HPC-20-83

ATTACHMENT B
18 PAGES

HOWARD COUNTY

Capital Project #C-0337

Maryland Avenue Bypass Culvert Historic Preservation Commission Submission

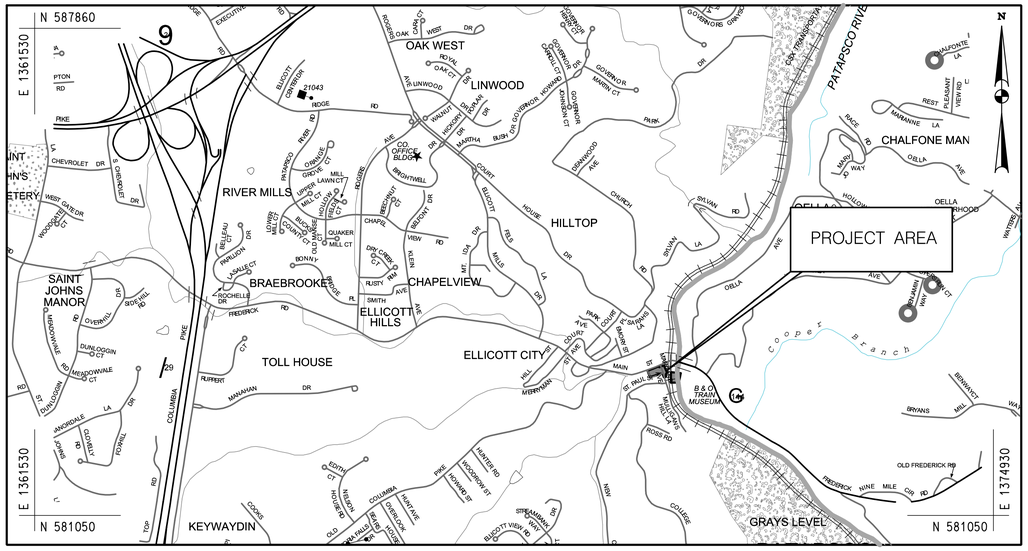
Storm Water Management Division
Bureau Of Environmental Services

65% PLANS
NOT FOR CONSTRUCTION

INDEX OF SHEETS

LEGEND

ELECTRICAL HAND BOX – SIGNALS — H.B.X
FLOW LINE
STATE, COUNTY OR CITY LINES
EXISTING TRAFFIC BARRIER
PROPOSED FENCE LINE — X — X —
EXISTING FENCE LINE — X — X —
PROPERTY LINE
EASEMENT LINE
EXISTING ROADWAY
BASE OR SURVEY LINE — +50 — 32 —
TRAVERSE POINT
APPROXIMATE LIMITS OF CUT AND/OR FILL — C F C F —
PROPOSED MAJOR CONTOUR — 180 —
PROPOSED MINOR CONTOUR — 181 —
LIMIT OF DISTURBANCE — LOD —
EXISTING MAJOR CONTOURS — 190 —
EXISTING MINOR CONTOURS — 191 —
EXISTING PIPE/CULVERT
EXISTING DROP INLET
WETLAND
WATERS OF THE US — WUS —
HEDGE /TREE LINE
BUSH /TREE
CONIFEROUS TREE
LIGHT POLE
SANITARY LINE — SAN — —
BUSH /TREE TO BE REMOVED
SOIL BORING



HORIZONTAL DATUM	NAD 83 /91
VERTICAL DATUM	NAVD 88

SCALE: 1" = 1000'
1000 0 1000 2000 feet

DESIGN NARRATIVE

THE PROPOSED MARYLAND AVENUE BYPASS CULVERTS INCLUDE SEVERAL CONVEYANCE IMPROVEMENT ELEMENTS TO REDUCE FLOODING FROM LARGE STORM EVENTS. THE PROPOSED WORK SEEKS TO IMPROVE STRUCTURAL INTEGRITY OF THE EXISTING CHANNEL AND TO PROVIDE ADDITIONAL CHANNEL CONVEYANCE CAPACITY. THE IMPROVEMENTS WILL BE COMPLETED AFTER REMOVAL OF THE EXISTING STRUCTURES SPANNING OVER THE STREAM AT 8049, 8055, 8059 AND 8069 MAIN STREET. THE EXISTING STREAM WALLS WILL BE RESTORED AND SEVERAL CONCRETE STREAM WALLS WILL BE RECONSTRUCTED IN NEW LOCATIONS TO ACCOMMODATE THE BYPASS CULVERT. A CONCRETE WEIR WILL BE PLACED PARALLEL TO STREAM FLOW, TO MAINTAIN BASE FLOW WITHIN THE CHANNEL BUT ALLOWING HIGH FLOWS TO OVERTOP THE WEIR FOR CONVEYANCE THROUGH THE BYPASS CULVERT. THE BYPASS CULVERT WILL RUN FROM JUST UPSTREAM OF MARYLAND AVENUE, BENEATH THE B&O TURNTABLE AND CSX RAILROAD, AND OUTLET ALONG THE PATAPSCO RIVER. THE PROPOSED BYPASS CULVERT WILL INCLUDE A SINGLE 18.5' WIDE BY 8.5' HIGH CULVERT. IT IS ANTICIPATED THAT THE UPPER SECTION OF CULVERT WILL BE CONSTRUCTED THROUGH OPEN CUT CONSTRUCTION METHODS, AND THE LOWER SECTION OF THE CULVERT WILL BE CONSTRUCTED THROUGH A JACKED CULVERT OPERATION. THE OUTFALL OF THE BYPASS CULVERT WILL BE STABILIZED WITH AN ENDWALL STRUCTURE AND OUTFALL PROTECTION/ENERGY DISSIPATION. THE EXISTING SEWER MAIN ALONG THE PATAPSCO RIVER WILL BE PROTECTED WITH CONCRETE AND NUMEROUS UTILITIES WITHIN MARYLAND AVENUE WILL BE TEMPORARILY OR PERMANENTLY RELOCATED.

HOWARD SCD SIGNATURE BLOCK

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

HOWARD SOIL CONSERVATION DISTRICT _____ DATE _____

PROFESSIONAL CERTIFICATION

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. 25819, EXPIRATION DATE: 2/5/2021

DESIGN CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

DATE _____ DESIGNER'S SIGNATURE _____

MARYLAND REGISTRATION NUMBER _____ PRINTED NAME _____

OWNER'S/DEVELOPER'S CERTIFICATION

I/WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION, OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION PRIOR TO BEGINNING THE PROJECT. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE.

DATE _____ OWNER /DEVELOPER SIGNATURE _____

PRINTED NAME AND TITLE _____

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MDOT SHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
2. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE (5) WORKING DAYS PRIOR TO ANY WORK BEING DONE.
   BUREAU OF UTILITIES 410–313–4900
   MISS UTILITY 800–257–7777
3. THIS PLAN IS PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
4. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS /BUREAU OF ENGINEERING CONSTRUCTION INSPECTION DIVISION AT (410) 313–5712 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
5. SURVEY OF THE SITE WAS PERFORMED BY AB CONSULTANTS NOV. 2016.
6. WETLANDS AND WATERS OF THE US WERE DELINEATED BY McCORMICK TAYLOR – AUGUST 2019.
7. OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND McCORMICK TAYLOR DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR COMPLETENESS OF THE INFORMATION GIVEN. THE CONTRACTOR MUST VERIFY SUCH INFORMATION TO HIS OWN SATISFACTION.
8. THE EXISTING INFORMATION SHOWN ON THESE PLANS WAS TAKEN FROM THE BEST AVAILABLE SOURCES AND SHALL BE VERIFIED BEFORE STARTING CONSTRUCTION. HOWARD COUNTY DOES NOT GUARANTEE THE COMPLETENESS OR THE CORRECTNESS OF THE SHOWN INFORMATION.
9. THE CONTRACTORS SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTORS'S OPERATION SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE UTILITY OWNER AT THE CONTRACTOR'S EXPENSE AND SUBJECT TO APPROVAL OF THE DPW BUREAU OF ENGINEERING CONSTRUCTION INSPECTION DIVISION.
10. SHOULD THE CONTRACTOR DISCOVER DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS, THE CONTRACTOR SHALL NOTIFY THE HOWARD COUNTY PROJECT MANAGER IMMEDIATELY TO RESOLVE THE SITUATION.
11. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED.
12. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS.
13. A JOINT PERMIT APPLICATION HAS BEEN SUBMITTED TO THE MARYLAND DEPARTMENT OF THE ENVIRONMENT FOR THIS PROJECT. (TRACKING NUMBER 2019–61647;19–NT–3250)
14. PROJECT IMPACTS INCLUDE WORK IN A USE I STREAM (TIBER–HUDSON BRANCH) AND A USE IV STREAM (PATAPSCO RIVER). FOR USE I STREAMS, WORK MAY NOT BE CONDUCTED DURING THE PERIOD BETWEEN MARCH 1 AND JUNE 15 INCLUSIVE. FOR USE IV STREAMS, WORK MAY NOT BE CONDUCTED DURING THE PERIOD BETWEEN MARCH 1 AND MAY 31 INCLUSIVE. THE SITE IS LOCATED WITHIN THE PATAPSCO RIVER LOWER NORTH BRANCH WATERSHED (02–13–09–06) WHICH HAS NO TIER II STREAM SEGMENTS REQUIRING THE IMPLEMENTATION OF MARYLAND'S ANTIDEGRADATION POLICY. HOWEVER, PATAPSCO RIVER LOWER NORTH BRANCH WATERSHED HAS BEEN IDENTIFIED AS IMPAIRED AND IS CURRENTLY UNDER A TMDL FOR SEDIMENT.
15. CONTRACTOR SHALL PROVIDE STRUCTURAL SHOP DRAWINGS FOR ALL PRECAST OR PRE–FABRICATED STRUCTURES FOR ENGINEER'S APPROVAL PRIOR TO CONSTRUCTION.
16. THE DEPARTMENT OF PUBLIC WORKS HAS DETERMINED THAT THE DISTURBANCE OF WETLANDS, STREAMS, BUFFERS, AND STEEP SLOPES FOR THIS PROJECT ARE CONSIDERED ESSENTIAL OR NECESSARY IN ACCORDANCE WITH SECTION 16.115(C) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. THE DEPARTMENT OF PLANNING AND ZONING APPROVED THE NECESSARY DISTURBANCES ON XXX.
17. THIS DOCUMENT INCLUDES INFORMATION AND DEPICTIONS OF BALTIMORE GAS AND ELECTRIC COMPANY'S (BGE) ELECTRIC AND/OR GAS UTILITIES LOCATED WITHIN THE PROJECT AREA (THE "BGE UTILITY INFORMATION"). LOCATIONS, DIMENSIONS, DEPTHS AND OTHER DETAILS OF ANY SUCH UTILITIES MAY NOT BE AS–BUILT, AND THE INFORMATION SHALL NOT BE RELIED UPON WITHOUT FIELD VERIFICATION. EXCAVATORS MUST EMPLOY SAFE DIGGING BEST PRACTICES WHEN APPROACHING BGE ELECTRIC AND GAS UTILITIES AND COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, INCLUDING, BUT NOT LIMITED TO, THE "MISS UTILITY LAW". NO REPRESENTATIONS, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, ARE MADE BY BGE AS TO THE QUALITY, COMPLETENESS, OR ACCURACY OF THE BGE UTILITY INFORMATION, AND IN ACCEPTING THIS DOCUMENT, THE RECIPIENT EXPRESSLY ACKNOWLEDGES AND AGREES THAT IT IS NOT RELYING ON THE ACCURACY OF THE SAME.

APPROVALS/PERMITS

AGENCY	#	DATE APPLIED	DATE APPROVED
MDE JOINT PERMIT APPLICATION	19–NT–3250; 2019–61647	9/20/19	TBD
HC–DPZ ESSENTIAL DISTURBANCE	TBD	TBD	TBD
HOWARD SOIL CONSERVATION DISTRICT	EP–20–018	30% 06/03/2020 65% TBD 90% TBD TBD Final	30% 06/22/2020 65% TBD 90% TBD TBD Final
MDE GENERAL PERMIT FOR STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITY	N/A	N/A	N/A
HC–DPZ ALTERNATIVE COMPLIANCE	N/A	N/A	N/A
HOWARD COUNTY HISTORIC PRESERVATION COMMISSION	HPC–20–TBD	TBD	TBD

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS DATE

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

CHIEF, STORMWATER MANAGEMENT DIVISION DATE

McCORMICK TAYLOR
509 South Exeter Street
4th Floor
Baltimore, Maryland 21202
(410) 662-7400

Howard County MARYLAND
Storm Water Management Division
Bureau of Environmental Services
9801 Broken Land Parkway
Columbia, Maryland 21046
(410) 313–6444

DES: EZS
DRN: MER
CHK: BGA
DATE: 11/10/20

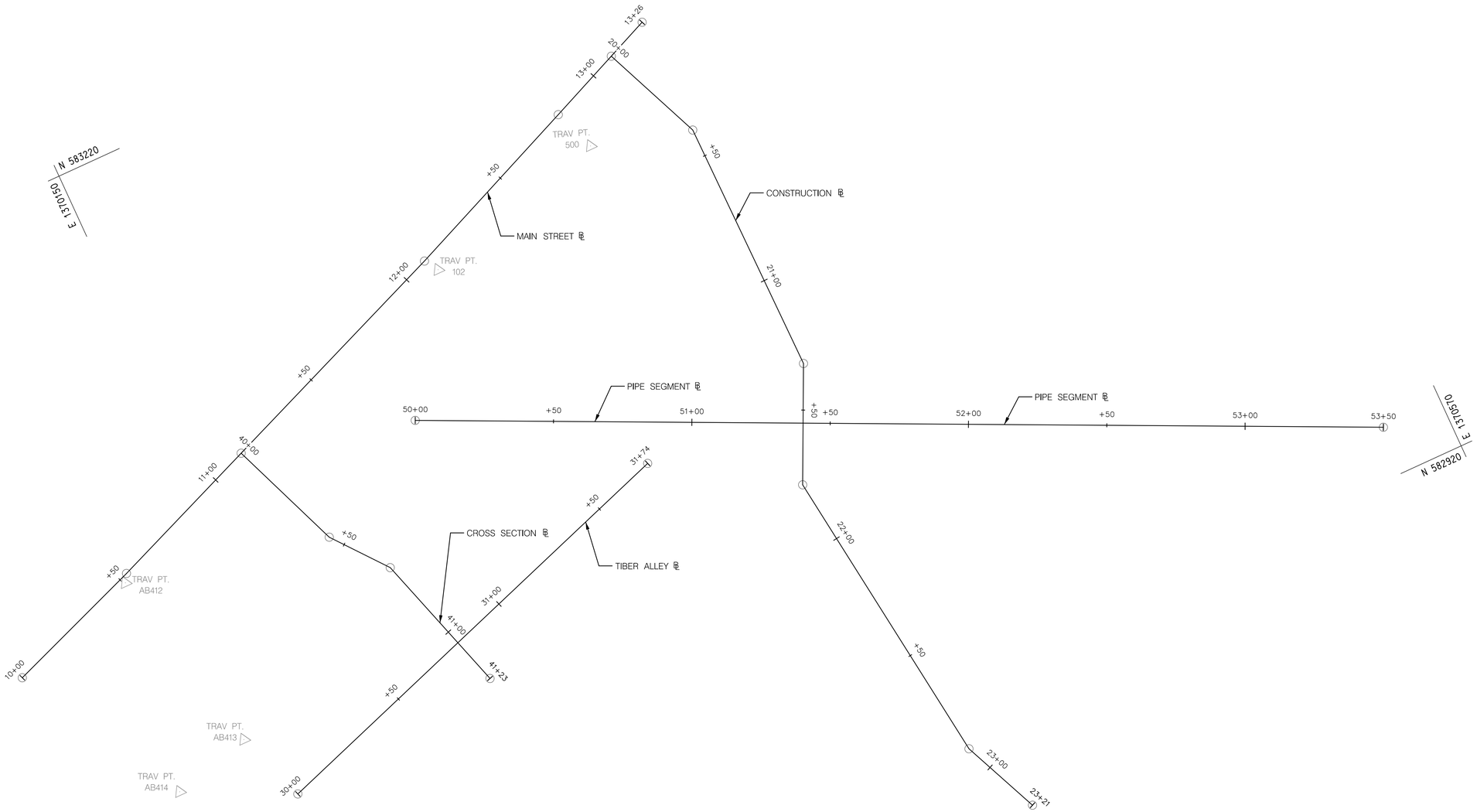
BY	NO.	REVISION	DATE

MARYLAND AVENUE BYPASS CULVERT
CAPITAL PROJECT #C–0337
HOWARD COUNTY
HSCD# EP–20–018

TITLE SHEET

SCALE AS SHOWN

SHEET 1 OF 18



TRAVERSE CONTROL COORDINATES			
POINT	NORTHING	EASTING	ELEVATION
102	583132.0800	1370260.4330	125.92
AB412	583076.3165	1370110.4834	125.66
AB413	583006.9611	1370125.7908	127.59
AB414	582999.4665	1370096.8379	119.85
500	583149.7783	1370329.1599	125.34

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, STORMWATER MANAGEMENT DIVISION — DATE

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CAPITAL PROJECT #C-0337
HOWARD COUNTY
HSCD# EP-20-018

GEOMETRY SHEET

SCALE
1" = 20'

SHEET
2 OF 18

LEGEND

- TIBER PARK PIERS AND PATHWAYS TO BE REMOVED
- BRIDGE STRUCTURE TO BE REMOVED
- BASEMENT STRUCTURES TO BE REMOVED DURING THIS PROJECT
- BUILDING TO BE REMOVED BY OTHERS
- EXISITNG MASONRY WALL TO BE REMOVED DURING THIS PROJECT

8049 MAIN STREET BUILDING STRUCTURE TO BE REMOVED BY OTHERS

8055 MAIN STREET BUILDING STRUCTURE TO BE REMOVED BY OTHERS

8059 MAIN STREET BUILDING STRUCTURE TO BE REMOVED BY OTHERS

TIBER PARK PEDESTRIAN BRIDGE TO BE REMOVED DURING THIS PROJECT

8069 MAIN STREET BASEMENT STRUCTURE TO BE REMOVED DURING THIS PROJECT

8069 MAIN STREET BUILDING STRUCTURE TO BE REMOVED BY OTHERS

TIBER ALLEY BRIDGE TO REMAIN DURING THIS PROJECT

8049 MAIN STREET BASEMENT STRUCTURE TO BE REMOVED DURING THIS PROJECT

8055 MAIN STREET BASEMENT STRUCTURE TO BE REMOVED DURING THIS PROJECT

8059 MAIN STREET BASEMENT STRUCTURE TO BE REMOVED DURING THIS PROJECT

TIBER PARK LANDSCAPING, PIERS AND PATHWAYS TO BE REMOVED

EXISITNG MASONRY WALL TO BE REMOVED DURING THIS PROJECT

EXISTING MASONRY WALLS TO REMAIN

TIBER BRANCH

TIBER PARK BRIDGE

TIBER ALLEY BRIDGE

MAIN STREET

B&O ELLICOTT CITY STATION MUSEUM

C&X RAILROAD

MUSEUM FREIGHT BUILDING

MARYLAND AVENUE

ST. PAUL STREET

PATAPSCO RIVER

N

SCALE: 1" = 20'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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MARYLAND AVENUE BYPASS CULVERT
CAPITAL PROJECT #C-0337
HOWARD COUNTY
HSCD# EP-20-018

DEMO SITE PLAN

SCALE: 1" = 20'

SHEET 3 OF 18

LEGEND
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- WOODS
- PROPERTY LINE
- WUS — WATERS OF THE US
- LOD — LIMIT OF DISTURBANCE
- SB — 75' STREAM BUFFER
- 100 YR FLOODPLAIN
- SAN — EXISTING SANITARY SEWER
- W — EXISTING WATER LINE
- G — EXISTING GAS LINE
- E — EXISTING OVERHEAD ELECTRIC LINE
- FO — EXISTING FIBER OPTIC LINE
- STRUCTURE TO BE REMOVED
- JACKING PIT
- SOIL BORING
- PROPOSED WALL
- FULL DEPTH PAVEMENT
- RIPRAP
- CONCRETE
- TEMPORARY BITUMINOUS SURFACE
  FINAL TREATMENT BY MASTER PLAN
- STREAM CHANNEL BOTTOM – NATURAL MATERIAL / EXISTING TO REMAIN
- BOLLARDS
- TRAFFIC BARRIER
- ORNAMENTAL FENCE
- IMBRICATED STONE

MAIN STREET
TIBER BRANCH
TIBER ALLEY (TO REMAIN)
TIBER ALLEY BRIDGE
TIBER BRANCH STREAM USE I
ST. PAUL STREET
MARYLAND AVENUE
MUSEUM FREIGHT BUILDING
B&O ELLICOTT CITY STATION MUSEUM
CSX RAILROAD
PATAPSCO RIVER STREAM USE IV
CSX RIGHT-OF-WAY
N 582200
E 1370150
N 582920
E 1370570
E 1370950

EXISTING BOX CULVERT UNDER MARYLAND AVENUE TO REMAIN
BOLLARDS @ 5' O.C.
REPAIR AND EXTEND EXISTING MASONRY WALL TO NEW SIDEWALK ELEVATION USING SALVAGED MATERIAL MATCHING ADJACENT PATTERN
CONCRETE WEIR WALL WITH STONE SURROUND ON ALL VISIBLE PORTIONS. UTILIZE SALVAGED MATERIAL. INSTALL IN ROUGHLY COURSED ASHLAR PATTERN.
COLORED CONCRETE SIDEWALK (DAVIS GRAY), 5' WIDTH, WITH STANDARD CONCRETE CURB AND GUTTER
STANDARD GUARDRAIL ON BRIDGE
CHANNEL CROSS
IMBRICATED STONE SPILLWAY
TIBER ALLEY
LIMITS OF JACKING PIT EXCAVATION. TEMPORARY PIT TO FACILITATE CONSTRUCTION OF CULVERT.
TIE INTO EX. SIDEWALK
CROSS SECTION
CONCRETE STREAM CHANNEL RETAINING WALLS WITH STONE SURROUND ON ALL VISIBLE PORTIONS. UTILIZE SALVAGED MATERIAL. INSTALL IN ROUGHLY COURSED ASHLAR PATTERN.
ORNAMENTAL FENCING ALONG EDGE
CONSTRUCTION
PIPE SEGMENT 2
REPAIR / MATCH EXISTING CONDITIONS, WHICH IS A MIX OF BRICK, CONCRETE, AND COBBLE STONES
PIPE SEGMENT
PIPE SEGMENT 1
EX. 36" RCP SANITARY SEWER FROM AS-BUILT "PATAPSCO RIVER INTERCEPTOR, FEB 1961"
SUBTERRANEAN 18.5'W x 8.5'H CONCRETE BOX CULVERT
CONCRETE END WALL WITH NATURAL STONE CLADDING ON ALL VISIBLE PORTIONS – NOMINALLY 4" – 6" THICK SARATOGA GRANITE, ASHLAR PATTERN
CLASS 2 RIP RAP NATURAL MATERIAL, GRAY
PROPOSED RIPRAP OUTFALL ENERGY DISSIPATOR
PROTECTION FOR EXISTING SEWER LINE

SCALE: 1" = 20'

NOTE:
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MARYLAND AVENUE BYPASS CULVERT
CAPITAL PROJECT #C-0337
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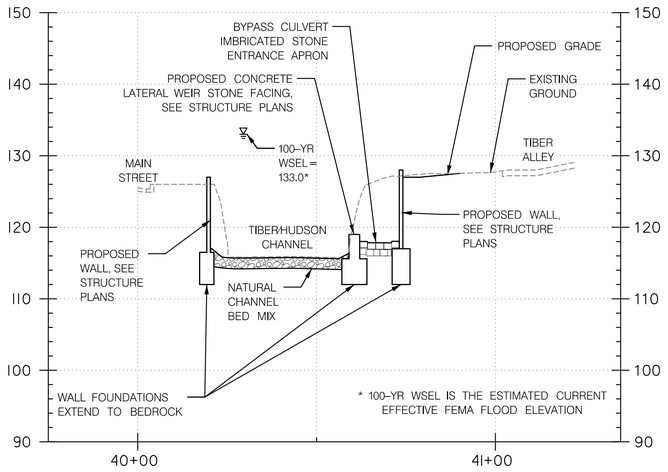
SITE PLAN

SCALE 1" = 20'

SHEET 4 OF 18

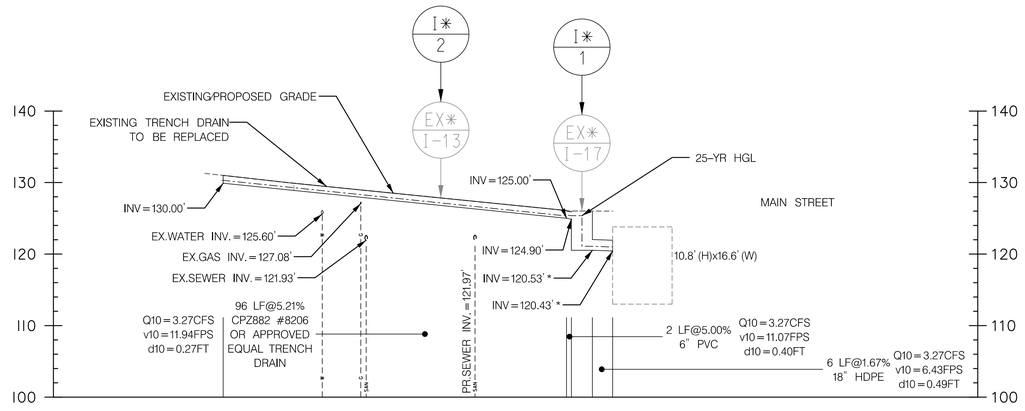


CHANNEL CROSS SECTION

Scale: Horiz: 1" = 20'
Vertical: 1" = 10'

CHANNEL BED MATERIAL MIX	
AMOUNT OF STONE (%)	STONE TYPE
XX	SHA CLASS 0
XX	SHA CLASS 1
XX	SHA CLASS 2
100	TOTAL

MATERIAL MIX D50 = X.X"



EX–I–13 & EX–I–17 PROFILE

Scale: Horiz: 1" = 20'
Vertical: 1" = 10'

*EXISTING INVERTS BASED ON FIELD MEASUREMENTS. CONTRACTOR TO VERIFY INVERTS PRIOR TO ORDERING DRAINAGE STRUCTURES.

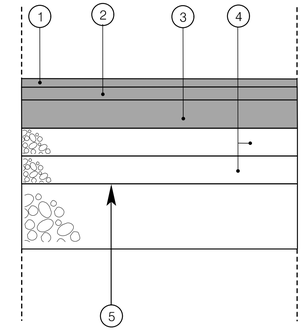
SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR) / PAVEMENT MATERIAL (INCHES)	3 TO <5	5 TO <7	≥ 7	3 TO <5	5 TO <7	≥ 7
			MIN. SUPERPAVE ASPHALT MIX WITH GAB			SUPERPAVE ASPHALT MIX WITH CONSTANT GAB		
P-1	PARKING BAYS: RESIDENTIAL AND NON-RESIDENTIAL PARKING DRIVE AISLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 2 HEAVY TRUCKS PER DAY	SUPERPAVE ASPHALT MIX FINAL SURFACE 9.5 MM, PG 64-22S, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		SUPERPAVE ASPHALT MIX INTERMEDIATE SURFACE (NA)	NA	NA	NA	NA	NA	NA
		SUPERPAVE ASPHALT MIX BASE 19.0 MM, PG 64 22S, LEVEL 1 (ESAL)	2.0	2.0	2.0	3.5	3.0	2.5
		GRADED AGGREGATE BASE (GAB)	8.5	7.0	5.0	4.0	4.0	4.0
P-2	PARKING DRIVE AISLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY LOCAL ROADS: ACCESS PLACE, ACCESS STREET CUL-DE-SACS: RESIDENTIAL	SUPERPAVE ASPHALT MIX FINAL SURFACE 9.5 MM, PG 64-22S, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		SUPERPAVE ASPHALT MIX INTERMEDIATE SURFACE 9.5 MM, PG 64-22S, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		SUPERPAVE ASPHALT MIX BASE 19.0 MM, PG 64-22S, LEVEL 1 (ESAL)	2.0	2.0	2.0	3.5	2.0	2.0
		GRADED AGGREGATE BASE (GAB)	8.0	4.0	3.0	4.0	4.0	4.0
P-3	PARKING DRIVE AISLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY LOCAL ROADS: ACCESS PLACE, ACCESS STREET CUL-DE-SACS: NON-RESIDENTIAL MINOR COLLECTORS: RESIDENTIAL	SUPERPAVE ASPHALT MIX FINAL SURFACE 9.5 MM, PG 64-22S, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		SUPERPAVE ASPHALT MIX INTERMEDIATE SURFACE 9.5 MM, PG 64-22S, LEVEL 1 (ESAL)	1.0	1.0	1.0	1.0	1.0	1.0
		SUPERPAVE ASPHALT MIX BASE 19.0 MM, PG 64-22S, LEVEL 1 (ESAL)	3.0	3.0	3.0	4.5	3.0	2.0
		GRADED AGGREGATE BASE (GAB)	10.0	6.0	3.0	6.0	6.0	6.0
P-4	MINOR COLLECTORS: NON-RESIDENTIAL MAJOR COLLECTORS	SUPERPAVE ASPHALT MIX FINAL SURFACE 12.5 MM, PG 64-22S, LEVEL 2 (LOW ESAL)	2.0	2.0	2.0	2.0	2.0	2.0
		SUPERPAVE ASPHALT MIX INTERMEDIATE SURFACE 12.5 MM, PG 64-22S, LEVEL 2 (LOW ESAL)	2.0	2.0	2.0	2.0	2.0	2.0
		SUPERPAVE ASPHALT MIX BASE 19.0 MM, PG 64-22S, LEVEL 2 (LOW ESAL)	4.0	4.0	3.0	6.0	5.0	3.0
		GRADED AGGREGATE BASE (GAB)	13.0	7.0	4.0	6.0	6.0	6.0

NOTES

1. HEAVY TRUCKS ARE DEFINED AS THOSE WITH SIX (6) WHEELS OR MORE INCLUDING GARBAGE TRUCKS.
2. SUPERPAVE ASPHALT MIX LAYERS SHALL BE PLACED IN APPROPRIATE COMPACTED LIFT THICKNESS: 19.0 MM BASE (2.0" MIN. TO 4.0" MAX.), 12.5 MM SURFACE (1.5" MIN. TO 3.0" MAX.), AND 9.5 MM SURFACE (1.0" MIN. TO 2.0" MAX.)
3. GRADED AGGREGATE BASE (GAB) TO BE PLACED AND COMPACTED IN 4" MAX. COMPACTED THICKNESS LAYERS.
4. THE INTERMEDIATE SURFACE COURSE LAYER MUST BE PLACED WITHIN 2 WEEKS OF PLACEMENT OF BASE COURSE, AND IS REQUIRED PRIOR TO SUBENTAL COMPLETION INSPECTION AND BOND REDUCTION.
5. IN LIEU OF PLACING THE INTERMEDIATE SURFACE COURSE LAYER FOR COMMERCIAL/INDUSTRIAL ENTRANCE APRONS WITHIN THE PUBLIC RIGHT-OF-WAY, AN EQUIVALENT THICKNESS OF THE INTERMEDIATE PAVEMENT LAYER THICKNESS OF THE BASE ASPHALT LAYER.
6. THE CONSTRUCTION DRAWINGS SHALL SHOW THE PAVING SECTION, ROAD CLASSIFICATION AND CBR VALUE FOR EACH ROADWAY.

SUPERPAVE ASPHALT MIX FINAL SURFACE.
SUPERPAVE ASPHALT MIX INTERMEDIATE SURFACE
SUPERPAVE ASPHALT MIX BASE
GRADED AGGREGATE BASE (GAB)

Revised 5/26/2017 / Revised 5/7/2007 / Approved	Howard County, Maryland Department of Public Works Approved: Bureau of Engineering Chief, Bureau of Engineering	PAVING SECTIONS P-1 to P-4	Detail R-2.01



FULL DEPTH RECONSTRUCTION DETAIL

NOT TO SCALE

PAVEMENT LEGEND:

1. 1.5" SUPERPAVE ASPHALT MIX 9.5 mm FOR SURFACE, PG 64S–22, LEVEL 1
2. 1" SUPERPAVE ASPHALT MIX 9.5 mm FOR SURFACE, PG 64S–22, LEVEL 1
3. 3" SUPERPAVE ASPHALT MIX 19.0 mm FOR BASE, PG 64S–22, LEVEL 1
4. 5" GRADED AGGREGATE BASE
5. TOP OF SUBGRADE
6. STANDARD CURB AND GUTTER

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, STORMWATER MANAGEMENT DIVISION — DATE

McCORMICK TAYLOR
509 South Exeter Street
4th Floor
Baltimore, Maryland 21202
(410) 662-7400

Howard County MARYLAND
Storm Water Management Division
Bureau of Environmental Services
9801 Broken Land Parkway
Columbia, Maryland 21046
(410) 313–6444

DES: EZS
DRN: MER
CHK: BGA
DATE: 11/10/20

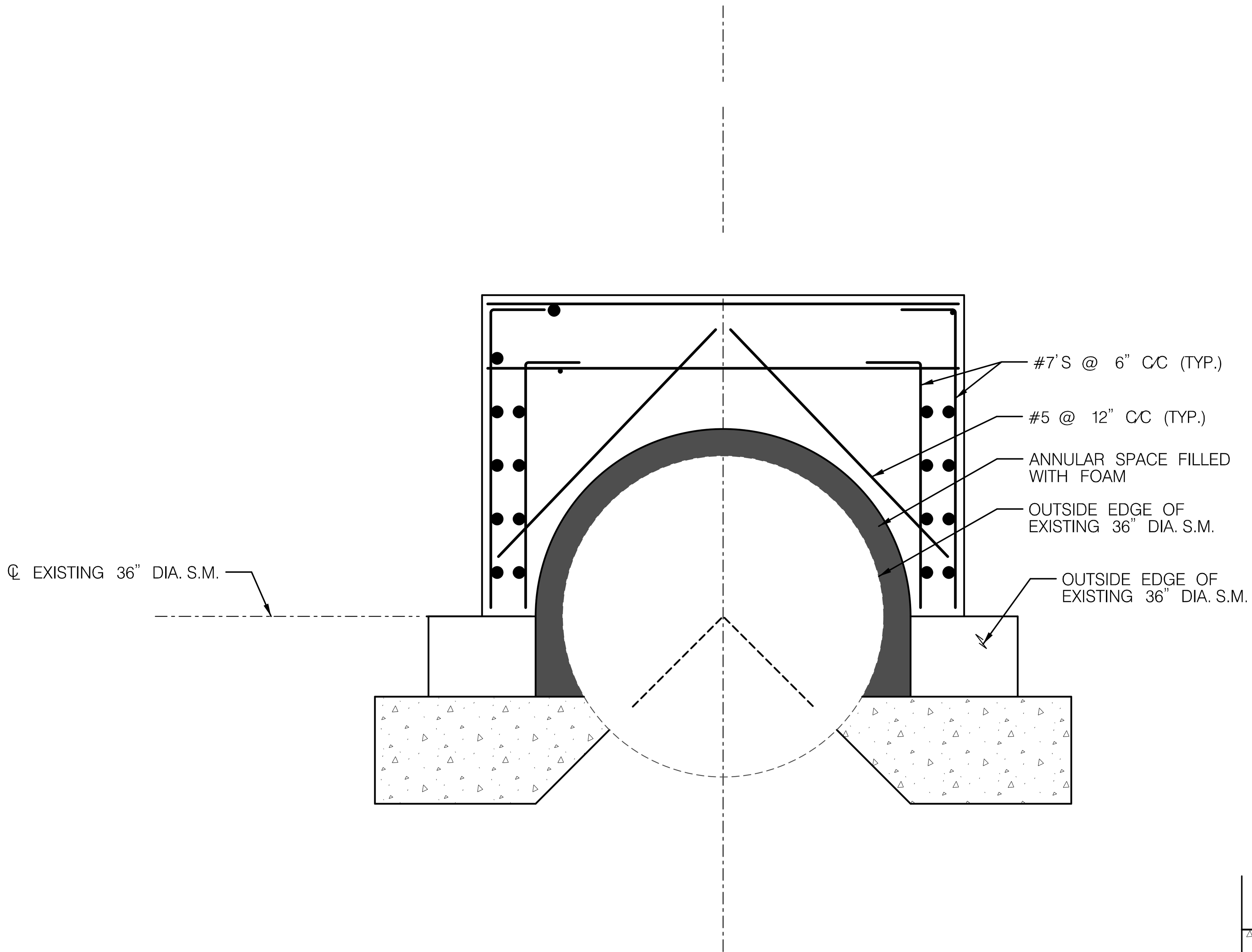
BY	NO.	REVISION	DATE

MARYLAND AVENUE BYPASS CULVERT
CAPITAL PROJECT #C–0337
HOWARD COUNTY
HSCD# EP–20–018

PIPE PROFILES /PAVEMENT DETAILS

SCALE: NONE

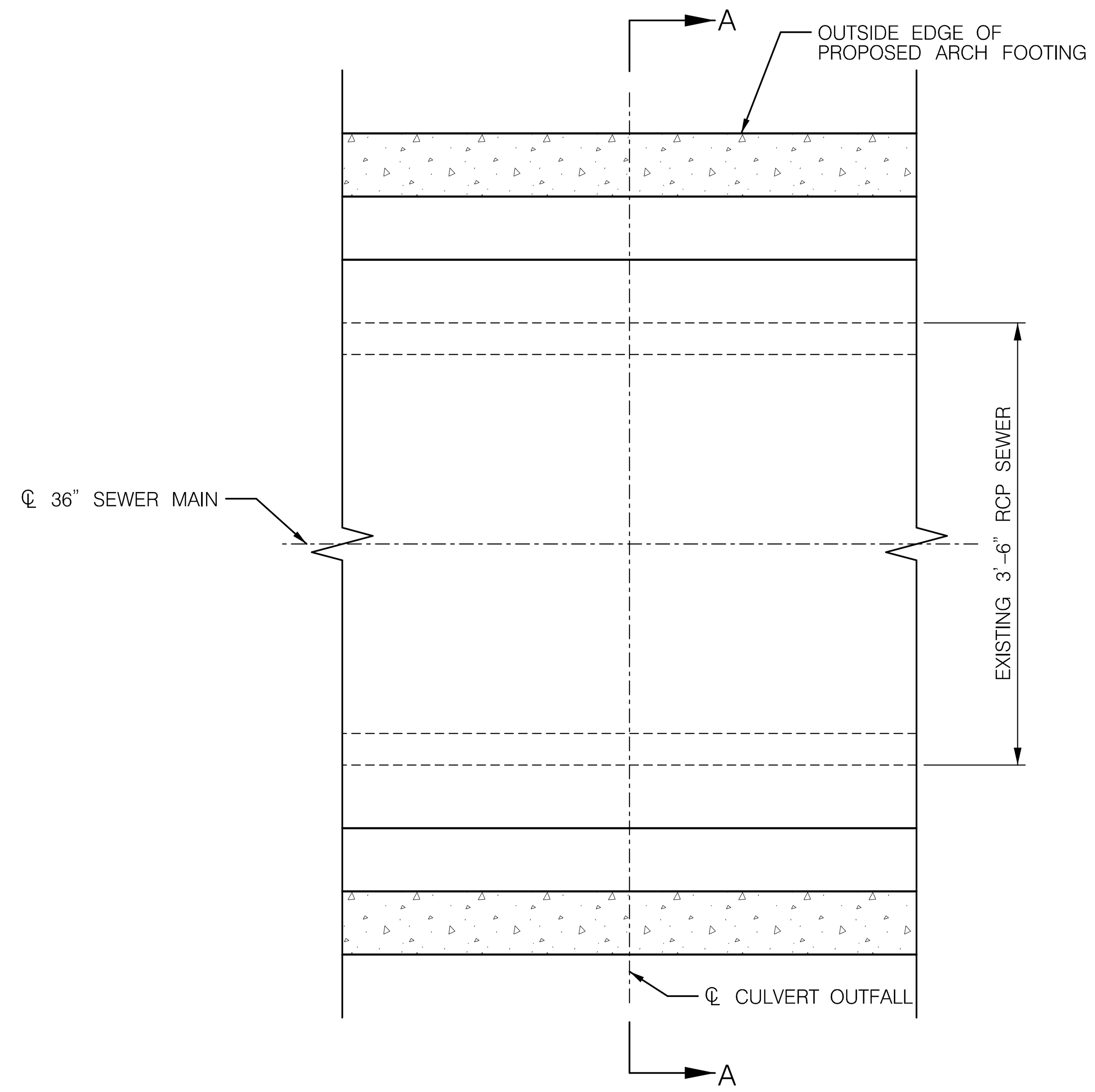
SHEET: 5 OF 18



SECTION A–A

SCALE: 1" =1'

NOTE:
ALL LONGITUDINAL REINFORCING STEEL BARS TO BE #5's SPACED AS SHOWN.



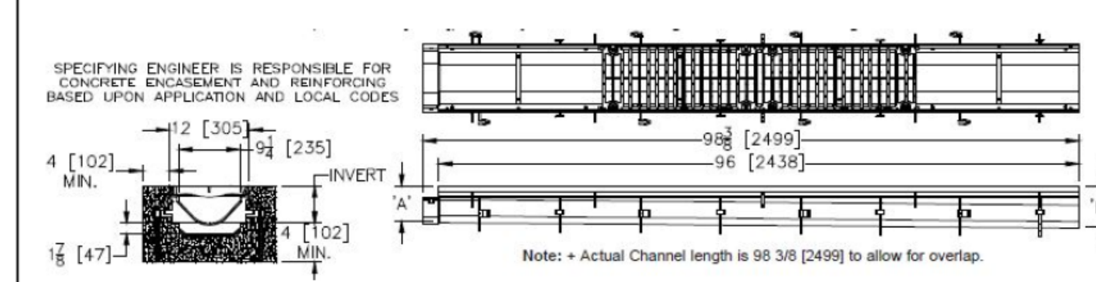
PROTECTION FOR EXISTING SEWER LINES*

SCALE: 1" =1'

* DETAIL TO BE UPDATED FOLLOWING 65% DESIGN PHASE

1-877-903-7246 **TRENCHDRAIN SUPPLY** www.trenchdrainsupply.com

Number	Series
Z882 Channel and Frame	**CPZ882** HDPE Channel Z882 Series



ENGINEERING SPECIFICATION: Zurn Z882
Channels shall be 96 [2438] long, 12 [305] wide reveal and have a 9-1/4 [235] throat. Modular channel sections shall be made of 0% water absorbent High Density Polyethylene (HDPE). Shall have a positive mechanical connection between channel sections that will not separate during the installation and shall mechanically lock into the concrete surround every 12 [305]. Channels shall weigh less than 5.05 lbs. [2.29kg] per linear foot, have a smooth, 3 [76] radiused self cleaning bottom with a Manning's coefficient of 0.009 and 1.04% or neutral 0% built in slope. Channels shall have rebar clips standard to secure trench in its final location. Shall be provided with standard DGC grates that lock down to frame. Zurn 12 [305] wide reveal Ductile Iron Slotted Grate conforming to ASTM specification A536-84, Grade 80-55-06. Ductile Iron grate is rated class C per the DIN EN1433 top load classifications. Supplied in 24 [608] nominal lengths with 13/16 [21] wide slots, and 1-1/2 [38] bearing depth. Grate has an open area of 80.8 sq. in per ft. [171,027 sq. mm per meter]. The 1/4 [6] thick Heavy-Duty Carbon Steel Frame Assembly conforms to ASTM specification A36 with 10 - 4 [102] long concrete anchors per 96 [2438]. Grate lockdown bars are to be integral to the frame. The frame is supplied with a powder coated finish. All welds must be performed by a certified welder per ASTM standard AWS D1.1. Frames Shall be produced in the U.S.A.

Trench No.	'A' Shallow Inv.	'B' Deep Inv.	Flow (cfs)	Flow (gpm)	Flow (lps)
8201	6.25 [159]	7.25 [184]	1.241	557	35
8202	7.25 [184]	8.25 [210]	1.725	774	49
8203	8.25 [210]	9.25 [235]	2.226	999	63
8203N	9.25 [235]	9.25 [235]	-	-	-
8204	9.25 [235]	10.25 [260]	2.745	1232	78
8205	10.25 [260]	11.25 [286]	3.271	1468	93
8206	11.25 [286]	12.25 [311]	3.808	1709	108
8206N	12.25 [311]	12.25 [311]	-	-	-
8207	12.25 [311]	13.25 [337]	4.347	1951	123
8208	13.25 [337]	14.25 [362]	4.893	2196	139
8209	14.25 [362]	15.25 [387]	5.443	2443	155
8209N	15.25 [387]	15.25 [387]	-	-	-
8210	15.25 [387]	16.25 [413]	5.996	2691	170
8211	16.25 [413]	17.25 [438]	6.551	2940	186
8212	17.25 [438]	18.25 [464]	7.106	3189	202

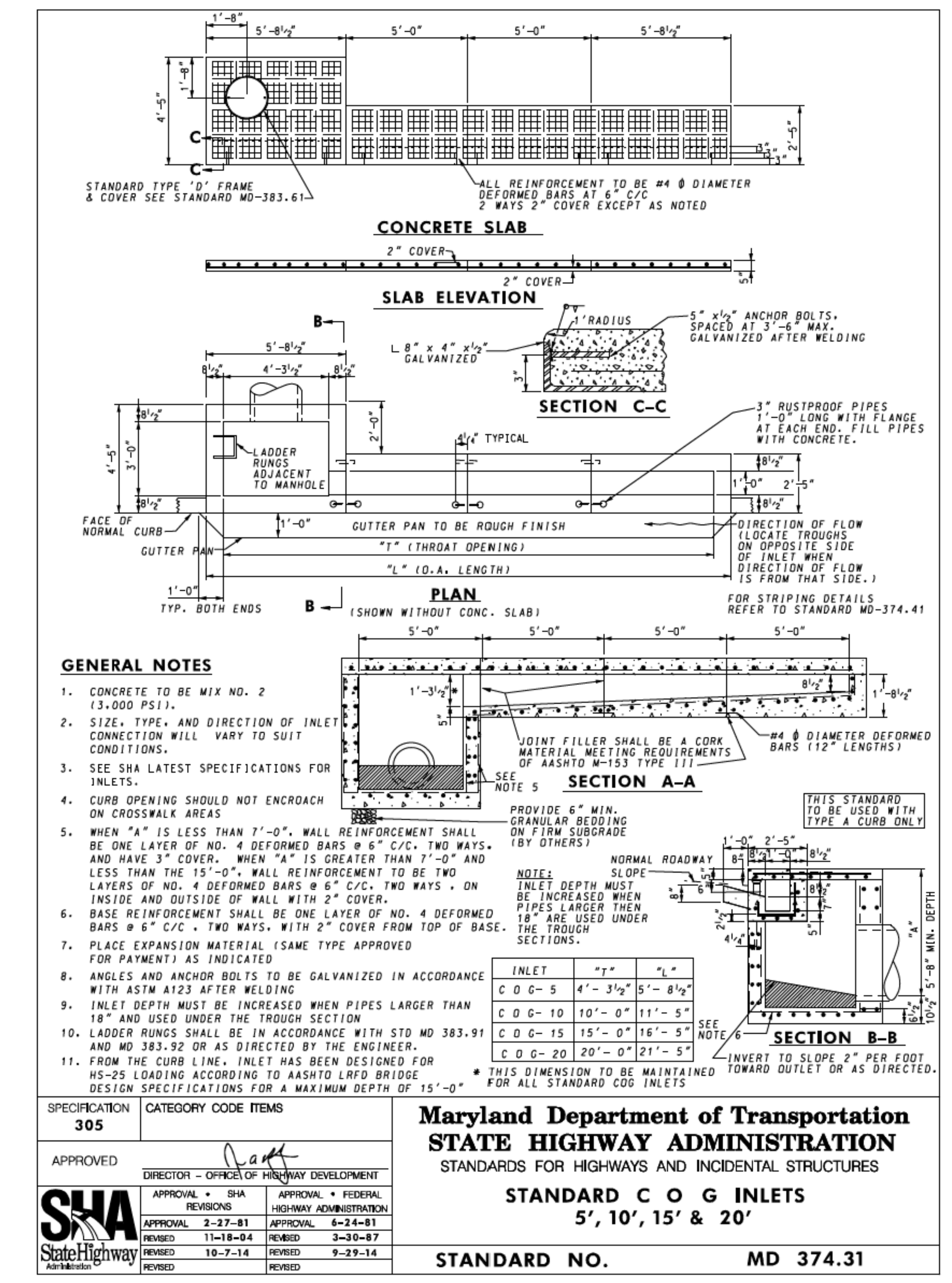
Manufacturer ZURN

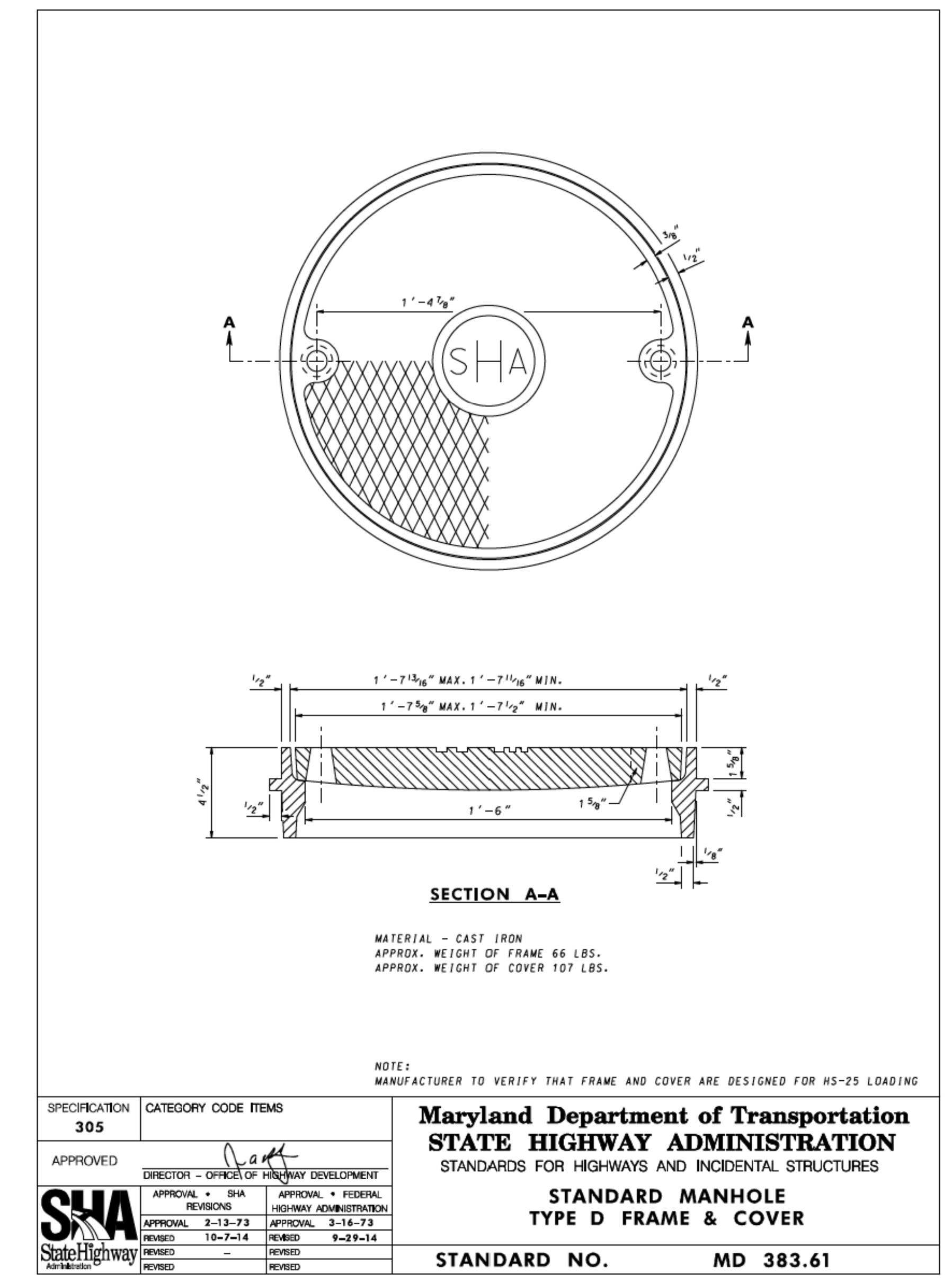
DISCLAIMER - The customer and the customer's architects, engineers, consultants, and other professionals are completely responsible for the selection installation and maintenance of any product purchased from Trench Drain Supply and/or its manufacturers. TRENCH DRAIN SUPPLY MAKES NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE SUITABILITY, DESIGN, MERCHANTIBILITY, OR FITNESS OF THE PRODUCT FOR CUSTOMERS APPLICATION. The drawing and information provided remain the property and copyright of the manufacturer listed. The manufacturer reserves the right to modify specification without notice.

TRENCH DRAIN DETAIL

NTS

*SEE ZURN Z882 TRENCH NO. 8206 ABOVE OR APPROVED EQUAL.





DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	McCORMICK TAYLOR 509 South Exeter Street 4th Floor Baltimore, Maryland 21202 (410) 662-7400	Howard County MARYLAND Storm Water Management Division Bureau of Environmental Services 9801 Broken Land Parkway Columbia, Maryland 21046 (410) 313-6444

CHIEF, STORMWATER MANAGEMENT DIVISION DATE

DES: EZS				
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CHK: BGA				
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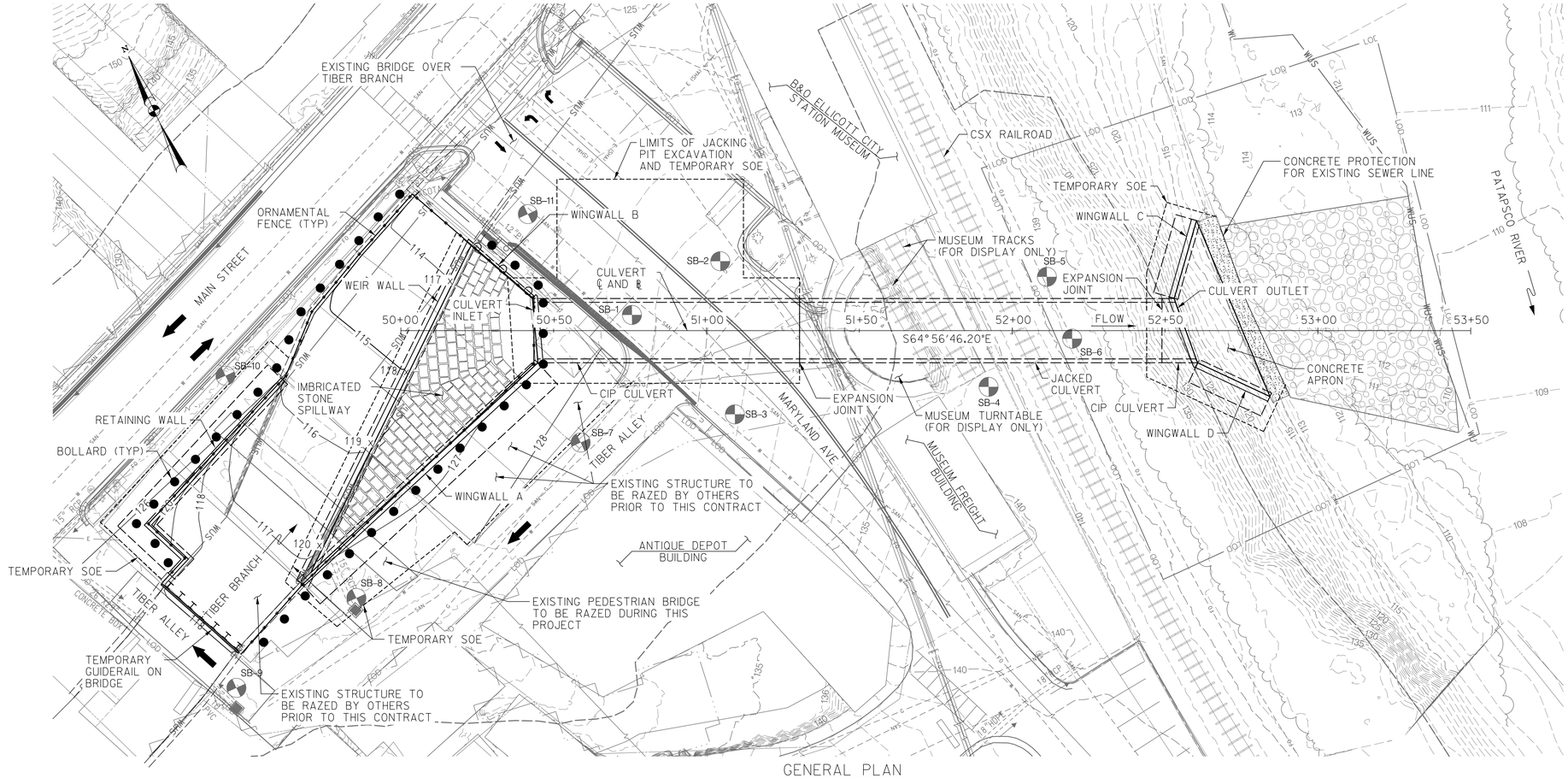
MARYLAND AVENUE BYPASS CULVERT
CAPITAL PROJECT #C–0337
HOWARD COUNTY
HSCD# EP–20–018

CONSTRUCTION DETAILS

SCALE: AS SHOWN

SHEET



GENERAL PLAN

SCALE: 1"=20'-0"

JACKED CULVERT GENERAL NOTES

STRUCTURAL

1. JACKED CULVERT CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 5,000 PSI AND BE MANUFACTURED IN ACCORDANCE WITH ASTM C 789 (AASHTO M 259) "PRECAST REINFORCED CONCRETE BOX SECTIONS FOR CULVERT, STORM DRAIN AND SEWERS" WITH PROPER CURING AND DESIGN STRENGTH ACHIEVED PRIOR TO JACKING.
2. ALL REINFORCING STEEL SHALL CONFORM TO ASTM SPECIFICATION A615, GRADE 60.
3. ALL REINFORCING STEEL SHALL BE PLACED 2" CLEAR OF THE NEAREST FACE OF CONCRETE UNLESS CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH, IN WHICH CASE 3" CLEAR SHALL BE PROVIDED.
4. CONSTRUCTION JOINTS SHALL BE LOCATED AS INDICATED ON THE DRAWINGS UNLESS OTHERWISE APPROVED BY THE ENGINEER.

CULVERT CONSTRUCTION

1. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF THE EXISTING BRIDGE AND ALL UTILITIES PRIOR TO CONSTRUCTION. UTILITIES MUST BE PROTECTED DURING CONSTRUCTION.
2. SEQUENCING DRAWINGS ARE PROVIDED TO ILLUSTRATE GENERAL CONSTRUCTION STAGING FOR THE WORK REQUIRED BY THE CONTRACT DOCUMENTS. ULTIMATELY, THE CONTRACTOR IS RESPONSIBLE FOR SEQUENCING ALL OF ITS WORK IN A SAFE, EFFICIENT, AND ECONOMICAL MANNER WITHIN THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND APPLICABLE REGULATIONS.
3. SURVEY MONITORING POINTS SHALL BE ESTABLISHED ALONG THE NEW CULVERT ALIGNMENT PRIOR TO CONSTRUCTION. SURVEY POINTS SHALL BE MONITORED CONTINUOUSLY DURING GROUND IMPROVEMENT AND TUNNEL CONSTRUCTION.
4. CONTRACTOR MAY CONSTRUCT THE NEW CULVERT USING CONVENTIONAL MINING OR JACKED BOX TUNNELING METHODS.
5. CONTRACTOR IS RESPONSIBLE FOR GROUND IMPROVEMENT MEANS AND METHODS, SUBJECT TO THE GUIDELINES OUTLINED IN THE PROJECT SPECIAL PROVISIONS.
6. CONTRACTOR MUST VERIFY THAT THE GROUND IMPROVEMENTS MEET THE MINIMUM REQUIREMENTS OUTLINED IN THE PLANS AND SPECIFICATIONS PRIOR TO TUNNEL EXCAVATION.
7. TUNNEL INITIAL SUPPORT AND GROUND CONTROL SHALL BE DESIGNED AND MAINTAINED BY THE CONTRACTOR. THE TYPE OF TUNNEL INITIAL SUPPORT WILL BE DICTATED BY THE CONSTRUCTION METHOD SELECTED.

TEMPORARY SUPPORT OF EXCAVATION (SOE)

1. CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY SOE. THE FOOTPRINT OF EACH PORTAL SOE SHALL SUIT CONTRACTOR'S MEANS AND METHODS, SUBJECT TO THE LIMITS SHOWN ON SHEET 12.
2. CONTRACTOR MAY INCORPORATE CULVERT WINGWALLS WITH ITS OWN TEMPORARY SOE.
3. CONTRACTOR SHALL ENSURE SLOPE AND ROADWAY STABILITY THROUGHOUT CONSTRUCTION.
4. THEORETICAL RAILROAD EXCAVATION LINE (TREL) IS DEFINED AS THE THEORETICAL LINE OF EXCAVATION INSIDE OF WHICH NO EXCAVATION SHALL OCCUR (OTHER THAN CULVERT JACKING).

CIP CULVERT GENERAL NOTES

SPECIFICATIONS: MDOT SHA STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, DATED JULY 2020, AND REVISIONS THEREOF AND ADDITIONS THERETO AND SPECIAL PROVISIONS FOR MATERIALS AND CONSTRUCTION.

DESIGN: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, EIGHTH EDITION, 2017, AND ALL INTERIMS.

LOADING: DESIGN LIVE LOADING: HL-93

LOAD RESTRICTIONS: THERE ARE RESTRICTIONS FOR PLACING EQUIPMENT AND MATERIALS ON EXISTING AND NEW STRUCTURES. REFER TO SECTION TC 6.14.

CONCRETE: CONCRETE COMPRESSIVE STRENGTH FOR DESIGN SHALL BE:
f'c = 3000 PSI FOR ELEMENTS USING MIX NO. 3
f'c = 4000 PSI FOR ELEMENTS USING MIX NO. 6

CIP CULVERT CONCRETE SHALL BE MIX NO. 3 (3500 PSI).

ALL CONCRETE FOR PARAPETS AND MOMENT SLABS ON WALLS AND RETAINING WALLS WITHIN 10 FT. OF THE PAVED ROADWAY SHALL BE MIX NO. 6 (4500 PSI) CONTAINING SYNTHETIC FIBERS (SEE SECTION 902.15.01).

RETAINING WALL CONCRETE SHALL BE MIX NO. 3 (3500 PSI).

ALL EXPOSED EDGES SHALL BE CHAMFERED 1"X1", UNLESS NOTED OTHERWISE.

REINFORCING STEEL: REINFORCING STEEL SHALL CONFORM TO ASTM A 615 GRADE 60, WITH A YIELD STRENGTH FOR DESIGN OF fy = 60000 PSI

ALL SPLICES, NOT SHOWN, SHALL BE LAPPED AS PER BAR LAP CHARTS.

ALL REINFORCING STEEL SHALL BE EPOXY COATED.

MINIMUM CLEAR COVER FOR REINFORCING STEEL SHALL BE 2", UNLESS NOTED OTHERWISE. BARS AT THE BOTTOM AND SIDES OF ALL FOOTINGS SHALL HAVE 3" MINIMUM COVER.

FOR TIES AND STIRRUPS, STANDARD ACI BENDING TOLERANCES ARE MODIFIED TO PLUS (+) ZERO INCHES, MINUS (-) NORMAL ACI BENDING TOLERANCES.

EXISTING STRUCTURES: ALL DIMENSIONS AFFECTED BY THE GEOMETRY AND/OR LOCATION OF THE STRUCTURES SHALL BE CHECKED IN THE FIELD BY THE CONTRACTOR BEFORE ANY MATERIAL IS ORDERED OR FABRICATED OR CONSTRUCTION BEGINS.

CONTRACTOR SHALL BE CAREFUL NOT TO DAMAGE THE EXISTING STONE MASONRY WALLS ON THE PROJECT SITE THAT ARE NOT IDENTIFIED TO BE REMOVED. ANY DAMAGE TO THE EXISTING STONE WALLS NOT IDENTIFIED FOR REMOVAL SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

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

ABBREVIATIONS

B/L	= BASELINE
BOT	= BOTTOM
CIP	= CAST-IN-PLACE
C/L	= CENTERLINE
CONST	= CONSTRUCTION
ELEV	= ELEVATION
FF	= FRONT FACE
MIN	= MINIMUM
RF	= REAR FACE
STA	= STATION
SOE	= SUPPORT OF EXCAVATION
TBD	= TO BE DETERMINED
TYP	= TYPICAL
➡	= DIRECTION OF TRAFFIC
◔	= BORING LOCATION

NOTES

1. FOR CULVERT PLAN AND LONGITUDINAL SECTION, SEE SHEET 7.
2. FOR CULVERT INLET PLAN, ELEVATION, AND SECTIONS, SEE SHEET 8.
3. FOR CULVERT OUTLET PLAN, ELEVATION, AND SECTIONS, SEE SHEET 9.
4. FOR RETAINING WALL PLAN, ELEVATION, AND SECTION, SEE SHEET 10.
5. FOR WEIR WALL PLAN, ELEVATION, AND SECTION, SEE SHEET 11.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, STORMWATER MANAGEMENT DIVISION — DATE

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Howard County MARYLAND
Storm Water Management Division
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DES: SMC
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DATE: 11/10/20

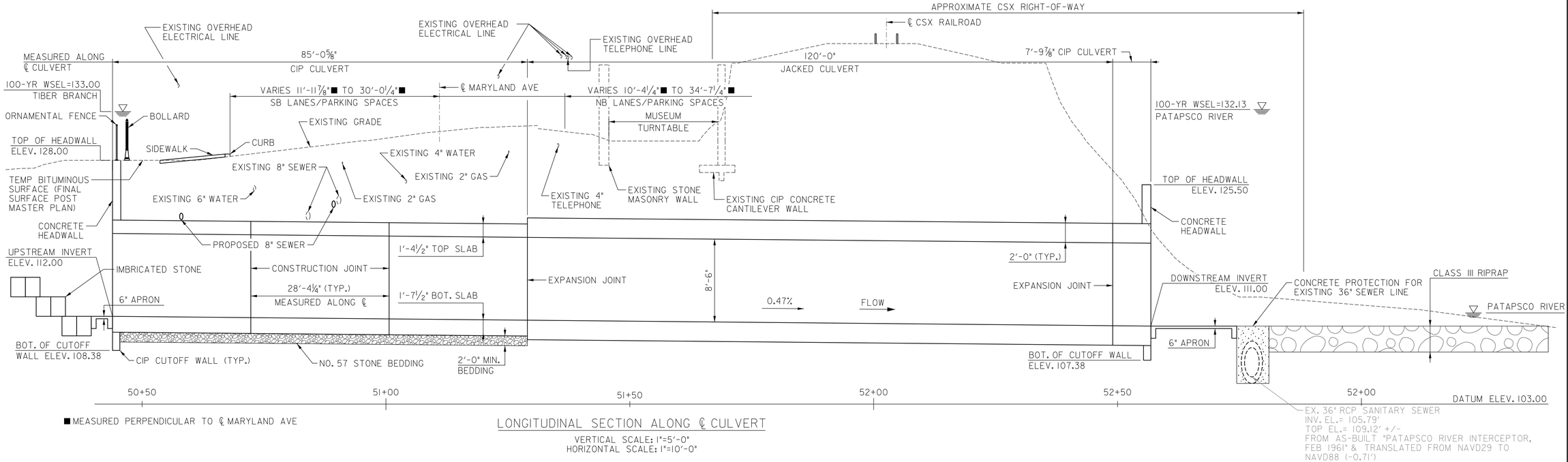
BY	NO.	REVISION	DATE

MARYLAND AVENUE BYPASS CULVERT
CAPITAL PROJECT #C-0337
HOWARD COUNTY
HSCD# EP-20-018

STRUCTURES GENERAL PLAN

SCALE: AS SHOWN

SHEET: 7 OF 18



■ MEASURED PERPENDICULAR TO ℄ MARYLAND AVE

LONGITUDINAL SECTION ALONG ℄ CULVERT

VERTICAL SCALE: 1"=5'-0"
HORIZONTAL SCALE: 1"=10'-0"

NOTES

1. FOR GENERAL PLAN, SEE SHEET 6.
2. FOR CULVERT INLET PLAN, ELEVATION, AND SECTIONS, SEE SHEET 8.
3. FOR CULVERT OUTLET PLAN, ELEVATION, AND SECTIONS, SEE SHEET 9.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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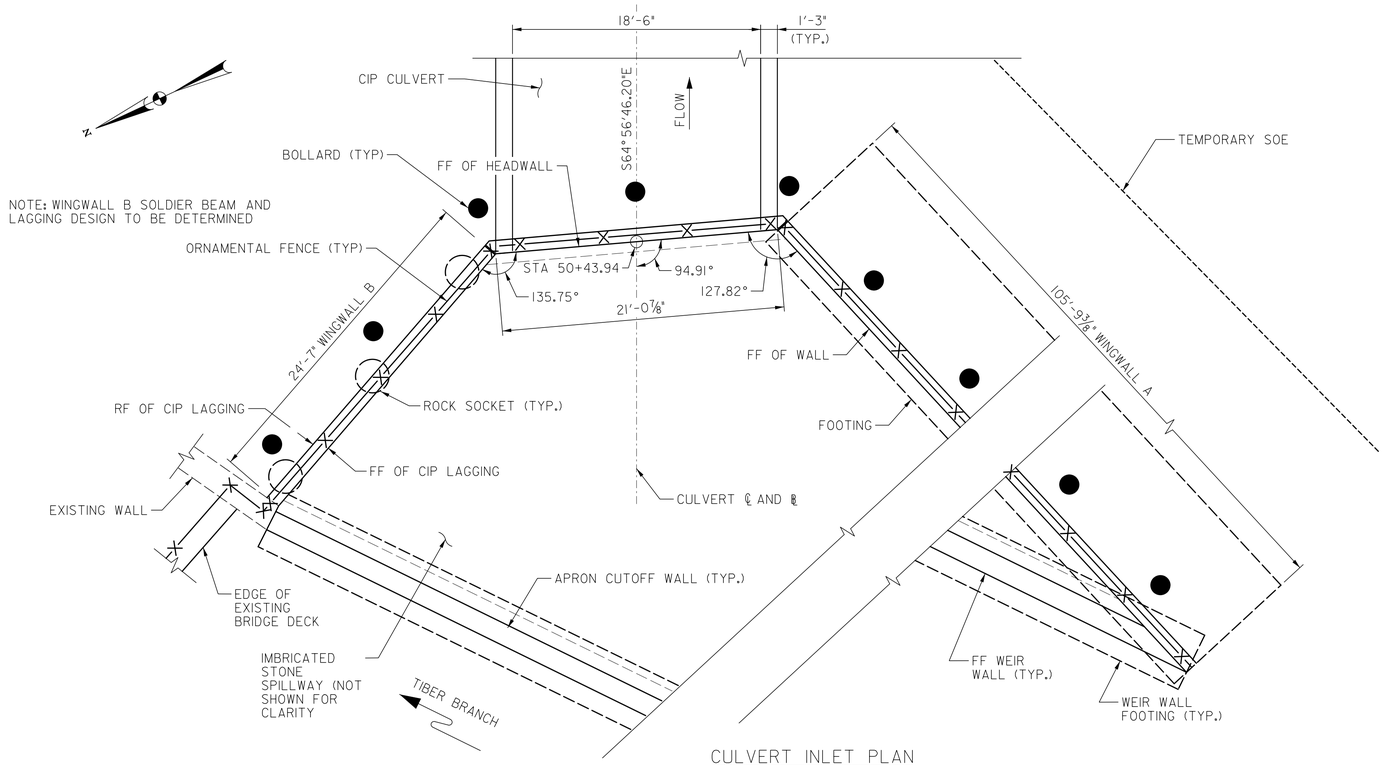
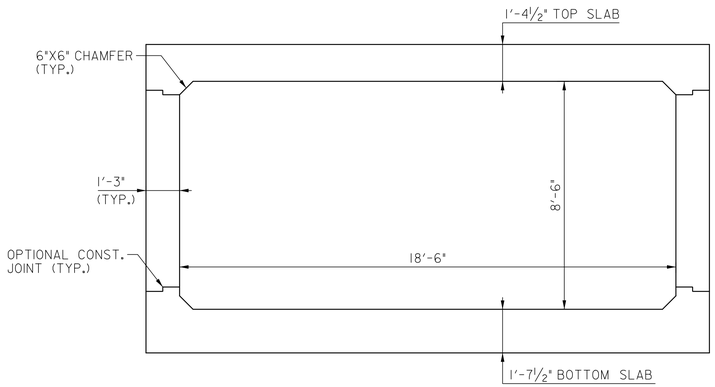
LONGITUDINAL SECTION

SCALE: AS SHOWN
SHEET: 8 OF 18



CULVERT INLET PLAN

SCALE: 3/16"=1'-0"

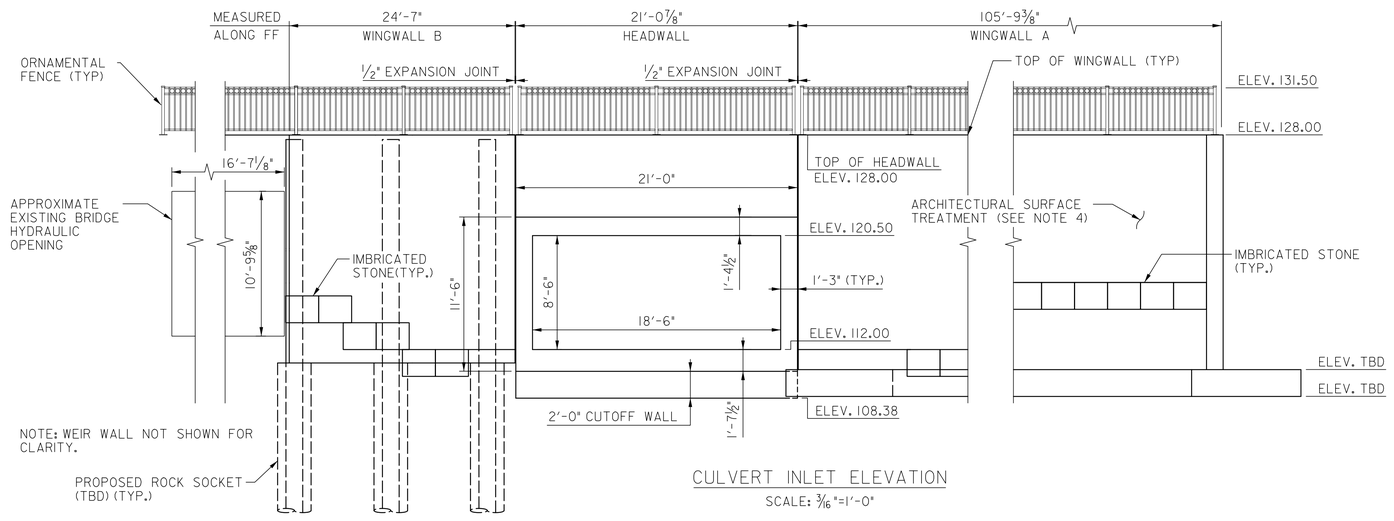


TYPICAL INLET CIP CULVERT SECTION

SCALE: 3/8"=1'-0"

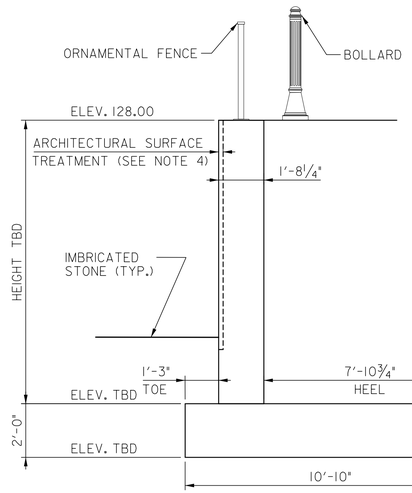
NOTES

1. FOR GENERAL PLAN, SEE SHEET 6.
2. FOR CULVERT PLAN AND LONGITUDINAL SECTION, SEE SHEET 7.
3. FOR WEIR WALL PLAN, ELEVATION AND SECTION, SEE SHEET 11.
4. ARCHITECTURAL SURFACE TREATMENT OF CONCRETE STREAM CHANNEL WALLS SHALL BE NATURAL STONE SURROUND ON ALL VISIBLE PORTIONS OF THE WALL UTILIZING SALAVAGED WALL MATERIAL TO THE EXTENT POSSIBLE.



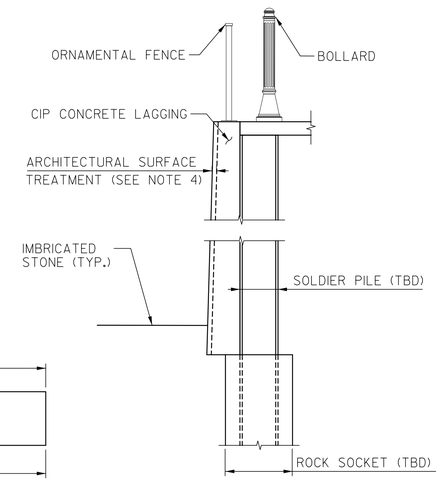
CULVERT INLET ELEVATION

SCALE: 3/16"=1'-0"



WINGWALL A SECTION

SCALE: 3/8"=1'-0"



WINGWALL B SECTION

SCALE: 3/8"=1'-0"

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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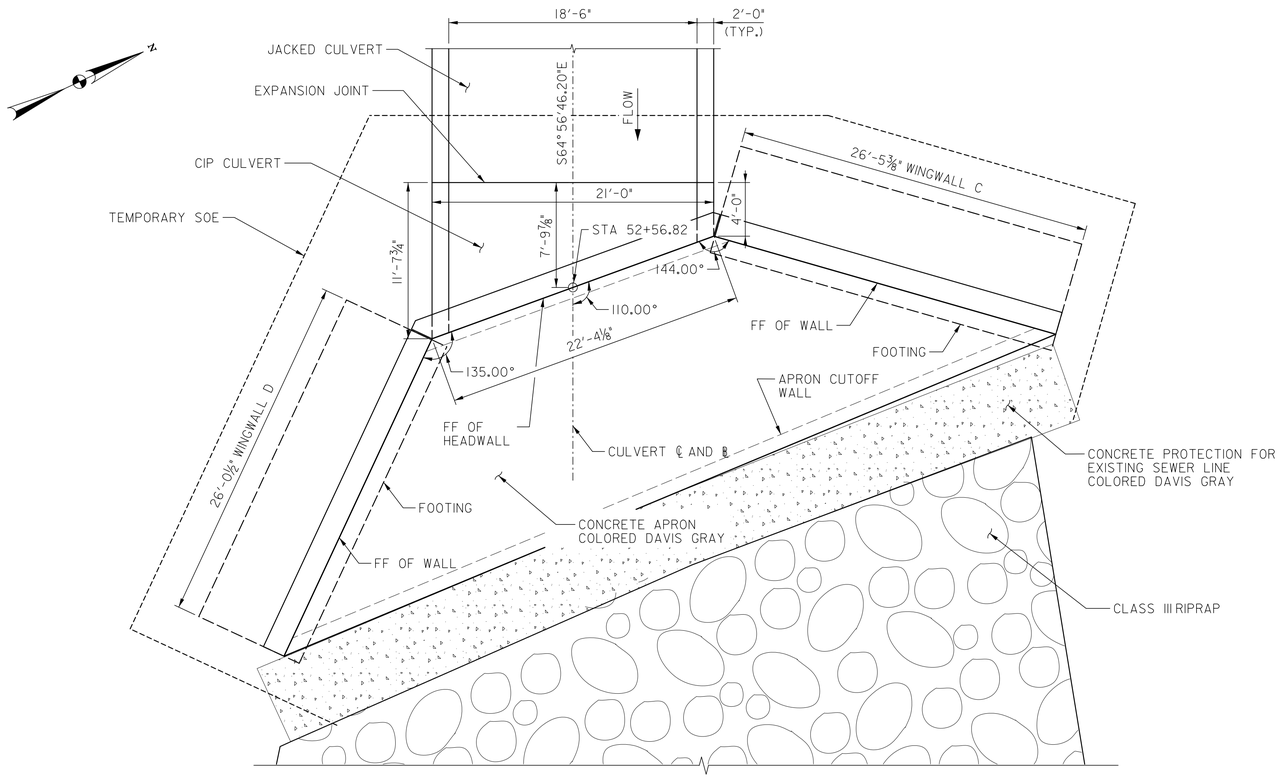
CULVERT INLET PLAN, ELEVATION, AND SECTIONS

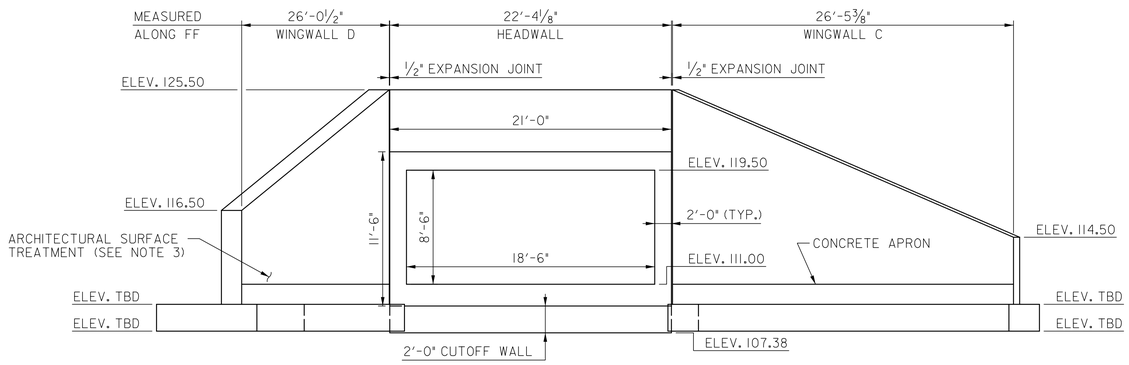
SCALE: AS SHOWN

SHEET 9 OF 18



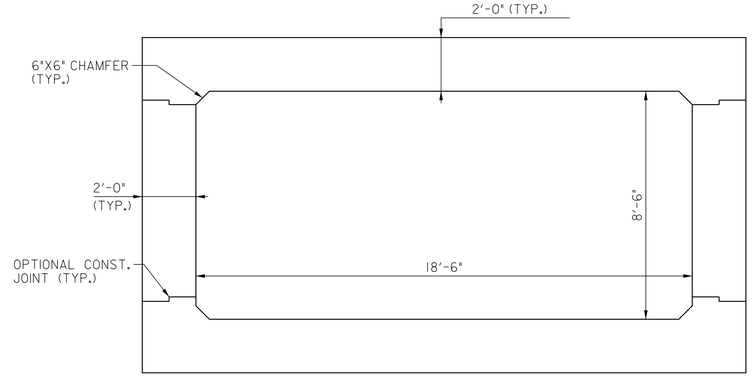
CULVERT OUTLET PLAN

SCALE: 3/16"=1'-0"



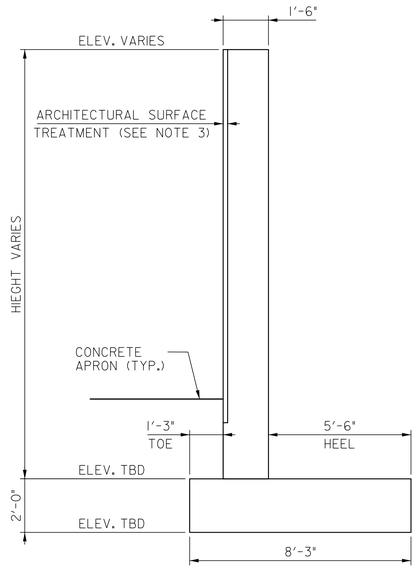
CULVERT OUTLET ELEVATION

SCALE: 3/16"=1'-0"



TYPICAL CIP OUTLET CULVERT SECTION

SCALE: 3/8"=1'-0"



TYPICAL OUTLET WINGWALL SECTION

SCALE: 3/8"=1'-0"

NOTES

1. FOR GENERAL PLAN, SEE SHEET 6.
2. FOR CULVERT PLAN AND LONGITUDINAL SECTION, SEE SHEET 7.
3. ARCHITECTURAL SURFACE TREATMENT OF CONCRETE WINGWALLS AND HEADWALL SHALL BE NATURAL STONE SURROUND ON ALL VISIBLE PORTIONS OF THE WALL UTILIZING SALAVAGED WALL MATERIAL TO THE EXTENT POSSIBLE.

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HOWARD COUNTY, MARYLAND

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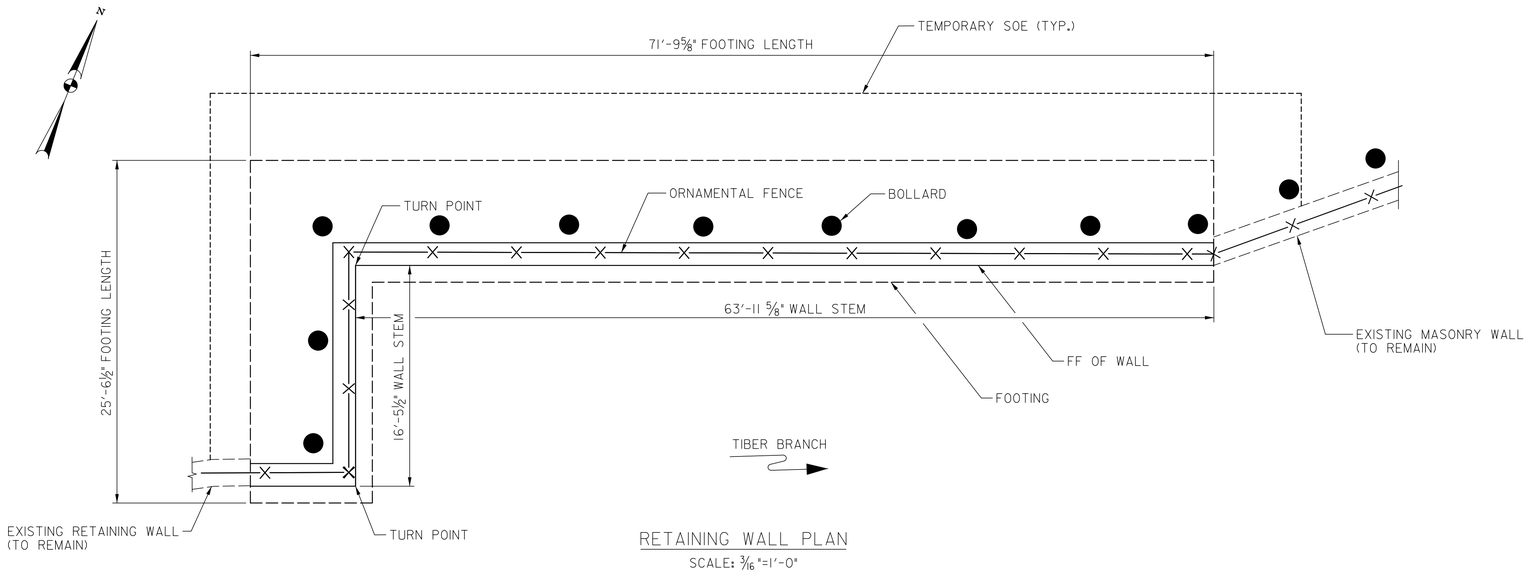
CULVERT OUTLET PLAN, ELEVATION, AND SECTION

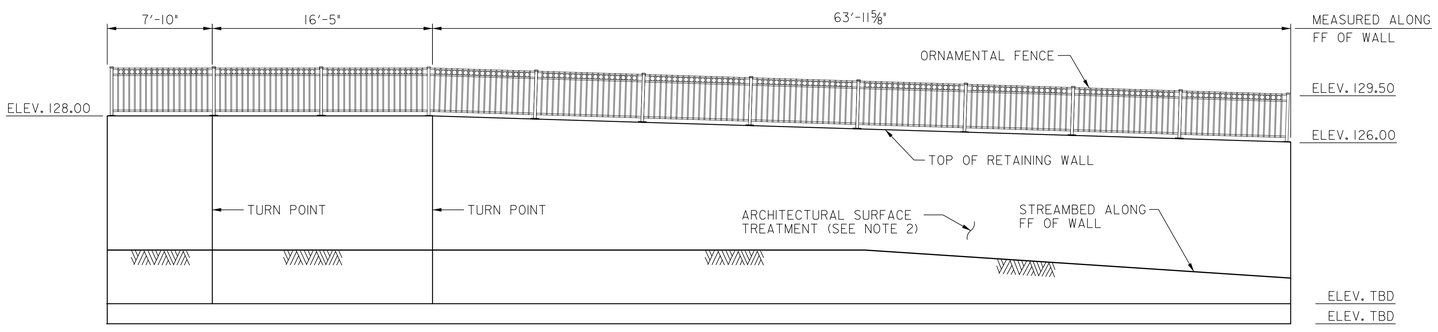
SCALE: AS SHOWN

SHEET 10 OF 18



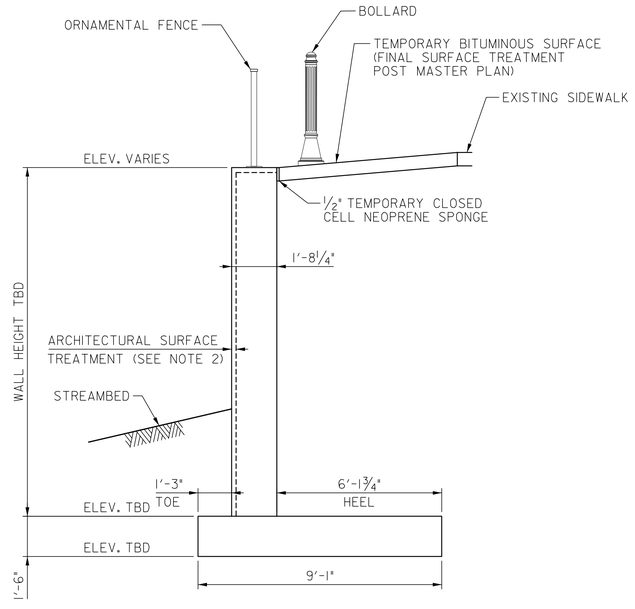
RETAINING WALL PLAN

SCALE: 3/16"=1'-0"



RETAINING WALL DEVELOPED ELEVATION

SCALE: 3/16"=1'-0"



TYPICAL SECTION

SCALE: 3/8"=1'-0"

NOTES

1. FOR GENERAL PLAN, SEE SHEET 6.
2. ARCHITECTURAL SURFACE TREATMENT OF CONCRETE STREAM CHANNEL WALLS SHALL BE NATURAL STONE SURROUND ON ALL VISIBLE PORTIONS OF THE WALL UTILIZING SALAVAGED WALL MATERIAL TO THE EXTENT POSSIBLE.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, STORMWATER MANAGEMENT DIVISION — DATE

McCORMICK TAYLOR
509 South Exeter Street
4th Floor
Baltimore, Maryland 21202
(410) 662-7400

Howard County MARYLAND
Storm Water Management Division
Bureau of Environmental Services
9801 Broken Land Parkway
Columbia, Maryland 21046
(410) 313-6444

DES: SMC
DRN: FT
CHK: AGB
DATE: 11/10/20

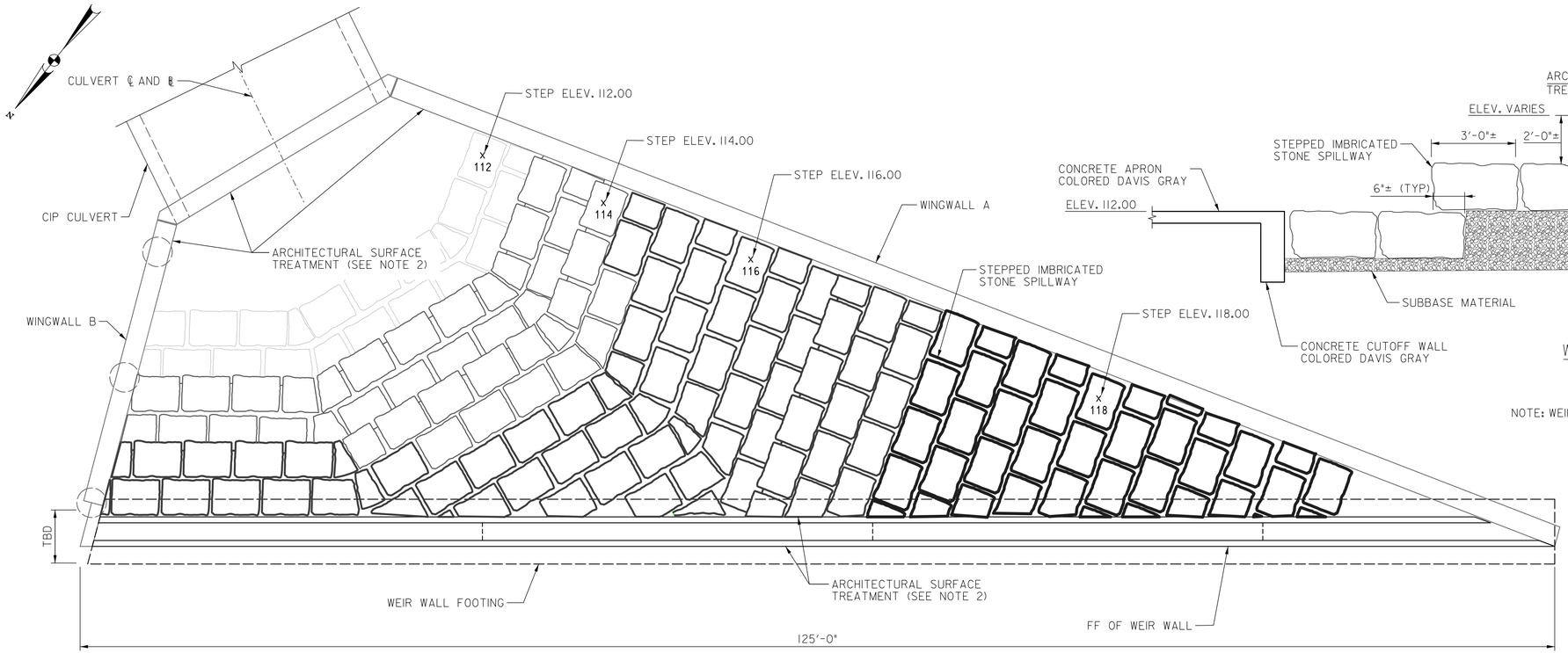
BY	NO.	REVISION	DATE

MARYLAND AVENUE BYPASS CULVERT
CAPITAL PROJECT #C-0337
HOWARD COUNTY
HSCD# EP-20-018

RETAINING WALL PLAN, ELEVATION, AND SECTION

SCALE: AS SHOWN

SHEET: 11 OF 18

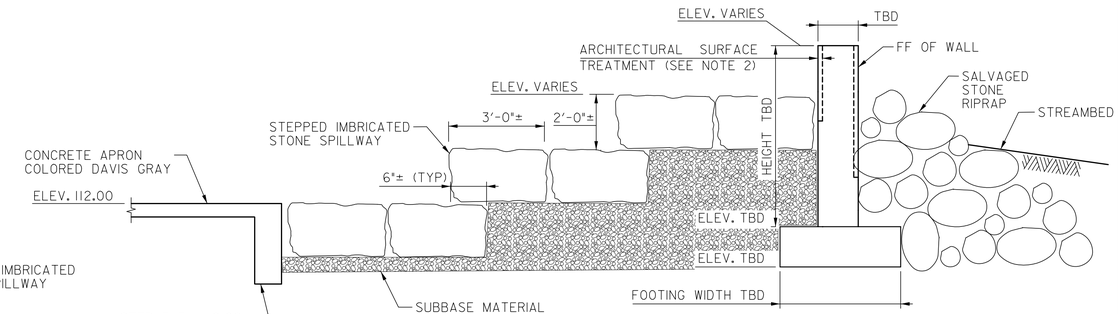


WEIR WALL PLAN

SCALE: 3/16"=1'-0"

WEIR WALL ELEVATION

VERTICAL SCALE: 3/8"=1'-0"
HORIZONTAL SCALE: 3/16"=1'-0"



WEIR WALL SECTION

SCALE: 3/8"=1'-0"

NOTE: WEIR WALL DESIGN TO BE DETERMINED

NOTES

1. FOR GENERAL PLAN, SEE SHEET 6.
2. ARCHITECTURAL SURFACE TREATMENT OF CONCRETE STREAM CHANNEL WALLS SHALL BE NATURAL STONE SURROUND ON ALL VISIBLE PORTIONS OF THE WALL UTILIZING SALAVAGED WALL MATERIAL TO THE EXTENT POSSIBLE.

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HOWARD COUNTY, MARYLAND

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MARYLAND AVENUE BYPASS CULVERT
CAPITAL PROJECT #C-0337
HOWARD COUNTY
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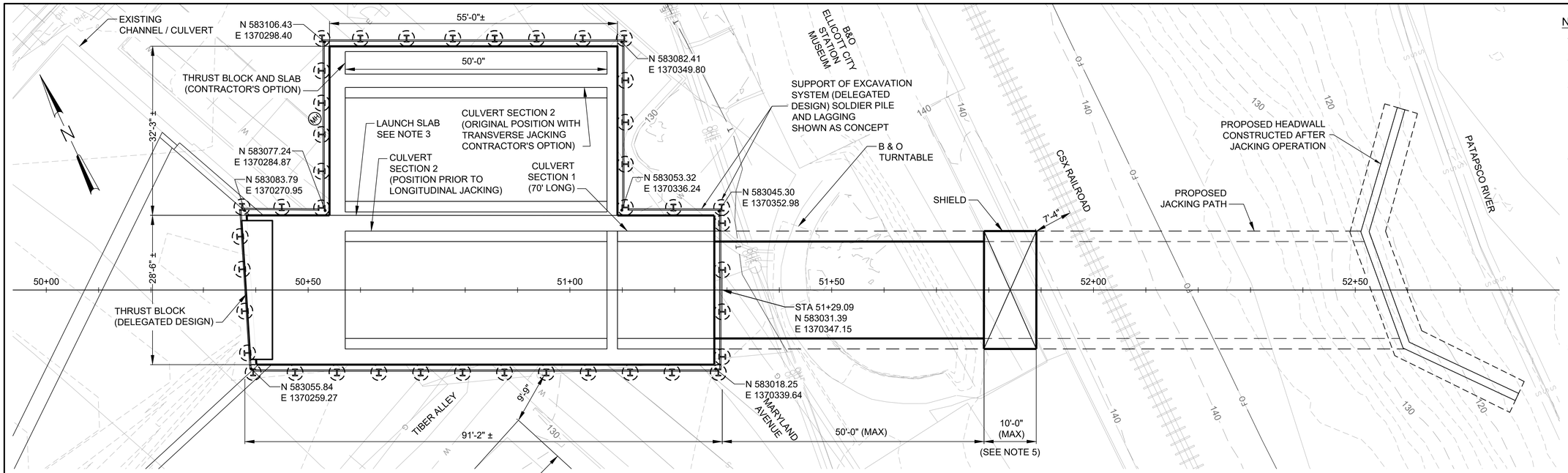
WEIR WALL PLAN, ELEVATION, AND SECTION

SCALE: AS SHOWN

SHEET: 12 OF 18



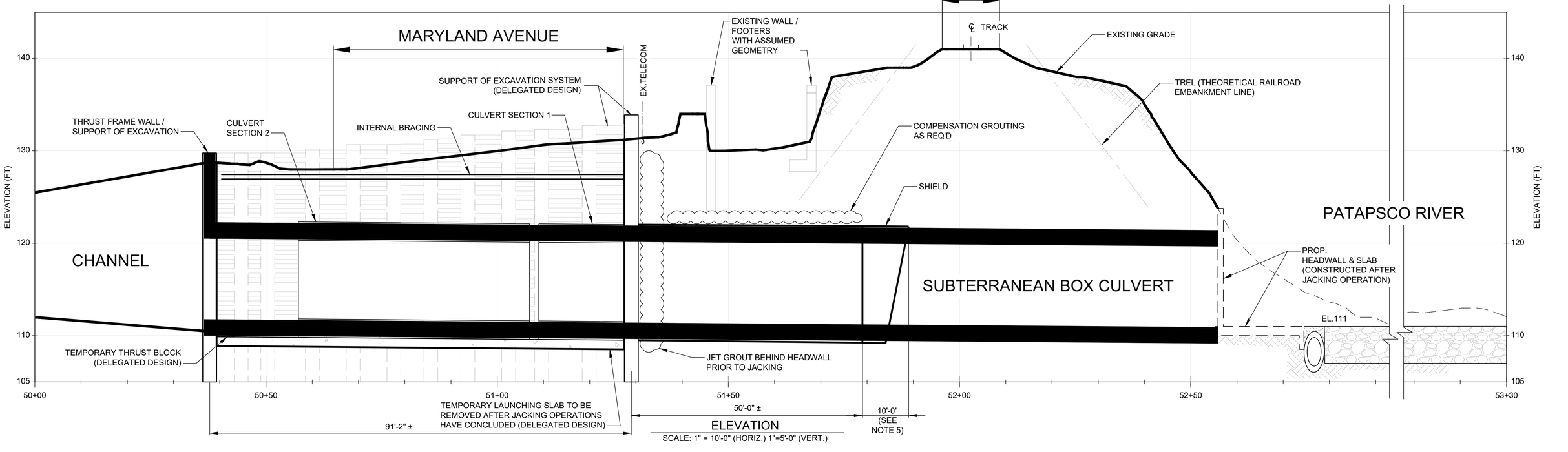
PLAN (BELOW BRACING LEVEL)
SCALE: 1" = 10'-0"

NOTES:

1. SEE SHEET 6 FOR GENERAL NOTES.
2. JACKING SYSTEM TO BE DESIGNED BY CONTRACTOR.
3. THRUST SLAB TO BE DESIGNED BY CONTRACTOR (PLATES OR CONCRETE SLAB). PIT OUTLINE SHOWN IS THE MAXIMUM ALLOWED TAKING (WITH BUMP OUT FOR SECTION 2 CONTRACTOR'S OPTION).
4. STAGE I SEQUENCE:
   - INSTALL SUPPORT OF EXCAVATION (CONTRACTOR DESIGN)
   - EXCAVATE TO BOE
   - INSTALL THRUST SLAB
   - CAST SECTION 1
   - PREPARE HEADWALL FOR TUNNELING
   - BEGIN EXCAVATION / JACKING
   - STOP JACKING PRIOR TO CSX TRACKS (BULKHEAD IF REQ'D)
   - CAST (OR JACK PREV. CAST) SECTION 2 INTO POSITION
5. SHIELD LENGTH RESTRICTION IS DEFINED TO LIMIT CLEAR DISTANCE TO TRACKS PRIOR TO JACKING SECTION 2. IF REVISED SECTION LENGTHS ARE USED, A LONGER SHIELD MAY BE USED.

10 0 10 20
SCALE: 1" = 10'-0"

5 0 5 10
SCALE: 1" = 5'-0"



ELEVATION
SCALE: 1" = 10'-0" (HORIZ.) 1"=5'-0" (VERT.)

C:\USERS\BALINGAS\AIBOX\JOBS\6046.1 MARYLAND AVENUE BYPASS CULVERT\CADD\PRESENTATIONS\FIG_S-012.DWG Nov 5, 2020 - 10:39 AM

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McMILLEN JACOBS ASSOCIATES

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9801 Broken Land Pkwy
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(410) 313–6444

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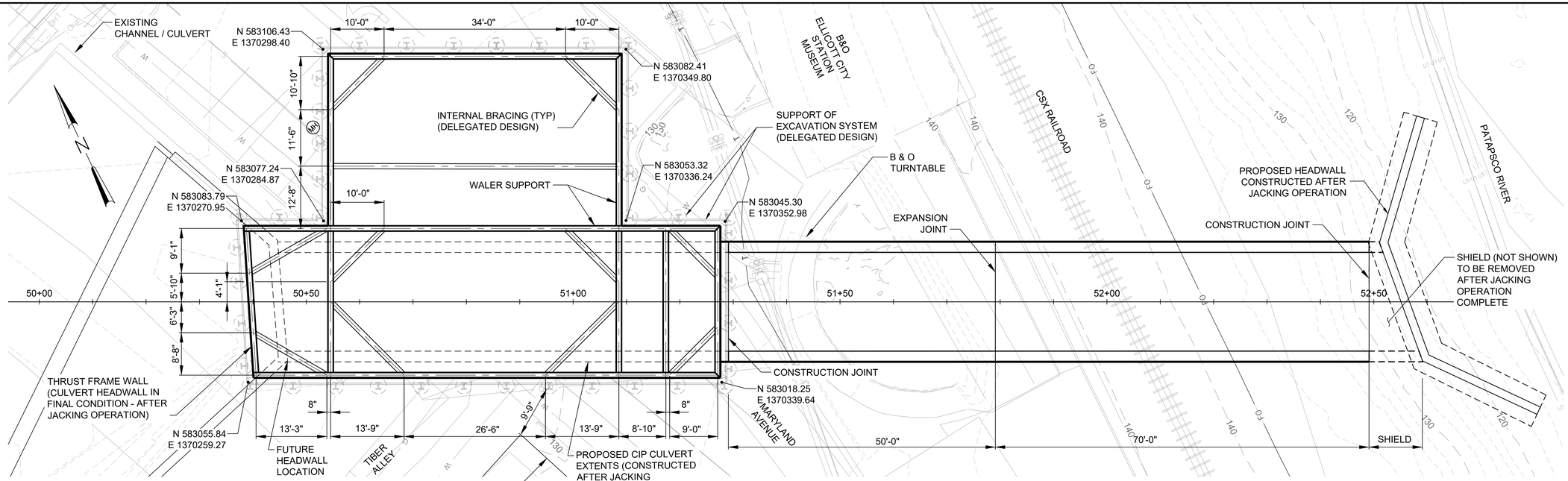
BY	NO.	REVISION	DATE
		DRAFT 65%	7/22/20

MARYLAND AVENUE BYPASS CULVERT
CAPITAL PROJECT #C-0337
HOWARD COUNTY
HSCD# EP-20-018

JACKED CULVERT STAGE I

SCALE: AS SHOWN

SHEET: 13 OF 18



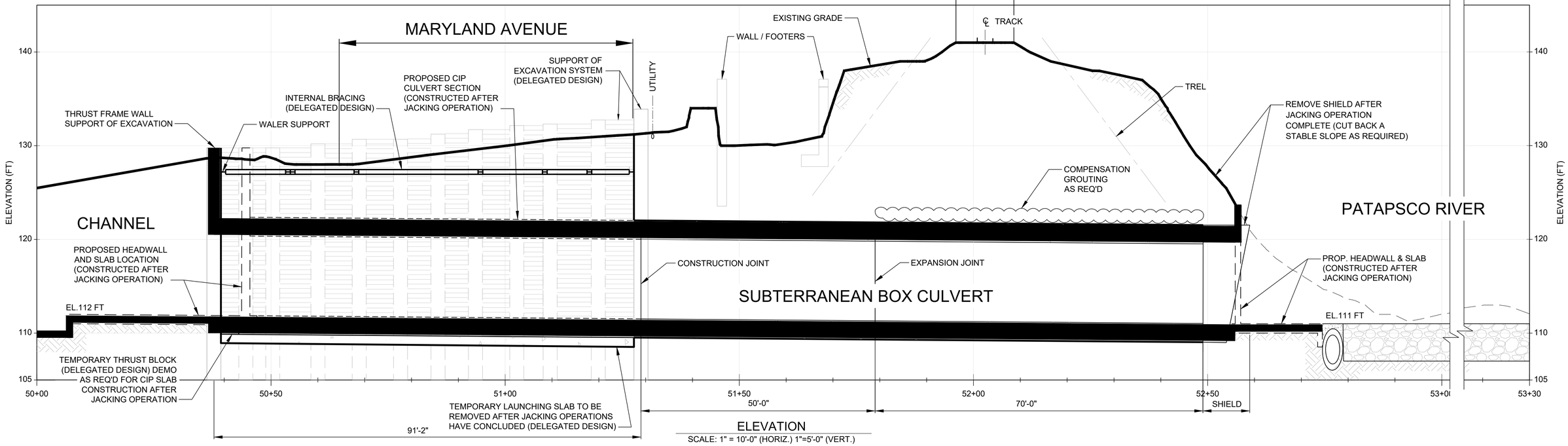
PLAN
SCALE: 1" = 10'-0"

NOTES:

1. SEE SHEET 6 FOR GENERAL NOTES.
2. STAGE II SEQUENCE:
   - CLEAR VEGETATION ON BREAKOUT SLOPE
   - JACK SECTION 2 AGAINST SECTION 1 AND RESUME JACKING/EXCAVATION OPERATION
   - HALT OPERATION AFTER BREAKING THROUGH SLOPE TO RIVER SIDE
   - ACCESS RIVER THROUGH CULVERT AND REPAIR ANY LOCALIZED SLOUGHING
   - CONSTRUCT REMAINING CULVERT SECTION AND HEADWALL

10 0 10 20
SCALE: 1" = 10'-0"

5 0 5 10
SCALE: 1" = 5'-0"



ELEVATION
SCALE: 1" = 10'-0" (HORIZ.) 1"=5'-0" (VERT.)

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, STORMWATER MANAGEMENT DIVISION — DATE

McMILLEN JACOBS ASSOCIATES

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DRN: EB				
CHK: TM				
DATE: 11/10/20		DRAFT 65%		7/22/20
	BY	NO.	REVISION	DATE

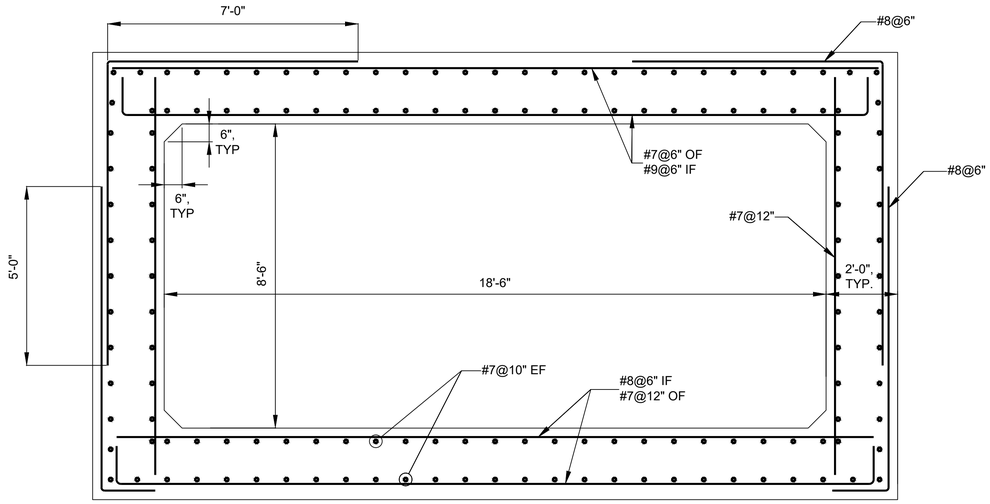
MARYLAND AVENUE BYPASS CULVERT
CAPITAL PROJECT #C-0337
HOWARD COUNTY
HSCD# EP-20-018

JACKED CULVERT STAGE II

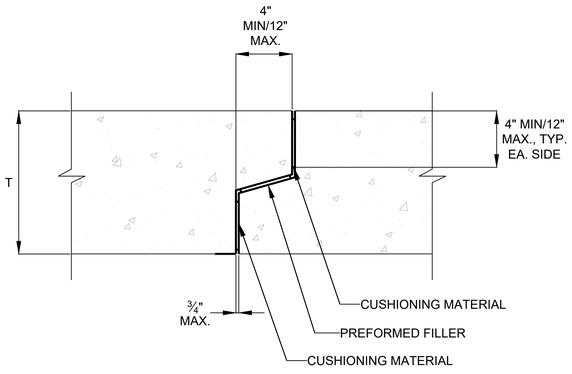
SCALE: AS SHOWN

SHEET 14 OF 18

C:\USERS\BALINGASA\BOX\JOBS\6046.1 MARYLAND AVENUE BYPASS CULVERT\CADD\PRESENTATIONS\FIG_S-013.DWG
Nov 5, 2020 - 10:41 AM



SECTION
NOT TO SCALE



JOINT DETAIL
NOT TO SCALE

NOTES:

1. CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 5,000 PSI.
2. REINFORCEMENT SHOWN IS A MINIMUM REQUIRED, ASSUMING A MAXIMUM CONCENTRIC THRUST OF 4,000 TONS WHEN JACKING AT THE BASE SLAB ONLY AND 7,000 TONS WHEN JACKING ALONG THE PERIMETER.
3. CUSHIONING MATERIAL SHALL COVER AT LEAST 50% OF THE CONCRETE SURFACE AREA. CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL ITS PROPOSED FINAL JOINT CONFIGURATION AND METHOD TO ENSURE A RIGID CONNECTION BETWEEN BOX SECTIONS DURING AND AFTER INSTALLATION.
4. CONSTRUCTION JOINTS AND GROUT HOLES ARE NOT SHOWN FOR CLARITY. CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL ITS PROPOSED JOINT SEQUENCE AND DETAILS AS WELL AS CONFIGURATION AND METHOD TO FILL THE ANNULUS BETWEEN THE CONCRETE BOX AND THE EXCAVATED MATERIAL.
5. ANTI-DRAG DETAILS NOT SHOWN. CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL ITS PROPOSED METHOD TO MANAGE RESISTANCE TO THE CONCRETE BOX.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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MARYLAND AVENUE BYPASS CULVERT
CAPITAL PROJECT #C-0337
HOWARD COUNTY
HSCD# EP-20-018

JACKED CULVERT
SECTION AND DETAIL

SCALE: AS SHOWN

SHEET: 15 OF 18

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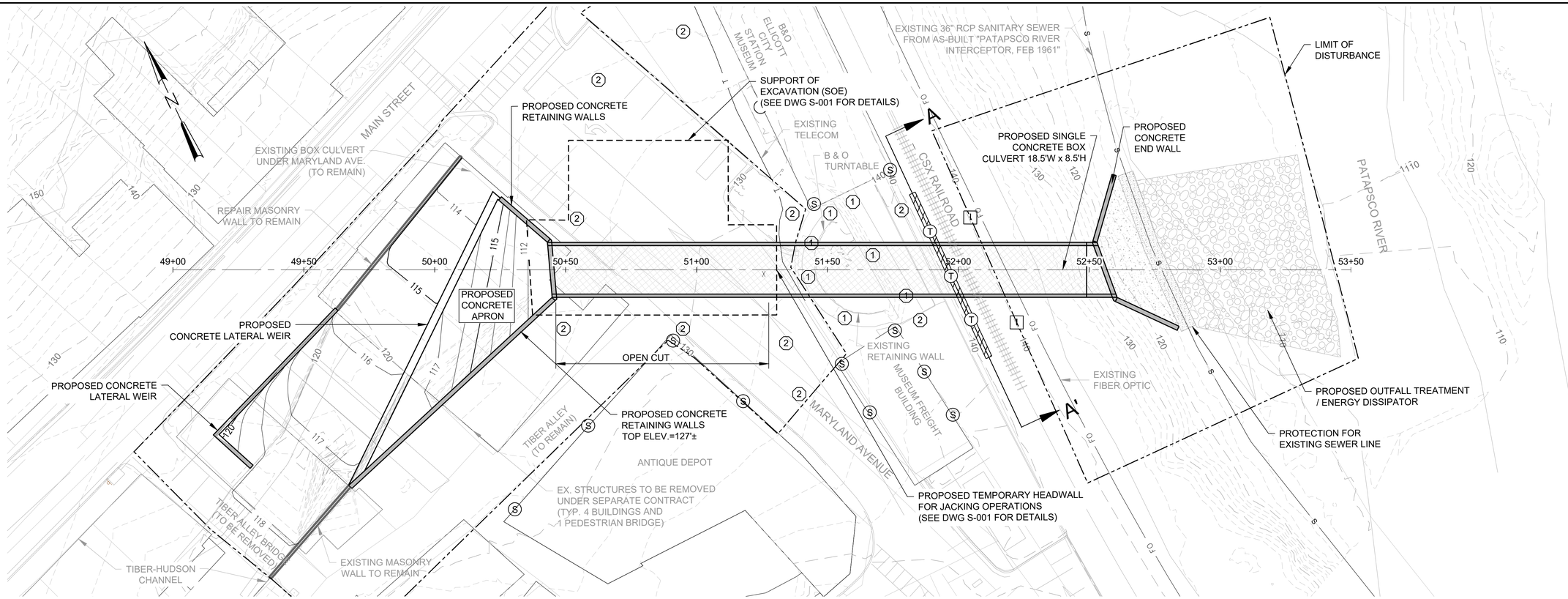
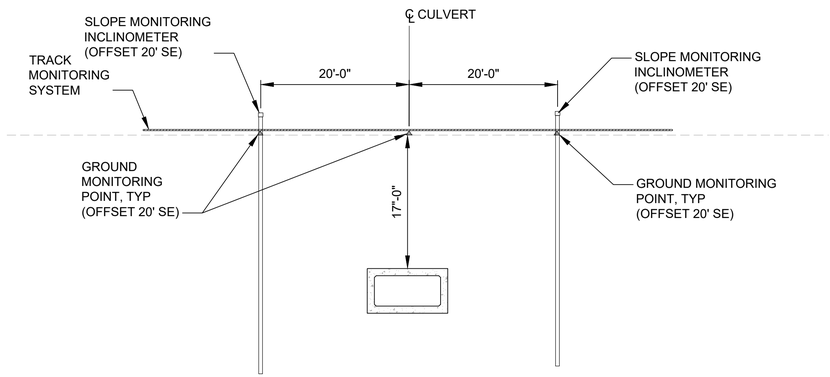


PLAN

SCALE: 1" = 20'-0"



VERTICAL

20 0 20 40

SCALE: 1" = 20'-0"

CROSS-SECTION A-A'

NOT TO SCALE

NOTES:

1. ALL GEOTECHNICAL INSTRUMENTATION SHOWN ON THIS SHEET ARE MANDATORY REQUIREMENTS. THE LOCATIONS SHOWN FOR THESE INSTRUMENTS ARE APPROXIMATE. CONTRACTOR TO DETERMINE THE ACTUAL LOCATIONS BASED ON FIELD CONDITIONS AND ACCESS RESTRICTIONS. ALL LOCATIONS ARE SUBJECT TO APPROVAL OF FACILITY OWNER.
2. FOR RESPONSE CRITERIA AND READING FREQUENCIES REFER TO GT-004.
3. FOR TYPICAL INSTRUMENTATION DETAILS REFER TO GT-005.
4. FOR ADDITIONAL INSTRUMENTATION REQUIREMENTS, SEE SPECIFICATION SECTION 31 09 13.
5. DMP TYPE 3 INSTRUMENTS ARE FOR MONITORING THE SUPPORT OF EXCAVATION (SOE) SYSTEM AND ARE NOT SHOWN FOR CLARITY. DMP TYPE 3 SHALL BE SPACED AT MAXIMUM 25 FOOT INTERVALS ALONG EACH SOE WALL. FOR ADDITIONAL INFORMATION SEE SPECIFICATION SECTION 31 09 13.

INSTRUMENTATION SUMMARY		
SYMBOL	INSTRUMENT TYPE	MINIMUM QUANTITY
(S)	STRUCTURE MONITORING POINT (SMP)	
(1)	DEFORMATION MONITORING POINT (DMP TYPE 1)	
(2)	DEFORMATION MONITORING POINT (DMP TYPE 2)	
(3)	DEFORMATION MONITORING POINT (DMP TYPE 3)	
[I]	INCLINOMETER (INC)	
(T)	TRACK MONITORING POINT (TMP)	
(U)	UTILITY MONITORING POINT (UMP)	
△	SEISMOGRAPH (SMG)	

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, STORMWATER MANAGEMENT DIVISION — DATE

McMILLEN JACOBS ASSOCIATES

Howard County MARYLAND
Storm Water Management Division
Bureau of Environmental Services
9801 Broken Land Pkwy
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(410) 313–6444

DES: KH
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MARYLAND AVENUE BYPASS CULVERT
CAPITAL PROJECT #C-0337
HOWARD COUNTY
HSCD# EP-20-018

GEOTECHNICAL INSTRUMENTION PLAN

SCALE: AS SHOWN

SHEET: 16 OF 18

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INSTRUMENT RESPONSE LEVELS		
INSTRUMENT TYPE	INSTRUMENT VALUES[1]	
	REVIEW (INCH)	ALERT (INCH)
STRUCTURE MONITORING POINT	TBD	TBD
DEFORMATION MONITORING POINT (DMP TYPE 1)	TBD	TBD
DEFORMATION MONITORING POINT (DMP TYPE 2)	TBD	TBD
DEFORMATION MONITORING POINT (DMP TYPE 3)	TBD	TBD
INCLINOMETER	TBD	TBD
TRACK MONITORING POINT	TBD	TBD
UTILITY MONITORING POINT	TBD	TBD
SEISMOGRAPH	FOR FREQUENCIES LESS THAN 40 HZ, PPV[2] REVIEW LEVEL = TBD IPS[3]	FOR FREQUENCIES LESS THAN 40 HZ, ALERT PPV = TBD IPS

NOTES:

1. ALL UNITS ARE IN INCHES UNLESS OTHERWISE NOTED ON TABLE.
2. PPV MEANS PEAK PARTICLE VELOCITY.
3. IPS MEANS INCHES PER SECOND.

INSTRUMENT TYPE	READING FREQUENCY [1]			
	X ≤ 50'	50' < X ≤ 100'	100' < X ≤ 150'	150' < X
STRUCTURE MONITORING POINT	TBD	TBD	TBD	TBD
DEFORMATION MONITORING POINT (DMP TYPE 1)	TBD	TBD	TBD	TBD
DEFORMATION MONITORING POINT (DMP TYPE 2)	TBD	TBD	TBD	TBD
DEFORMATION MONITORING POINT (DMP TYPE 3)	TBD	TBD	TBD	TBD
INCLINOMETER	TBD	TBD	TBD	TBD
TRACK MONITORING POINT	TBD	TBD	TBD	TBD
UTILITY MONITORING POINT	TBD	TBD	TBD	TBD
SEISMOGRAPH	TBD			

NOTE:

1. X IS THE DISTANCE ALONG THE CULVERT CENTERLINE.

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DEPARTMENT OF PUBLIC WORKS
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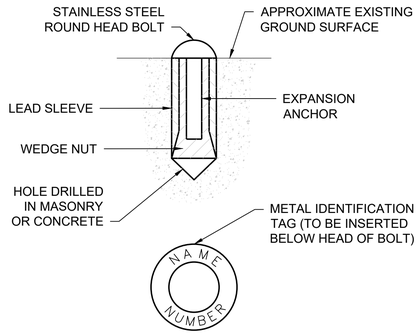
MARYLAND AVENUE BYPASS CULVERT
CAPITAL PROJECT #C-0337
HOWARD COUNTY
HSCD# EP-20-018

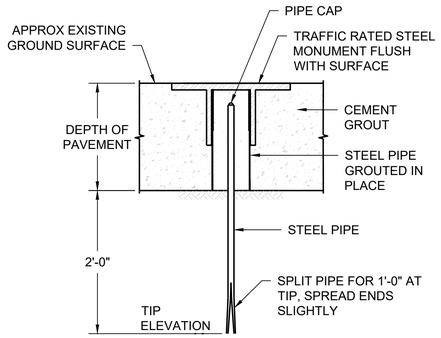
GEOTECHNICAL INSTRUMENTATION SCHEDULES

SCALE: AS SHOWN

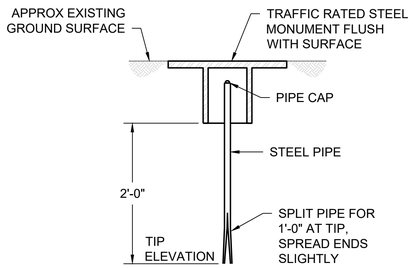
SHEET: 17 OF 18



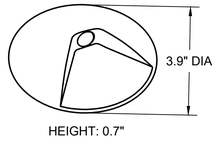
DEFORMATION MONITORING POINT (GMP) ①
IN MASONRY, ASPHALT OR CONC SLAB
NOT TO SCALE



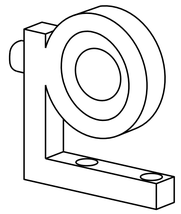
DEFORMATION MONITORING POINT (GMP) ②
IN TRAFFIC AREAS
NOT TO SCALE



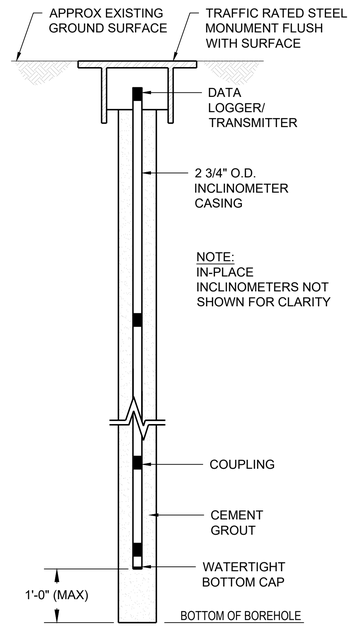
DEFORMATION MONITORING POINT (GMP) ②
IN UNIMPROVED AREAS
NOT TO SCALE



POLYMER DOME PRISM FOR
DEFORMATION MONITORING POINTS (GMP) ②
NOT TO SCALE

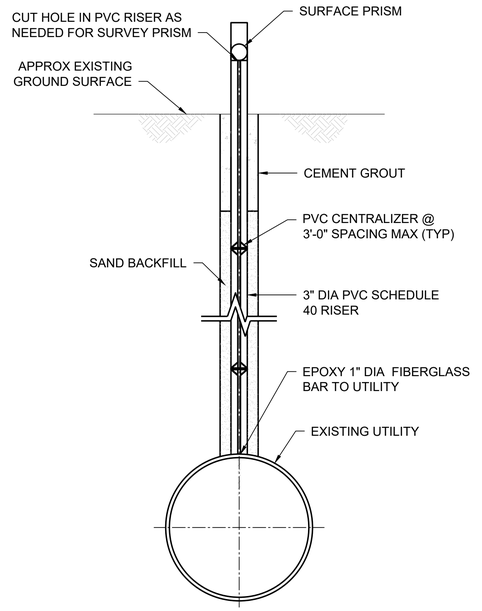


L-BAR PRISM ASSEMBLY FOR
STRUCTURE MONITORING POINTS (SMP) Ⓢ
OR DEFORMATION MONITORING POINTS (DMP) ③
NOT TO SCALE



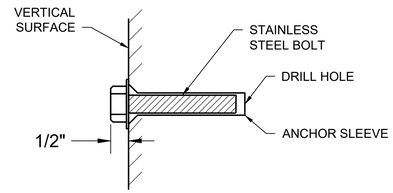
THE BOTTOM OF THE INCLINOMETER CASING SHALL EXTEND A MIN OF 15'-0" BELOW BASE OF EXCAVATION.

INCLINOMETER (INC) Ⓘ
NOT TO SCALE



HEIGHT OF PVC RISER, ROD AND SURVEY PRISM ABOVE GROUND SURFACE IS FIELD FIT.

UTILITY MONITORING POINT (UMP) Ⓤ
NOT TO SCALE



STRUCTURAL MONITORING POINT (SMP) Ⓢ
ON VERTICAL SURFACE
NOT TO SCALE

TO BE COMPLETED

TRACK MONITORING POINT (TMP) Ⓣ
NOT TO SCALE

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MARYLAND AVENUE BYPASS CULVERT
CAPITAL PROJECT #C-0337
HOWARD COUNTY
HSCD# EP-20-018

GEOTECHNICAL INSTRUMENTATION DETAILS

SCALE: AS SHOWN

SHEET: 18 OF 18