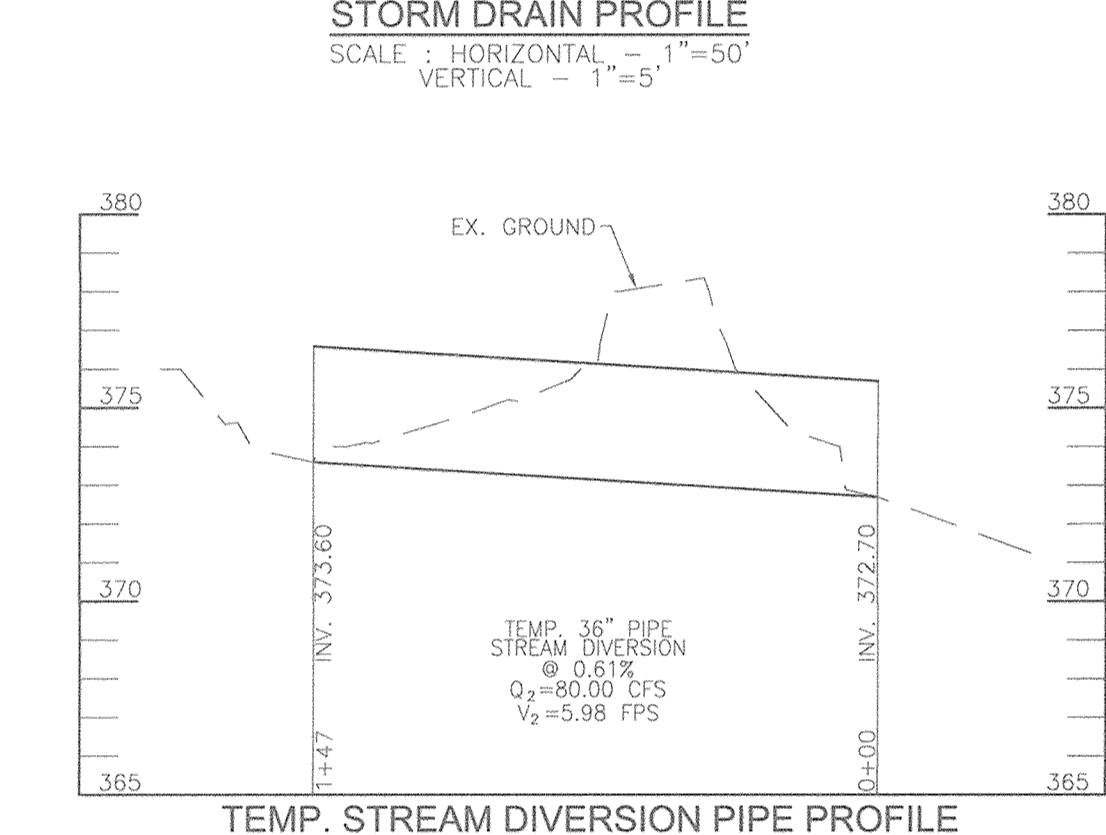
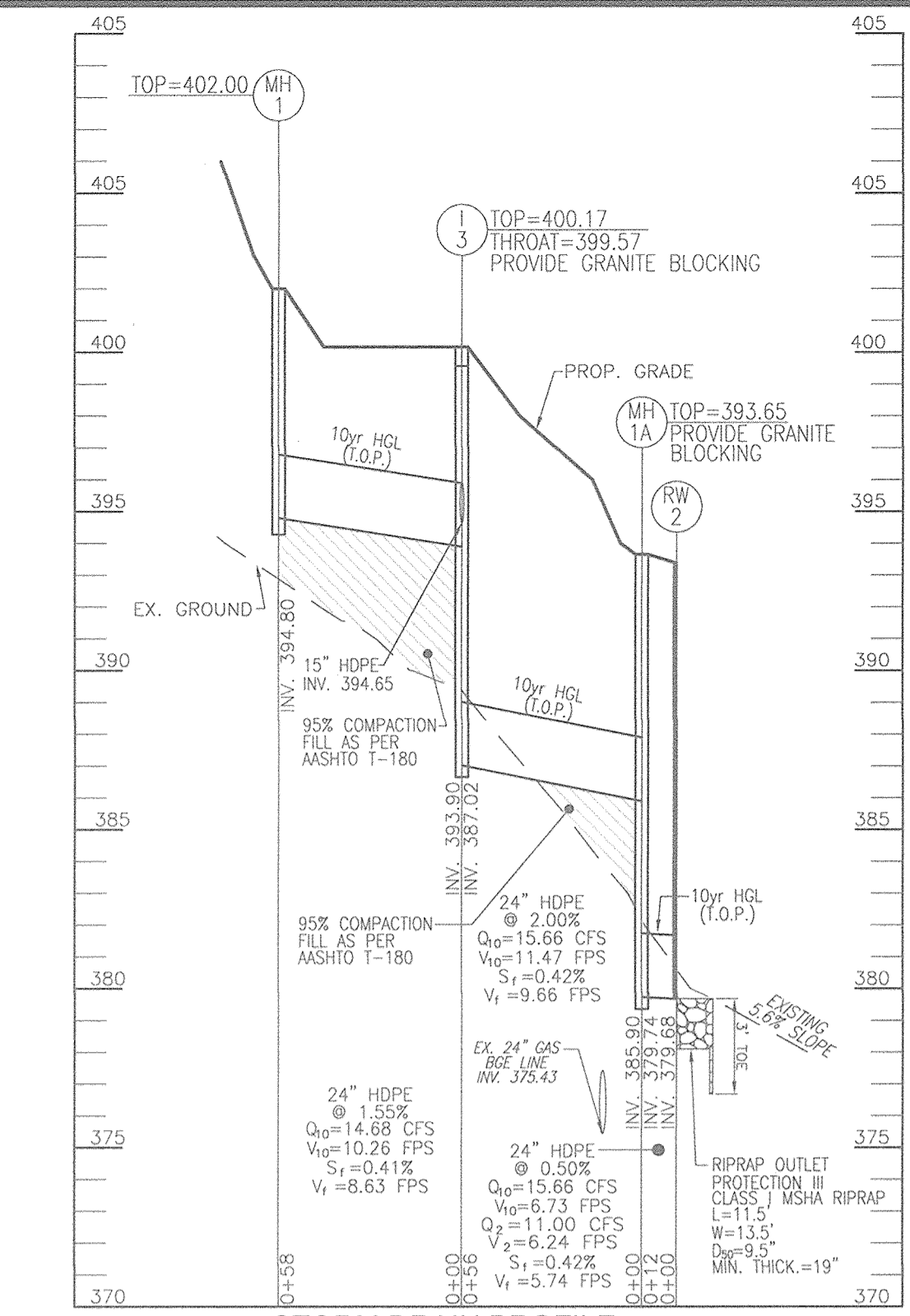
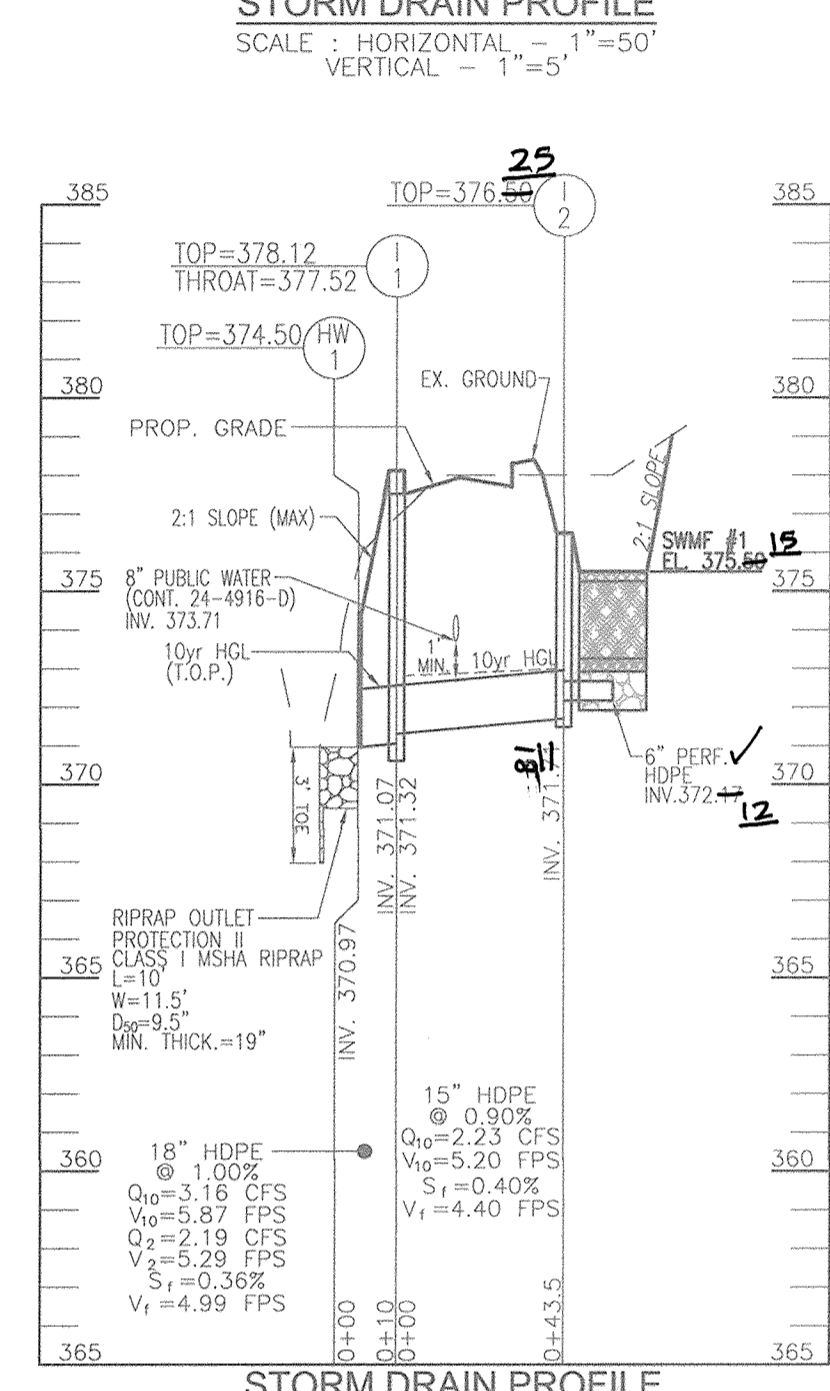
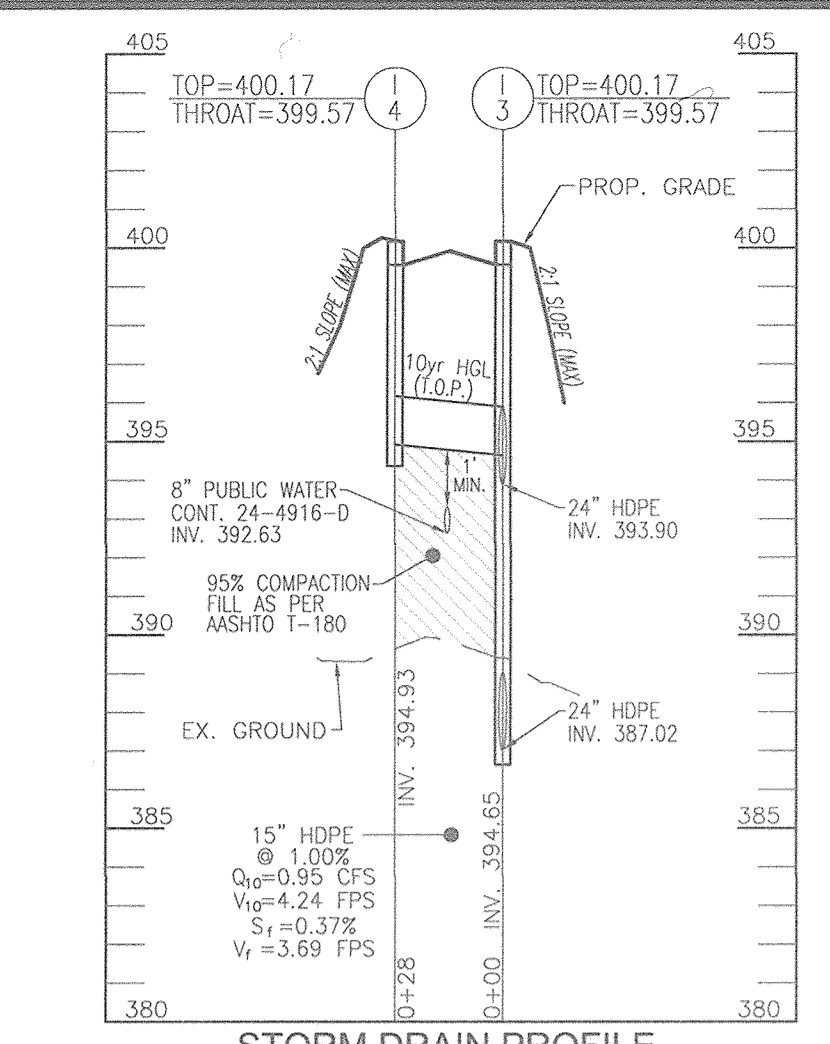
I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.

R.H. VOGEL
 P.E. NAME
 DATE: 2/20/19

NO AS-BUILT INFORMATION ON THIS SHEET



- LEGEND:**
- PROPERTY LINE
 - RIGHT-OF-WAY LINE
 - ADJACENT PROPERTY LINE
 - EXISTING 10' CONTOUR
 - EXISTING CURB AND GUTTER
 - EXISTING UTILITY POLE
 - EXISTING LIGHT POLE
 - EXISTING MAILBOX
 - EXISTING SIGN
 - EXISTING SANITARY MANHOLE
 - EXISTING SANITARY LINE
 - EXISTING CLEANOUT
 - EXISTING FIRE HYDRANT
 - EXISTING WATER LINE
 - EXISTING FENCE
 - EXISTING TREELINE
 - EXISTING LIMIT OF WETLANDS
 - EXISTING WEILANDS
 - LIMITS OF FLOODPLAIN
 - PROPOSED PUBLIC WATER AND UTILITY EASEMENT
 - PROPOSED STORMDRAIN
 - PROPOSED STORMDRAIN INLET
 - PROPOSED TREELINE
 - PROPOSED CURB
 - PROPOSED SIDEWALK
 - PROPOSED 10' CONTOUR
 - PROPOSED 2' CONTOUR
 - MODERATE SLOPPS (1:32 - 24:594)
 - STEEP SLOPE (>25%)
 - SOILS BOUNDARY
 - STREET TREES
 - MICRO-BORRENTION (M-6)
 - PROP. 100 YR FLOODPLAIN EASEMENT
 - EX. DIRM 100 YR FLOODPLAIN EASEMENT
 - DRAINAGE DIVIDE



AS-BUILT CERTIFICATION FOR PSWM

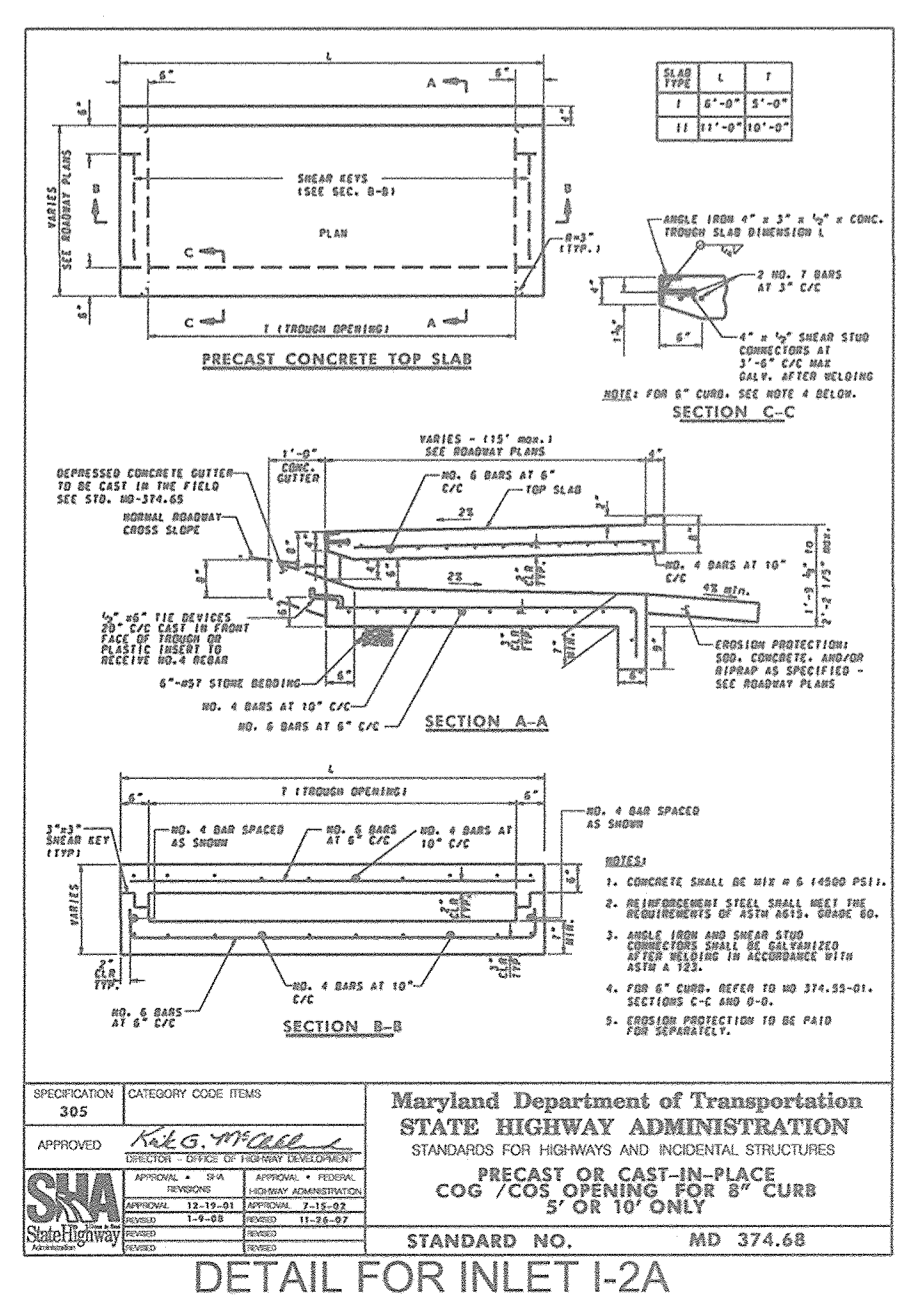
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NAME: Robert H. Vogel P.E. NO. 16193 DATE: 2/20/19

TEMP. STREAM DIVERSION NOTES:

- TEMPORARY STREAM DIVERSION TO BE CONSTRUCTED DURING A 5-DAY CLEAR (NO-PRECIPIATION) PERIOD AND IN ACCORDANCE WITH DATES STIPULATED BY THE MDE PERMIT.
- CONTRACTOR SHOULD ONLY BEING TEMPORARY AND FINAL STREAM DIVERSION WORK IN AN AREA WHICH CAN BE COMPLETED BY THE END OF THE EACH DAY, INCLUDING GRADING ADJACENT TO THE CHANNEL.
- AT THE END OF EACH WORK DAY, THE WORK AREA MUST BE STABILIZED AND THE PUMP AROUND REMOVED FROM THE CHANNEL.
- WORK SHOULD NOT BE CONDUCTED IN THE CHANNEL DURING RAIN EVENTS.
- WORK WILL BE PERMITTED IN THE STREAM ONLY DURING THOSE TIMES DICTATED BY THE MDE PERMIT.

OWNER/DEVELOPER
BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20725
301-359-3500



STORM DRAIN STRUCTURE SCHEDULE

NO.	TYPE	LOCATION	NORTHING	EASTING	THROAT	TOP	INV. IN	INV. OUT	COMMENTS
I-1	TYPE A-5 INLET		540510.86	1341080.96	377.52	378.12	374.30	371.07	HO. CO. STD. D-4.01
I-2	YARD INLET		540511.94	1341039.26		376.00	6' 372.44	16' 371.88	HO. CO. STD. D-4.14
I-2A	PRECAST COS OPENING INLET (6' WIDE x 5.67' DEEP)		540524.71	1341061.36	377.52	378.12			SHA MD 374.68
I-3	TYPE A-5 INLET		540212.33	1341086.71	399.57	400.17	15' 394.65	387.02	HO. CO. STD. D-4.01
I-4	TYPE A-5 INLET		540203.44	1341084.39	399.57	400.17	24' 393.90	394.93	HO. CO. STD. D-4.01
MH-4	STANDARD 4' PRECAST MANHOLE		540173.35	1341130.28		402.00		394.80	HO. CO. STD. G-5.12
MH-1A	STANDARD 4' PRECAST MANHOLE		540289.02	1341084.77		393.65	385.90	379.74	HO. CO. STD. G-5.13
ES-1	CONCRETE HEADWALL		540663.70	1341200.44		374.47	373.60		HO. CO. STD. D-5.51
ES-2	CONCRETE HEADWALL		540532.96	1341023.51		383.18	375.00		HO. CO. STD. D-5.51
HW-1	TYPE 'A' HEADWALL		540503.57	1341091.15		374.47	370.97		HO. CO. STD. D-5.11

PIPE SCHEDULE

SIZE	TYPE	LENGTH
15"	HDPE (SD)	72
18"	HDPE (SD)	10
24"	HDPE (SD)	143
6"	PERF. HDPE (SWM)	74

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cliff Johnson 5-12-16
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Walt Selman 8-9-16
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

William J. J. J. 8-11-14
DIRECTOR DATE

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET, ELLICOTT CITY, MD 21043
TEL: 410.461.7666 FAX: 410.461.8961

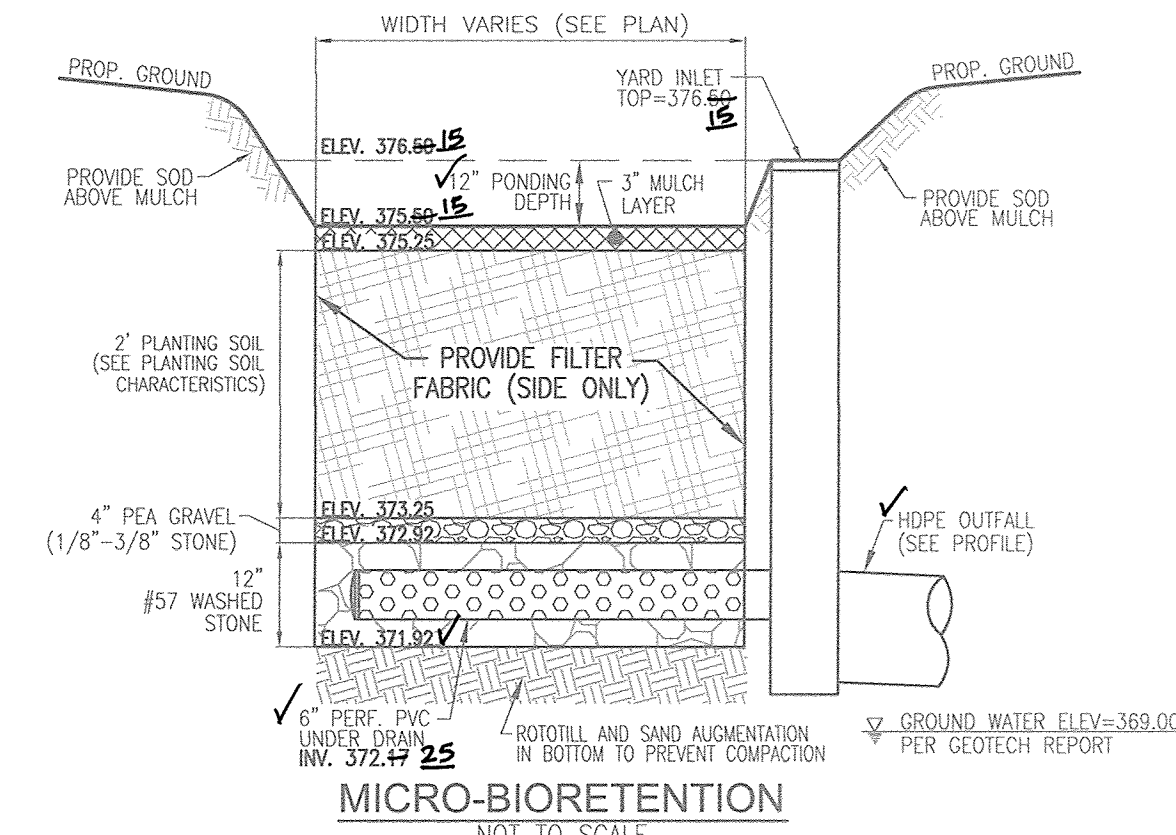
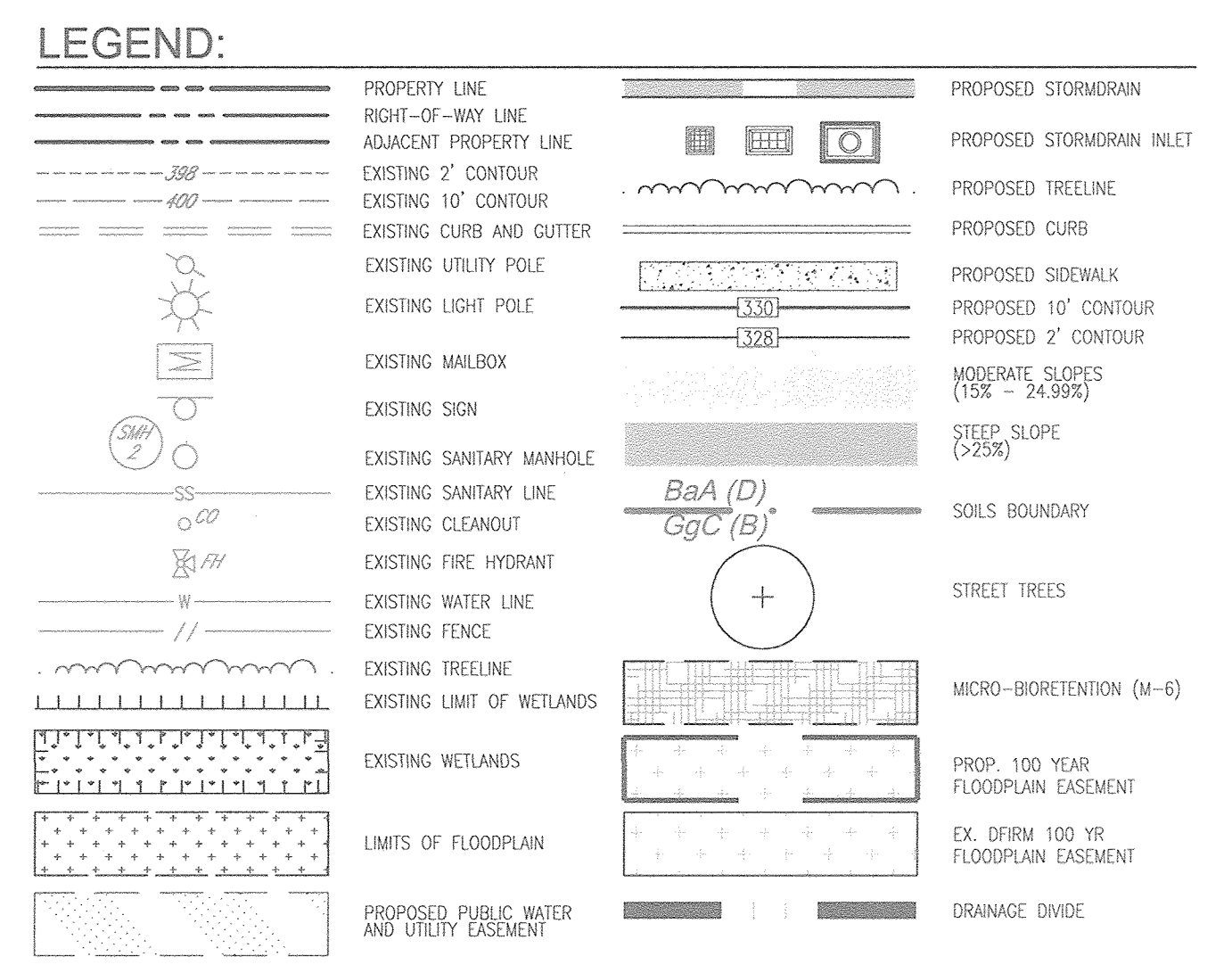
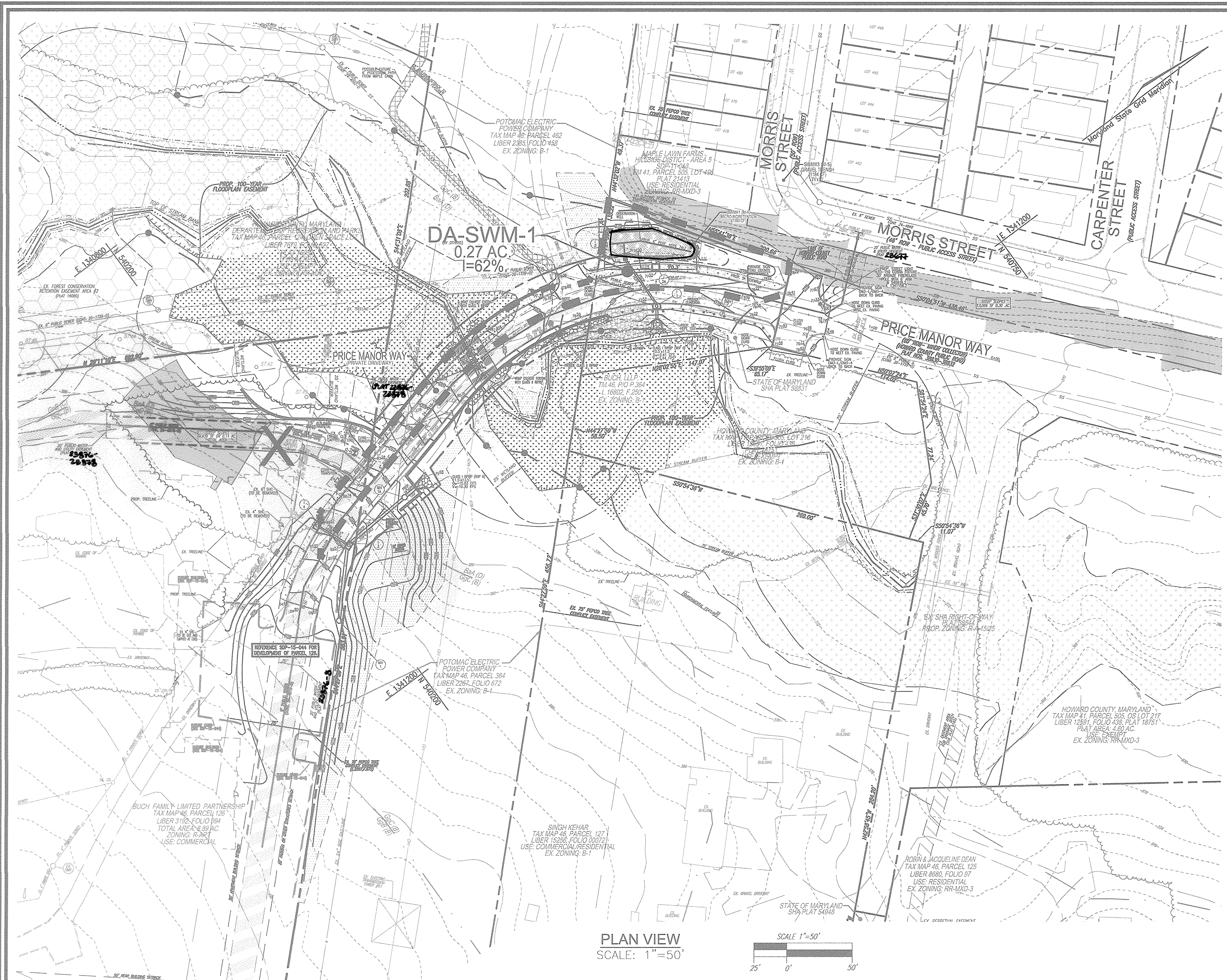
SITE DEVELOPMENT PLAN
STORM DRAIN DRAINAGE AREA MAP AND PROFILES
BUCH ROAD EXTENSION
10945 PRICE MANOR WAY
ZONED: R-APT & B-1 (L. 3192 / F. 394) PARCEL 126, PARCEL 364, PARCEL 305 (LOT 498), PARCEL 127
TAX MAP 46 BLOCK 4 5TH ELECTION DISTRICT LAUREL, MD 20725 HOWARD COUNTY, MARYLAND

DESIGN BY: RHV/DZE
DRAWN BY: DZE/KG
CHECKED BY: RHV
DATE: APRIL 2016
SCALE: AS SHOWN
W.O. NO.: 12-50-01

PROFESSIONAL CERTIFICATE
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. EXPIRATION DATE: 08-27-2018

7 SHEET OF 19

AS-BUILT - AUG. 2018



MICROBIORETENTION NOTES:
 1. ONLY THE SIDES OF MICROBIORETENTION ARE TO BE HAVING FILTER FABRIC. FILTER FABRIC BETWEEN LAYER OR AT THE BOTTOM OF THE MICROBIORETENTION WILL CAUSE THE MBR TO FAIL, AND THEREFORE SHALL NOT BE INSTALLED.
 2. WRAP THE PERFORATED MBR UNDERDRAIN PIPE WITH 1/4\"/>

Pe = 1.27
 ESDv=(Pe/RvxA)/12
 Rv=0.05+0.009xI
 Vmin=1.0\"/>

DA	% IMPERV	Rv	DA	ESDv	REQ. VOLUME	MINIMUM VOLUME PROVIDED*	MAXIMUM VOLUME PROVIDED*	FACILITY TYPE	SURFACE AREA	STORAGE DEPTH (FT)
1	62	0.61	0.27	770	606	1576	1316	MICRO-BIORETENTION	1316	1.0

TOTAL ESDv BY SUBAREA: 770 1,316

DRAINAGE AREA #	AREA TREATED (SF)	FACILITY NUMBER	PERMEABLE PAVEMENT (A-2)	ADD UNDER PERM. PAVE INFILTRATION (A-2)	LANDSCAPE PERM. PAVE INFILTRATION (M-3)	BIOTRENTATION (A-2)	BIOTRENTATION (M-5)	TRAVEL (M-6)	RETENTION (M-6)	ESDv VOLUME PROVIDED
1	11903	SWM#1	0	0	0	0	0	0	0	1316
SUBTOTAL 1			0	0	0	0	0	0	0	1316

TOTAL AREA 11903 SF
 0.27 AC
 TOTAL ESDv PROVIDED: 1316

Appendix B.4. Construction Specifications for Environmental Site Design Practices

Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil [2\"/>			

APPENDIX B.4.C SPECIFICATIONS FOR MICRO-BIORETENTION, RAIN GARDEN, LANDSCAPE INFILTRATION & INFILTRATION BERMS

1. MATERIAL SPECIFICATIONS
 THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.

2. FILTERING MEDIA OR PLANTING SOIL
 THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE MICRO-BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVIDE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIALLY LISTED UNDER COMAR 15.03.01.02. THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:
 * SOIL COMPONENT - LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION).
 * ORGANIC CONTENT - MINIMUM 10% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (5% TO 40% OR SANDY LOAM LOAM, COARSE SAND (20%), AND COMPOST (60%).
 * CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
 * PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. AMENDMENTS (E.G., LIME, LIMONITE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE THERE SHALL BE AT LEAST ONE SOIL TEST PER PROJECT. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH AND ADDITIONAL TESTS OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.

3. COMPACTION
 IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF THE BIORETENTION PRACTICES AND THE REQUIRED BACKFILL, WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TIRE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH-PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE.
 COMPACTION CAN BE ALLEVATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACURE THE SOIL PROFILE THROUGHOUT THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.
 ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE OPTIMAL SAND LAYER. PUMP ANY PONDING WATER BEFORE PREPARING (ROTOTILLING) BASE.
 WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO FINAL GRADE.
 WHEN BACKFILLING THE BIORETENTION FACILITY WITH SOIL IN LOTS 12 TO 18\"/>

OPERATION AND MAINTENANCE SCHEDULE FOR LANDSCAPE INFILTRATION (M-3), MICRO-BIORETENTION (M-6), RAIN GARDENS (M-7), BIOTRENTATION SWALE (M-8), AND ENHANCED FILTERS (M-9)

1. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL PRUNING.
 MATERIAL ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, TABLE A.4.1 AND 2.

2. THE OWNER SHALL PERFORM A PLANT IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.

3. THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.

4. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

5. SHOULD SYSTEM FAIL, AND UPON DETERMINING FAILURE OF SYSTEM IS DUE TO PLANTING MEDIA, ALL PLANT MATERIAL WITHIN THE UNIT, INCLUDING TREES, SHALL BE REMOVED AND REPLACED.

OWNER/DEVELOPER

BUCH LLLP
 10945 PRICE MANOR WAY
 LAUREL, MD 20723
 301-359-3500

**SITE DEVELOPMENT PLAN
 STORMWATER MANAGEMENT DRAINAGE AREA MAP, NOTES AND DETAILS**

**BUCH ROAD EXTENSION
 10945 PRICE MANOR WAY**

ZONED: R-APT & B-1 (L 3192 / F. 394) PARCEL 126, PARCEL 364, PARCEL 505 (LOT 486), PARCEL 127 HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 8407 MAIN STREET ELLICOTT CITY, MD 21043 TEL: 410.461.7666 FAX: 410.461.8961

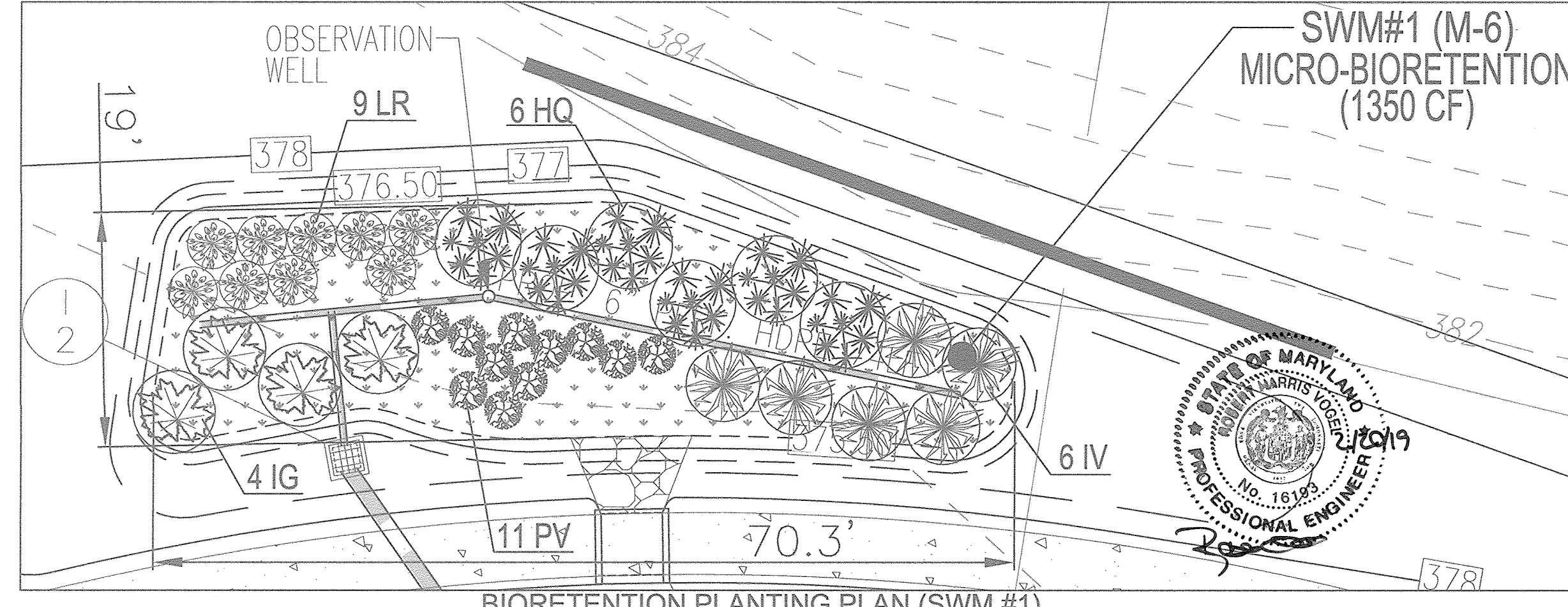
PROFESSIONAL CERTIFICATE
 I HEREBY CERTIFY THAT THE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. EXPIRATION DATE: 08-27-2018

DESIGN BY: RHV/DZE
 DRAWN BY: DZE/KGC
 CHECKED BY: RHV
 DATE: APRIL 2016
 SCALE: AS SHOWN
 W.O. NO.: 12-50.01

8 SHEET OF 19

LEGEND KEY	QTY	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS
IG	4	ILEX GLABRA "SHAMROCK" INKBERRY HOLLEY	1 GALLON	18" O.C.
IV	6	ITEA VIRGINICA "HENRY'S GARNETT" VIRGINIA SWEETSPHIRE	1 GALLON	18" O.C.
HQ	6	HYDRANGEA QUERCIFOLIA OAKLEAF HYDRANGEA	1 GALLON	30" O.C.
LR	9	LEUCOTHEO RACEMOSA FETTERBUSH	1 GAL.	30" O.C.
PV	11	PANICUM VIRGATUM SWITCHGRASS	1 GAL.	36" O.C.

LEGEND	QTY	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS
	37	BAPTISIA AUSTRALIS FALSE INDIGO	4" POT	12"-15" O.C. FOR SIDES AND BOTTOM OF MBR. MIX ALL VARIETIES IN A NATURALIZED RANDOM PATTERN THROUGHOUT. PLANT IN GROUPS OF NO LESS THAN 9 PLANTS PER CLUMP
	37	ACORUS GRAMINEUS "ODON" GOLDEN VARIEGATED SWEET FLAG	1 QT.	



AS-BUILT CERTIFICATION FOR PSWM

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THE "AS-BUILT" PLANS AND WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS CURRENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.

P.E. NAME: Roger Kraus 6/193 DATE: 2/20/19

MICRO-BIORETENTION PLANTING REQUIREMENTS	PLANTINGS PROVIDED	PERENNIALS/GROUND COVER PROVIDED										
MBR #	LF	AREA	STEMS REQUIRED (0.0229)	STEMS PROVIDED	IG	IV	HQ	LR	PV	BA	AG	TOTAL
1	161.92	1080.15	25	36	4	6	6	9	11	37	37	74
TOTALS:	162	1080	25	36	4	6	6	9	11	37	37	74

BIORETENTION AREAS ARE TO BE PLANTED BASED ON A MINIMUM DENSITY OF 1000 STEMS PER PLANTED ACRE (0.0229 STEMS PER SQUARE FOOT).

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division: 5-12-16
 Chief, Division of Land Development: 5-9-16
 Director: 5-11-16

NO.	DESCRIPTION	DATE	BY
1	AS-BUILT	8/11/16	AS
2	AS-BUILT	8/11/16	AS
3	AS-BUILT	8/11/16	AS
4	AS-BUILT	8/11/16	AS
5	AS-BUILT	8/11/16	AS
6	AS-BUILT	8/11/16	AS
7	AS-BUILT	8/11/16	AS
8	AS-BUILT	8/11/16	AS
9	AS-BUILT	8/11/16	AS
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27	AS-BUILT	8/11/16	AS
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29	AS-BUILT	8/11/16	AS
30	AS-BUILT	8/11/16	AS

NO.	DESCRIPTION	DATE	BY
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29	AS-BUILT	8/11/16	AS
30	AS-BUILT	8/11/16	AS

NO.	DESCRIPTION	DATE	BY
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2	AS-BUILT	8/11/16	AS
3	AS-BUILT	8/11/16	AS
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30	AS-BUILT	8/11/16	AS

GENERAL NOTES:

SPECIFICATIONS: SHA SPECIFICATIONS DATED JULY, 2008
 REVISIONS THEREOF AND ADDITIONS THERETO AND SPECIAL PROVISIONS FOR MATERIALS & CONSTRUCTION

ASHTO LRFD BRIDGE DESIGN SPECIFICATIONS DATED 2010 AND ALL INTERIMS.

CONCRETE: LOAD AND RESISTANCE FACTOR DESIGN METHOD $f_c = 4500$ PSI.

REINFORCING STEEL DESIGN: $f_y = 60,000$ PSI

LOADING: HS-25

CONCRETE: CULVERT ENDS FOOTINGS, WING WALLS AND HEAD WALLS SHALL BE CAST-IN-PLACE. ALL CONCRETE SHALL BE MIX 6 (4500 PSI).

REINFORCING STEEL: REINFORCING STEEL SHALL CONFORM TO ASTM A 615 GRADE 60.

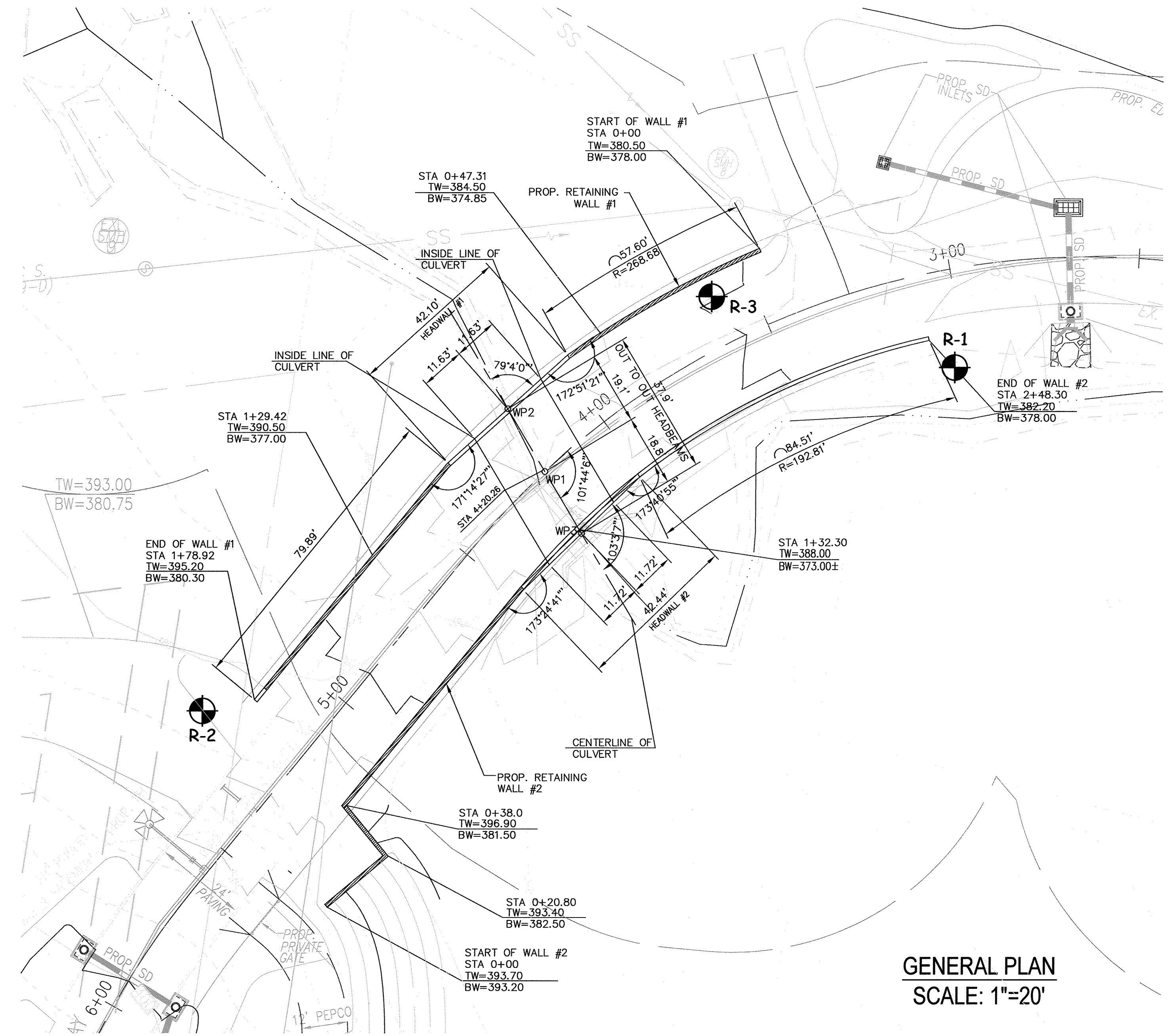
ONLY GRADE 60 CAN BE USED ON THIS PROJECT.

ALL SPLICES, NOT SHOWN, SHALL BE LAPPED AS PER BAR LAP CHARTS. MINIMUM COVER FOR ANY BAR SHALL BE 2" UNLESS OTHERWISE NOTED, WITH THE EXCEPTION OF BARS AT THE BOTTOM AND SIDES OF ALL FOOTINGS WHICH SHALL HAVE 3" MINIMUM COVER UNLESS OTHERWISE NOTED.

KEYS: ALL KEYS ARE NOMINAL SIZE.

RESTRICTIONS FOR PLACING EQUIPMENT ON EXISTING AND NEW STRUCTURES AND STORING MATERIALS ON/OR AGAINST EXISTING AND NEW STRUCTURE(S) ELEMENTS. THE LIMITATIONS BASICALLY RELATE TO LOADS THAT ARE BEYOND MARYLAND'S LEGAL VEHICLES AND/OR POSTED LOAD LIMITS (WHERE APPLICABLE) AND MATERIALS STOCKPILED ON/OR AGAINST STRUCTURES OR STRUCTURAL ELEMENTS. FOR DETAILS OF SUCH RESTRICTIONS SEE SECTION TC 6.14 TITLED "RESTRICTIONS FOR PLACING AND USING EQUIPMENT ON STRUCTURES, OR STORING MATERIALS ON/OR AGAINST STRUCTURES" IN THE CONTRACT DOCUMENTS. IN ORDER TO COMPLY WITH THIS ARTICLE, THE CONTRACTOR SHALL READ SECTION TC 6.14 PRIOR TO COMMENCING ANY WORK ON STRUCTURES IN THIS CONTRACT.

COVER FOR CULVERT: NO HEAVY CONSTRUCTION EQUIPMENT SHALL BE PERMITTED TO PASS OVER THE CULVERT UNTIL A MINIMUM OF 3 FT OF COMPACTED FILL HAS BEEN PLACED OVER THE CULVERT.

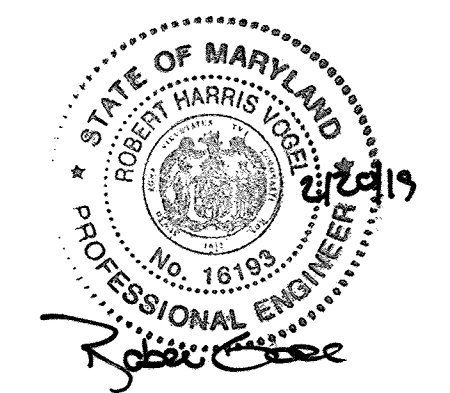


NOTES:
 TW: TOP OF WALL/PARAPET (PARAPET IS 42 INCHES HIGH)
 BW: LOW SIDE FINISHED GRADE

GENERAL PLAN
 SCALE: 1"=20'

OWNER/DEVELOPER
 BUCH LLLP
 10945 PRICE MANOR WAY
 LAUREL, MD 20723
 301-359-3500

AS-BUILT CERTIFICATION FOR PSWM
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.
 Robert V. Goe 1/6/19 2/20/19
 P.E. # DATE



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad Edmon
 CHIEF, DEVELOPMENT ENGINEERING DIVISION 4w 5-12-16
 DATE

Victor Lewis
 CHIEF, DIVISION OF LAND DEVELOPMENT 8-9-16
 DATE

Nadine J. J. [Signature]
 DIRECTOR 8-11-16
 DATE

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
ARCH CULVERT
GENERAL PLAN
BUCH ROAD EXTENSION
 10945 PRICE MANOR WAY
 ZONED: R-APT & B-1 (L. 3192 / F. 394) PARCEL 126, PARCEL 364, PARCEL 505 (LOT 486), PARCEL 127, PARCEL 127 HOWARD COUNTY, MARYLAND

TAX MAP 46 BLOCK 4 5TH ELECTION DISTRICT

ECs 1340 CHARWOOD ROAD SUITE A HANOVER, MARYLAND 21076 PHONE: (410) 859-4300 FAX: (410) 859-4324

PROFESSIONAL CERTIFICATE
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 28503, EXPIRATION DATE: 12-31-2019.

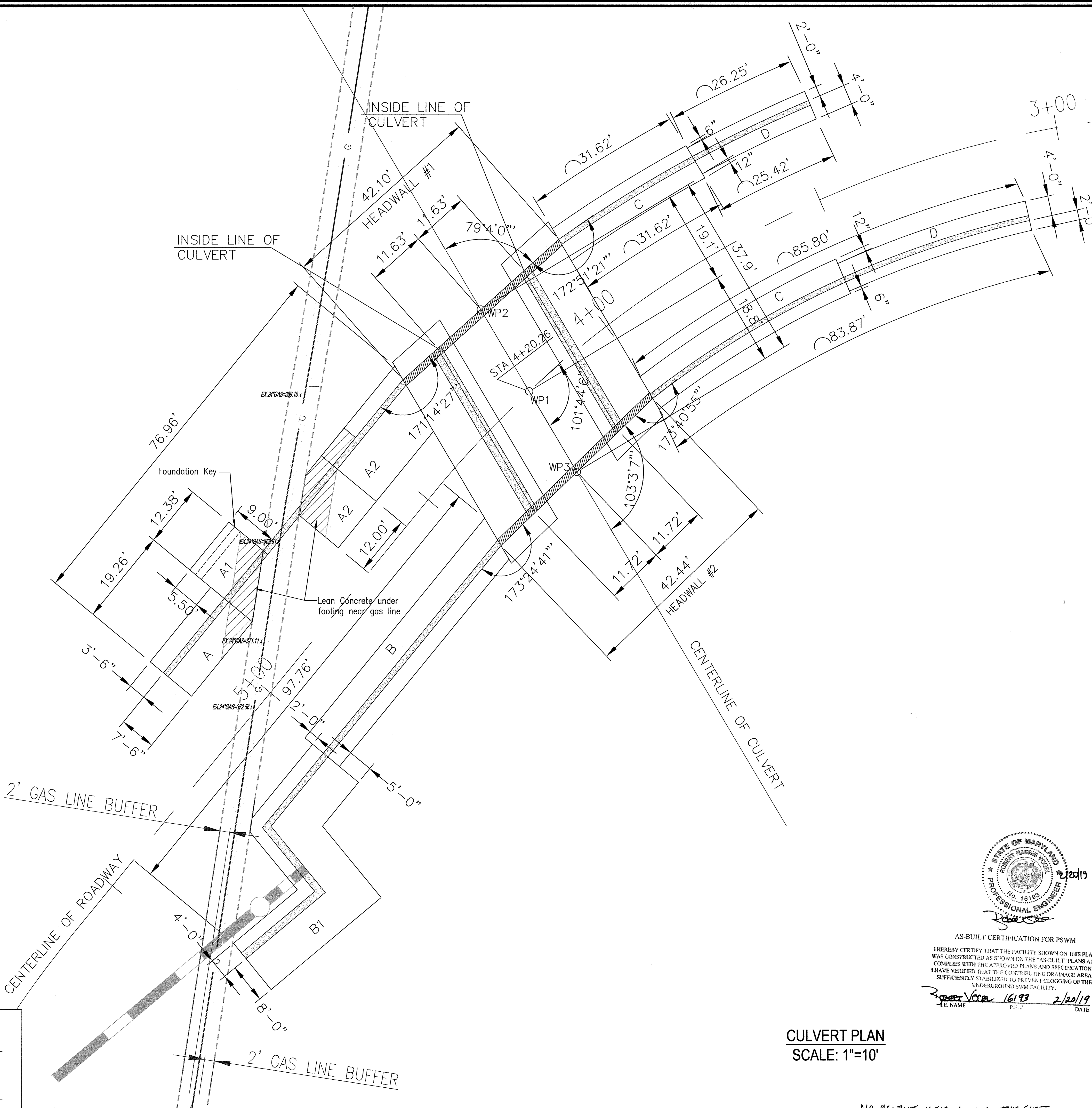
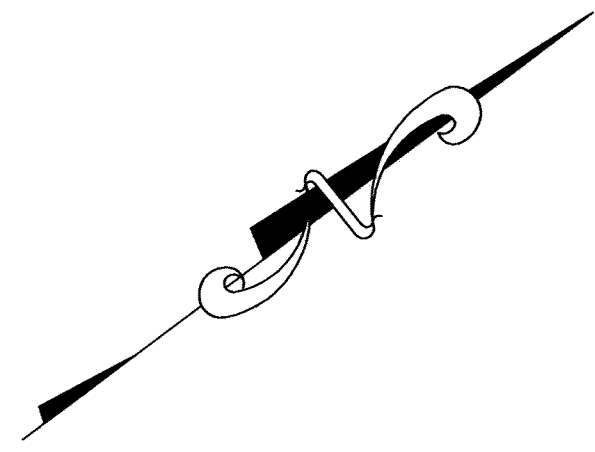
DESIGN BY: DMA/HMA
 DRAWN BY: DMA/HMA
 CHECKED BY: HMA
 DATE: APR 2016
 SCALE: AS SHOWN
 W.O. NO.: 7722-B

HASAN M. ABOUMATAR, P.E.

9 SHEET OF 19

NO AS-BUILT INFORMATION ON THIS SHEET

AS-BUILT - AUG. 2018



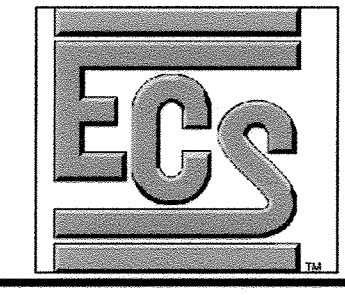
OWNER/DEVELOPER
 BUCH LLLP
 10945 PRICE MANOR WAY
 LAUREL, MD 20723
 301-359-3500

NO.	REVISION	DATE

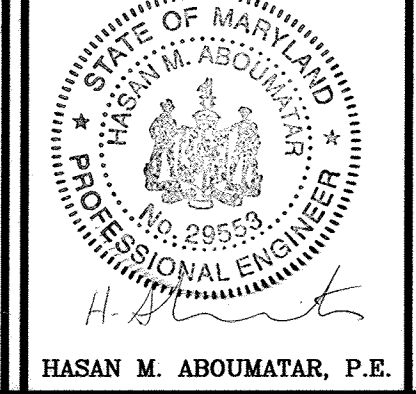
SITE DEVELOPMENT PLAN
ARCH CULVERT
GEOMETRIC AND FOOTING LAYOUT
BUCH ROAD EXTENSION
 10945 PRICE MANOR WAY
 ZONED: R-APT & B-1
 TAX MAP 46 BLOCK 4 5TH ELECTION DISTRICT
 PARCEL 126, PARCEL 364
 PARCEL 505 (LOT 496), PARCEL 127
 HOWARD COUNTY, MARYLAND



AS-BUILT CERTIFICATION FOR PSWM
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.
 Robert Harris 16193 2/20/19
 P.E. # DATE



1340 CHARWOOD ROAD
 SUITE A
 HANOVER, MARYLAND 21076
 PHONE: (410) 859-4300
 FAX: (410) 859-4324

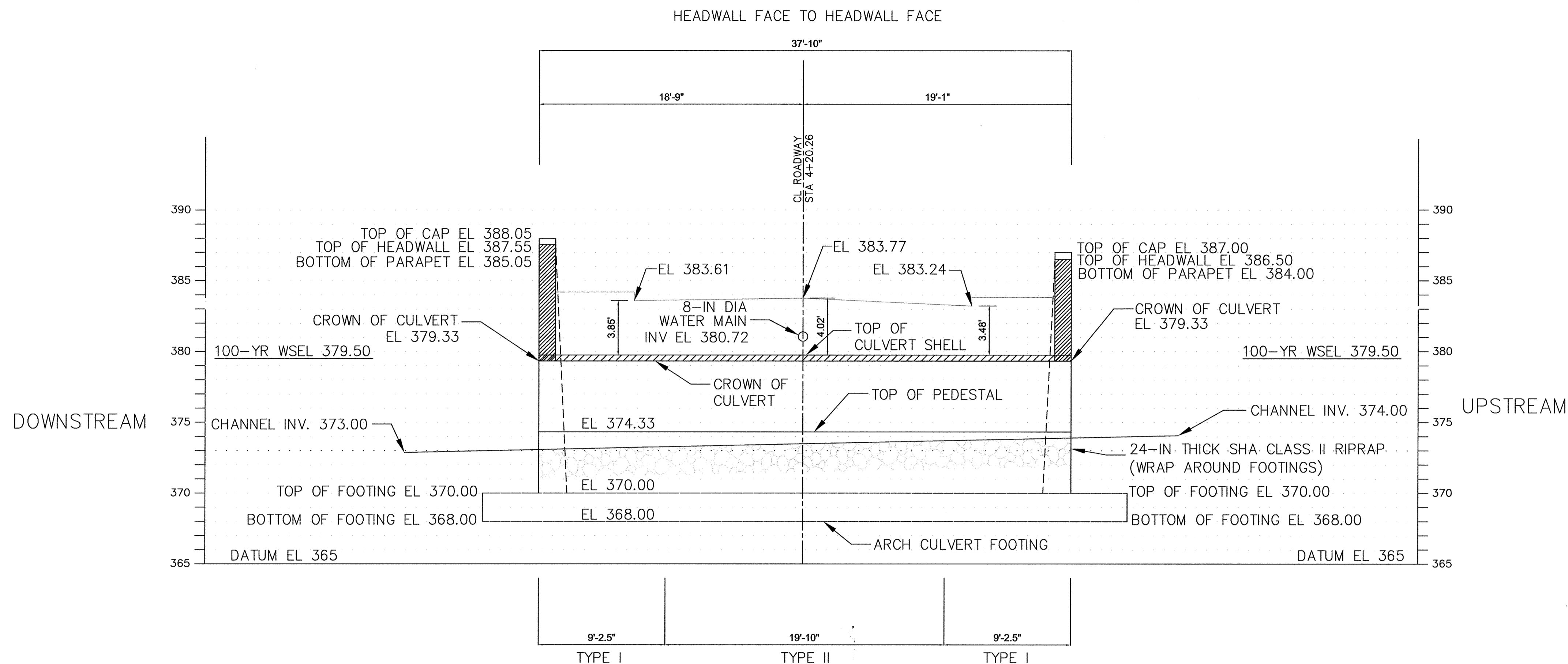


PROFESSIONAL CERTIFICATE
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 89593, EXPIRATION DATE 12-31-2019.
 DESIGN BY: DMA/HMA
 DRAWN BY: DMA/HMA
 CHECKED BY: HMA
 DATE: APR 2016
 SCALE: AS SHOWN
 W.O. NO.: 7272-B
 HASAN M. ABOUMATAR, P.E.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division
 Chief, Division of Land Development
 Director
 DATE: 5-22-16
 DATE: 8-9-16
 DATE: 8-11-16

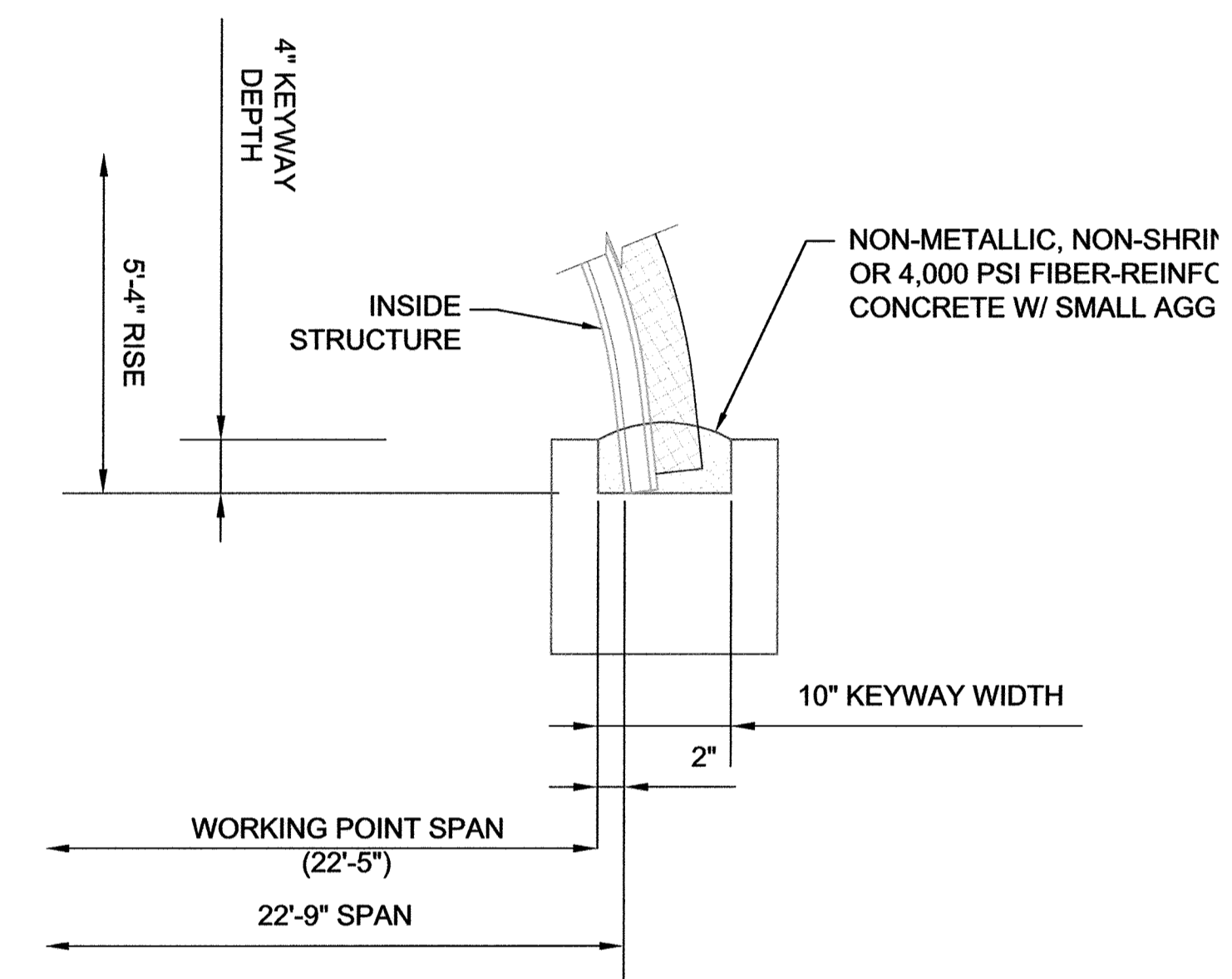
CULVERT PLAN
SCALE: 1"=10'

NO AS-BUILT INFORMATION ON THIS SHEET



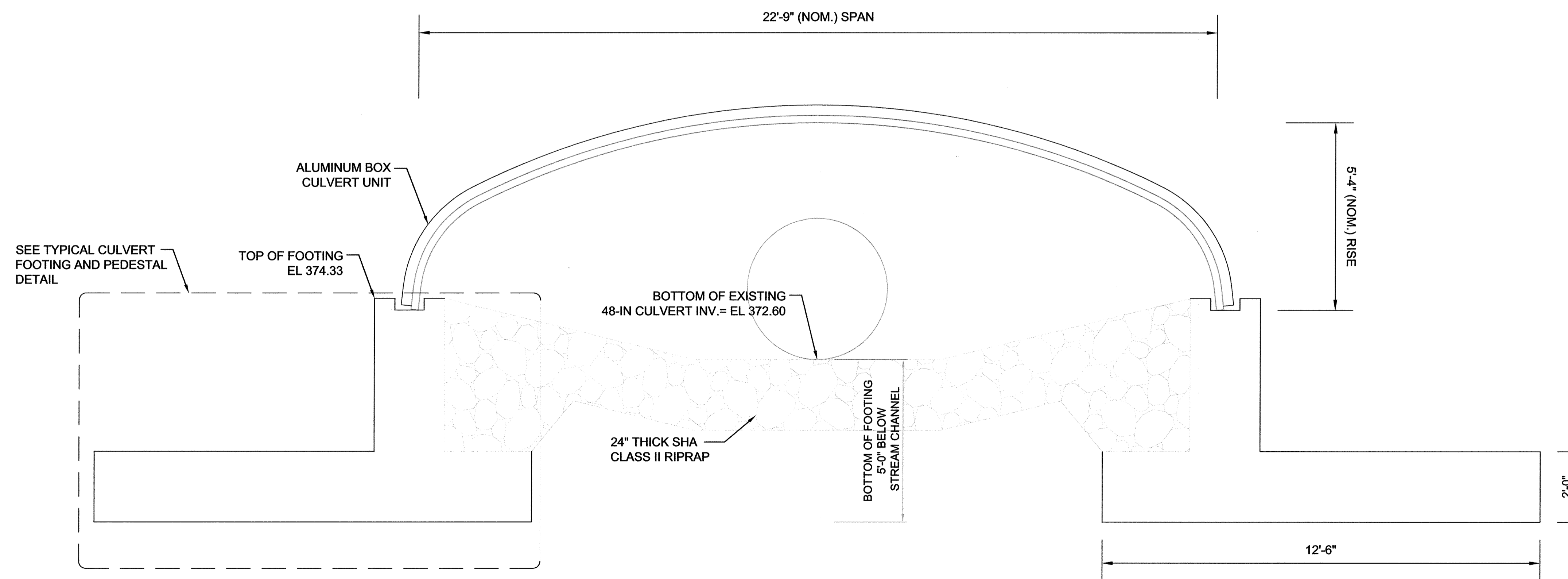
CULVERT LONGITUDINAL SECTION AT CENTERLINE
SCALE: 1"=5'

NOTE: I&II INDICATES
CULVERT FOOTING AND
PEDESTAL DETAIL TYPE



TYPICAL CULVERT UNIT
GROUT DETAIL
NOT TO SCALE

OWNER/DEVELOPER
BUCH LLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500



CULVERT SECTION @ CENTERLINE OF ROADWAY
SCALE: 1/2" = 1'



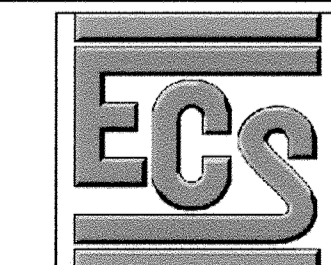
AS-BUILT CERTIFICATION FOR PSWM
I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.
Robert Vogel 16193 2/20/19
P.E. NAME P.E.# DATE

NO AS-BUILT INFORMATION ON THIS SHEET

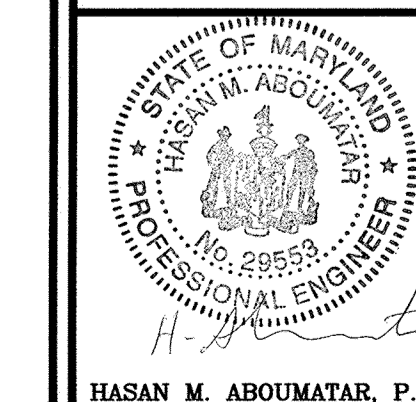
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Phil P... 5-12-16
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE
 Kate... 8-9-16
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE
 William... 8-11-16
 DIRECTOR DATE

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
**ARCH CULVERT
 CULVERT PROFILE**
 BUCH ROAD EXTENSION
 10945 PRICE MANOR WAY
 ZONED: R-APT & B-1
 TAX MAP 46 BLOCK 4
 5TH ELECTION DISTRICT
 PARCEL 126, PARCEL 364
 PARCEL 505 (LOT 496), PARCEL 127
 HOWARD COUNTY, MARYLAND



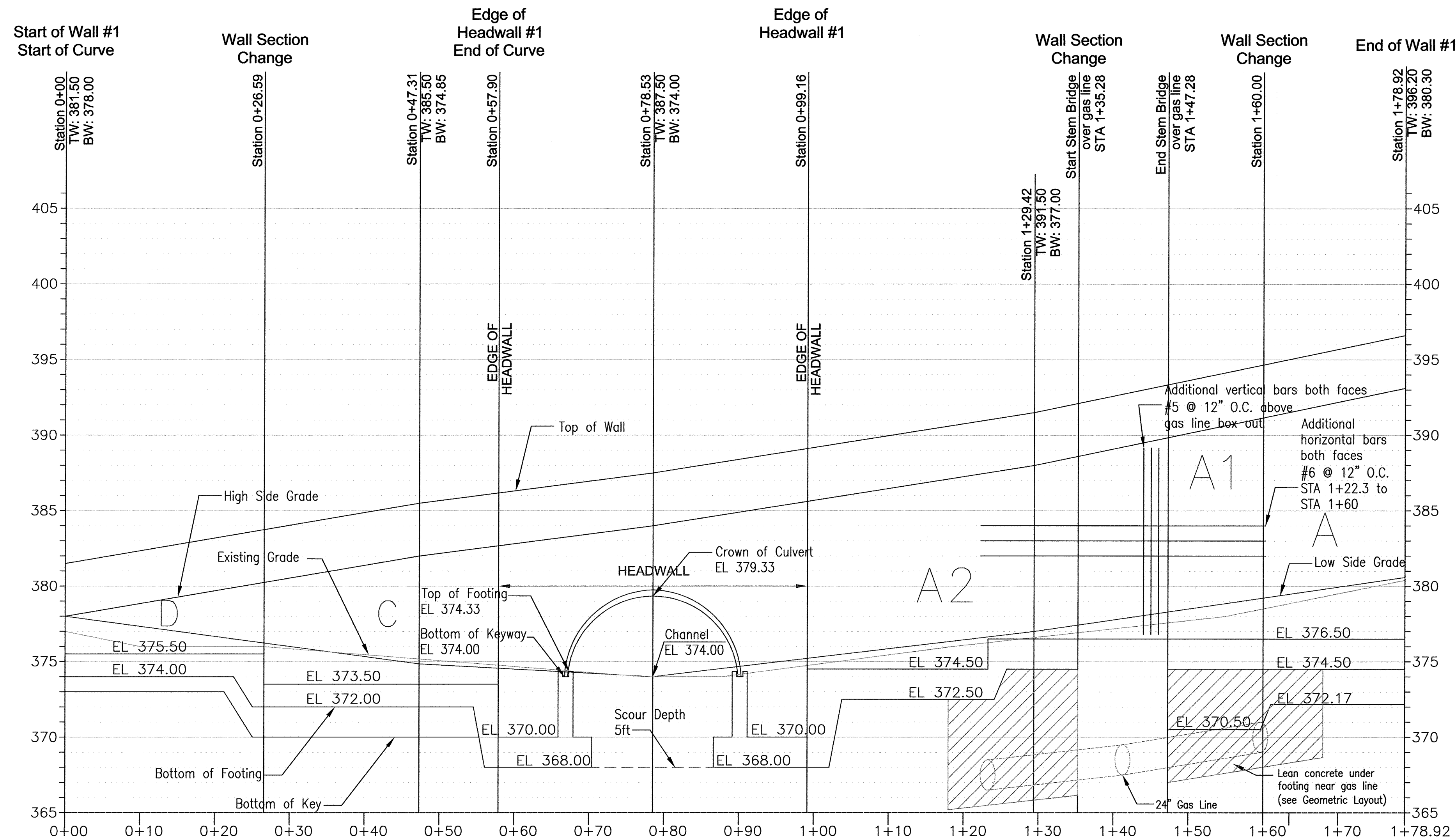
1340 CHARWOOD ROAD
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 PHONE: (410) 859-4300
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DESIGN BY: DMA/HMA
 DRAWN BY: DMA/HMA
 CHECKED BY: HMA
 DATE: APR 2016
 SCALE: AS SHOWN
 W.O. NO.: 7272-B

PROFESSIONAL CERTIFICATE
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 28553, EXPIRATION DATE 12-31-2015.
 HASAN M. ABOUMATAR, P.E.
 11 SHEET OF 19

AS-BUILT - AUG. 2018

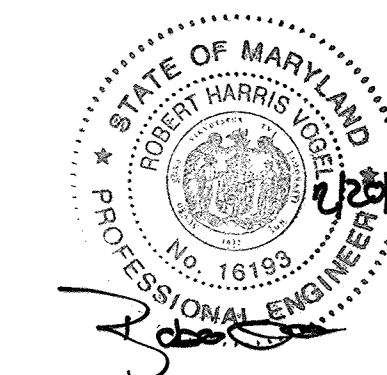


HEADWALL 1 PROFILE
 HORIZONTAL SCALE: 1"=10'
 VERTICAL SCALE: 1"=5'

NOTES:
 TW: TOP OF WALL/PARAPET (PARAPET IS 42 INCHES HIGH)
 BW: LOW SIDE FINISHED GRADE
 A, B, C OR D INDICATES WING WALL TYPE. SEE WING WALL SCHEDULE FOR DETAILS.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 5-12-16
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE
 [Signature] 8-9-16
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE
 [Signature] 8-11-16
 DIRECTOR DATE



AS-BUILT CERTIFICATION FOR PSWM

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.

[Signature] 16193 2/20/19
 P.E. # DATE

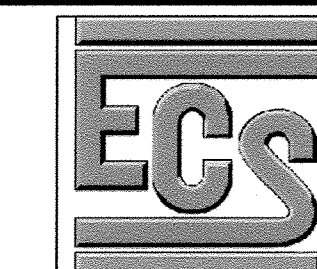
NO AS-BUILT INFORMATION ON THIS SHEET

OWNER/DEVELOPER

BUCH LLLP
 10945 PRICE MANOR WAY
 LAUREL, MD 20723
 301-359-3500

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
**ARCH CULVERT
 HEADWALL #1 & WINGWALLS PROFILE**
BUCH ROAD EXTENSION
 10945 PRICE MANOR WAY
 ZONED: R-APT & B-1 (L 3192 / F. 394) PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127
 TAX MAP 46 BLOCK 4 5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND



1340 CHARWOOD ROAD
 SUITE A
 HANOVER, MARYLAND 21076
 PHONE: (410) 859-4300
 FAX: (410) 859-4324

PROFESSIONAL CERTIFICATE

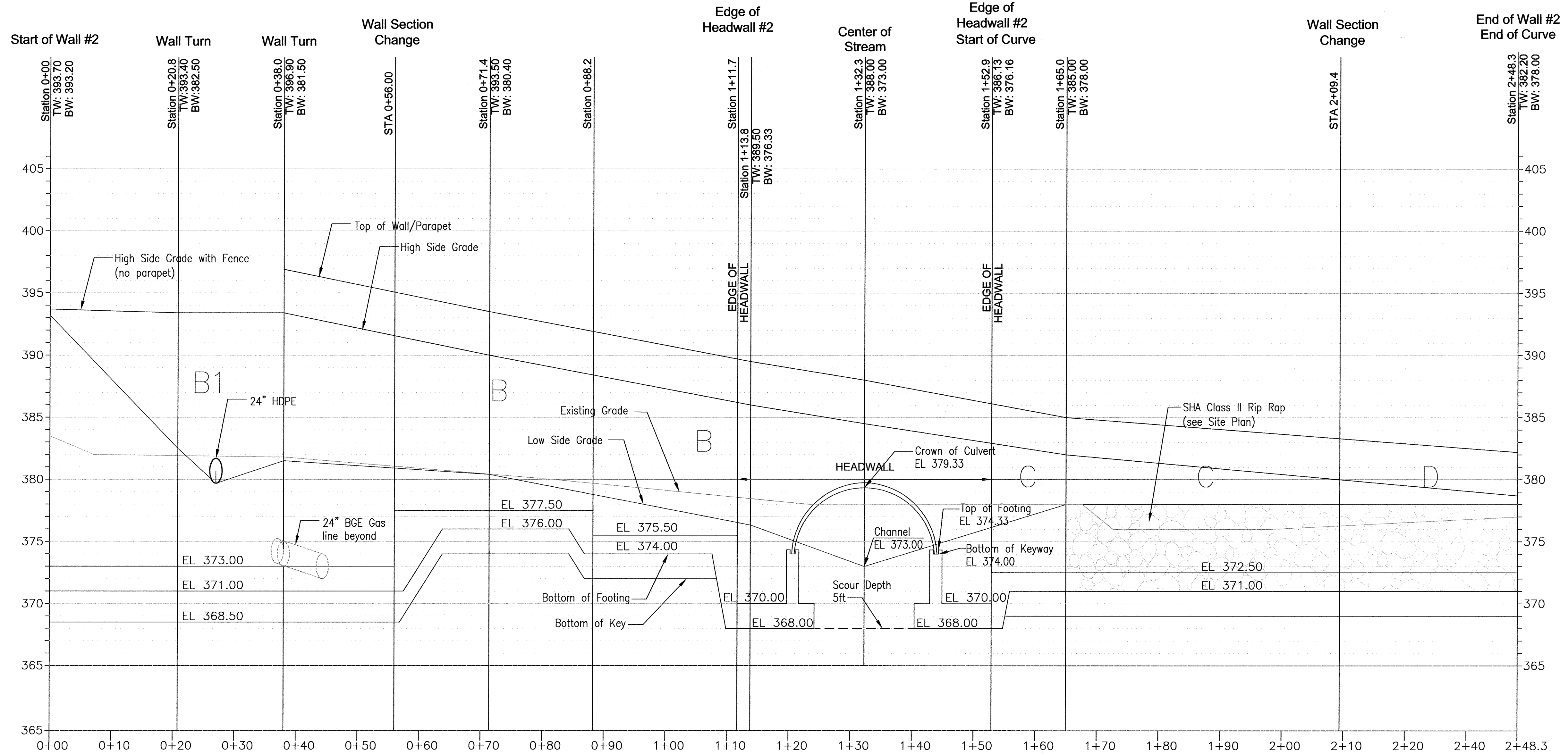
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 28533, EXPIRATION DATE: 12-31-2015.

[Signature] HASAN M. ABOUMATAR, P.E.

DESIGN BY: DMA/HMA
 DRAWN BY: DMA/HMA
 CHECKED BY: HMA
 DATE: APR 2016
 SCALE: AS SHOWN
 W.O. NO.: 7272-B

12 SHEET OF 19

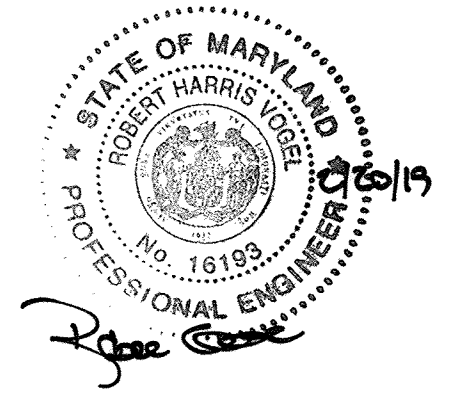
AS-BUILT - AUG. 2018



HEADWALL 2 PROFILE
 HORIZONTAL SCALE: 1"=10'
 VERTICAL SCALE: 1"=5'

NOTES:
 TW: TOP OF WALL/PARAPET (PARAPET IS 42 INCHES HIGH)
 BW: LOW SIDE FINISHED GRADE
 A, B, C OR D INDICATES WING WALL TYPE. SEE WING WALL SCHEDULE FOR DETAILS.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division *[Signature]* 5-12-16
 Chief, Division of Land Development *[Signature]* 8-9-16
 Director *[Signature]* 8-11-16



AS-BUILT CERTIFICATION FOR PSWM
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.
[Signature] 16193 2/20/19
 P.D. NAME P.E. # DATE

NO AS-BUILT INFORMATION ON THIS SHEET

OWNER/DEVELOPER
 BUCH LLLP
 10945 PRICE MANOR WAY
 LAUREL, MD 20723
 301-359-3500

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
ARCH CULVERT HEADWALL #2 & WINGWALLS PROFILE
BUCH ROAD EXTENSION
 10945 PRICE MANOR WAY
 ZONED: R-APT & B-1 (L. 3182 / F. 394) PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127 HOWARD COUNTY, MARYLAND

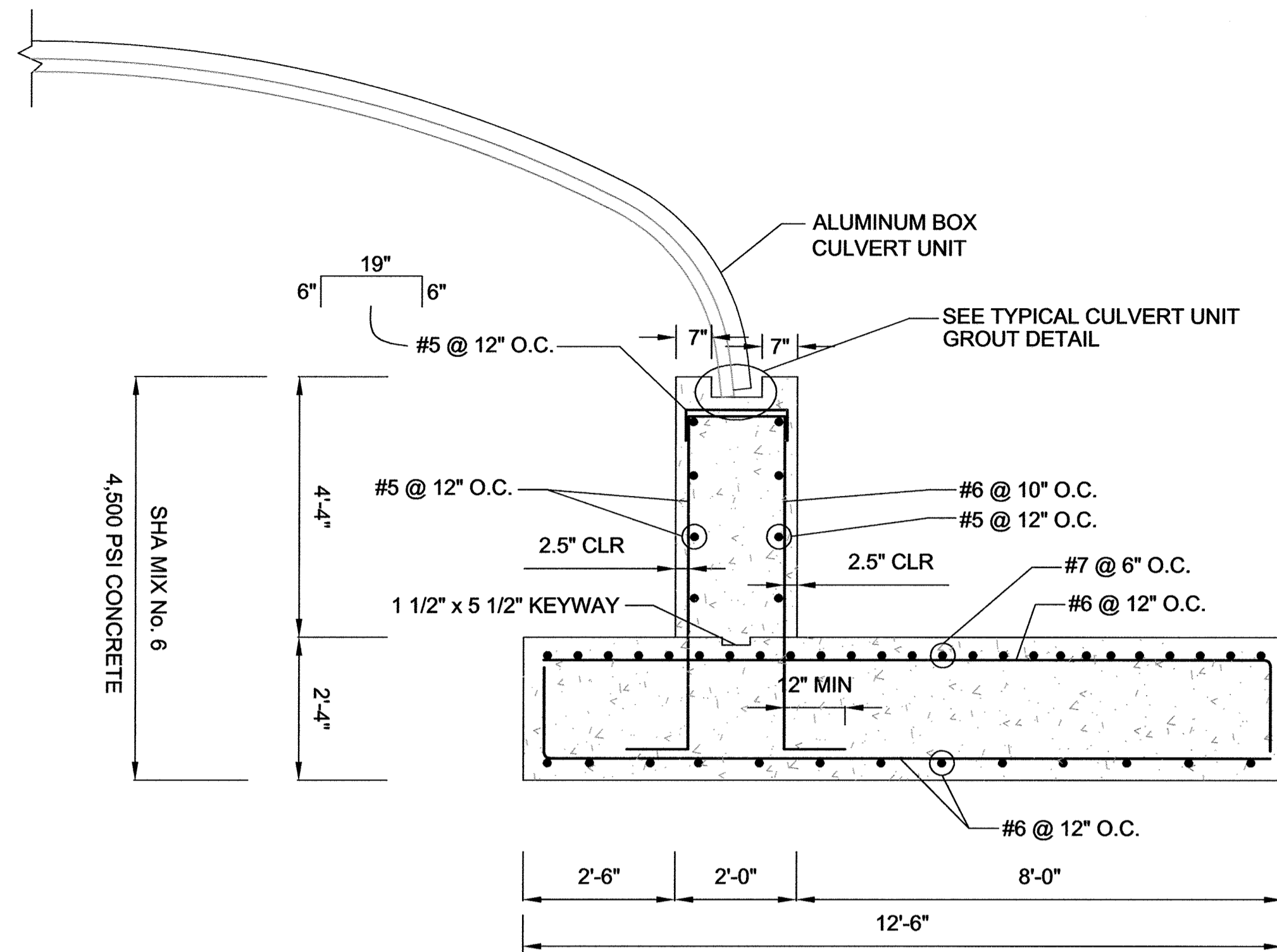
TAX MAP 46 BLOCK 4 5TH ELECTION DISTRICT

ECST
 1340 CHARWOOD ROAD
 SUITE A
 HANOVER, MARYLAND 21076
 PHONE: (410) 859-4300
 FAX: (410) 859-4324

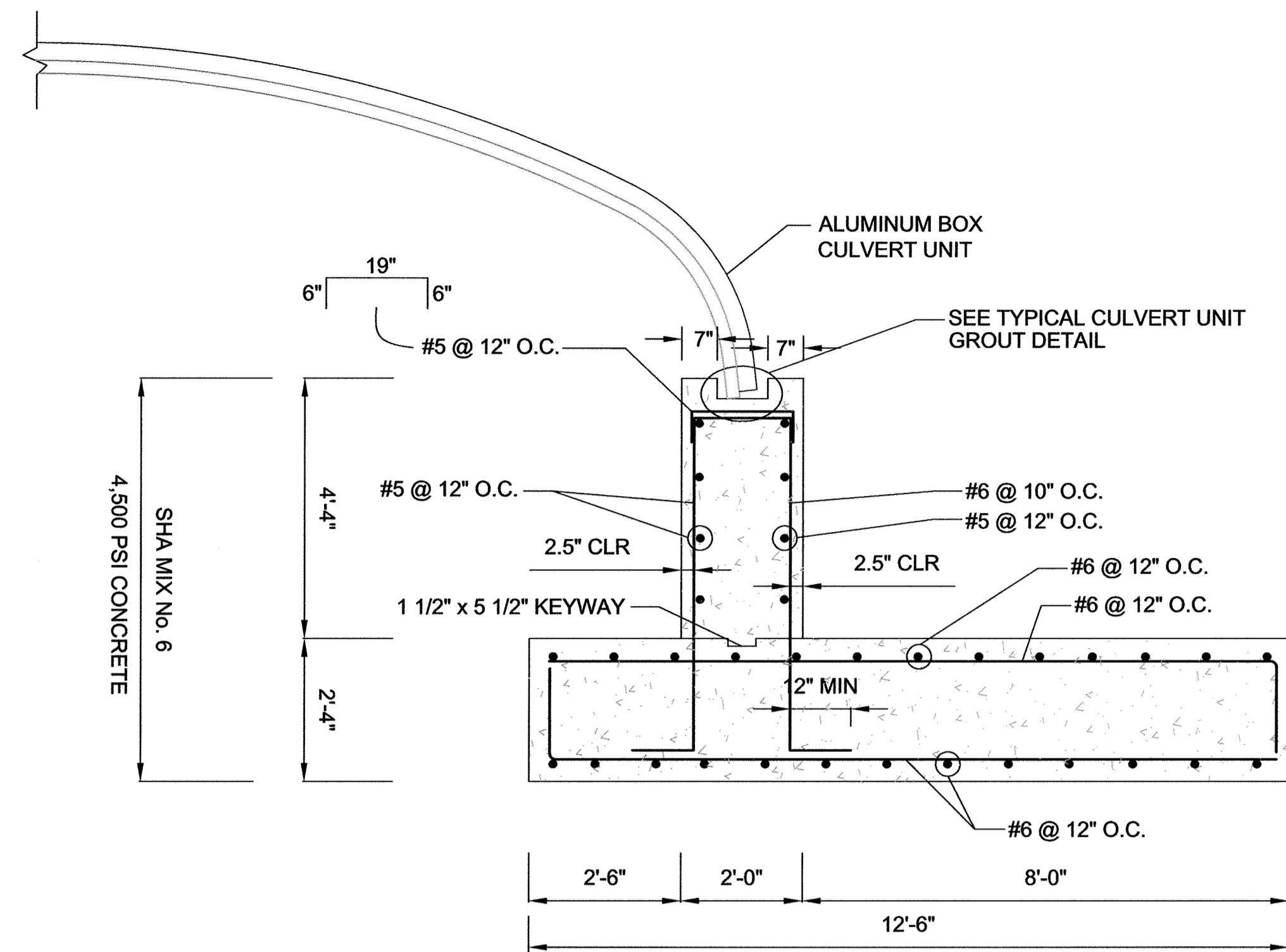
PROFESSIONAL CERTIFICATE
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 28653, EXPIRATION DATE 12-31-2015.
 DESIGN BY: DMA/HMA
 DRAWN BY: DMA/HMA
 CHECKED BY: HMA
 DATE: APR 2016
 SCALE: AS SHOWN
 W.O. NO.: 7272-B
 HASAN M. ABOUMATAR, P.E.

13 SHEET OF 19

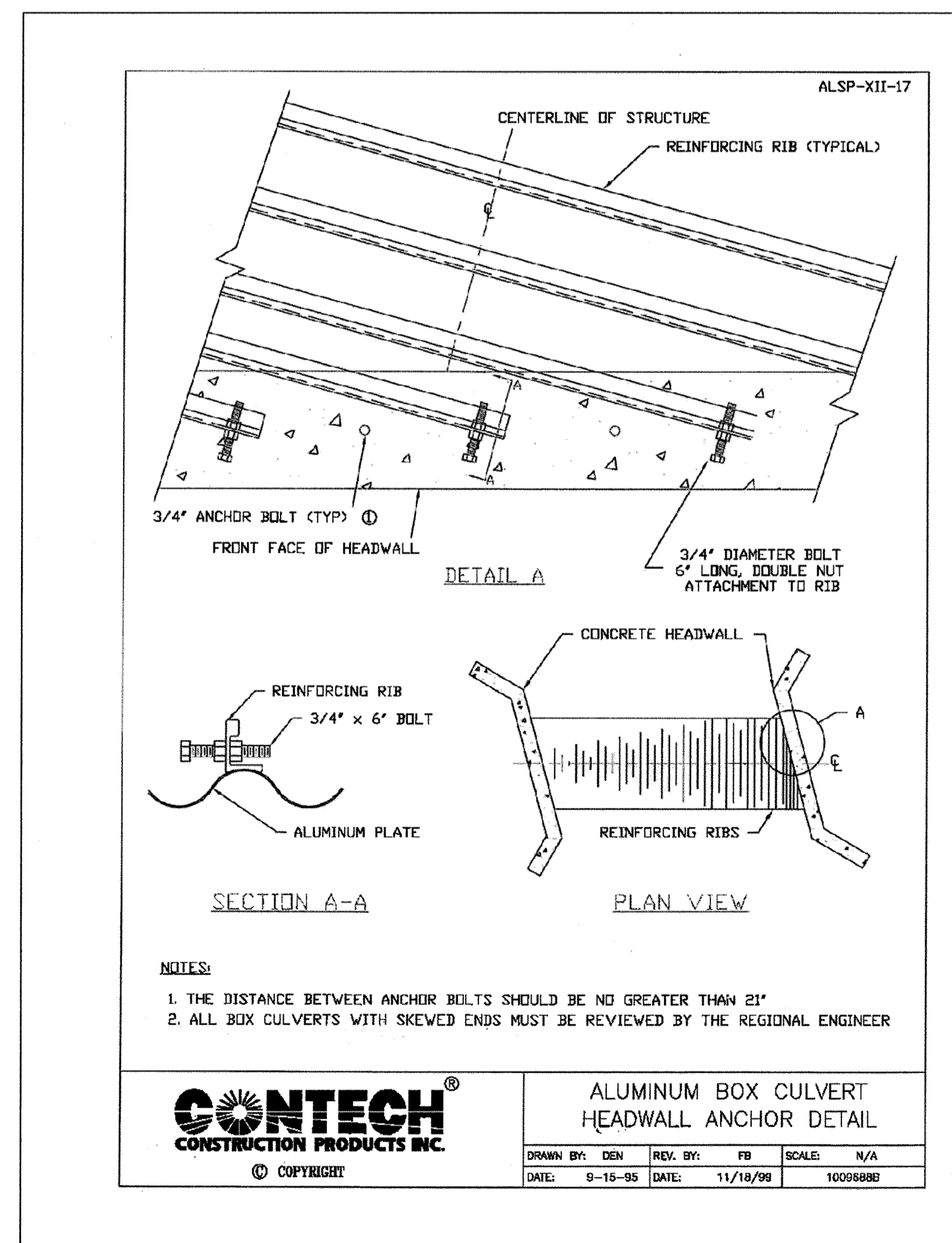
AS-BUILT-AUG. 2018



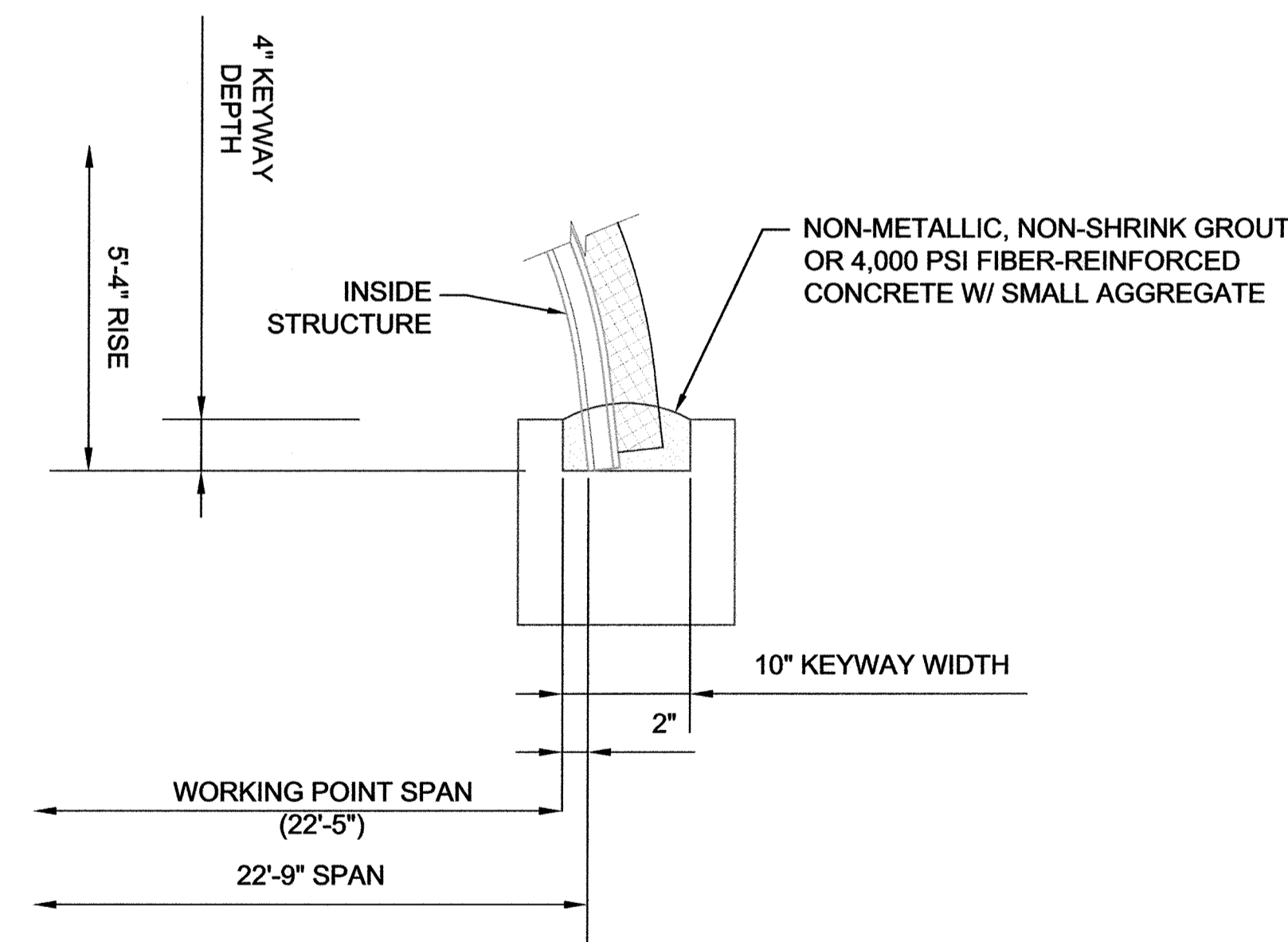
TYPE I CULVERT FOOTING AND PEDESTAL DETAIL
SCALE: 1/2" = 1'



TYPE II CULVERT FOOTING AND PEDESTAL DETAIL
SCALE: 1/2" = 1'



CULVERT HEADWALL ANCHOR DETAIL
SCALE: NTS



TYPICAL ALBC STRIP FOOTING
KEYWAY DETAIL
NOT TO SCALE



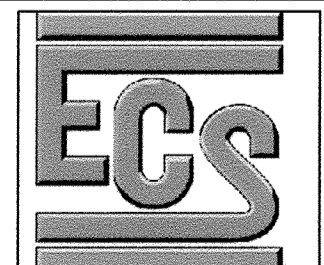
AS-BUILT CERTIFICATION FOR PSWM
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Robert Vora 16193 2/20/19
P.E. # DATE

NO AS-BUILT INFORMATION ON THIS SHEET

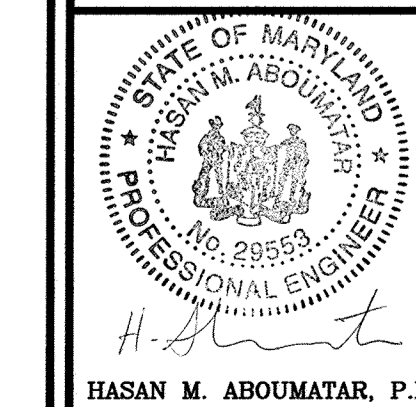
OWNER/DEVELOPER
BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
**ARCH CULVERT
CULVERT FOOTING DETAILS**
BUCH ROAD EXTENSION
10945 PRICE MANOR WAY
ZONED: R-APT & B-1 (L. 3192 / F. 394)
PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127 HOWARD COUNTY, MARYLAND
TAX MAP 46 BLOCK 4 5TH ELECTION DISTRICT



1340 CHARWOOD ROAD
SUITE A
HANOVER, MARYLAND 21076
PHONE: (410) 859-4300
FAX: (410) 859-4324



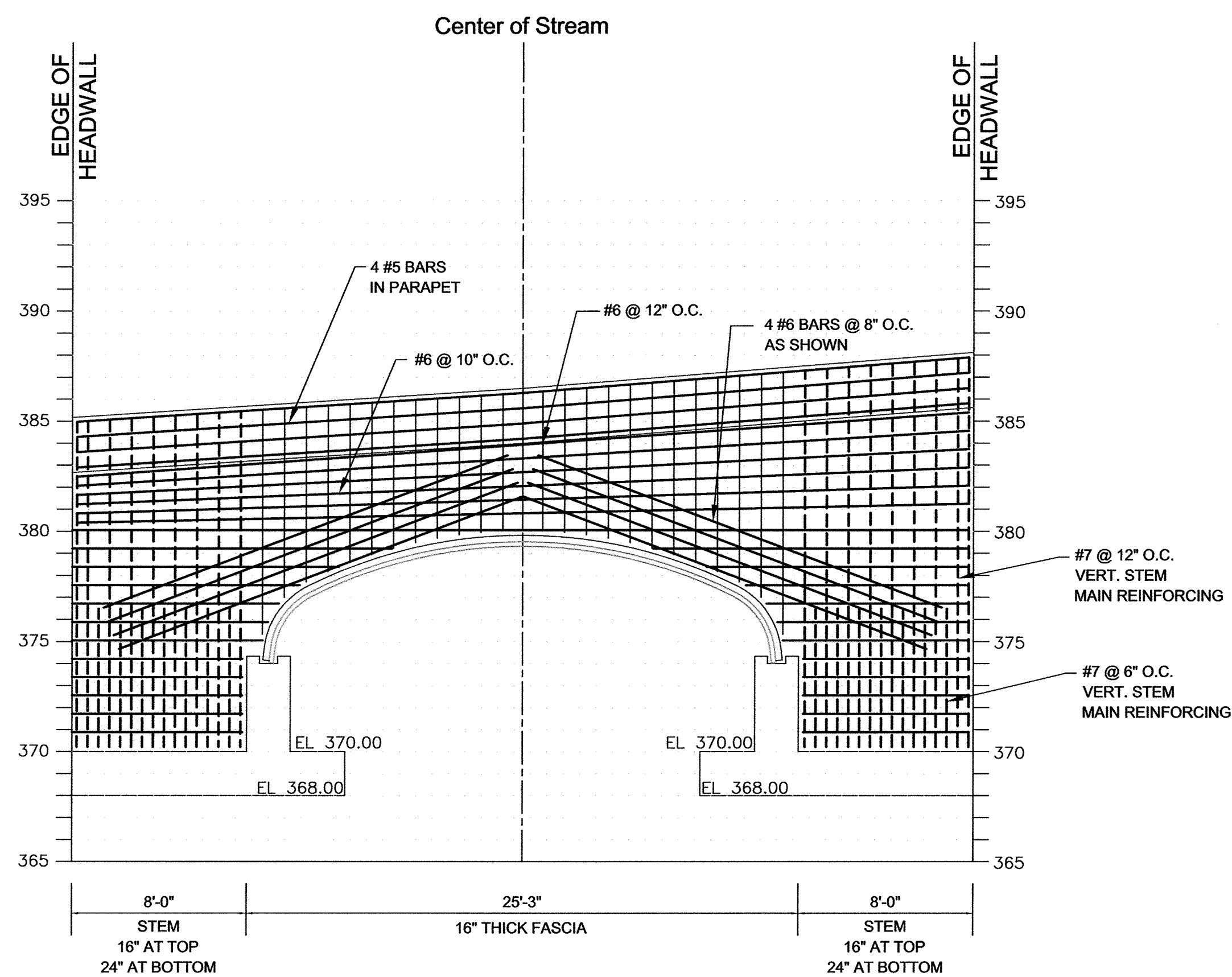
DESIGN BY: DMA/HMA
DRAWN BY: DMA/HMA
CHECKED BY: HMA
DATE: APR 2016
SCALE: AS SHOWN
W.O. NO.: 7272-B

PROFESSIONAL CERTIFICATE
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 28503, EXPIRATION DATE 12-31-2015.
HASAN M. ABOUMATAR, P.E.
14 SHEET OF 19

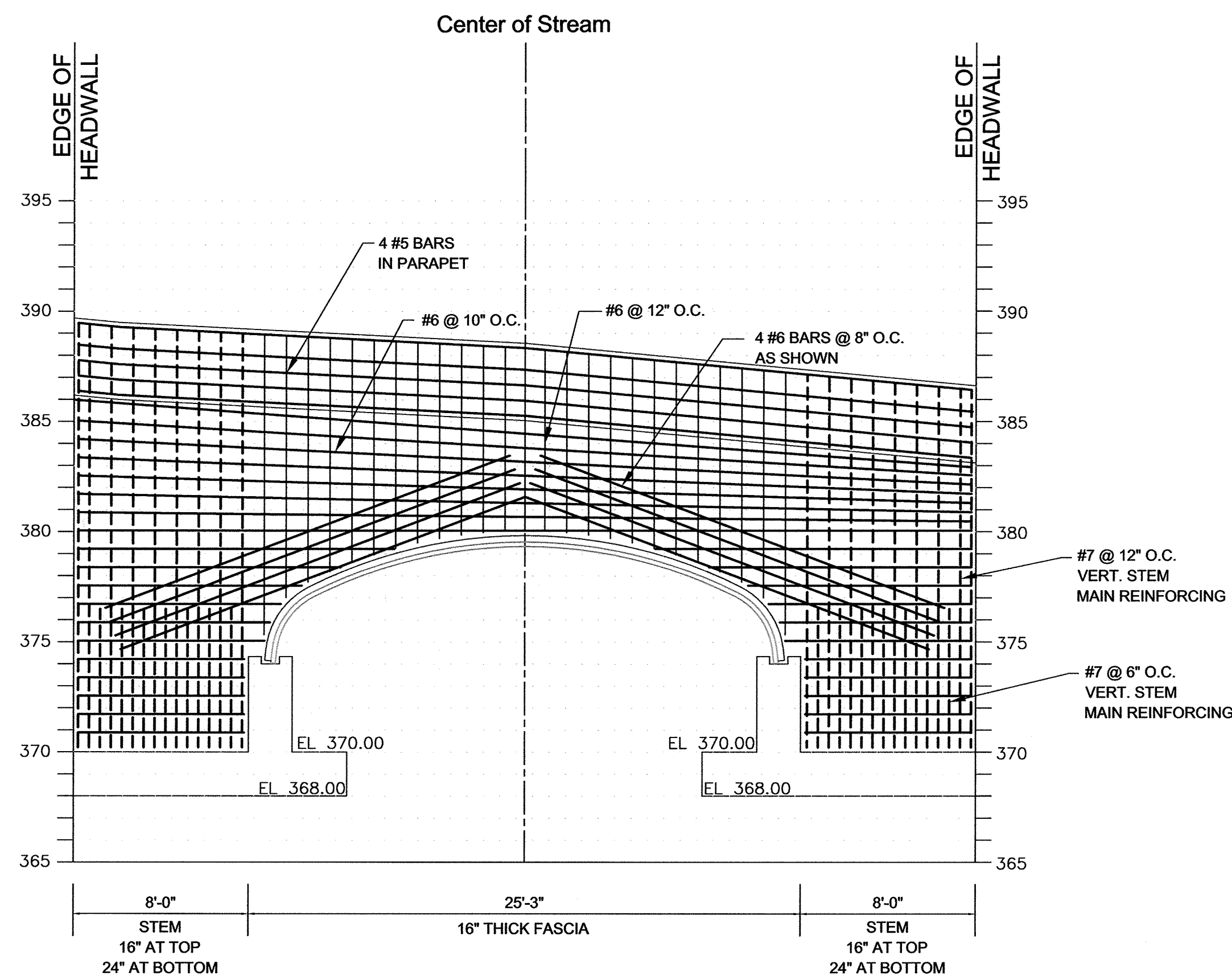
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division 5-12-16
Chief, Division of Land Development 8-9-16
Director 8-11-16

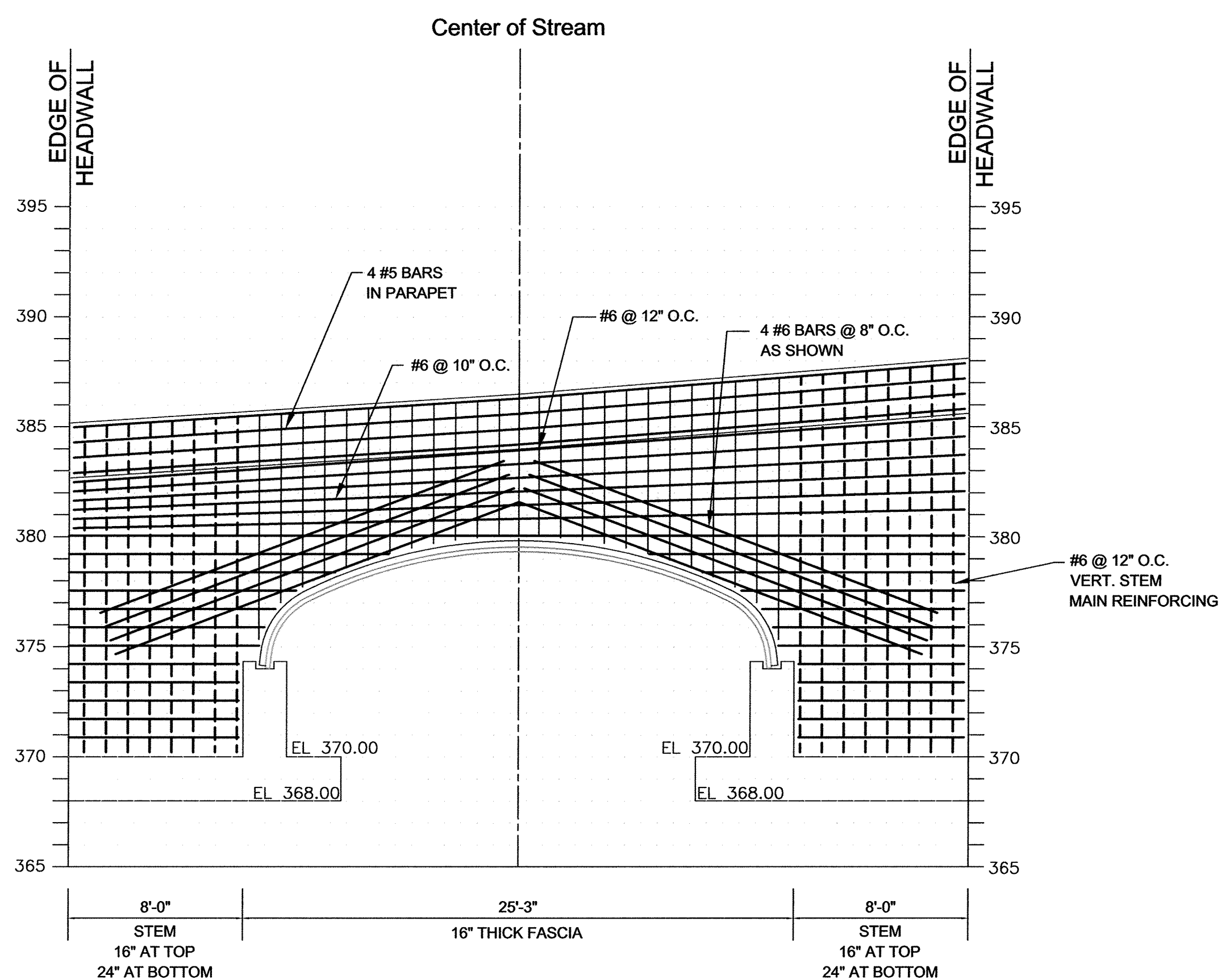
AS-BUILT - AUG. 2018



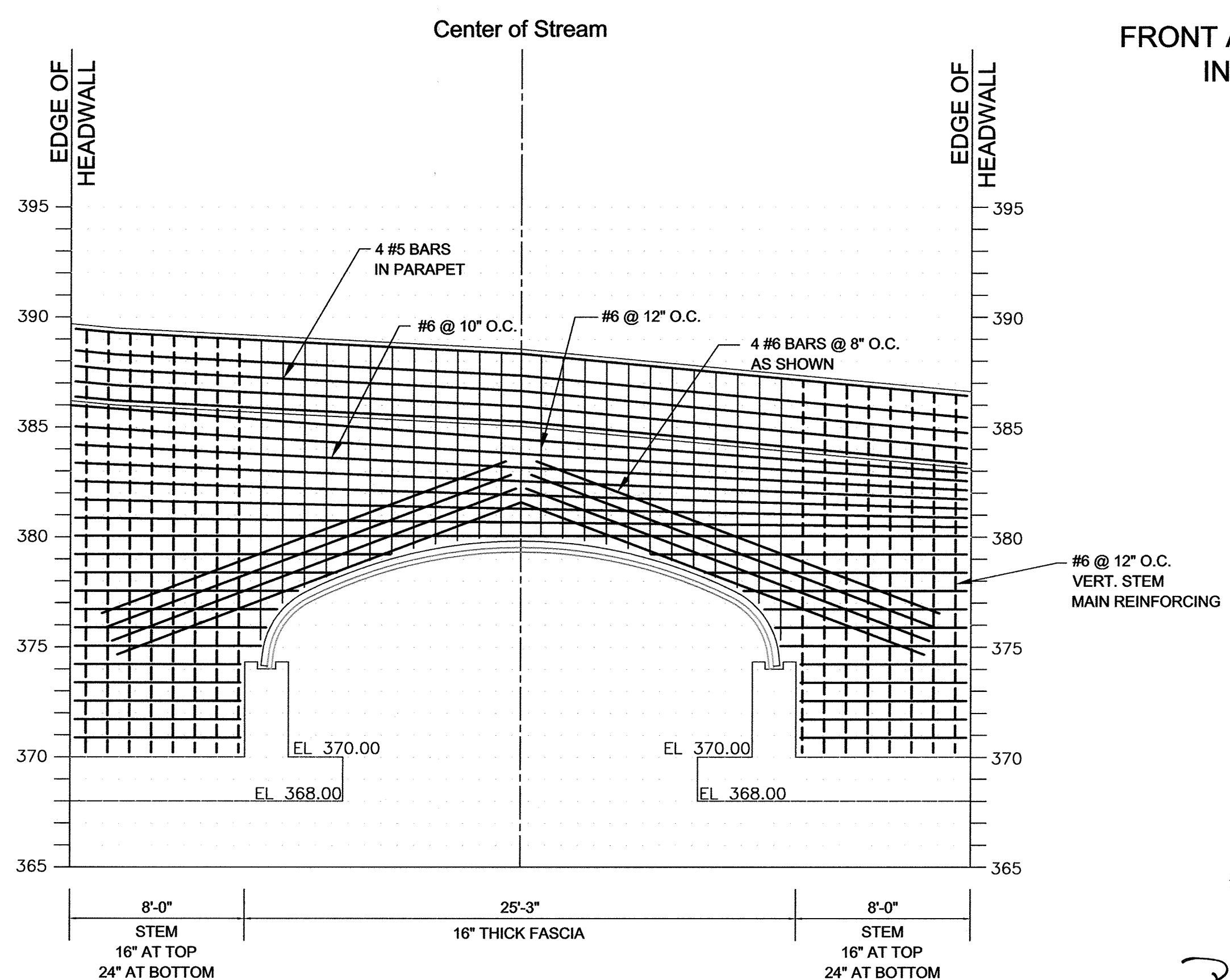
HEADWALL 1 (UPSTREAM) ELEVATION - REAR STEEL
SCALE: 1" = 5'



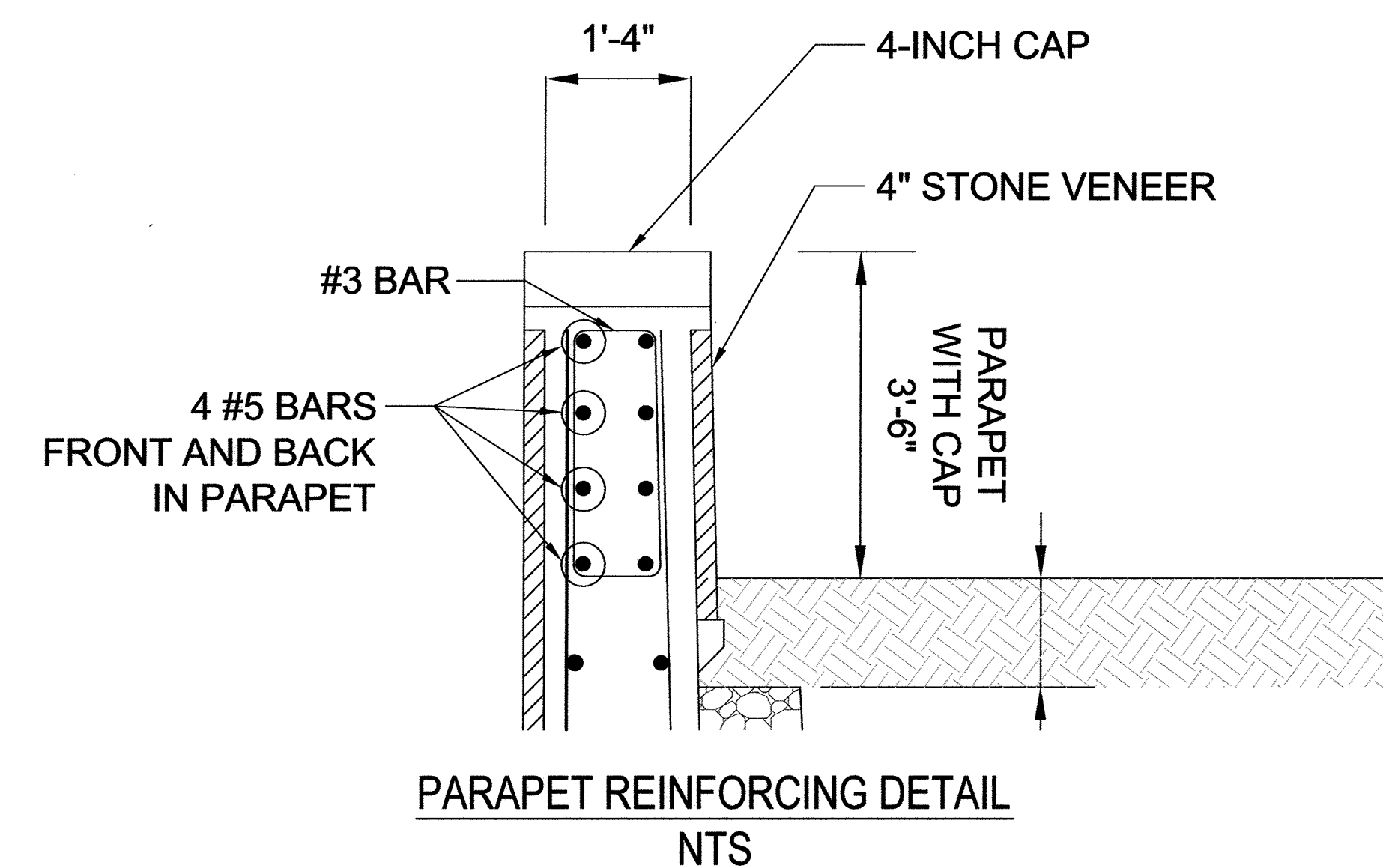
HEADWALL 2 (DOWNSTREAM) ELEVATION - REAR STEEL
SCALE: 1" = 5'



HEADWALL 1 (UPSTREAM) ELEVATION - FRONT STEEL
SCALE: 1" = 5'



HEADWALL 2 (DOWNSTREAM) ELEVATION - FRONT STEEL
SCALE: 1" = 5'



OWNER/DEVELOPER
BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division *[Signature]* 5-12-16
 Chief, Division of Land Development *[Signature]* 8-9-16
 Director *[Signature]* 8-11-16



AS-BUILT CERTIFICATION FOR PSWM
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.
 Robert Vesel 16193 2/22/19
 P.E. # DATE

NO.	REVISION	DATE

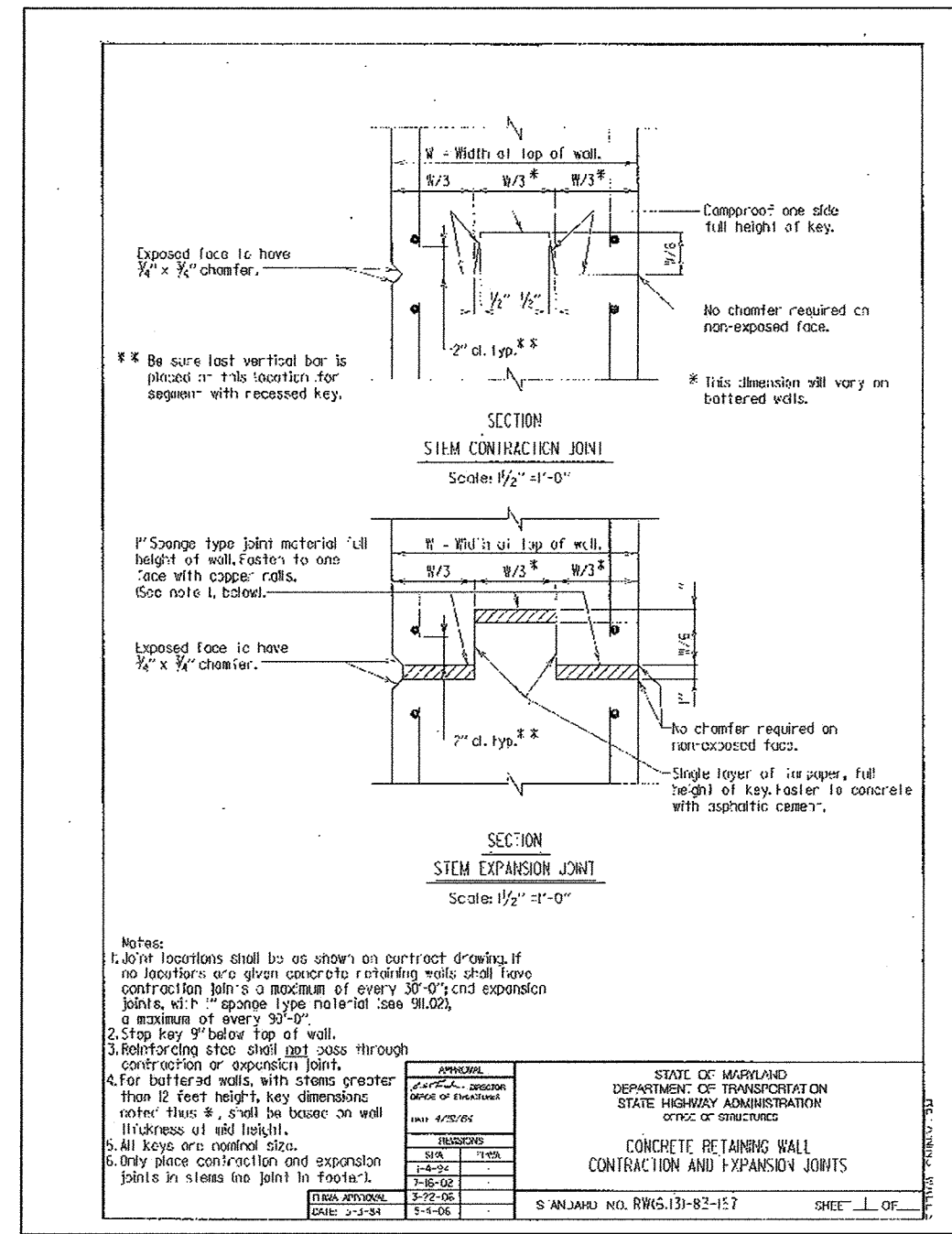
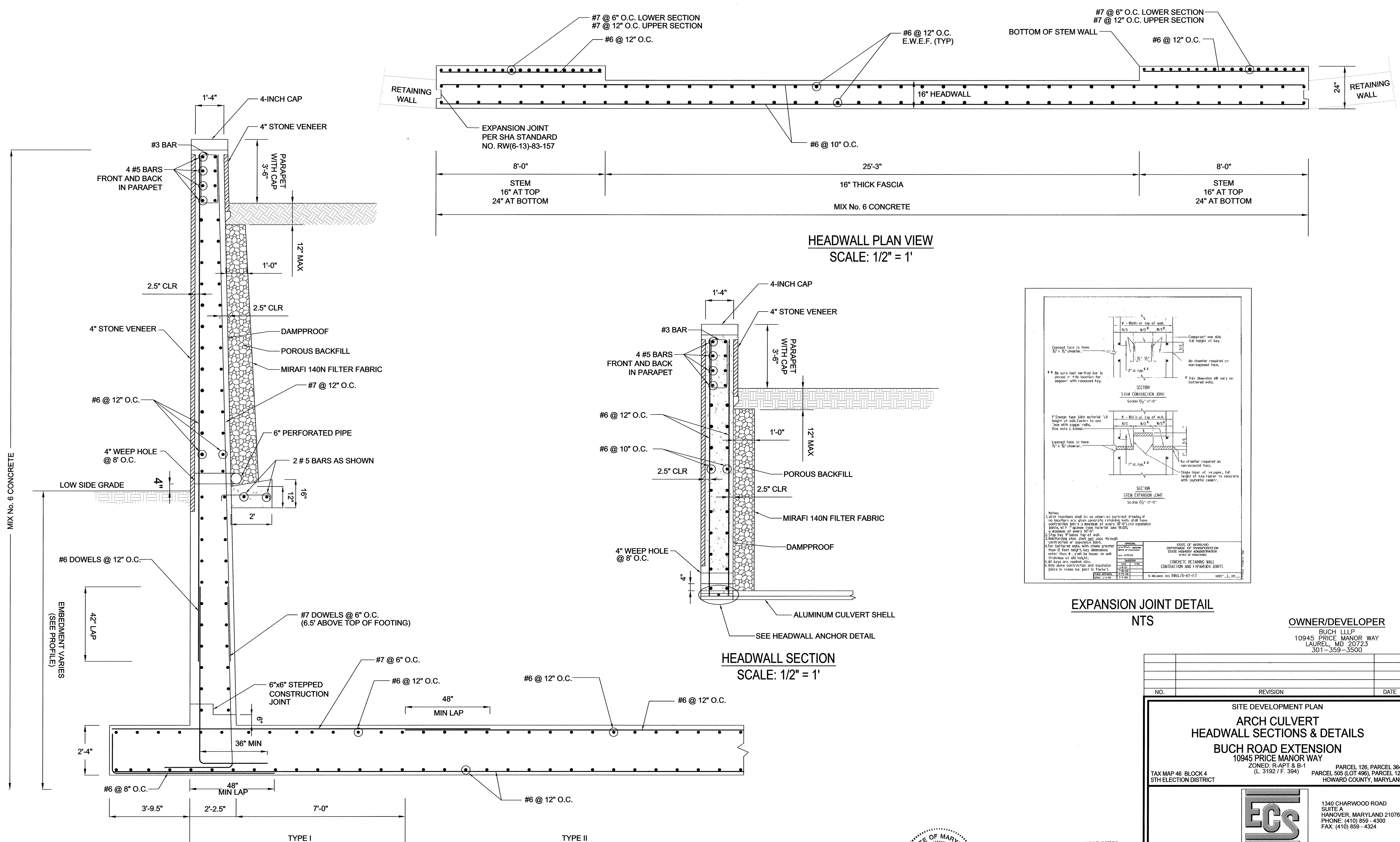
SITE DEVELOPMENT PLAN
**ARCH CULVERT
 CULVERT FOOTING DETAILS**
 BUCH ROAD EXTENSION
 10945 PRICE MANOR WAY
 ZONED: R-APT & B-1 (L. 3192 / F. 394)
 TAX MAP 46 BLOCK 4 5TH ELECTION DISTRICT
 PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127 HOWARD COUNTY, MARYLAND

ECS
 1340 CHARWOOD ROAD
 SUITE A
 HANOVER, MARYLAND 21076
 PHONE: (410) 859-4300
 FAX: (410) 859-4324

PROFESSIONAL CERTIFICATE
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 29553, EXPIRATION DATE 12-31-2015.
 HASAN M. ABOUMATAR, P.E.
 DESIGN BY: DMA/HMA
 DRAWN BY: DMA/HMA
 CHECKED BY: HMA
 DATE: APR 2016
 SCALE: AS SHOWN
 W.O. NO.: 7272-B

15 SHEET OF 19

NO AS-BUILT INFORMATION ON THIS SHEET



EXPANSION JOINT DETAIL
NTS

OWNER/DEVELOPER
BUCH LLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Chief, Development Engineering Division 5-12-16
Chief, Division of Land Development 8-9-16
Director 8-11-16

STEM WALL SECTION
SCALE: 1/2" = 1'



AS-BUILT CERTIFICATION FOR PSMW
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.
 P.E. NAME: *Robert Harris* 16193 2/20/19 DATE

NO AS-BUILT INFORMATION ON THIS SHEET

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
ARCH CULVERT HEADWALL SECTIONS & DETAILS
 BUCH ROAD EXTENSION
 10945 PRICE MANOR WAY
 ZONED: R-APT & B-1 (L. 3162 / F. 304)

TAX MAP 46 BLOCK 4 5TH ELECTION DISTRICT
 PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127 HOWARD COUNTY, MARYLAND

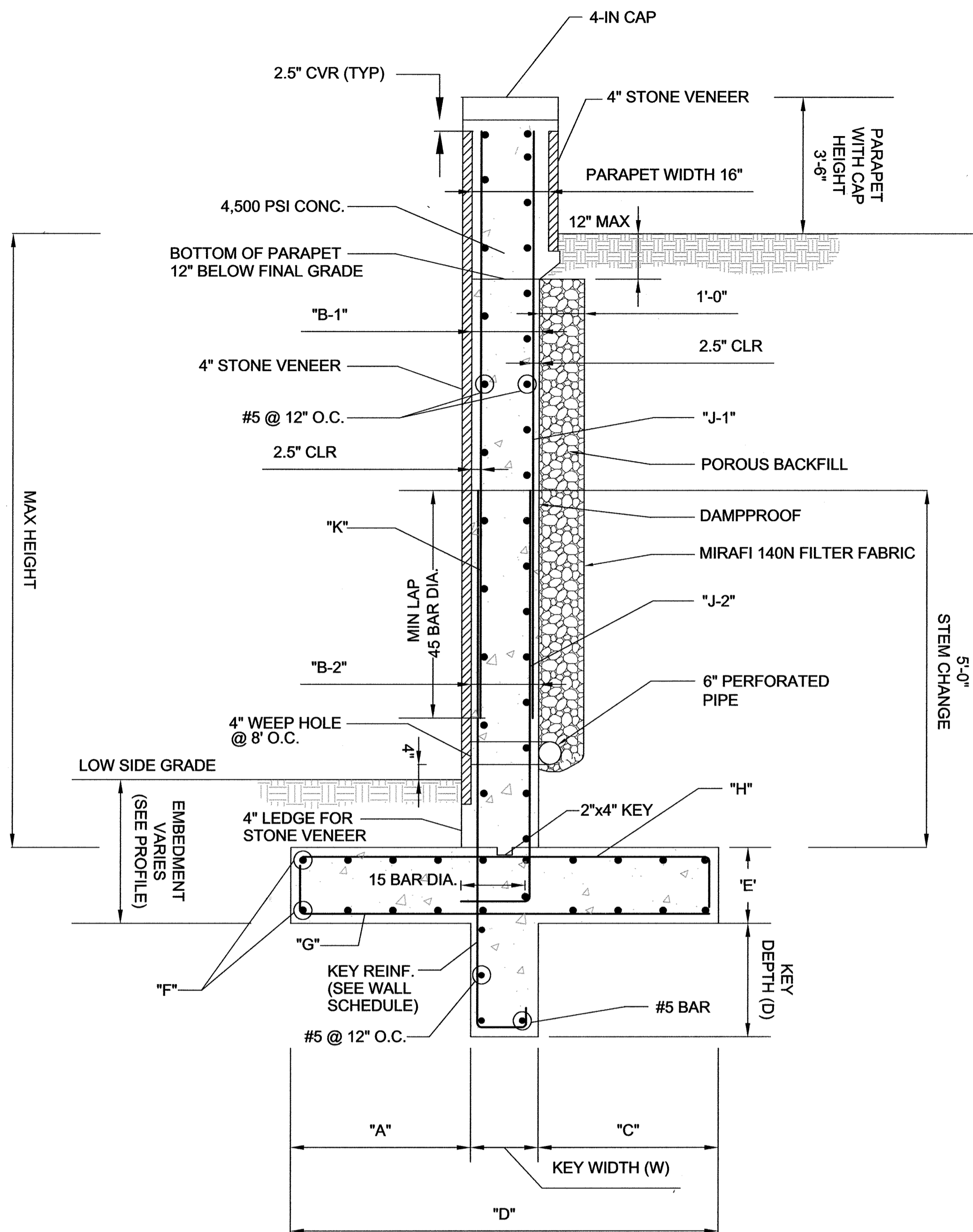
1340 CHARWOOD ROAD SUITE A HANOVER, MARYLAND 21076
 PHONE: (410) 859-4300 FAX: (410) 859-4324

PROFESSIONAL CERTIFICATE
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 28553 EXPIRATION DATE 12-31-2015

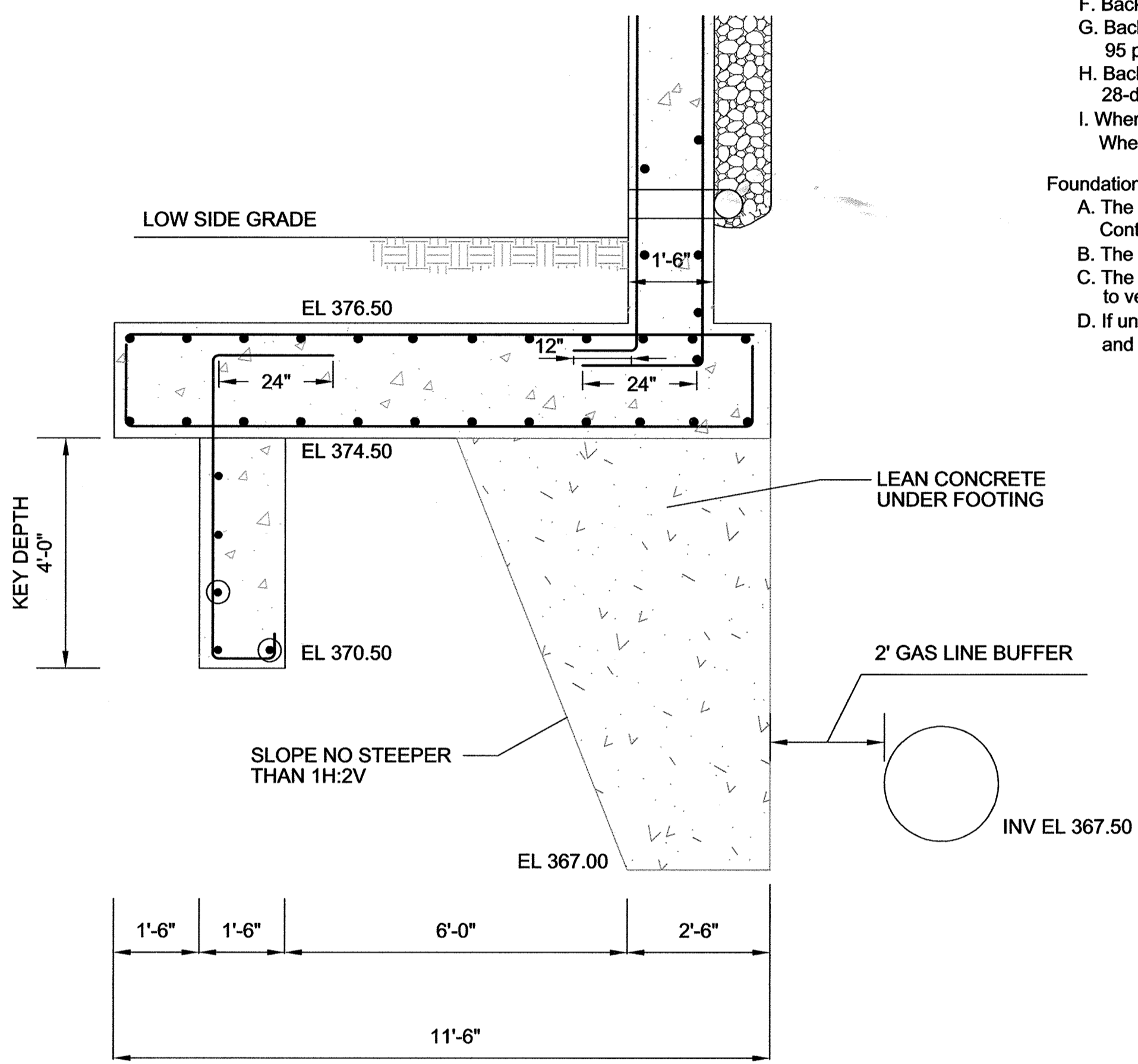
DESIGN BY: DMA/HMA
 DRAWN BY: DMA/HMA
 CHECKED BY: HMA
 DATE: APR 2016
 SCALE: AS SHOWN
 W.O. NO.: 7272-B

HASAN M. ABOUMATAR, P.E.

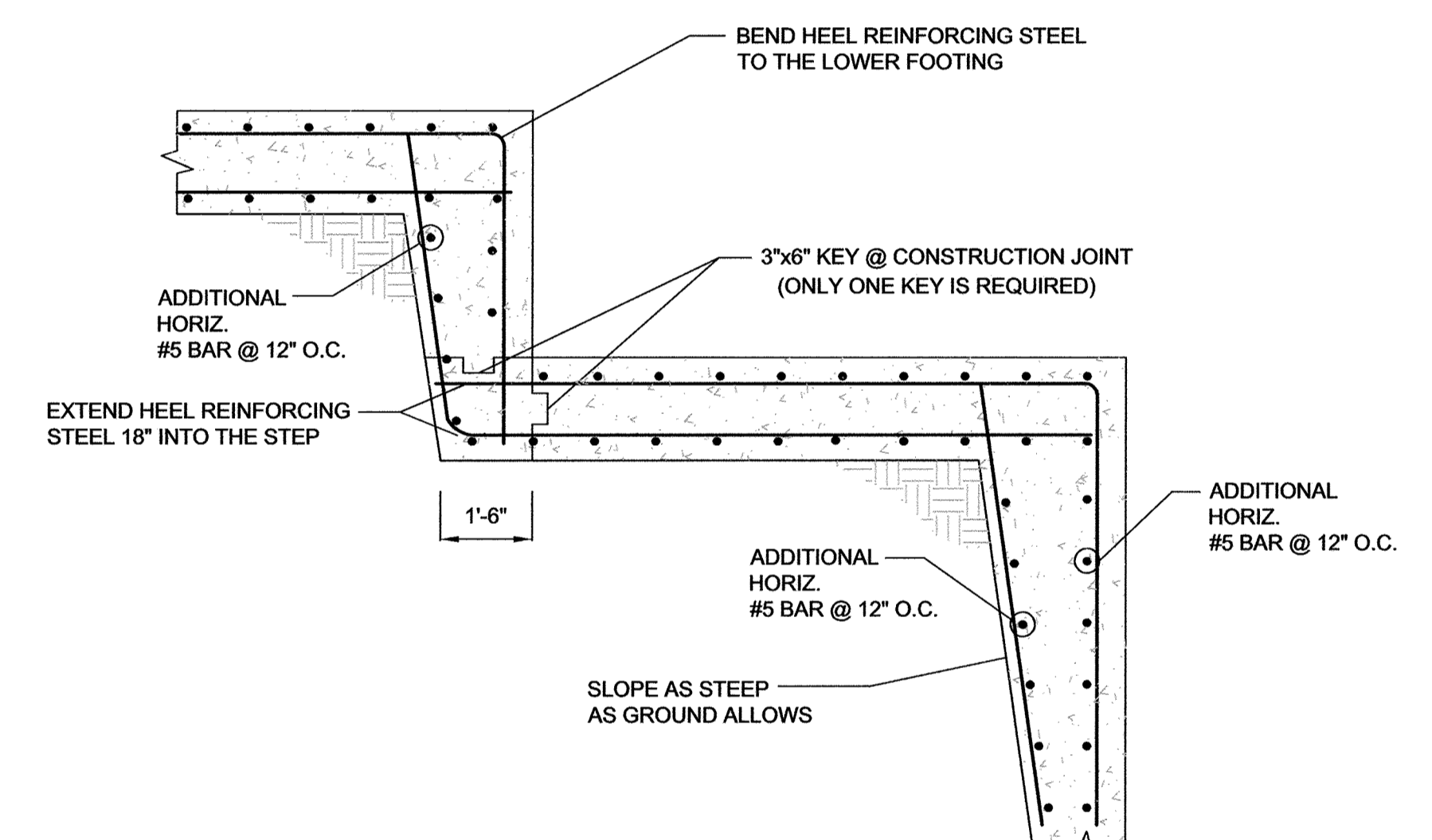
16 SHEET OF 19



TYPICAL RETAINING WALL SECTION
SEE WING WALL SCHEDULE FOR DETAILS
NOT TO SCALE



TYPICAL RETAINING WALL SECTION A1
NOT TO SCALE



TYP. WING WALL STEP DETAIL
SCALE: 1/2"=1'

OWNER/DEVELOPER
BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

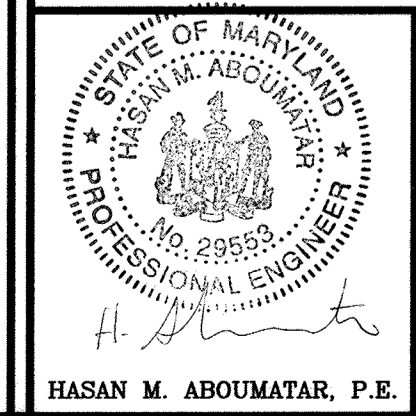
WALL TYPE	MAX. HEIGHT	WALL & FOOTING DIMENSION						FOOTING REINFORCEMENT			STEM REINFORCEMENT			KEY*	
		TOE "A"	STEM "B-1"	STEM "B-2"	HEEL "C"	WIDTH "D"	THICKNESS "E"	"F"	"G"	"H"	"J-1"	"J-2"	"K"	REINFOR.	SIZE (WxD)
A	16'-6"	3'-6"	14"	16"	6'-2"	11'-0"	1'-6"	#5@12"	#6@12"	#6@6"	#7@12"	#7@6"	#5@12"	#6@18"	16"x34"
B	13'-0"	3'-0"	14"	14"	4'-10"	9'-0"	1'-6"	#5@12"	#6@12"	#6@6"	#7@12"	#7@6"	#5@12"	#6@18"	14"x24"
C	11'-0"	2'-6"	14"	14"	3'-10"	7'-6"	1'-6"	#5@12"	#6@12"	#6@12"	#5@12"	#7@12"	#5@12"	#6@18"	14"x24"
D	7'-6"	2'-0"	12"	12"	3'-0"	6'-0"	1'-2"	#5@12"	#6@12"	#6@12"	#5@12"	#6@12"	#5@12"	#6@18"	12"x12"
A1	13'-6"	9'-0"	16"	18"	1'-0"	11'-6"	2'-0"	#5@12"	#6@8"	#5@12"	#5@12"	#7@8"	#5@12"	#6@12"	18"x48"
A2	11'-6"	1'-2"	16"	18"	11'-8"	14'-2"	2'-0"	#5@12"	#6@12"	#7@12"	#6@12"	#8@8"	#5@12"	NONE	NO KEY
B1	18'-0"	8'-0"	16"	18"	2'-6"	12'-0"	2'-0"	#5@12"	#6@8"	#5@12"	#6@12"	#7@6"	#5@12"	#6@12"	18"x30"

* NOTE: All footing keys aligned with stem, with the exception of Wall Type A1. See typical section for A1 for details.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division: 5-12-16
 Chief, Division of Land Development: 8-9-16
 Director: 8-11-14



AS-BUILT CERTIFICATION FOR PSWM
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.
 DE NAME: Hasan M. Aboumatar, P.E.
 DATE: 2/20/19



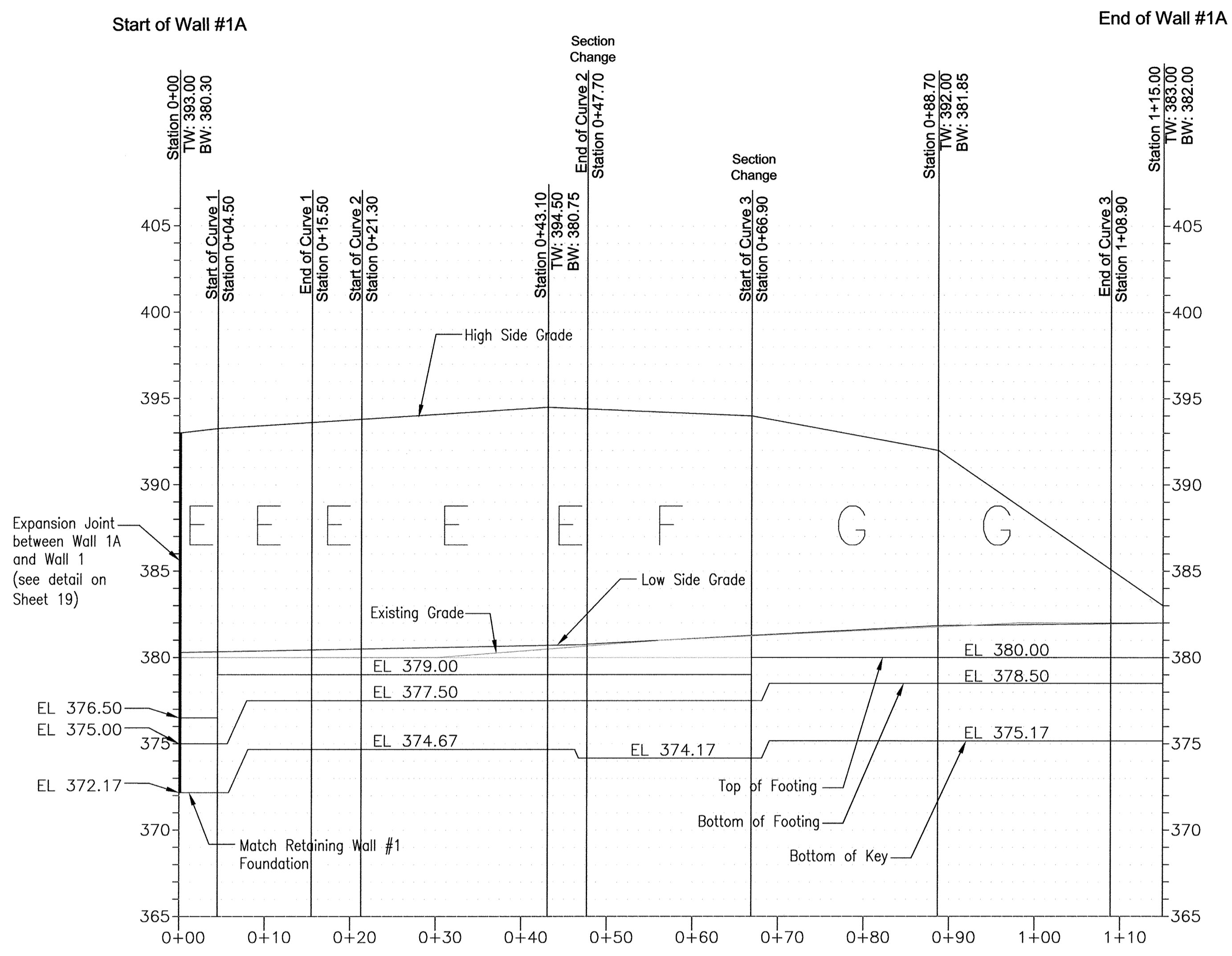
PROFESSIONAL CERTIFICATE
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 28523, EXPIRATION DATE 12-31-2015.
 DESIGN BY: DMA/HMA
 DRAWN BY: DMA/HMA
 CHECKED BY: HMA
 DATE: APR 2016
 SCALE: AS SHOWN
 W.O. NO.: 7272-B

17 SHEET OF 19
 SDP-15-071

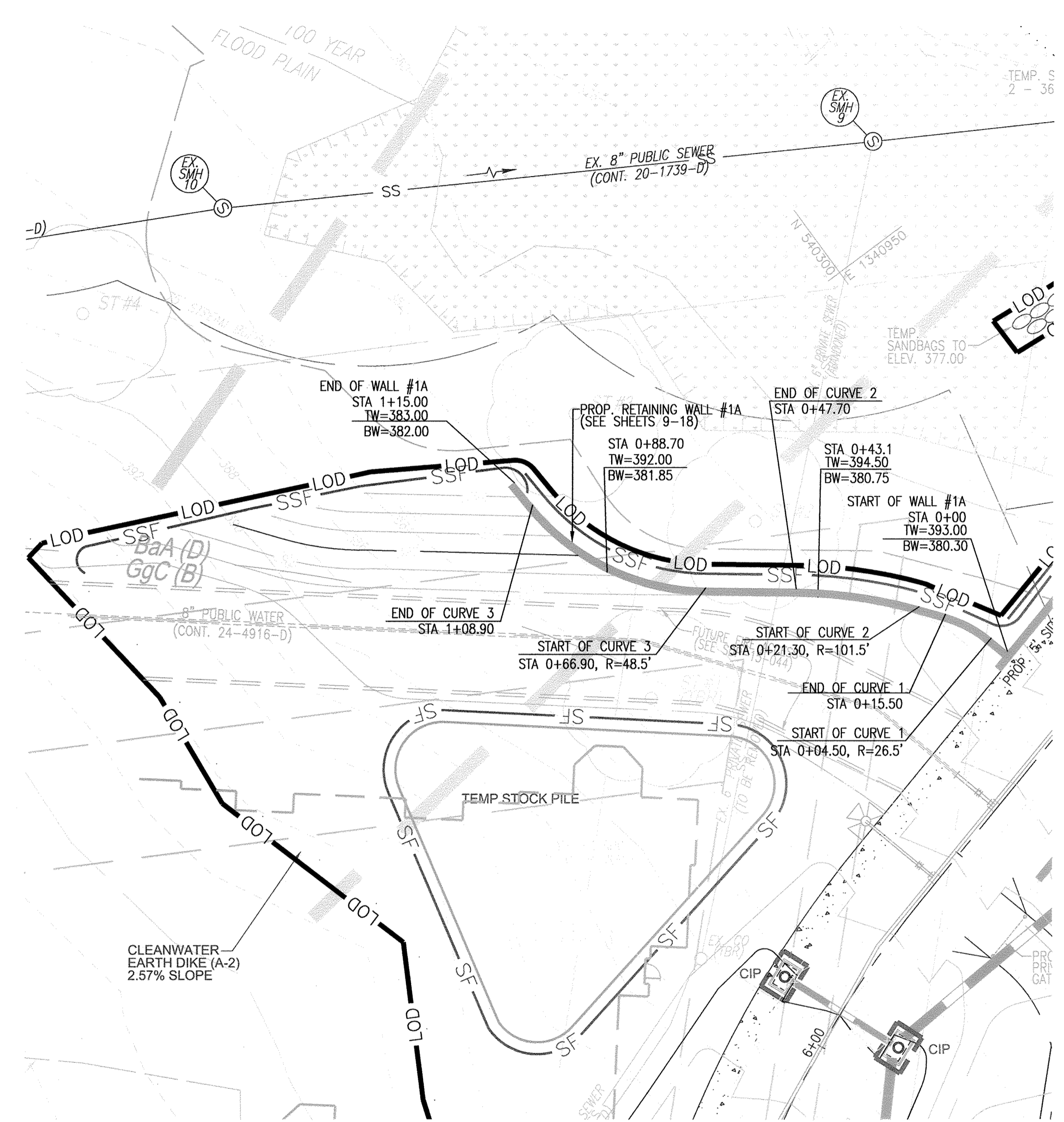
AS-BUILT - AUG. 2018

NO AS-BUILT INFORMATION ON THIS SHEET

- Quality Assurance
 A. The Owner shall engage a qualified testing agency to provide observation and testing services as described below.
 B. Concrete Placement
 1. The agency shall inspect the formwork and reinforcing steel placement for compliance with the contract documents. Reinforcing steel should be inspected for correct size, quantity, and spacing.
 2. Fresh concrete shall be sampled in accordance with ASTM C 172, and tested for slump, air entrainment, and temperature.
 3. Test cylinders shall be molded in accordance with ASTM C 31. Four test cylinders shall be molded for each day's pour, or for every 50 cubic yards of concrete placed, whichever is greater.
 C. Fill Placement
 1. All soil fills shall be tested in accordance with ASTM D 2922.
 2. A minimum of one compaction test per lift should be made per 2,500 square feet of fill lift area, but not fewer than two tests per lift should be made.
 3. The elevations and locations of the field density tests should be clearly identified at the time of fill placement and compaction.
 D. Field Verification
 1. Wall foundations shall be excavated to the grades shown; however, no contractor or subcontractor shall rely on dimensions & grades shown on these drawings without verifying their correctness by field measure.
 Soil Backfill
 A. Material should consist of soil classified as SM or more granular, in accordance with ASTM D 2487.
 B. Material should have no particle larger than 2.5 inches and shall contain at least 36 percent, by weight, retained on the U.S. No. 200 sieve.
 C. Materials should have a Liquid Limit less than 40, and a Plasticity Index less than 10.
 D. Material should have a minimum friction angle of 32 degrees.
 E. The Contractor should submit samples of the proposed backfill soils to the Geotechnical Engineer of Record for approval prior to their use.
 F. Backfill shall be moisture conditioned to within 2 percentage points of the optimum moisture content, as determined in accordance with ASTM D-1557.
 G. Backfill shall be placed in loose lifts, not exceeding 8 inches in thickness, and then compacted to at least 95 percent of the maximum dry density, as determined in accordance with ASTM D-1557.
 H. Backfilling shall not occur against the wall until the wall concrete has attained at least 75 percent of the 28-day design strength, and no earlier than 3 days after placement.
 I. Where feasible, maintain equal grades on each side of the wall during backfilling to prevent overturning and lateral movements. When the grade differential at the wall exceeds 12 inches, only hand-operated compaction equipment shall be allowed.
 Foundation
 A. The wall foundation shall be excavated to the grades and lines as shown on the construction drawings. Contractor should take care not to disturb foundation soils beyond the lines and grades shown.
 B. The foundation shall bear at the minimum embedment depths indicated, as measured from the final grade at the front of the wall.
 C. The foundation subgrade soils shall be tested by a qualified representative of the Geotechnical Engineer to verify the availability of the design bearing pressure of 3,000 psf.
 D. If unsuitable soils are encountered at design foundation levels, the unsuitable soils shall be removed and the over-excavated areas shall be replaced with compacted structural fill.



RETAINING WALL 1A PROFILE
 HORIZONTAL SCALE: 1"=10'
 VERTICAL SCALE: 1"=5'



SITE PLAN
 SCALE: 1"=20'

OWNER/DEVELOPER
 BUCH LLLP
 10945 PRICE MANOR WAY
 LAUREL, MD 20723
 301-359-3500

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division: *Chad Edrino* 5-12-16
 Chief, Division of Land Development: *Vicki Paulson* 8-9-16
 Director: *William J. Jaffe* 8-11-16

NOTES:
 TW: HIGH SIDE FINISHED GRADE
 BW: LOW SIDE FINISHED GRADE
 E, F OR G INDICATES RETAINING WALL TYPE. SEE RETAINING WALL SCHEDULE FOR DETAILS.



AS-BUILT CERTIFICATION FOR PSWM
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.
 Robert Harris 16193 2/20/19
 P.E. NAME P.E. # DATE

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
ARCH CULVERT
RETAINING WALL #1A PLAN & PROFILE
BUCH ROAD EXTENSION
 10945 PRICE MANOR WAY
 ZONED R-AFT & B-1
 TAX MAP 46 BLOCK 4 5TH ELECTION DISTRICT
 PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127 HOWARD COUNTY, MARYLAND

EGS
 1340 CHARWOOD ROAD
 SUITE A
 HANOVER, MARYLAND 21076
 PHONE: (410) 859-4300
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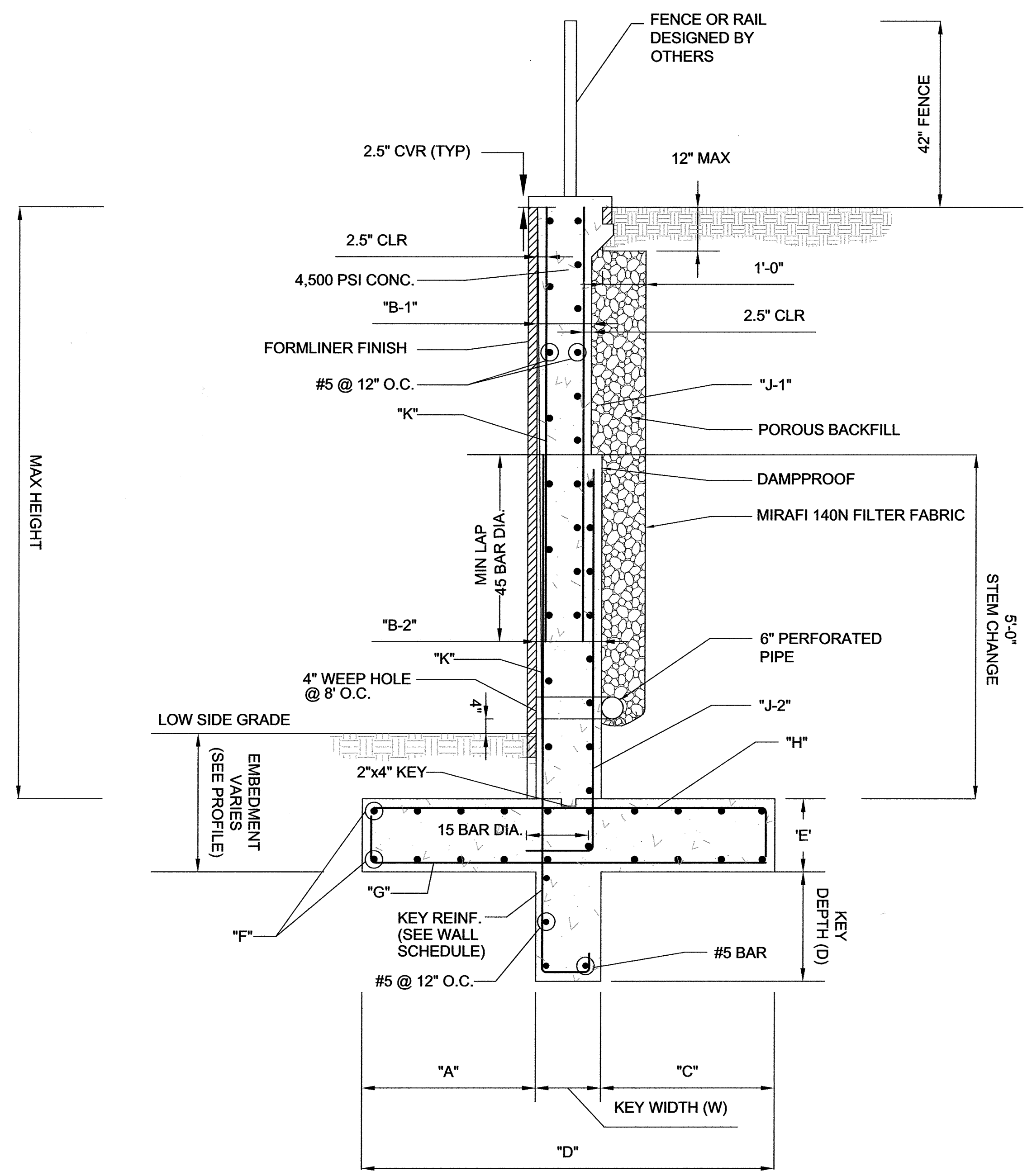
PROFESSIONAL CERTIFICATE
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LIES OF THE STATE OF MARYLAND, LICENSE NO. 29553 EXPIRATION DATE 12-31-2015
 HASAN M. ABOUMATAR, P.E.

DESIGN BY: DMA/HMA
 DRAWN BY: DMA/HMA
 CHECKED BY: HMA
 DATE: APR 2016
 SCALE: AS SHOWN
 W.O. NO.: 7272-B

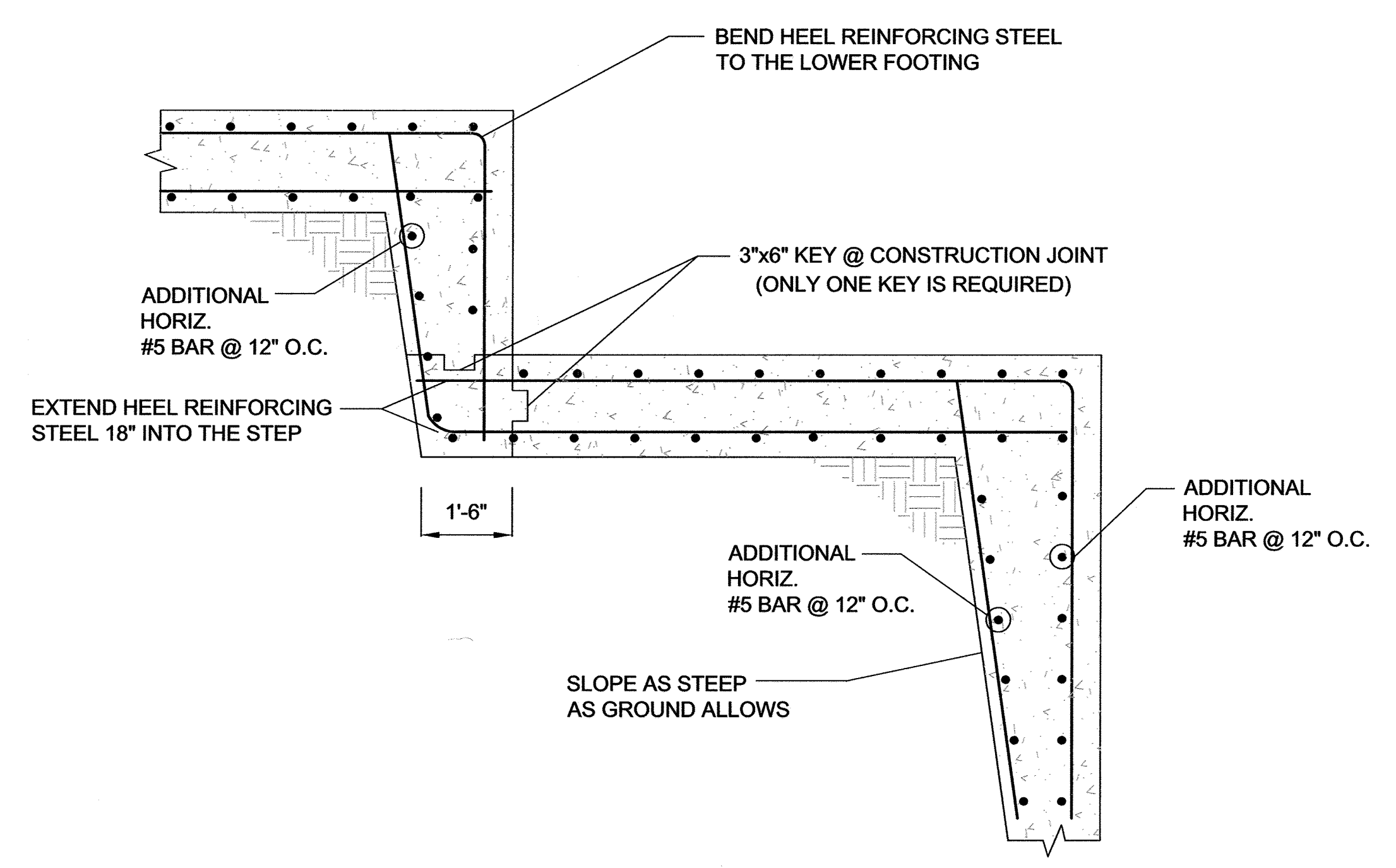
18 SHEET OF 19

NO AS-BUILT INFORMATION ON THIS SHEET

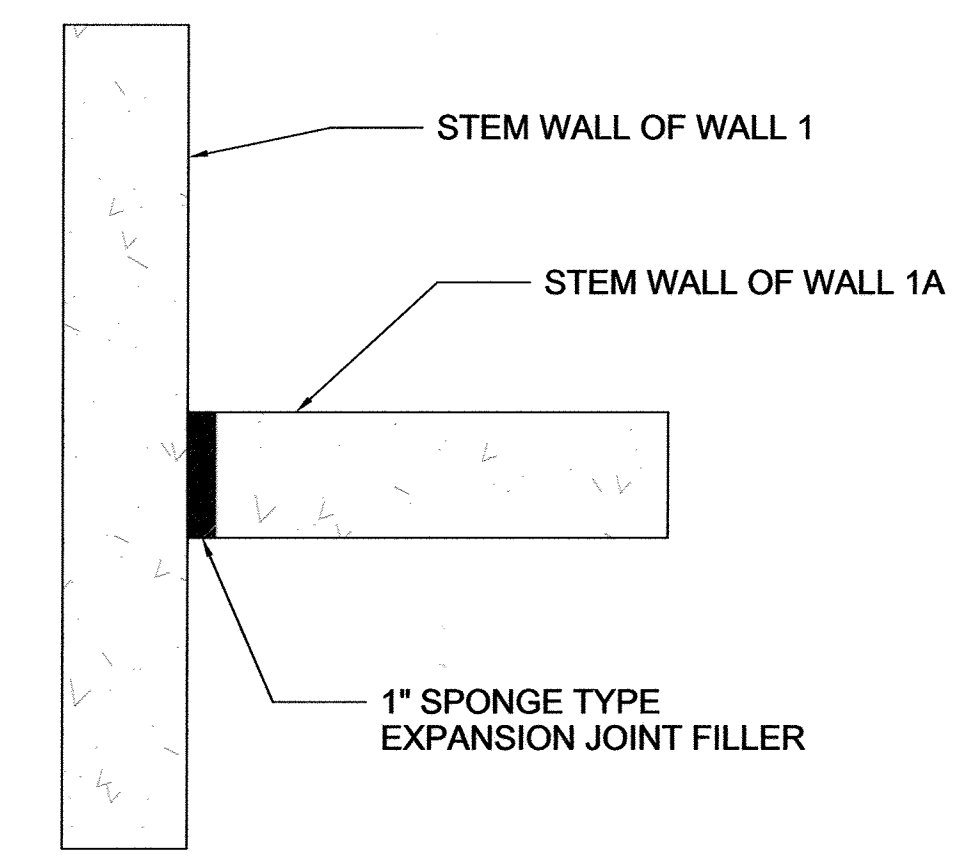
- Quality Assurance**
- A. The Owner shall engage a qualified testing agency to provide observation and testing services as described below.
 - B. Concrete Placement
 - 1. The agency shall inspect the formwork and reinforcing steel placement for compliance with the contract documents. Reinforcing steel should be inspected for correct size, quantity, and spacing.
 - 2. Fresh concrete shall be sampled in accordance with ASTM C 172, and tested for slump, air entrainment, and temperature.
 - 3. Test cylinders shall be molded in accordance with ASTM C 31. Four test cylinders shall be molded for each day's pour, or for every 50 cubic yards of concrete placed, whichever is greater.
 - C. Fill Placement
 - 1. All soil fills shall be tested in accordance with ASTM D 2922.
 - 2. A minimum of one compaction test per lift should be made per 2,500 square feet of fill lift area, but not fewer than two tests per lift should be made.
 - 3. The elevations and locations of the field density tests should be clearly identified at the time of fill placement and compaction.
 - D. Field Verification
 - 1. Wall foundations shall be excavated to the grades shown; however, no contractor or subcontractor shall rely on dimensions & grades shown on these drawings without verifying their correctness by field measure.
- Soil Backfill**
- A. Material should consist of soil classified as SM or more granular, in accordance with ASTM D 2487.
 - B. Material should have no particle larger than 2.5 inches and shall contain at least 36 percent, by weight, retained on the U.S. No. 200 sieve.
 - C. Materials should have a Liquid Limit less than 40, and a Plasticity Index less than 10.
 - D. Material should have a minimum friction angle of 32 degrees.
 - E. The Contractor should submit samples of the proposed backfill soils to the Geotechnical Engineer of Record for approval prior to their use.
 - F. Backfill shall be moisture conditioned to within 2 percentage points of the optimum moisture content, as determined in accordance with ASTM D-1557.
 - G. Backfill shall be placed in loose lifts, not exceeding 8 inches in thickness, and then compacted to at least 95 percent of the maximum dry density, as determined in accordance with ASTM D-1557.
 - H. Backfilling shall not occur against the wall until the wall concrete has attained at least 75 percent of the 28-day design strength, and no earlier than 3 days after placement.
 - I. Where feasible, maintain equal grades on each side of the wall during backfilling to prevent overturning and lateral movements. When the grade differential at the wall exceeds 12 inches, only hand-operated compaction equipment shall be allowed.
- Foundation**
- A. The wall foundation shall be excavated to the grades and lines as shown on the construction drawings. Contractor should take care not to disturb foundation soils beyond the lines and grades shown.
 - B. The foundation shall bear at the minimum embedment depths indicated, as measured from the final grade at the front of the wall.
 - C. The foundation subgrade soils shall be tested by a qualified representative of the Geotechnical Engineer to verify the availability of the design bearing pressure of 3,000 psf.
 - D. If unsuitable soils are encountered at design foundation levels, the unsuitable soils shall be removed and the over-excavated areas shall be replaced with compacted structural fill.



TYPICAL RETAINING WALL 1A SECTION
SEE RETAINING WALL SCHEDULE FOR DETAILS
NOT TO SCALE



TYP. RETAINING WALL 1A STEP DETAIL
SCALE: 1/2"=1'



PLAN VIEW OF RET. WALL 1A AND WALL 1
TYP. EXPANSION JOINT DETAIL
NTS'

OWNER/DEVELOPER
BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

WALL TYPE	MAX. HEIGHT	WALL & FOOTING DIMENSION						FOOTING REINFORCEMENT			STEM REINFORCEMENT			KEY	
		TOE "A"	STEM "B-1"	STEM "B-2"	HEEL "C"	WIDTH "D"	THICKNESS "E"	"F"	"G"	"H"	"J-1"	"J-2"	"K"	REINFOR.	SIZE (WXD)
E	16'-6"	3'-6"	1'-2"	1'-4"	6'-2"	11'-0"	1'-6"	#5@12"	#6@12"	#6@6"	#7@12"	#7@6"	#5@12"	#6@18"	16"x34"
F	15'-5"	4'-11"	1'-2"	1'-4"	2'-11"	9'-2"	1'-6"	#5@12"	#7@12"	#7@12"	#7@12"	#7@6"	#5@12"	#6@18"	16"x40"
G	14'-0"	6'-2"	1'-2"	1'-2"	1'-5"	8'-11"	1'-6"	#5@12"	#7@12"	#7@12"	#7@10"	#7@10"	#5@12"	#6@18"	16"x40"

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad Chisholm
CHIEF, DEVELOPMENT ENGINEERING DIVISION
DATE: 5-12-16

Vent DeLore
CHIEF, DIVISION OF LAND DEVELOPMENT
DATE: 8-9-16

William Jaffe
DIRECTOR
DATE: 8-11-16



AS-BUILT CERTIFICATION FOR PSWM

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.

Robert Harris
P.E. NAME: Robert Harris
P.E. # 16193
DATE: 2/29/19

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
ARCH CULVERT
RETAINING WALL# 1A SECTIONS & DETAILS
BUCH ROAD EXTENSION
10945 PRICE MANOR WAY
ZONED: R-APT & B-1 (L. 3192 / F. 394)

TAX MAP 46 BLOCK 4 5TH ELECTION DISTRICT

PARCEL 126, PARCEL 364, PARCEL 505 (LOT 498), PARCEL 127 HOWARD COUNTY, MARYLAND

1340 CHARWOOD ROAD SUITE A HANOVER, MARYLAND 21076
PHONE: (410) 859-4300 FAX: (410) 859-4324

PROFESSIONAL CERTIFICATE
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 28623 EXPIRATION DATE 12-31-2019

DESIGN BY: DMA/HMA
DRAWN BY: DMA/HMA
CHECKED BY: HMA
DATE: APRIL 2016
SCALE: AS SHOWN
W.O. NO.: 7272-B

HASAN M. ABOUMATAR, P.E.

19 SHEET OF 19

NO AS-BUILT INFORMATION ON THIS SHEET

AS-BUILT-AUG. 2018