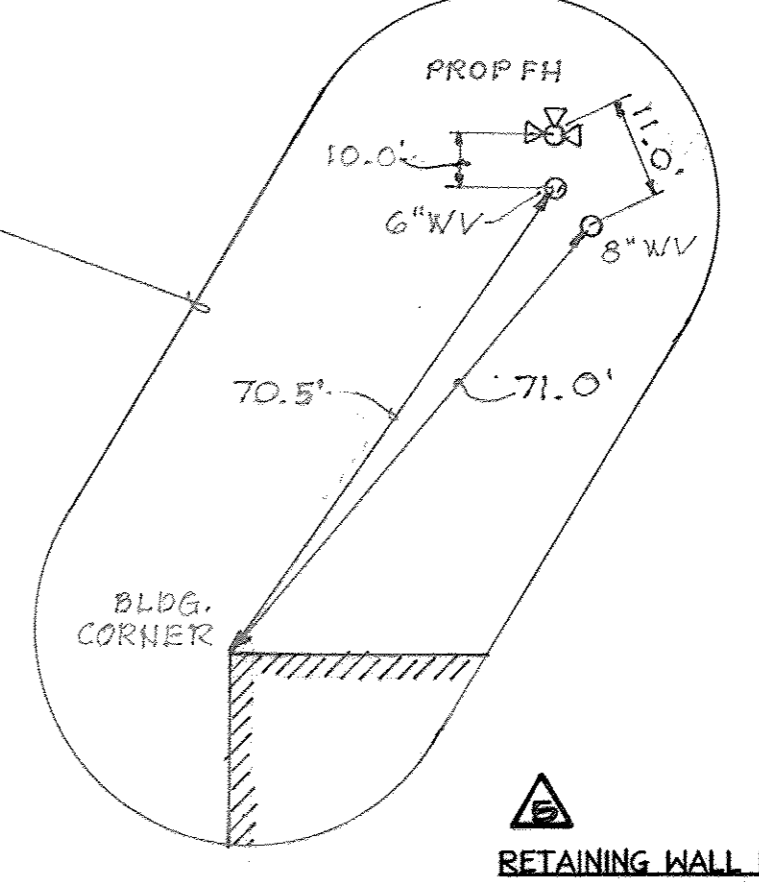


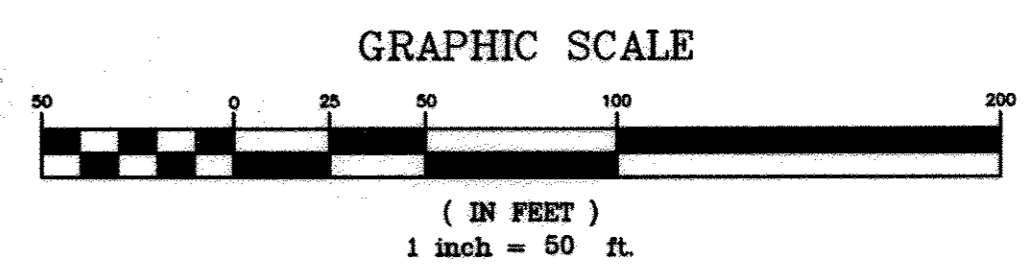
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RETAINING WALL NOTE: PORTIONS OF AN EXISTING RETAINING WALL AND GEOGRID ARE TO BE ABANDONED IN PLACE AND ARE DEEMED NON-STRUCTURAL. SEE SHEET 7 FOR LOCATION OF ABANDONED GEOGRID.

CAUTION: ABANDONED NON-STRUCTURAL GEOGRID FROM ABANDONED RETAINING WALL IS LOCATED WITHIN THE PUBLIC WATER AND UTILITY EASEMENT (BELOW THE INVERT OF THE WATER MAIN) FROM WL STA 6+50 TO WL STA 9+00.

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.
 SIGNATURE OF ENGINEER: [Signature]
 WILLIAM R. ZINK, P.E.
 MD LICENSE NUMBER: 20587
 EXPIRATION DATE: 09-06-2016
 DATE: 7/28/16



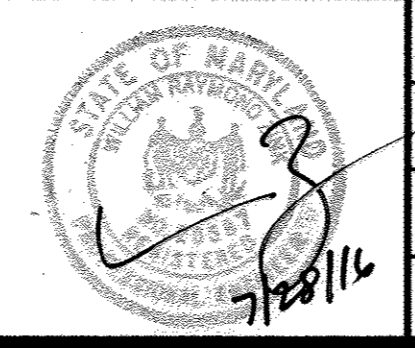
AS-BUILT
 6/12/17

MATCHLINE - SEE SHEET 3 OF 6 FOR CONTINUATION

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 [Signature]
 CHIEF, BUREAU OF UTILITIES

DEPARTMENT OF PLANNING & ZONING
 HOWARD COUNTY, MARYLAND
 [Signature]
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

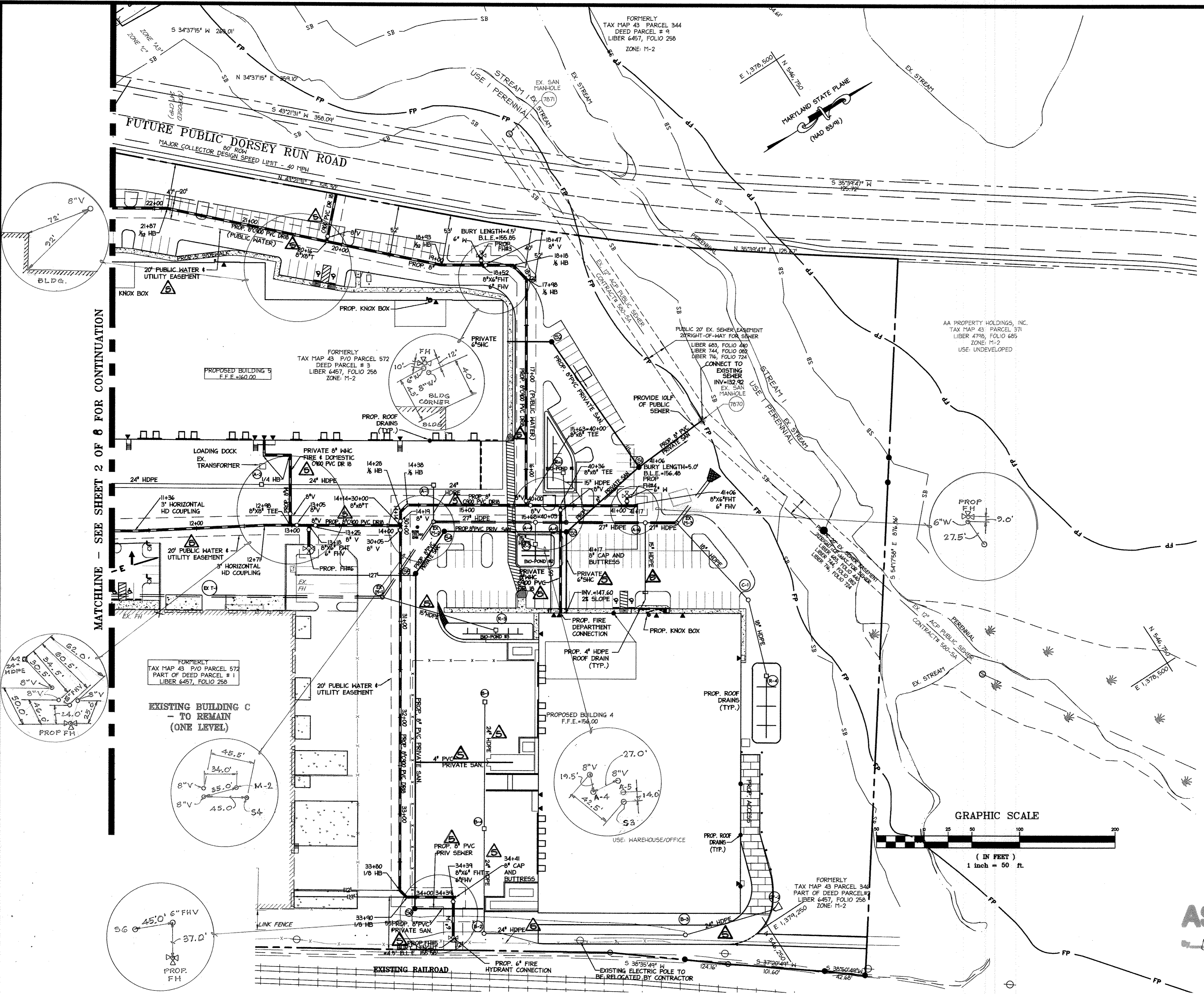
christopher consultants
 engineering • surveying • land planning
 1172 colts Neck drive suite 100 colts neck, md 21046-2000
 410.260.9600



DES:	ENJ	5	ADJUST WATER MAIN DESIGN & UPDATE	
			RETAINING WALL NOTES	5-18-16
PRN:	DAM	4	RETAINING WALL NOTE	4-1-16
		3	ADDRESS REDLINE COMMENTS	1-6-15
CHK:	ENJ	2	ADDRESS REDLINE COMMENTS	11-18-14
		1	REDLINE REVISIONS TO USE PVC FOR WATERLINE, NOTES AND ESTIMATE REVISED.	11/2014
DATE:	09/06/12	BY:	NQ	REVISION

PUBLIC WATER & SEWER PLANS
 600 SCALE MAP NO. _____ BLOCK NO. _____

PUBLIC WATER AND SEWER PLANS
DORSEY RUN INDUSTRIAL CENTER
NORTH SIDE REDEVELOPMENT
 MONTEVIDEO ROAD AND FUTURE DORSEY RUN ROAD
 1st ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND
 CONTRACT NO. 14-4602-D
 SCALE 1"=50'
 SHEET 2 OF 8



- GENERAL NOTES:**
1. ALL WATER MAINS AND 8" SEWER MAINS ASSOCIATED WITH THIS REDEVELOPMENT PROJECT SHALL BE C900 PVC DRIB.
 2. THE VERTICAL AND HORIZONTAL LOCATION OF THE EXISTING 8" WATERMAIN HAS NOT BEEN FIELD VERIFIED SO, THE GENERAL CONTRACTOR SHALL PROVIDE TEST PITS TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF THE EXISTING WATERMAIN PRIOR TO MAKING NEW CONNECTIONS FOR EXTENSIONS.
 3. ALL REQUIRED WATER METERS AND BACKFLOW PREVENTION DEVICES SHALL BE INSTALLED WITHIN THE PROPOSED BUILDING.
 4. THE PURPOSE OF THIS PLAN IS TO DEPICT THE DESIGN LAYOUT OF PUBLIC WATER AND SEWER LINES ONLY. ALL OTHER PROPOSED IMPROVEMENTS DEPICTED ON THIS PLAN ARE FOR INFORMATIONAL PURPOSES ONLY AND WILL BE CONSTRUCTED BY OTHERS AS PART OF A SITE DEVELOPMENT PLAN.
 5. ANY FILL REQUIRED UNDER A PROPOSED WATERMAIN SHALL BE 95% COMPACTED PER AASHTO STANDARD T-180.
 6. EXISTING VALVES SHALL BE CLOSED TEMPORARILY WHEN A NEW WATERMAIN CONNECTION IS MADE TO THE EXISTING LINES. THE SERVICE TO EXISTING FIRE HYDRANT LOCATED TO THE NORTH OF THE EXISTING BUILDING WILL BE INTERRUPTED BY CLOSING EXISTING VALVE WHILE THIS CONNECTION IS MADE. USE TAPING SLEEVE AND VALVES FOR CONNECTION TO EXISTING WATER MAIN.
 7. THE PUBLIC SEWER MANHOLES PROPOSED AS PART OF THIS PLAN SET SHALL BE STANDARD PRECAST MANHOLES PER COUNTY DETAIL GS.11 AND THE DROP MANHOLES SHALL BE TYPE 'A' STANDARD COUNTY DETAIL SI.32
 8. SEE SHEET 6 FOR WATER LINE DATA CHART.

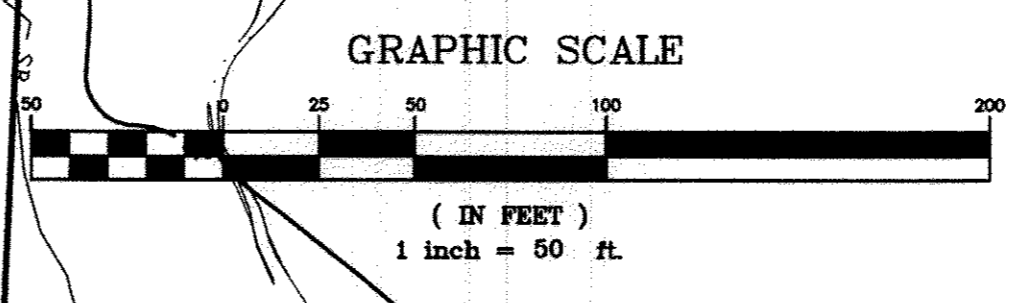
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NOTE: SEE SHEET 6 FOR WATER LINE FITTING INFORMATION.

FIRE HYDRANT DATA		
PROP. FH#	BURY LENGTH	BURY LINE ELEV.
FH#1	5.0'	153.18
FH#2	6.0'	157.70
FH#3	4.5'	155.70
FH#4	5.0'	156.46
FH#5	4.5'	155.58
FH#7	5.5'	182.10

STRUCTURE SCHEDULE					
STRUCTURE	TYPE	NORTHING	EASTING	TOP	REMARKS
S 1	4'-0" DIA. DROP MANHOLE	N 546,397.50	E 1,378,777.13	155.00	DROP MANHOLE TYPE 'A' DETAIL NO. SI.32
S 2	4'-0" DIA. DROP MANHOLE	N 546,392.19	E 1,378,617.79	157.00	DROP MANHOLE TYPE 'A' DETAIL NO. SI.32
S 3	4'-0" DIA. DROP MANHOLE	N 546,247.12	E 1,378,792.10	156.00	DROP MANHOLE TYPE 'A' DETAIL NO. SI.32
S 4	4'-0" DIA. STD. MANHOLE	N 546,190.01	E 1,378,721.83	156.20	STD. MANHOLE DETAIL NO. GS.11
S 5	4'-0" DIA. STD. MANHOLE	N 546,140.64	E 1,378,742.44	156.00	STD. MANHOLE DETAIL NO. GS.11
S 6	4'-0" DIA. STD. MANHOLE	N 545,949.77	E 1,379,024.16	154.30	STD. MANHOLE DETAIL NO. GS.11

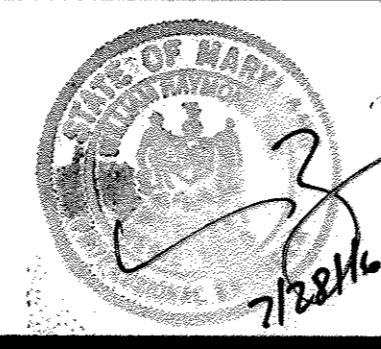
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 SIGNATURE OF ENGINEER: *William R. Zink*
 WILLIAM R. ZINK, P.E.
 MD LICENSE NUMBER: 20567
 EXPIRATION DATE: 09-06-2016
 DATE: 7/28/16



AS-BUILT
 6/12/17

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 a/zallc
 DATE

DEPARTMENT OF PLANNING & ZONING
 HOWARD COUNTY, MARYLAND
 10-27-16
 DATE



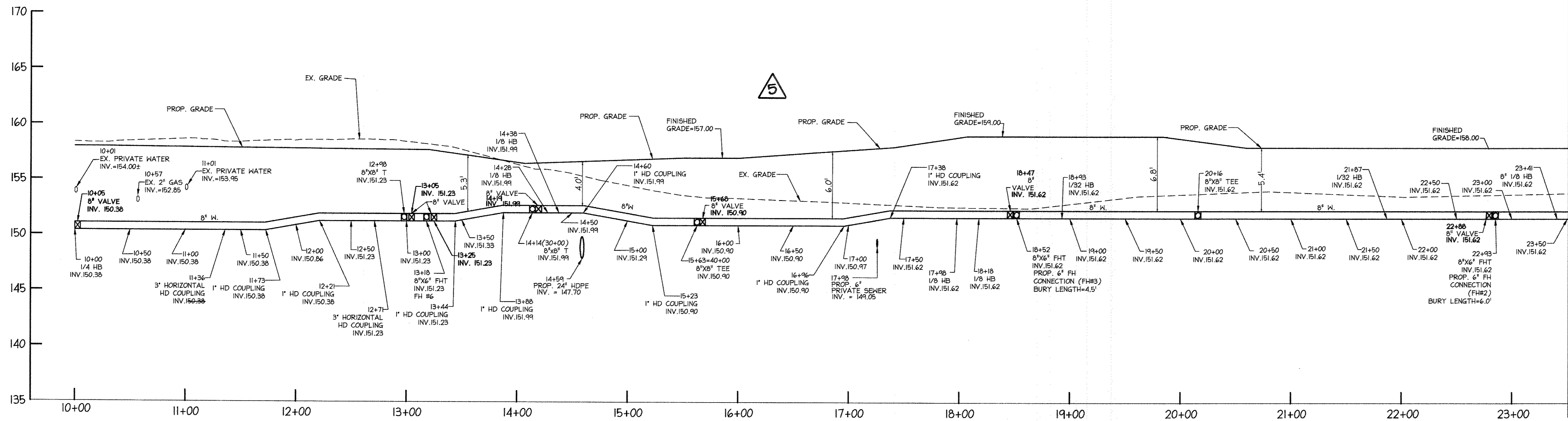
DES:	ENJ	5	ADJUST WATER MAIN DESIGN & UPDATE	5-18-16
DRN:	DAM	4	RETAINING WALL NOTES	4-1-16
CHK:	ENJ	3	ADDRESS REDLINE COMMENTS	1-6-15
		2	ADDRESS REDLINE COMMENTS	11-18-14
		1	REDLINE REVISIONS - TO USE PVC FOR WATERLINE, NOTES AND ESTIMATE REVISED.	11/2014
DATE:	09/06/12	BY:	NO.	REVISION

PUBLIC WATER & SEWER PLANS
 600 SCALE MAP NO. _____ BLOCK NO. _____

PUBLIC WATER AND SEWER PLANS
DORSEY RUN INDUSTRIAL CENTER
 NORTH SIDE REDEVELOPMENT
 MONTEVIDEO ROAD AND FUTURE DORSEY RUN ROAD
 1ST ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND
 CONTRACT NO. 14-4602-D

SCALE
 1"=50'
 SHEET
 3 OF 8

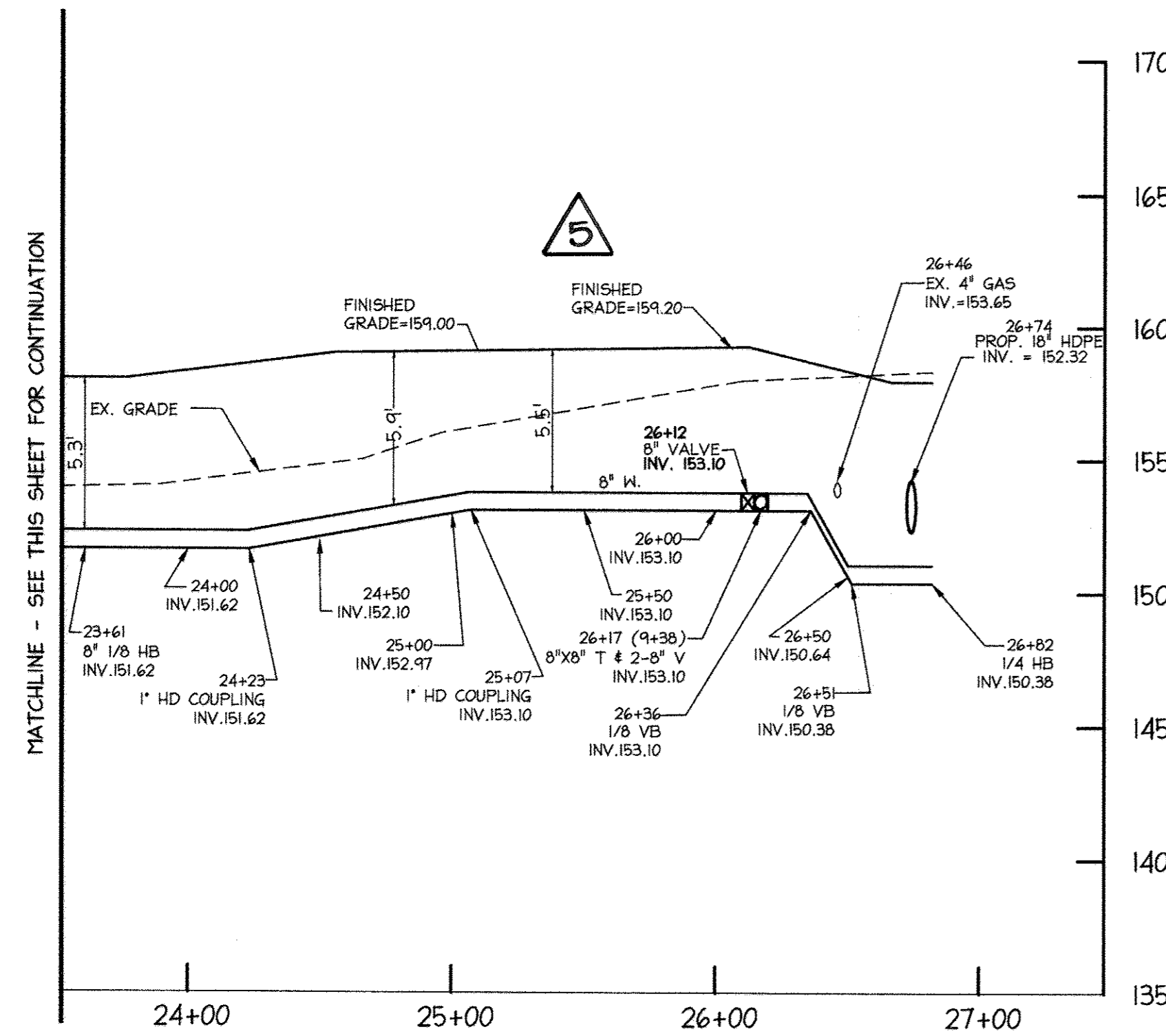
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FROM STA: 10+00 TO STA: 26+82

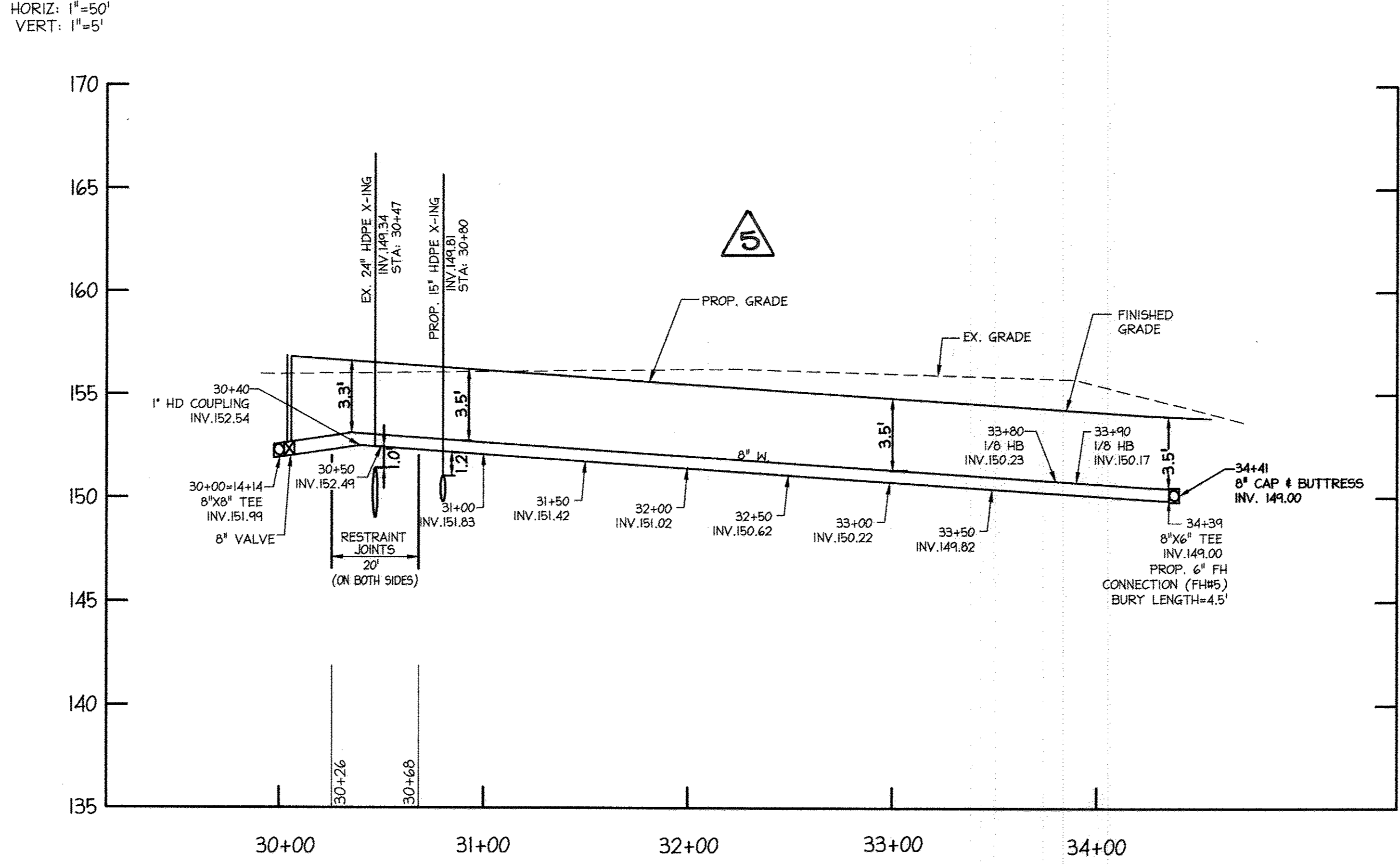
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MATCHLINE - SEE THIS SHEET FOR CONTINUATION



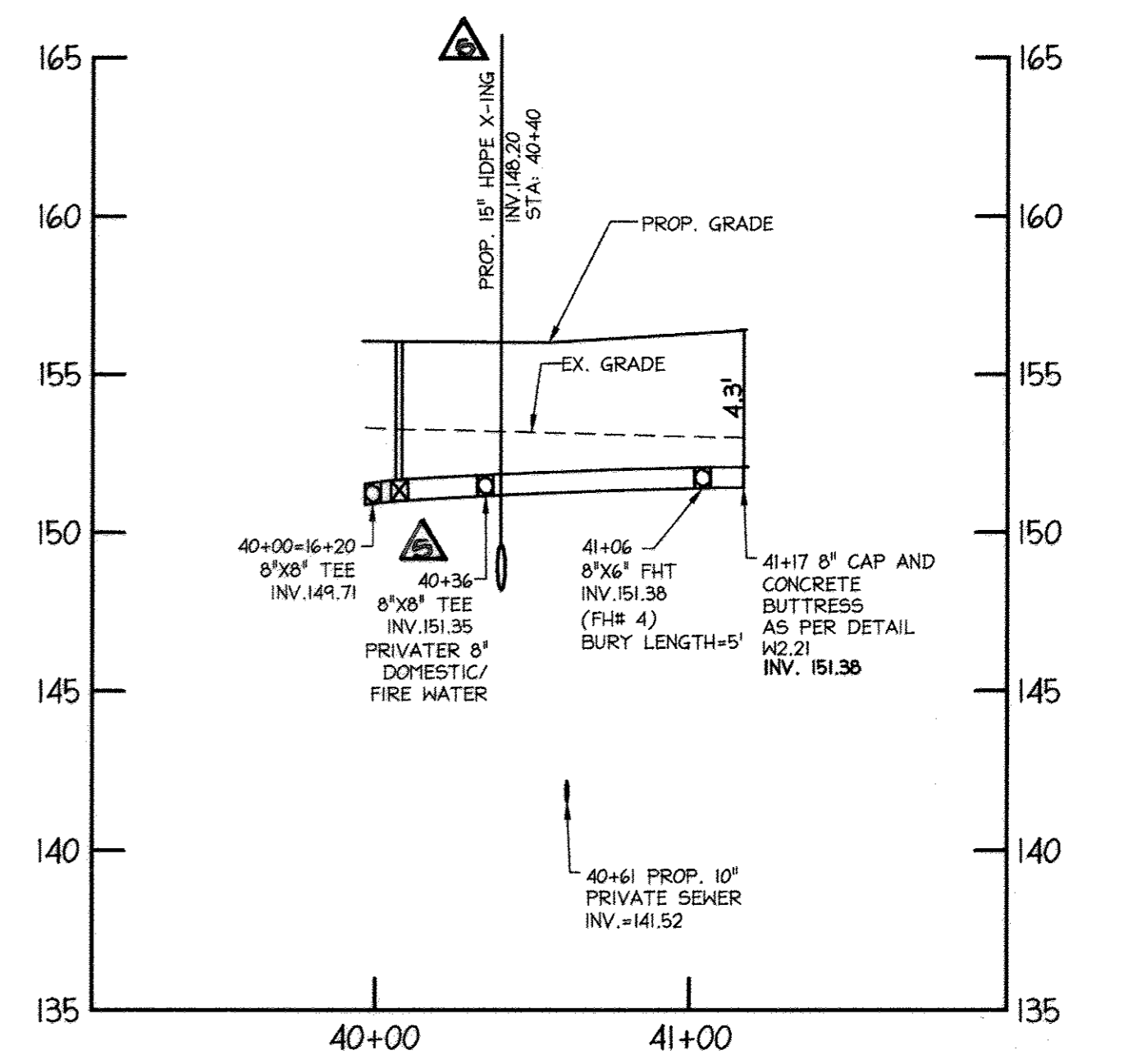
FROM STA: 10+00 TO STA: 26+82

PROFILE SCALE
HORIZ: 1"=50'
VERT: 1"=5'



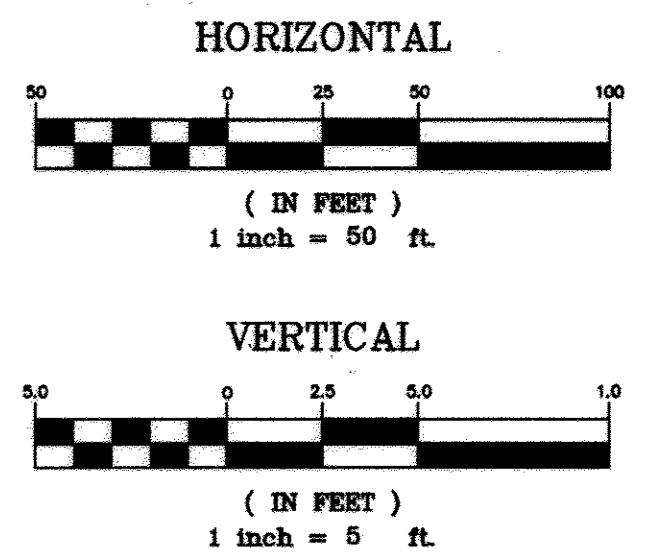
FROM STA: 30+00 TO STA: 34+39

PROFILE SCALE
HORIZ: 1"=50'
VERT: 1"=5'



FROM STA: 40+00 TO STA: 41+17

PROFILE SCALE
HORIZ: 1"=50'
VERT: 1"=5'

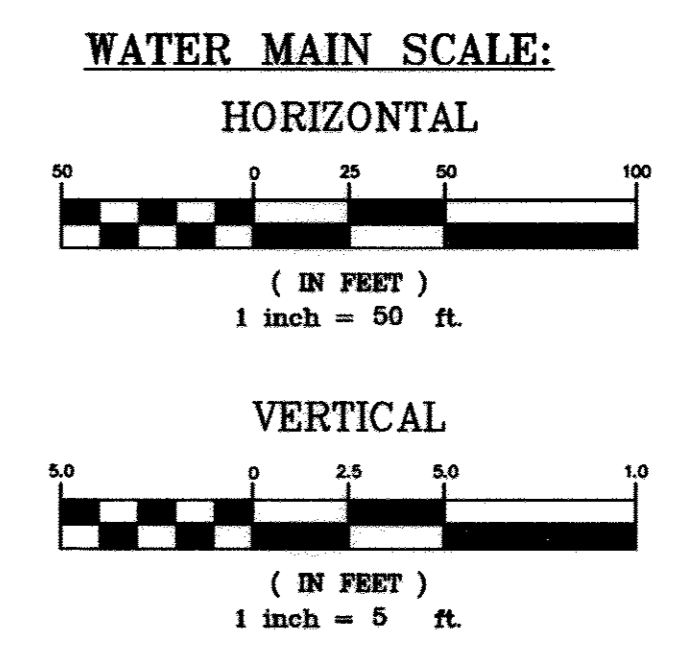
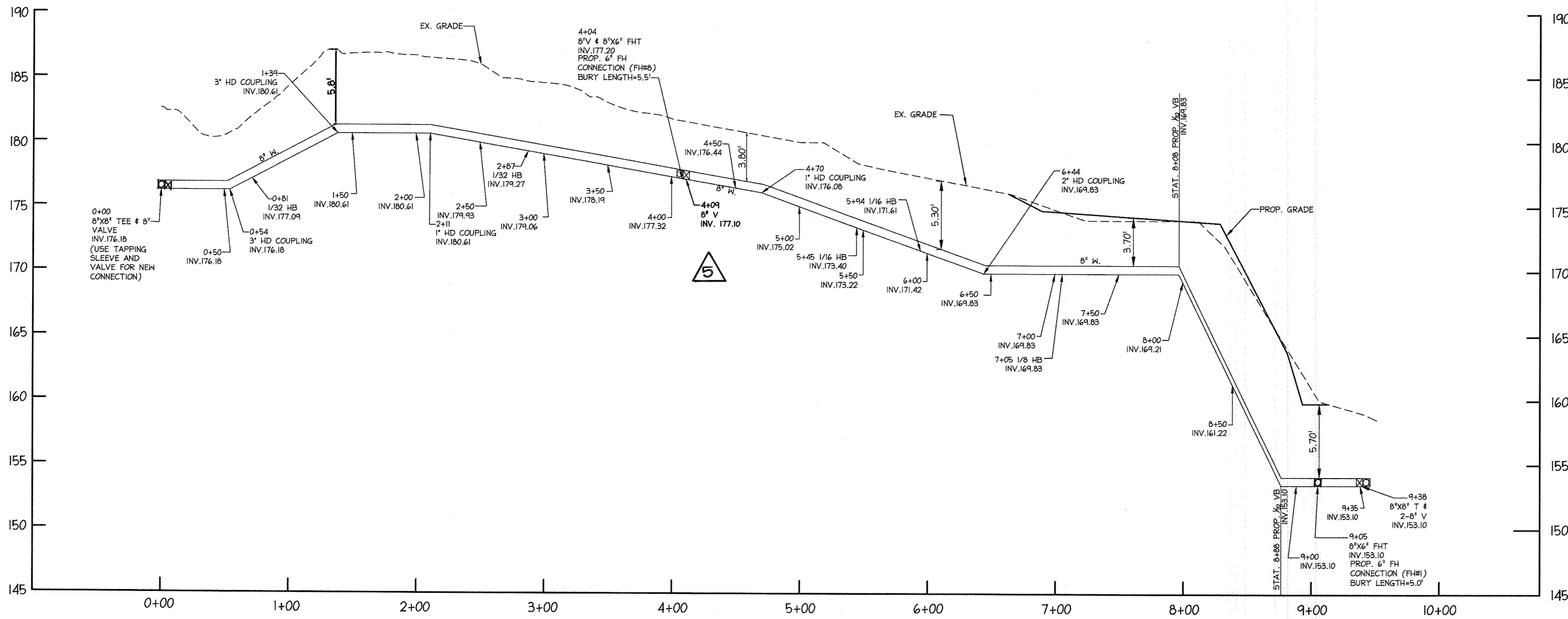


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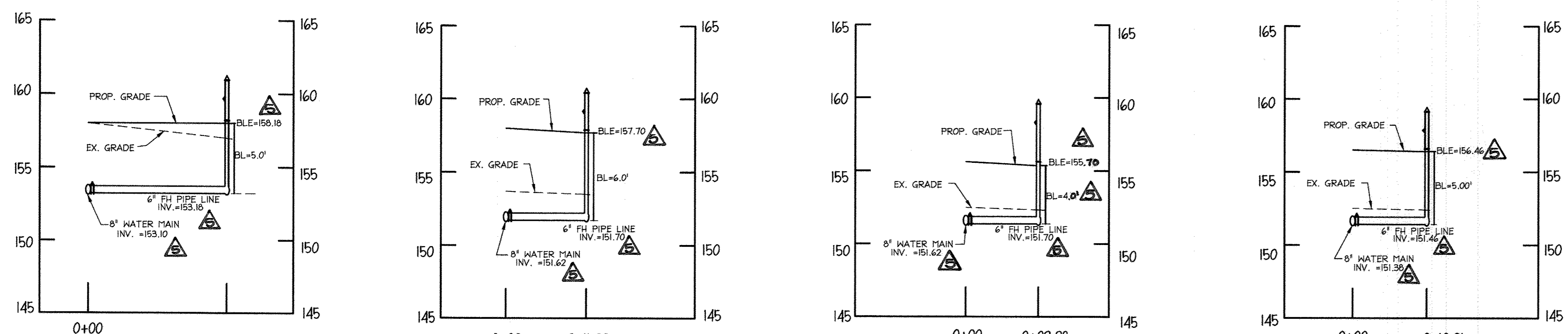
SIGNATURE OF ENGINEER: *[Signature]*
WILLIAM R. ZINK, P.E.
M.D. LICENSE NUMBER: 20567
EXPIRATION DATE: 09-06-2016

DATE: 7/28/16

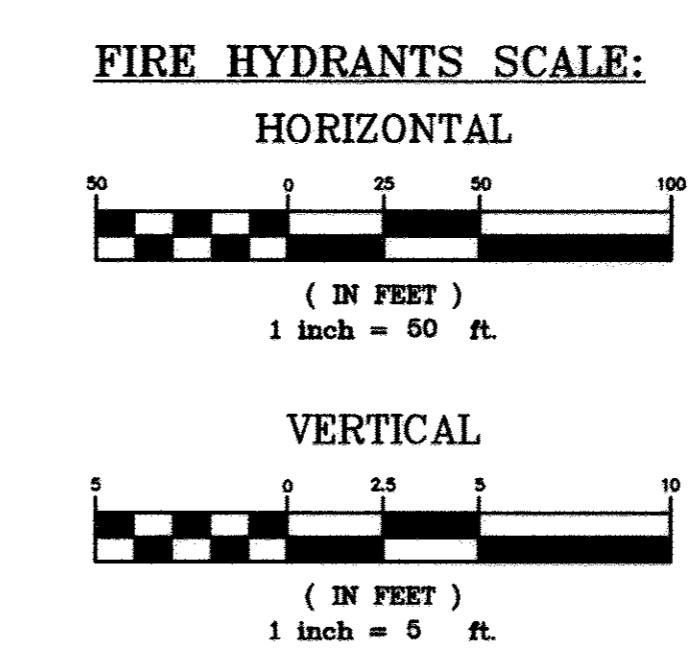
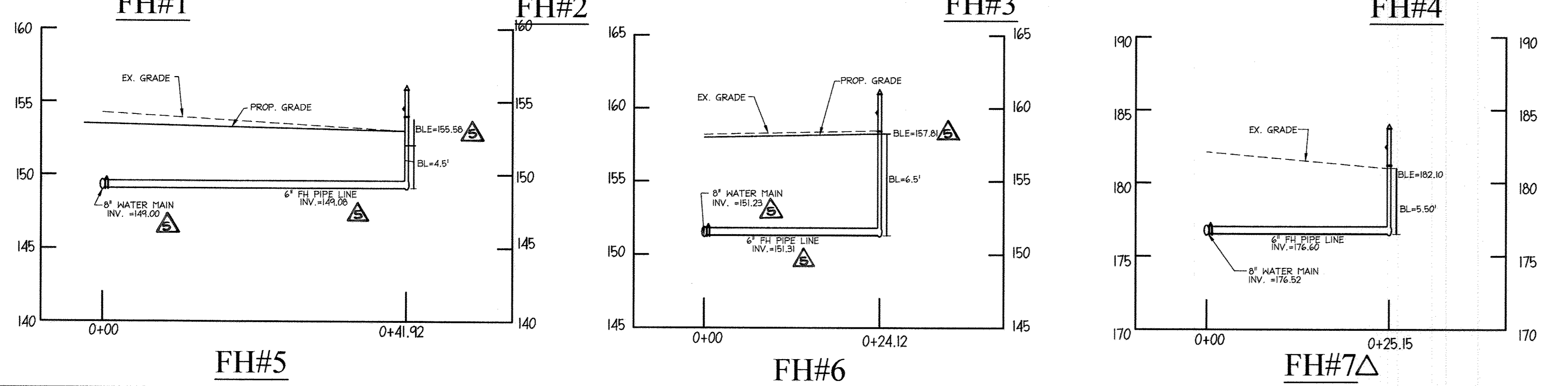
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>[Signature]</i> CHIEF, BUREAU OF UTILITIES	DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND <i>[Signature]</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION	 christopher consultants engineering - surveying - land planning 7122 GREENBERRY GARDEN DRIVE SUITE 100, OMAHA, NE 68166-2106 402.492.8800 - FAX 402.491.0146 - WWW.CHICONSULTANTS.COM		DES: ENJ	5	ADJUST WATER MAIN DESIGN & UPDATE		PROFILES OF PUBLIC WATER LINES	PUBLIC WATER AND SEWER PLANS DORSEY RUN INDUSTRIAL CENTER NORTH SIDE REDEVELOPMENT MONTEVIDEO ROAD AND FUTURE DORSEY RUN ROAD 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND CONTRACT NO. 14-4602-D	SCALE AS SHOWN
				DRN: DAM	3	ADDRESS REDLINE COMMENTS	1-6-15			SHEET 4 OF 8
				CHK: ENJ	2	ADDRESS REDLINE COMMENTS	11-18-14			
				DATE: 09/06/12	1	REDLINE REVISIONS - TO USE PVC FOR WATERLINE, NOTES AND ESTIMATE REVISED.	11/2014			
				BY: NO.		REVISION	DATE	600 SCALE MAP NO.	BLOCK NO.	



FROM STA: 0+00 TO STA: 9+40



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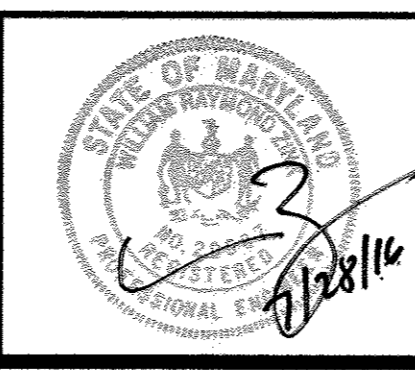
AS-BUILT
6/12/17

PROFESSIONAL CERTIFICATION
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SIGNATURE OF ENGINEER: [Signature]
WILLIAM R. ZINK, P.E.
M.D. LICENSE NUMBER: 20587
EXPIRATION DATE: 09-06-2016
DATE: 7/28/16

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
[Signature]
CHIEF, BUREAU OF UTILITIES

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND
[Signature]
CHIEF, DEVELOPMENT ENGINEERING DIVISION

christopher consultants
engineering · surveying · land planning
christopher consultants, llc
2172 columbia gateway, ste. 100, coltsville, md 21048-2860
410.897.8982 · 410.891.0106 · fax 410.897.8950



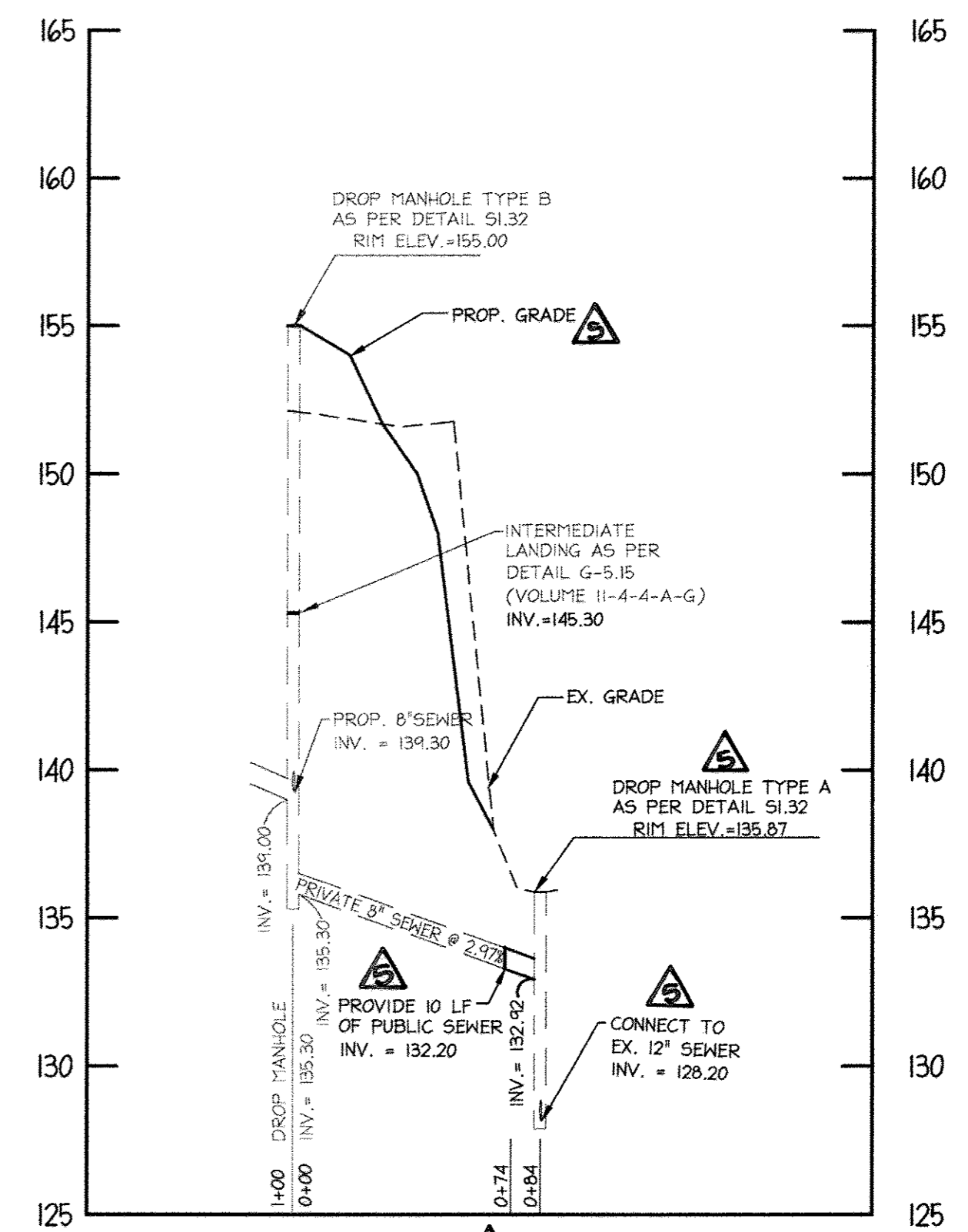
DES:	ENJ	5	ADJUST WATER MAIN DESIGN & UPDATE	
DRN:	DAM	3	RETAINING WALL NOTES	
CHK:	ENJ	2	ADDRESS REDLINE COMMENTS	1-6-15
		2	ADDRESS REDLINE COMMENTS	11-10-14
DATE:	09/06/12	1	REDLINE REVISIONS - TO USE PVC FOR WATERLINE, NOTES AND ESTIMATE REVISED.	11/20/14
BY:	NO.		REVISION	DATE

PROFILES OF PUBLIC WATER LINES & FIRE HYDRANTS
600 SCALE MAP NO. _____ BLOCK NO. _____

PUBLIC WATER AND SEWER PLANS
DORSEY RUN INDUSTRIAL CENTER
NORTH SIDE REDEVELOPMENT
MONTEVIDEO ROAD AND FUTURE DORSEY RUN ROAD
1st ELECTION DISTRICT
HOWARD COUNTY, MARYLAND
CONTRACT NO. 14-4602-D
SCALE AS SHOWN
SHEET 5 OF 8

WATER LINE DATA (VERTICAL FITTINGS)				
LOCATION	FITTING	NAD 83/91 COORDINATES		INVERT
		NORTHING	EASTING	
W.M. STA. 0+54	3" HD COUPLING	N 545083.62	E 1378023.59	176.18
W.M. STA. 1+39	3" HD COUPLING	N 545144.26	E 1378069.78	180.61
W.M. STA. 2+11	1" HD COUPLING	N 545208.47	E 1378116.22	180.61
W.M. STA. 4+70	1" HD COUPLING	N 545425.71	E 1378261.01	176.08
W.M. STA. 6+44	2" HD COUPLING	N 545585.58	E 1378300.73	169.83
W.M. STA. 8+08	8" 1/32 VB	N 545731.59	E 1378344.62	169.83
W.M. STA. 8+88	8" 1/32 VB	N 545798.32	E 1378388.75	153.10
W.M. STA. 11+73	1" HD COUPLING	N 545950.59	E 1378564.30	150.38
W.M. STA. 12+21	1" HD COUPLING	N 545992.07	E 1378588.44	150.38
W.M. STA. 13+44	1" HD COUPLING	N 546096.42	E 1378653.46	151.23
W.M. STA. 13+88	1" HD COUPLING	N 546133.27	E 1378677.54	151.99
W.M. STA. 14+60	1" HD COUPLING	N 546190.82	E 1378699.65	151.99
W.M. STA. 15+23	1" HD COUPLING	N 546243.54	E 1378724.14	150.90
W.M. STA. 16+96	1" HD COUPLING	N 546349.72	E 1378634.23	150.90
W.M. STA. 17+38	1" HD COUPLING	N 546372.71	E 1378599.08	151.62
W.M. STA. 24+23	1" HD COUPLING	N 545946.79	E 1378254.14	151.62
W.M. STA. 25+07	1" HD COUPLING	N 545900.81	E 1378324.44	153.10
W.M. STA. 26+36	8" 1/8 VB	N 545830.20	E 1378432.40	153.10
W.M. STA. 26+51	8" 1/8 VB	N 545867.84	E 1378422.03	150.38
W.M. STA. 30+40	1" HD COUPLING	N 546133.00	E 1378725.13	152.54

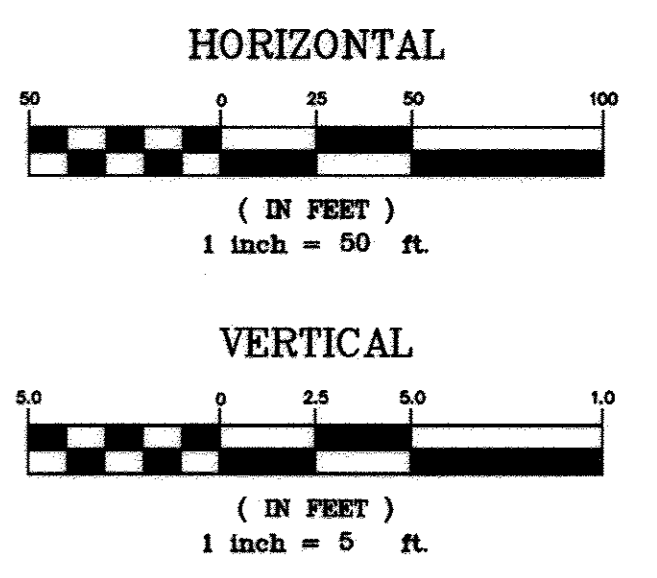
WATER LINE DATA (HORIZONTAL FITTINGS)				
LOCATION	FITTING	NAD 83/91 COORDINATES		INVERT
		NORTHING	EASTING	
W.M. STA. 0+00	8"X8" T54V	N 545032.43	E 1378003.57	176.18
W.M. STA. 0+81	8" 1/32 HB	N 545099.06	E 1378031.63	177.09
W.M. STA. 2+87	8" 1/32 HB	N 545272.45	E 1378160.61	179.27
W.M. STA. 4+04	8"X6" FHT	N 545370.09	E 1378224.49	177.20
W.M. STA. 4+09	8" V	N 545373.97	E 1378227.03	177.10
W.M. STA. 5+45	8" 1/16 HB	N 545488.48	E 1378301.95	173.40
W.M. STA. 5+94	8" 1/16 HB	N 545536.12	E 1378310.94	171.61
W.M. STA. 7+05	8" 1/8 HB	N 545645.26	E 1378288.11	169.83
W.M. STA. 9+05	8" 1/8 FHT	N 545823.83	E 1378381.44	153.10
W.M. STA. 9+35	8" V	N 545843.94	E 1378416.48	153.10
W.M. STA. 26+17 (9+38)	8"X8" T	N 545840.75	E 1378417.22	153.10
W.M. STA. 10+00 (26+82)	8" 1/4 HB	N 545804.79	E 1378471.25	150.38
W.M. STA. 10+05	8" V	N 545808.08	E 1378473.39	150.38
W.M. STA. 11+36	8" 3" HDC	N 545918.32	E 1378545.52	150.38
W.M. STA. 12+71	8" 3" HDC	N 545814.31	E 1378492.16	151.23
W.M. STA. 12+98	8"X8" T	N 546035.57	E 1378613.76	151.23
W.M. STA. 13+05	8" V	N 546063.92	E 1378632.29	151.23
W.M. STA. 13+18	8"X6" FHT	N 546064.41	E 1378634.23	151.23
W.M. STA. 13+25	8" V	N 546080.25	E 1378642.82	151.23
W.M. STA. 14+14 (30+00)	8"X8" T	N 546154.82	E 1378691.83	151.99
W.M. STA. 14+19	8" V	N 546157.44	E 1378687.83	151.99
W.M. STA. 14+28	8" 1/8 HB	N 546162.73	E 1378679.70	151.99
W.M. STA. 14+38	8" 1/8 HB	N 546172.49	E 1378677.66	151.99
W.M. STA. 15+63 (40+00)	8"X8" T	N 546276.70	E 1378745.84	150.90
W.M. STA. 15+68 (40+03)	8" V	N 546280.58	E 1378748.38	150.90
W.M. STA. 17+98	8" 1/8 HB	N 546405.71	E 1378548.65	151.62
W.M. STA. 18+18	8" 1/8 HB	N 546401.62	E 1378529.07	151.62
W.M. STA. 18+47	8" V	N 546377.55	E 1378513.33	151.62
W.M. STA. 18+52	8"X6" FHT	N 546373.66	E 1378510.78	151.62
W.M. STA. 18+93	8" 1/32 HB	N 546339.04	E 1378488.15	151.62
W.M. STA. 20+16	8"X8" T	N 546299.36	E 1378449.67	151.62
W.M. STA. 21+87	8" 1/32 HB	N 546129.50	E 1378282.60	151.62
W.M. STA. 22+88	8" V	N 546044.71	E 1378227.12	151.62
W.M. STA. 22+93	8"X6" FHT	N 546044.70	E 1378227.12	151.62
W.M. STA. 23+41	8" 1/8 HB	N 546000.77	E 1378198.38	151.62
W.M. STA. 23+61	8" 1/8 HB	N 545980.77	E 1378202.19	151.62
W.M. STA. 26+12	8" V	N 545843.08	E 1378412.57	153.10
W.M. STA. 33+80	8" 1/8 HB	N 545946.93	E 1379009.53	150.23
W.M. STA. 33+90	8" 1/8 HB	N 545948.97	E 1379019.30	150.17
W.M. STA. 34+39	8"X6" FHT	N 545990.01	E 1379046.01	149.00
W.M. STA. 34+41	8" CAP	N 545992.22	E 1379047.59	149.00
W.M. STA. 40+03	8" VALVE	N 546280.58	E 1378748.37	149.71
W.M. STA. 40+36	8"X8" T	N 546306.89	E 1378765.59	151.35
W.M. STA. 41+06	8"X6" FHT	N 546365.37	E 1378803.21	151.38
W.M. STA. 41+17	8"CAP	N 546374.83	E 1378809.36	151.38



PROFILE FOR PUBLIC SEWER EXTENSION
 PROFILE SCALE
 HORIZ: 1"=50'
 VERT: 1"=5'

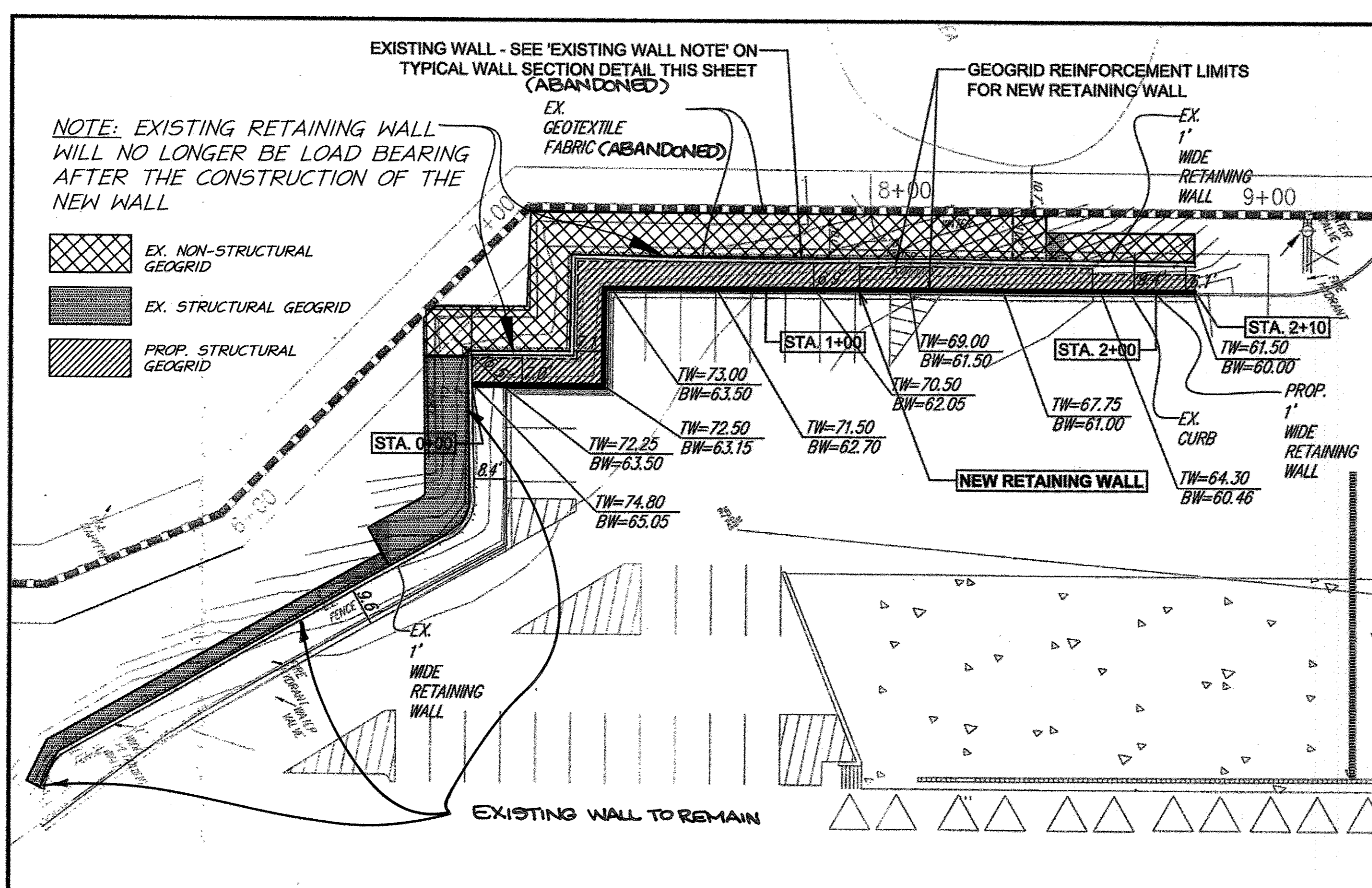
NOTE: REDLINE CHANGES ARE BASED ON DESIGN ACCEPTANCE, NOT CONSTRUCTED WATER MAIN. USING STANDARD PROCEDURES, CID NEEDS TO VERIFY AND SIGN OFF ON IN-FIELD CONDITIONS THROUGH THE AS-BUILT PROCESS AND PER THEIR COMPLIANCE GUIDELINES. ~~DED CANNOT ASSUME RESPONSIBILITY FOR APPROVING IN-FIELD CONDITIONS THAT WERE SUPPOSED TO BE DONE AS AN AS-BUILT APPROVED BY CID.~~

AS-BUILT
 6/12/17



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.
 SIGNATURE OF ENGINEER: *[Signature]*
 WILLIAM R. ZINK, P.E.
 MD LICENSE NUMBER: 20587
 EXPIRATION DATE: 09-06-2016
 DATE: 7/28/16

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE: 10-27-16	DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE: 10-27-16	christopher consultants engineering - surveying - land planning 717 colinton way ste 100 colinton md 21046-2800	DES: ENJ DRN: DAM CHK: ENJ DATE: 09/06/12	5 ADJUST WATER MAIN DESIGN & UPDATES 3 RETAINING WALL NOTES 3 ADDRESS REDLINE COMMENTS 2 ADDRESS REDLINE COMMENTS 1 REDLINE REVISIONS - TO USE PVC FOR WATERLINE, NOTES AND ESTIMATE REVISED.	1-6-15 11-18-14 11/2014	PROFILES OF PUBLIC SEWER LINES 800 SCALE MAP NO. _____ BLOCK NO. _____	PUBLIC WATER AND SEWER PLANS DORSEY RUN INDUSTRIAL CENTER NORTH SIDE REDEVELOPMENT MONTEVIDEO ROAD AND FUTURE DORSEY RUN ROAD 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND CONTRACT NO. 14-4602-D	SCALE AS SHOWN SHEET 6 OF 8
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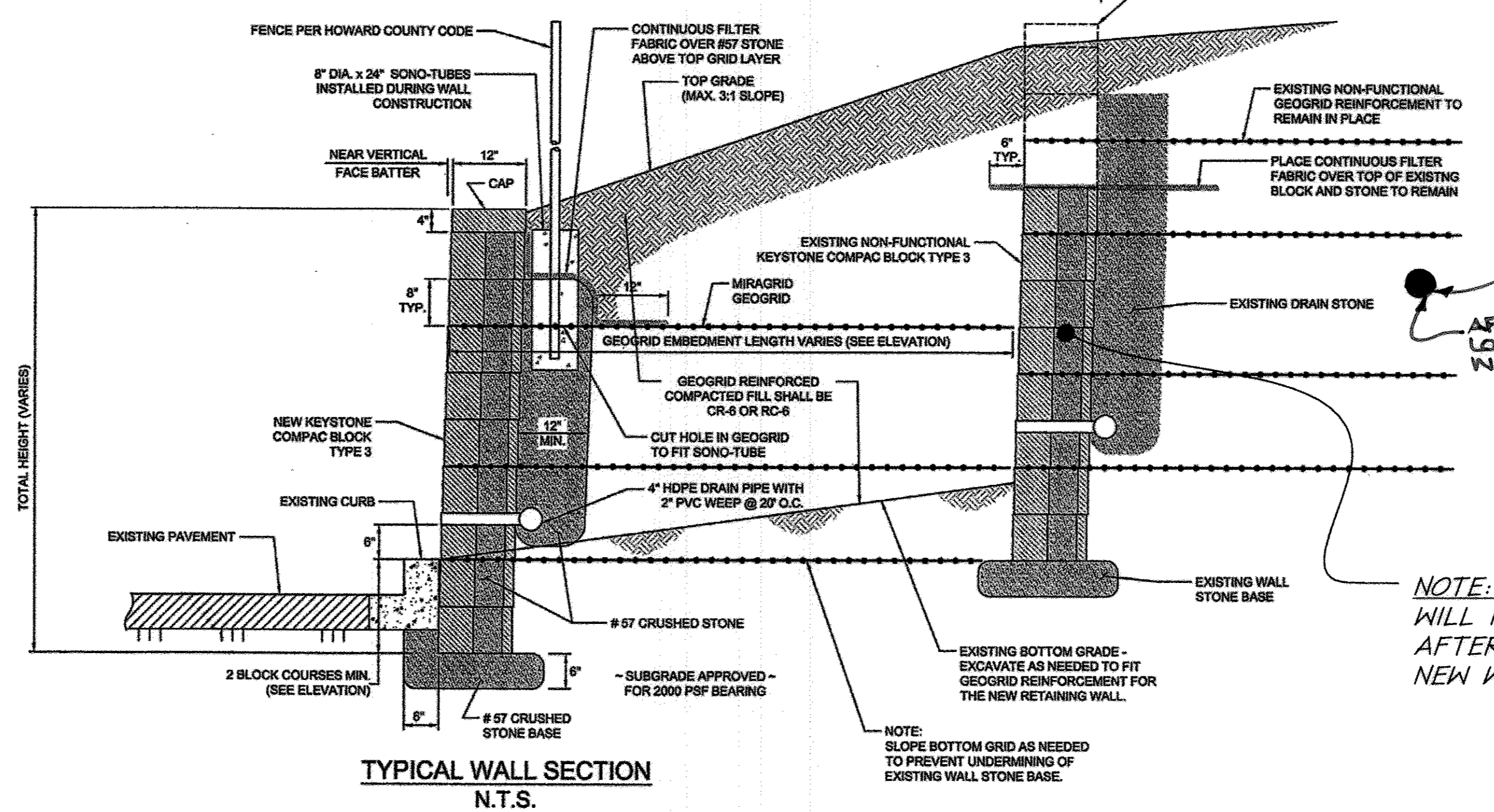


**SPECIFICATIONS
MODULAR CONCRETE BLOCK RETAINING WALL**

- PART 1: GENERAL**
- 1.01 DESCRIPTION**
- A. WORK SHALL CONSIST OF FURNISHING AND INSTALLATION OF A MODULAR CONCRETE BLOCK RETAINING WALL SYSTEM IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES, GRADES, DESIGN, AND DIMENSIONS SHOWN ON THE PLANS.
- B. WORK INCLUDES PREPARING FOUNDATION SOIL, FURNISHING AND INSTALLING LEVELING PAD, UNIT DRAINAGE FILL AND BACKFILL TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS.
- C. WORK INCLUDES FURNISHING AND INSTALLING GEOGRID SOIL REINFORCEMENT OF THE TYPE, SIZE, LOCATION, AND LENGTHS DESIGNATED ON THE CONSTRUCTION DRAWINGS.
- 1.02 DELIVERY, STORAGE AND HANDLING**
- A. CONTRACTOR SHALL CHECK ALL MATERIALS UPON DELIVERY TO ASSURE THAT THE PROPER TYPE, GRADE, COLOR, AND CERTIFICATION HAS BEEN RECEIVED.
- B. CONTRACTOR SHALL PROTECT ALL MATERIALS FROM DAMAGE DUE TO JOB SITE CONDITIONS AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. DAMAGED MATERIALS SHALL NOT BE INCORPORATED INTO THE WORK.
- PART 2: PRODUCTS**
- 2.01 MODULAR CONCRETE RETAINING WALL UNITS**
- A. MODULAR CONCRETE UNITS SHALL CONFORM TO THE FOLLOWING ARCHITECTURAL REQUIREMENTS:
FACE COLOR - COLOR MAY BE SPECIFIED BY THE OWNER.
FACE FINISH - SCULPTURED ROCK FACE IN ANGULAR TRI-PLANNER OR FLAT CONFIGURATION. OTHER FACE FINISHES WILL NOT BE ALLOWED WITHOUT WRITTEN APPROVAL OF OWNER.
- BOND CONFIGURATION - RUNNING WITH BONDS NORMALLY LOCATED AT MIDPOINT VERTICALLY ADJACENT UNITS, IN BOTH STRAIGHT AND CURVED ALIGNMENTS. EXPOSED SURFACES OF UNITS SHALL BE FREE OF CHIPS, CRACKS OR OTHER IMPERFECTIONS WHEN VIEWED FROM A DISTANCE OF 10 FEET UNDER DIFFUSED LIGHTING.
- B. MODULAR CONCRETE MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C1372 - STANDARD SPECIFICATIONS FOR SEGMENTAL RETAINING WALL UNITS.
- C. MODULAR CONCRETE UNITS SHALL CONFORM TO THE FOLLOWING STRUCTURAL AND GEOMETRIC REQUIREMENTS MEASURED IN ACCORDANCE WITH APPROPRIATE REFERENCES:
COMPRESSIVE STRENGTH = 3000 PSI MINIMUM.
ABSORPTION = 9% MAXIMUM (9% IN NORTHERN STATES) FOR STANDARD WEIGHT AGGREGATES.
DIMENSIONAL TOLERANCES = ±1/8" FROM NOMINAL UNIT DIMENSIONS NOT INCLUDING ROUGH SPLIT FACE, ±1/16" UNIT HEIGHT - TOP AND BOTTOM PLANES; UNIT SIZE - 8" (H) X 16" (W) X 12" (D) MINIMUM.
- 2.02 SHEAR CONNECTORS**
- A. SHEAR CONNECTORS SHALL BE 1/2 INCH DIAMETER THERMOSET ISOPHTHALIC POLYESTER RESIN-PROTRUDED FIBERGLASS REINFORCEMENT RODS OR EQUIVALENT TO PROVIDE CONNECTION BETWEEN VERTICALLY AND HORIZONTALLY ADJACENT UNITS. STRENGTH OF SHEAR CONNECTORS BETWEEN VERTICAL ADJACENT UNITS SHALL BE APPLICABLE OVER A DESIGN TEMPERATURE OF 10 DEGREES F TO +100 DEGREES F. B. SHEAR CONNECTORS SHALL BE CAPABLE OF HOLDING THE GEOGRID IN THE PROPER DESIGN POSITION DURING GRID PRE-TENSIONING AND BACKFILLING.
- 2.03 BASE LEVELING PAD MATERIAL**
- A. MATERIAL SHALL CONSIST OF A COMPACTED #57 CRUSHED STONE BASE AS SHOWN ON THE CONSTRUCTION DRAWINGS.
- 2.04 UNIT DRAINAGE FILL**
- A. UNIT DRAINAGE FILL SHALL CONSIST OF #57 CRUSHED STONE.
- 2.05 REINFORCED BACKFILL**
- A. REINFORCED BACKFILL SHALL TYPE SM, BE FREE OF DEBRIS AND MEET THE FOLLOWING GRADATION TESTED IN ACCORDANCE WITH ASTM D-422 AND MEET OTHER PROPERTIES SHOWN ON THE PLAN:
- | SIEVE SIZE | PERCENT PASSING |
|------------|-----------------|
| 2 INCH | 100-75 |
| 3/4 INCH | 100-75 |
| NO. 40 | 0-50 |
| NO. 200 | 0-55 |
- PLASTICITY INDEX (PI) <10 AND LIQUID LIMIT <35 PER ASTM D-4318.
- B. MATERIAL CAN BE SITE EXCAVATED SOILS WHERE THE ABOVE REQUIREMENTS CAN BE MET. UNSUITABLE SOILS FOR BACKFILL (HIGH PLASTIC CLAYS OR ORGANIC SOILS) SHALL NOT BE USED IN THE REINFORCED SOIL MASS.
- 2.06 GEOGRID SOIL REINFORCEMENT**
- A. GEOSYNTHETIC REINFORCEMENT SHALL CONSIST OF GEOGRIDS MANUFACTURED SPECIFICALLY FOR SOIL REINFORCEMENT APPLICATIONS AND SHALL BE:
- UNIT WEIGHT - 75 LBS/UNIT MINIMUM FOR STANDARD WEIGHT AGGREGATES.
 - INTER-UNIT SHEAR STRENGTH - 1000 PLF MINIMUM AT 2 PSI NORMAL PRESSURE; AT 2 PSI NORMAL FORCE.
 - GEOGRID/UNIT PEAK CONNECTION STRENGTH - 1000 PLF MINIMUM.
 - MODULAR CONCRETE UNITS SHALL CONFORM TO THE FOLLOWING CONNECTION REQUIREMENTS:
VERTICAL SETBACK = 1/8" PER COURSE (NEAR VERTICAL) OR 1/4" PER COURSE PER THE DESIGN ALIGNMENT AND GRID POSITIONING MECHANISM - FIBERGLASS PINS, TWO PER UNIT MINIMUM.
 - MAXIMUM HORIZONTAL GAP BETWEEN ERECTED UNITS SHALL BE 1/2 INCH.
- 2.07 DRAINAGE PIPE**
- A. THE DRAINAGE PIPE SHALL BE PERFORATED CORRUGATED HOPE PIPE MANUFACTURED IN ACCORDANCE WITH ASTM D-1248.
- PART 3: EXECUTION**
- 3.01 EXCAVATION**
- A. CONTRACTOR SHALL EXCAVATE TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS. OWNER'S REPRESENTATIVE SHALL BE RESPONSIBLE FOR INSPECTING AND APPROVING THE EXCAVATION PRIOR TO PLACEMENT OF LEVELING MATERIAL OR FILL SOILS.
- 3.02 BASE LEVELING PAD**
- A. LEVELING PAD MATERIAL SHALL BE PLACED TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS, TO A MINIMUM THICKNESS OF 8 INCHES AND EXTEND LATERALLY A MINIMUM OF 6" IN FRONT AND BEHIND THE MODULAR WALL UNIT.
- B. LEVELING PAD SHALL BE PREPARED TO INSURE FULL CONTACT TO THE BASE SURFACE OF THE CONCRETE UNITS.
- 3.03 MODULAR UNIT INSTALLATION**
- A. FIRST COURSE OF UNITS SHALL BE PLACED ON THE LEVELING PAD AT THE APPROPRIATE LINE AND GRADE. ALIGNMENT AND LEVEL SHALL BE CHECKED IN ALL DIRECTIONS AND INSURE THAT UNITS ARE IN FULL CONTACT WITH THE BASE AND PROPERLY SEATED.
- B. PLACE THE FRONT OF UNITS SIDE-BY-SIDE. DO NOT LEAVE GAPS BETWEEN ADJACENT UNITS. LAYOUT OF CORNERS AND CURVES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- C. INSTALL SHEAR/CONNECTING DEVICES PER MANUFACTURER'S RECOMMENDATIONS.
- D. PLACE AND COMPACT DRAINAGE FILL WITHIN AND BEHIND WALL UNITS. PLACE AND COMPACT BACKFILL SOIL BEHIND DRAINAGE FILL. FOLLOW WALL ERECTION AND DRAINAGE FILL CLOSELY WITH STRUCTURE BACKFILL. THE CONTRACTOR SHALL NOT ALLOW SURFACE RUNOFF FROM ADJACENT AREAS TO ENTER THE WALL CONSTRUCTION SITE.
- E. MAXIMUM STACKED VERTICAL HEIGHT OF WALL UNITS, PRIOR TO UNIT DRAINAGE FILL AND BACKFILL PLACEMENT AND COMPACTION, SHALL NOT EXCEED THREE COURSES.
- 3.04 STRUCTURAL GEOGRID INSTALLATION**
- A. GEOGRID SHALL BE ORIENTED WITH THE HIGHEST STRENGTH AXIS PERPENDICULAR TO THE WALL ALIGNMENT.
- B. GEOGRID REINFORCEMENT SHALL BE PLACED AT THE STRENGTHS, LENGTHS, AND ELEVATIONS SHOWN ON THE CONSTRUCTION DESIGN DRAWINGS OR AS DIRECTED BY THE ENGINEER.
- C. THE GEOGRID SHALL BE LAID HORIZONTALLY ON COMPACTED BACKFILL AND ATTACHED TO THE MODULAR WALL UNITS. PLACE THE NEXT COURSE OF MODULAR CONCRETE UNITS OVER THE GEOGRID. THE GEOGRID SHALL BE PULLED TIGHT, AND ANCHORED PRIOR TO BACKFILL PLACEMENT ON THE GEOGRID.
- D. GEOGRID REINFORCEMENTS SHALL BE CONTINUOUS
- 3.05 TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY UPON THE GEOGRID REINFORCEMENT. A MINIMUM FILL THICKNESS OF 2 INCHES IS REQUIRED PRIOR TO OPERATION OF TRACKED VEHICLES OVER THE GEOGRID. TRACKED VEHICLE TURNING SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND DAMAGING THE GEOGRID.**
- 3.06 CAP INSTALLATION**
- A. CAP UNITS SHALL BE GLUED TO UNDERLYING UNITS WITH AN ALL-WEATHER ADHESIVE RECOMMENDED BY THE MANUFACTURER.
- 3.07 FIELD QUALITY CONTROL**
- A. THE OWNER SHALL ENGAGE INSPECTION AND TESTING SERVICES, INCLUDING INDEPENDENT LABORATORIES, TO PROVIDE QUALITY ASSURANCE AND TESTING SERVICES DURING CONSTRUCTION.
- B. AS A MINIMUM QUALITY ASSURANCE TESTING SHOULD INCLUDE FOUNDATION SOIL INSURANCE TESTING AND BACKFILL TESTING. VERIFICATION OF DESIGN PARAMETERS, AND OBSERVATION OF CONSTRUCTION FOR GENERAL COMPLIANCE WITH DESIGN DRAWINGS AND SPECIFICATIONS.

NEW WALL LOCATION PLAN
1" = 20'
(N.T.S.)

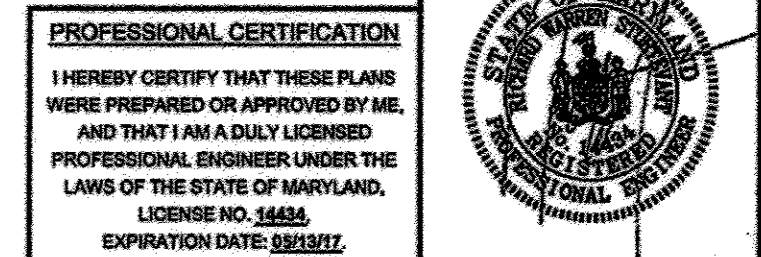
EXISTING WALL NOTE:
WITH THE NEW WALL IN PLACE, EXISTING WALL SYSTEM (BLOCKS AND GEOGRIDS) SITUATED BEHIND NEW WALL WILL NO LONGER BE FUNCTIONAL. EXISTING BLOCK COURSES FOR THE EXISTING WALL MAY THEN BE DEMOLISHED OR STAY IN PLACE (BURIED) AT CONTRACTOR'S DISCRETION.



SECTIONS OF BLOCK RETAINING WALL AND GEOGRID WITHIN THE PUBLIC WATER AND UTILITY ALIGNMENT ABOVE THE ELEVATION OF THE WATER LINE SHOULD BE FULLY REMOVED. THE GEOGRID/BLOCK BELOW THE INVERT OF THE WATERLINE MAY REMAIN IN PLACE AS "NON-STRUCTURAL".

- HOWARD COUNTY NOTES:**
- NO TREES SHALL BE PLANTED WITHIN 10 FEET OF THE TOP OF THE RETAINING WALL.
 - RETAINING WALLS SHALL ONLY BE CONSTRUCTED UNDER THE OBSERVATION OF A REGISTERED PROFESSIONAL ENGINEER AND A (NICET, WACEL, OR EQUIVALENT) CERTIFIED SOILS TECHNICIAN.
 - ONE SOIL BORING SHALL BE REQUIRED EVERY ONE HUNDRED FEET ALONG THE ENTIRE LENGTH OF THE WALL. COPIES OF ALL BORING REPORTS SHALL BE PROVIDED TO THE HOWARD COUNTY INSPECTOR PRIOR TO THE START OF CONSTRUCTION.
 - THE REQUIRED BEARING PRESSURE BENEATH THE WALL SYSTEM SHALL BE VERIFIED IN THE FIELD BY A CERTIFIED SOILS TECHNICIAN. TESTING DOCUMENTATION MUST BE PROVIDED TO THE HOWARD COUNTY INSPECTOR PRIOR TO START OF CONSTRUCTION. THE REQUIRED BEARING TEST SHALL BE THE DYNAMIC CONE PENETROMETER TEST ASTM STP-398.
 - THE SUITABILITY OF FILL MATERIAL SHALL BE CONFIRMED BY THE ON-SITE SOILS TECHNICIAN. EACH 8' LIFT MUST BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY AND THE TESTING REPORT SHALL BE MADE AVAILABLE TO THE HOWARD COUNTY INSPECTOR UPON COMPLETION OF CONSTRUCTION.
 - WALLS SHALL NOT BE CONSTRUCTED ON UNCERTIFIED FILL MATERIALS.
 - WALLS SHALL NOT BE CONSTRUCTED WITHIN A HOWARD COUNTY RIGHT-OF-WAY OR EASEMENT.

NOTE: EXISTING RETAINING WALL WILL NO LONGER BE LOAD BEARING AFTER THE CONSTRUCTION OF THE NEW WALL



HILLIS-CARNES
ENGINEERING ASSOCIATES
10275 Guilford Road, Suite A Annapolis Junction, Maryland
(410) 880-4788 WWW.HCEA.COM Fax: (410) 880-4098

**NEW RETAINING WALL PLAN & CONSTRUCTION DETAILS
DORSEY RUN INDUSTRIAL CENTER
HOWARD COUNTY, MARYLAND**

REVISION NO.	DESCRIPTION	DATE

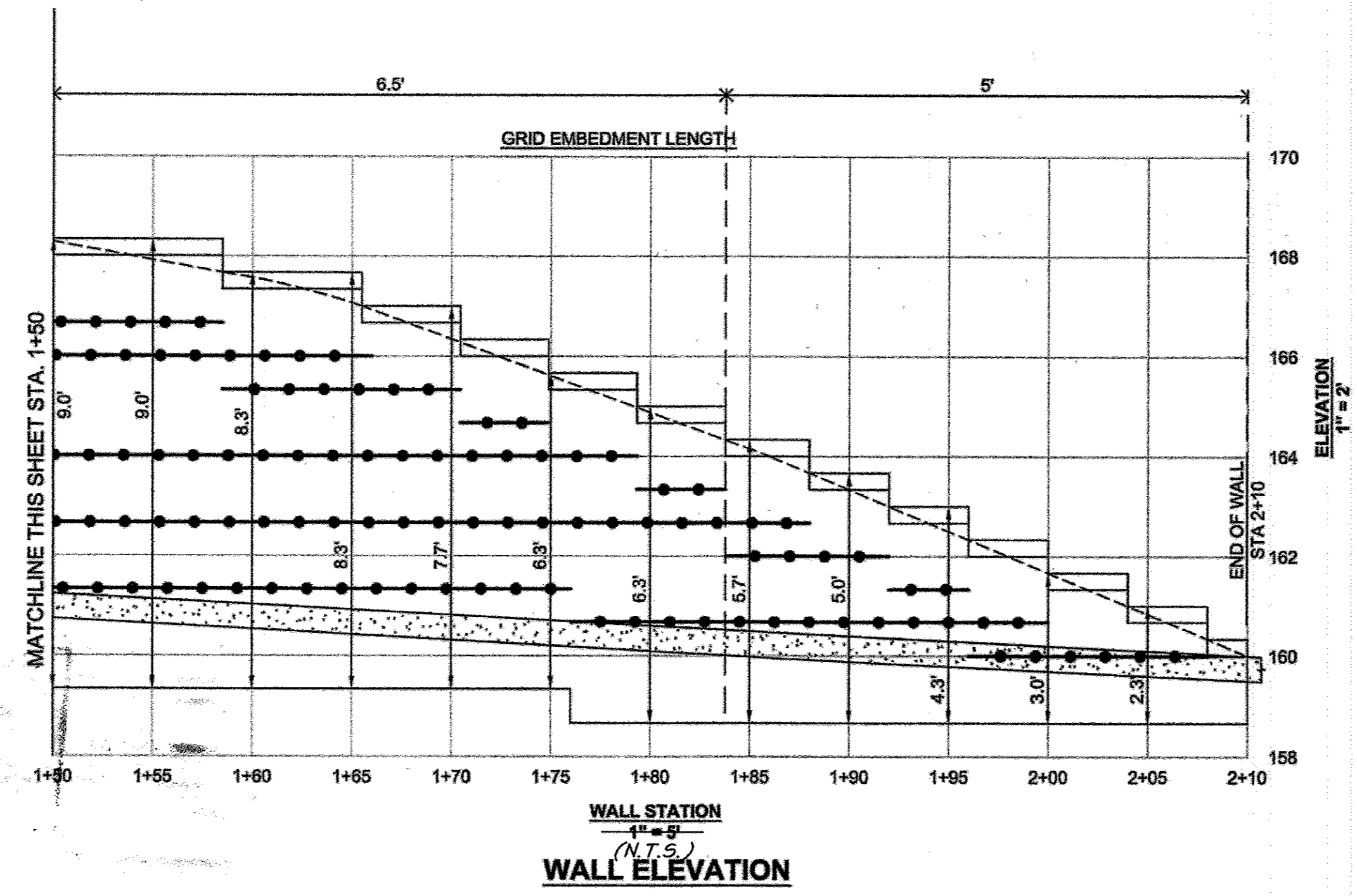
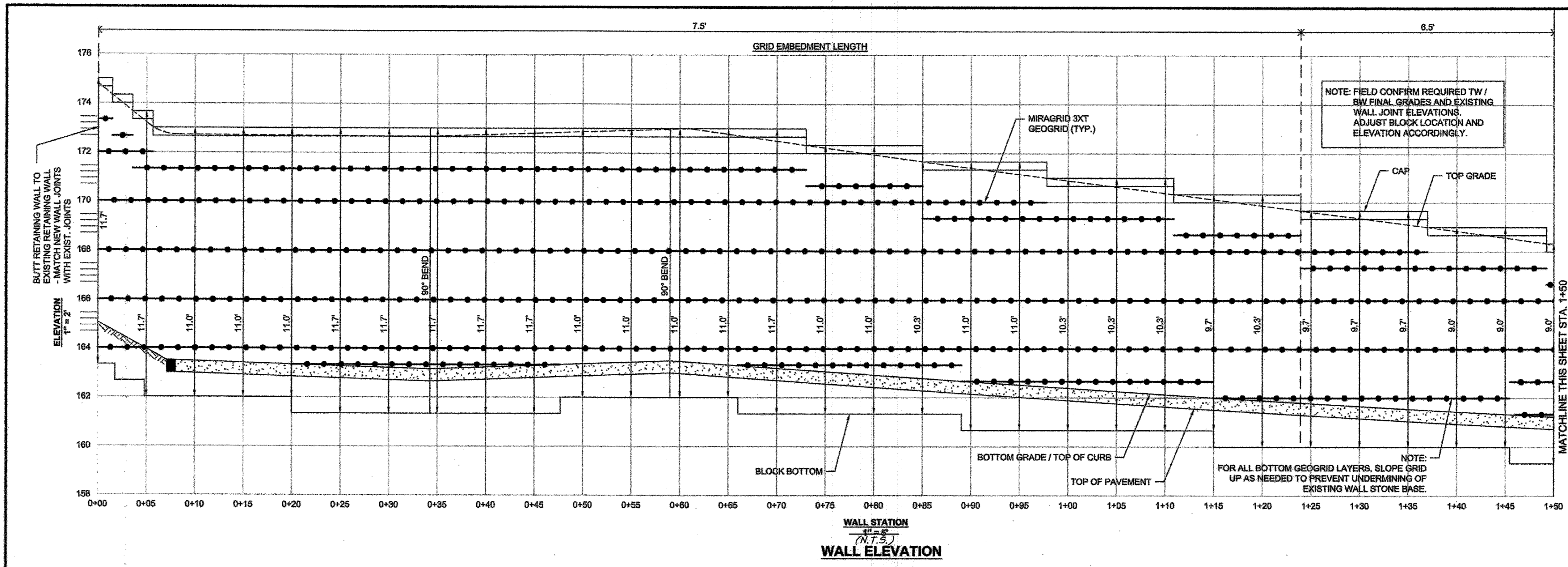
DESIGNED BY:	HM
DRAWN BY:	HM
APPROVED BY:	RWS
DATE:	10/19/2015
JOB NUMBER:	15439-A
SCALE:	AS SHOWN
DATE:	10/19/2015

1 of 2 SHEET

NOTE: RETAINING WALL PLANS ARE INCLUDED FOR INFORMATIONAL PURPOSES ONLY SEE SDD-08-116 FOR ACTUAL RETAINING WALL DESIGN

AS-BUILT
6/22/17

<p>DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND</p> <p><i>Alfred C. ...</i> CHIEF, BUREAU OF UTILITIES</p>	<p>DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND</p> <p><i>...</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION</p>	<p>christopher consultants engineering · surveying · land planning christopherconsultants, inc. 7175 calderhead drive, suite 100, columbia, md 21046-0900 410.223.2500 · fax: 410.223.2148 · hp: 410.223.2863</p> <p>PROFESSIONAL ENGINEER 10/16</p>	<p>DES: ENJ DRN: DAM CHK: ENJ DATE: 09/06/12 BY NO. REVISION DATE</p> <p>1. ADJUST WATER MAIN DESIGN & UPDATE 2. RETAINING WALL NOTES 3. RETAINING WALL 4. RETAINING WALL</p>	<p>600 SCALE MAP NO. BLOCK NO.</p>	<p>PUBLIC WATER AND SEWER PLANS DORSEY RUN INDUSTRIAL CENTER NORTH SIDE REDEVELOPMENT MONTEVIDEO ROAD AND FUTURE DORSEY RUN ROAD 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND CONTRACT NO. 14-4602-D</p> <p>SCALE SHEET 7 OF 8</p> <p>MDC-860</p>
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NOTE: THE EXISTING RETAINING WALL LOCATED DIRECTLY BEHIND THIS PROPOSED WALL WILL NO LONGER BE LOAD BEARING AFTER THE CONSTRUCTION OF THIS NEW WALL IS COMPLETE. SEE SHEET 7 FOR THE LOCATION OF THE WALLS.

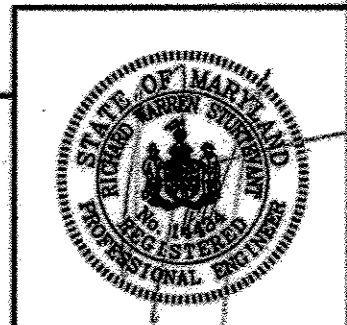
DATE PLOTTED: 10/16/2015 3:14 PM

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Chalford Road, Suite A Annapolis Junction, Maryland
(410) 892-4788 WWW.HILLIS-CARNES.COM Fax: (410) 892-4098

NEW RETAINING WALL ELEVATION
DORSEY RUN INDUSTRIAL CENTER
HOWARD COUNTY, MARYLAND

REVISION NO.	DESCRIPTION	DATE	JOB NUMBER:	DESIGNED BY:
			15439-A	HM
			SCALE: AS SHOWN	DRAWN BY: HM
			DATE: 10/19/2015	APPROVED BY: RWS

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE PLANS 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. 3658 EXPIRATION DATE: 08/31/17.



AS-BUILT

6/12/17

NOTE: RETAINING WALL PLANS ARE INCLUDED FOR INFORMATIONAL PURPOSES ONLY. SEE SDP-08-116 FOR ACTUAL RETAINING WALL DESIGN.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
[Signature] 9/22/16
CHIEF, BUREAU OF UTILITIES DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND
[Signature] 10-23-16
CHIEF, DEVELOPMENT ENGINEERING DIVISION M.G. DATE

christopher consultants
engineering - surveying - land planning
christopher consultants, inc.
7172 oakridge gateway drive suite 100 columbiana md 21046-2990
410.272.8999 - fax: 410.272.8993



DES:	ENJ		
DRN:	DAM		
CHK:	ENJ	5	ADJUST WATER MAIN DESIGN AND UPDATE RETAINING WALL NOTES
DATE:	09/06/12	4	RETAINING WALL 4/1/16
BY:	NO.	REVISION	DATE

600 SCALE MAP NO. _____ BLOCK NO. _____

PUBLIC WATER AND SEWER PLANS
DORSEY RUN INDUSTRIAL CENTER
NORTH SIDE REDEVELOPMENT
MONTEVIDEO ROAD AND FUTURE DORSEY RUN ROAD
1st ELECTION DISTRICT
HOWARD COUNTY, MARYLAND
CONTRACT NO. 14-4602-D

SCALE
SHEET
8 OF 8

MDC-860