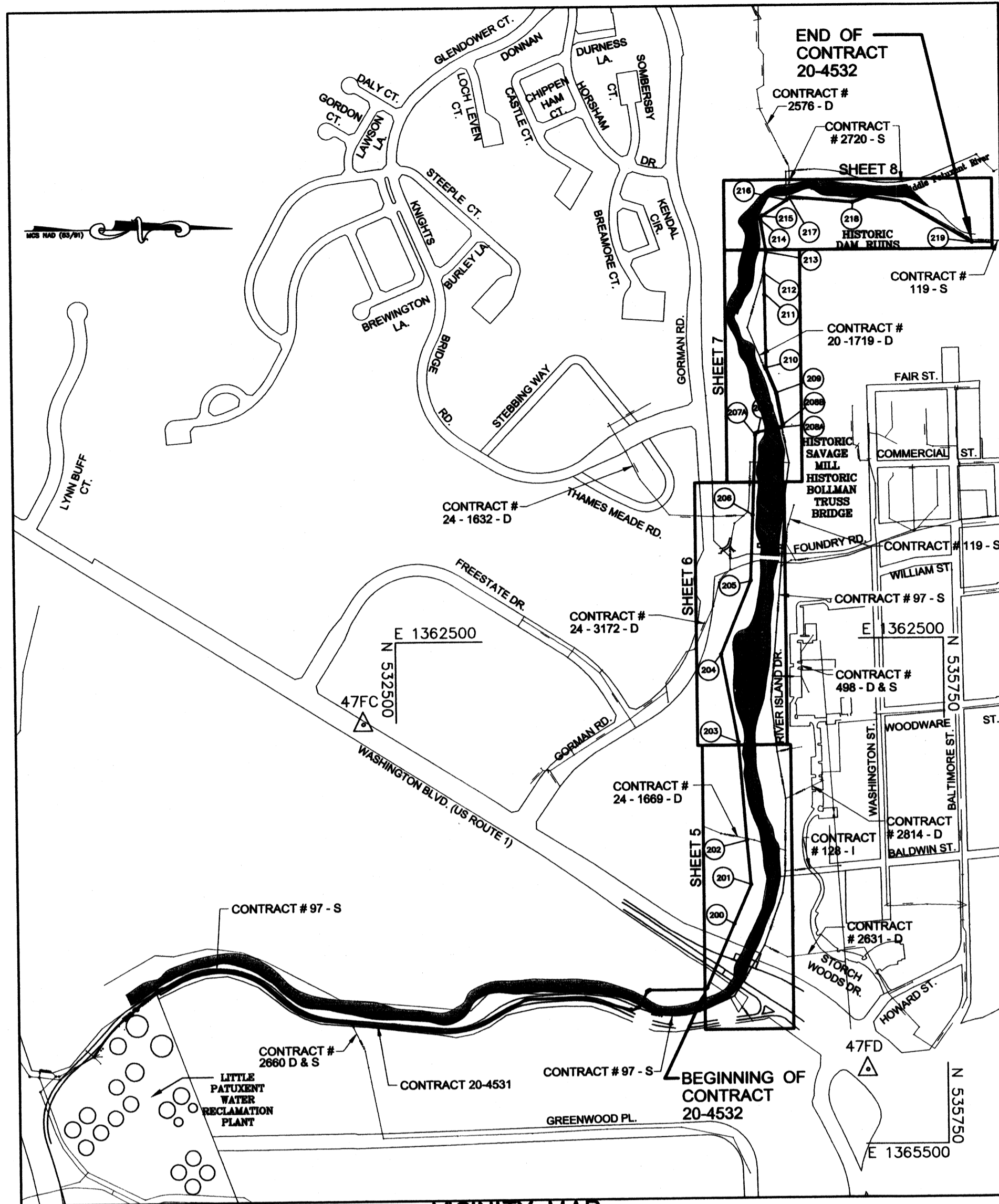


HOWARD COUNTY GEODETIC SURVEY CONTROL

HO. CO. MONUMENT 47FC
 ELEV. 186.429
 N 532305.0496
 E 1362985.1295

HO. CO. MONUMENT 47FD
 ELEV. 201.247
 N 535277.4137
 E 1365059.7231



QUANTITIES				
ITEMS	QUANTITIES ESTIMATED	AS-BUILTS		
		QUANTITIES	TYPE	MANUFACTURER/SUPPLIER
42-INCH SEWER	4521 L.F.	4526.5± L.F.	FRP	HOBAS
36-INCH SEWER	943 L.F.	920 L.F.	FRP	HOBAS
72-INCH MANHOLE	22 EA.	22 EA.	PRE-CAST	ATLANTIC MH
DIVERSION STRUCTURE	1 EA.	1 EA.	CONCRETE	
JUNCTION CHAMBER	1 EA.	1 EA.	CONCRETE	
MITERED BEND	3 EA.	4 EA.	FRP	HOBAS
54-INCH STEEL CASING	126 L.F.	126± L.F.	STEEL	NORTHWEST PIPE CO.
59-INCH STEEL LINER PLATE TUNNEL	450 L.F.	450± L.F.	STEEL	BRADSHAW

LITTLE PATUXENT PARALLEL INTERCEPTOR SEWER CAPITAL PROJECT NO. S-6175 CONTRACT NO. 20-4532 HOWARD COUNTY, MARYLAND

AS-BUILT 8/18/10
 SHEET INDEX

SHEET NO.	TITLE
1	TITLE SHEET
2	GENERAL NOTES
3	COMPOSITE PROFILE A
4	COMPOSITE PROFILE B
5	PLAN & PROFILE
6	PLAN & PROFILE
7	PLAN & PROFILE
8	PLAN & PROFILE
9	MISCELLANEOUS DETAILS
10	TUNNEL - PLAN & DETAILS
11	DIVERSION STRUCTURE - PLAN & SECTIONS
12	DIVERSION STRUCTURE - STRUCTURAL DETAILS
13	JUNCTION CHAMBER - PLAN & SECTIONS
14	JUNCTION CHAMBER - STRUCTURAL DETAILS
15	STREAM CROSSING - PLAN & DETAILS
16	SEDIMENT & EROSION CONTROL - PLAN
17	SEDIMENT & EROSION CONTROL - PLAN
18	SEDIMENT & EROSION CONTROL - PLAN
19	SEDIMENT & EROSION CONTROL - PLAN
20	SEDIMENT & EROSION CONTROL - PLAN
21	SEDIMENT & EROSION CONTROL - NOTES
22	SEDIMENT & EROSION CONTROL - DETAILS
23	GRAVITY BYPASS - PLAN & PROFILE
24	GRAVITY BYPASS - DETAILS
25	MAINTENANCE OF TRAFFIC US ROUTE 1
26	LANDSCAPE PLAN-FOUNDRY ROAD
27	LANDSCAPE NOTES-FOUNDRY ROAD

NAME OF UTILITY CONTRACTOR :
 Sediment control measures for this contract will be implemented in accordance with Section 219 of the Specifications and as shown on the drawings.

This plan is approved for soil erosion and sediment control by the Howard Soil Conservation District
John K. Blanton 9/22/08
 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. 8146 EXPIRATION DATE: 10/8/11

DEVELOPER'S CERTIFICATION
 "I/WE CERTIFY THAT ALL THE DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THIS CONSTRUCTION PROJECT WILL HAVE A CERTIFICATION OF ATTENDANCE AT A MARYLAND DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT"
Richard B. Sporn 12/14/08
 BUREAU OF ENGINEERING
 DEPARTMENT OF PUBLIC WORKS

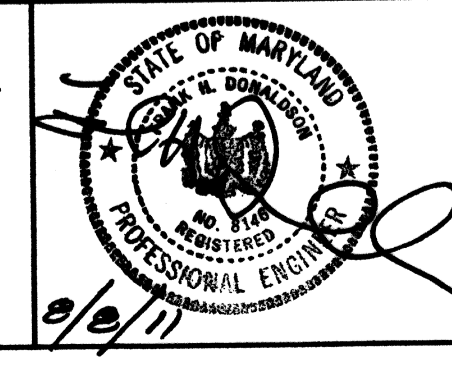
ENGINEER'S CERTIFICATION
 "I CERTIFY THAT THIS PLAN OF EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICABLE AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT"
J. O. Harris
 PATTON HARRIS RUST & ASSOCIATES, INC.
 8818 CENTRE PARK DRIVE, COLUMBIA, MD 21045

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

John G. K... 12/14/08 *Richard B. Sporn* 12/14/08
 DIRECTOR OF PUBLIC WORKS DATE CHIEF, BUREAU OF ENGINEERING DATE

Steve C. Chen 12/14/08 *...* 12/14/08
 CHIEF, BUREAU OF UTILITIES DATE CHIEF, UTILITY DESIGN DIVISION DATE

Patton Harris Rust & Associates, Inc.
 Engineers, Surveyors, Planners, Landscape Architects.
 PHRA
 8818 Centre Park Drive
 Columbia, MD 21045
 T 410.997.8900
 F 410.997.9282



DES: C.H.	
DRN: K.L.B.	
CHK: G.C.L.	
R.J.C.	AS-BUILT 12/10
BY NO.	REVISION DATE

TITLE SHEET
 600' SCALE MAP 47 BLOCK 10, 16, 17, & 18

LITTLE PATUXENT
 PARALLEL INTERCEPTOR SEWER
 CAPITAL PROJECT S-6175
 CONTRACT NO. 20-4532
 1ST ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 1 OF 27

GENERAL NOTES

- Approximate location of existing sewer mains are shown. The contractor shall take all necessary precautions to protect existing sewer mains and services and maintain uninterrupted service. Any damage incurred shall be repaired immediately to the satisfaction of the Engineer at the Contractor's expense.
- All horizontal controls are based on Maryland State Reference System NAD '83/'91.
- All vertical controls are based on NAVD 88, and are iron bars and caps or PK nails.
- All pipe elevations shown are invert elevations unless otherwise noted on the plans.
- Clear all utilities by a minimum of 12 inches. Clear all poles by 5'-0" minimum or tunnel as required unless otherwise noted. The owner has contacted the utility companies and has made arrangements for bracing of any poles that may be compromised during construction. In the event the contractor's work requires the bracing of additional poles, any cost incurred by the owner for the bracing of additional poles or damages shall be deducted from monies owed to the contractor. The contractor shall coordinate with the utility companies to schedule the bracing of the poles.
- For details not shown on the drawings, and for materials and construction methods, use Howard County Design Manual, Volume IV, Standard Specifications and Detail for Construction (Latest Edition). The contractor shall have a copy of Volume IV on the job.
- The contractor shall notify the following utility companies or agencies at least five working days before starting work shown on these plans:

AT&T	1-800-252-1133
BGE (Contractor Services)	410-850-4620
BGE (Emergency)	410-685-1400
Howard County DPW Bureau of Utilities	410-313-4900
Colonial Pipeline Co.	410-795-1390
Miss Utility	1-800-257-7777
State Highway Administration	410-531-5533
Verizon	1-800-743-0033 / 410-224-9210
- Trees and shrubs are to be protected from damage to the maximum extent. Trees and shrubs located within the temporary construction easement are not to be removed or damaged by the contractor.
- The contractor shall remove trees, stumps and roots along the line of excavation. Payment for such removal shall be made per each as indicated in the schedule of prices.
- The contractor shall notify the Howard County DPW Bureau of Highways at 410-313-7450 at least five working days before open cutting or boring/jacking of any County road for laying sewer mains. The approval of these drawings will constitute compliance with DPW requirements per Section 18.114(a) of the Howard County Code.
- The existing utilities shown are from the best available records and shall be verified by the contractor prior to construction. All existing utilities shall be test pitted / located as necessary and in advance of the proposed construction to properly make all required utility crossings and/or connections. Any discrepancies or utility conflicts shall be immediately reported to the Engineer. Any damage done to the utilities due to this operation shall be repaired immediately at the contractor's expense.
- All construction shall be done in accordance with the latest Howard County Standard Details and Specifications, including all addenda, unless otherwise noted on the Drawings or in the Specifications.
- The contractor shall be responsible for cleaning up all dust and mud on all roads due to vehicles arriving and leaving the job site on a daily basis and as directed by the Engineer.
- All work shall comply with the approved Sediment and Erosion Control Plan shown on the Drawings and all applicable provisions of the "1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control" issued jointly by the Maryland Department of the Environment and the Natural Resources Conservation Services.
- The Contractor shall be responsible for repairing and replacing any existing fences, concrete curb, driveways, paving, curb and gutter part, walkways, etc. damaged or removed during construction. All disturbed areas shall be returned to their original or better condition.
- It shall be distinctly understood that failure to mention specifically any work which would normally be required to complete the Project shall not relieve the Contractor of his responsibility to complete such work.
- Topographic field survey was performed in September, 2006 By Patton Harris Rust & Assoc. Inc.
- Contractor shall be responsible for securing staging and stockpile areas. A possible area that may be available is indicated on the plans.
- For this project, the State Of Maryland Department of the Environment (MDE), permit tracking number is 07-NT-3268.
- If rock blasting is used in the river, the contractor shall submit blasting plans to MDE for approval and use.
- Bentonite clay dams shall be installed along pipe alignment every 500 L.F., see sheet 9 for detail.
- Sewer flows shall not be introduced to the new sewer pipe unless directed by the County.

SEWER NOTES

- All sewer mains shall be fiberglass reinforced pipe (FRP), unless otherwise noted.
- All manholes shall be 6'-0" inside diameter unless otherwise noted.
- Manhole frame and covers shall be 30" in diameter, watertight and flush with the tops of the manhole top. See sheet 9 for details.
- Manholes shall be 18 inches above ground in unpaved areas, unless otherwise noted. See Howard County detail G-5.41, "Manhole special backfill" for details.
- Manholes shall be as per "72" precast sanitary manhole" on sheet 9.
- Bentonite clay shall be applied a minimum 9" around the pipe openings to ex. structures and existing manholes receiving new pipes.
- Provide pipe joint 5-feet from the face of each side of all proposed manholes.

MANHOLE SCHEDULE

STRUCTURE	TYPE	STANDARD DETAIL	LOCATION	INV. OUT	INV. IN	TOP	REMARKS
MH-200	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534494.45 E 1364186.94	122.12	122.22	137.8	AS-BUILT 6/3/10
MH-201	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534596.29 E 1363953.38	122.79	122.89	137.8	
MH-202	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534571.04 E 1363694.48	123.43	123.53	139.5	
MH-203	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534526.48 E 1363114.34	125.37	125.47	145.4	
MH-204	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534435.31 E 1362586.99	126.54	126.64	145.6	
MH-205	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534615.79 E 1362150.33	128.62	128.72	146.2	
MH-206	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534629.10 E 1361770.51	129.75	129.85	146.9	☉ INVERT 129.75
MH-207A	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534648.45 E 1361289.19	131.29	131.39	147.9	↑ 131.34
MH-207B	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534659.17 E 1361273.59	131.50	131.60	147.5	131.55
MH-208A	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534803.82 E 1361247.72	132.14	132.24	149.7	132.19
MH-208B	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534814.89 E 1361225.63	132.12	132.65	151.8	132.60
MH-209	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534784.27 E 1361034.58	143.13	143.23	158.2	143.18
MH-210	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534721.47 E 1360892.35	144.85	144.95	152.5	144.90
MH-211	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534714.13 E 1360465.77	153.09	153.19	162.3	153.14
MH-212	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534712.41 E 1360339.16	158.02	158.12	170.2	158.07
MH-213	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534711.13 E 1360207.96	159.72	159.83	170.9	159.77
MH-214	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534699.92 E 1360010.98	160.31	160.51	170.5	160.41
MH-215	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534713.04 E 1359989.50	160.67	161.87	169.9	160.77
MH-216	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534851.25 E 1359901.54	162.82	163.03	173.9	162.92
MH-217	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 534868.98 E 1359888.68	162.67	162.77	173.0	162.70
MH-218	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 535238.41 E 1359915.13	165.72	165.82	177.8	↓ 165.69
MH-219	6' PRECAST MANHOLE	SEE SEWER NOTE 5	N 535948.78 E 1360160.54	175.93	176.03	197.1	☉ INVERT 175.84

RESTORATION SCHEDULE

LOCATION	RESTORATION
100 FT EAST OF MH200 TO 100 FT WEST OF MH205	SEED AND MULCH
150 FT EAST OF MH206 TO MH207B	SEED AND MULCH
MH 207B TO MH208A	RIVER CROSSING
MH208A TO DIVERSION STRUCTURE	SEED AND MULCH
DIVERSION STRUCTURE TO MH213	SEED AND MULCH
MH213 TO MH 214	SEED AND MULCH
MH214 TO JUNCTION CHAMBER	SEED AND MULCH
JUNCTION CHAMBER TO MH219	SEED AND MULCH

TABLE OF COORDINATES TRAVERSE STATIONS

NAME	NORTHING	EASTING	ELEVATION
TRAV-307	531311.94	136442.05	130.65
TRAV-306	531602.71	1364458.00	130.98
TRAV-304	531942.53	1364710.57	129.18
TRAV-303	532490.36	1364788.36	131.97
TRAV-302	532902.23	1364803.01	131.92
TRAV-301	533179.72	1364655.40	132.02
TRAV-311	533905.81	1364722.25	138.50
KCI-12	534492.73	1364353.50	-
KCI-13	534562.11	1364249.04	-
KCI-14	534643.67	1364072.96	-
KCI-15	534666.64	1363902.61	-
KCI-16	534652.28	1363802.29	-
KCI-17	534607.94	1363679.20	-
KCI-18	534512.21	1363579.17	-
KCI-19	534565.33	1363469.53	140.92
KCI-20	534531.22	1363322.41	-
KCI-21	534542.11	1363141.68	-
KCI-22	534511.90	1362951.00	-
KCI-23	534471.60	1362722.01	-

TABLE OF COORDINATES TRAVERSE STATIONS

NAME	NORTHING	EASTING	ELEVATION
KCI-24	534461.67	1362538.54	-
KCI-25	534604.20	1362409.93	-
KCI-26	534651.73	1362171.96	-
KCI-27	534565.90	1362045.01	159.98
KCI-30	534522.51	1361807.72	-
KCI-31	534591.91	1361759.98	-
KCI-32	534619.22	1361607.15	154.10
KCI-33	534651.51	1361440.79	154.11
KCI-34	534654.06	1361177.25	145.37
LPS-102	534676.62	1360784.80	149.43
KCI-36	534600.00	1360529.42	150.10
KCI-37	534698.77	1360080.78	169.75
KCI-38	534743.80	1359964.03	-
KCI-39	534868.47	1359887.72	173.13
KCI-40	535102.75	1359907.73	175.72
DAM-11	535225.18	1359908.50	-
KCI-43	535560.64	1359908.23	-
KCI-44	535733.49	1360008.13	-

PHASING OF SEWER MANHOLES / PIPE INSTALLATION

The following sequence of construction is not a complete list of tasks or work required to complete the contract requirements. The sequence of construction may be modified or revised at the request of the Contractor with the approval of the County prior to start of construction.

- Install 275 feet of 72-inch steel liner plate tunnel and 42-inch carrier pipe beneath US Route 1. Connect carrier pipe to existing 42-inch stub at MH-112 from Contract 20-4531.
- Simultaneously continue installation of 42-inch sewer from MH 200 to MH-205.
- Install 175 feet of 72-inch steel liner plate tunnel and 42-inch carrier pipe beneath Foundry Rd. Connect carrier pipe to existing 42-inch pipe at MH-205.
- Continue installation of 42-inch sewer to MH-208B. (This includes the river crossing between MH-207B and MH-208A.) See sheet 15 for river crossing details.
- Install 36-inch sewer interceptor to MH 212. Pressure test sewer prior to accepting flows.
- Install temporary gravity bypass from temporary doghouse MH-3 to Ex MH-1261. This shall be done in accordance to the special provisions of the specifications paragraph 20 and Sheets 23 and 24.
- Construct diversion structure and remove ex. 30-inch sewer and install proposed 42-inch sewer in some trench from the diversion structure to junction structure.
- Construct junction chamber and after approval, Connect ex. 30-inch sewer.
- Remove gravity bypass system.
- Continue installation of 42-inch sewer from the junction structure to stub north of MH-219 (Limit of contract 20-4532.)
- Pressure test sewer from Junction Structure to MH-219.
- Restore all disturbed areas to existing conditions.

EXISTING

- 148 --- INTERIOR CONTOUR
- 150 --- INDEX CONTOUR
- C --- C --- CABLE
- E --- E --- CURB AND GUTTER
- X --- X --- ELECTRIC
- F --- F --- FENCE
- G --- G --- GAS
- G --- G --- GUARDRAIL
- OHW --- OVERHEAD WIRE
- P --- P --- PROPERTY LINE
- R --- R --- ROAD - CENTERLINE
- S --- S --- ROAD - EDGE OF DIRT, GRAVEL
- T --- T --- ROAD - EDGE OF MACADAM
- W --- W --- RIGHT OF WAY LINE (R/W)
- S --- S --- SANITARY SEWER
- S --- S --- STORM DRAIN
- S --- S --- STREAM EDGE
- T --- T --- TELEPHONE
- T --- T --- TREELINE
- W --- W --- FENCE, STONE, BRICK OR CONC. WALL
- W --- W --- WATER MAIN
- WB --- WB --- WETLAND BOUNDARY
- ⊕ FIRE HYDRANT
- ⊙ MANHOLE, ELECTRIC
- ⊙ MANHOLE, GAS
- ⊙ MANHOLE, TELEPHONE
- ⊙ MANHOLE, SANITARY SEWER
- ⊙ MANHOLE, STORM DRAIN
- ⊙ MANHOLE, WATER
- ⊙ VERIZON/BGE POLE
- ⊙ SIGN
- ⊙ TREE
- ⊙ TREE TO BE REMOVED

LEGEND

PROPOSED

- LOD --- LOD --- LIMIT OF DISTURBANCE
- SF --- SF --- SILT FENCE
- SSF --- SSF --- SUPER SILT FENCE
- TP --- TP --- TREE PROTECTION FENCE
- SB --- SB --- STREAM BUFFER
- R/W --- RIGHT OF WAY (R/W)
- I --- I --- INTERCEPTOR SEWER
- P --- P --- PROPERTY LINE
- D --- D --- DRAINAGE & UTILITY R/W
- T --- T --- TEMPORARY CONSTRUCTION AREA
- △ TRAVERSE STATION
- ⊕ B2-1 SOIL BORING
- ⊙ TP NO. TEST PIT
- ⊙ MANHOLE, SANITARY SEWER
- ⊙ ABANDON
- ⊙ REMOVE
- FRP FIBERGLASS REINFORCED PIPE

GENERAL NOTES

AS-BUILT

LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 2 OF 27

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. 8146 EXPIRATION DATE: 10/6/11

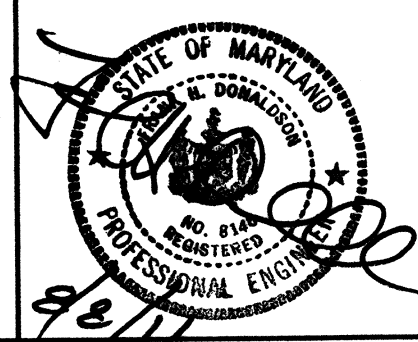
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Jan G. K... 12/16/08 *Richard J. S...* 12/12/08
DIRECTOR OF PUBLIC WORKS DATE CHIEF, BUREAU OF ENGINEERING DATE

Shane C. Ben... 12/12/08 *...* 12/11/08
CHIEF, BUREAU OF UTILITIES DATE CHIEF, UTILITY DESIGN DIVISION DATE

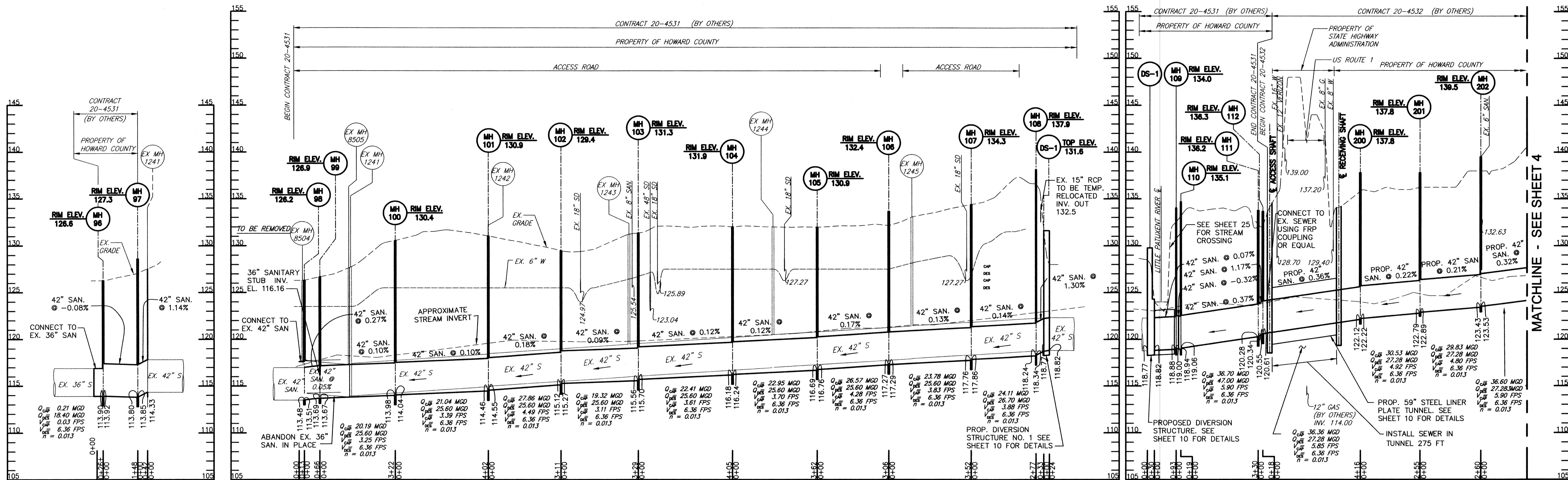
Patton Harris Rust & Associates, Inc.
Engineers, Surveyors, Planners, Landscape Architects.

8818 Centre Park Drive
Columbia, MD 21045
T 410.997.8900
F 410.997.9282



DES: C.H.
DRN: K.L.B.
CHK: G.C.L.
R.J.C. AS-BUILT 12/10
DECEMBER, 2008 BY NO. REVISION DATE

600' SCALE MAP 47 BLOCK 10, 16, 17, & 18



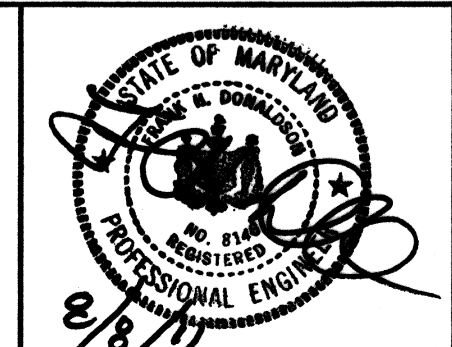
PROFILE
 HORIZONTAL: 1"=200'
 VERTICAL: 1"=5'

QDES & VDES
 CALCULATED FROM
 MANNING'S EQUATION

PROFESSIONAL CERTIFICATION
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 LICENSE NO. 8146 EXPIRATION DATE: 10/8/11

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Director: *John G. K...* 12/12/08
 Chief, Bureau of Engineering: *Robert J. S...* 12/12/08
 Chief, Bureau of Utilities: *John C. C...* 12/12/08
 Chief, Utility Design Division: *...* 12/12/08

Patton Harris Rust & Associates, Inc.
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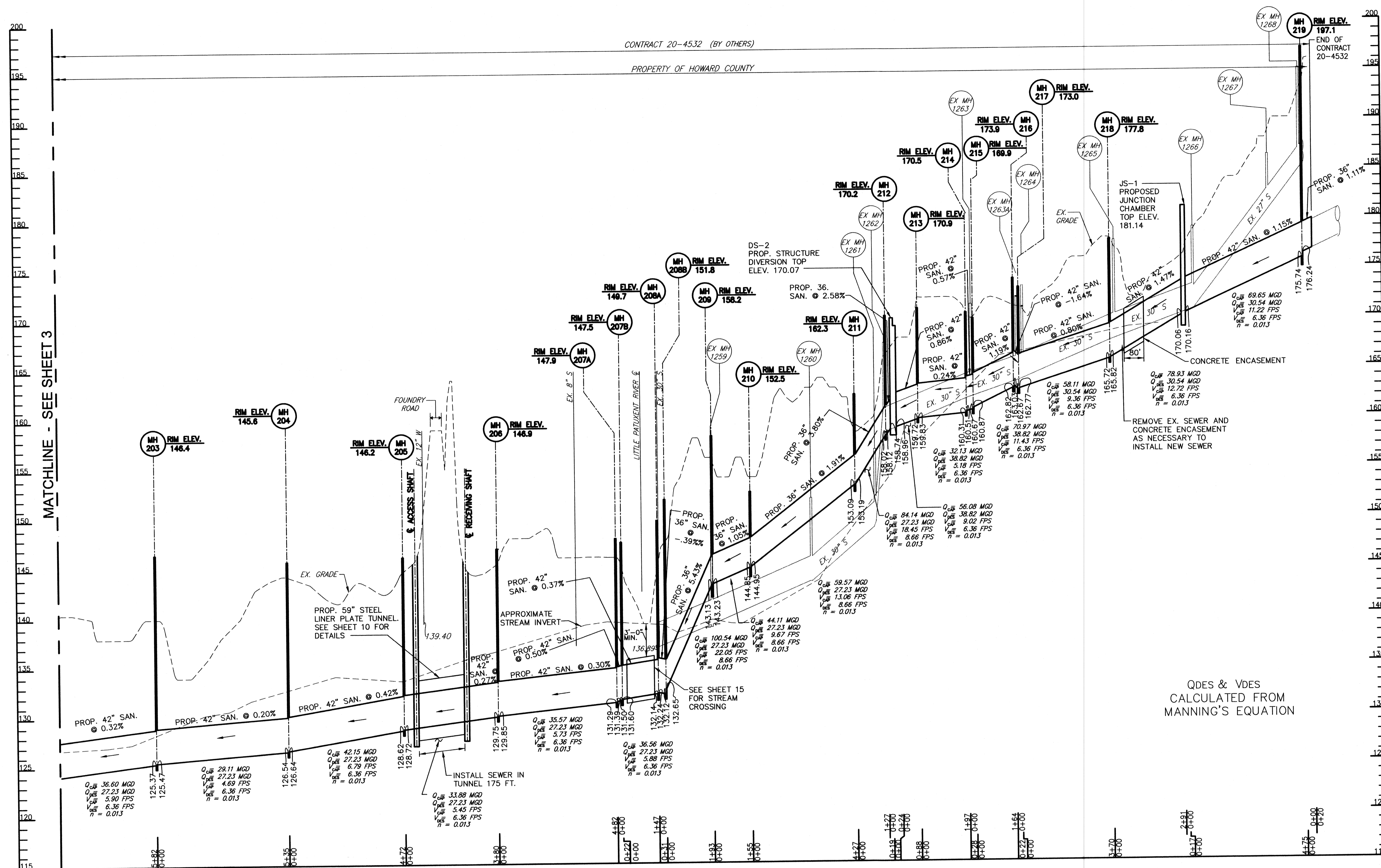
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DRN:	K.L.B.		
CHK:	G.C.L.		
	R.J.C.	AS-BUILT	12/10
DECEMBER, 2008	BY NO.	REVISION	DATE

COMPOSITE PROFILE A
 600' SCALE MAP 47
 BLOCK 10, 16, 17 & 18

AS-BUILT
 LITTLE PATUXENT
 PARALLEL INTERCEPTOR SEWER
 CAPITAL PROJECT S-6175
 CONTRACT NO. 20-4532
 1ST ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 3 OF 27

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PROFILE
 HORIZONTAL: 1"=200'
 VERTICAL: 1"=5'

QDES & VDES
 CALCULATED FROM
 MANNING'S EQUATION

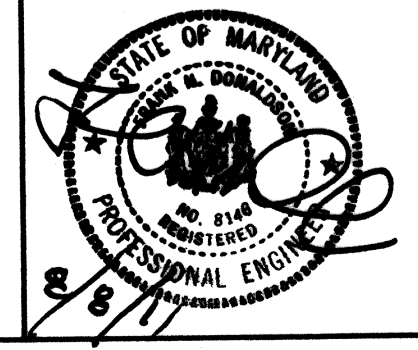
MATCHLINE - SEE SHEET 3

CONTRACT 20-4532 (BY OTHERS)
 PROPERTY OF HOWARD COUNTY

PROFESSIONAL CERTIFICATION
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I
 AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
 LICENSE NO. 8146 EXPIRATION DATE: 10/8/11

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Director of Public Works: *John C. Green* 12/12/08
 Chief, Bureau of Engineering: *Michael J. Sapan* 12/12/08
 Chief, Bureau of Utilities: *John C. Green* 12/12/08
 Chief, Utility Design Division: *John C. Green* 12/12/08

Patton Harris Rust & Associates, Inc.
 Engineers, Surveyors, Planners, Landscape Architects.
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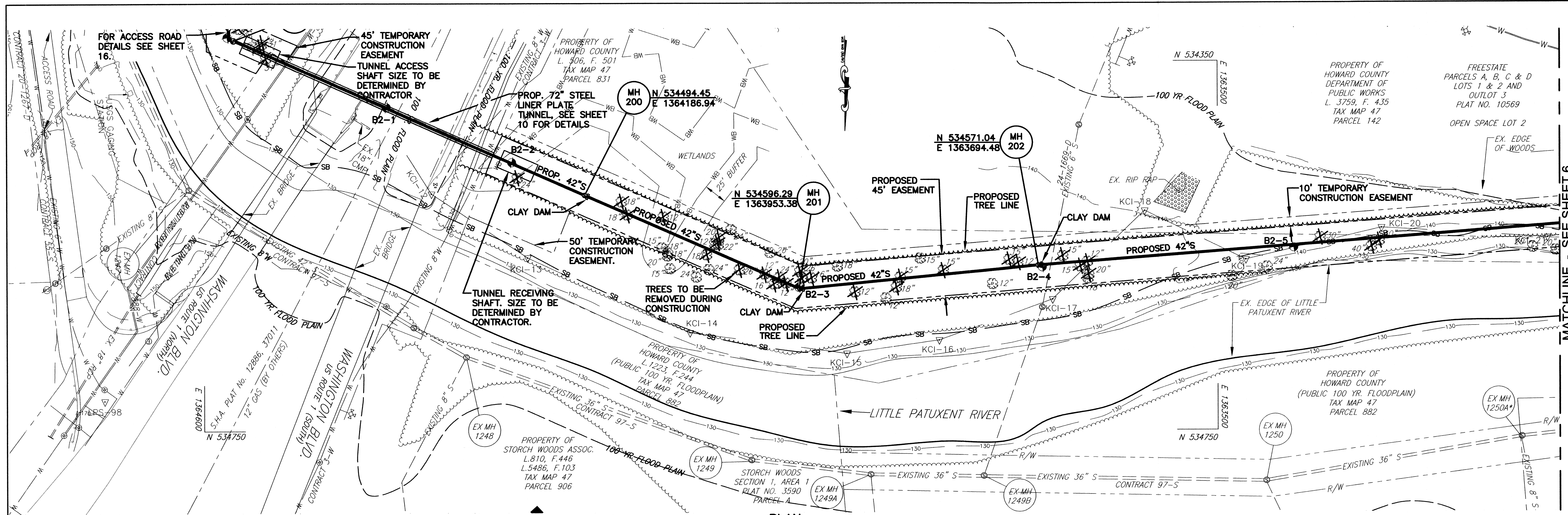


DES:	C.H.		
DRN:	K.L.B.		
CHK:	G.C.L.		
DECEMBER, 2008	R.J.C.	AS-BUILT	12/10
BY NO.		REVISION	DATE

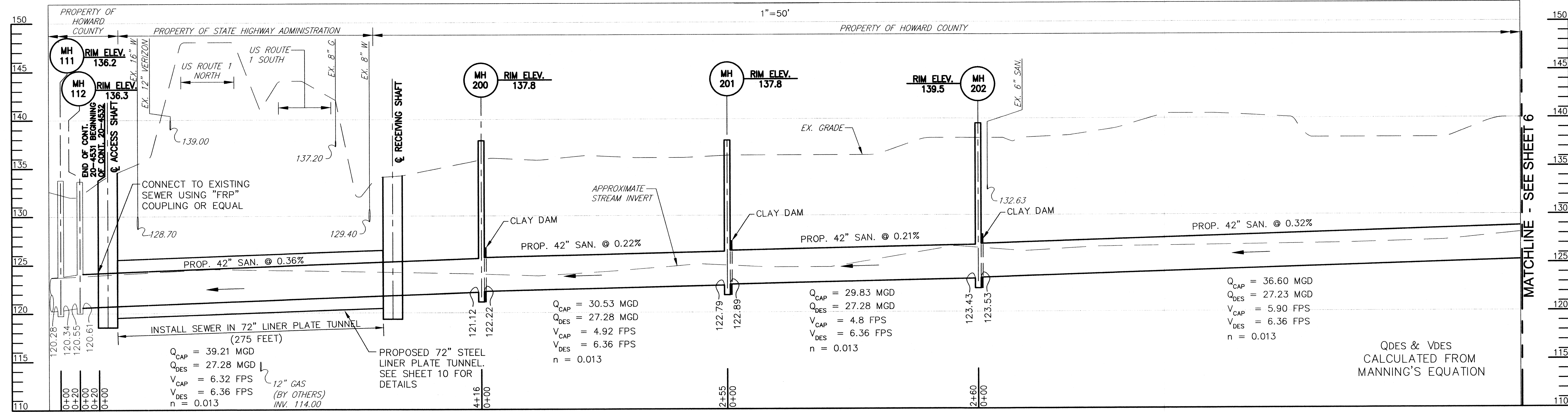
COMPOSITE PROFILE B
 600' SCALE MAP 47
 BLOCK 10, 16, 17, & 18

LITTLE PATUXENT
 PARALLEL INTERCEPTOR SEWER
 CAPITAL PROJECT S-6175
 CONTRACT NO. 20-4532
 1ST ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

AS-BUILT
 SCALE AS SHOWN
 SHEET 4 OF 27



PLAN
1"=50'



PROFILE
HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

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. **8146** EXPIRATION DATE: **10/8/11**

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
John G. K... 12/12/08 *Robert ...* 12/12/08
DIRECTOR OF PUBLIC WORKS DATE CHIEF, BUREAU OF ENGINEERING DATE
Stuart C. Gen... 12/12/08 *...* 12/12/08
CHIEF, BUREAU OF UTILITIES DATE CHIEF, UTILITY DESIGN DIVISION DATE

Patton Harris Rust & Associates, Inc.
Engineers, Surveyors, Planners, Landscape Architects.
PHRA
8818 Centre Park Drive
Columbia, MD 21045
T 410.997.8900
F 410.997.9282

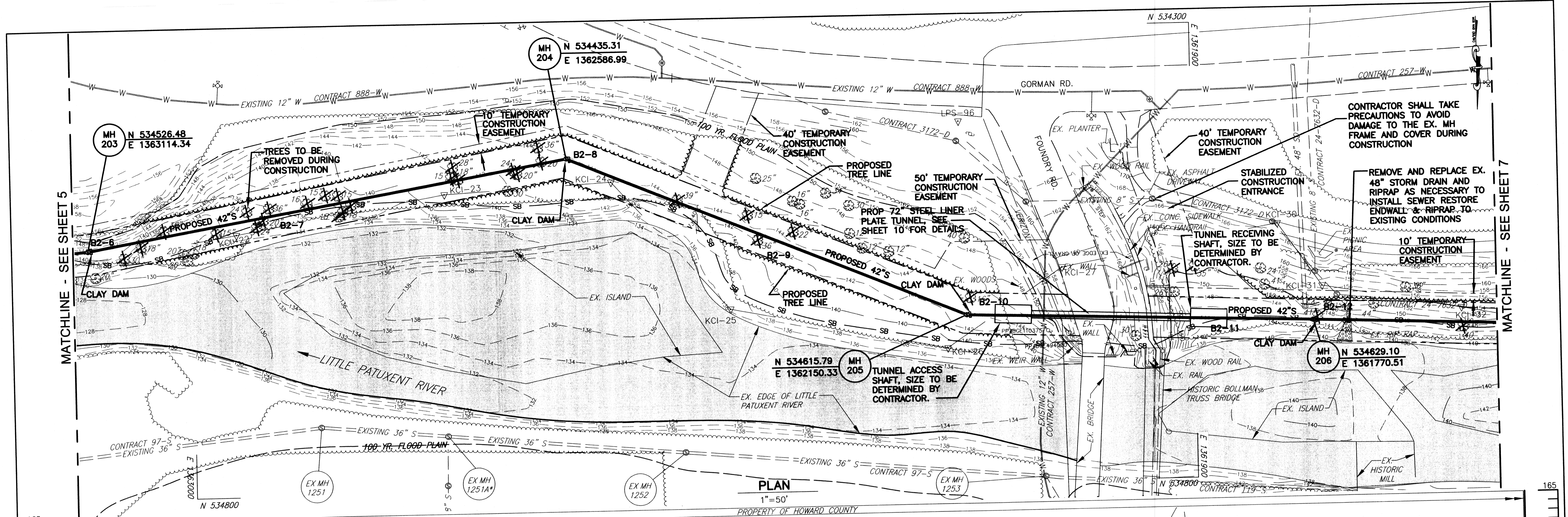


DES: C.H.			
DRN: K.L.B.			
CHK: G.C.L.			
DECEMBER, 2008	BY NO.	AS-BUILT	DATE 12/10
		REVISION	

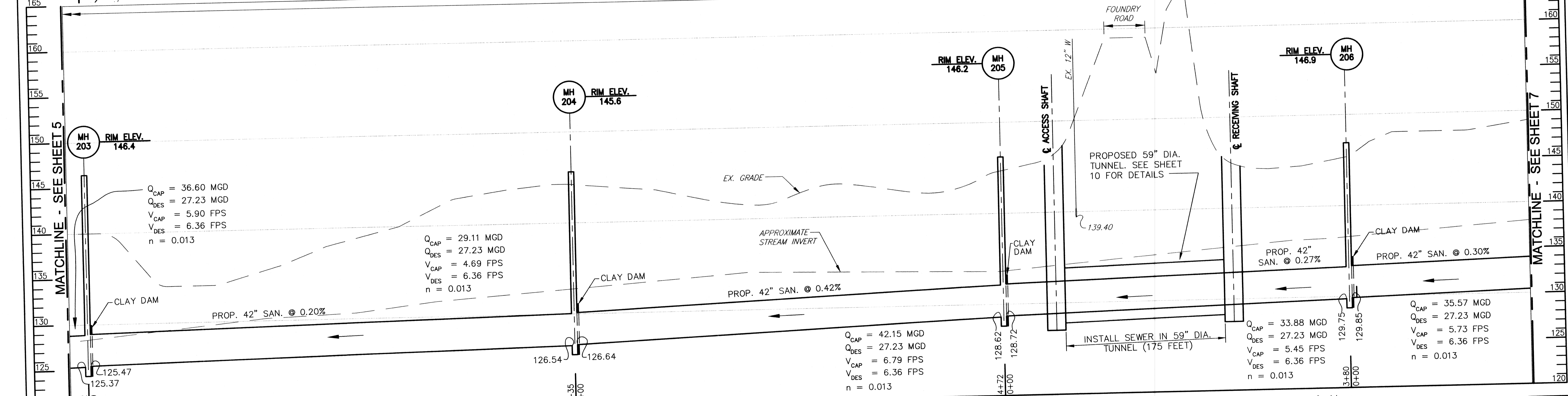
PLAN AND PROFILE
600' SCALE MAP 47 BLOCK 10, 16, 17, & 18

LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 5 OF 27



PLAN
1"=50'
PROPERTY OF HOWARD COUNTY

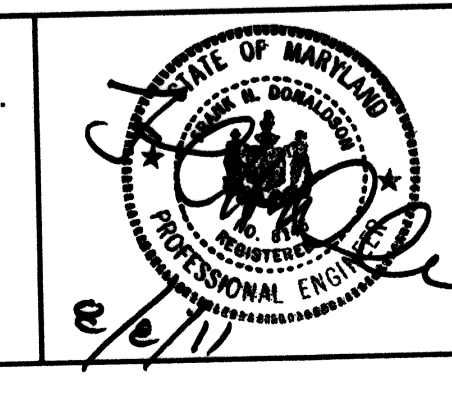


PROFILE
HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
John G. K... 12/12/08
 DIRECTOR OF PUBLIC WORKS DATE CHIEF, BUREAU OF ENGINEERING
Stake C. Chen 12/12/08
 CHIEF, BUREAU OF UTILITIES DATE CHIEF, UTILITY DESIGN DIVISION

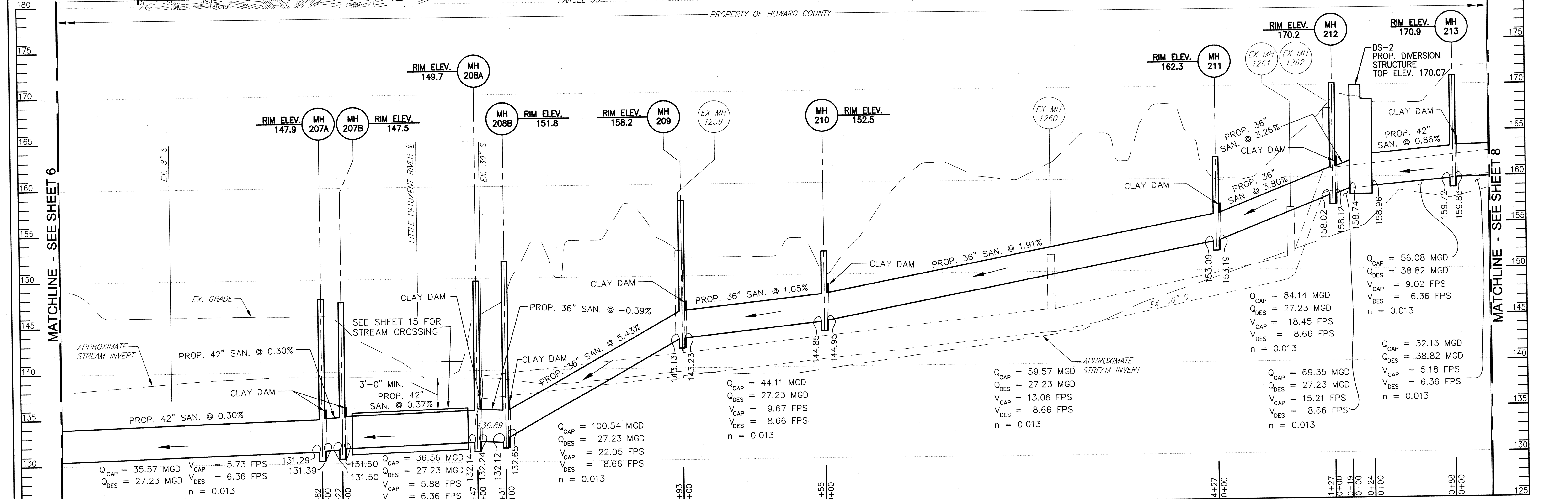
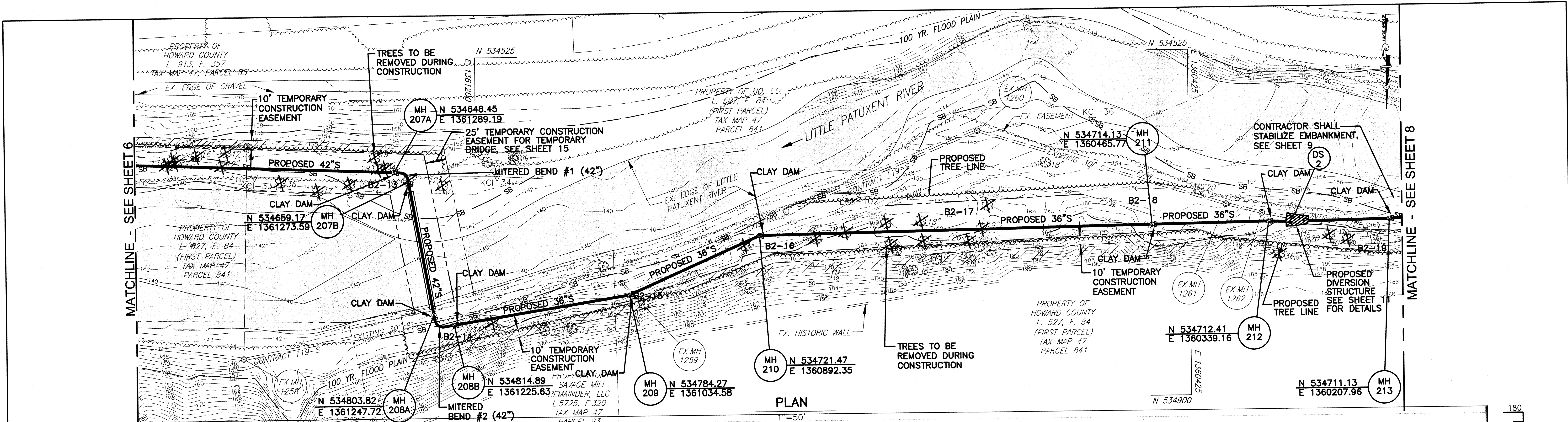
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DES: C.H.	
DRN: K.L.B.	
CHK: G.C.L.	12/10
DECEMBER, 2008	
BY NO.	REVISION
	DATE

PLAN AND PROFILE
60' SCALE MAP 47 BLOCK 10, 16, 17, & 18

QDES & VDES CALCULATED FROM MANNING'S EQUATION
AS-BUILT
 LITTLE PATUXENT
 PARALLEL INTERCEPTOR SEWER
 CAPITAL PROJECT S-6175
 CONTRACT NO. 20-4532
 1ST ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND
 SCALE AS SHOWN
 SHEET 6 OF 27



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 LICENSE NO. **8146** EXPIRATION DATE: **10/6/11**

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

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PLAN AND PROFILE
 600' SCALE MAP 47 BLOCK 10, 16, 17, & 18

LITTLE PATUXENT PARALLEL INTERCEPTOR SEWER
 CAPITAL PROJECT S-6175
 CONTRACT NO. 20-4532
 1ST ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

AS-BUILT

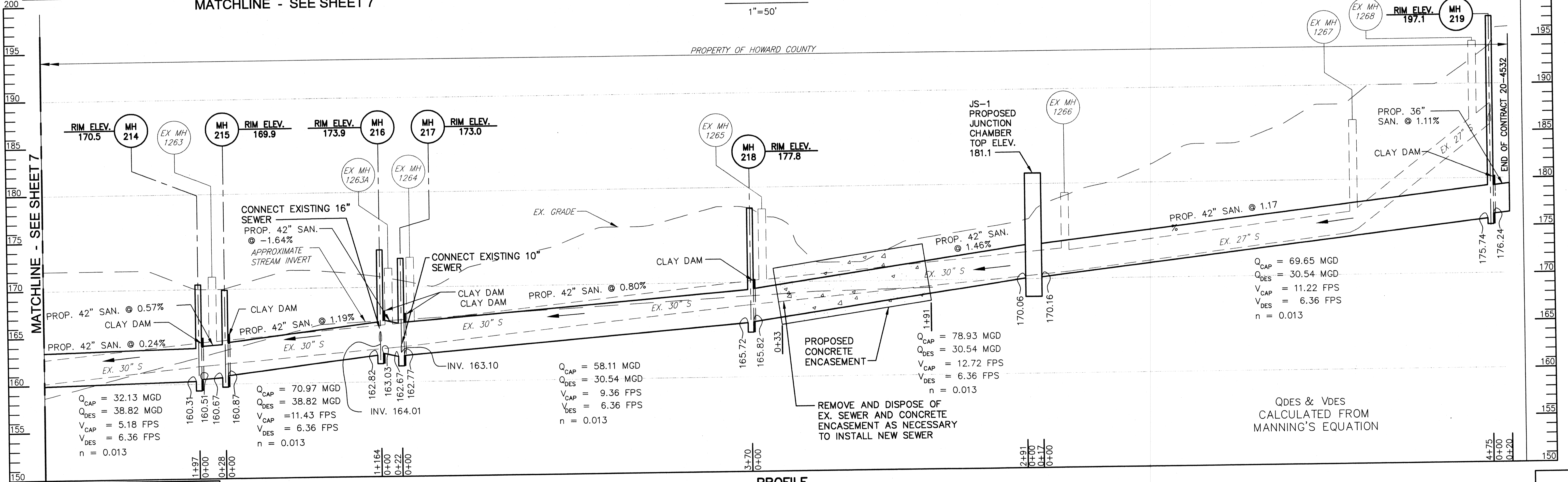
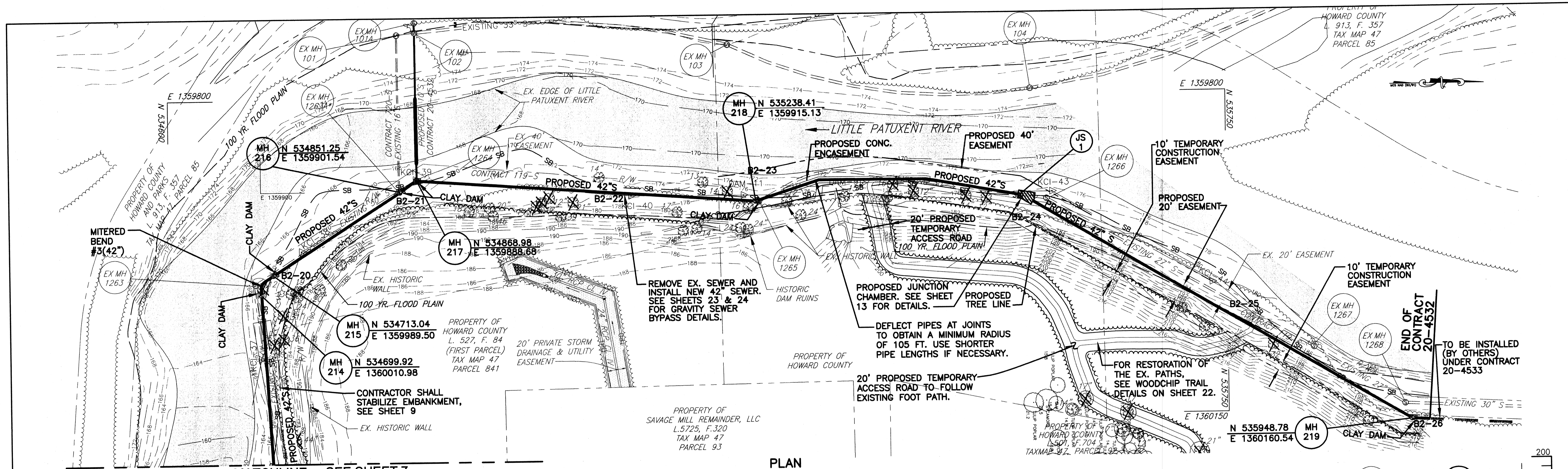
DES: C.H.
 DRN: K.L.B.
 CHK: G.C.L.
 R.J.C. AS-BUILT 12/10
 DECEMBER, 2008

REVISION

DATE

SCALE AS SHOWN

SHEET 7 OF 27



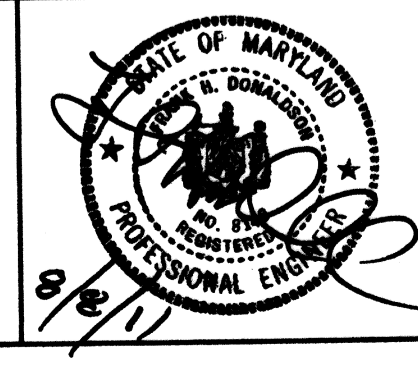
PROFESSIONAL CERTIFICATION
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *John C. Chen* DATE: 12/12/08
Chief, Bureau of Engineering: *Richard J. Sapan* DATE: 11/12/08
Chief, Bureau of Utilities: *John C. Chen* DATE: 12/11/08
Chief, Utility Design Division: *John C. Chen* DATE: 12/11/08

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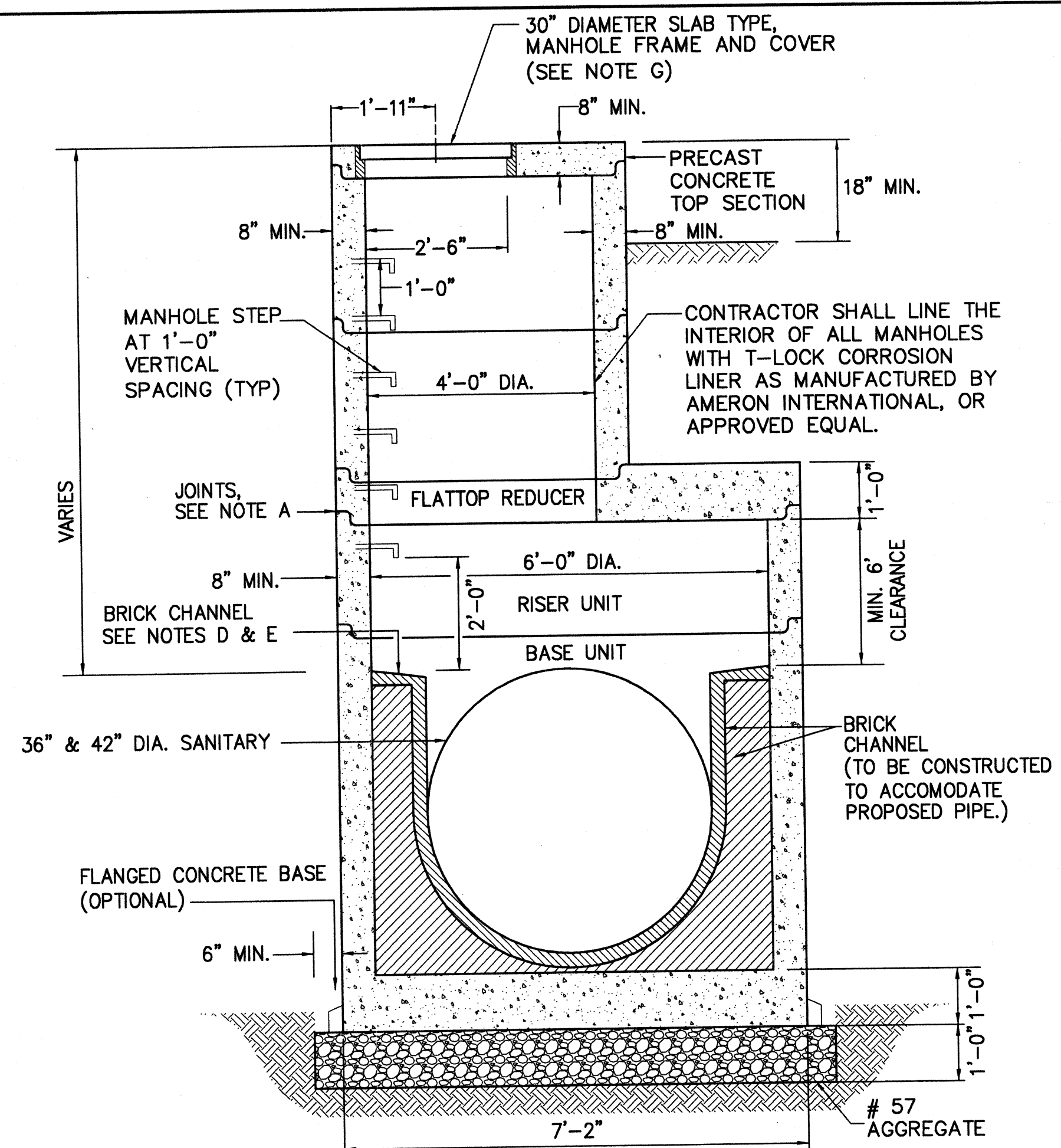


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DECEMBER, 2008	BY NO.	REVISION	DATE
			12/10

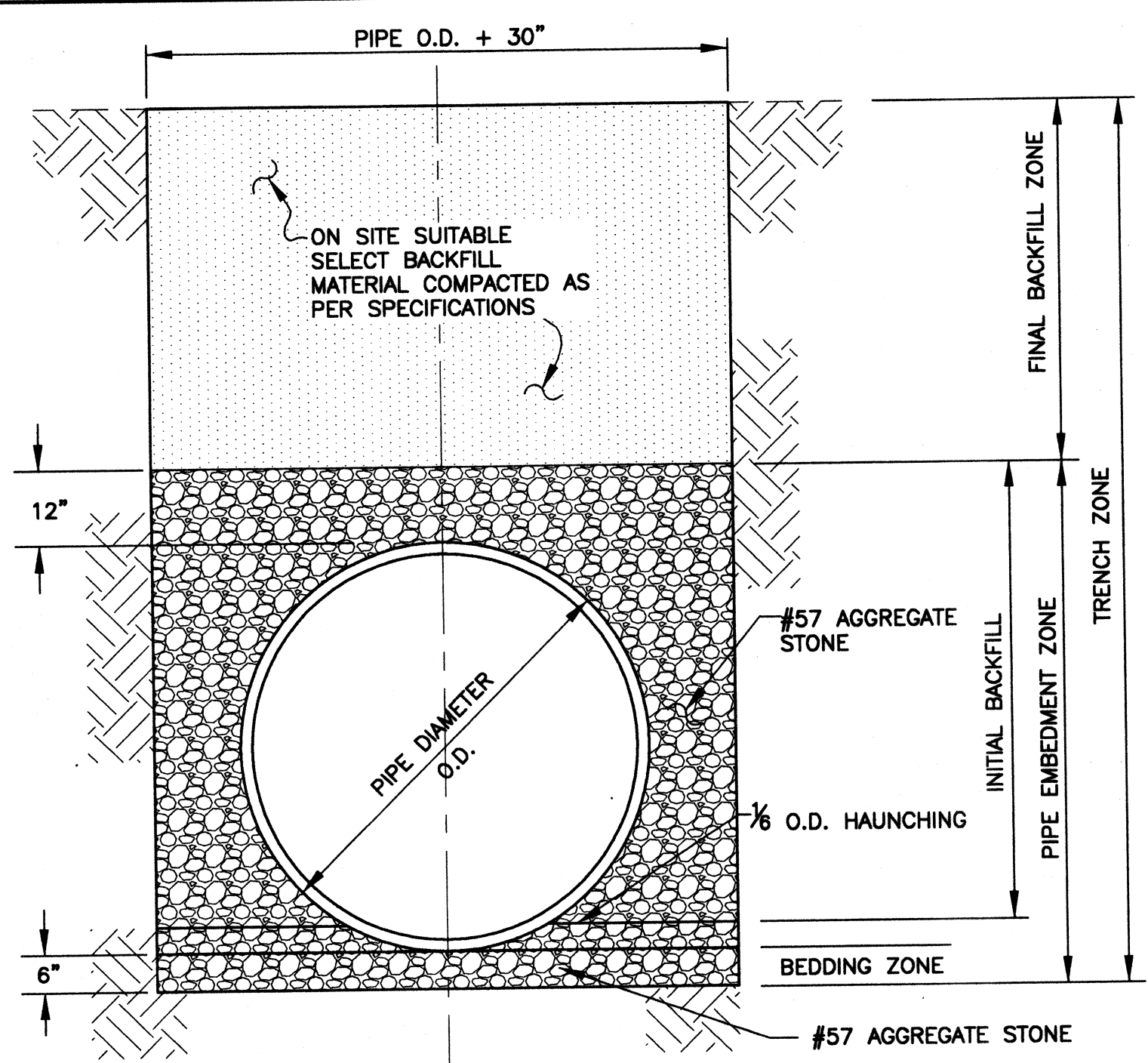
PLAN AND PROFILE
600' SCALE MAP 47
BLOCK 10, 16, 17, & 18

LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 8 OF 22



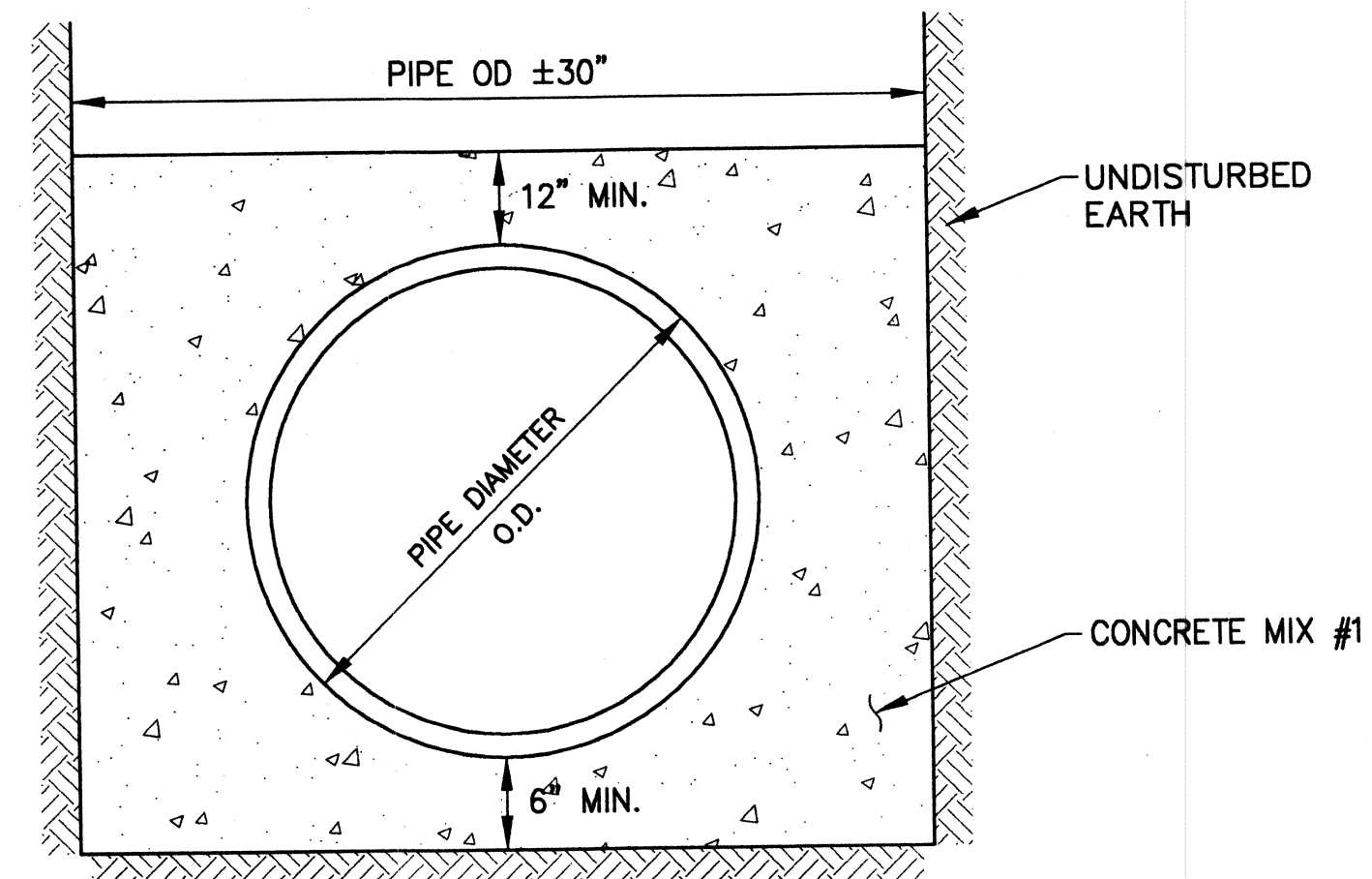
72" PRE-CAST SANITARY MANHOLE
SCALE: N.T.S.



TRENCH DETAIL (UNPAVED)
SCALE: N.T.S.

TRENCH NOTES:

- 1.) STEEL PLATE TO BE PLACED OVER OPEN TRENCH UNTIL PIPE HAS BEEN INSTALLED AND BACKFILLED.



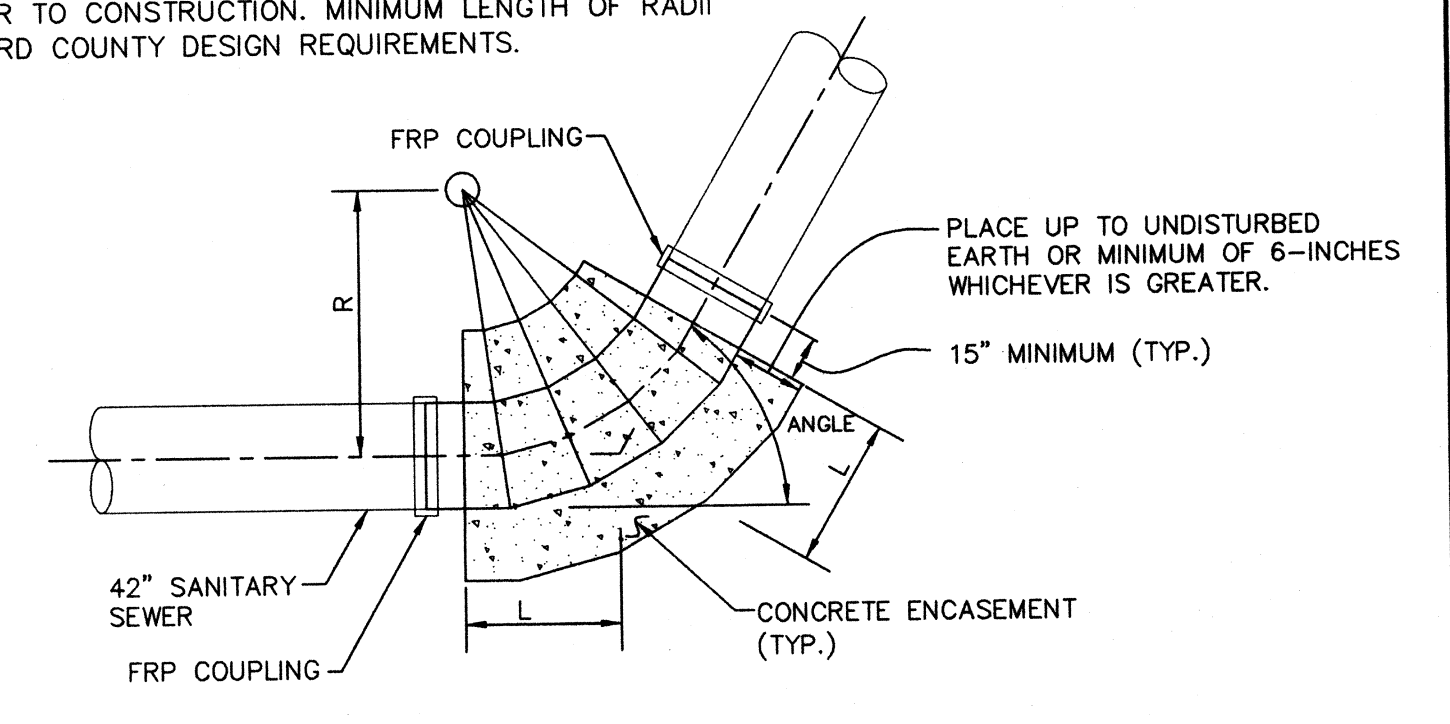
CONCRETE ENCASEMENT DETAIL
SCALE: N.T.S.

NOTES:

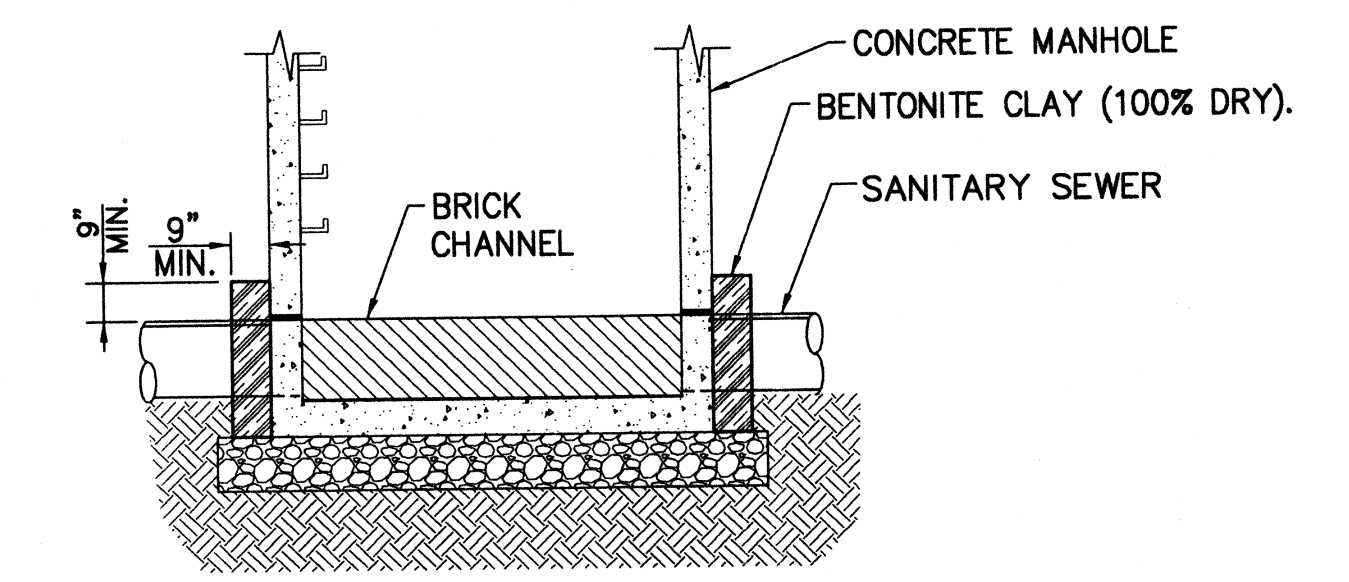
- 1.) POUR CONCRETE AGAINST UNDISTURBED EARTH. REMOVE TRENCH SHEETING BEFORE POURING CONCRETE.
- 2.) CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI @ 28 DAYS.

PROPOSED MITERED PIPE BENDS					
BEND #	LOCATION	ANGLE	R	L	NO. OF MITERS
1	15' WEST OF MH 207A	76°-36'-40"	8.75'	6.91'	6
2	15' SOUTH OF MH 208A	88°-47'-41"	8.75'	8.72'	6
3	15' WEST OF MH 215	67°-00'-02"	8.75'	5.79'	5

- NOTE: 1. MITER ANGLES SHALL NOT EXCEED 15 DEGREES.
2. CONTRACTOR SHALL CONFIRM REQUIRED DIMENSIONS OF MITERED BENDS WITH MANUFACTURER PRIOR TO CONSTRUCTION. MINIMUM LENGTH OF RADII SHALL CONFORM TO HOWARD COUNTY DESIGN REQUIREMENTS.



TYPICAL MITER BEND DETAIL
SCALE: N.T.S.



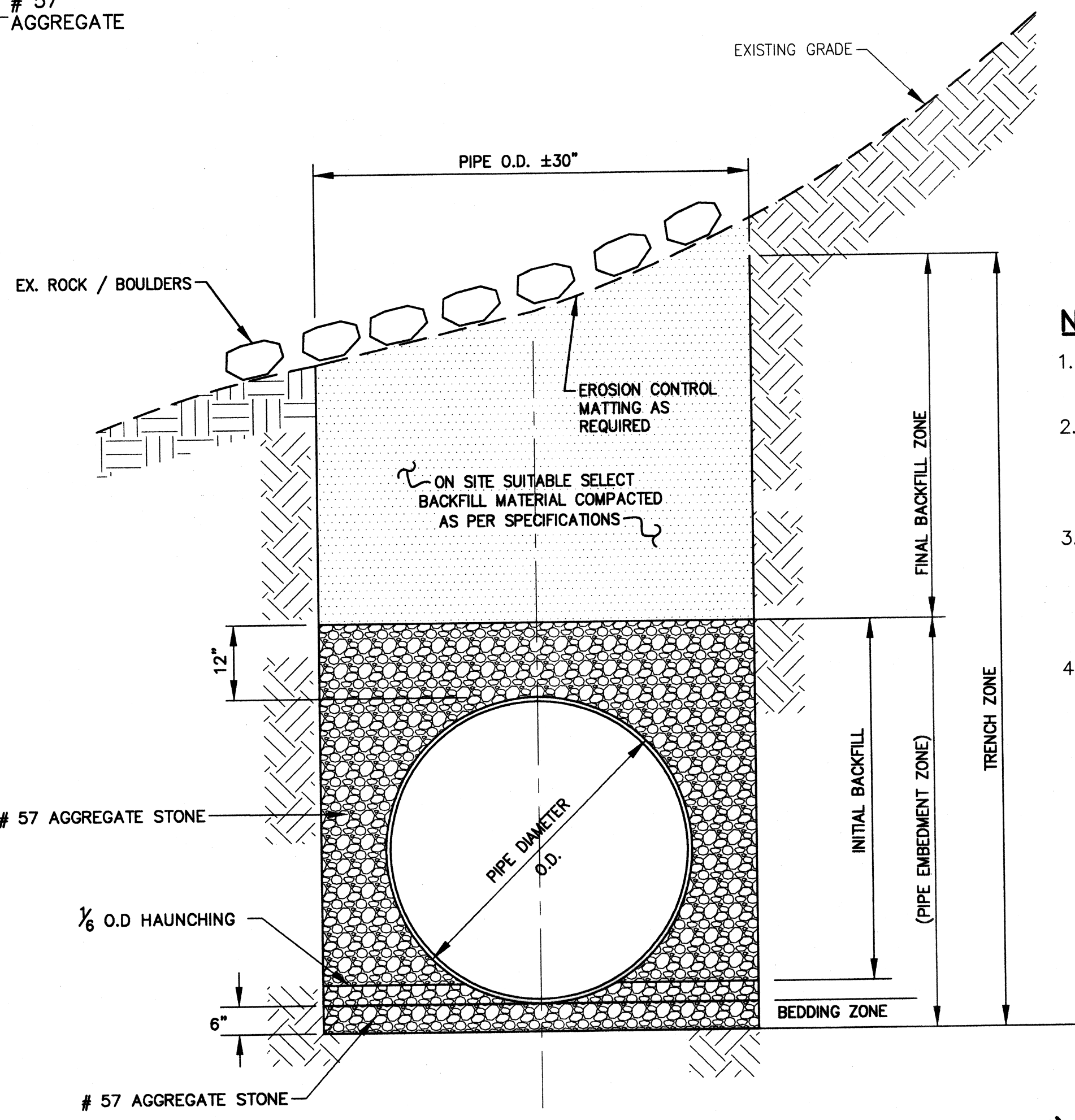
BENTONITE CLAY PLACEMENT FOR EX. MANHOLES & STRUCTURES DETAILS
SCALE: N.T.S.

NOTE:

- 1.) CLAY RING APPLIES TO EX. MANHOLES AND EX. STRUCTURES AS SHOWN ON THE DRAWING OR IN THE SPECIFICATIONS.

72" PRE-CAST SANITARY MANHOLE NOTES:

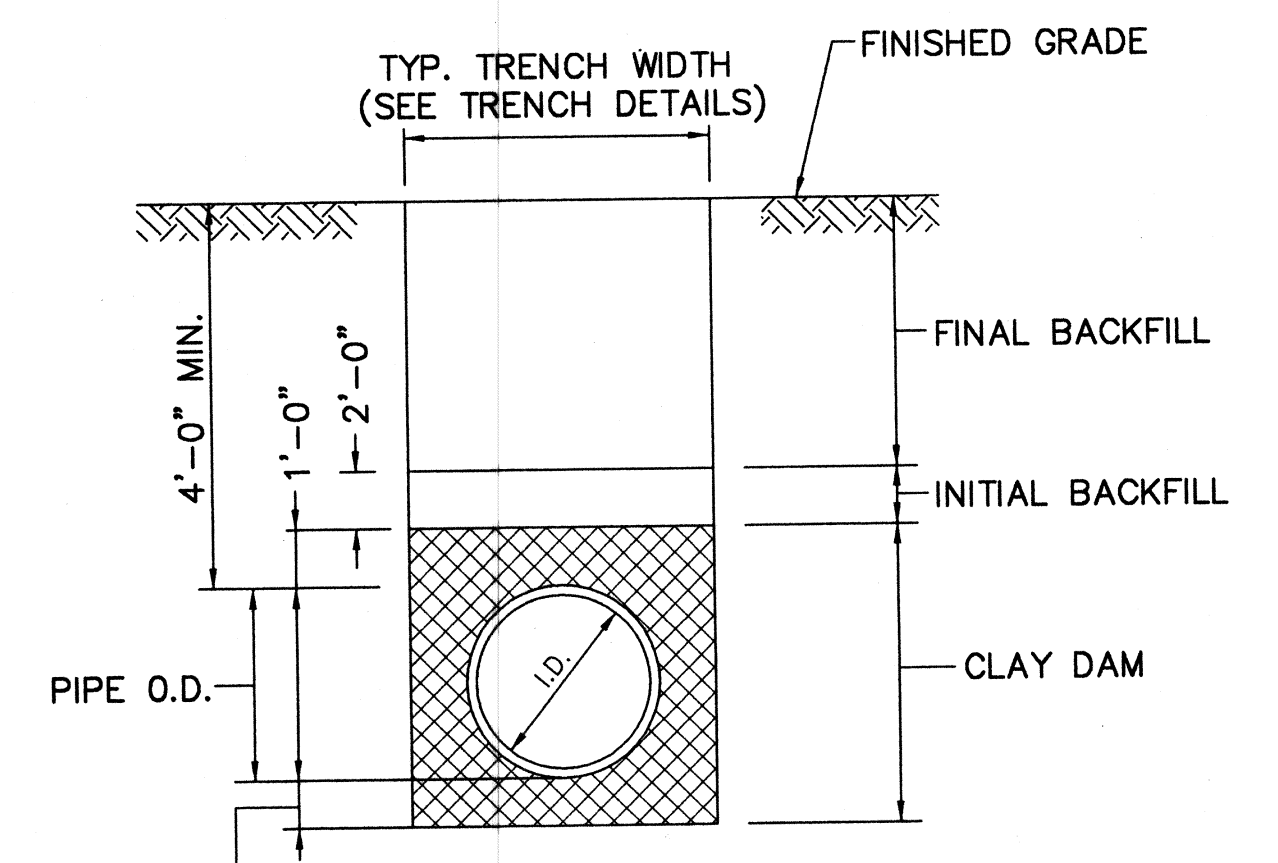
- A.) SEE GENERAL NOTES APPLICABLE TO ALL PRECAST MANHOLES ON DETAIL G-5.11.
- B.) MANHOLE DESIGN SPECIFICATIONS SHALL CONFORM TO "PRECAST REINFORCED CONCRETE MANHOLE SECTION A.S.T.M. DESIGNATION C-478, LATEST REVISIONS.
- C.) THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATER TIGHT USING "O" RING RUBBER GASKETS MEETING A.S.T.M. C-443 AND C-361 OR APPROVED EQUAL. ANY EXCESSIVE OPENINGS WITHIN THE JOINTS SHALL BE FILLED USING A NON-SHRINK GROUT FILLER.
- D.) BENCH AND CHANNEL TO BE CONSTRUCTED OF ONE COURSE OF BRICK ON EDGE. BENCH TO SLOPE A MINIMUM OF 1 INCH PER FOOT TOWARDS CHANNEL.
- E.) BENCH HEIGHT ABOVE PIPE INVERT TO BE EQUAL TO DIAMETER OF THE OUTGOING PIPE OR AS DIRECTED BY THE ENGINEER.
- F.) CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING MINIMUM REQUIREMENT FOR REINFORCING. REINFORCING SHALL BE DESIGNED BY A LICENSED STRUCTURAL ENGINEER REGISTERED IN THE STATE OF MARYLAND. REINFORCING SHOP DRAWINGS SHALL BE SUBMITTED AND APPROVED PRIOR TO MANUFACTURE OF MANHOLES.
- G.) MANHOLE FRAME AND COVER SHALL BE PER MODEL B-6077 SOLID LID, FURNISHED BOLTED DOWN AND WATERTIGHT, AS MANUFACTURED BY BARRY PATTERN AND FOUNDRY OR APPROVED EQUAL. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF THE FRAME AND COVER FOR APPROVAL.



TRENCH DETAIL (W/ SLOPE STABILIZATION)
SCALE: N.T.S.

NOTES:

- 1.) GRADE SHALL BE RETURNED TO EXISTING CONDITION AFTER CONSTRUCTION.
- 2.) ANY SLOPES GREATER THAN 3:1 SHALL BE STABILIZED WITH EROSION CONTROL MATTING (LANDLOK 450 OR APPROVED EQUAL). SEE SHEET 22 FOR ANCHORING REQUIREMENTS.
- 3.) ROCK REMOVED DURING PIPE INSTALLATION SHALL BE PLACED AND SPREAD OVER THE DISTURBED AREA TO MIMIC EXISTING CONDITIONS. ROCK SHALL BE PLACED OVER EROSION CONTROL MATTING.
- 4.) AREA SHALL BE SEEDED AND MULCHED AS PER SHEET 21.



BENTONITE CLAY DAM TYPICAL PIPE BEDDING DETAIL
SCALE: N.T.S.

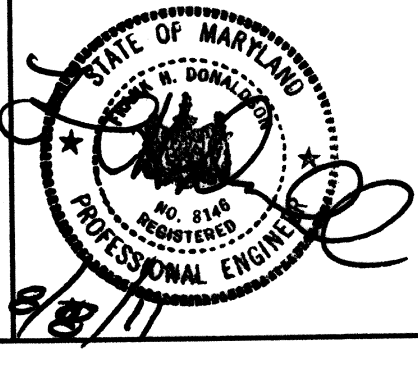
CLAY DAM NOTES

- 1.) CLAY DAM SHALL BE INSTALLED AT INTERVALS NO GREATER THAN 1,000 FEET AND AS SHOWN ON WETLAND RESTORATION PLAN.
- 2.) CLAY DAM LENGTH SHALL BE 2 FEET ALONG THE PIPE AXIS, AND SHALL BE PLACED FROM UNDERCUT SUBGRADE OR TRENCH SUBGRADE UP TO 12" ABOVE THE CROWN OF THE PIPE.
- 3.) PLACE CLAY DAM IN 6" LIFTS, USING CLAY MEETING THE REQUIREMENTS OF AASHTO M145 SOIL GROUPS A-6 OR A-7 AND COMPACT TO MIN. 92%
- 4.) INITIAL AND FINAL BACKFILL SHALL BE PLACED FROM THE PIPE SPRINGLINE UP TO FINISH SUBGRADE. SEE TRENCH DETAIL.

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LICENSE NO. 8146 EXPIRATION DATE: 10/8/11

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
Director of Public Works: [Signature] 12/12/08
Chief, Bureau of Engineering: [Signature] 12/12/08
Chief, Bureau of Utilities: [Signature] 12/12/08
Chief, Utility Design Division: [Signature] 12/11/08

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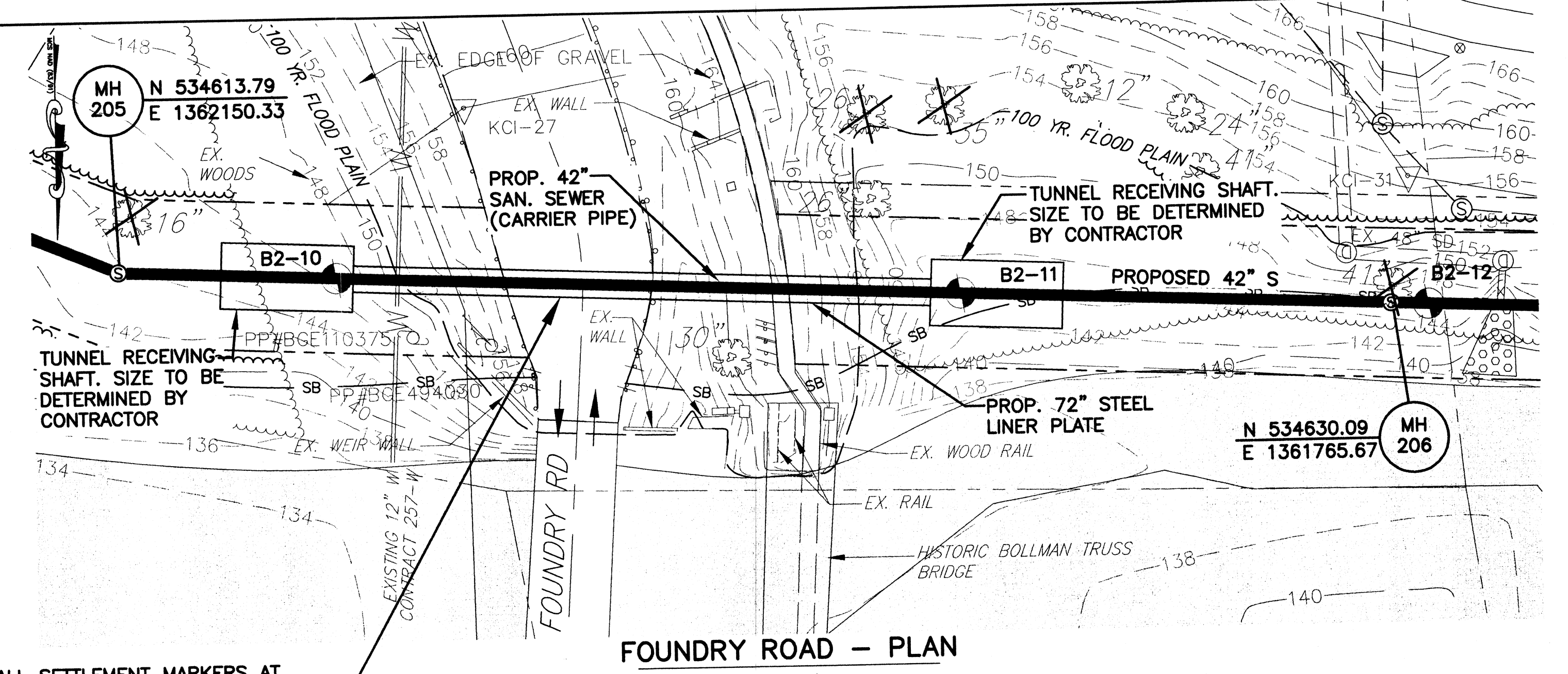
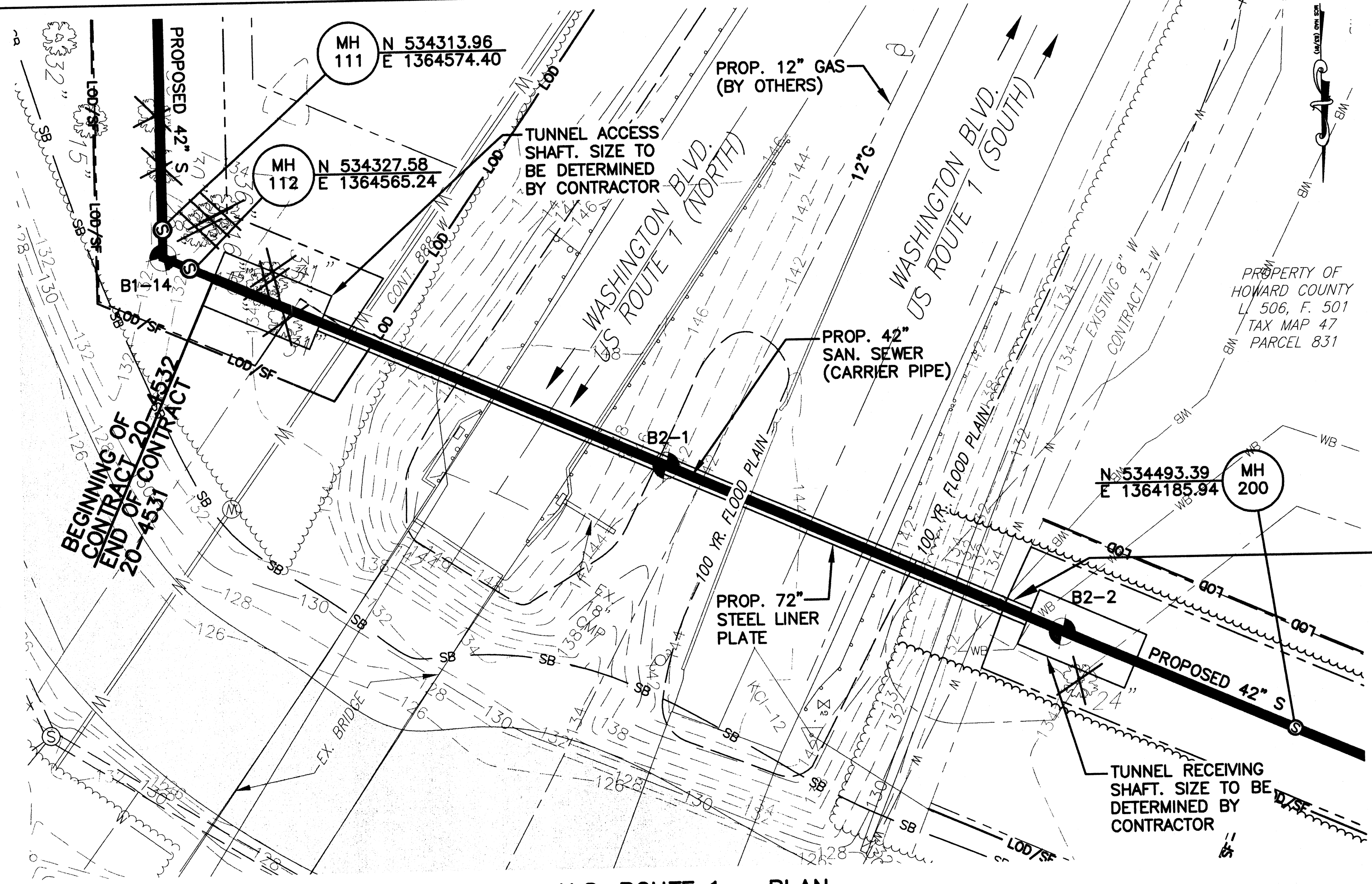


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DECEMBER, 2008	BY NO.	AS-BUILT	REVISION	DATE

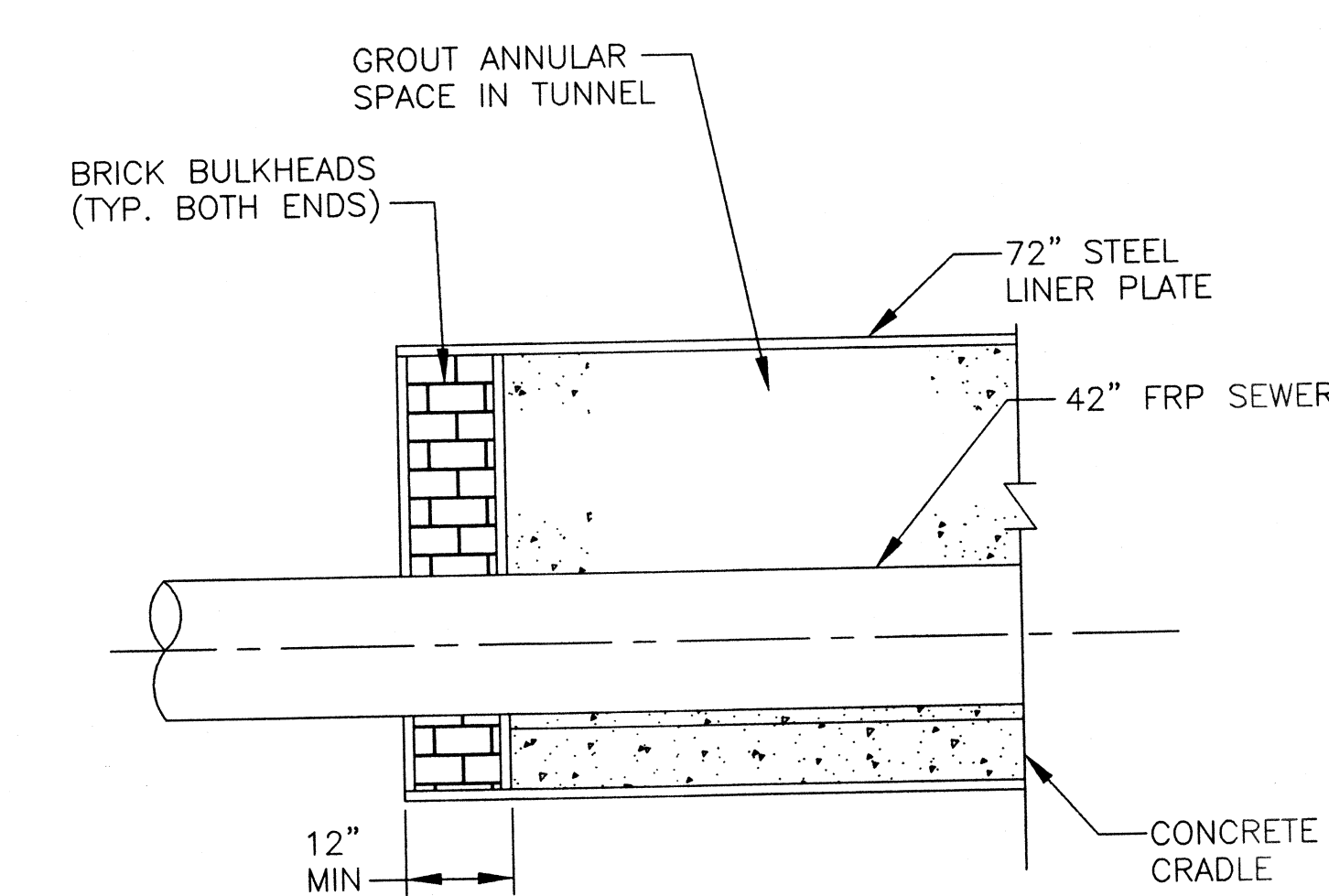
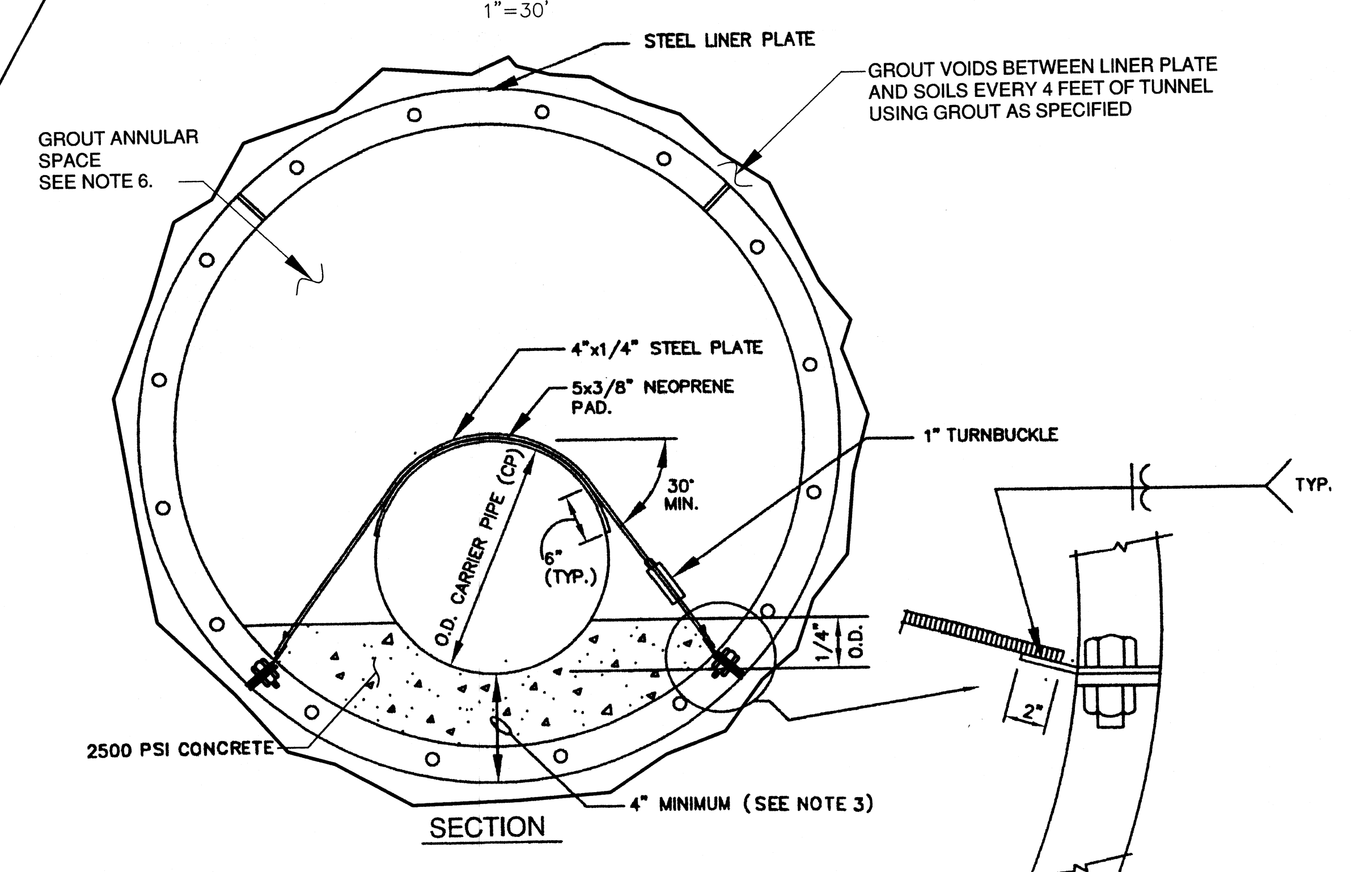
MISCELLANEOUS DETAILS
600' SCALE MAP 47
BLOCK 10, 16, 17, & 18

LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

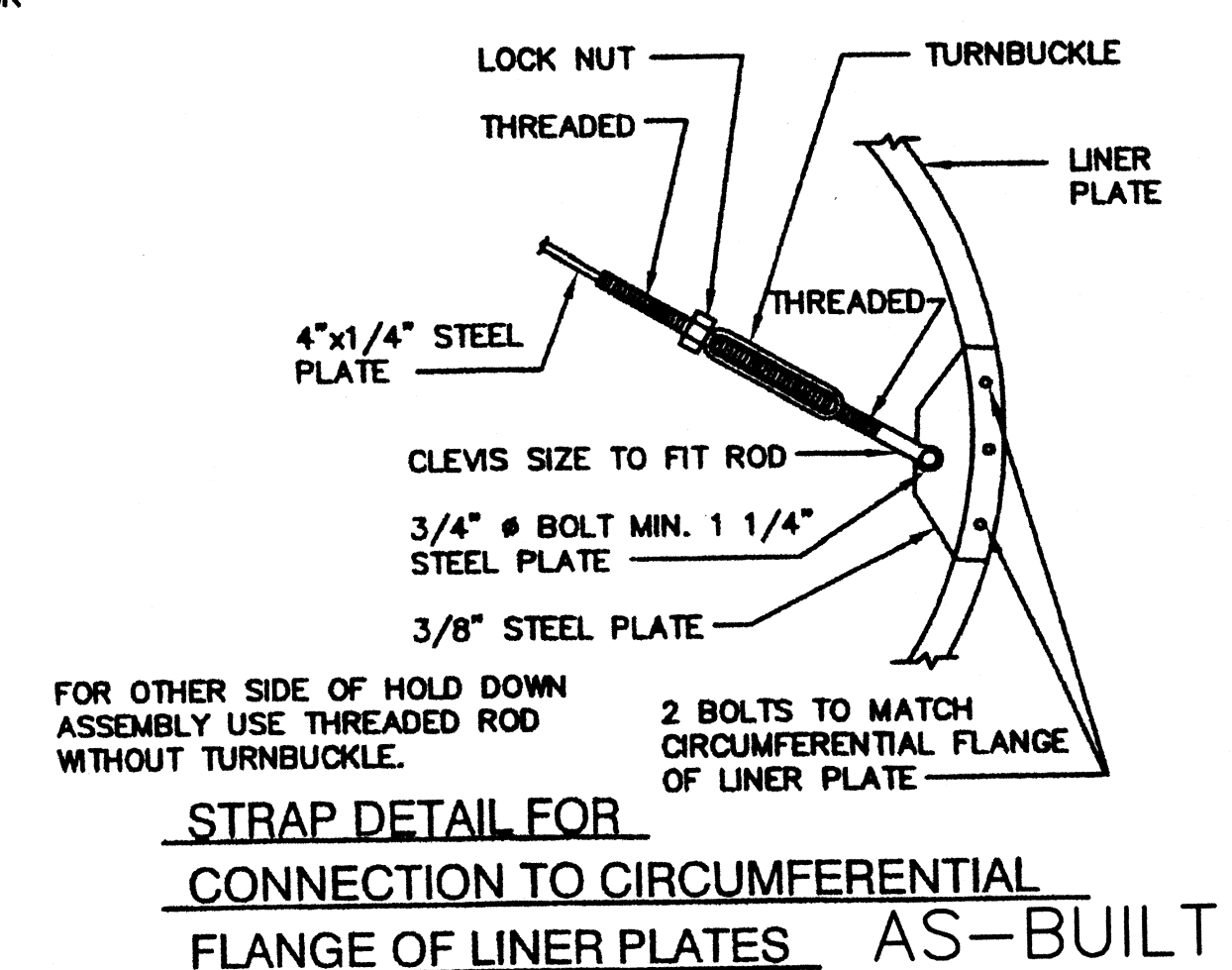
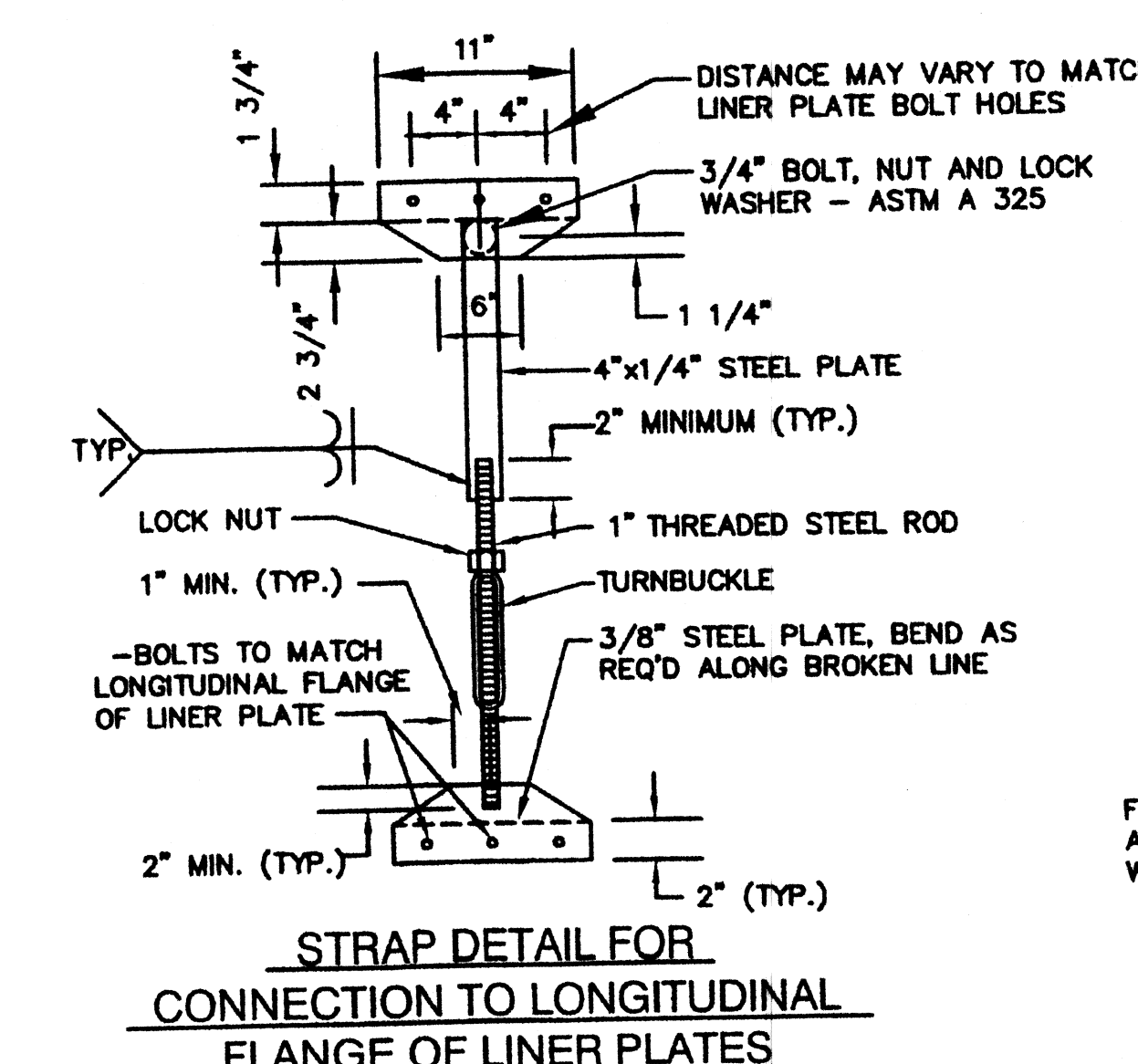
SCALE AS SHOWN
SHEET 9 OF 27



INSTALL SETTLEMENT MARKERS AT INTERVALS OF 25 FEET FROM THE FACE OF THE ACCESS SHAFT TO RECEIVING SHAFT, AND AT 10 AND 20 FEET INTERVALS FROM THE TUNNEL CENTER LINE. SEE SPECIFICATIONS.



- NOTES:**
- ALL STEEL LINER PLATES SHALL CONFORM TO ASTM A1011, ASTM A139 (36,000) AND AASHTO M167.
 - THE MINIMUM THICKNESS OF THE LINER PLATE SHALL BE 12 GAGE (0.1046").
 - CONTRACTOR SHALL PROVIDE MINIMUM 4" OF CONCRETE BETWEEN LINER PLATE AND BOTTOM OF CARRIER PIPE.
 - THE TUNNEL SHALL MEET THE REQUIREMENTS OF THE MARYLAND STATE HIGHWAY ADMINISTRATION MASTER PUBLIC UTILITY PERMIT ISSUED FOR THIS PROJECT.
 - NO WELDING OR CUTTING WILL BE PERMITTED IN THE FIELD.
 - ANNULAR SPACE IN LINER PLATE TUNNEL SHALL BE FILLED W/ GROUT, WITH A MINIMUM COMPRESSIVE STRENGTH OF 100 PSI. AFTER A SUCCESSFUL PRESSURE TEST OF THE CARRIER PIPE.
 - SEE HOWARD COUNTY STD. SPECIFICATION SECTIONS 905, 963, 1000 & 1012.



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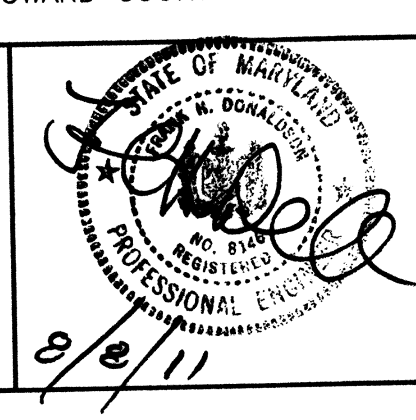
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John C. Chen 12/12/08 *John C. Chen* 12/11/08
DIRECTOR OF PUBLIC WORKS DATE CHIEF, BUREAU OF ENGINEERING DATE

John C. Chen 12/12/08 *John C. Chen* 12/11/08
CHIEF, BUREAU OF UTILITIES DATE CHIEF, UTILITY DESIGN DIVISION DATE

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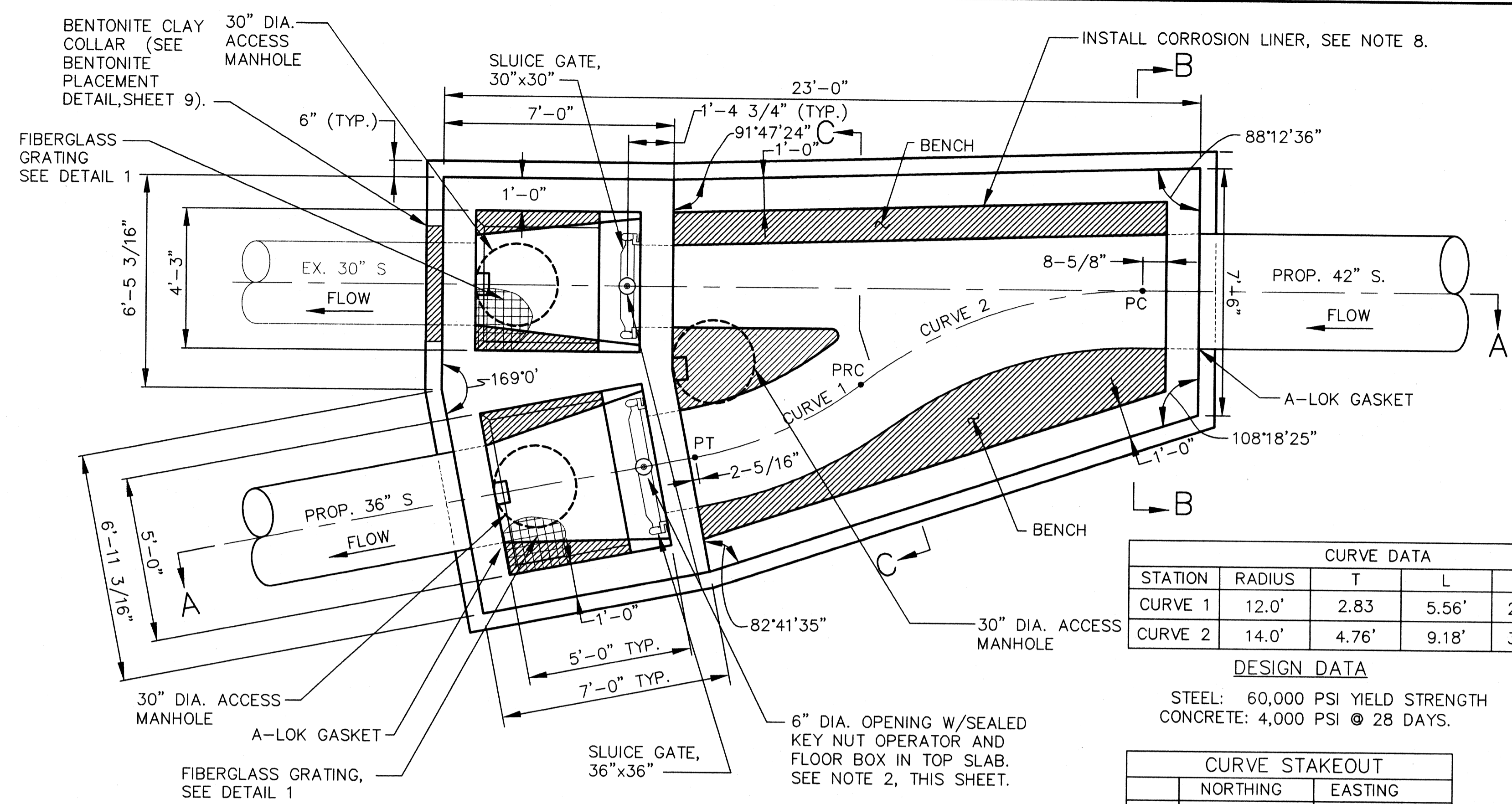


DES:	C.H.			
DRN:	K.L.B.			
CHK:	G.C.L.			
DATE:	DECEMBER, 2008	BY:	NO.	REVISION

TUNNEL PLAN AND DETAILS
600' SCALE MAP 47 BLOCK 10, 16, 17, & 18

LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 10 OF 27

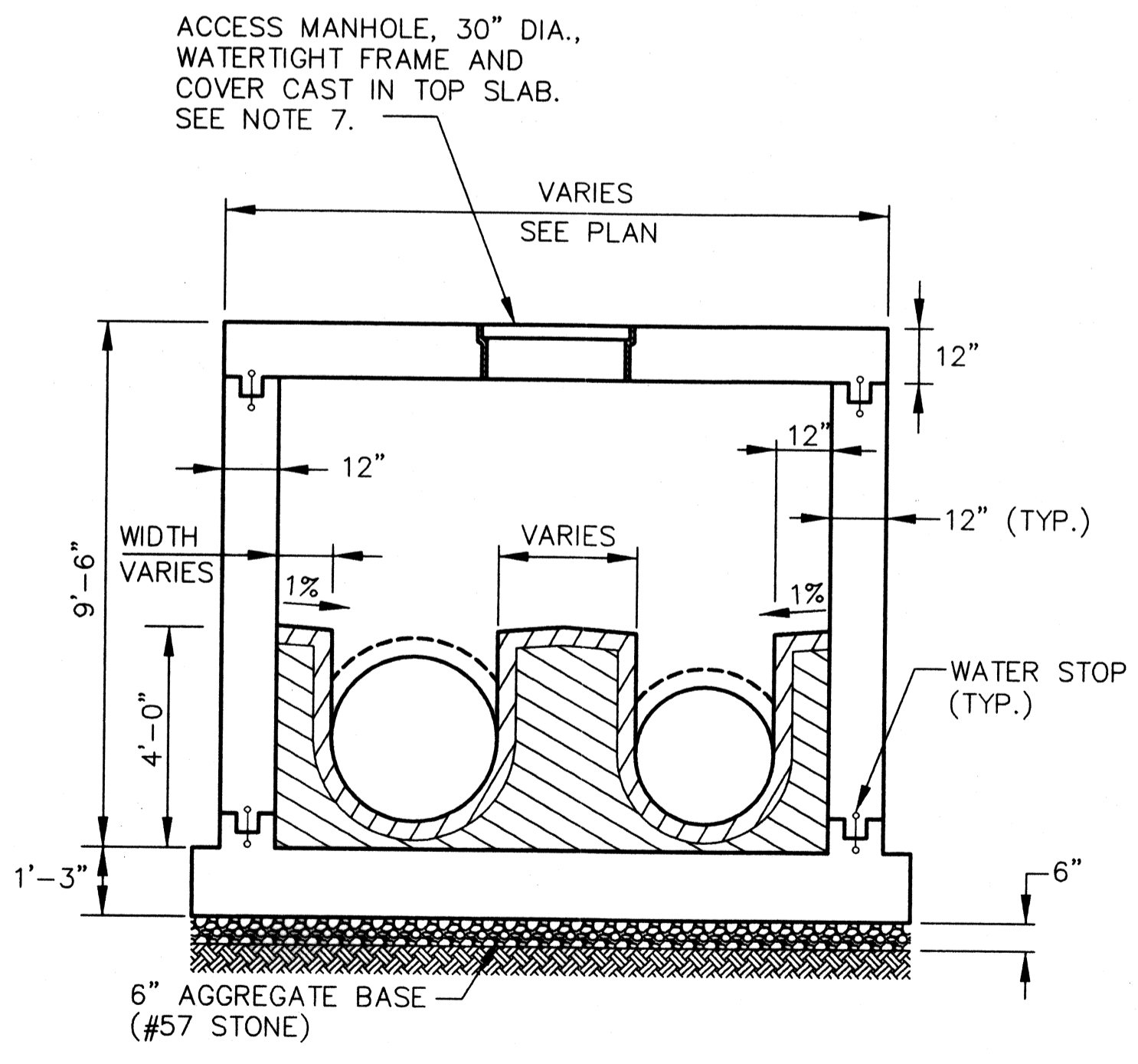
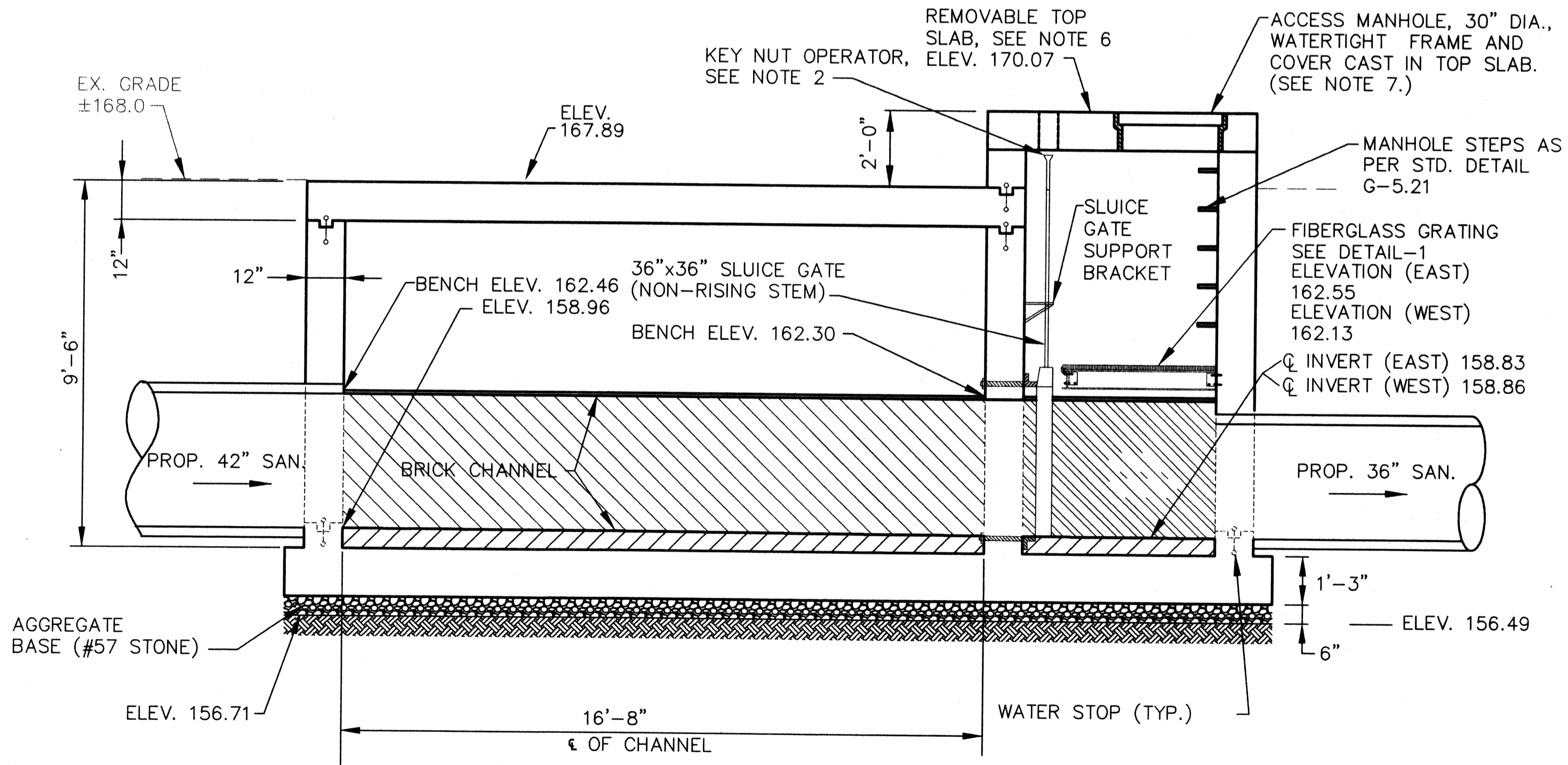
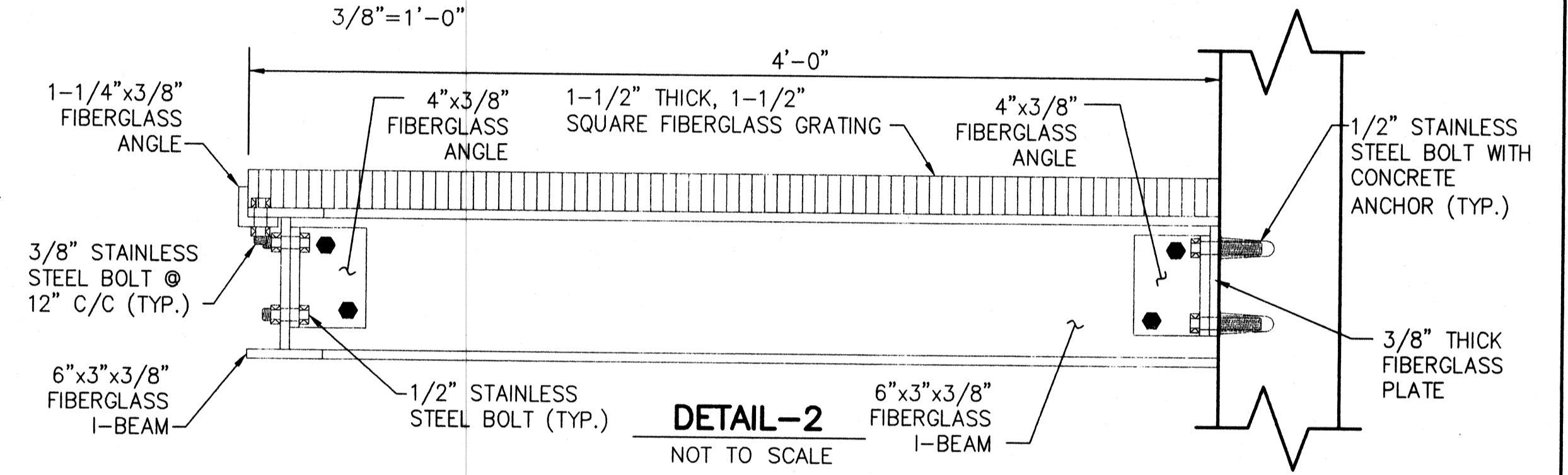
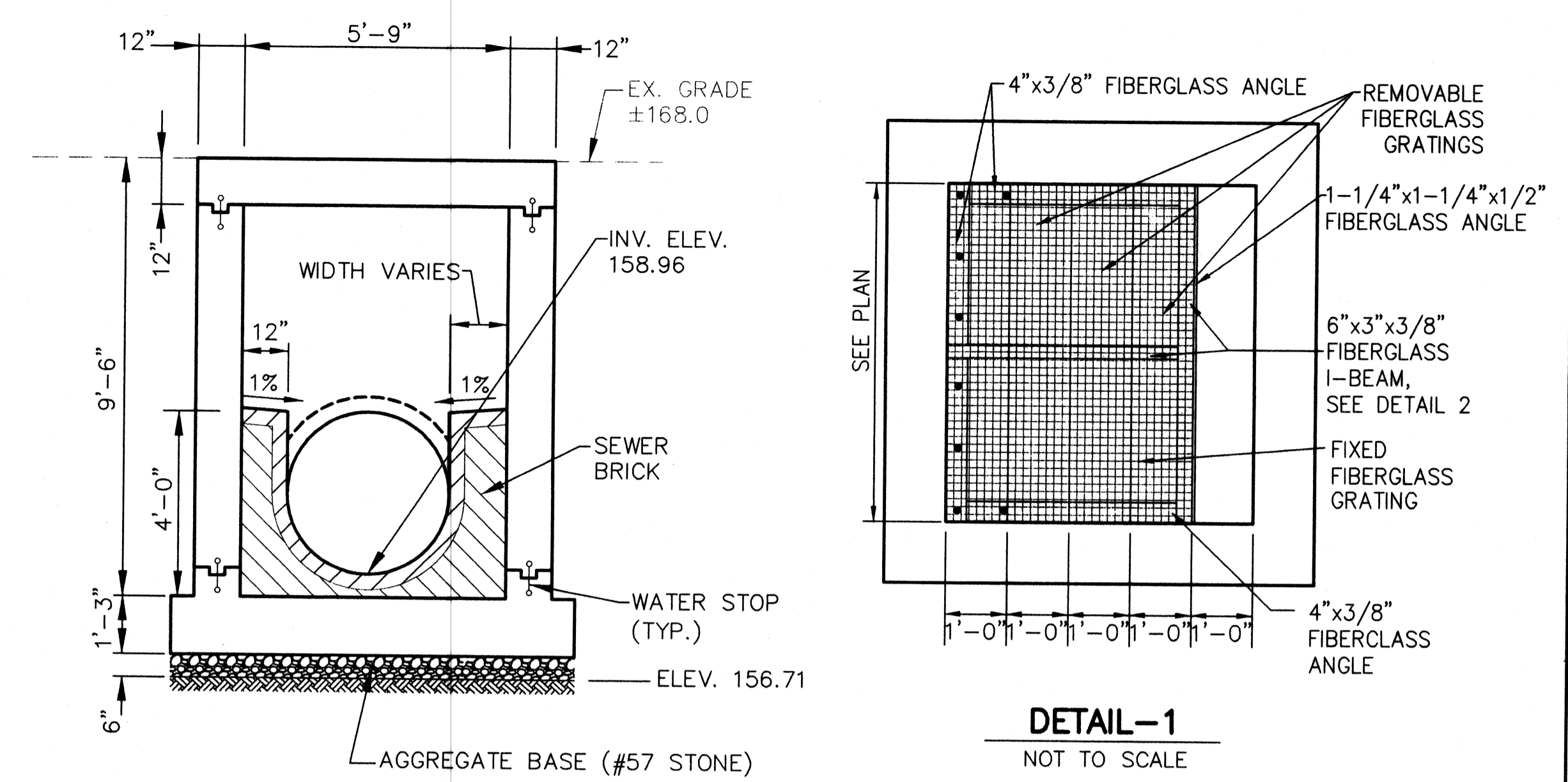


PLAN
3/8"=1'-0"

CURVE DATA				
STATION	RADIUS	T	L	Δ
CURVE 1	12.0'	2.83	5.56'	26°-35'-18"
CURVE 2	14.0'	4.76'	9.18'	37°-35'-18"

DESIGN DATA
STEEL: 60,000 PSI YIELD STRENGTH
CONCRETE: 4,000 PSI @ 28 DAYS.

CURVE STAKEOUT	
PT	NORTHING 534713.05 EASTING 1360319.50
PRC	NORTHING 534711.69 EASTING 1360314.14
PC	NORTHING 534710.35 EASTING 1360305.22



- NOTES:**
- SEE SHEETS 23 AND 24 FOR GRAVITY BYPASS DETAILS.
 - GROUND LEVEL POSITION INDICATOR SHALL BE A SEALED UNIT WITH A STAINLESS STEEL FLOOR BOX. KEY NUT OPERATOR AND OPERATOR AND POSITION INDICATOR SHALL BE GPI-S SERIES AS MANUFACTURED BY DYNATORQUE, INC., OR APPROVED EQUAL.
 - FOR STRUCTURAL DETAILS SEE SHEET 12.
 - A-LOK GASKETS SHALL BE USED AT PIPE ENTRY/EXIT POINTS OF THE DIVERSION STRUCTURE, WHERE INDICATED ON DRAWINGS.
 - SLUICE GATES SHALL BE FONTAINE SERIES 20 MODEL 202-WALL MOUNTED (COMPLETED WITH WALL THIMBLE) AND NON-RISING STEM (NR1) OR APPROVED EQUAL.
 - TOP SLABS ABOVE SLUICE GATES SHALL BE REMOVABLE. LIFT HOOKS SHALL BE INSTALLED IN TOP SLABS, SEE DETAIL 2 SHEET 12. JOINT BETWEEN TOP SLAB AND WALLS SHALL BE SEALED WITH A BITUMINOUS MASTIC OR EQUIVALENT.
 - MANHOLE FRAME AND COVER SHALL BE PER MODEL B-6077 SOLID LID, FURNISHED BOLTED DOWN AND WATERTIGHT, AS MANUFACTURED BY BARRY PATTERN AND FOUNDRY OR APPROVED EQUAL. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF THE FRAME AND COVER FOR APPROVAL.
 - CONTRACTOR SHALL LINE THE INTERIOR OF THE STRUCTURE WITH T-LOCK CORROSION LINER AS MANUFACTURED BY AMERON INTERNATIONAL, OR APPROVED EQUAL.

PROFESSIONAL CERTIFICATION
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

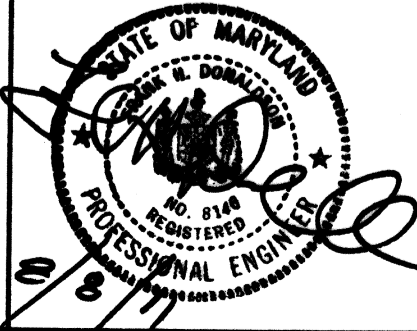
Joseph M. Beck 12/12/08
DIRECTOR OF PUBLIC WORKS DATE CHIEF, BUREAU OF ENGINEERING

Stake C. Ben 12/12/08
CHIEF, BUREAU OF UTILITIES DATE CHIEF, UTILITY DESIGN DIVISION

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DRN:	K.L.B.		
CHK:	G.C.L.		
BY:	R.J.C.	AS-BUILT	12/10
NO.:			
REVISION:			
DATE:			

DIVERSION STRUCTURE
PLAN & SECTIONS

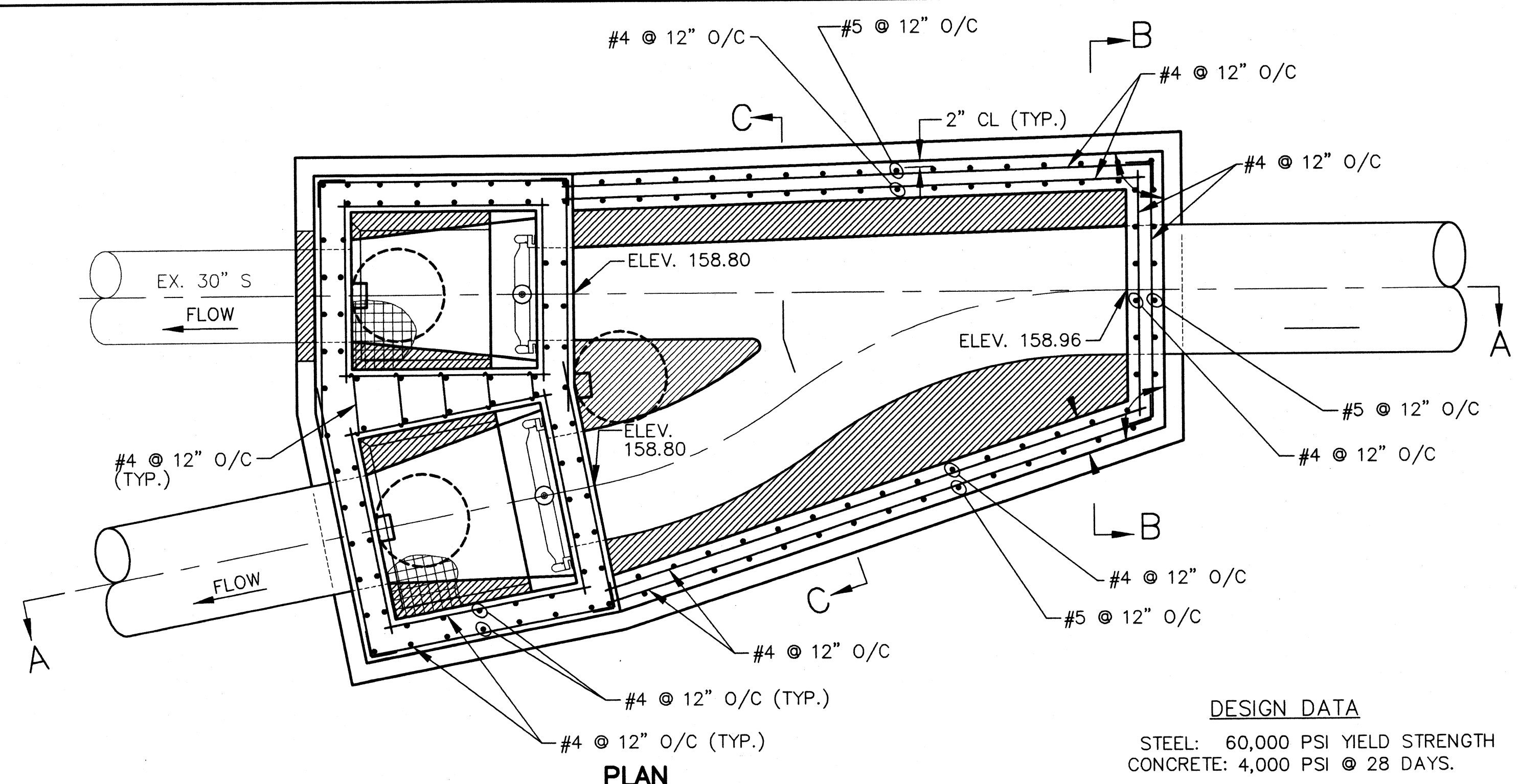
600' SCALE MAP 47 BLOCK 10, 16, 17, & 18

AS-BUILT

LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 11 OF 22

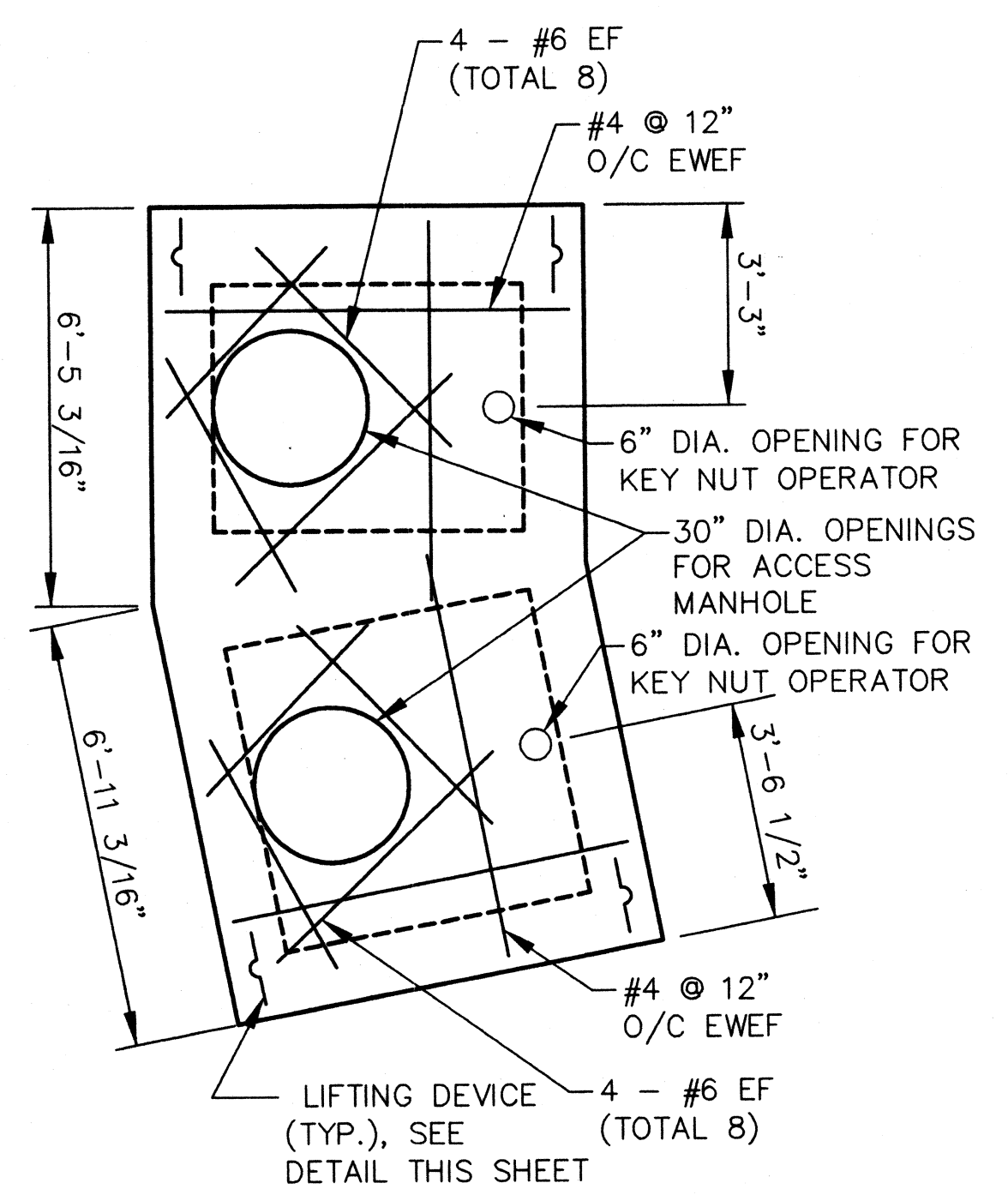


PLAN

3/8"=1'-0"

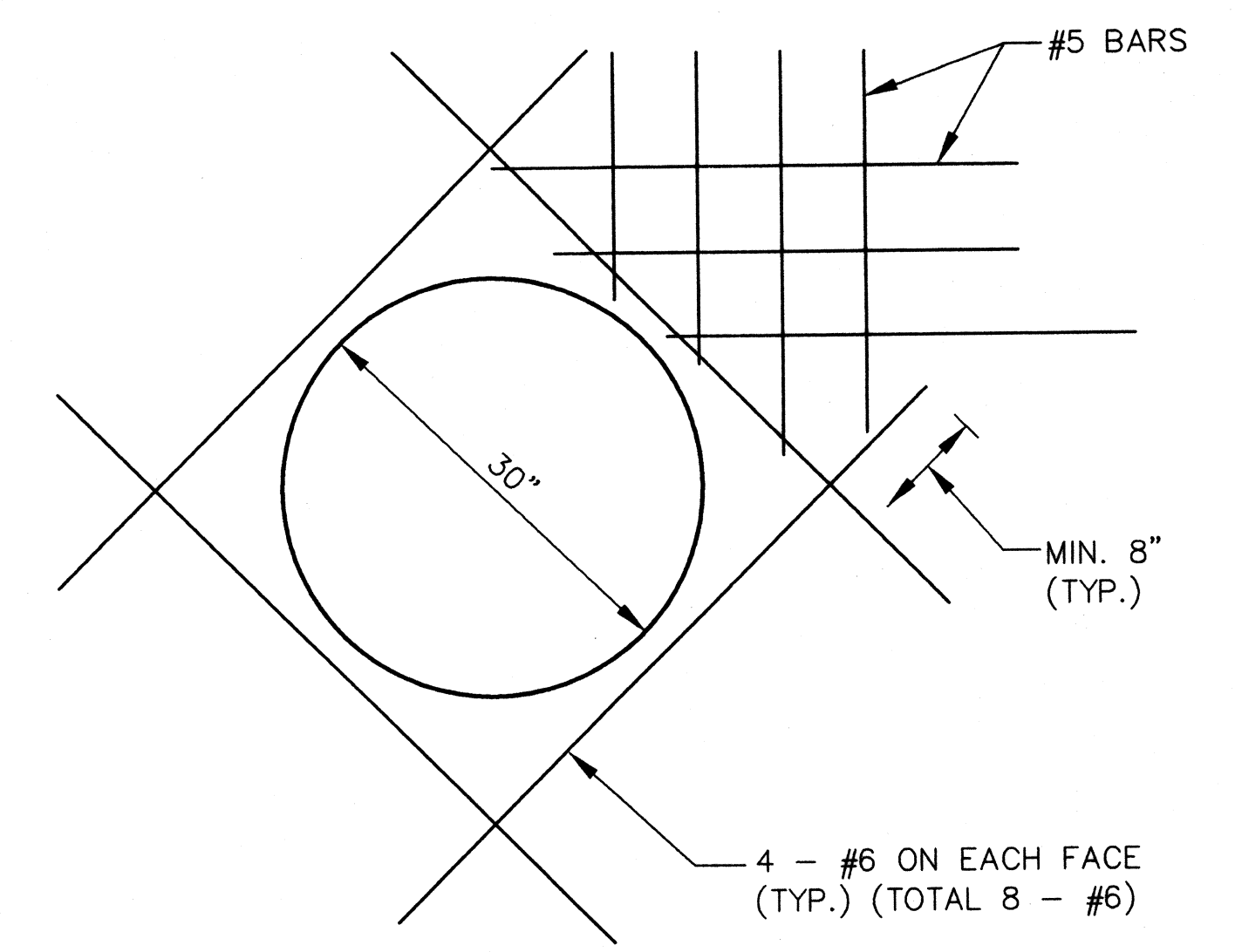
DESIGN DATA

STEEL: 60,000 PSI YIELD STRENGTH
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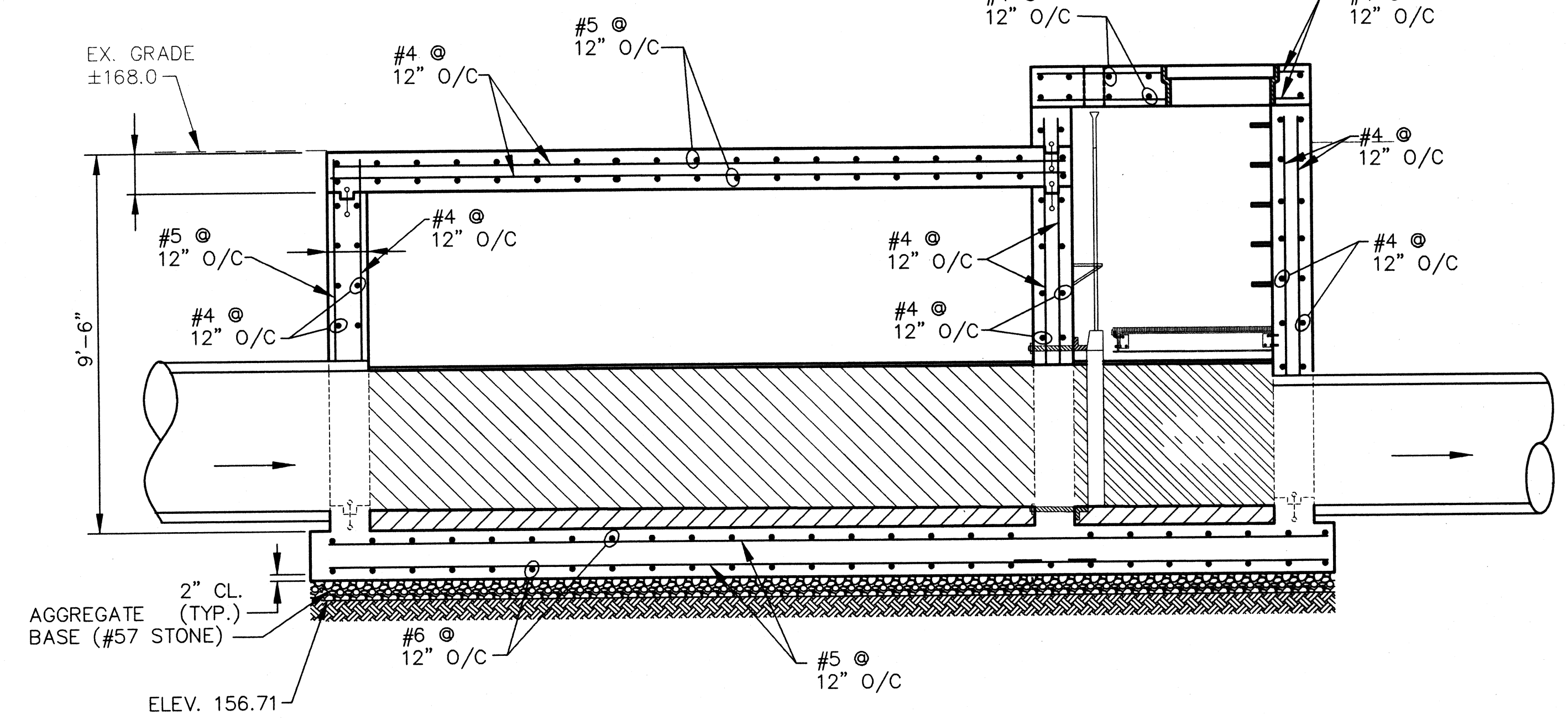
PLAN - REMOVABLE TOP SLAB

3/8"=1'-0"



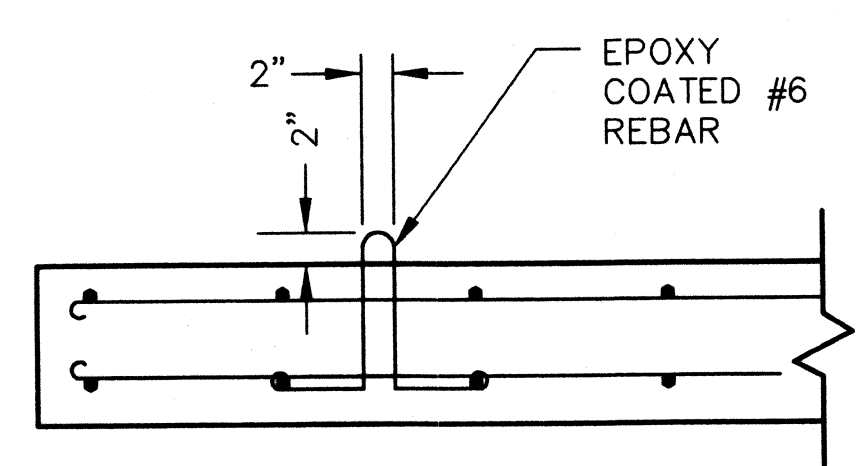
DETAIL 3 - MANHOLE OPENING

NOT TO SCALE



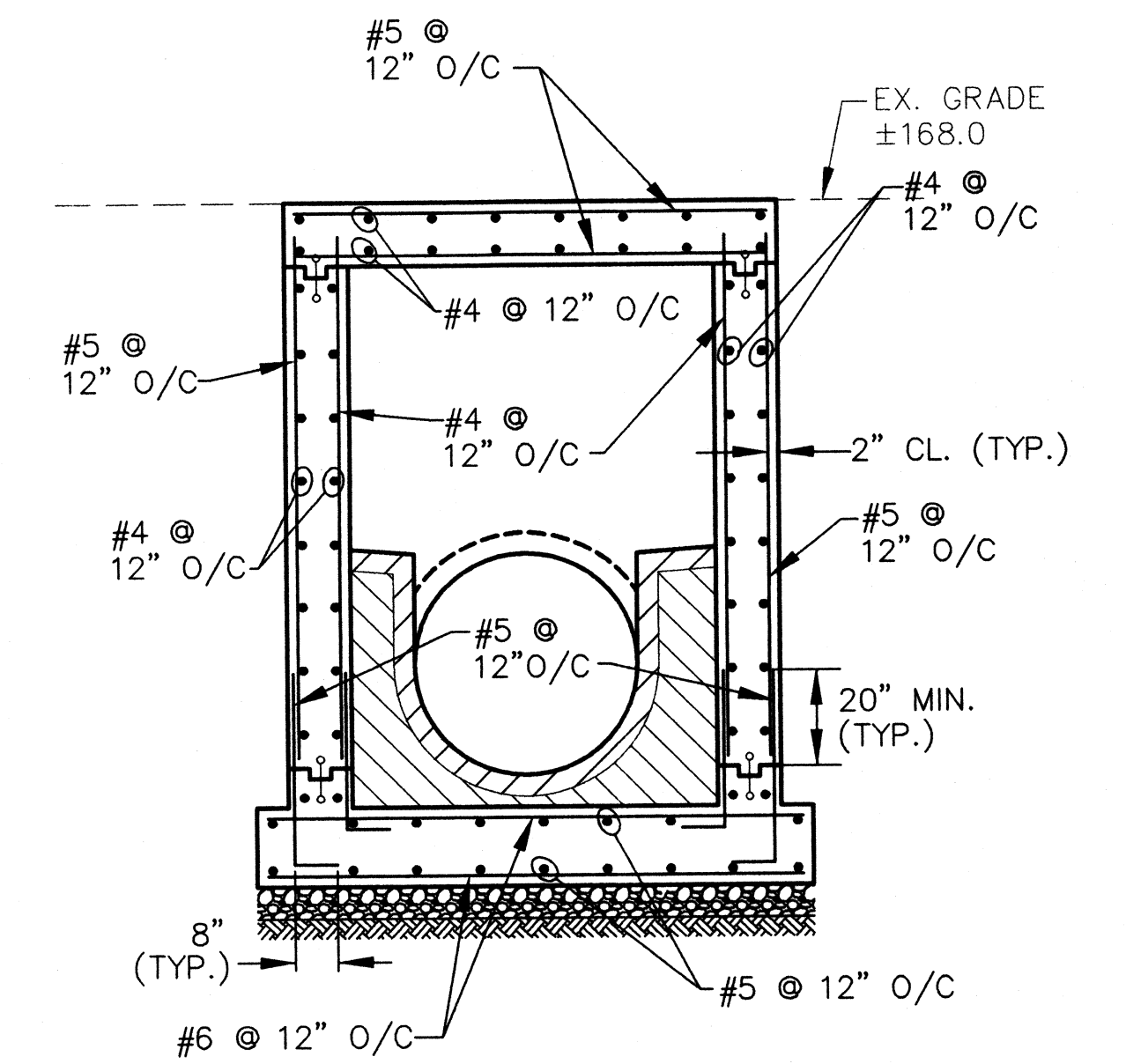
SECTION A-A

3/8"=1'-0"



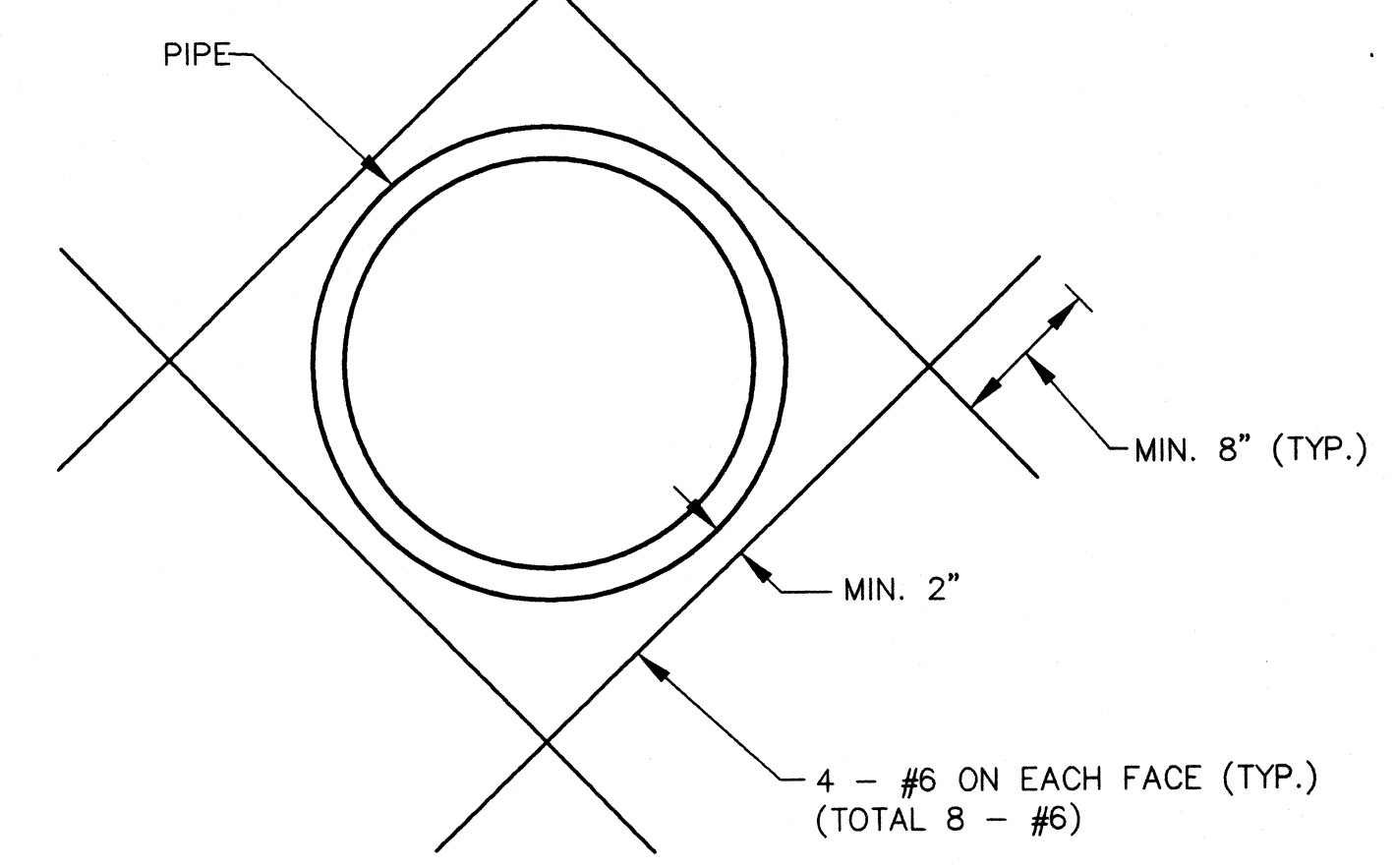
DETAIL 2 - LIFTING DEVICE

NOT TO SCALE



SECTION B-B

3/8"=1'-0"

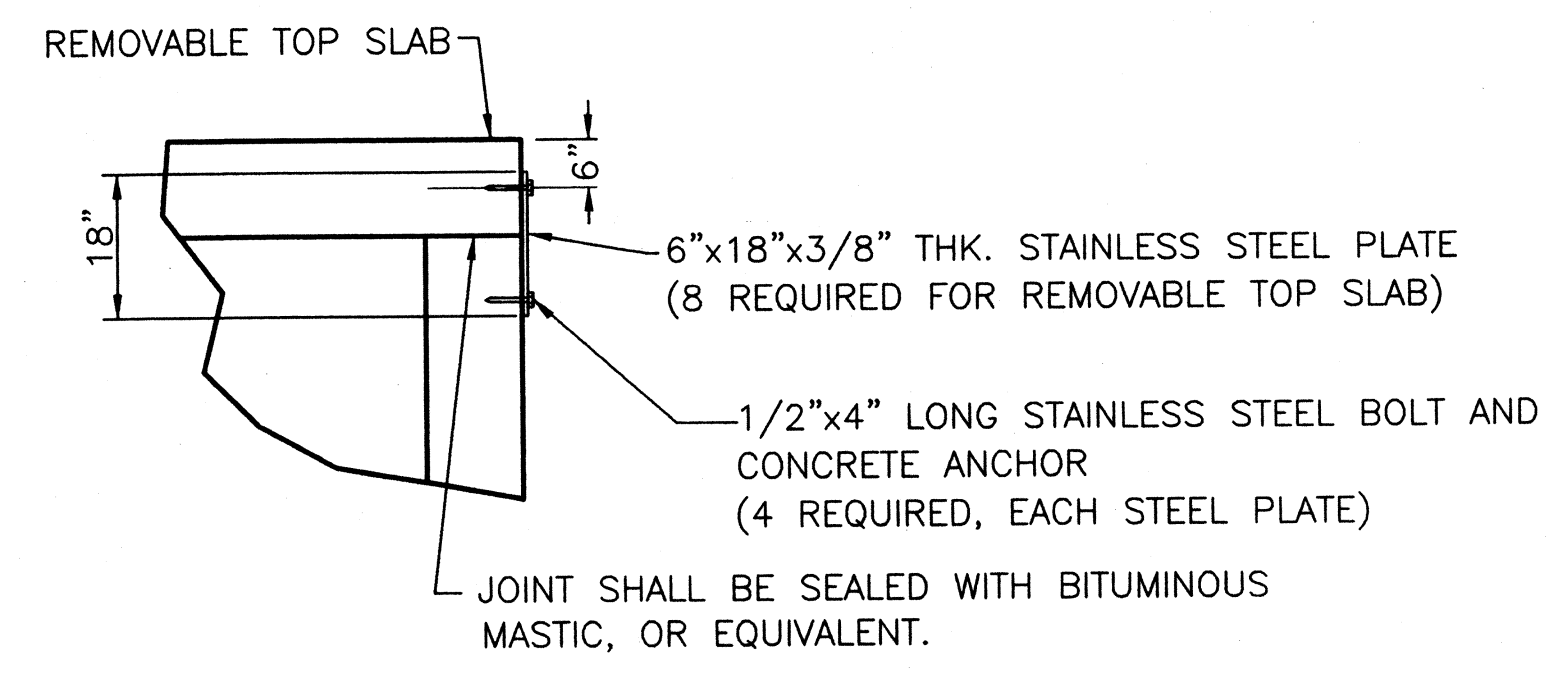


DETAIL 1 - PIPE OPENING IN WALL

NOT TO SCALE

NOTES:

- 1.) CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 4,000 psi @ 28 DAYS.
- 2.) STEEL SHALL HAVE A YIELD STRENGTH OF 60,000 psi.
- 3.) STEEL REINFORCING SHALL HAVE A MINIMUM CLEARANCE OF 2" AND SHALL CONFORM TO ASTM A615, GRADE 60.
- 4.) LAP LENGTH SHALL HAVE BE A MINIMUM OF 20".



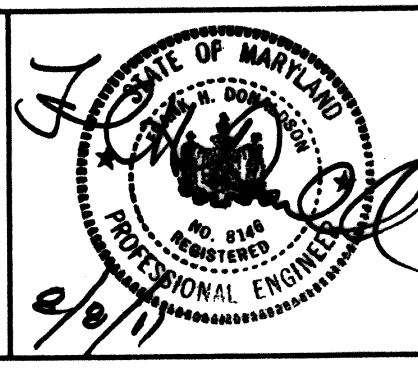
CONNECTION DETAIL

NOT TO SCALE

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. 8146 EXPIRATION DATE: 10/8/11

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Director of Public Works: *John B. ...* DATE: 12/12/08
 Chief, Bureau of Engineering: *Paul J. ...* DATE: 12/11/08
 Chief, Bureau of Utilities: *Stacy C. ...* DATE: 12/11/08

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 Engineers, Surveyors, Planners, Landscape Architects.
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 Columbia, MD 21045
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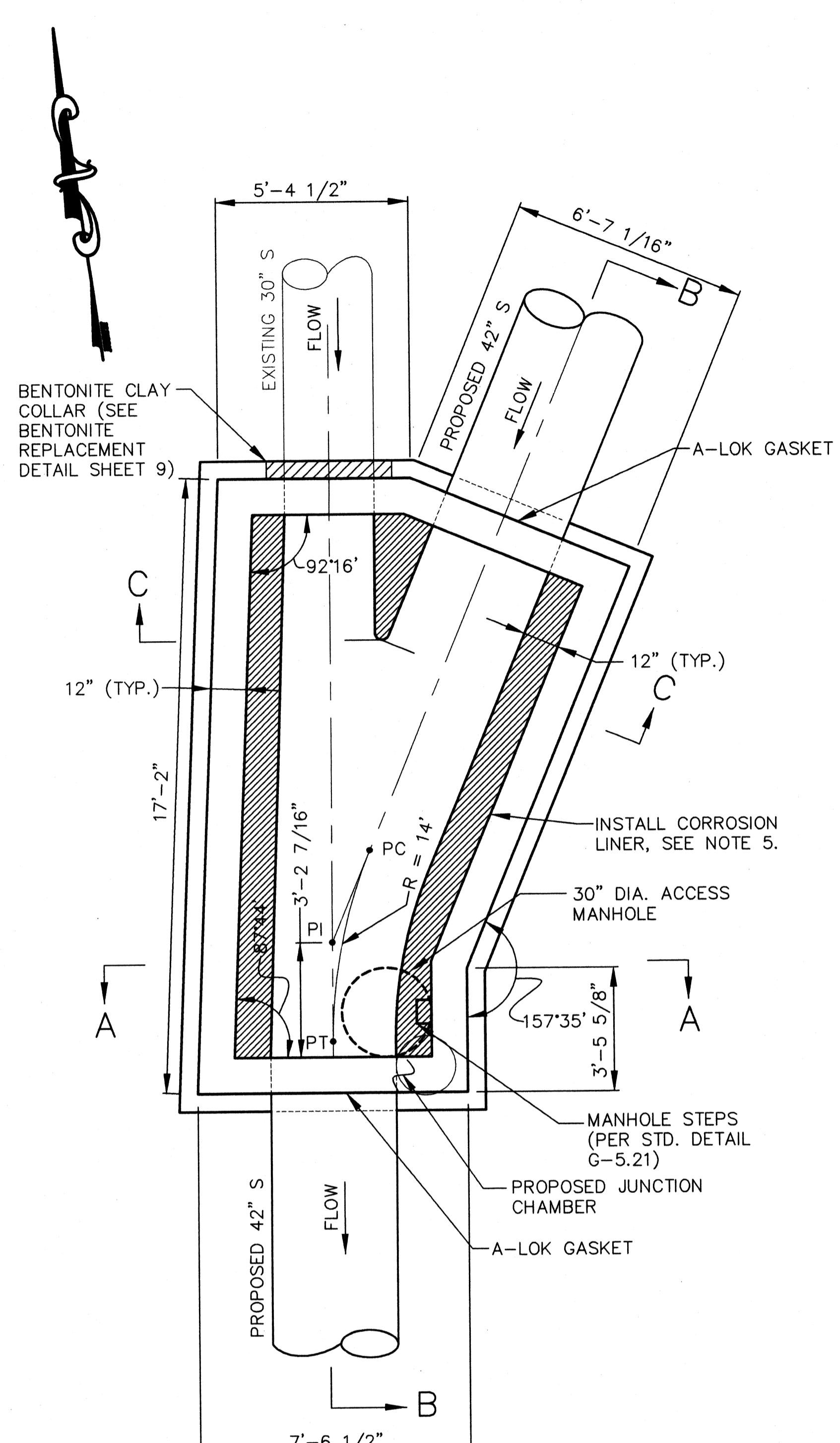
DES: C.H.				
DRN: K.L.B.				
CHK: G.C.L.				
R.J.C.	AS-BUILT	12/10		
DECEMBER, 2008	BY NO.	REVISION	DATE	

DIVERSION STRUCTURE
 STRUCTURAL DETAILS
 600' SCALE MAP 47 BLOCK 10, 16, 17, & 18

LITTLE PATUXENT
 PARALLEL INTERCEPTOR SEWER
 CAPITAL PROJECT S-6175
 CONTRACT NO. 20-4532
 1ST ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

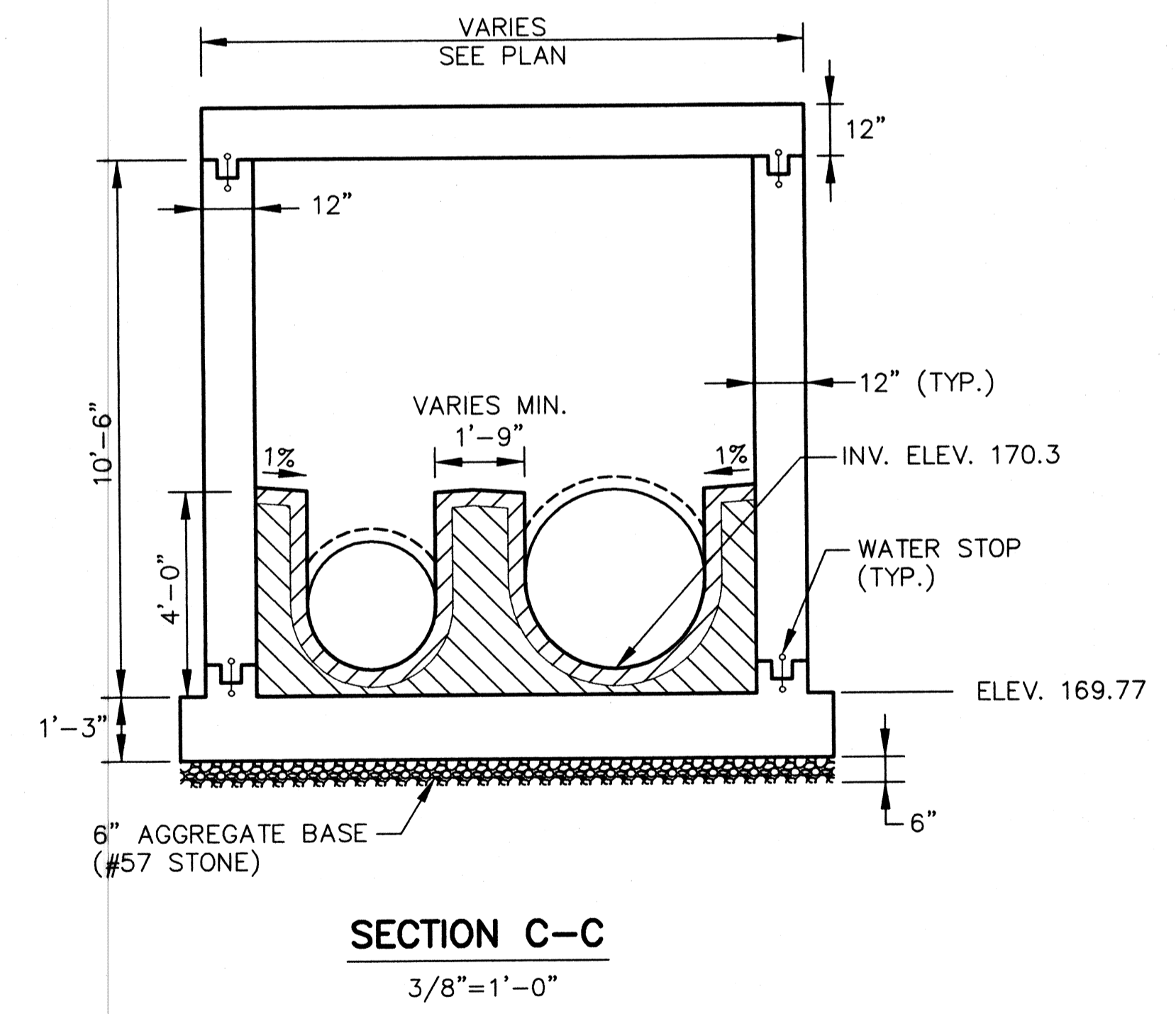
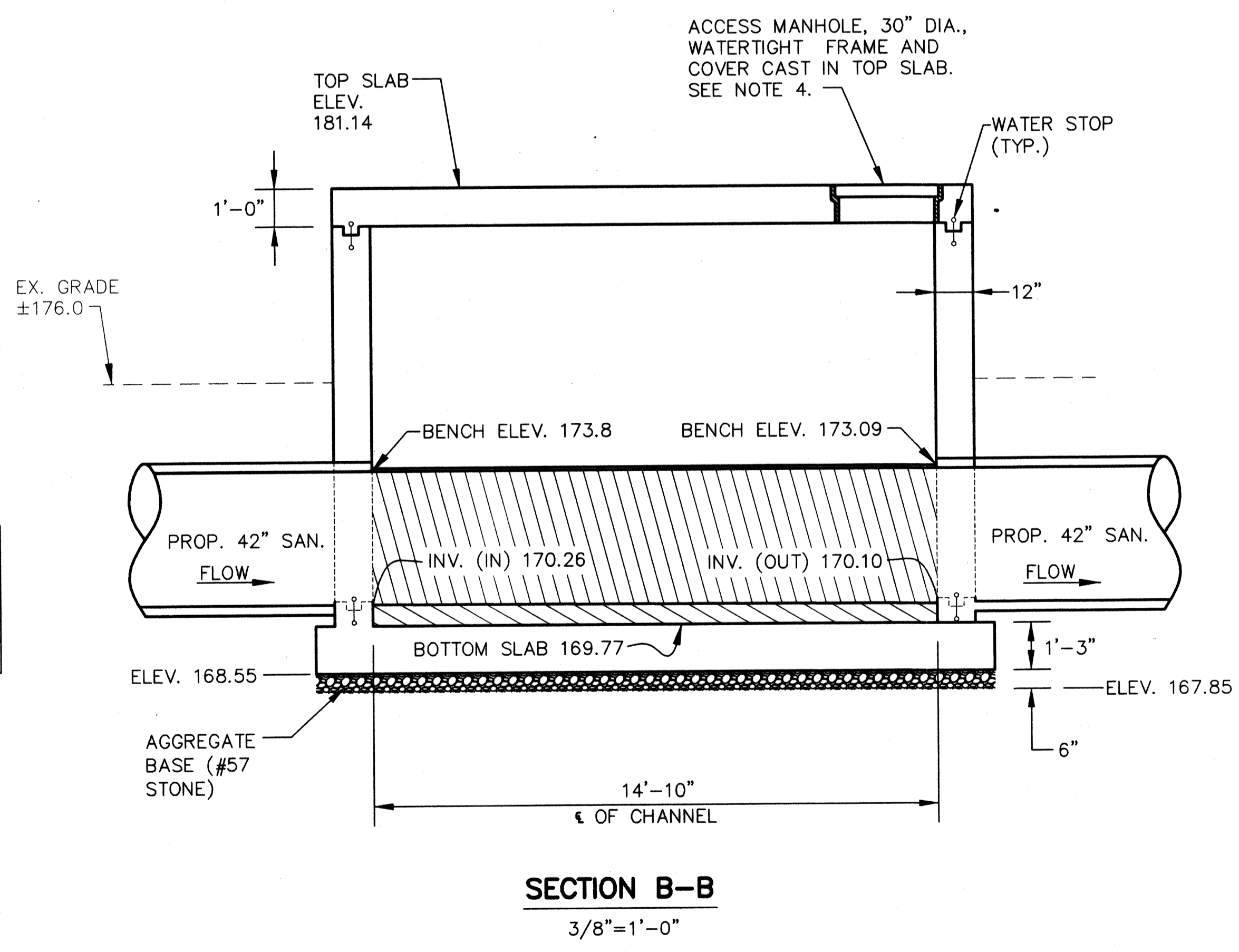
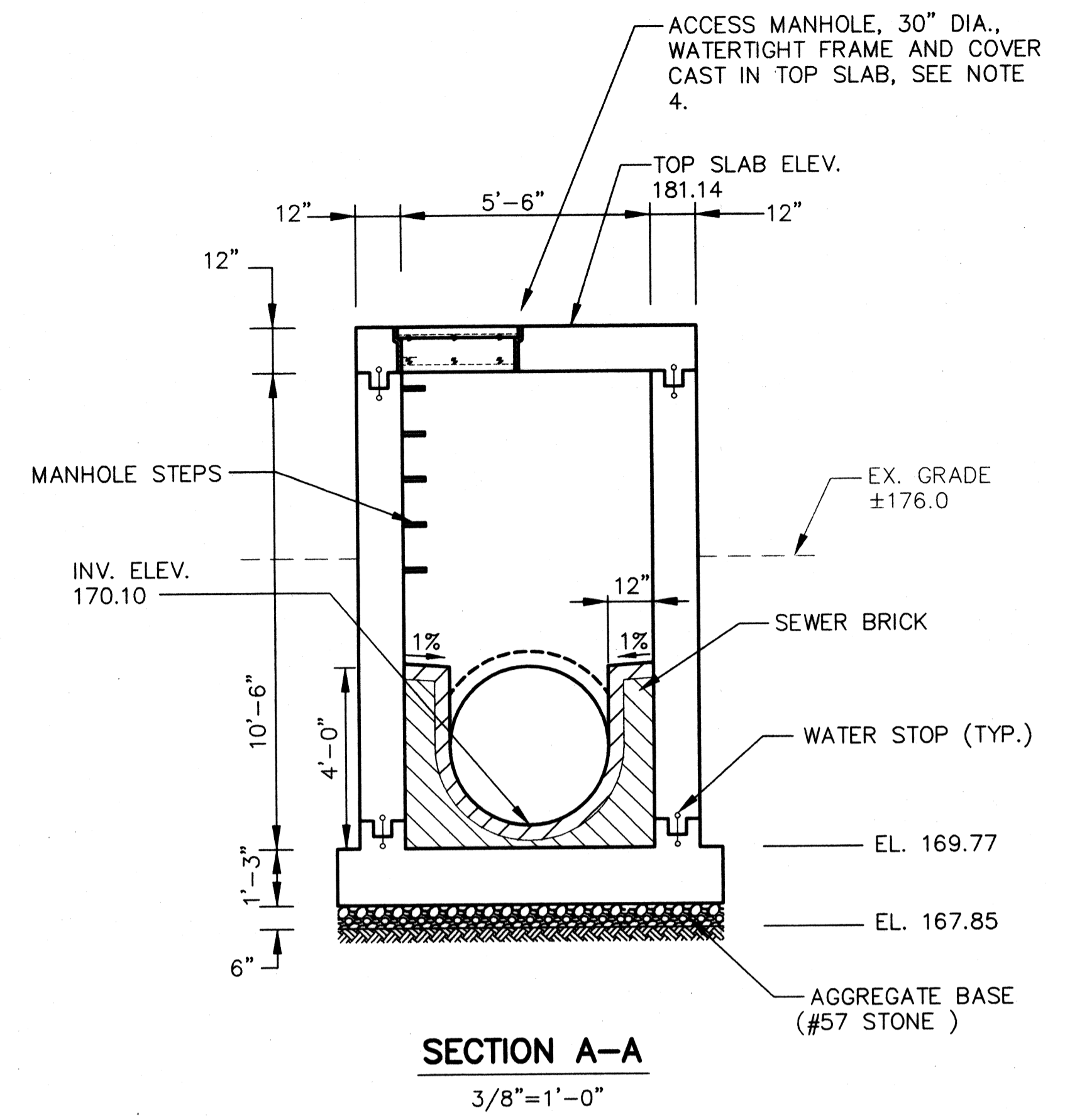
SCALE AS SHOWN
 SHEET 12 OF 27

AS-BUILT



CURVE DATA				
STATION	RADIUS	TANGENT	LENGTH	INCLUDED ANGLE
CURVE 1	14.0'	2.77'	5.44'	22°24'41"

CURVE STAKEOUT		
	NORTHING	EASTING
PT	N 534493.39	E 1364185.94
PI	N 534594.60	E 1363954.45
PC	N 534573.16	E 1363691.36



- NOTES:**
- SEE SHEETS 23 AND 24 FOR GRAVITY BYPASS DETAILS.
 - FOR STRUCTURAL DETAILS SEE SHEET 14.
 - A-A LOK GASKETS SHALL BE USED AT PIPE ENTRY/EXIT POINTS OF THE DIVERSION STRUCTURE, WHERE INDICATED ON DRAWINGS.
 - MANHOLE FRAME AND COVER SHALL BE PER MODEL B-6077 SOLID LID, FURNISHED BOLTED DOWN AND WATERTIGHT, AS MANUFACTURED BY BARRY PATTERN AND FOUNDRY OR APPROVED EQUAL. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF THE FRAME AND COVER FOR APPROVAL.
 - CONTRACTOR SHALL LINE THE INTERIOR OF THE STRUCTURE WITH T-LOCK CORROSION LINER AS MANUFACTURED BY AMERON INTERNATIONAL, OR APPROVED EQUAL.

PROFESSIONAL CERTIFICATION

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

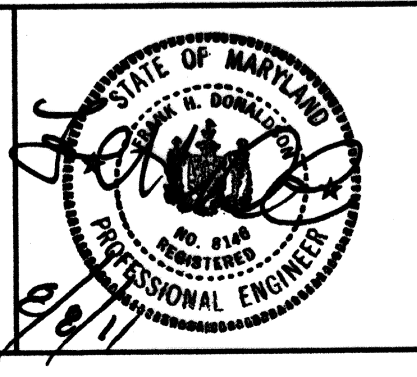
12/16/08
12/16/08

12/11/08

12/11/08

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DES: C.H.			
DRN: K.L.B.			
CHK: G.C.L.			
R.J.C.	AS-BUILT	12/10	
BY NO.	REVISION	DATE	

JUNCTION CHAMBER
PLAN & SECTIONS

600' SCALE MAP 47

BLOCK 10, 16, 17, & 18

AS-BUILT

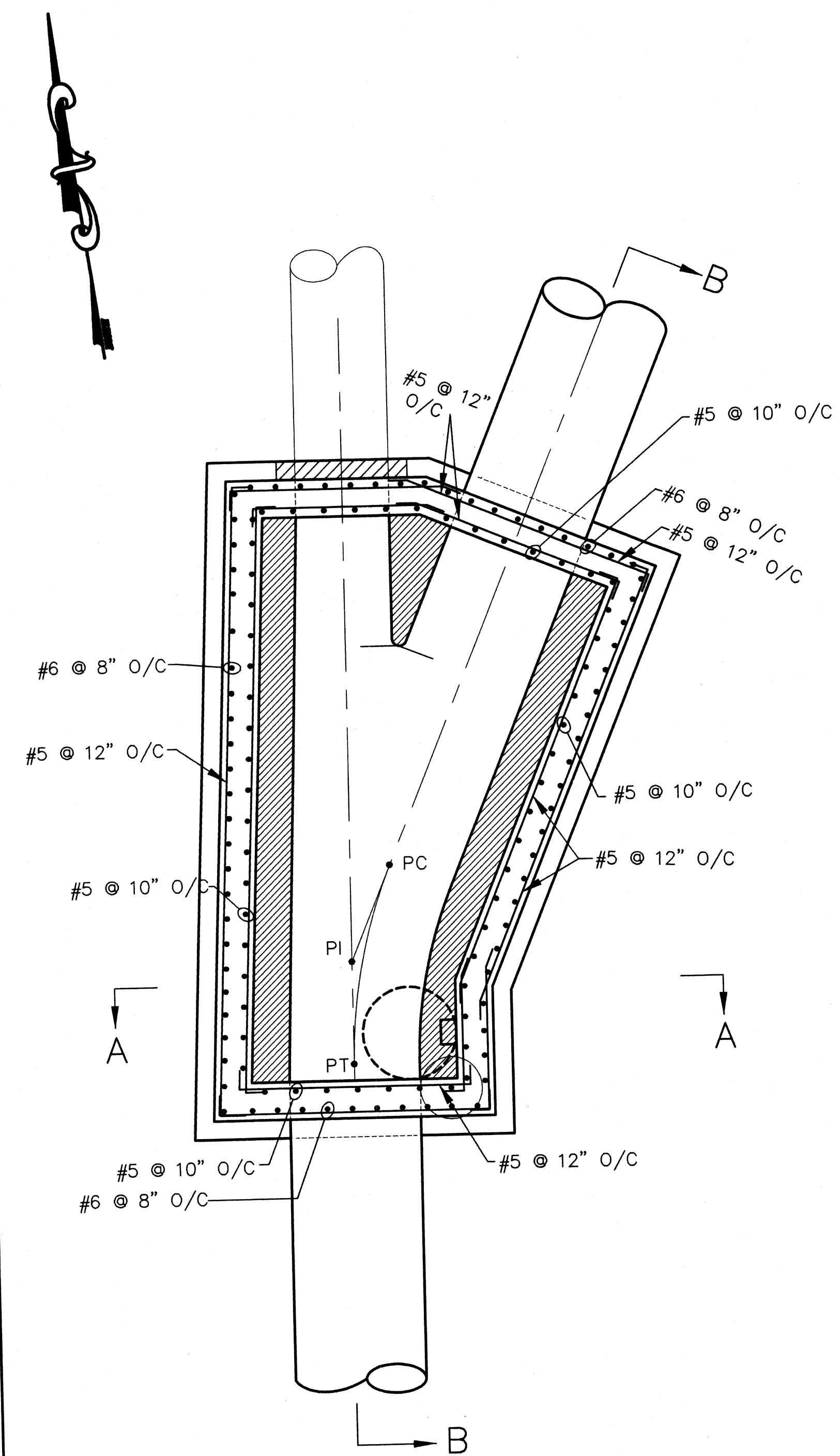
LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

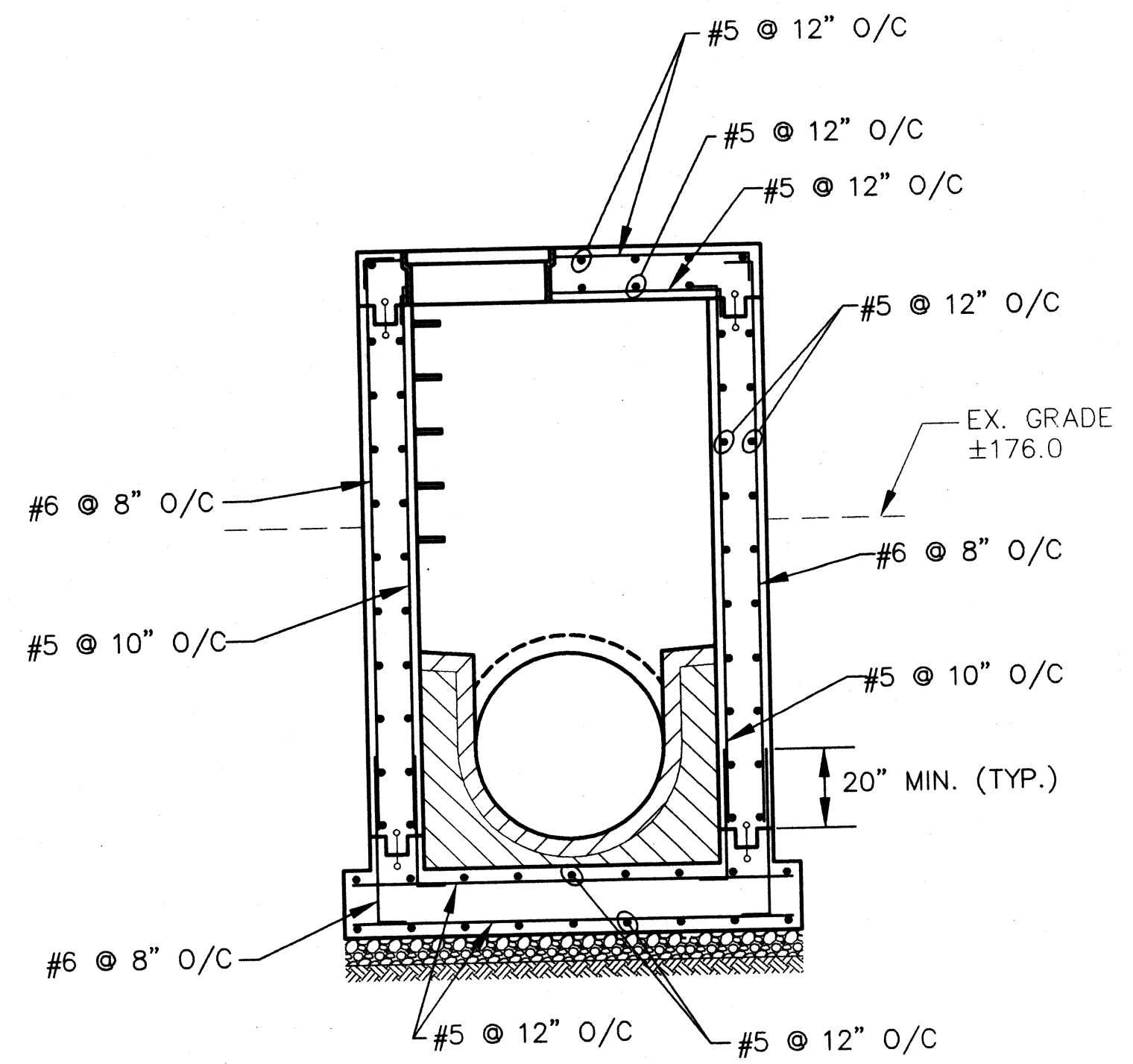
SHEET 13 OF 27

NOTES:

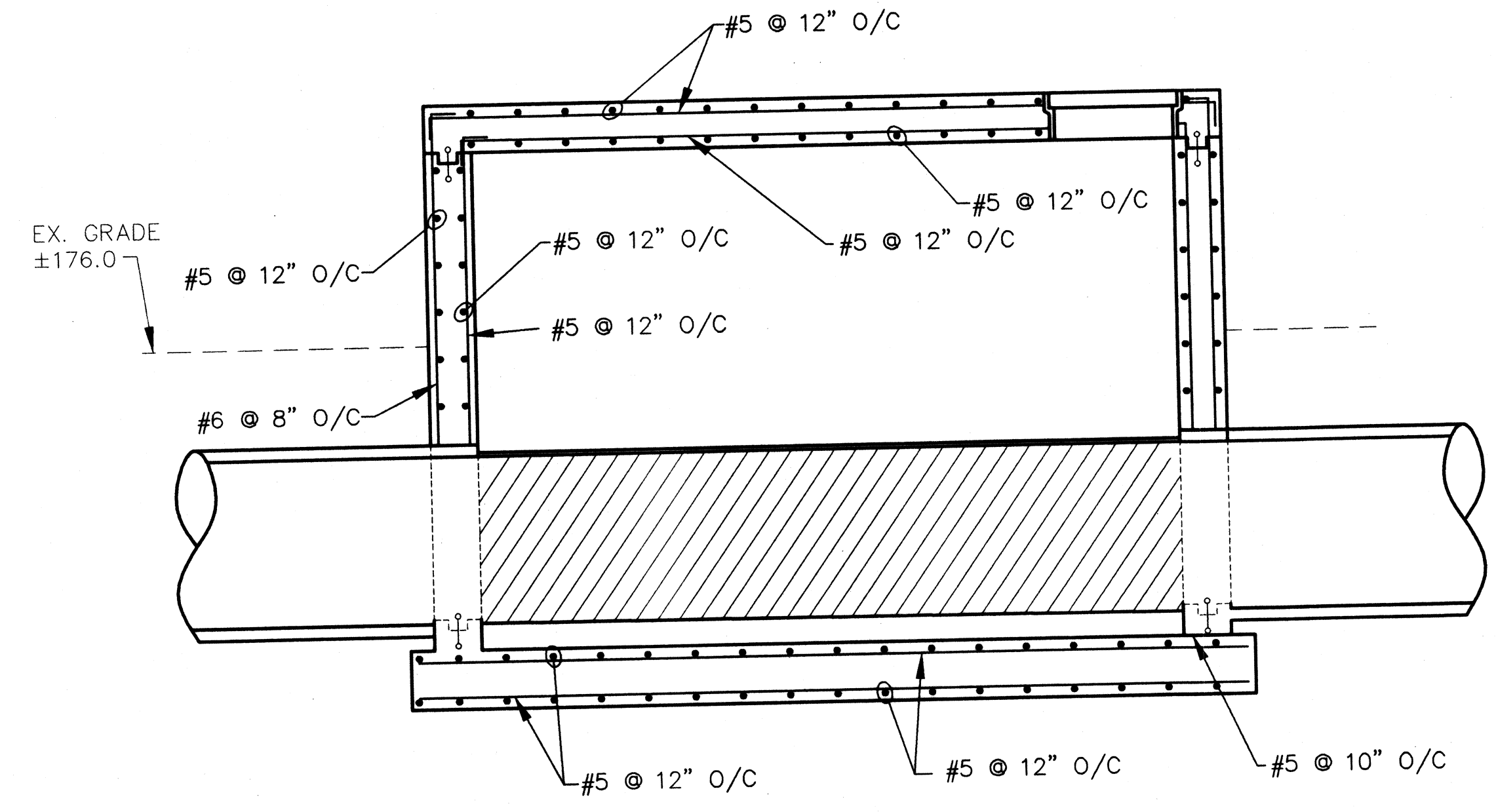
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2. STEEL SHALL HAVE A YIELD STRENGTH OF 60,000 psi.
3. STEEL REINFORCING SHALL HAVE A MINIMUM CLEARANCE OF 2" AND SHALL CONFORM TO ASTM A615, GRADE 60.
4. LAP LENGTH SHALL BE A MINIMUM OF 24".



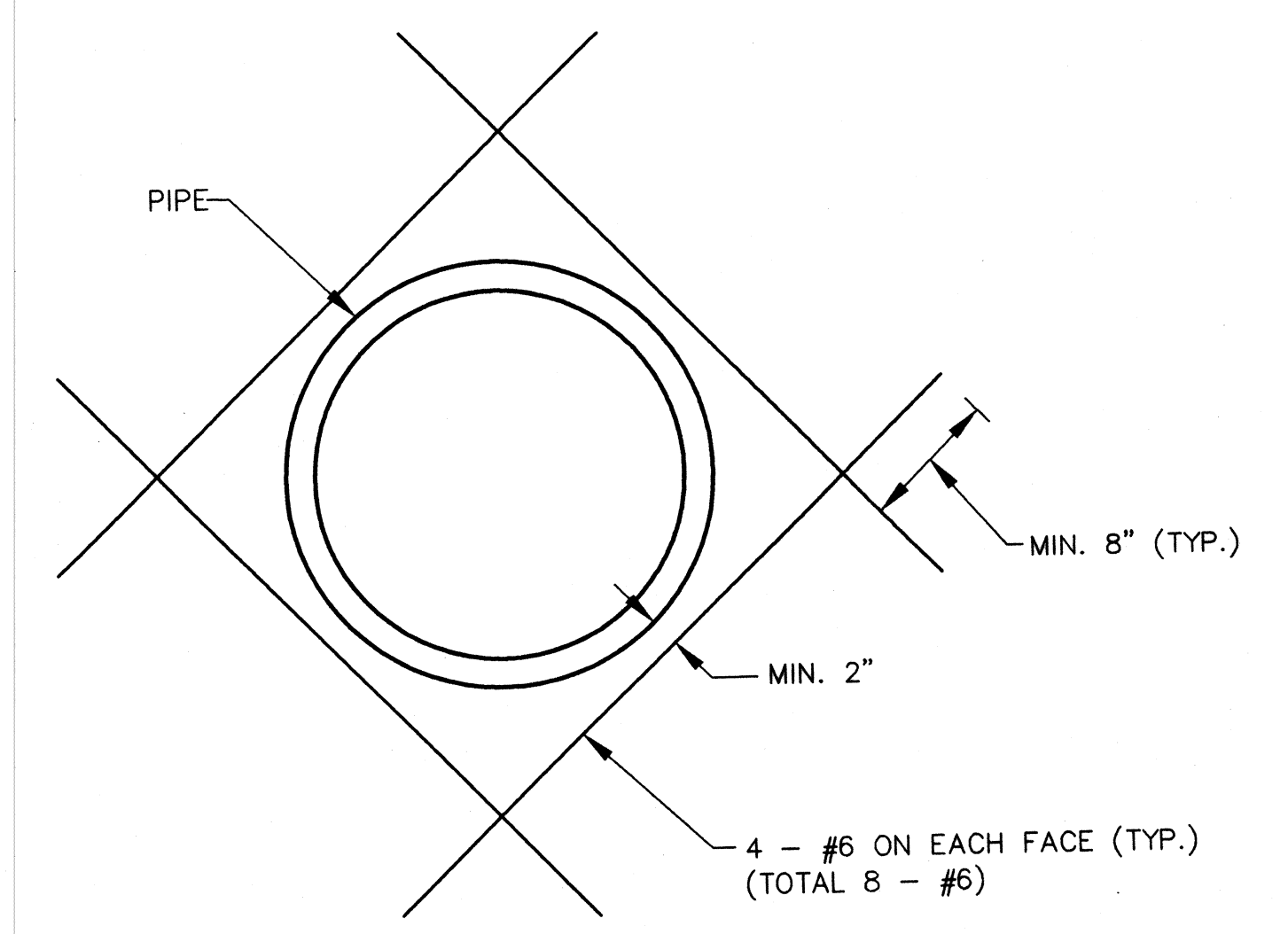
PLAN
3/8"=1'-0"



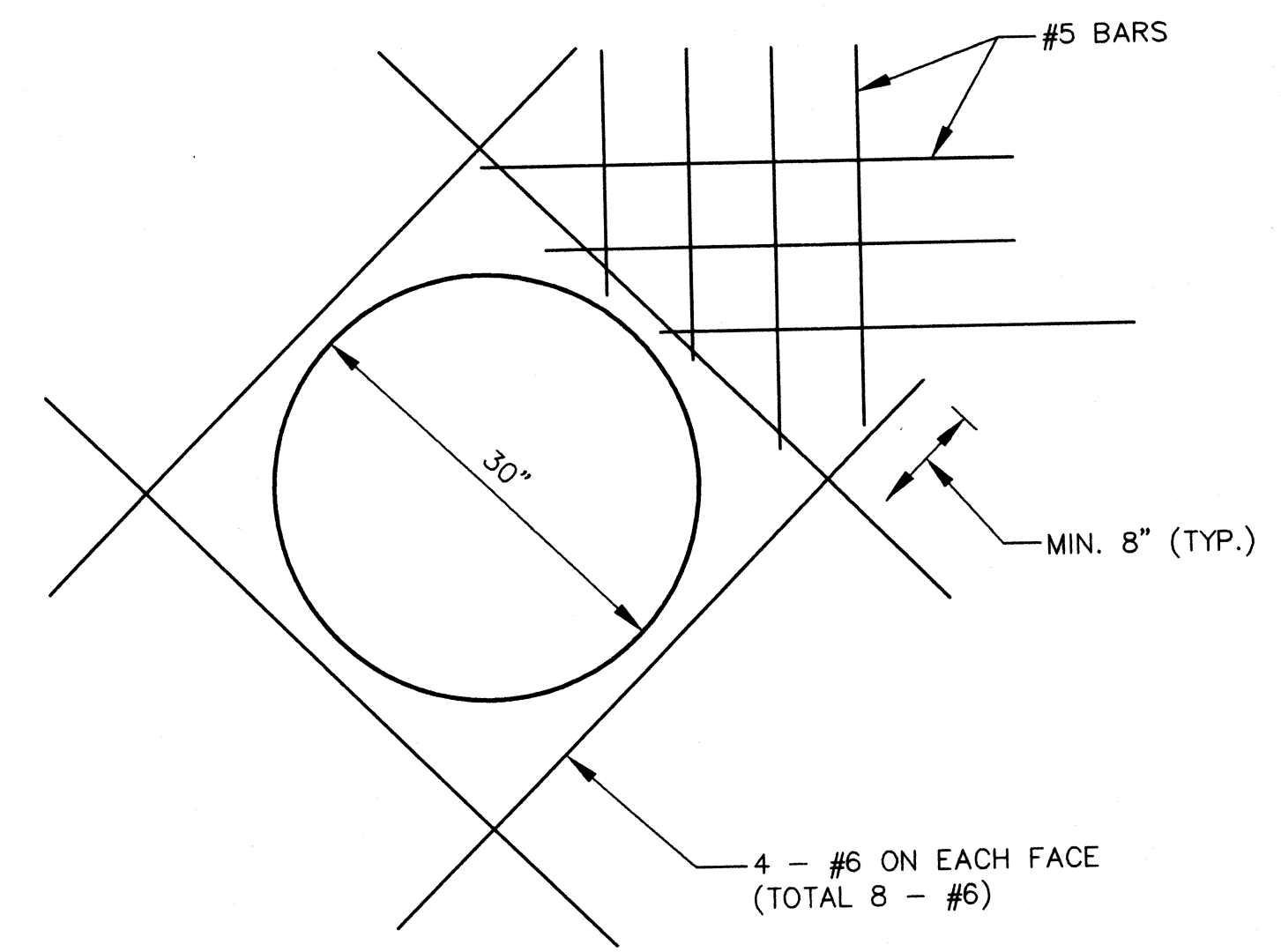
SECTION A-A
3/8"=1'-0"



SECTION B-B
3/8"=1'-0"



DETAIL 1 - PIPE OPENING IN WALL
NOT TO SCALE



DETAIL 2 - MANHOLE OPENING
NOT TO SCALE

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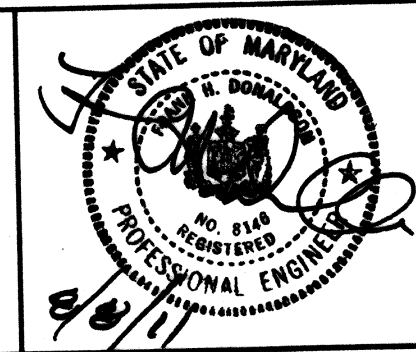
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John H. K... 12/12/08 *Robert J. ...* 12/12/08
DIRECTOR OF PUBLIC WORKS DATE CHIEF, BUREAU OF ENGINEERING DATE

John C. ... 12/12/08 *...* 12/11/08
CHIEF, BUREAU OF UTILITIES DATE CHIEF, UTILITY DESIGN DIVISION DATE

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DES:	C.H.		
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CHK:	G.C.L.		
R.J.C.	AS-BUILT	12/10	
DECEMBER, 2008	BY NO.	REVISION	DATE

JUNCTION CHAMBER
STRUCTURAL DETAILS

600' SCALE MAP 47 BLOCK 10, 16, 17, & 18

AS-BUILT

LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 14 OF 27

MGWC 1.5: SANDBAG/STONE CHANNEL DIVERSION

Temporary measure for dewatering 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 material which is resistant to ultraviolet 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.

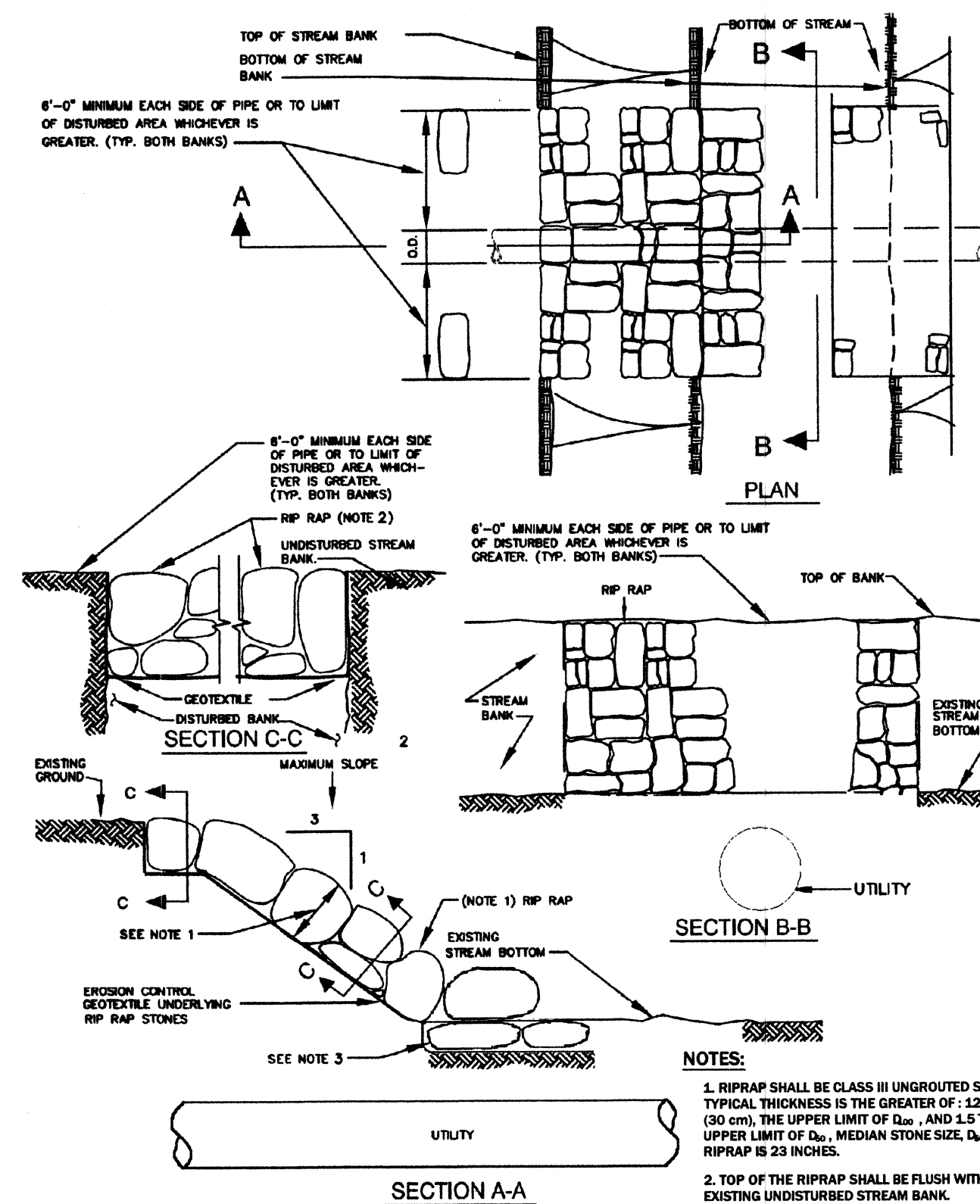
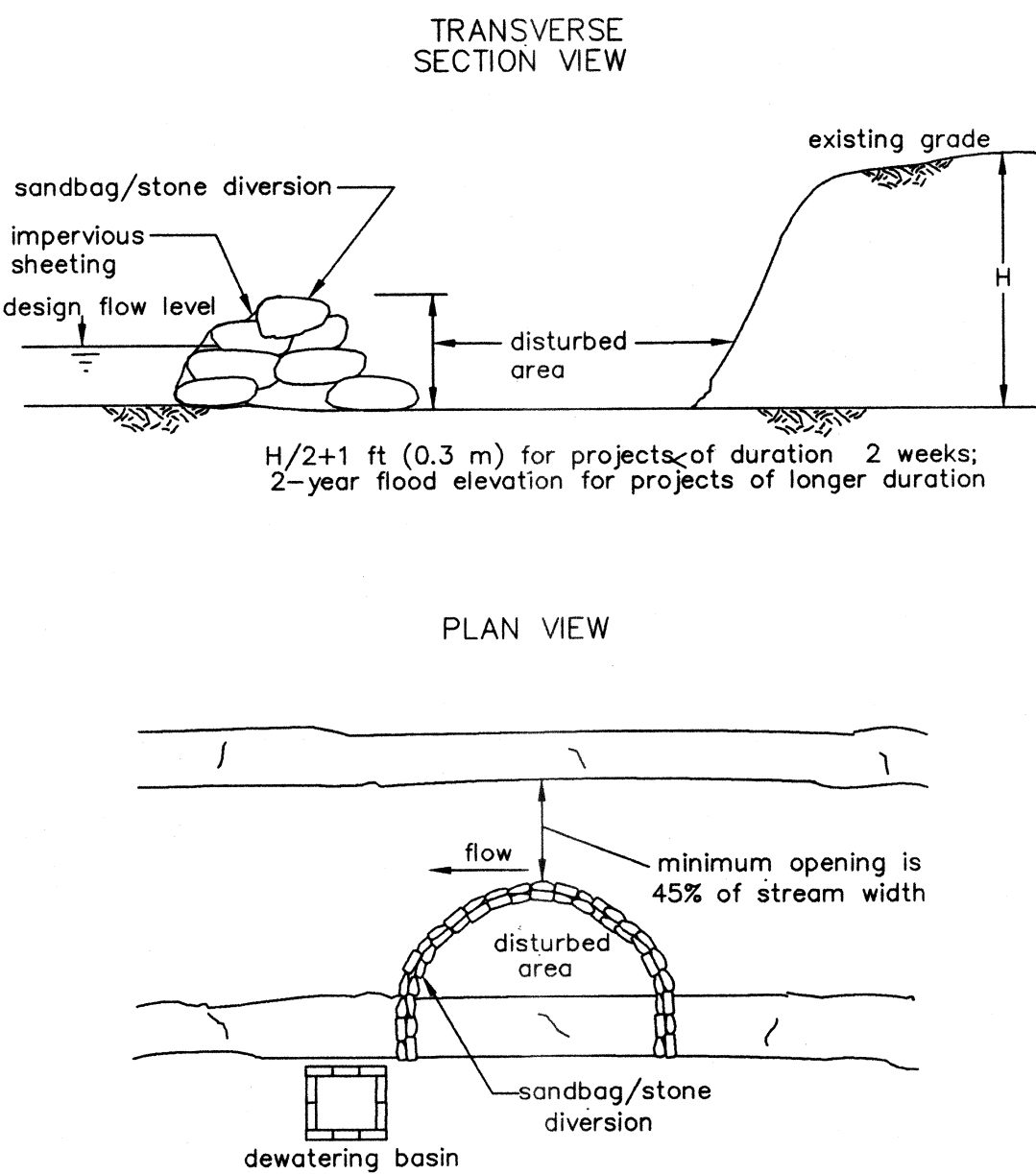
Installation of this measure should proceed as follows (refer to Detail 1.5):

- The diversion structure should be installed from upstream to downstream.
- 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.
- All excavated material should be deposited and stabilized in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
- Sediment-laden water from the construction area should be pumped to a dewatering basin.

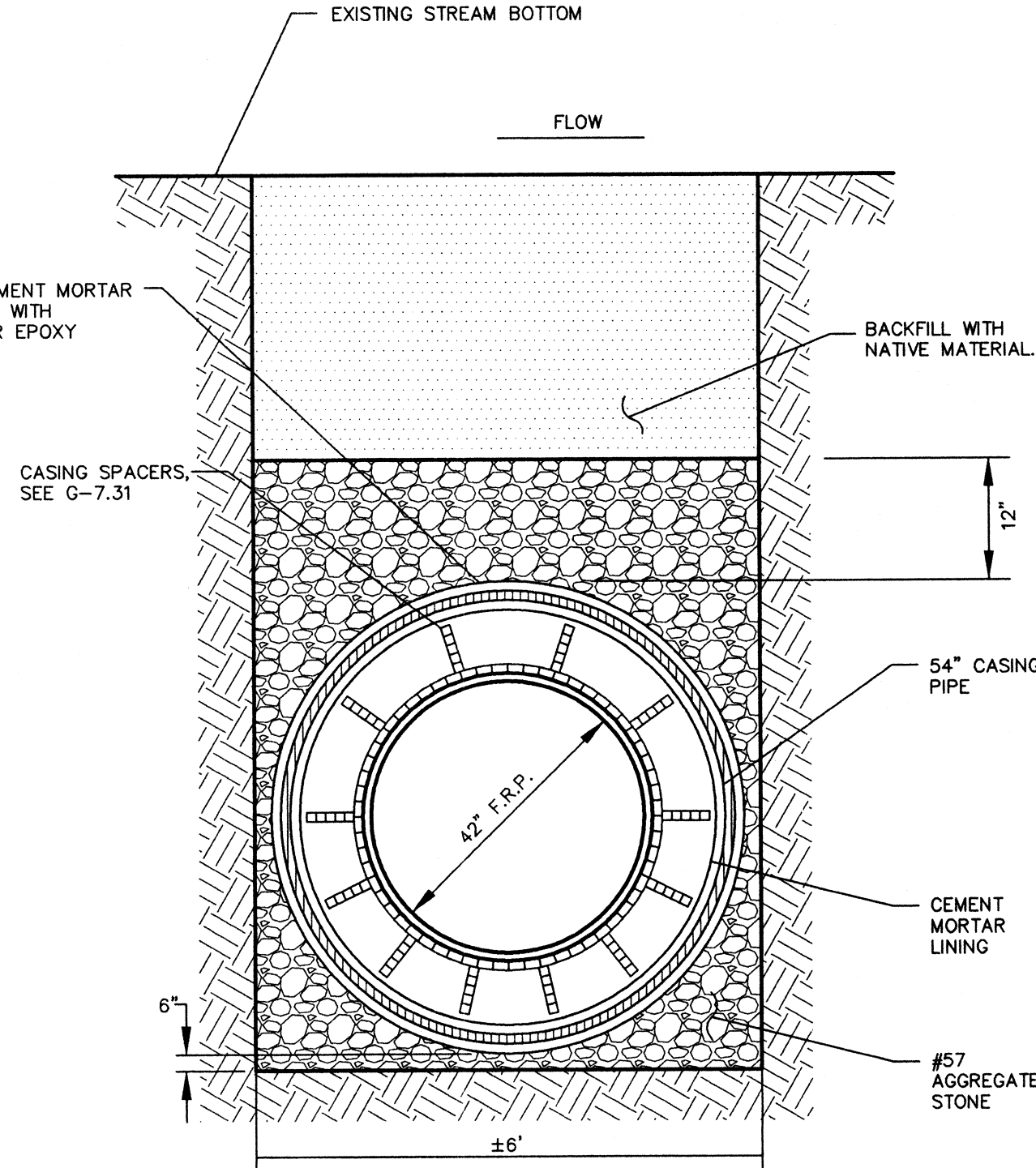
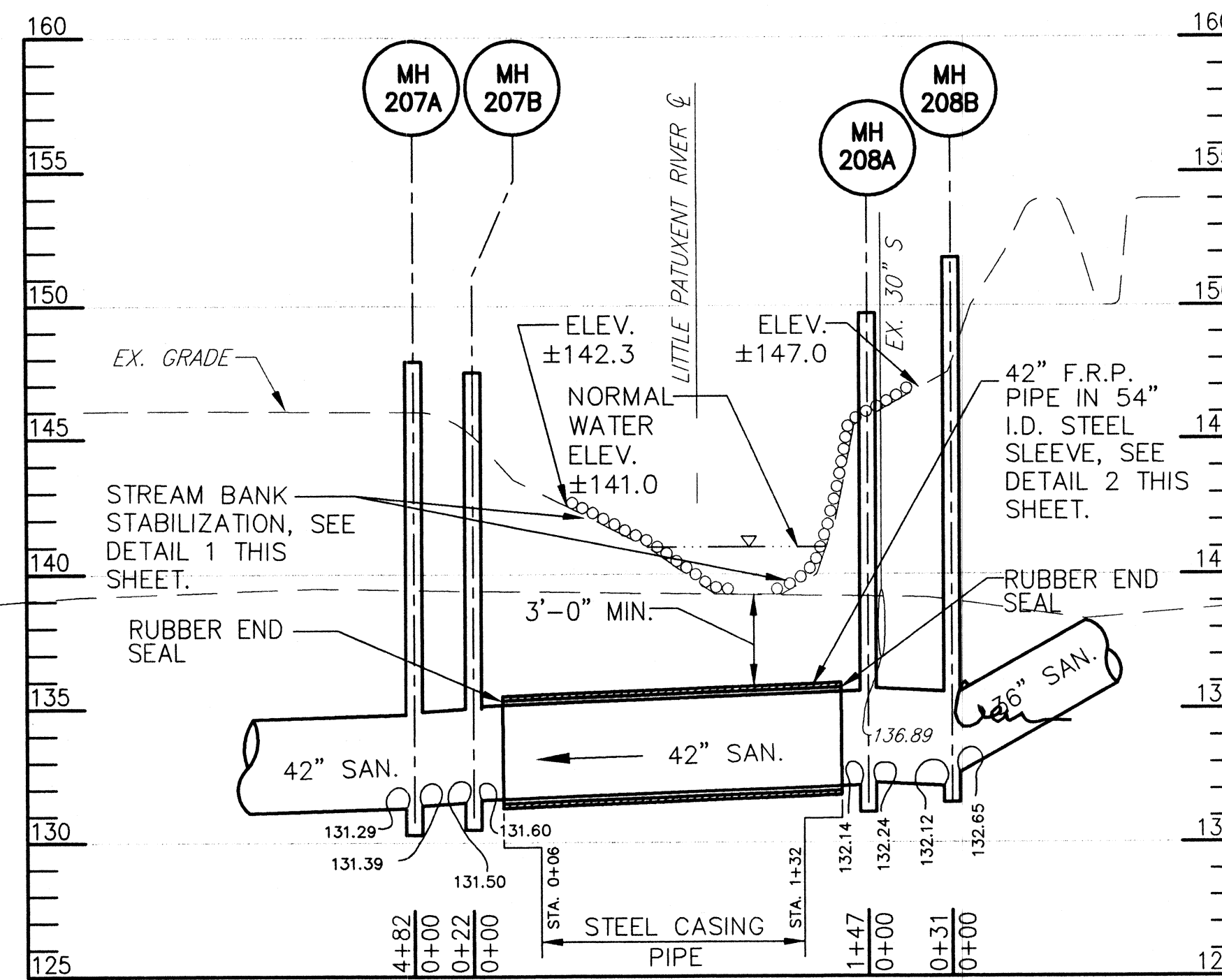
MGWC 1.5: SANDBAG/STONE CHANNEL DIVERSION

- 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.
- 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 wear are observed during the construction time or if project time is expected to last more than 2 weeks.
- 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.
- 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**



**DETAIL 1
STREAM BANK PROTECTION AT CROSSING**
NO SCALE



- NOTES:**
- STEEL CASING PIPE TO BE 54" I.D. x 1/2" THICK WITH CEMENT MORTAR LINING ON INSIDE.
 - 42" F.R.P. AND 54" STEEL PIPE SHALL BE INSTALLED USING THE OPEN CUT METHOD.
 - CASING SPACERS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
 - CONTRACTOR SHALL PREVENT FLOTATION OF CARRIER PIPE DURING INSTALLATION.
 - CONTRACTOR TO SEAL ENDS OF STEEL CASING W/ RUBBER END SEALS AS PER HOCO DETAIL G-7.31.
 - STEEL CASING PIPE SHALL CONFORM TO ASTM A1011, ASTM A1018 AND ASTM A139 GRADE B (36,000).
 - CEMENT MORTAR LINING SHALL CONFORM TO AWWA C200.

AS-BUILT

BY THE DEVELOPER:

I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THE PLAN. 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 INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.

DEVELOPER _____ 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.

ENGINEER _____ DATE _____

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. 8146 EXPIRATION DATE: 10/8/11

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

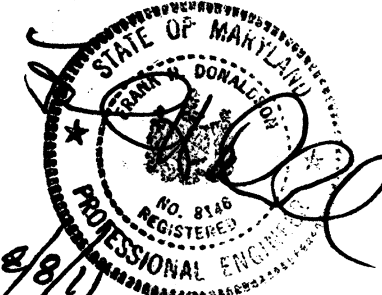
John G. K... 12/16/08 *Richard Sapan* 12/16/08
DIRECTOR OF PUBLIC WORKS DATE CHIEF, BUREAU OF ENGINEERING DATE

Steve C. Chen 12/12/08 *Chy Don Lee* 12/11/08
CHIEF, BUREAU OF UTILITIES DATE CHIEF, UTILITY DESIGN DIVISION DATE

Patton Harris Rust & Associates, Inc.
Engineers, Surveyors, Planners, Landscape Architects.

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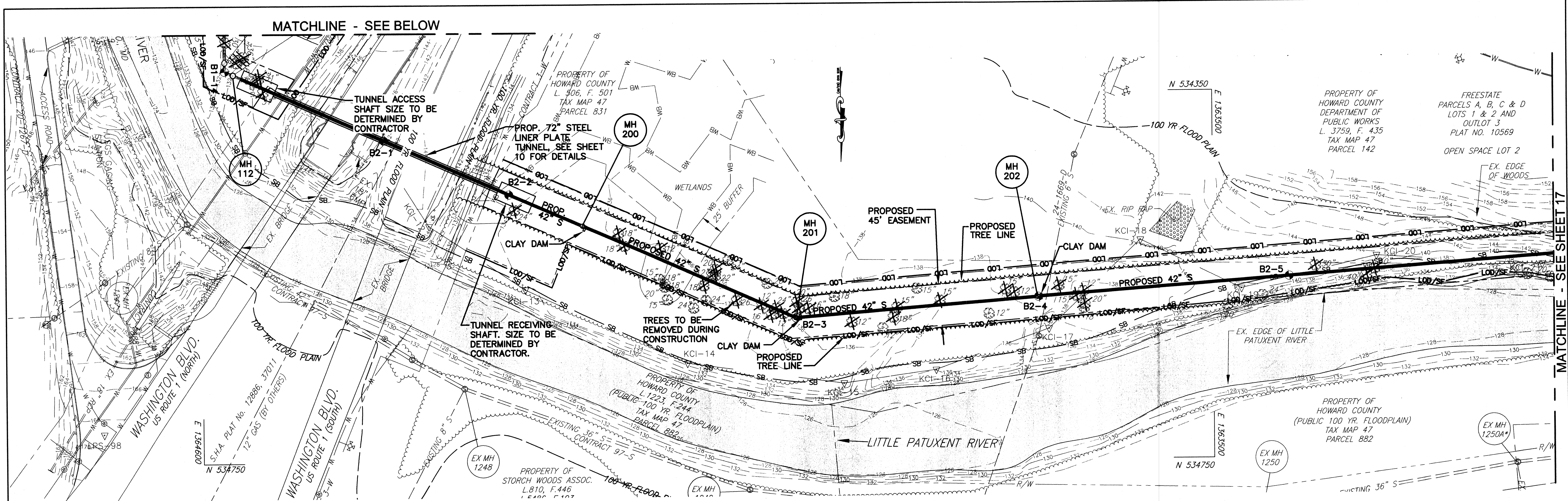
DES: C.H.					
DRN: B.K.E.					
CHK: G.C.L.					
DECEMBER, 2008	BY NO.	REVISION	DATE		
			12/10		

600' SCALE MAP 47	BLOCK 10, 16, 17, & 18
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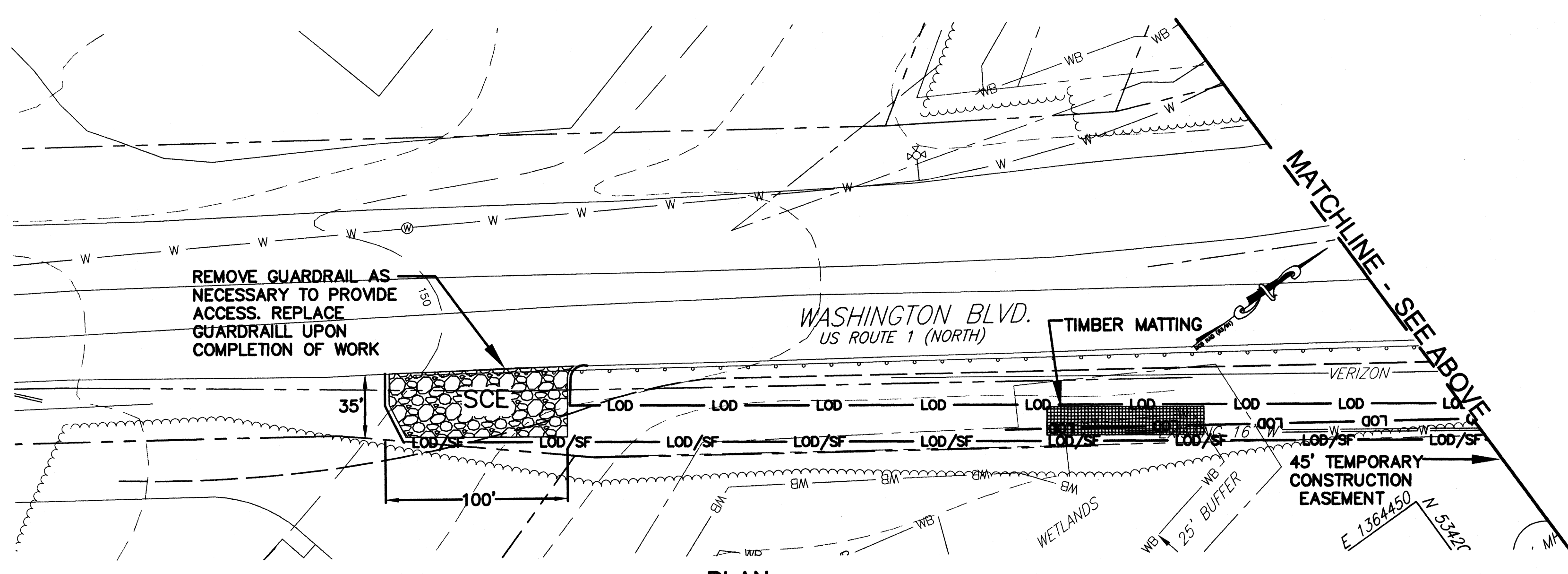
**STREAM CROSSING
PLAN & DETAILS**

LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 15 OF 27



PLAN
1"=50'



PLAN
1"=50'

- NOTES:**
- CONTRACTOR TO COORDINATE INSTALLATION, USE AND REMOVAL OF THE ACCESS ROAD W/ THE CONTRACTOR CONSTRUCTING CONTRACT #20-4531. COMPENSATION WILL NOT BE GIVEN TO THE CONTRACTOR FOR DELAYS, INCONVENIENCES OR DAMAGE SUSTAINED DUE TO LACK OF COORDINATION BETWEEN CONTRACTORS.
 - ALL EXCESS FILL MATERIAL WILL BE REMOVED FROM THE 100-YEAR FLOODPLAIN AND EXISTING CONTOURS WILL BE RESTORED ONCE THE UTILITY HAS BEEN INSTALLED. AS SUCH, THERE WILL BE NO "MOUNDING" OR "WASTING" OF MATERIALS WITHIN THE LOD.

PROFESSIONAL CERTIFICATION
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 LICENSE NO. 8146 EXPIRATION DATE: 10/9/11

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Jan G. K... 12/12/08 *Richard J. ...* 12/12/08
 DIRECTOR OF PUBLIC WORKS DATE CHIEF, BUREAU OF ENGINEERING DATE

Stake C. ... 12/12/08 *...* 12/11/08
 CHIEF, BUREAU OF UTILITIES DATE CHIEF, UTILITY DESIGN DIVISION DATE

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[Professional Engineer Seal]
 PROFESSIONAL ENGINEER
 8/11

DES:	C.H.			
DRN:	K.L.B.			
CHK:	G.C.L.			
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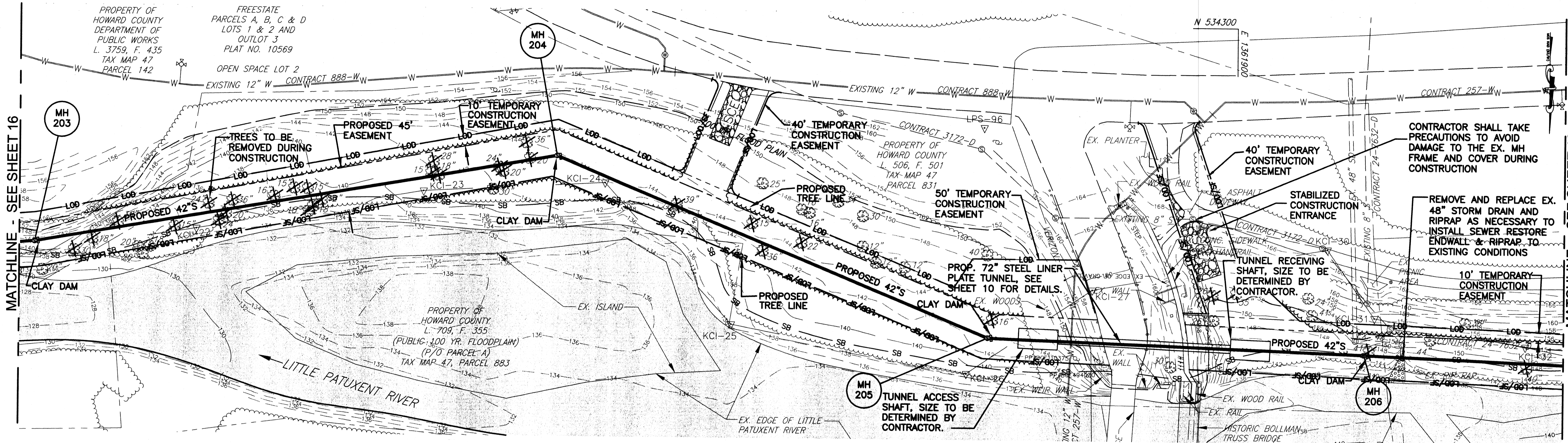
SEDIMENT & EROSION CONTROL PLAN

600' SCALE MAP 47 BLOCK 10, 16, 17, & 18

LITTLE PATUXENT PARALLEL INTERCEPTOR SEWER
 CAPITAL PROJECT S-6175
 CONTRACT NO. 20-4532
 1ST ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 16 OF 27

AS-BUILT



PLAN
1"=50'

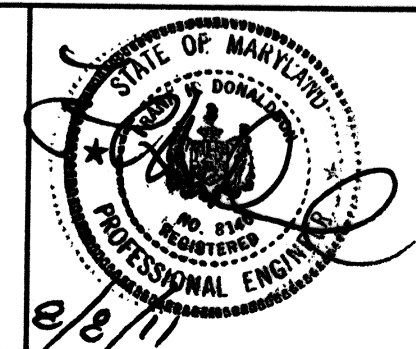
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LICENSE NO. 8146 EXPIRATION DATE: 10/8/11

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *Jan G. K...* 12/12/08
 Chief, Bureau of Engineering: *Richard L. Sapan* 12/12/08
 Chief, Bureau of Utilities: *Steve C. Green* 12/11/08
 Chief, Utility Design Division: *Ed Dan Linn* 12/11/08

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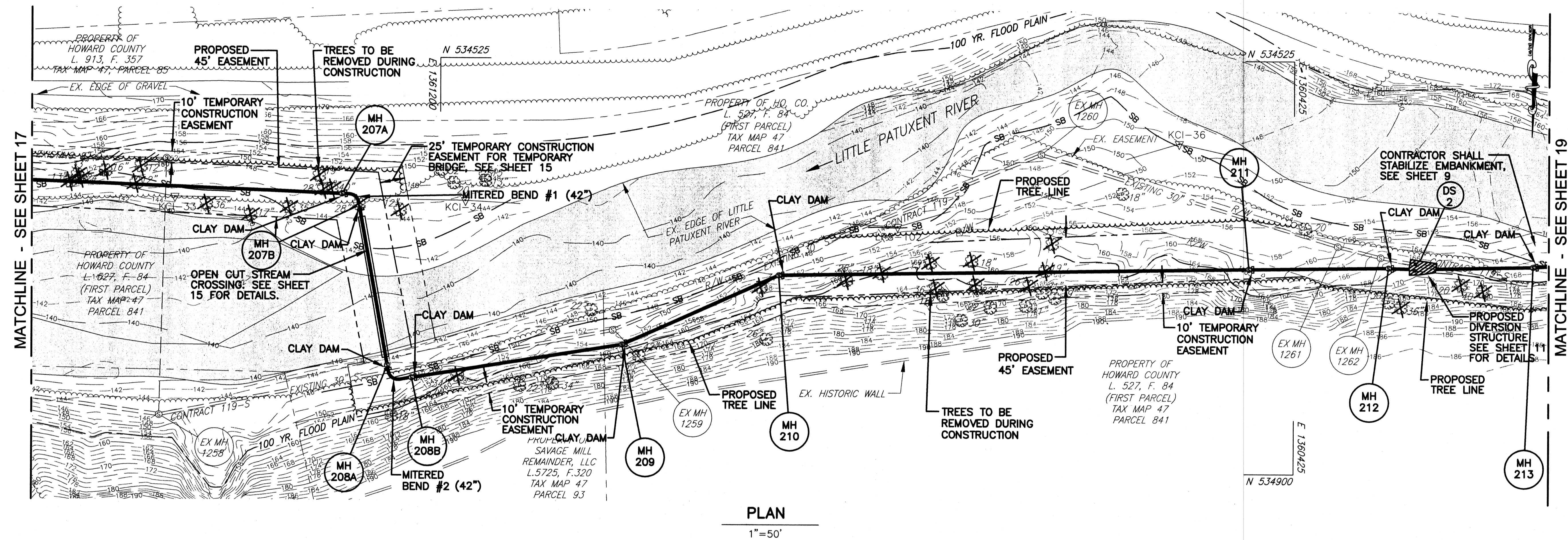
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SEDIMENT & EROSION CONTROL PLAN
600' SCALE MAP 47 BLOCK 10, 16, 17, & 18

AS-BUILT

LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 17 OF 27



PLAN

1" = 50'

NOTES:

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DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Director of Public Works: *John P. ...* 12/12/08
 Chief, Bureau of Engineering: *Michael ...* 12/12/08
 Chief, Bureau of Utilities: *Steve C. ...* 12/11/08
 Chief, Utility Design Division: *De ...* 12/11/08

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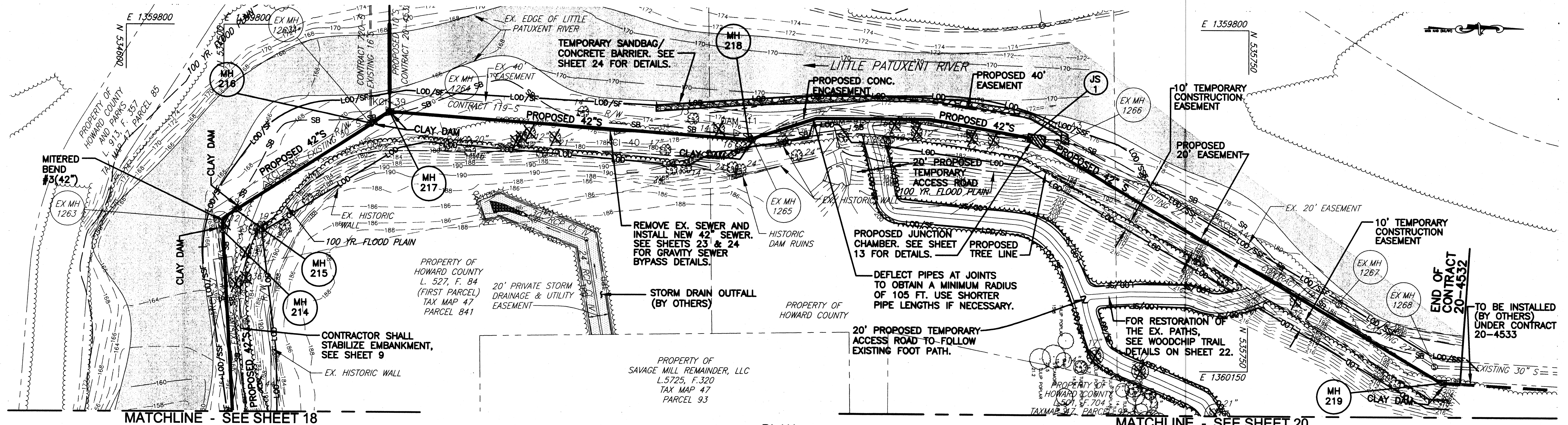


DES:	C.H.			
DRN:	K.L.B.			
CHK:	G.C.L.			
DECEMBER, 2008	BY NO.	REVISION	DATE	12/10

SEDIMENT & EROSION CONTROL PLAN
 600' SCALE MAP 47 BLOCK 10, 16, 17, & 18

AS-BUILT
 LITTLE PATUXENT PARALLEL INTERCEPTOR SEWER
 CAPITAL PROJECT S-6175
 CONTRACT NO. 20-4532
 1ST ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 18 OF 27



PLAN
1"=50'

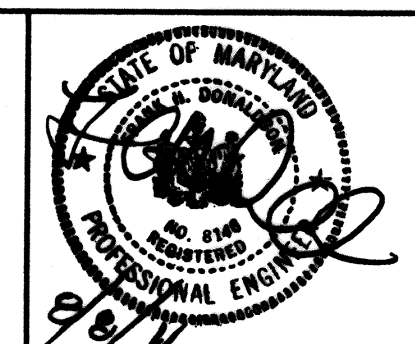
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 Chief, Bureau of Utilities: *John C. Lee* 12/12/08
 Chief, Utility Design Division: *Debra L...* 12/11/08

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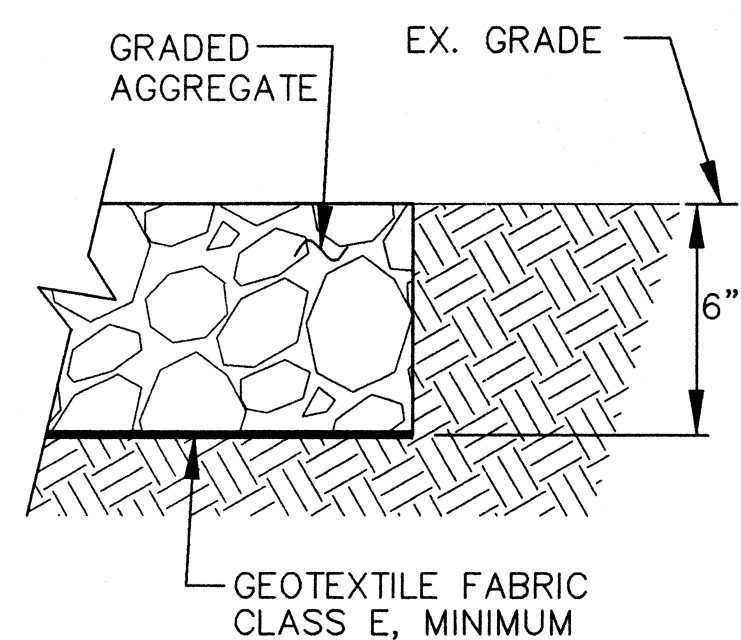
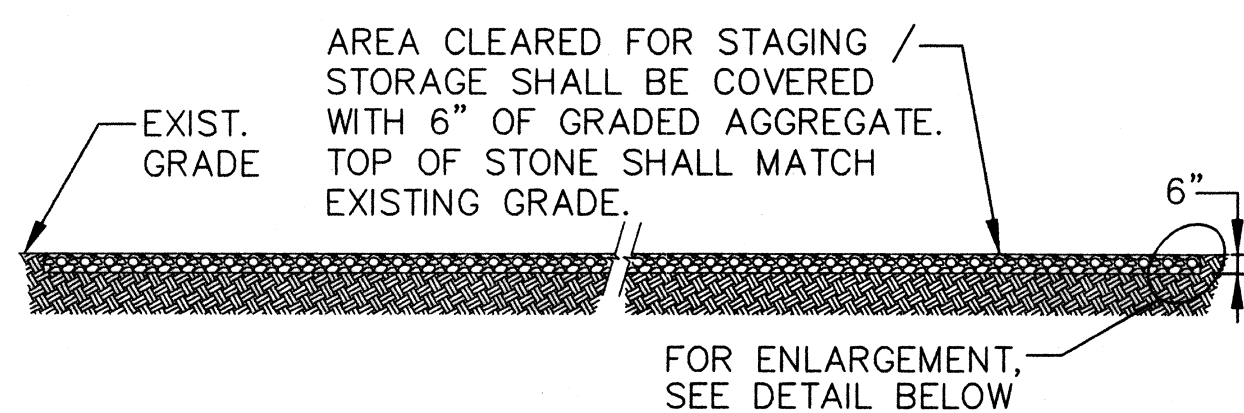


DES: C.H.			
DRN: K.L.B.			
CHK: G.C.L.			
DECEMBER, 2008	BY NO.	AS-BUILT	DATE 12/10

SEDIMENT & EROSION CONTROL PLAN
600' SCALE MAP 47 BLOCK 10, 16, 17, & 18

AS-BUILT
LITTLE PATUXENT PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND
SCALE AS SHOWN
SHEET 19 OF 27

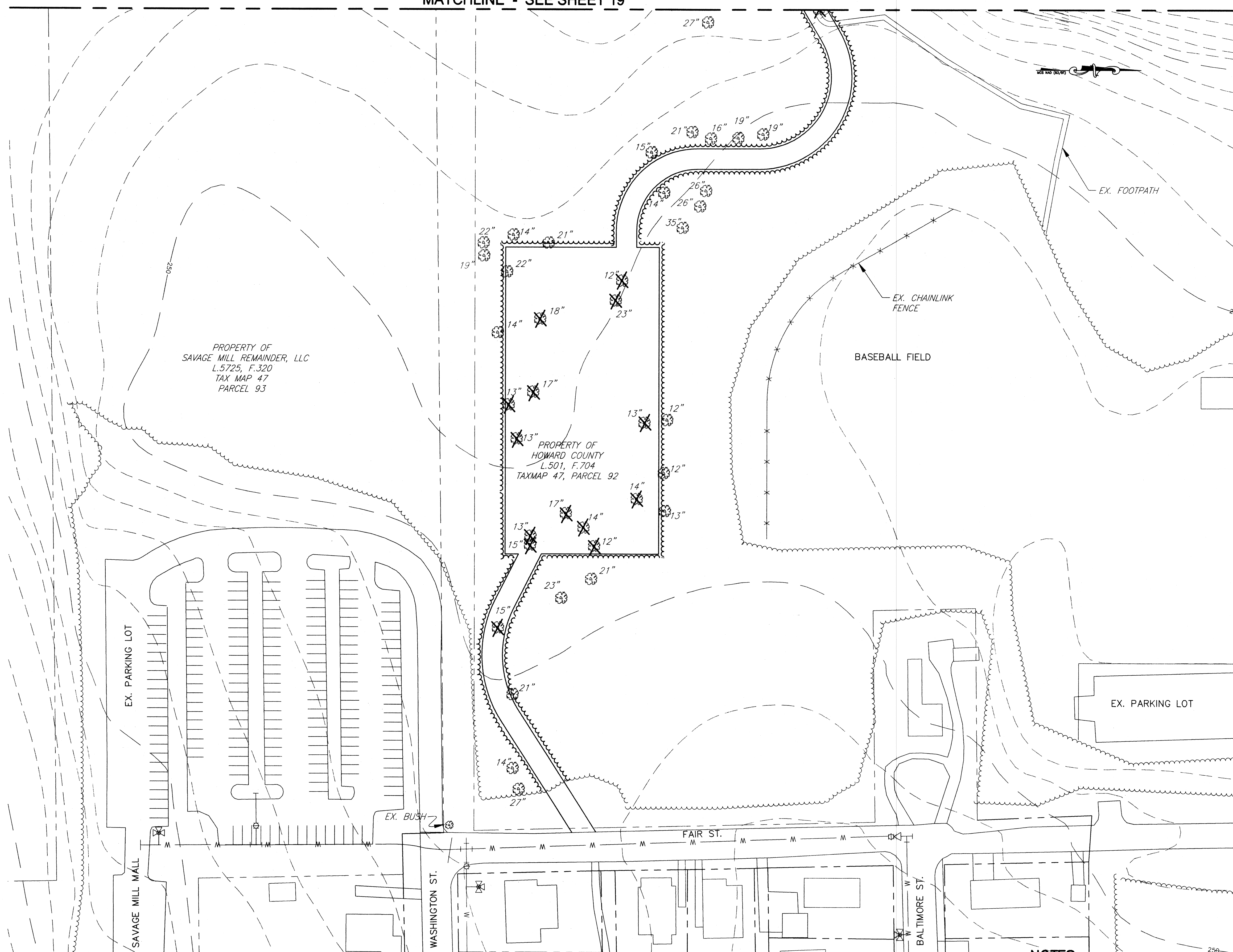
MATCHLINE - SEE SHEET 19



STAGING AREA
NOT TO SCALE

NOTES:

1. PAVING SHALL HAVE POSITIVE DRAINAGE WITH NO PONDING.
2. ON COMPLETION OF CONSTRUCTION, REGRADE AND COMPACT PAVED AREA. ADD ADDITIONAL AGGREGATE IF NECESSARY.
3. ALL ARMORING OF ACCESS ROAD SHALL BE PLACED ON FILTER FABRIC AND REMOVED ON COMPLETION.
4. STABILIZED ROADS AS DETAILED ELSEWHERE.



PLAN

1"=50'

NOTES:

1. ALL EXCESS FILL MATERIAL WILL BE REMOVED FROM THE 100-YEAR FLOODPLAIN AND EXISTING CONTOURS WILL BE RESTORED ONCE THE UTILITY HAS BEEN INSTALLED. AS SUCH, THERE WILL BE NO "MOUNDING" OR "WASTING" OF MATERIALS WITHIN THE LOD.

AS-BUILT

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. 8146 EXPIRATION DATE: 10/8/11

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John G. K... 12/12/08
DIRECTOR OF PUBLIC WORKS DATE CHIEF, BUREAU OF ENGINEERING

Steve C. Chen 12/11/08
CHIEF, BUREAU OF UTILITIES DATE CHIEF, UTILITY DESIGN DIVISION

Patton Harris Rust & Associates, Inc.
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DECEMBER, 2008	BY NO. REVISION DATE	
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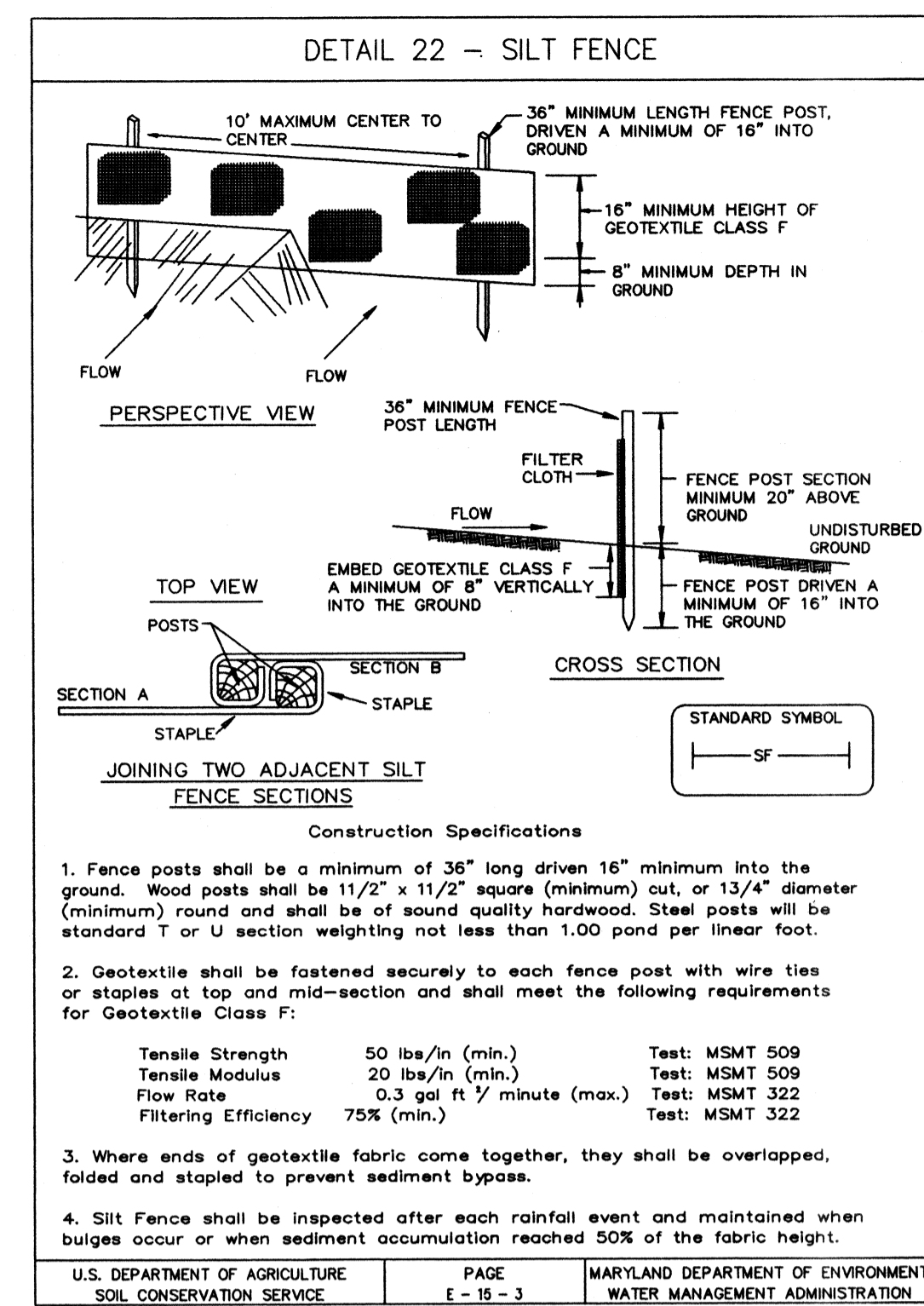
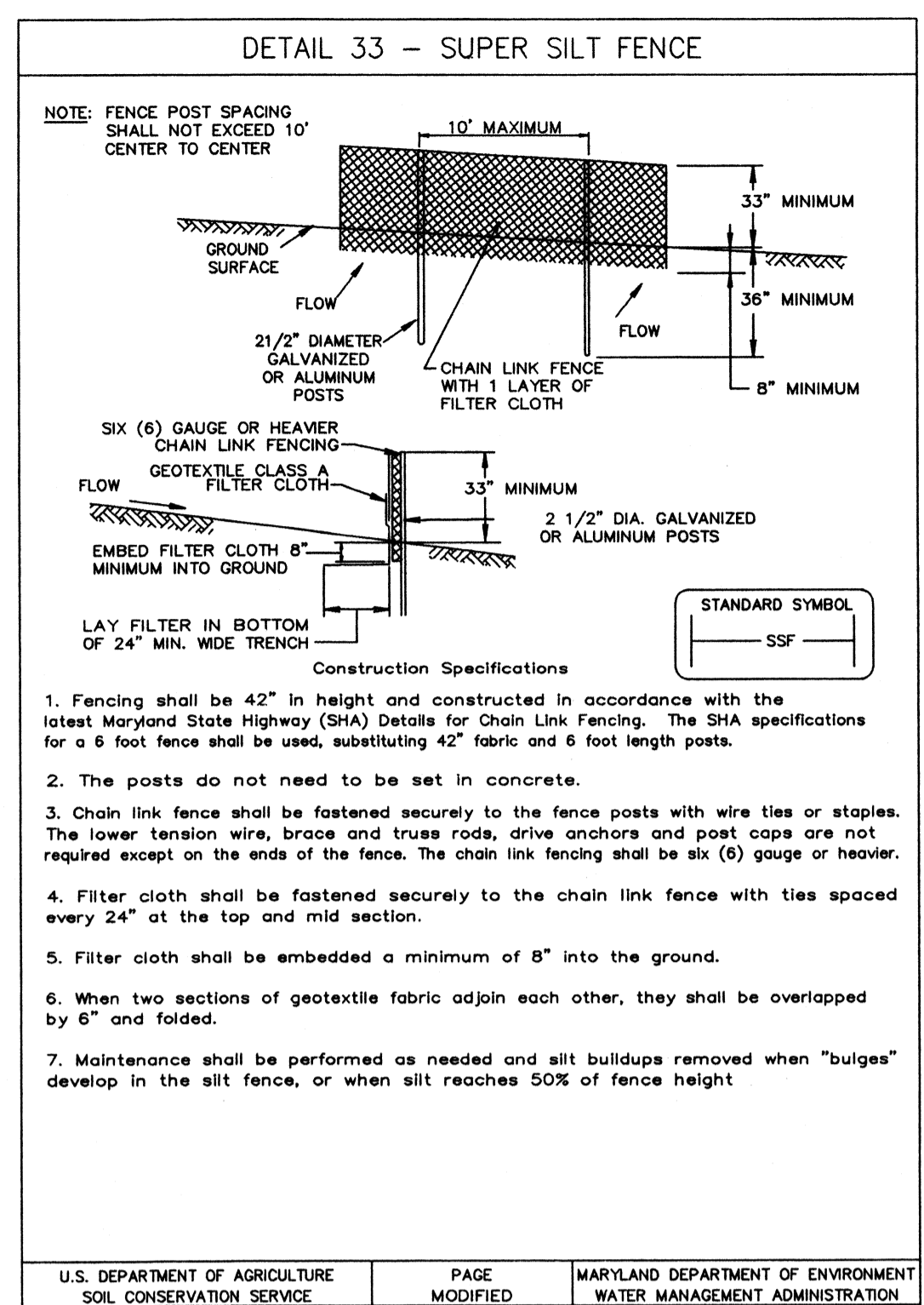
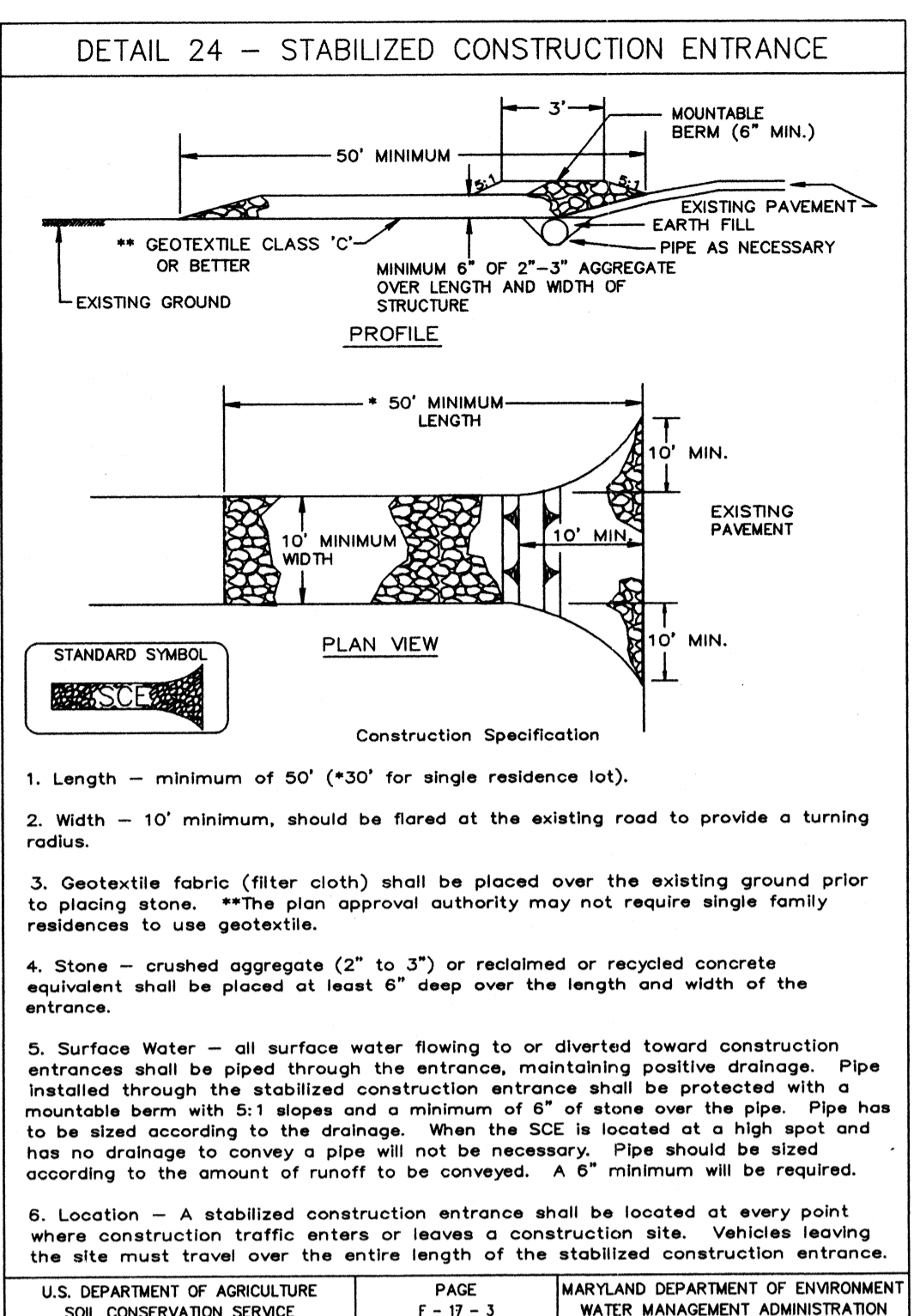
SEDIMENT & EROSION CONTROL PLAN

600' SCALE MAP 47 BLOCK 10, 16, 17, & 18

LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 20 OF 27



SILT FENCE

Silt Fence Design Criteria

Slope Steepness	Silt Fence Length	
	(Maximum) Slope Length	(Maximum) Silt Fence Length
Flatter than 50:1	unlimited	unlimited
50:1 to 10:1	125 feet	1,000 feet
10:1 to 5:1	100 feet	750 feet
5:1 to 3:1	60 feet	500 feet
3:1 to 2:1	40 feet	250 feet
2:1 and steeper	20 feet	125 feet

Note: In areas of less than 2% slope and sandy soils (USDA general classification system, soil Class A) maximum slope length and silt fence length will be unlimited. In these areas a silt fence may be the only perimeter control required.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE E-15-3A MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

SUPER SILT FENCE

Design Criteria

Slope	Slope Steepness	Slope Length (maximum)	Silt Fence Length (maximum)
0 - 10%	0 - 10:1	Unlimited	Unlimited
10 - 20%	10:1 - 5:1	200 feet	1,500 feet
20 - 33%	5:1 - 3:1	100 feet	1,000 feet
33 - 50%	3:1 - 2:1	100 feet	500 feet
50% +	2:1 +	50 feet	250 feet

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE H-28-3A MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

GEOTEXTILE FABRICS

CLASS	APPARENT OPENING SIZE MM. MAX.	GRAB TENSILE STRENGTH LB. MIN.	BURST STRENGTH PSI. MIN.
A	0.30**	250	500
B	0.60	200	320
C	0.30	200	320
D	0.60	90	145
E	0.30	90	145
F (SILT FENCE)	0.40 - 0.80#	90	190

#US STD SIEVE CW-02215 **0.50 mm MAX. FOR SUPER SILT FENCE

The properties shall be determined in accordance with the following procedures:

- Apparent opening size MSMT 323
- Grab tensile strength ASTM D 1682: 4x8" specimen, 1x2" clamps, 12"/min stain rate in both principal directions of geotextile fabric.
- Burst strength ASTM D 3786

The fabric shall be inert to commonly encountered chemicals and hydrocarbons, and will be rot and mildew resistant. It shall be manufactured from fibers consisting of long chain synthetic polymers, and composed of a minimum of 85% by weight of polyolefins, polyesters, or polyamides. The geotextile fabric shall resist deterioration from ultraviolet exposure.

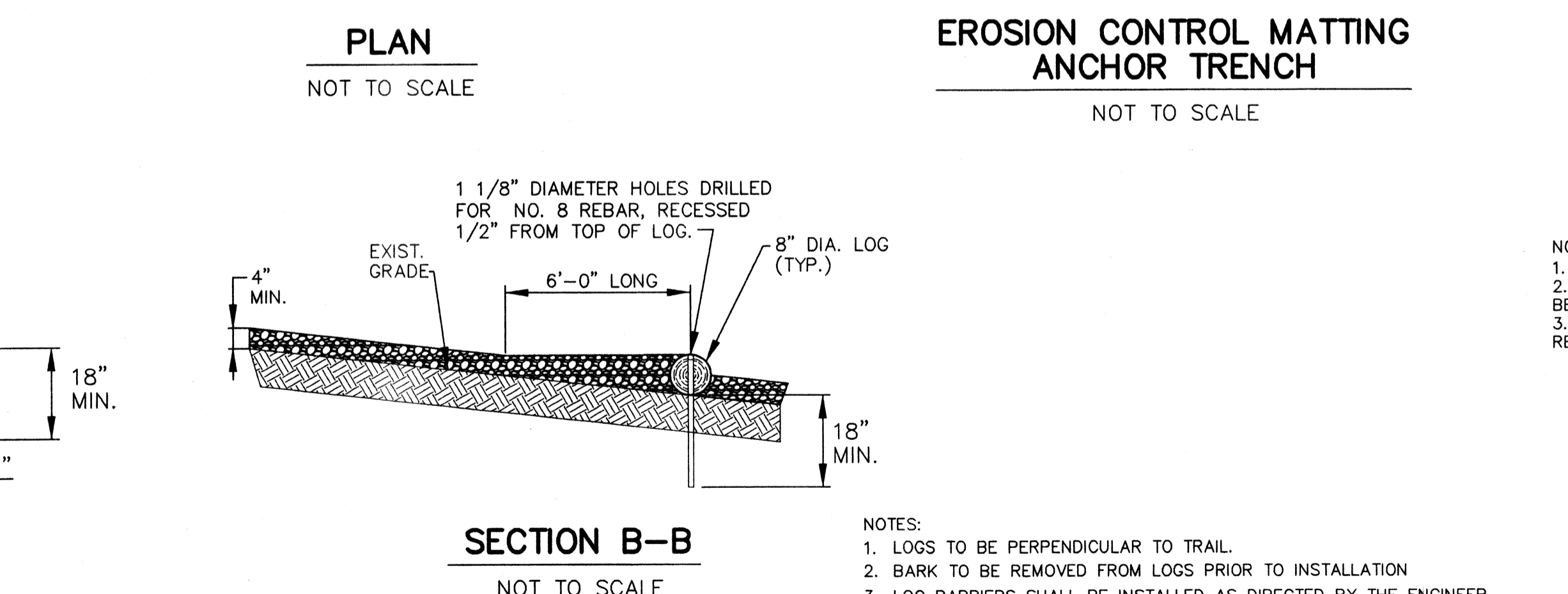
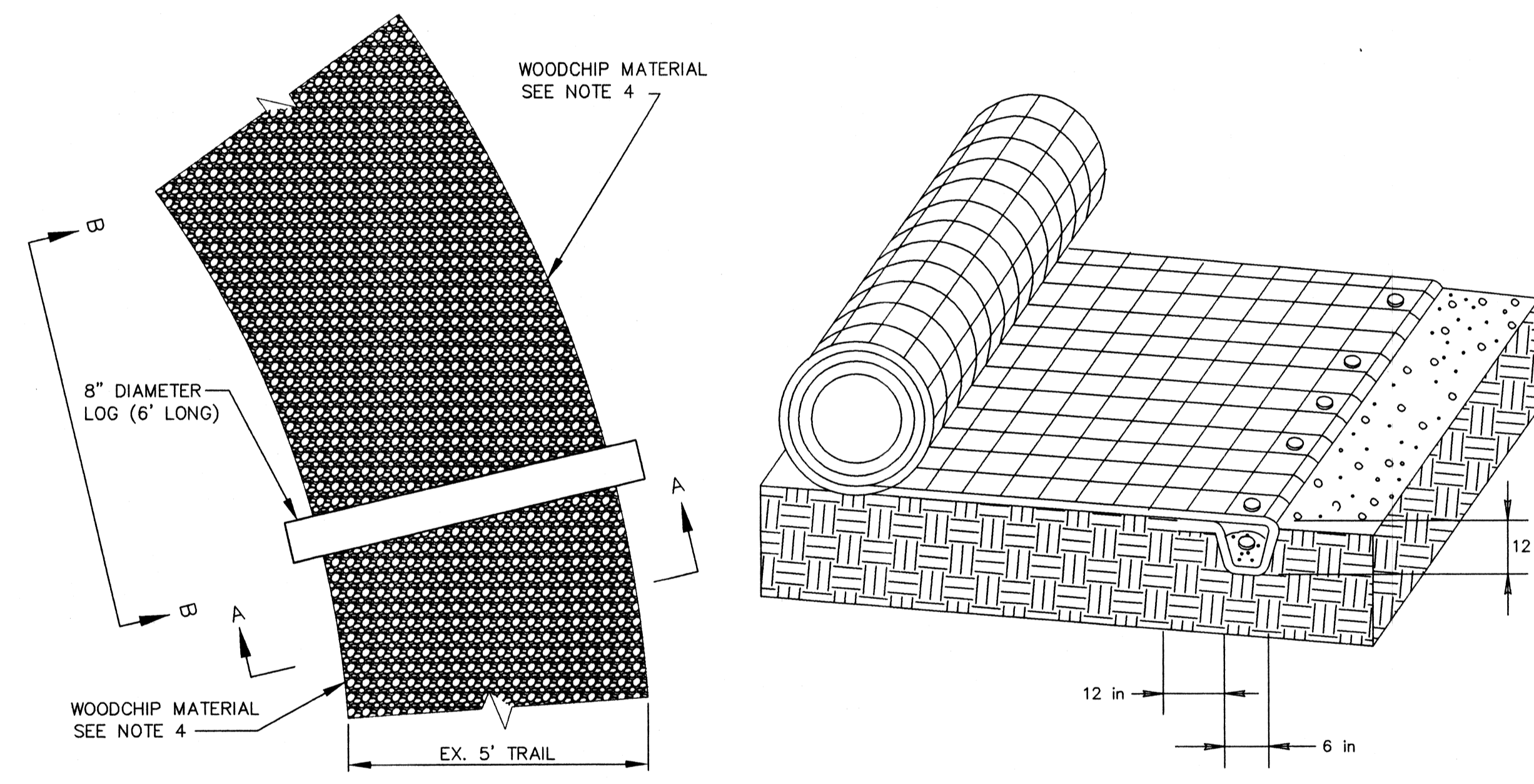
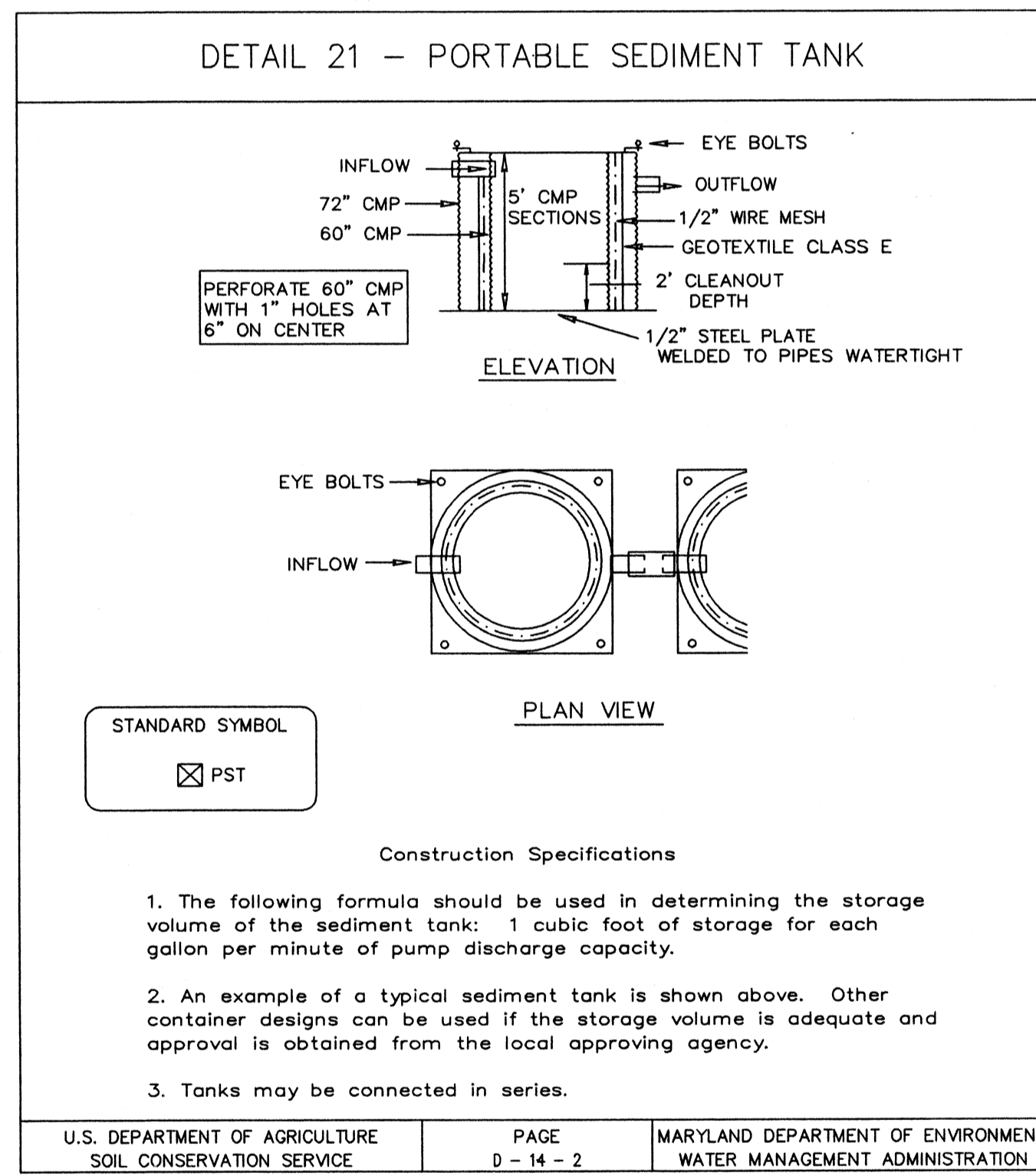
In addition, Classes A through E shall have a 0.01 cm./sec. minimum permeability when tested in accordance with MSMT 507, and an apparent minimum elongation of 20 percent (20%) when tested in accordance with the grab strength requirements listed above.

Silt Fence Class F geotextile fabrics for silt fence shall have a 50 lb./in. minimum tensile strength and a 20 lb./in. minimum tensile modulus when tested in accordance with MSMT 509. The material shall also have a 0.3 gal./ft.²/min. flow rate and seventy-five percent (75%) minimum filtering efficiency when tested in accordance with MSMT 322.

Geotextile fabrics used in the construction of silt fence shall resist deterioration from ultraviolet exposure. The fabrics shall contain sufficient amounts of ultraviolet ray inhibitors and stabilizers to provide a minimum of 12 months of expected usable construction life at a temperature range of 0 to 120 degrees F.

- ### Maryland Department of the Environment Best Management Practices for Working in Nontidal Wetlands, the Nontidal Wetland Buffer, Waters of the State and the 100-Year Floodplain
- No excess fill, construction material, or debris shall be stockpiled or stored in nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
 - Place materials in a location and manner that does not adversely impact surface or subsurface water flow into or out of nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
 - 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.
 - 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.
 - Repair and maintain any serviceable 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.
 - Rectify any nontidal wetlands, wetland buffers, waterways, or 100-year floodplain temporarily impacted by any construction.
 - 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 fescue 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.
 - After installation has been completed, make post-construction grades and elevations the same as the original grades and elevations in temporarily impacted areas.
 - 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.
 - Stormwater runoff from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.
 - 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.



- NOTES:
- ANCHOR PATTERN (2 ANCHORS /yd²)
 - U-SHAPED WIRE STAPLES, METAL GEOTEXTILE PINS, TRIANGULAR WOODEN OR PLASTIC STAKES CAN BE USED TO ANCHOR TRIMS TO THE GROUND SURFACE
 - CONTRACTOR SHALL INSTALL AND ANCHOR EROSION CONTROL MATTING PER MANUFACTURERS RECOMMENDATIONS AND GUIDELINES.

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. 8146 EXPIRATION DATE: 10/18/11

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John G. B... 12/16/08 *Richard J. ...* 12/16/08
DIRECTOR OF PUBLIC WORKS DATE CHIEF, BUREAU OF ENGINEERING DATE

Stacy C. Ben... 12/16/08 *Debra J. ...* 12/16/08
CHIEF, BUREAU OF UTILITIES DATE CHIEF, UTILITY DESIGN DIVISION DATE

Patton Harris Rust & Associates, Inc.
Engineers, Surveyors, Planners, Landscape Architects.

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STATE OF MARYLAND
PROFESSIONAL ENGINEER
NO. 8146
EXPIRES 10/18/11

DES: C.H.			
DRN: K.L.B.			
CHK: G.C.L.			
DECEMBER, 2008	BY NO.	REVISION	DATE
			12/10

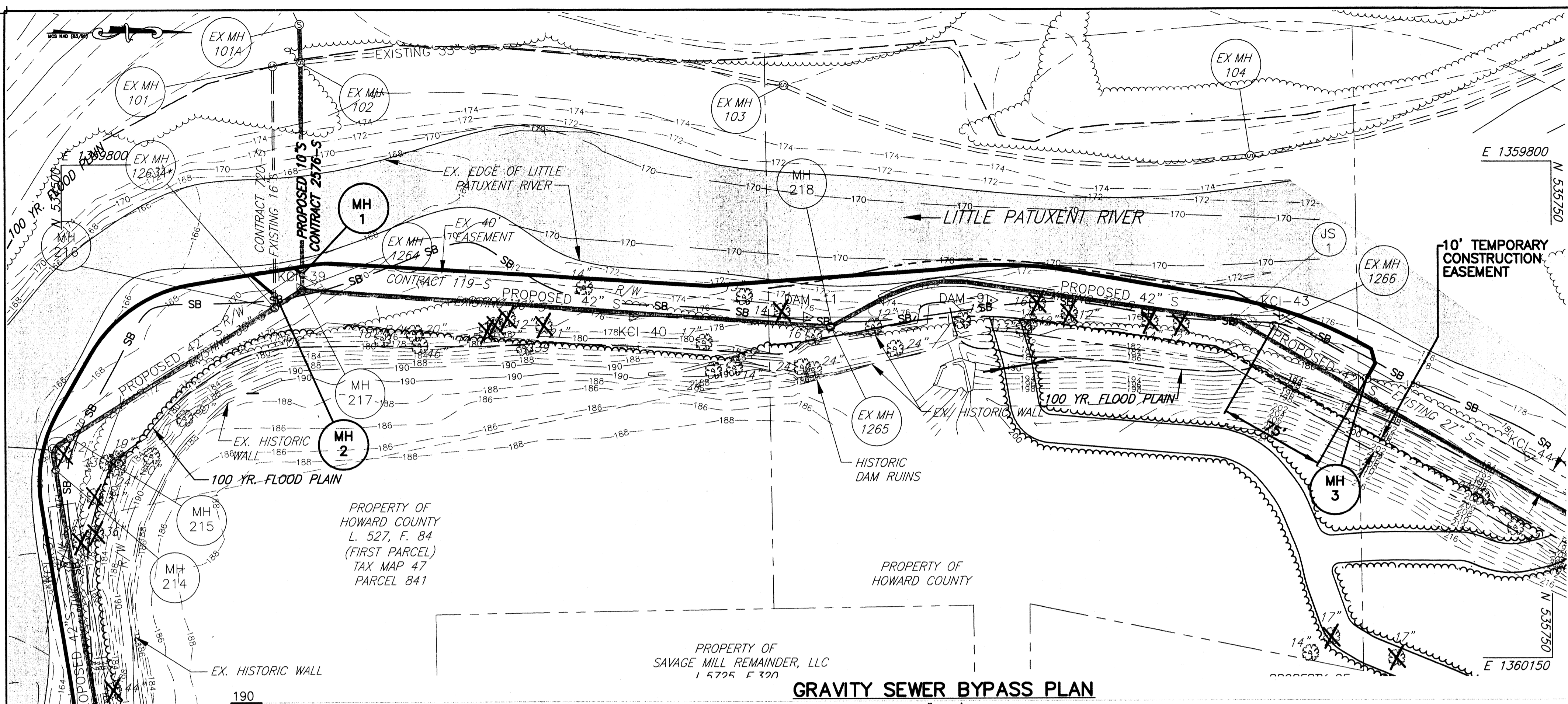
SEDIMENT & EROSION CONTROL DETAILS

600' SCALE MAP 47 BLOCK 10, 16, 17, & 18

LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 22 OF 27

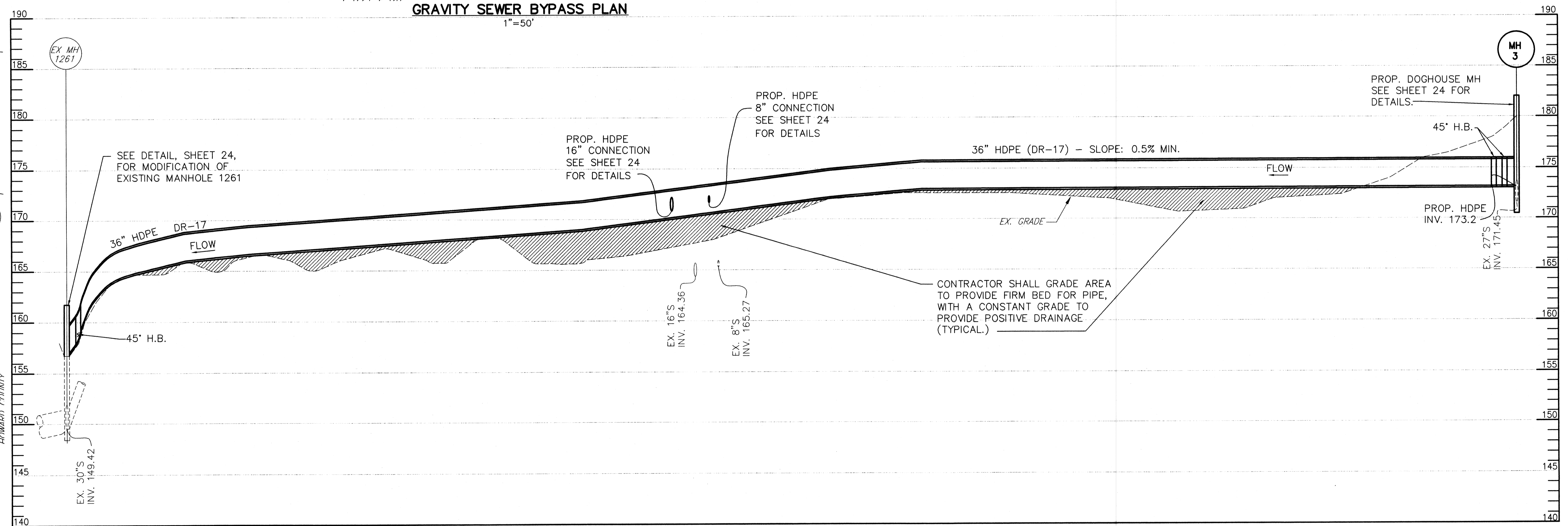


GRAVITY SEWER BYPASS PLAN
1"=50'

NOTES:

- 1.) PROPOSED DOGHOUSE MANHOLES (MH-1, MH-2 & MH-3) SHALL BE LOCATED PER THE CHART SHOWN BELOW. SEE SHEET 24 FOR DETAILS.
- 2.) EXISTING MANHOLES 101, 101A, 102, 103 AND 104 SHALL BE RAISED 5 FEET DURING BYPASS OPERATIONS TO PREVENT SURCHARGE OF THE EXISTING SEWER. THE CONTRACTOR SHALL BE RESPONSIBLE, INCLUDING PAYMENTS OF PENALTIES FOR ANY VIOLATIONS AND SPILLAGE OF SEWER.
- 3.) METHODS OF RAISING MANHOLES SHALL BE APPROVED BY ENGINEER PRIOR TO CONSTRUCTION.
- 4.) THE CONTRACTOR SHALL SUPPORT AND ANCHOR THE TEMPORARY PIPE TO PREVENT FLOTATION AND MOVEMENT. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND DESIGN TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

MANHOLE	EX. PIPE SIZE	NORTHING	EASTING	MANHOLE SIZE
MH-1	8"	534869.84	1359878.39	48" PRECAST
MH-2	16"	534850.39	1359892.01	48" PRECAST
MH-3	27"	535619.68	1359952.86	60" PRECAST



GRAVITY BYPASS PROFILE

HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

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LICENSE NO. 8146 EXPIRATION DATE: 10/8/11

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
Director of Public Works: [Signature] 12/12/08
Chief, Bureau of Engineering: [Signature] 12/12/08
Chief, Bureau of Utilities: [Signature] 12/12/08
Chief, Utility Design Division: [Signature] 12/11/08

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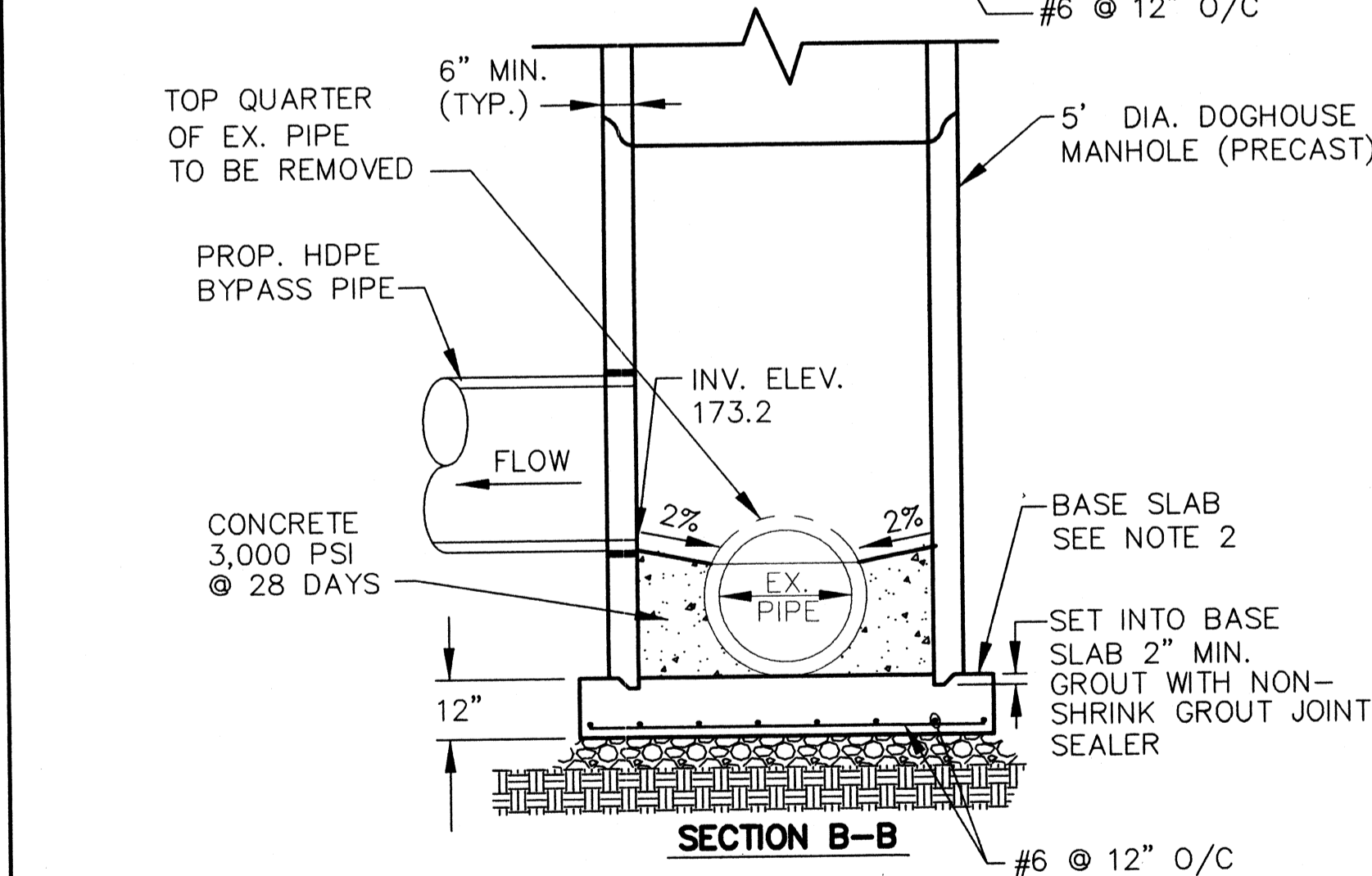
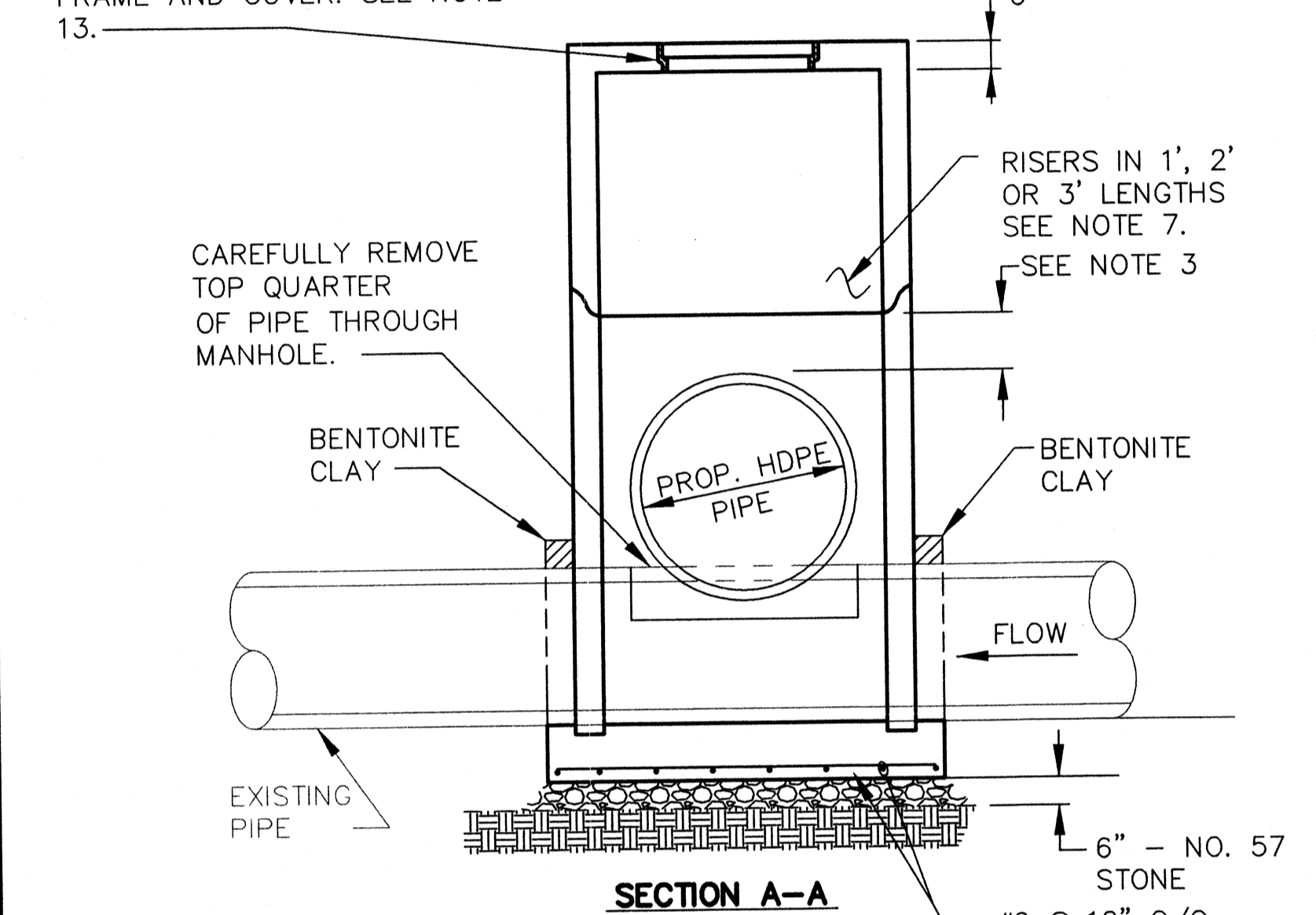
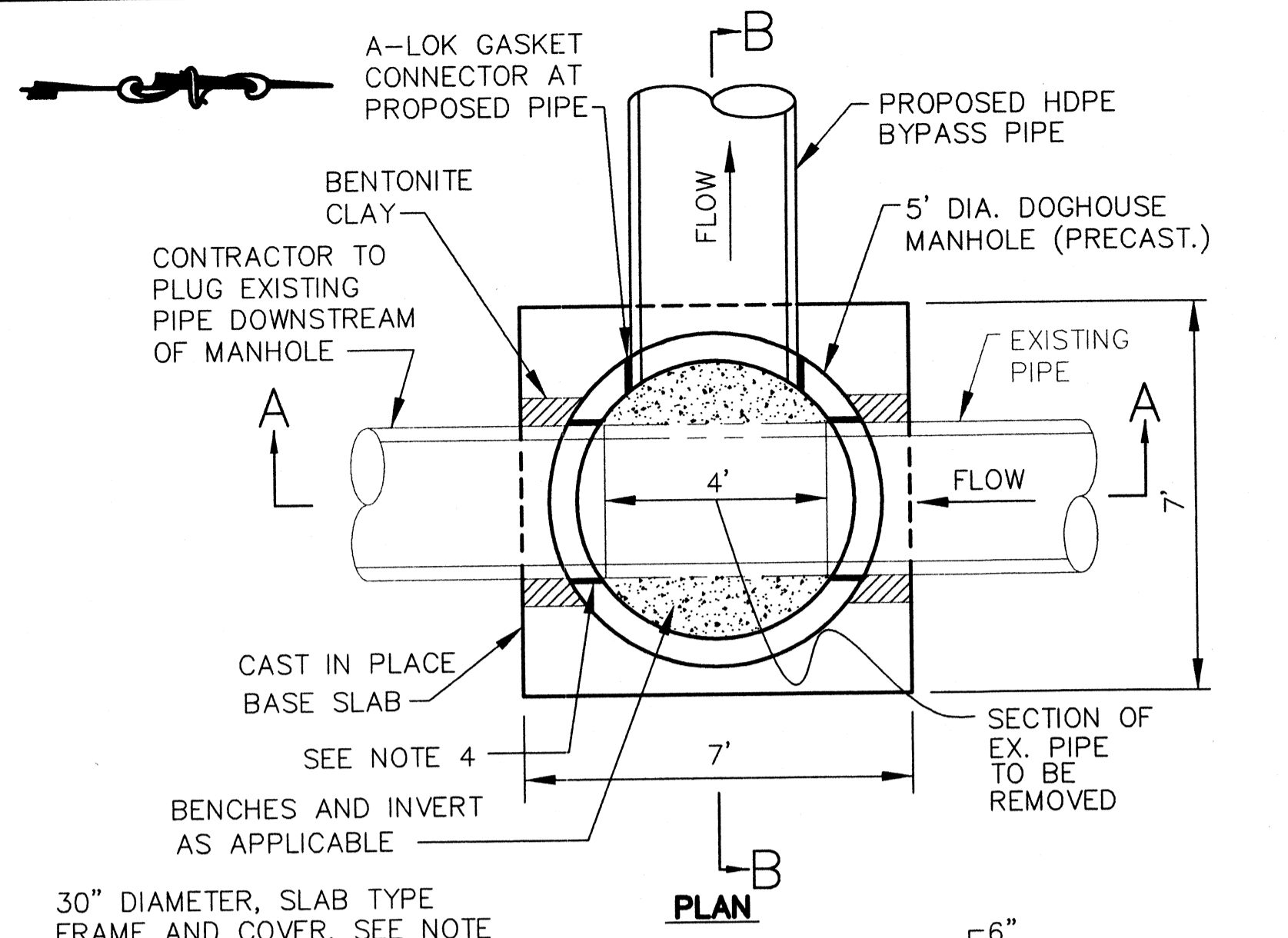


DES:	C.H.		
DRN:	K.L.B.		
CHK:	G.C.L.		
DECEMBER, 2008	BY NO.	AS-BUILT	12/10
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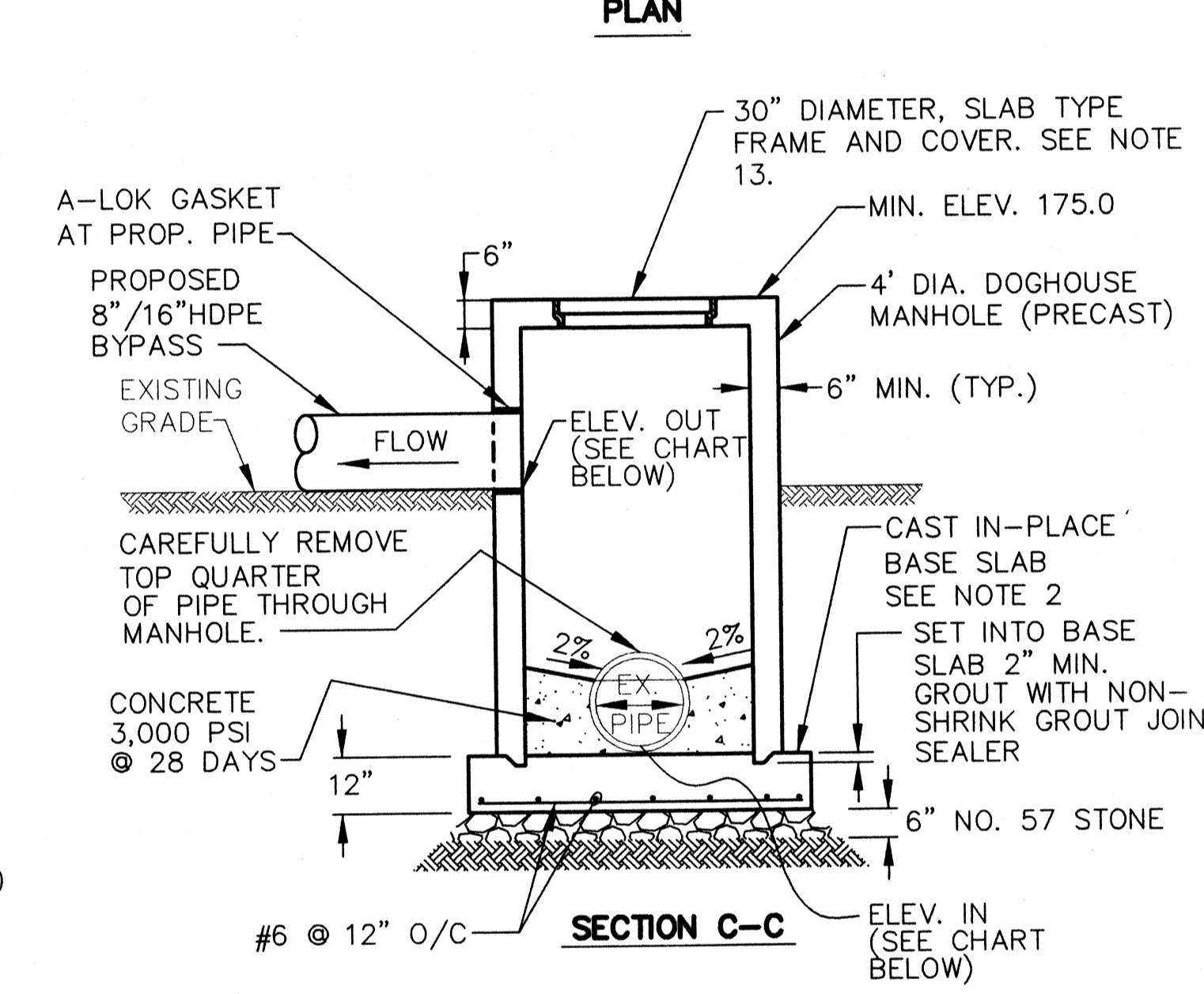
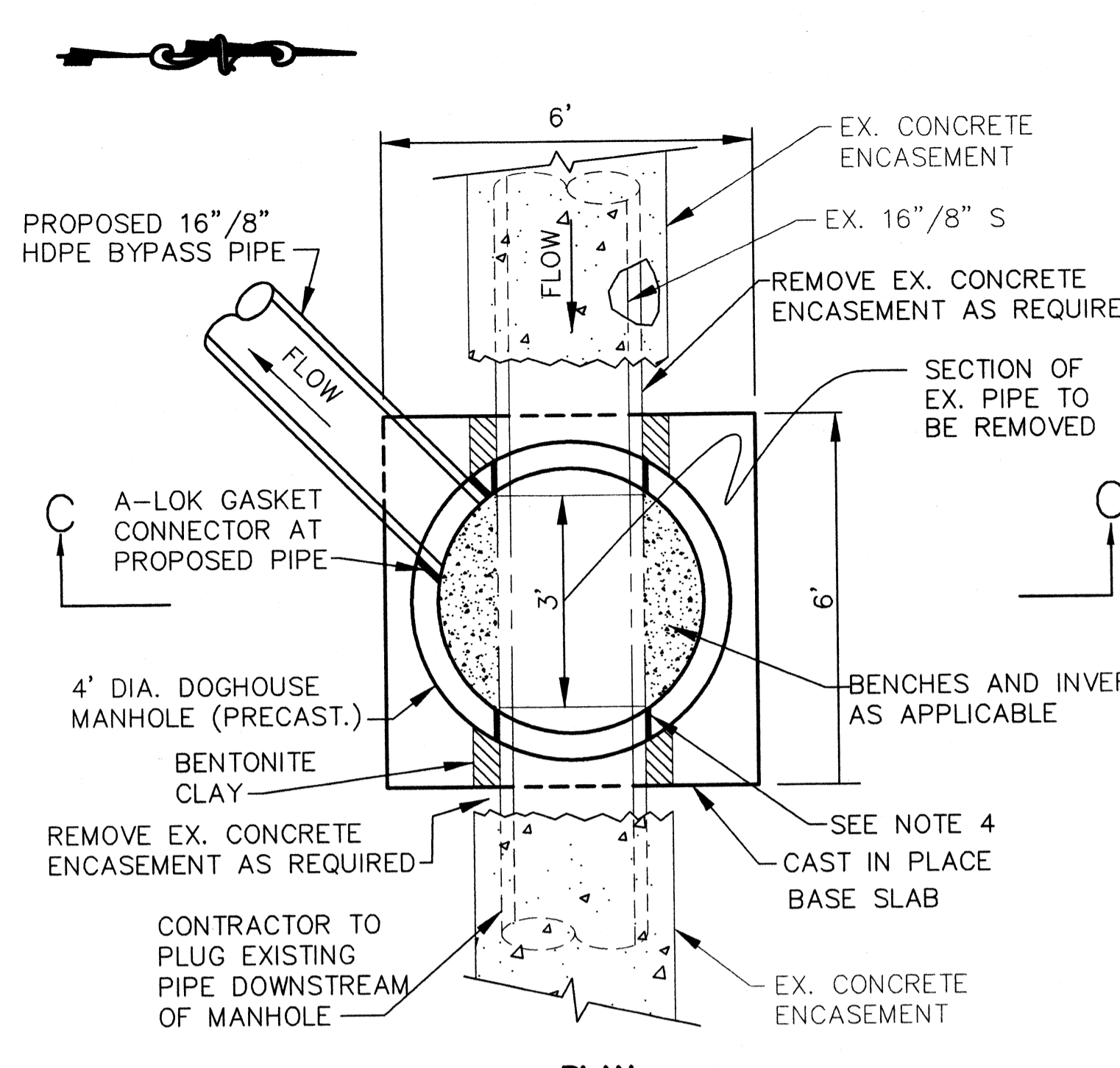
GRAVITY BYPASS PLAN AND PROFILE
60' SCALE MAP 47 BLOCK 10, 16, 17, & 18

LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

AS-BUILT
SCALE AS SHOWN
SHEET 23 OF 27

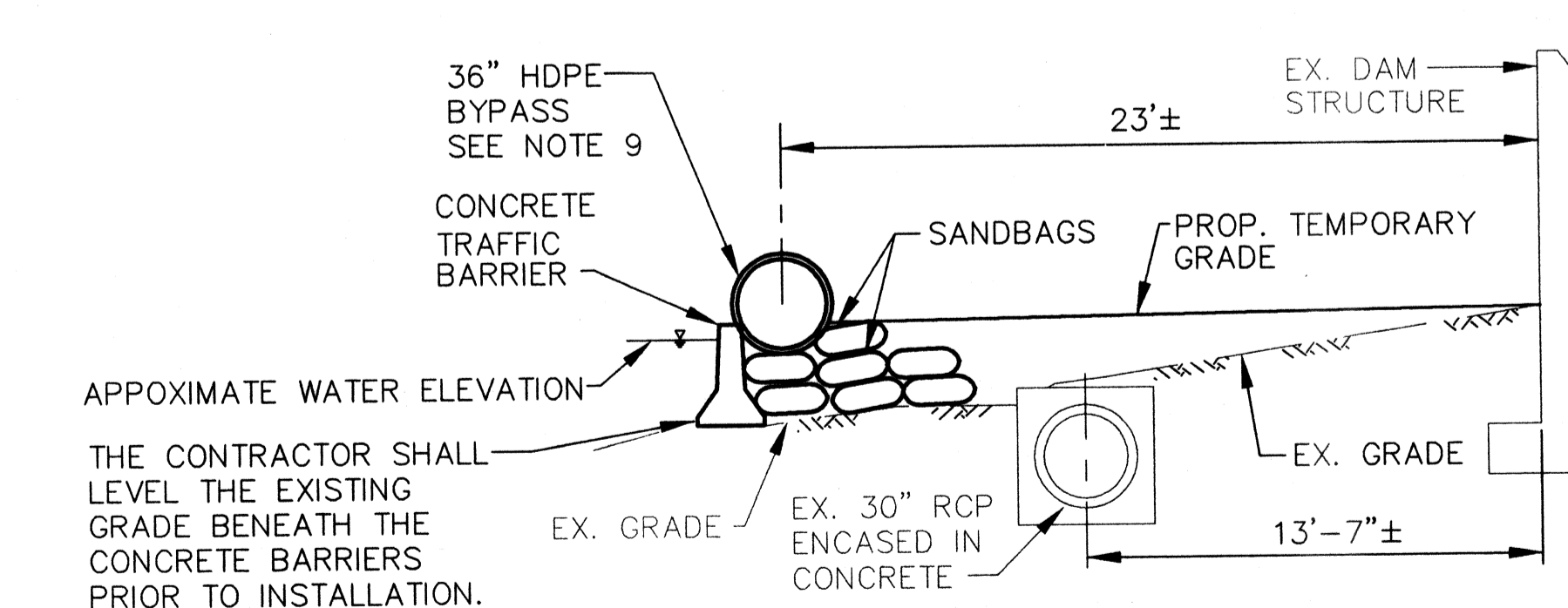


TEMPORARY DOGHOUSE MANHOLE, MH-3 ON EXISTING 27" S
NOT TO SCALE



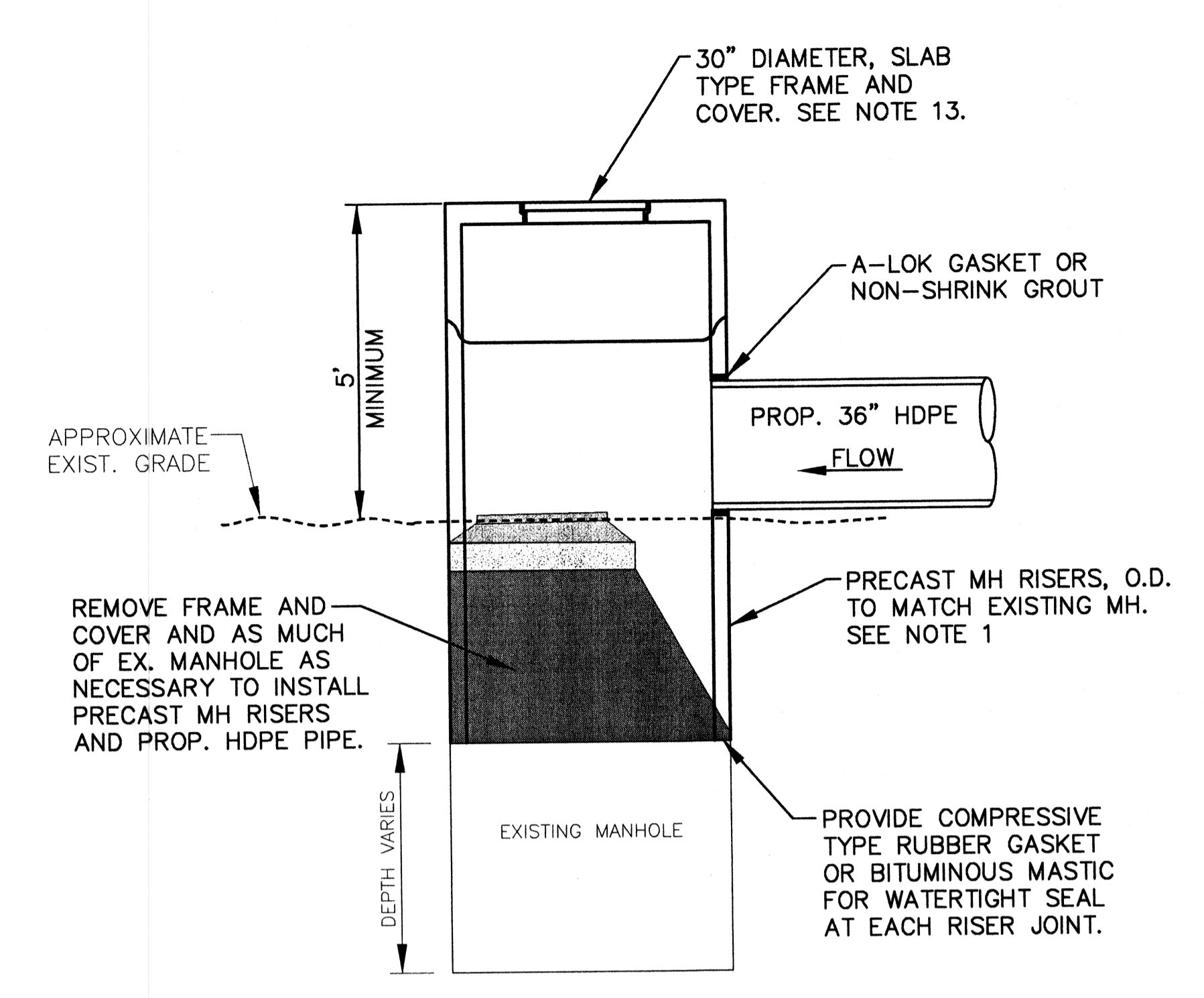
TEMPORARY DOGHOUSE MANHOLES (MH-1 & MH-2)
NOT TO SCALE

MH	ELEV. (OUT)	ELEV. (IN)
MH-1	170.0	165.3
MH-2	170.0	164.6

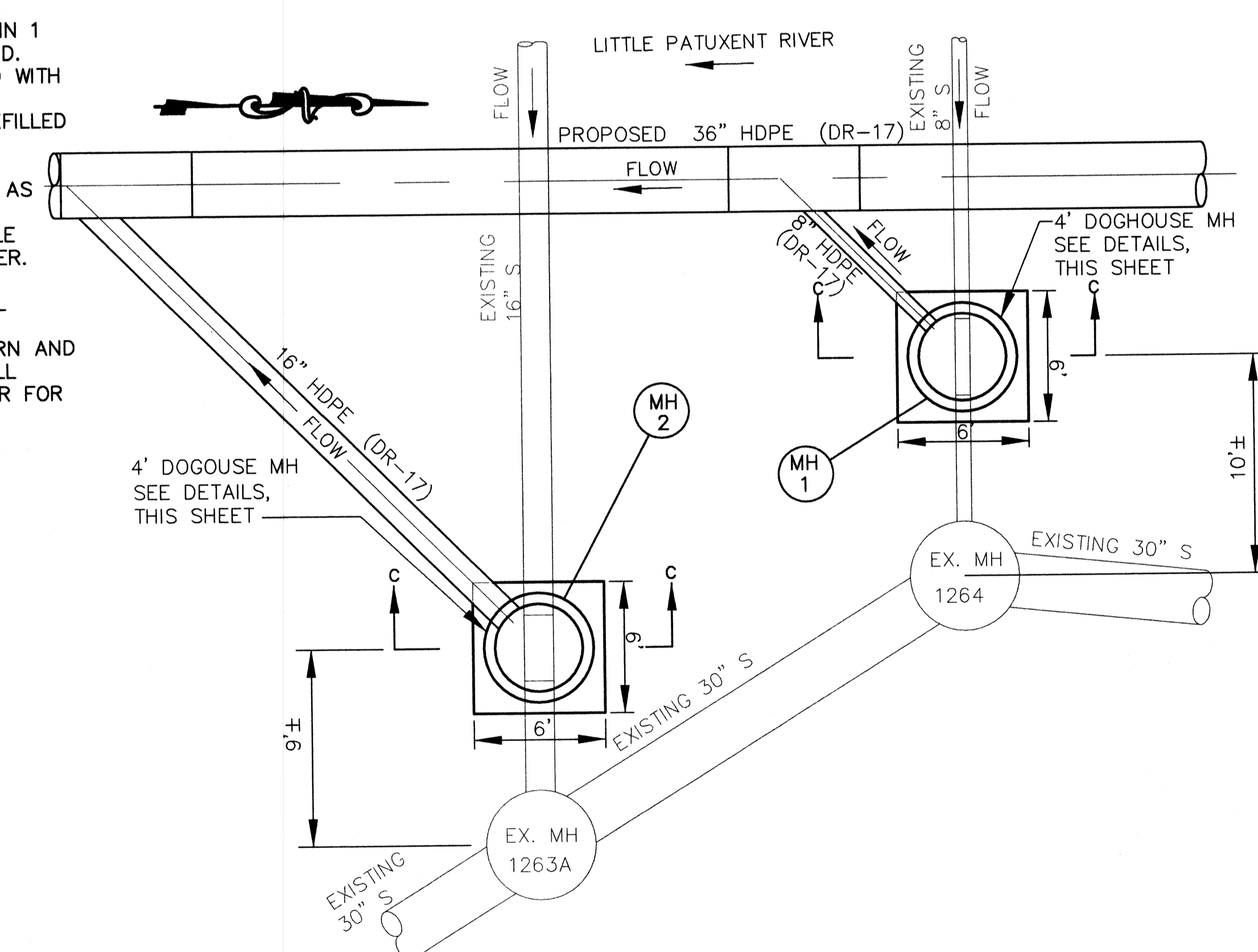


SECTION AT TEMPORARY SANDBAG/CONCRETE BARRIER
SCALE: 1" = 5'

- GENERAL NOTES:**
- 1.) PRECAST MANHOLE RISERS SHALL BE FURNISHED AS PER HOWARD COUNTY DETAIL G-5.13.
 - 2.) CONCRETE: BASE SLAB - COMPRESSIVE STRENGTH OF 3,000 PSI @ 28 DAYS (POURED-IN PLACE.) DOGHOUSE RISER - COMPRESSIVE STRENGTH OF 4,000 PSI @ 28 DAYS (PRECAST.)
 - 3.) PROVIDE 12" MINIMUM CLEARANCE FROM PROPOSED PIPE AND FROM DOGHOUSE OPENING TOP(S) TO RISER JOINT.
 - 4.) MINIMUM 1" CLEARANCE SHALL BE MAINTAINED BETWEEN PIPES AND PRECAST DOGHOUSE PIPE OPENINGS. OPENINGS SHALL BE GROUTED WITH NON-SHRINK GROUT JOINT FILLER.
 - 5.) ALL REINFORCING STEEL SHALL CONFORM TO ASTM A-615, GRADE 60.
 - 6.) PRECAST MANHOLE RISER JOINTS: THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR WON DESIGN. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATER TIGHT USING THE MANUFACTURERS RECOMMENDED ASTM OR ASSHTO APPROVED SEALANT.
 - 7.) THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGNING, FURNISHING, INSTALLING, OPERATING AND MAINTAINING THE BYPASS SYSTEM, AS PER THE SPECIFICATIONS.
 - 8.) THE CONTRACTOR SHALL BE RESPONSIBLE FOR INCLUDING PAYMENT OF PENALTIES, FOR ANY VIOLATIONS AND SPILLAGE OF SEWAGE.
 - 9.) THE CONTRACTOR SHALL SUPPORT AND ANCHOR THE PIPE TO PREVENT FLOTATION AND MOVEMENT DURING BYPASS OPERATIONS. CONTRACTOR SHALL ALSO ENSURE THAT PIPE MOVEMENT WILL NOT OCCUR AT THE MANHOLE CONNECTION. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND DESIGN TO HOWARD COUNTY FOR APPROVAL PRIOR TO CONSTRUCTION. PRIOR TO ACCEPTING FLOWS, THE BYPASS SYSTEM SHALL BE INSPECTED & APPROVED BY THE COUNTY.
 - 10.) CONTRACTOR SHALL VERIFY OUTSIDE DIAMETER AND MATERIAL OF THE EXISTING 16" AND 8" LATERALS PRIOR TO ORDERING MATERIAL.
 - 11.) AFTER THE PROP. SEWER IS COMPLETED, AND THE BYPASS SYSTEM IS REMOVED, THE CONTRACTOR SHALL REPLACE THE TOP QUARTER OF THE EXISTING PIPE. DOGHOUSE MANHOLES SHALL BE REMOVED TO WITHIN 1 FOOT OF THE CROWN OF THE EXISTING PIPE. THE I.D. OF THE REMAINING DOGHOUSE MH SHALL BE FILLED WITH CONCRETE. ONCE CURED, THE REMAINDER OF THE DOGHOUSE MANHOLES SHALL BE BURIED AND BACKFILLED TO EXISTING GRADE.
 - 12.) PRECAST CONCRETE TRAFFIC BARRIERS SHALL BE AS PER MARYLAND STATE HIGHWAY STD. DETAIL MD 104.01-53. CONCRETE BARRIERS SHALL BE CAPABLE OF BEING INTERLOCKED WITH THE ADJACENT BARRIER.
 - 13.) MANHOLE FRAME AND COVER SHALL BE PER MODEL B-6077 SOLID LID, FURNISHED BOLTED DOWN AND WATER TIGHT, AS MANUFACTURED BY BARRY PATTERN AND FOUNDRY OR APPROVED EQUAL. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF THE FRAME AND COVER FOR APPROVAL.



MODIFICATIONS TO EXISTING MANHOLE - 1261
NOT TO SCALE



GRAVITY BYPASS CONNECTIONS FOR 8" AND 16" LATERAL SIPHON LINES
SCALE: 1" = 5' AS-BUILT

PROFESSIONAL CERTIFICATION
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LICENSE NO. 8146 EXPIRATION DATE: 10/8/11

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *John G. K...* DATE: 12/12/08
Chief, Bureau of Engineering: *Richard Sapan* DATE: 12/12/08
Chief, Bureau of Utilities: *Stake C. Chen* DATE: 12/12/08
Chief, Utility Design Division: *...* DATE: 12/11/08

Patton Harris Rust & Associates, Inc.
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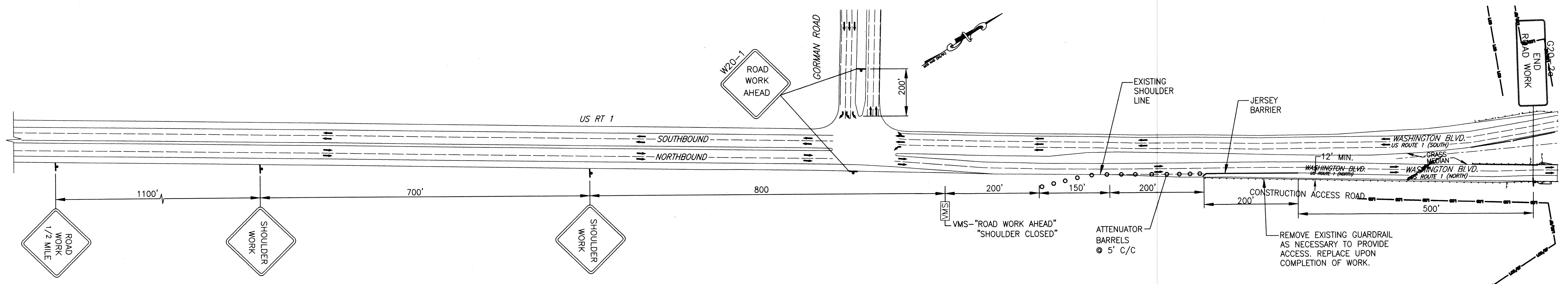
Professional Engineer Seal: *Patton Harris Rust & Associates, Inc.*

DES: C.H.			
DRN: K.L.B.			
CHK: G.C.L.			
DECEMBER, 2008	BY NO.	REVISION	DATE
			12/10

GRAVITY BYPASS DETAILS
600' SCALE MAP 47 BLOCK 10, 16, 17, & 18

LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 24 OF 27



PLAN
1"=100'

NOTES:

- 1.) ALL SIGNS SHALL COMPLY WITH MUTCD STANDARDS.
- 2.) ALL WORK SHALL COMPLY WITH THE PERMIT REQUIREMENTS INCLUDED IN THE SPECIAL PROVISIONS.
- 3.) CONTRACTOR TO COORDINATE INSTALLATION USE AND REMOVAL OF THE ACCESS ROAD W/ THE CONTRACTOR CONSTRUCTING CONTRACT #20-4531. COMPENSATION WILL NOT BE GIVEN TO THE CONTRACTOR FOR DELAYS, INCONVENIENCES OR DAMAGE SUSTAINED DUE TO LACK OF COORDINATION BETWEEN CONTRACTORS.

LEGEND

- TEMPORARY SIGN FOR TRAFFIC CONTROL
- DIRECTION OF TRAFFIC
- MESSAGE BOARD
- BARRELS
- TEMPORARY JERSEY BARRIER
- GUARD RAIL

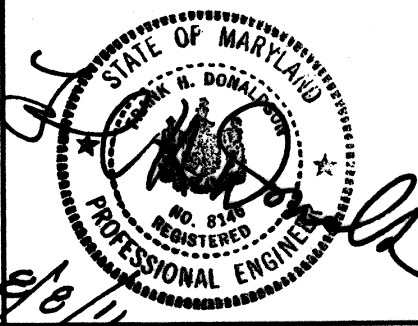
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AS-BUILT

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	
<i>[Signature]</i> DIRECTOR OF PUBLIC WORKS	<i>[Signature]</i> DATE
<i>[Signature]</i> CHIEF, BUREAU OF ENGINEERING	<i>[Signature]</i> DATE
<i>[Signature]</i> CHIEF, BUREAU OF UTILITIES	<i>[Signature]</i> DATE
<i>[Signature]</i> CHIEF, UTILITY DESIGN DIVISION	<i>[Signature]</i> DATE

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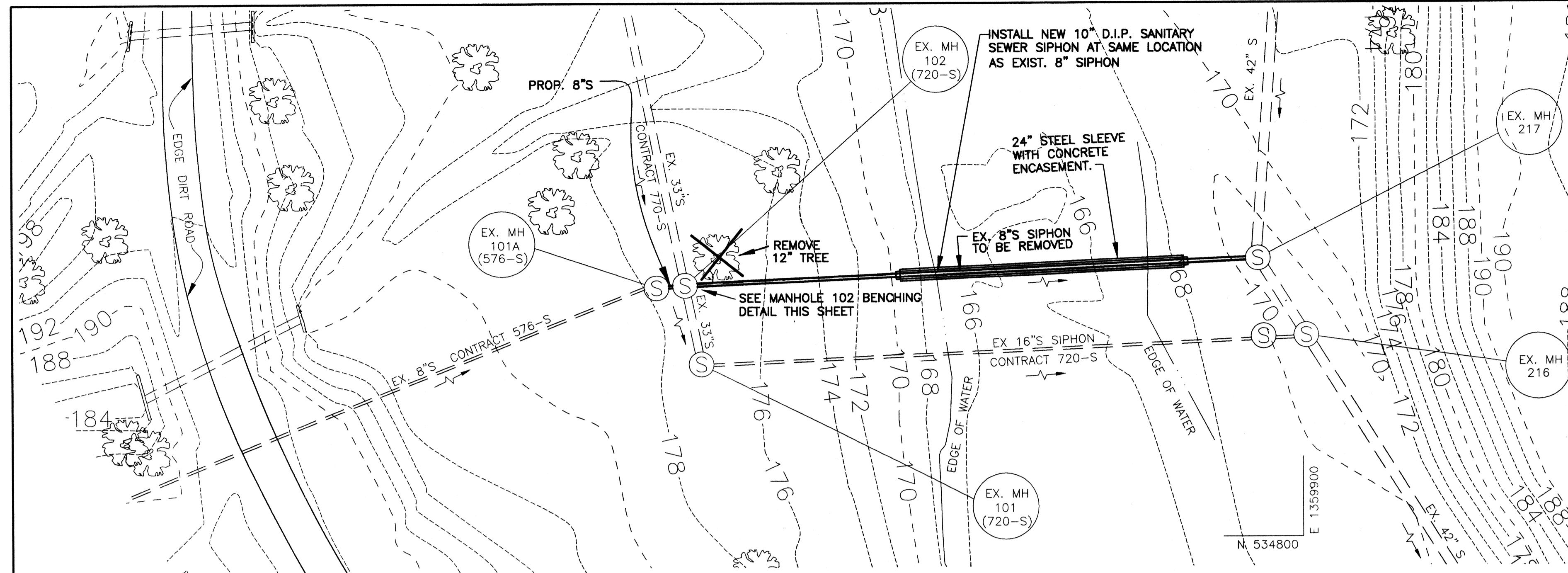
DES: C.H.					
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DECEMBER, 2008	BY	NO.	REVISION	DATE	12/10

**MAINTENANCE OF TRAFFIC
U.S. ROUTE 1**

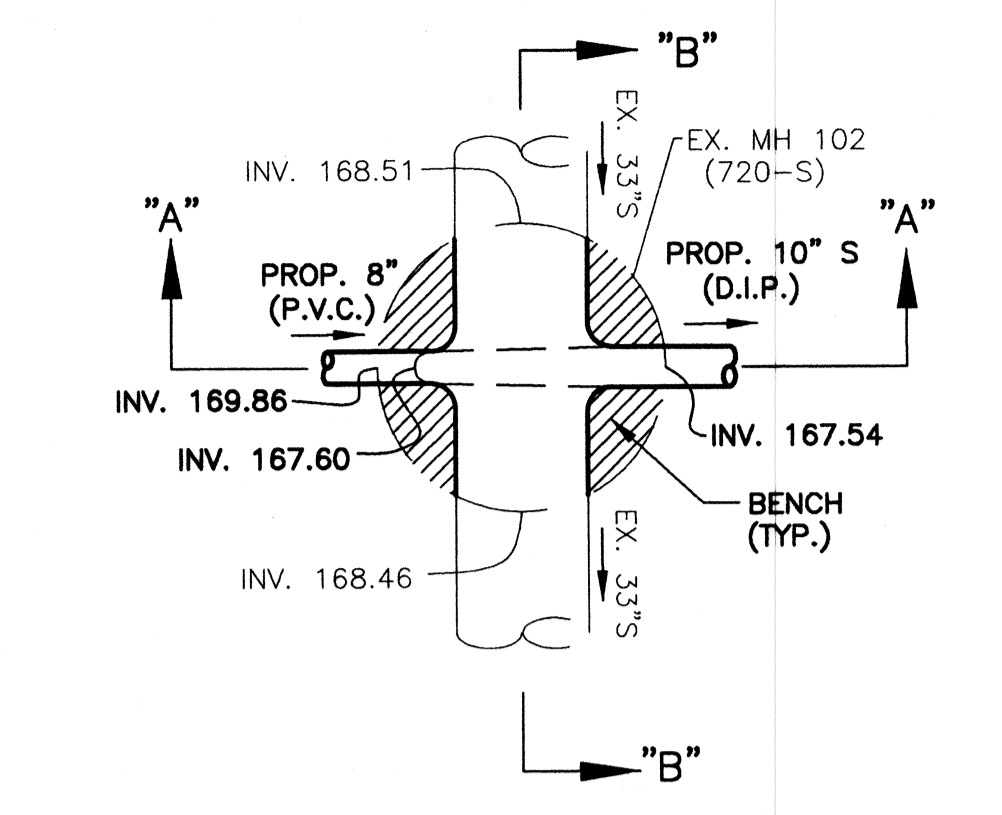
600' SCALE MAP 47 BLOCK 10, 16, 17, & 18

**LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER**
CAPITAL PROJECT S-6175
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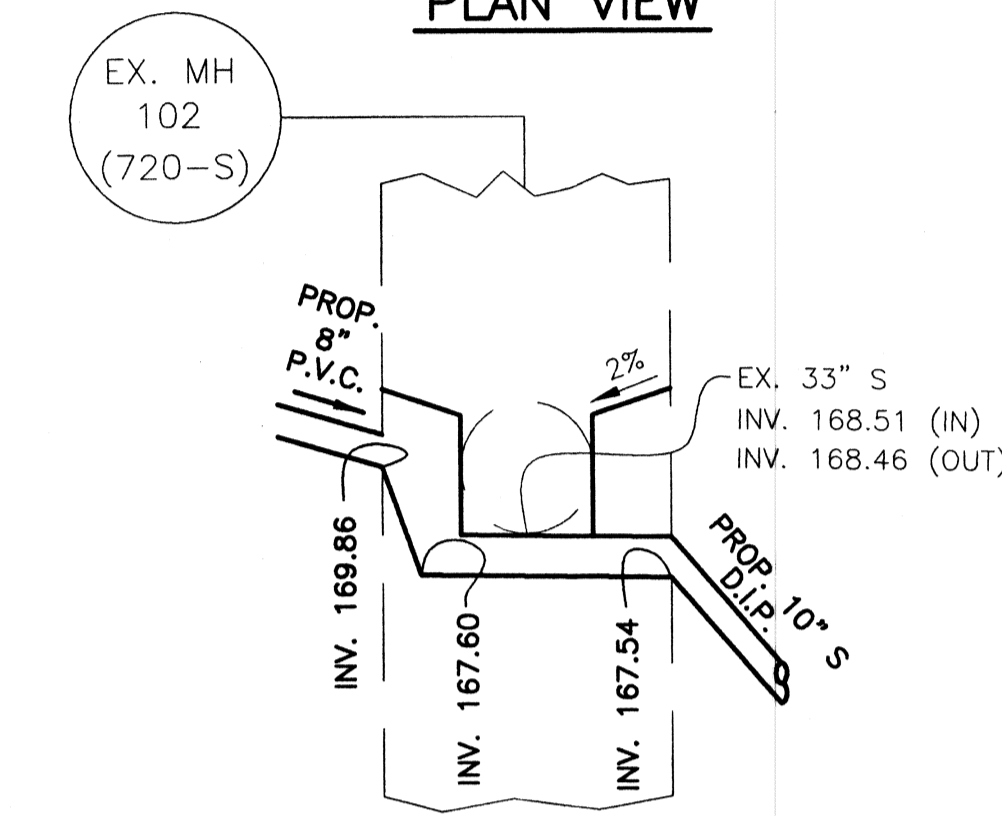
SCALE AS SHOWN
SHEET 25 OF 27



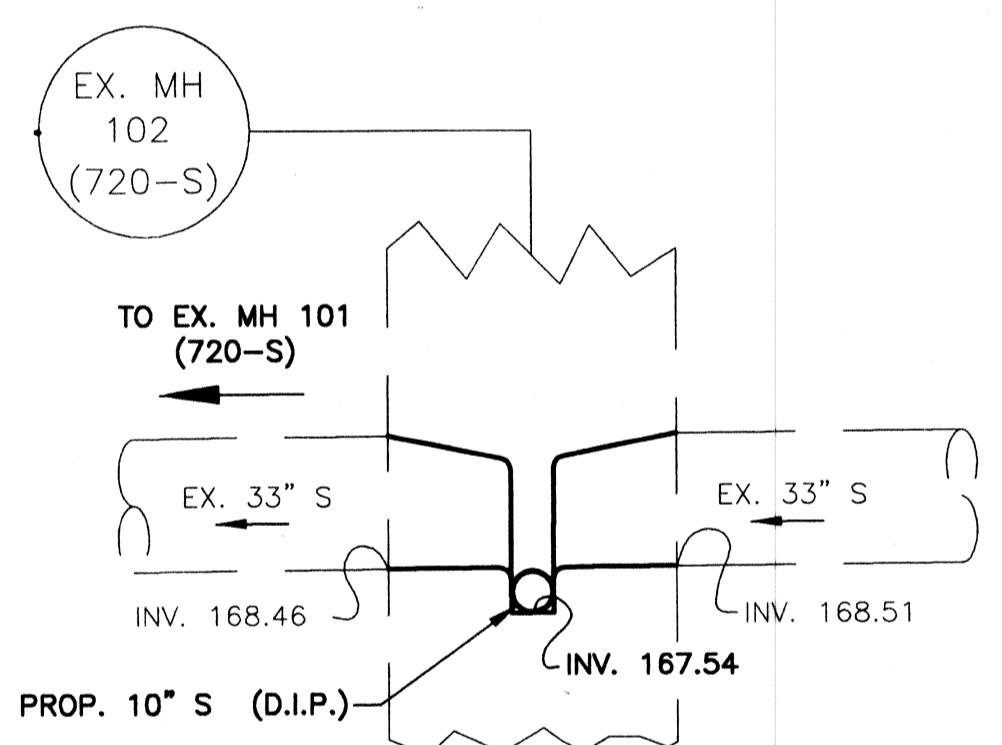
PLAN
1"=20'



PLAN VIEW

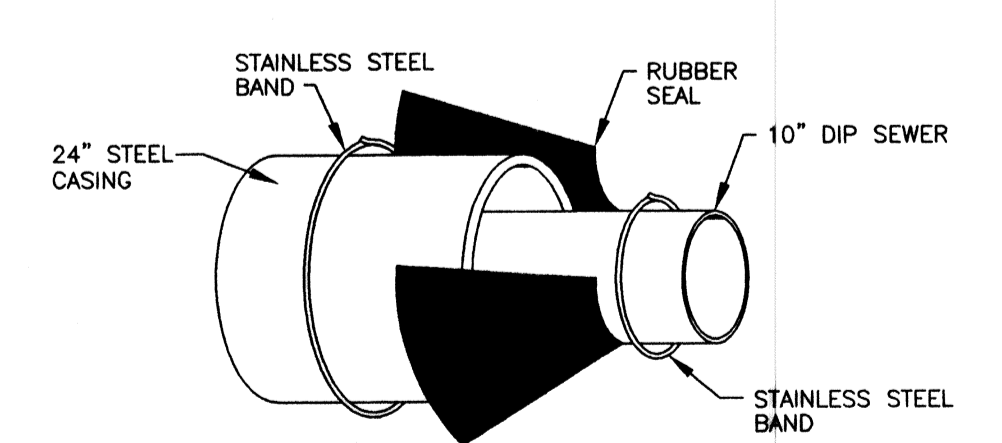


SECTION "A"



SECTION "B"

MANHOLE 102 BENCHING DETAIL
SCALE: 1/4"=1'0"



CASING END CLOSURE
SCALE: NO SCALE

SUGGESTED SEQUENCE OF CONSTRUCTION

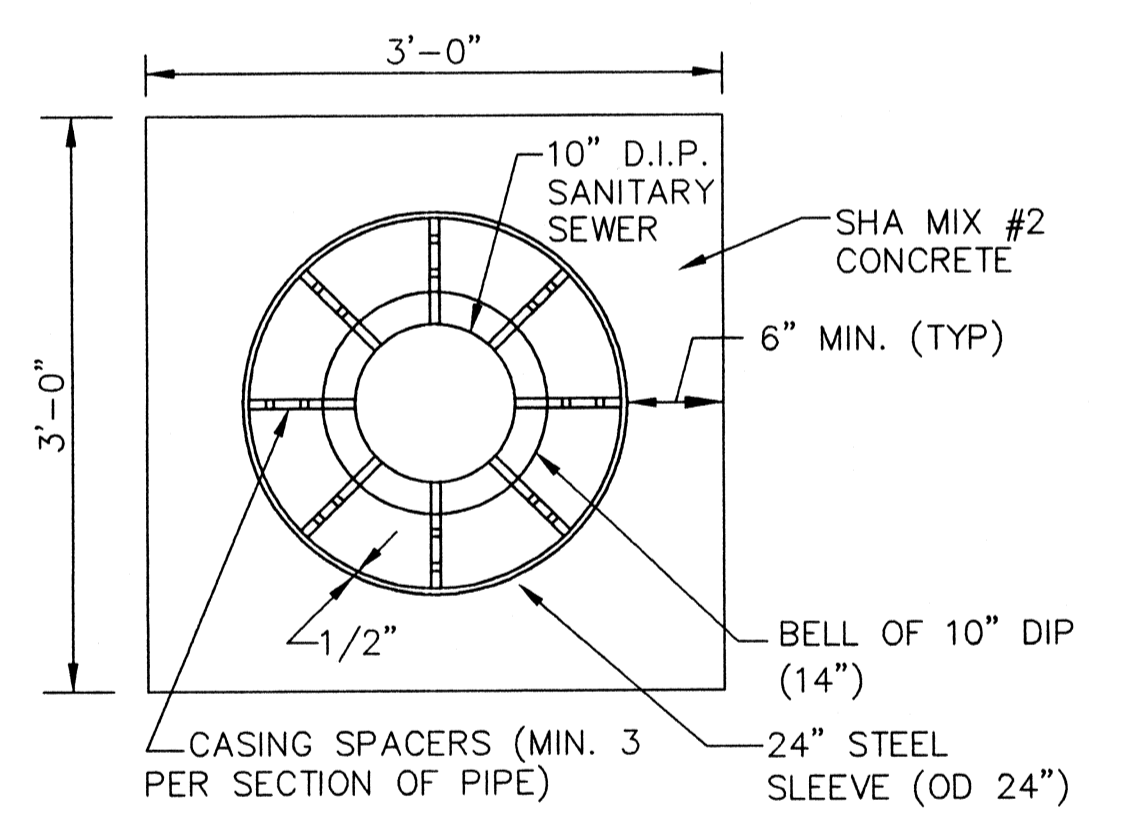
1. PLUG EXISTING 8" SEWERS IN MANHOLE 102 (720-S).
2. INSTALL FLOW THROUGH PLUG ON 33" SEWER IN MH 102 (720-S).
3. INSTALL TEMPORARY BYPASS PUMP AND PIPING FOR 8" SEWER UPSTREAM OF MANHOLE 101A (576-S).
4. PLUG EXISTING 8" SEWER IN MANHOLE 217.
5. INSTALL FLOW THROUGH PLUG ON 42" SEWER IN MANHOLE 217.
6. REMOVE SLUDGE/CLEAN MANHOLE 101A (576-S), MANHOLE 102 (720-S) AND MANHOLE 217.
7. CORE DRILL MANHOLE 101A (576-S) FOR NEW 8" SEWER, CORE DRILL MANHOLE 102 (720-S) FOR NEW 8" SEWER AND NEW 10" SEWER, CORE DRILL MANHOLE 217 FOR NEW 10" SEWER.
8. REMOVE EXISTING 8" DIP SIPHON, INSTALL NEW 10" SIPHON AND NEW 8" SEWER. SEE STREAM CROSSING PLAN AND DETAILS ON SHEET 2.
9. FILL LOWER PORTION OF MANHOLE 101A (576-S) AND MANHOLE 102 (720-S) WITH 2500 PSI CONCRETE. INSTALL BRICK CHANNELS FOR NEW 8" SEWER AND NEW 10" SIPHON.
10. REMOVE SEWER FLOW PLUGS FROM MANHOLE 102 (720-S) AND MANHOLE 217.
11. REMOVE TEMPORARY BYPASS PUMPING AND PLUG FROM 8" SEWER.
12. RESTORE SITE.

NOTES:

1. SEE SHEET 2 FOR STREAM CROSSING DETAILS.
2. ALL PIPE SHALL BE D.I.P. CLASS 54 UNLESS OTHERWISE NOTED ON THE PLAN, MEETING THE REQUIREMENTS OF AWWA C151. PIPE SHALL BE RESTRAINED JOINT TR FLEX PIPE WITH PROTECTO 401 LINING BY U.S. PIPE OR EQUAL.
3. JOINT DEFLECTION SHALL NOT EXCEED 3 DEGREES.
4. ALL PIPE, STONE AND CONCRETE ENCASEMENT SHALL BE INSTALLED ON FIRM, STABLE GROUND.

LEGEND

EX MH 102 (720-S) (720-S) IS CONTRACT NUMBER (TYPICAL)

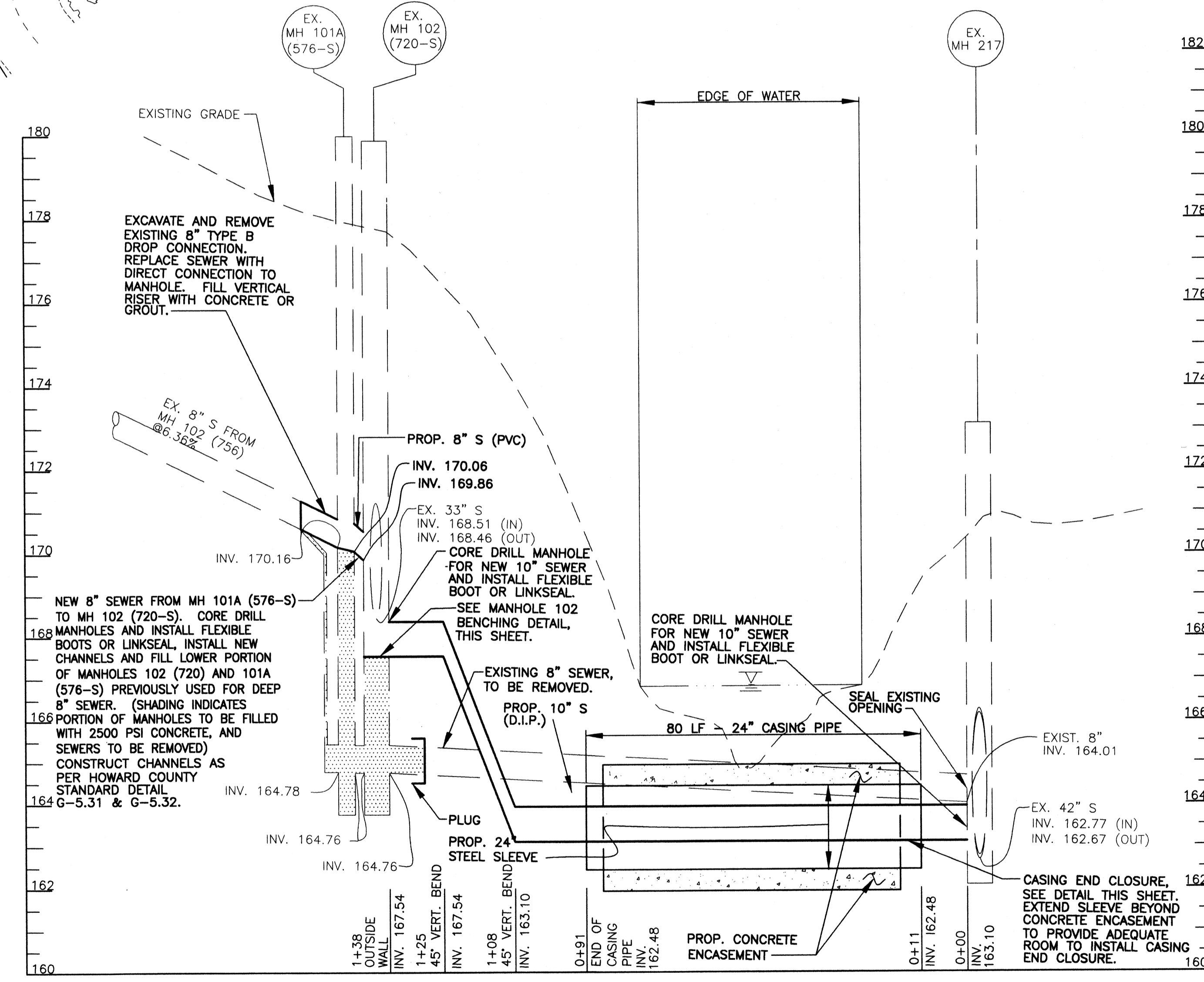


NOTES:

1. STEEL CASING PIPE TO BE 24"Ø x 1/2" THICK WITH CEMENT MORTAR LINING ON INSIDE.
2. 10" DIP AND 24" STEEL PIPE SHALL BE INSTALLED USING THE OPEN CUT METHOD.
3. CONCRETE SHALL BE POURED AGAINST UNDISTURBED EARTH. REMOVE TRENCH SHEETING BEFORE POURING CONCRETE.
4. CASING SPACERS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
5. CONTRACTOR SHALL PREVENT FLOTATION OF CARRIER PIPE WHILE CONCRETE CURES.
6. CASING END SEAL SHALL BE PER HOWARD COUNTY SPECIFICATIONS.
7. SEE STD. SPECIFICATION SECTIONS 912 AND 963.

SLEEVE & ENCASEMENT DETAIL
SCALE: NO SCALE

QUANTITIES			
ITEMS	AS-BUILTS		
	QUANTITIES	TYPE	MANUFACTURER/SUPPLIER
10" TYTON, CL56 w/PROTECTO 401	140 L.F.	DIP	U.S. PIPE
54-INCH STEEL CASING (CONCRETE LINED)	80 L.F.	STEEL	NORTHWEST PIPE CO.
16" 45° VERT. BENDS CL153	2 EA.	MJ DIP	FERGUSON ENTERPRISES
SPACER, SP S/S	12 EA.		FERGUSON ENTERPRISES



PROFILE

HORIZONTAL: 1"=20'
VERTICAL: 1"=2'

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. 20745 EXPIRATION DATE: 2-17-2018

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
Director of Public Works: *Janet K. ...* 12/16/08
Chief, Bureau of Engineering: *Robert J. ...* 12/12/08
Chief, Bureau of Utilities: *Stacy C. ...* 12/12/08
Chief, Utility Design Division: *Debra ...* 12/11/08

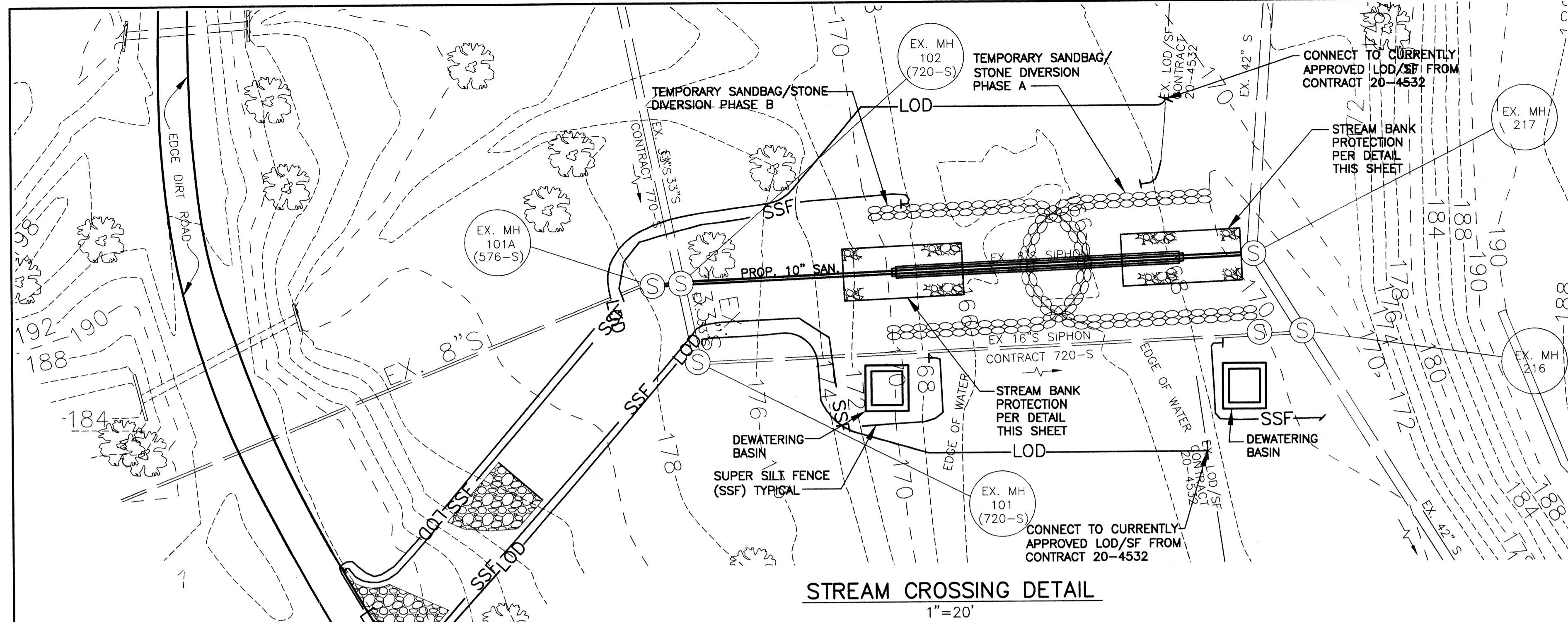
Patton Harris Rust & Associates, Inc.
Engineers, Surveyors, Planners, Landscape Architects.
PHRA
8818 Centre Park Drive
Columbia, MD 21045
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F 410.997.9282



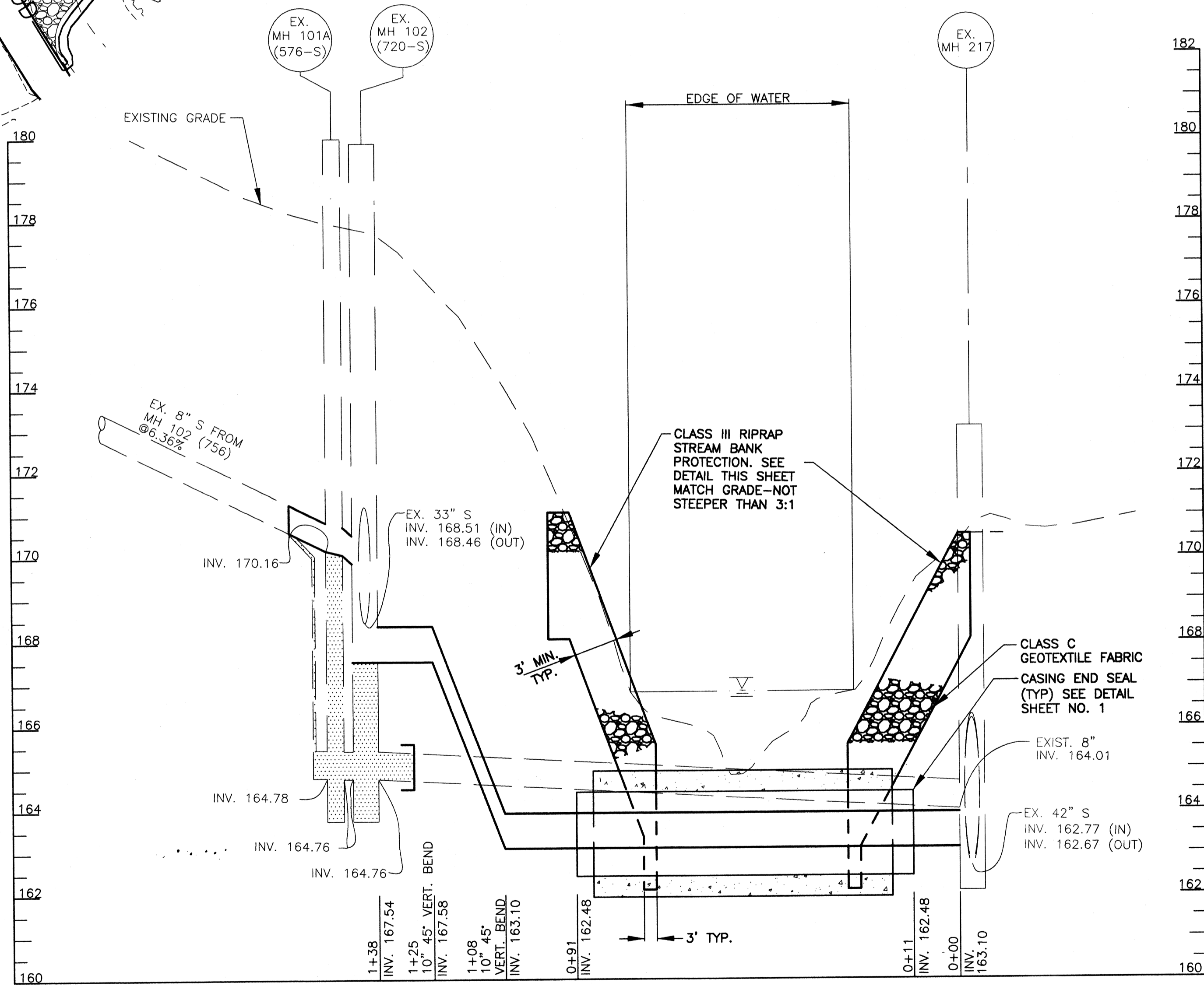
DES:	B.G.W.			
DRN:	R.J.C.			
CHK:	G.C.L.			
SEPTEMBER, 2010	BY NO.	REVISION	DATE	

10" REPLACEMENT INVERTED SIPHON
PLAN AND PROFILE
600' SCALE MAP 47 & 48 BLOCK 1843 & 1942

LITTLE PATUXENT
PARALLEL INTERCEPTOR SEWER
CAPITAL PROJECT S-6175
CONTRACT NO. 20-4532
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND
SCALE AS SHOWN
SHEET 1 OF 2



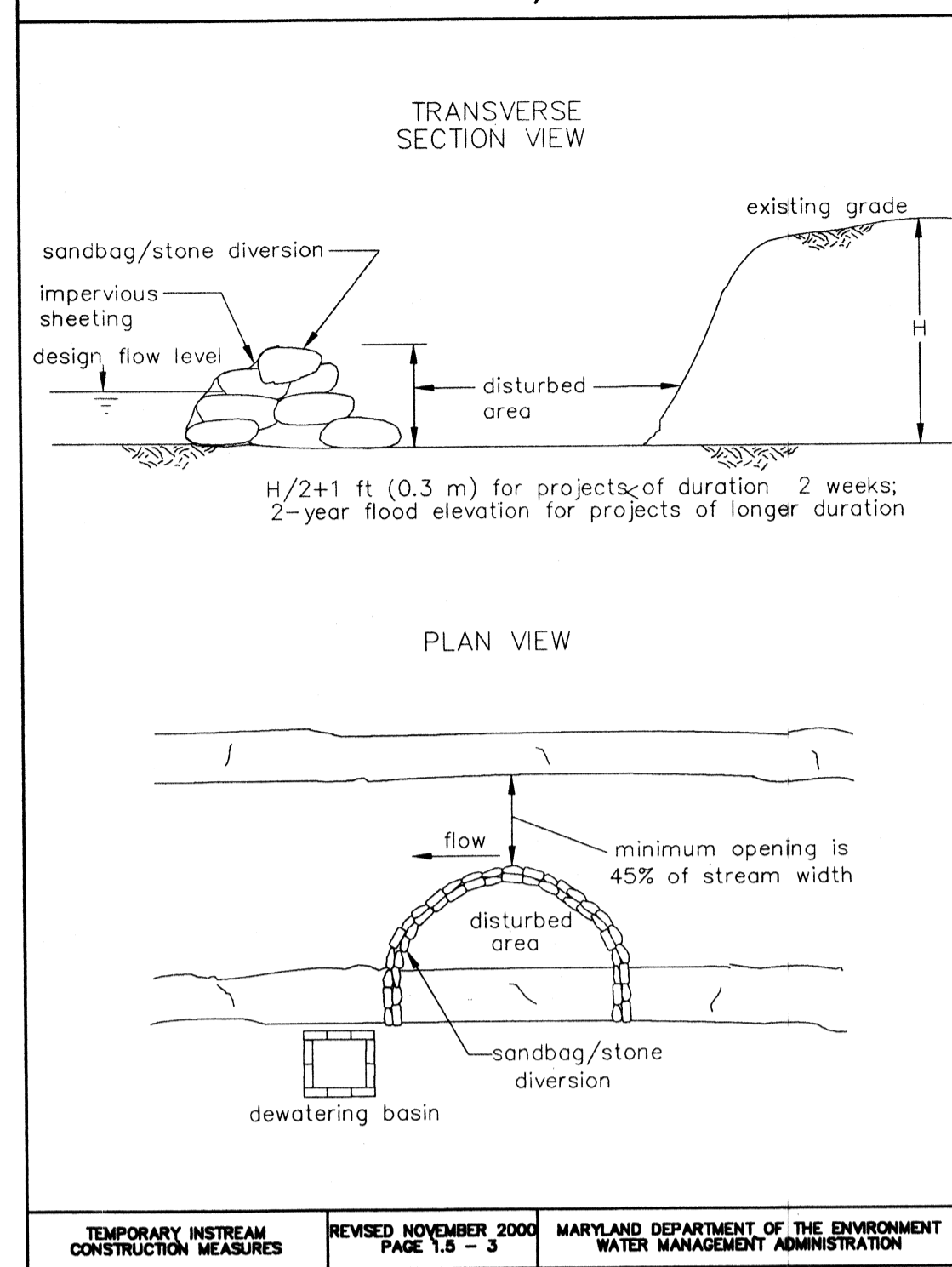
STREAM CROSSING DETAIL
1"=20'



PROFILE - STREAM CROSSING

SCALE: 1"=20' HORIZ
1"=2' VERT.

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



TEMPORARY INSTREAM CONSTRUCTION MEASURES REVISED NOVEMBER 2000 PAGE 1.6 - 3 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES

MGWC 1.5: SANDBAG/STONE CHANNEL DIVERSION

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 ultraviolet 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 impermeable 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.

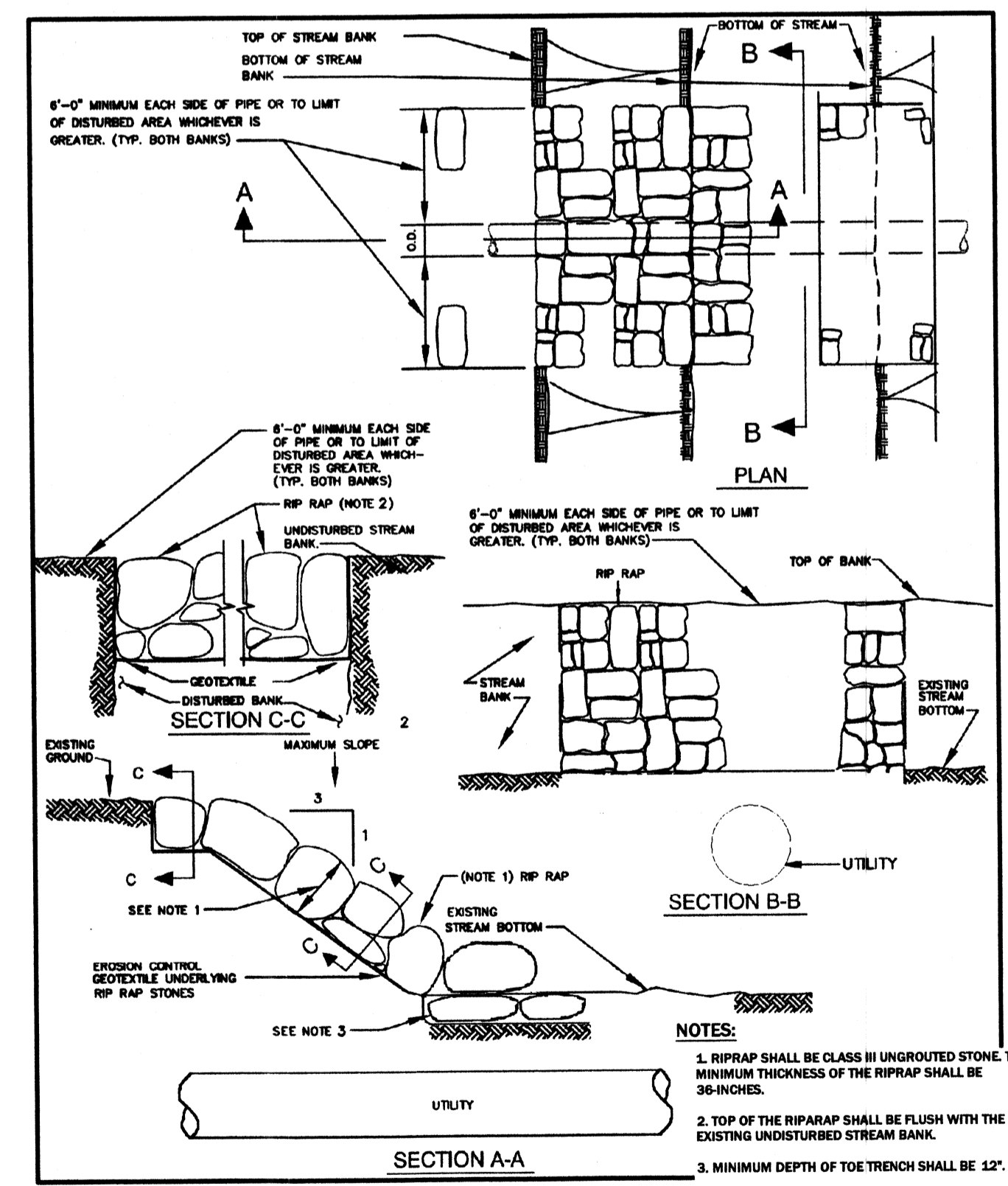
Sandbag/stone diversions can be used independently or as components of other stream diversion techniques. Installation of this measure should proceed as follows (refer to Detail 1.5):

- The diversion structure should be installed from upstream to downstream.
- 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 bank full 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 fill. Additionally, it may be necessary to prepare the bank in a similar fashion.
- All excavated material should be deposited and stabilized in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
- Sediment laden water from the construction area should be pumped to a dewatering basin.

TEMPORARY INSTREAM CONSTRUCTION MEASURES MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES REVISED NOVEMBER 2000
PAGE 1.5 - 1

MGWC 1.5: SANDBAG/STONE CHANNEL DIVERSION

- 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.
- 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.
- 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.
- 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.



DETAIL
STREAM BANK PROTECTION AT CROSSING
NO SCALE

STREAM CROSSING NOTES:

- STREAM CROSSING SHALL BE INSTALLED IN ACCORDANCE WITH MGWC STANDARD 1.5. PHASE A WILL OCCUR FROM STATION 0+00 (EX. MH 217) TO STATION 0+45. PHASE B WILL OCCUR FROM STATION 0+45 TO STATION 0+90.
- ALL EROSION CONTROL MEASURES NECESSARY FOR INSTALLATION OF THE SEWER MAIN ACROSS THE STREAM SHALL BE REMOVED ONLY UPON STREAM STABILIZATION AND APPROVAL OF THE SEDIMENT CONTROL INSPECTOR.
- CONTRACTOR TO PUMP THE WATER FROM THE DISTURBED AREA FOR EACH STREAM CROSSING VIA A PUMP AND HOSE TO THE DEWATERING BASIN IN ORDER THAT WORK MAY PROCEED IN THE DRY.
- RIPRAP SHALL MATCH EXISTING NATIVE STONE. TEXAS QUARRY WHITE STONE SHALL NOT BE ACCEPTABLE.

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. 20745 EXPIRATION DATE: 2-19-2013

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

J. G. K. 12/16/08 *Michael J. Sorenson* 12/14/08
DIRECTOR OF PUBLIC WORKS DATE CHIEF, BUREAU OF ENGINEERING DATE

Shane C. O'Connell 12/12/08 *Debra L. Linn* 12/11/08
CHIEF, BUREAU OF UTILITIES DATE CHIEF, UTILITY DESIGN DIVISION DATE

Patton Harris Rust & Associates, Inc.
Engineers, Surveyors, Planners, Landscape Architects.

P.H.R.A.
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STATE OF MARYLAND
PROFESSIONAL ENGINEER

DES:	B.G.W.
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SEPTEMBER, 2010	BY NO. REVISION DATE

10" REPLACEMENT INVERTED SIPHON
STREAM CROSSING DETAILS

600' SCALE MAP 47 & 48 BLOCK 1843 & 1942

AS-BUILT 3/21/11

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SCALE AS SHOWN
SHEET 2 OF 2