U.S. 40 WATER SERVICE MAIN REPLACEMENT

CAPITAL PROJECT NO. W-8311

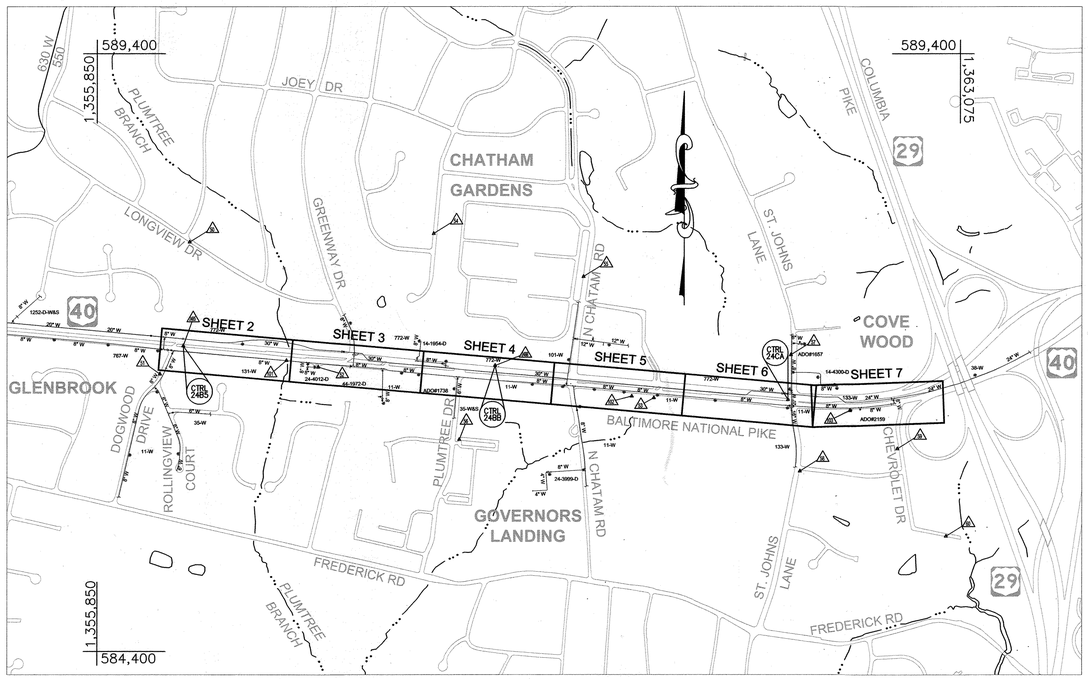
CONTRACT NO. 44-4731

HOWARD COUNTY, MARYLAND

NO.	INDEX OF SHEETS
1	TITLE SHEET
2	8" WATER LINE PLAN & PROFILE STATION 0+00 – 9+50
3	8" WATER LINE PLAN & PROFILE STATION 9+50 – 20+00
4	8" WATER LINE PLAN & PROFILE STATION 20+00 – 30+50
5	8" WATER LINE PLAN & PROFILE STATION 30+50 – 41+00
6	8" WATER LINE PLAN & PROFILE STATION 41+00 – 51+50
7	8" WATER LINE PLAN & PROFILE STATION 51+50 – 60+51
8	MISCELLANEOUS DETAILS AND SEQUENCE OF CONSTRUCTION
9	MISCELLANEOUS DETAILS
10	EROSION & SEDIMENT CONTROL DETAILS
11	TRAFFIC CONTROL DETAILS
12	CORROSION PROTECTION DETAILS
13	CORROSION PROTECTION DETAILS

LEGEND

- EXIST. WATER MAIN / VALVE VAULT
- PROP. WATER MAIN
- TEMP. WATER MAIN
- EXIST. WATER MAIN TO BE ABANDONED
- EXIST. SEWER MAIN / MANHOLE
- EXIST. STORM DRAIN
- EXIST. GAS
- EXIST. ELECTRIC (UNDERGROUND)
- EXIST. ELECTRIC (ABOVE GROUND)
- EXIST. CABLE TV
- EXIST. TELEPHONE (UNDERGROUND)
- EXIST. TELEPHONE (ABOVE GROUND)
- RIGHT OF WAY
- GUARDRAIL
- FENCE
- PROPERTY LINE
- SILT FENCE
- LIMITS OF DISTURBANCE
- ROAD CENTERLINE
- TRAVERSE
- STREAM / WATERWAY EDGE
- 630 W / 550 — WATER PRESSURE ZONE BOUNDARY
- SHRUB
- VALVE
- FIRE HYDRANT
- BGE POLE
- STREET SIGN
- ROAD DELINEATOR
- BORING LOCATION
- CONTINUITY TEST STATION
- ### — SAN. MANHOLE IDENTIFICATION
- TH1G — TEST PIT LOCATION
- CIP — CURB INLET PROTECTION



VICINITY MAP
SCALE: 1" = 600'

WATER ZONE PRESSURE: 550W

TEST GRADIENT: #830

DRAINAGE AREA: PATAPSCO

WHC'S: 4

TYPE OF BUILDING: RESIDENTIAL/COMMERCIAL

HORIZONTAL AND VERTICAL CONTROL BASED ON MARYLAND NAD83 (91) (HORIZONTAL) AND NAVD88 (VERTICAL) DATUM.

HOWARD COUNTY GEODETIC SURVEY CONTROL NUMBERS:

NO. 24B5	NO. 24BB	NO. 24CA
N 586,956.27	N 586,791.24	N 586,506.22
E 1,356,570.78	E 1,359,181.16	E 1,361,634.27
ELEV. 390.17	ELEV. 386.13	ELEV. 398.25

QUANTITIES

NAME OF UTILITY CONTRACTOR: RUSTLER CONSTRUCTION

SURVEY AND DRAFTING DIVISION AS-BUILT DATE: 9/2/2014

ITEMS	QUANTITIES ESTIMATED	AS-BUILT QUANTITIES	AS-BUILT TYPE	AS-BUILT MANUFACTURER / SUPPLIER
WATER				
8" Water Pipe	~~6,057~~ 6,063 L.F.	6,110.5	C900 DR-18	NATIONAL PIPE & PLASTICS
6" Water Pipe	~~296~~ 277 L.F.	302.5	C900 DR-18	NATIONAL PIPE & PLASTICS
8" Valve and Roadway Box	~~12~~ 7 EA.	14	GATE	MUELLER CO.
6" Valve and Roadway Box	~~24~~ 15 EA.	23	GATE	MUELLER CO.
8" X 8" Tee	7 EA.	7	MECHANICAL JT.	TYLER UNION
8" X 6" Tee	20 EA.	22	MECHANICAL JT.	TYLER UNION
Test Station	20 EA.	20	VAULT	PRISM PRECAST PRODUCTS
Fire Hydrant	10 EA.	10	5'	MUELLER CO.

Note: 6" water pipe and 6" valve & roadway box quantities include 6" services that are not shown on plans, but are represented on the Water Services Table on Sheet 8.

HOWARD SOIL CONSERVATION DISTRICT CERTIFICATION:

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

HOWARD SCD — DATE 3/14/13

ENGINEER'S DESIGN CERTIFICATION:

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

SIGNATURE OF ENGINEER — DATE 3/11/13
NATHAN C. ATKINSON, P.E.

OWNER'S / DEVELOPER'S CERTIFICATION:

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

BUREAU OF ENGINEERING — DATE 3/11/13
DEPARTMENT OF PUBLIC WORKS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 3/13/13
CHIEF, BUREAU OF ENGINEERING — DATE 3/13/13
CHIEF, BUREAU OF UTILITIES — DATE 3/13/13
CHIEF, UTILITY DESIGN DIVISION — DATE 3/12/13

URS
MONTGOMERY PARK BUSINESS CENTER
1800 WASHINGTON BOULEVARD, SUITE 410
BALTIMORE, MARYLAND 21230
(410) 468-0875

STATE OF MARYLAND — NATHAN CHRISTOPHER ATKINSON — No. 28817 — PROFESSIONAL ENGINEER

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. 28817, Expiration Date: 08/01/13.

NATHAN C. ATKINSON

DESIGN: NCA
DRAWN: BJW
CHK: EMT
DATE: 3/7/13

NO.	REVISION	DATE	BY
1	REMOVE TEMPORARY WATER SERVICE, REVISE ALIGNMENT	9/3/2013	URS
2	RELOCATE PROPOSED FIRE HYDRANT	10/4/2013	URS
3	ADD PROP. 6" AND 8" VALVES AND ROADWAY BOXES	11/15/2013	URS
4	REVISE 8" WATERLINE VERTICAL ALIGNMENT	11/22/2013	URS
5	ADD MODIFICATIONS TO EXISTING GUARDRAIL	2/3/2014	URS
6	REVISE PLAN TO ADD 4" WATER SERVICE & INDOOR METER	1/23/2020	RIK
7	AS-BUILT	7/15/2024	WRA

TITLE SHEET

600' SCALE MAP NO. 24 — BLOCK NO. 12

U.S. 40 WATER SERVICE MAIN REPLACEMENT
CAPITAL PROJECT NO. W-8311
CONTRACT NO. 44-4731
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN

SHEET 1 OF 13

AS-BUILT 1/2015

GENERAL NOTES

PART I

1. Approximate locations of existing mains are shown. The contractor shall take all necessary precautions to protect existing 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.

2. Topographic field surveys were performed on November 2011 by Harford Aerial and J.A. Rice Inc..

3. Horizontal and Vertical Survey Controls:

The coordinates shown on the drawings are based on Maryland State Reference System NAD '83/'91 as projected by Howard County Geodetic Control Stations No. 24B5, No. 24BB and No. 24CA.

All vertical controls are based on NAVD '88. Vertical controls provided on the drawings are aluminum stamped discs.

4. All pipe elevations shown are invert elevations unless otherwise noted on the plans.

5. 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 poles as shown on the drawings. 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 the contractor. The contractor shall coordinate with the utility companies to schedule the bracing of the poles.

6. For details not shown on the drawing, and for materials and construction methods, use Howard County Design Manual, Volume IV, Standard Specifications and Details for Construction (Latest Edition). The contractor shall have a copy of Volume IV on the job.

7. Where test pits have been made on existing utilities, they are noted by the symbol ■ at the locations of the test pits. A note or notes containing the results of the test pit or pits is included on the drawings. Existing utilities in the vicinity of the proposed work for which test pits have not been dug shall be located by the contractor two weeks in advance of construction operations at his own expense.

8. 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 (Construction Services)	410-637-8713
BGE (Emergency)	410-685-0123
Bureau of Utilities	410-313-4900
Colonial Pipeline Company	410-795-1390
Miss Utility	1-800-257-7777
State Highway Administration (District 7 Office)	301-624-8100
State Highway Administration (Signal Shop)	410-787-7650
Verizon	1-800-743-0033

9. Trees and shrubs are to be protected from damage to the maximum extent. Trees and shrubs located within the construction strip are not to be removed or damaged by the contractor.

10. The contractor shall remove trees, stumps and roots along the line of excavation. Payment for such removal shall be included in the unit price bid for construction of the main.

11. The contractor shall notify the Bureau of Highways, Howard County, at (410)-313-7450 at least five working days before open cutting or boring/jacking of any County road for laying water/sewer mains or house connections. The approval of these drawings will constitute compliance with DPW requirements per Section 18.114(a) of the Howard County Code.

12. The contractor shall coordinate any disruption of traffic signals, sensors and wiring with Maryland State Highway Administration, Office of Traffic and Safety.

13. Working hours shall be limited to 9am - 3pm and 8pm - 5am. See specifications for acceptable working days. In the event of a double lane closure, the contractor shall be limited to working hours of 8pm-5am.

PART II - WATER

1. All water mains to be C-900 or Fusible C-905 unless otherwise noted. There shall be no deflection of PVC pipe joints or bending of AWWA C-900 pipe.

2. Tops of all water mains to have a minimum of 3'-6" of cover unless otherwise noted.

3. Valves adjacent to tees shall be strapped to tees.

4. All fittings shall be buttressed or anchored with concrete in accordance with the Standard Details unless otherwise provided for on the drawings.

5. Fire hydrants shall be set to the bury line elevations shown on the drawings. All fire hydrants shall be restrained and buttressed with concrete in accordance with the Standard Details. The soil around the fire hydrant shall be compacted in accordance with Section 1000 and 1005 of the Standard Specifications.

6. The contractor shall not operate any water main valves on the existing water system.

7. Tracer wires and continuity test stations shall be installed on all DIP and PVC water mains in accordance with the Howard County Design Manual.

8. For PVC water mains, all records for the Quality Control and Qualification Test Requirements noted in Section 5.1 of the AWWA Standard C900 for PVC pressure pipe shall be submitted with the pipe material certifications or shop drawings prior to approval of the material for use. The test records shall be for the pipe to be installed under this contract. All PVC pipe shall contain markings to allow cross referencing of the pipe supplied to the test records received.

9. Unless otherwise noted on the plans or in the specifications, seventeen (17) pound sacrificial anodes shall be installed on all valves and metallic fittings used with PVC water mains in accordance with Volume IV, Standard Specifications and Details for Construction. Magnesium anodes shall be installed on all valves and ductile iron fittings including restraints and harnesses. Zinc anodes shall be installed on all stainless steel fittings and saddles used with PVC mains. All "tees" used with PVC mains shall be ductile iron. See Corrosion Protection Details Sheets 12 & 13.

10. The contractor shall notify Howard County DPW as any unknown utility services are encountered. Contractor shall reconnect all active water services encountered.

11. The contractor shall verify that existing water lines and valves are restrained prior to removal of existing water line, at connection locations. Contractor shall provide thrust blocking and/or deadmen anchors on the existing water system where there is no existing thrust projection.

12. The contractor shall abandon existing waterline in place unless otherwise indicated on the plans. Contractor shall cap all cut or open ends, remove existing valve roadway boxes and abandon existing valves in place. The contractor shall be responsible for removal and disposal of existing waterline where indicated to be replaced in-kind.

13. The contractor shall mill and overlay asphalt for the full lane width for any lane encroached by the utility trench more than 1 linear foot, per SHA specifications. Prior to excavation, Contractor shall notify Howard County DPW if utility trench will encroach more than one lane. The contractor shall also mill and overlay 50 linear feet beyond the limits of the new 8-inch waterline and 50 linear feet into named street intersections. See limit of disturbance for detail.

14. For ada ramp improvements, contractor shall replace one additional sidewalk panel to transition from new ada ramp to existing sidewalks narrower than 5-feet.

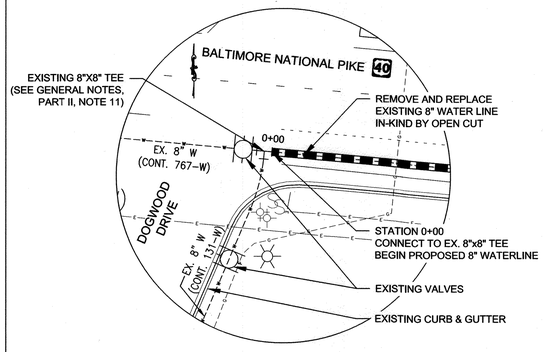
Manhole #	Invert			Rim Elevation
1498	354.16			370.51 +/-
1497	353.16			368.02 +/-

WATER MAIN STAKE-OUT SCHEDULE

Station	Fitting	Northing	Easting	Invert
0+40.00	1.50° HD COUPLING (VERT.)	586,917.12	1,356,533.76	384.80
1+00.00	0.25° HD COUPLING (VERT.)	586,911.69	1,356,593.52	384.81
2+00.00	1.00° HD COUPLING (VERT.)	586,902.64	1,356,693.11	384.39
2+50.00	8"x6" TEE	586,898.12	1,356,742.90	383.31
2+50.00	6" VALVE & ROADWAY BOX	586,893.51	1,356,742.48	383.31
2+50.00	FIRE HYDRANT (4'-6" BURY)	586,888.64	1,356,742.04	383.31
2+56.00	TEST STATION	586,887.89	1,356,748.00	-
3+80.00	1.00° HD COUPLING (VERT.)	586,886.35	1,356,872.37	380.49
4+60.00	0.50° HD COUPLING (VERT.)	586,879.12	1,356,952.04	377.36
6+00.00	8"x6" TEE	586,866.45	1,357,091.47	373.11
6+00.00	6" VALVE & ROADWAY BOX	586,861.83	1,357,091.05	373.11
6+00.00	FIRE HYDRANT (4'-6" BURY)	586,857.91	1,357,090.69	373.11
6+06.00	TEST STATION	586,857.27	1,357,096.66	-
8+20.00	0.75° HD COUPLING (VERT.)	586,846.54	1,357,310.56	366.42
9+25.00	8"x6" TEE	586,837.04	1,357,415.13	364.82
9+25.00	6" VALVE & ROADWAY BOX	586,832.43	1,357,414.71	364.82
9+25.00	FIRE HYDRANT (4'-6" BURY)	586,828.50	1,357,414.36	364.82
9+31.00	TEST STATION	586,827.76	1,357,420.31	-

TEST PIT DATA

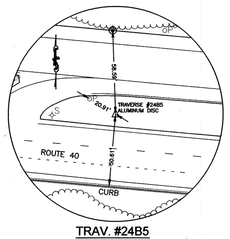
TEST PIT NUMBER	TYPE OF UTILITY	TOP DEPTH
TH 1G	6" WRAPPED STEEL GAS PIPE	3.76



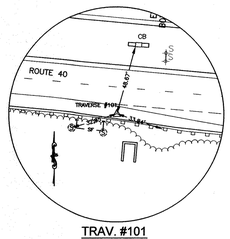
DETAIL - STATION 0+00
SCALE: 1" = 20'

TRAVERSE COORDINATE SCHEDULE

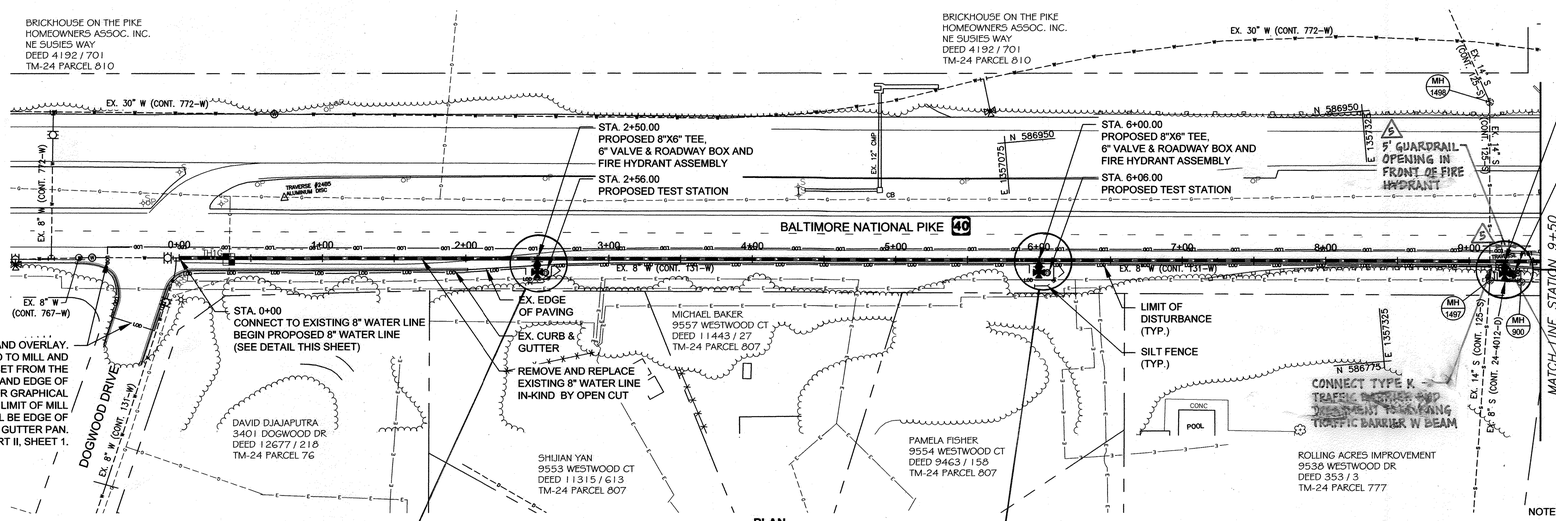
POINT	NORTHING	EASTING	ELEVATION
24B5	586,956.27	1,356,570.78	390.17
101	586,834.61	1,357,434.96	370.99



TRAV. #24B5



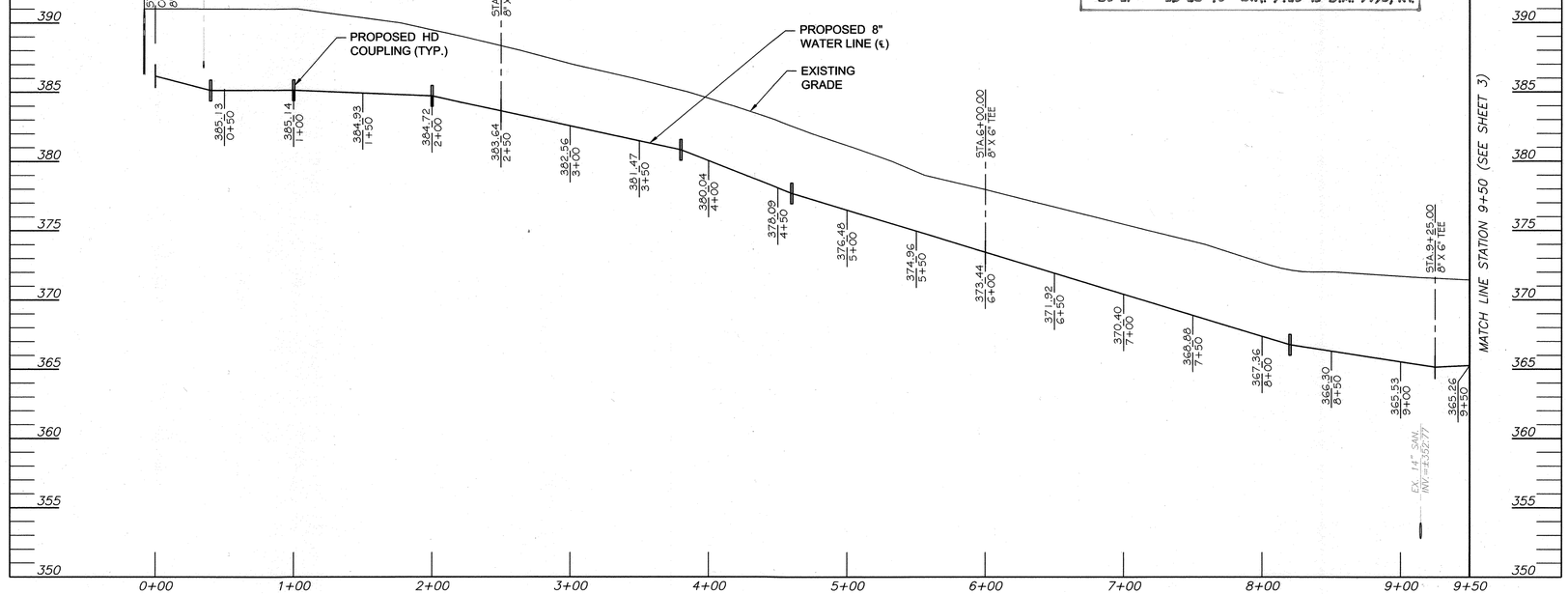
TRAV. #101



PLAN
SCALE: 1" = 50'

NOTE: SEE THE WATER SERVICE TABLE ON SHEET 8 FOR ADDITIONAL INFORMATION REGARDING THE EXISTING WATER HOUSE CONNECTIONS.

5	TYPE K TRAFFIC BARRIER END TREATMENT (MD 605.10)
	1 EA. EB US-40, STA. 9+22.5, RT.
5	TYPE C TRAFFIC BARRIER END TREATMENT (MD 605.02)
	1 EA. EB US-40, STA. 9+27.5, RT.
5	REMOVAL AND DISPOSAL OF EXISTING TRAFFIC BARRIER W-BEAM
	30 LF EB US-40 STA. 9+20 TO STA. 9+50, RT.



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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	3/13/13 DATE	CHIEF, BUREAU OF ENGINEERING	3/13/13 DATE
CHIEF, BUREAU OF UTILITIES	3/13/13 DATE	CHIEF, UTILITY DESIGN DIVISION	3/12/13 DATE

URS
MONTGOMERY PARK BUSINESS CENTER
1800 WASHINGTON BOULEVARD, SUITE 410
BALTIMORE, MARYLAND 21230
(410) 468-0875

STATE OF MARYLAND — NATHAN C. ATKINSON — No. 28817 — PROFESSIONAL ENGINEER

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. 28817, Expiration Date: 08/01/13

NATHAN C. ATKINSON

DESIGN: NCA
DRAWN: BJW
CHK: EMT
DATE: 3/7/13

NO.	REVISION	DATE	BY
5	ADD MODIFICATIONS TO EXISTING GUARDRAIL	2/3/2014	URS

8" WATER MAIN
PLAN AND PROFILE
STATION 0+00 - 9+50

600' SCALE MAP NO. 24 | BLOCK NO. 12

U.S. 40 WATER SERVICE MAIN REPLACEMENT
CAPITAL PROJECT NO. W-8311
CONTRACT NO. 44-4731
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

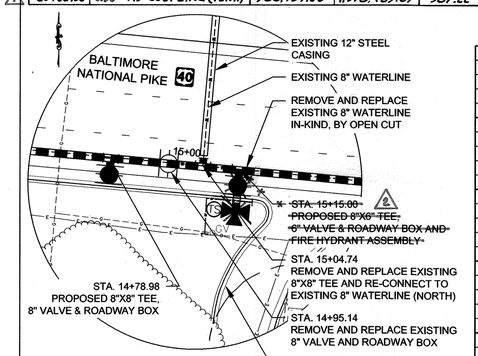
SCALE: AS SHOWN

SHEET 2 OF 13

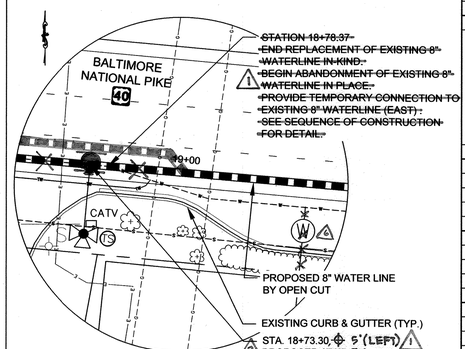
AS-BUILT 1/2015

WATER MAIN STAKE-OUT SCHEDULE

Station	Fitting	Northing	Easting	Invert
10+00.00	0.75° HD COUPLING (VERT.)	586,830.25	1,357,489.83	365.11
11+25.04	8"x 8" TEE	586,818.94	1,357,614.35	367.31
11+40.00	0.75° HD COUPLING(VERT.)	586,817.55	1,357,629.25	367.58
13+40.00	1.50° HD COUPLING(VERT.)	586,799.04	1,357,828.39	373.72
14+60.00	3.00° HD COUPLING(VERT.)	586,787.93	1,357,947.87	374.27
14+78.98	8"x 8" TEE	586,786.17	1,357,966.78	375.39
14+78.98	8" VALVE & ROADWAY BOX	586,781.56	1,357,966.35	375.39
14+99.14	8" VALVE & ROADWAY BOX	586,784.68	1,357,982.86	376.28
15+04.74	8"x 8" TEE	586,783.79	1,357,992.42	376.81
15+09.00	TEST STATION	586,771.98	1,357,995.61	–
15+15.00	8"x 6" TEE	586,783.11	1,358,002.66	377.44
15+15.00	6" VALVE & ROADWAY BOX	586,778.50	1,358,002.22	377.44
15+15.00	FIRE HYDRANT (5'-0" BURY)	586,771.46	1,358,001.55	377.44
15+40.00	2.25° HD COUPLING (VERT.)	586,780.54	1,358,027.53	378.82
15+69.00	TEST STATION	586,766.28	1,358,055.34	–
15+75.00	8"x 6" TEE	586,777.40	1,358,062.39	379.49
15+75.00	6" VALVE & ROADWAY BOX	586,772.79	1,358,061.95	379.49
15+75.00	FIRE HYDRANT (5'-6" BURY)	586,765.75	1,358,061.28	379.49
17+50.00	1/8 BEND (HORZ.)	586,761.20	1,358,236.64	382.59
17+55.00	1/8 BEND (HORZ.)	586,765.72	1,358,242.08	382.68
17+66.89	8"x 8" TEE	586,764.69	1,358,253.86	382.84
17+80.60	METER CONNECTION	586,763.37	1,358,267.54	383.08
18+46.76	METER CONNECTION	586,767.33	1,358,332.88	384.26
18+73.30	8"x 6" TEE	586,754.83	1,358,359.86	384.73
18+73.30	6" VALVE & ROADWAY BOX	586,753.67	1,358,359.76	384.73
18+79.96	TEST STATION	586,729.26	1,358,364.34	–
18+95.00	1/8 BEND (HORZ.)	586,752.98	1,358,381.46	385.15
19+00.00	1/8 BEND (HORZ.)	586,747.57	1,358,386.02	385.24
19+10.00	1.00° HD COUPLING (VERT.)	586,746.71	1,358,395.98	385.42
19+34.28	METER CONNECTION	586,744.65	1,358,420.08	385.85
20+00.00	0.50° HD COUPLING(VERT.)	586,739.03	1,358,485.65	385.22



DETAIL - STATION 15+04
SCALE: 1" = 20'



DETAIL - STATION 18+78
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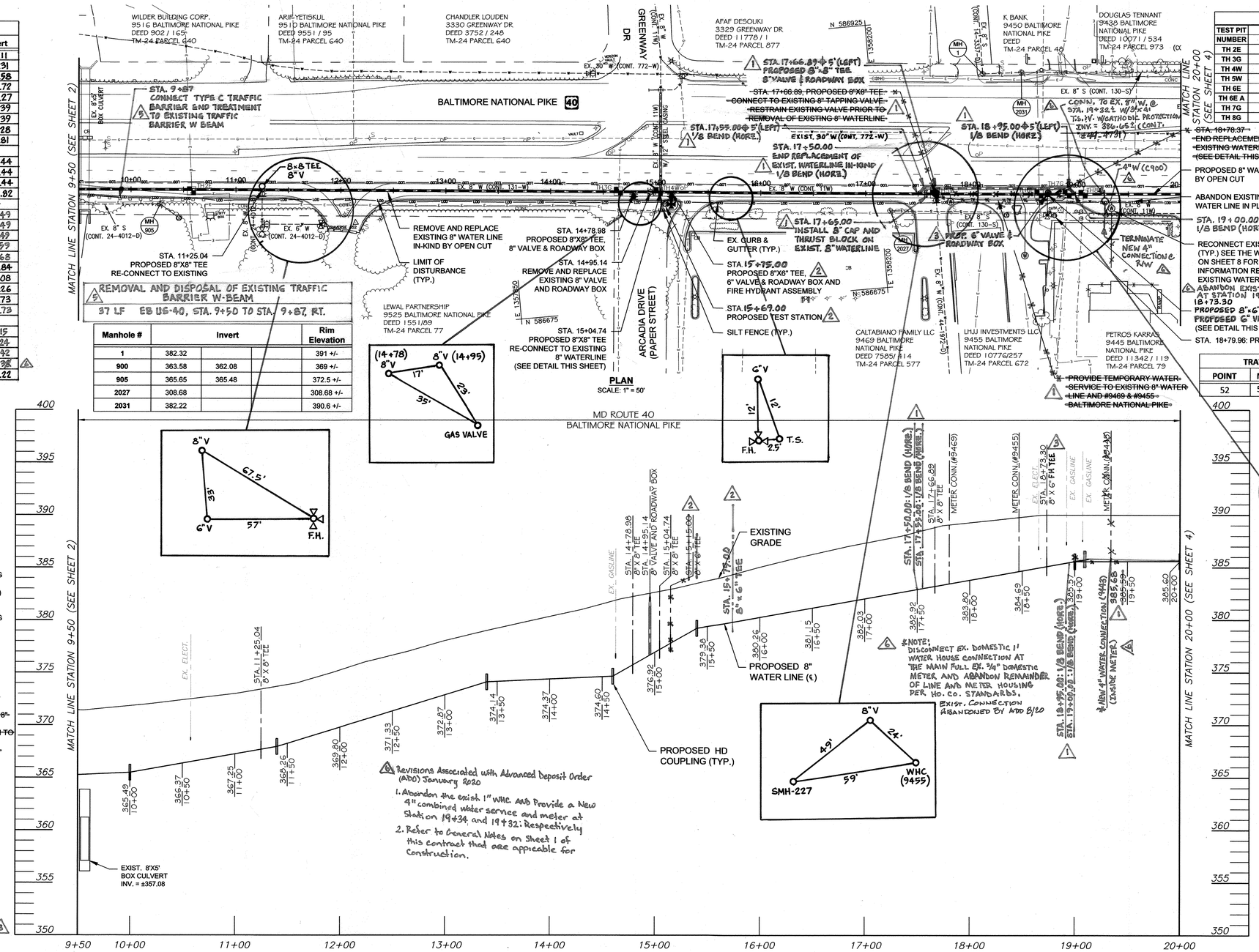


Manhole #	Invert			Rim Elevation
1	382.32			391 +/-
900	363.58	362.08		369 +/-
905	365.65	365.48		372.5 +/-
2027	308.68			308.68 +/-
2031	382.22			390.6 +/-

REMOVAL AND DISPOSAL OF EXISTING TRAFFIC BARRIER W-BEAM
37 LF EB US-40, STA. 9+50 TO STA. 9+87, RT.

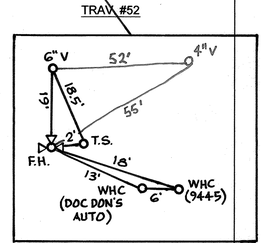
PLAN
SCALE: 1" = 50'

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

Revisions Associated with Advanced Deposit Order (ADD) January 2020
1. Abandon the exist 1" WHC And Provide a New 4" combined water service and meter at Stat. on 19+34, and 19+32: Respectively
2. Refer to General Notes on Sheet 1 of this contract that are applicable for Construction.

TEST PIT DATA		
TEST PIT NUMBER	TYPE OF UTILITY	TOP DEPTH
TH 2E	4" PLASTIC ELECTRIC CONDUIT	3.62
TH 3G	6" WRAPPED STEEL GAS PIPE	5.05
TH 4W	8" X 8" CAST IRON WATER TEE	5.64
TH 5W	8" X 8" CAST IRON WATER TEE	4.05
TH 6E	4" STEEL ELECTRIC CONDUIT	2.94
TH 6E A	SEE TEST HOLE REPORT	DRY
TH 7G	4" STEEL GAS PIPE	2.52
TH 8G	1 1/4" PLASTIC GAS PIPE	2.34

TRAVERSE COORDINATE SCHEDULE			
POINT	NORTHING	EASTING	ELEVATION
52	586,780.17	1,357,700.32	376.13



APPROVED FOR ADD
HC Bureau of Utilities
Site Address 9455 Balt. Nat Pk.
Approved
Date 3-3-2020

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 3/13/13
CHIEF, BUREAU OF ENGINEERING — DATE 3/13/13
CHIEF, BUREAU OF UTILITIES — DATE 3/13/13
CHIEF, UTILITY DESIGN DIVISION — DATE 3/12/13

URS
MONTGOMERY PARK BUSINESS CENTER
1800 WASHINGTON BOULEVARD, SUITE 410
BALTIMORE, MARYLAND 21230
(410) 468-0875

STATE OF MARYLAND — NATHAN CHRISTOPHER ATKINSON — No. 28811 — PROFESSIONAL ENGINEER
NATHAN C. ATKINSON

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. 28811, Expiration Date: 08/01/13

DESIGN: NCA
DRAWN: BJW
CHK: EMT
DATE: 3/7/13

NO.	REVISION	DATE	BY
1	REMOVE TEMP. WATER SERVICE, REVISE ALIGNMENT	7/15/2013	URS
2	RELOCATE PROPOSED FIRE HYDRANT	10/4/2013	URS
3	ADD PROP. 6" VALVE AND ROADWAY BOX	11/15/2013	URS
4	ADD MODIFICATIONS TO EXISTING GUARDRAIL	2/3/2014	URS
6	REV. PLAN TO ADD 4" WATER SERVICE & INSIDE METER	1/23/2020	

600' SCALE MAP NO. 24 — BLOCK NO. 12

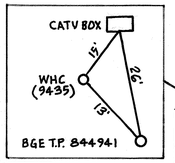
8" WATER MAIN
PLAN AND PROFILE
STATION 9+50 - 20+00

U.S. 40 WATER SERVICE MAIN REPLACEMENT
CAPITAL PROJECT NO. W-8311
CONTRACT NO. 44-4731
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN
SHEET 3 OF 13

AS-BUILT 1/2015

Manhole #	Invert			Rim Elevation
2024	376.31			387.00 +/-
2025	378.84			389.38 +/-
2026	380.16			390.21 +/-
2028	375.26			384.80 +/-
2029	377.72			386.80 +/-
2030	380.09			391.10 +/-

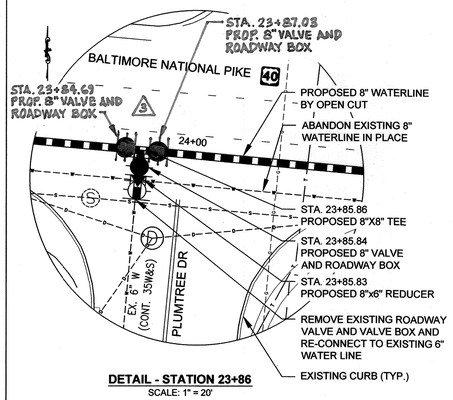


WATER MAIN STAKE-OUT SCHEDULE

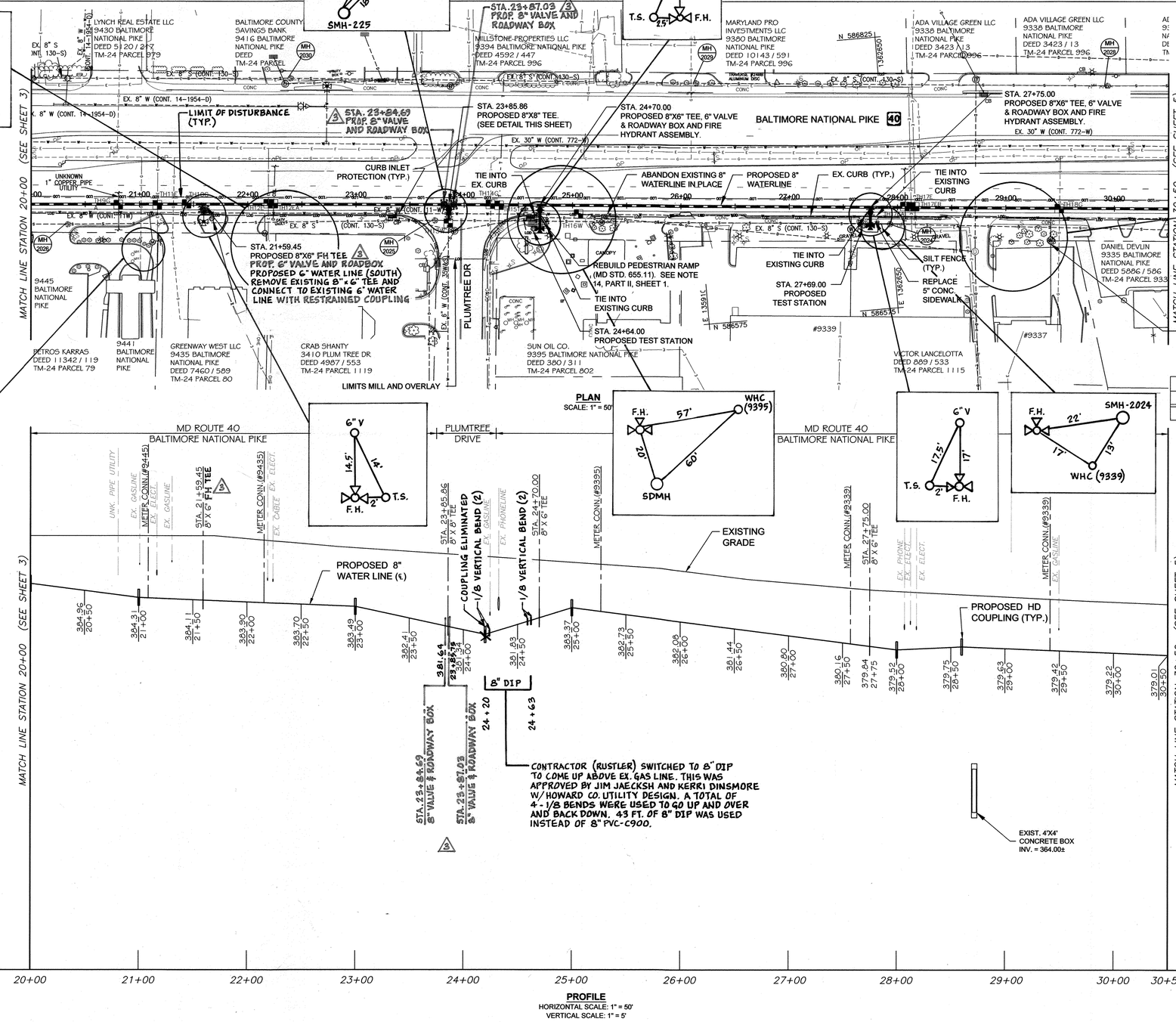
Station	Fitting	Northing	Easting	Invert	
21+00.00	0.50° HD COUPLING (VERT.)	586,730.48	1,358,585.29	383.98	
21+08.75	METER CONNECTION	586,729.73	1,358,594.01	383.95	
21+59.45	8"x 6" TEE	586,725.40	1,358,644.52	383.74	
21+59.46	6" VALVE & ROADWAY BOX	586,724.24	1,358,644.42	383.74	3
21+66.84	TEST STATION	586,711.58	1,358,650.72	-	
22+15.78	METER CONNECTION	586,720.38	1,358,700.63	383.51	
23+00.00	1.00° HD COUPLING (VERT.)	586,712.86	1,358,784.51	383.16	
23+84.69	8" VALVE & ROADWAY BOX	586,705.31	1,358,868.84	381.84	3
23+85.83	8"x6" REDUCER	586,696.61	1,358,869.20	381.31	
23+85.84	8" VALVE AND ROADWAY BOX	586,700.59	1,358,869.58	381.31	
23+85.86	8"x8" TEE	586,705.20	1,358,870.03	381.31	
23+87.03	8" VALVE & ROADWAY BOX	586,705.87	1,358,871.20	381.27	3
24+20.00	3.0° HD COUPLING (VERT.)	586,702.05	1,358,904.02	380.57	
24+64.00	TEST STATION	586,676.29	1,358,945.82	-	
24+70.00	8"x6" TEE	586,697.43	1,358,953.81	382.11	
24+70.00	6" VALVE & ROADWAY BOX	586,692.82	1,358,953.38	382.11	
24+70.00	FIRE HYDRANT (6'-0" BURY)	586,675.89	1,358,951.81	382.11	
25+00.00	2.50° HD COUPLING (VERT.)	586,694.67	1,358,983.68	383.04	
25+26.92	METER CONNECTION	586,692.18	1,359,010.49	382.69	
27+57.33	METER CONNECTION	586,670.92	1,359,239.91	379.73	
27+69.00	TEST STATION	586,652.96	1,359,249.97	-	
27+75.00	8"x6" TEE	586,669.29	1,359,257.51	379.51	
27+75.00	6" VALVE & ROADWAY BOX	586,664.68	1,359,257.08	379.51	
27+75.00	FIRE HYDRANT (6'-0" BURY)	586,652.55	1,359,255.96	379.51	
28+00.00	1.00° HD COUPLING (VERT.)	586,666.98	1,359,282.40	379.18	
28+60.00	0.50° HD COUPLING (VERT.)	586,661.45	1,359,342.14	379.46	
29+41.38	METER CONNECTION	586,653.94	1,359,423.18	379.13	

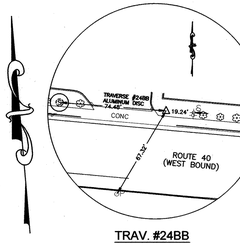
TEST PIT DATA

TEST PIT NUMBER	TYPE OF UTILITY	TOP DEPTH
TH 9G	SEE TEST HOLE REPORT	DRY
TH 9G A	1" UNKNOWN COPPER PIPE	3.62
TH 10G	1" STEEL GAS PIPE	2.26
TH 11E	(6) 3/4" ELECTRIC CABLES	3.14
TH 12E	4" PLASTIC ELECTRIC CONDUIT	3.45
TH 12E A	(4) 1 1/2" CTV CABLES	3.50
TH 13W	8" CAST IRON WATER PIPE	4.76
TH 14G	4" WRAPPED STEEL GAS PIPE	5.10
TH 15T	(3) 4" PLASTIC TELEPHONE CONDUITS	3.65
TH 16W	8" CAST IRON WATER PIPE	3.84
TH 17E	4" PLASTIC ELECTRIC CONDUIT	2.65
TH 17E A	6" STEEL TELEPHONE CONDUIT	2.98
TH 17E B	4" PLASTIC ELECTRIC CONDUIT	3.10
TH 18G	1/2" PLASTIC GAS PIPE	2.62



DETAIL - STATION 23+86
SCALE: 1" = 20'





TRAVERSE COORDINATE SCHEDULE

POINT	NORTHING	EASTING	ELEVATION
24BB	586,791.24	1,359,181.16	386.13

PLAN
SCALE: 1" = 50'

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 3/13/13
CHIEF, BUREAU OF ENGINEERING — DATE 3/13/13
CHIEF, BUREAU OF UTILITIES — DATE 3/13/13
CHIEF, UTILITY DESIGN DIVISION — DATE 3/12/13

URS
MONTGOMERY PARK BUSINESS CENTER
1800 WASHINGTON BOULEVARD, SUITE 410
BALTIMORE, MARYLAND 21230
(410) 468-0875

STATE OF MARYLAND — NATHAN CARL ATKINSON — No. 28817 — PROFESSIONAL ENGINEER

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. 28817, Expiration Date: 08/01/13.

NATHAN C. ATKINSON

DESIGN: NCA
DRAWN: BJW
CHK: EMT
DATE: 3/7/13

NO.	REVISION	DATE	BY
3	ADD PROF. 6" AND 8" VALVES & ROADWAY BOXES	11/15/2013	URS

8" WATER MAIN
PLAN AND PROFILE
STATION 20+00 - 30+50

600' SCALE MAP NO. 24 | BLOCK NO. 12

U.S. 40 WATER SERVICE MAIN REPLACEMENT
CAPITAL PROJECT NO. W-8311
CONTRACT NO. 44-4731
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN

SHEET 4 OF 13

AS-BUILT 1/2015

WATER MAIN STAKE-OUT SCHEDULE

	Station	Fitting	Northing	Easting	Invert
	30+51.05	METER CONNECTION	586,643.82	1,359,532.38	378.68
	30+65.85	TEST STATION	586,625.35	1,359,545.53	-
	30+72.67	8"x6" TEE	586,641.82	1,359,553.91	378.59
3	30+72.67	6" VALVE & ROADWAY BOX	586,640.69	1,359,553.82	378.59
	30+89.58	METER CONNECTION	586,640.26	1,359,570.74	378.52
	32+58.84	METER CONNECTION	586,624.64	1,359,739.28	377.82
	32+75.85	TEST STATION	586,606.21	1,359,754.66	-
	32+81.92	8" x 6" TEE	586,622.51	1,359,762.26	377.73
3	32+81.92	6" VALVE & ROADWAY BOX	586,621.95	1,359,762.15	377.73
	33+02.84	8" VALVE & ROADWAY BOX	586,620.58	1,359,783.09	377.64
	33+10.11	8" x 8" TEE	586,619.91	1,359,790.33	377.61
	33+10.15	8" VALVE & ROADWAY BOX	586,623.71	1,359,790.76	377.61
4	33+45.55	0.75° HD COUPLING (VERT.)	586,616.36	1,359,825.60	377.47
4 3	33+62.39	8" VALVE & ROADWAY BOX	586,614.67	1,359,842.35	377.62
4	33+63.56	8"x 8" TEE	586,614.55	1,359,843.51	377.63
4	33+63.56	8" VALVE & ROADWAY BOX	586,609.94	1,359,843.13	377.63
4 3	33+64.73	8" VALVE & ROADWAY BOX	586,614.44	1,359,844.68	377.64
4	33+79.61	1.50° HD COUPLING (VERT.)	586,612.99	1,359,859.49	377.77
4	34+25.90	0.75° HD COUPLING (VERT.)	586,608.48	1,359,905.56	376.98
	35+03.54	1/8 BEND (HOR.)	586,600.90	1,359,982.83	376.66
	35+11.68	1/8 BEND (HOR.)	586,606.08	1,359,989.11	376.62
	35+59.87	TEST STATION	586,586.53	1,360,035.70	-
	35+66.47	8" x 6" TEE	586,601.07	1,360,043.67	376.40
3	35+66.47	6" VALVE & ROADWAY BOX	586,599.90	1,360,043.56	376.40
	35+93.90	8" VALVE & ROADWAY BOX	586,598.56	1,360,070.98	376.28
	36+68.86	METER CONNECTION	586,591.70	1,360,145.63	375.98
	38+08.75	8" x 6" TEE	586,578.90	1,360,284.93	375.40
3	38+08.75	6" VALVE & ROADWAY BOX	586,577.74	1,360,284.84	375.40
	38+15.09	TEST STATION	586,561.21	1,360,289.67	-
	38+50.54	1/8 BEND (VERT.)	586,575.08	1,360,326.55	375.23
	38+52.01	1/8 BEND (VERT.)	586,574.95	1,360,328.01	375.75
	38+71.56	1/8 BEND (VERT.)	586,573.16	1,360,347.48	373.67
	38+73.02	1/8 BEND (VERT.)	586,573.02	1,360,348.93	375.12
	39+67.06	METER CONNECTION	586,564.42	1,360,442.58	374.32
	40+68.76	METER CONNECTION	586,555.12	1,360,543.85	373.46
	40+78.63	8" x 6" TEE	586,554.21	1,360,553.68	373.37
3	40+78.63	6" VALVE & ROADWAY BOX	586,553.05	1,360,553.57	373.37
	40+84.32	TEST STATION	586,539.46	1,360,558.04	-
	41+00.00	2.00° HD COUPLING (VERT.)	586,552.26	1,360,574.96	373.19

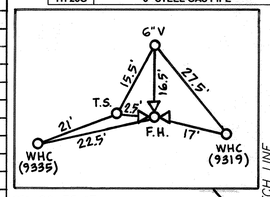
TEST PIT DATA

TEST PIT NUMBER	TYPE OF UTILITY	TOP DEPTH
TH 19G	2" WRAPPED STEEL GAS PIPE	3.08
TH 20G	2" WRAPPED STEEL GAS PIPE	2.57
TH 21W	8" DUCTILE IRON WATER PIPE	3.75
TH 22W	SEE TEST HOLE REPORT	DRY
TH 23T	(6) 4" PLASTIC TELEPHONE CONDUITS	4.96
TH 24G	12" DUCTILE IRON WATER PIPE	4.60
TH 25G	2" WRAPPED STEEL GAS PIPE	2.50
TH 26E	5" STEEL ELECTRIC CONDUIT	3.76
TH 27E	5" STEEL ELECTRIC CONDUIT	3.40
TH 28G	6" STEEL GAS PIPE	2.82

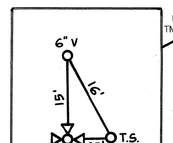
Manhole #	Invert			Rim Elevation
954	369.23			380.40 +/-
955	371.14			381.40 +/-
956	371.70			383.55 +/-
2021	370.08			381.21 +/-
2022	371.88			383.50 +/-
2023	374.16			385.30 +/-

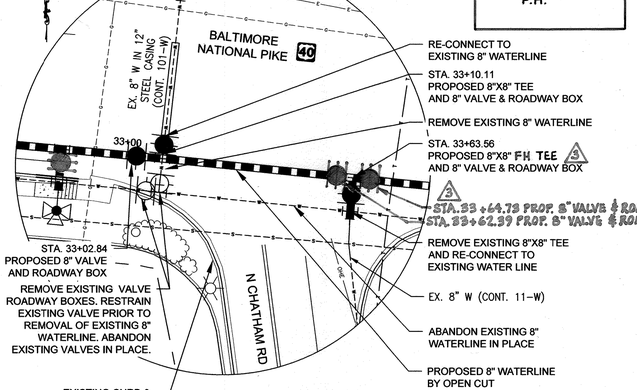
TRAVERSE COORDINATE SCHEDULE

POINT	NORTHING	EASTING	ELEVATION
53	586,520.50	1,360,511.69	377.37
102	586,534.34	1,360,327.28	379.99

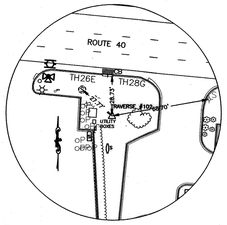


STA. 30+72.67
PROPOSED 8"x 6" FH TEE
PROP. 6" VALVE AND ROADWAY BOX
PROPOSED 6" WATERLINE (SOUTH)
REMOVE EXISTING 8"x 6" TEE
REMOVE EXIST. 6" VALVE AND REPLACE WITH A RESTRAINED COUPLING
RE-CONNECT TO EX. 6" WATERLINE WITH RESTRAINED COUPLING

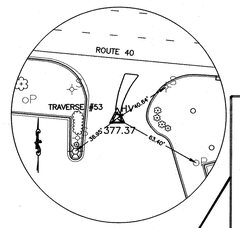




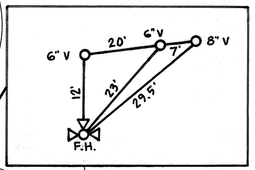
DETAIL - STATION 33+03 - 33+64
SCALE: 1" = 20'

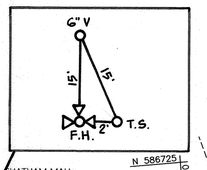


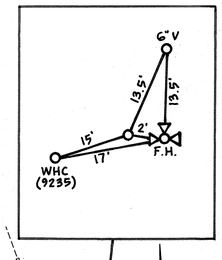
TRAV. #102



TRAV. #53







STA. 32+81.92
PROPOSED 8"x 6" FH TEE
PROP. 6" VALVE AND ROADWAY BOX
PROPOSED 6" WATERLINE (SOUTH)
REMOVE EXISTING 8"x 6" TEE
REMOVE EXIST. 6" VALVE AND REPLACE WITH A RESTRAINED COUPLING
RE-CONNECT TO EXIST. 6" WATERLINE (SOUTH) WITH RESTRAINED COUPLING

MATCH LINE STATION 30+50 (SEE SHEET 4)

N CHATHAM RD

DEED 3423/13
A-24 PARCEL 996

DEED 12519/161
TM-24 PARCEL 996

EX. 8" S (CONT. 130-S)

EX. 12" S (CONT. 32-S)

EX. 30" W (CONT. 772-W)

EX. 12" STEEL CASING PIPES

EX. 8" W (CONT. 101-W)

PROPOSED 8"X8" TEE AND VALVES (SEE DETAIL THIS SHEET)

LIMIT OF DISTURBANCE (TYP.)

BALTIMORE NATIONAL PIKE 40

STA. 33+62.39 PROP. 8" VALVE & ROADWAY BOX
STA. 33+64.73 PROP. 8" VALVE & ROADWAY BOX

PROPOSED 8" WATERLINE BY OPEN CUT

ABANDON EXISTING 8" WATERLINE IN PLACE

8"x6" TEE
6"V

CURB INLET PROTECTION (TYP.)

STA. 40+84.32
PROPOSED TEST STATION

TIE INTO EXISTING CURB

REBUILD PEDESTRIAN RAMP (MD STD. 655.11)

STA. 30+65.85
PROPOSED TEST STATION

TIE INTO EXISTING CURB

RECONNECT EXISTING WATER SERVICE. (TYP.) SEE THE WATER SERVICE TABLE ON SHEET 8 FOR ADDITIONAL INFORMATION REGARDING THE EXISTING WATER HOUSE CONNECTIONS.

PROP. 6" VALVE AND ROADWAY BOX

STA. 32+75.85
PROPOSED TEST STATION

STA. 35+03.54
PROPOSED 1/8 HORIZONTAL BEND

STA. 35+11.68
PROPOSED 1/8 HORIZONTAL BEND

STA. 35+59.87 PROPOSED TEST STATION

EX. CURB & GUTTER (TYP.)

STA. 35+93.90
PROPOSED 8" VALVE AND ROADWAY BOX

REMOVE EXISTING VALVE ROADWAY BOX AND ABANDON EXISTING VALVE IN PLACE

STA. 38+15.09
PROPOSED TEST STATION

DANIEL DEVLIN
9335 BALTIMORE NATIONAL PIKE
DEED 5886/586
TM-24 PARCEL 933

JASON PARKER
9315 BALTIMORE NATIONAL PIKE
DEED 11985/14
TM-24 PARCEL 933

MCDONALDS USA LLC
9309 BALTIMORE NATIONAL PIKE
DEED
TM-24 PARCEL 933

LIMITS MILL AND OVERLAY

REPLACE LEVEL LANDING AREA AND 12:1 RAMP AREA OF PEDESTRIAN RAMP

WEINMAN LEHMAN CORP.
9291 BALTIMORE NATIONAL PIKE
DEED 6421/670
TM-24 PARCEL 650

#9275

RSV ENTERPRISES LLC
DEED 4239/1
TM-24 PARCEL 626

#9267

RED STONE LLP
9251 BALTIMORE NATIONAL PIKE
DEED 3758/585
TM-24 PARCEL 96

CHEVY CHASE BANK, FSB
9245 BALTIMORE NATIONAL PIKE
DEED 5871/653
TM-24 PARCEL 1154

F&L ASSOC. LLP
9235 BALTIMORE NATIONAL PIKE
DEED 5953/76
TM-24 PARCEL 1154

CHATHAM MALL
BALTIMORE NATIONAL PIKE
DEED 628/474
TM-24 PARCEL 1075

N 586725
E 1360300
N 586475
E 1360500

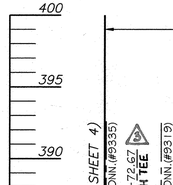
STA. 35+66+47
PROPOSED 8"X6" FH TEE
PROP. 6" VALVE AND ROADWAY BOX
PROPOSED 6" WATERLINE (SOUTH)
REMOVE EXISTING 8"x 6" TEE
REMOVE EXIST. 6" VALVE AND REPLACE WITH A RESTRAINED COUPLING
RE-CONNECT TO EXISTING 6" WATERLINE (SOUTH) WITH RESTRAINED COUPLING

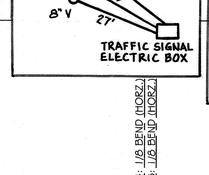
STA. 38+08.75
PROPOSED 8"x 6" FH TEE
PROP. 6" VALVE AND ROADWAY BOX
PROPOSED 6" WATERLINE (SOUTH)
REMOVE EXISTING 8"x 6" TEE
REMOVE EXIST. 6" VALVE AND REPLACE WITH A RESTRAINED COUPLING
RE-CONNECT TO EXISTING 6" WATERLINE (SOUTH) WITH RESTRAINED COUPLING

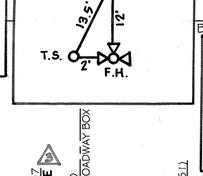
STA. 40+78.63
PROPOSED 8"x 6" FH TEE
PROP. 6" VALVE AND ROADWAY BOX
PROPOSED 6" WATERLINE (SOUTH)
REMOVE EXISTING 8"x 6" TEE
REMOVE EXIST. 6" VALVE AND REPLACE WITH A RESTRAINED COUPLING
RE-CONNECT TO EXISTING 6" WATERLINE (SOUTH) WITH RESTRAINED COUPLING

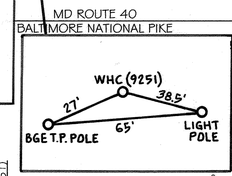
MATCH LINE STATION 41+00 (SEE SHEET 6)

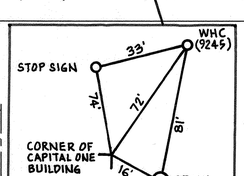
PLAN
SCALE: 1" = 50'

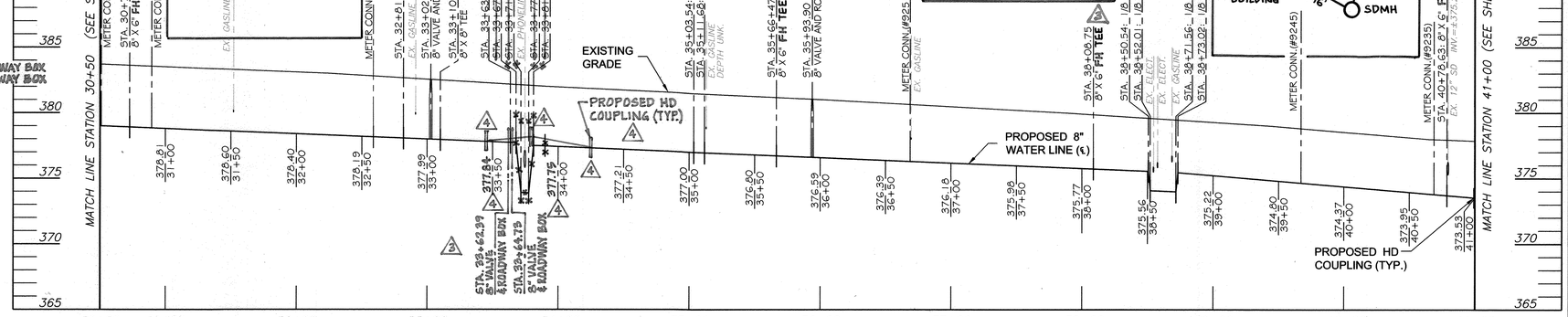












PROFILE
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 3/13/13
CHIEF, BUREAU OF ENGINEERING — DATE 3/13/13
CHIEF, BUREAU OF UTILITIES — DATE 3/13/13
CHIEF, UTILITY DESIGN DIVISION — DATE 3/12/13

URS
MONTGOMERY PARK BUSINESS CENTER
1800 WASHINGTON BOULEVARD, SUITE 410
BALTIMORE, MARYLAND 21230
(410) 468-0875

STATE OF MARYLAND — NATHAN C. ATKINSON — No. 28817 — PROFESSIONAL ENGINEER

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. 28817, Expiration Date: 08/01/13.

DESIGN: NCA
DRAWN: BJW
CHK: EMT
DATE: 3/7/13

NO.	REVISION	DATE	BY
3	ADD PROP. 6" AND 8" VALVES & ROADWAY BOXES	11/15/2013	URS
4	REVISE 8" WATERLINE VERTICAL ALIGNMENT	11/22/2013	URS

8" WATER MAIN
PLAN AND PROFILE
STATION 30+50 - 41+00

600' SCALE MAP NO. 24 | BLOCK NO. 12

U.S. 40 WATER SERVICE MAIN REPLACEMENT
CAPITAL PROJECT NO. W-8311
CONTRACT NO. 44-4731
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN

SHEET 5 OF 13

AS-BUILT 1/2015

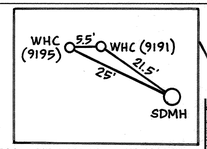
Manhole #	Invert			Rim Elevation
953	367.53	364.00		377.30 +/-
1171	365.50	364.50		377.60 +/-
1172	375.48			385.60 +/-
1173	383.30			393.50 +/-
2017	368.32 (W)	363.06	361.99 (S)	378.23 +/-
2018	365.17	364.17		377.43 +/-
2019	372.48			383.50 +/-
2020	385.76			397.13 +/-

WATER MAIN STAKE-OUT SCHEDULE

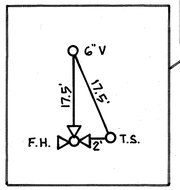
Station	Fitting	Northing	Easting	Invert
41+20.00	2.50" HD COUPLING (VERT.)	586,550.43	1,360,594.88	372.32
41+82.11	METER CONNECTION	586,544.75	1,360,656.73	372.34
41+88.10	METER CONNECTION	586,544.20	1,360,662.69	372.34
42+74.00	TEST STATION	586,520.72	1,360,746.80	-
42+80.00	8"x6" TEE	586,535.79	1,360,754.21	372.37
42+80.00	6" VALVE & ROADWAY BOX	586,531.18	1,360,753.78	372.37
42+80.00	FIRE HYDRANT (4'-6" BURY)	586,520.32	1,360,752.78	372.37
45+00.00	1.50" HD COUPLING (VERT.)	586,515.66	1,360,973.28	372.42
45+26.69	METER CONNECTION	586,513.22	1,360,999.86	373.10
46+14.78	8"x 6" TEE	586,505.16	1,361,087.58	375.32
3 46+14.78	6" VALVE & ROADWAY BOX	586,503.98	1,361,087.65	375.32
46+21.07	TEST STATION	586,488.16	1,361,092.34	-
46+51.68	1/8 BEND (HOR.)	586,501.78	1,361,124.33	376.26
46+63.41	1/8 BEND (HOR.)	586,492.77	1,361,131.83	376.55
46+69.41	0.50" HD COUPLING (VERT.)	586,492.22	1,361,137.80	376.71
46+97.28	METER CONNECTION	586,489.69	1,361,165.56	377.64
48+15.30	METER CONNECTION	586,478.98	1,361,283.09	381.59
49+44.00	TEST STATION	586,457.53	1,361,410.37	-
49+50.00	8"x6" TEE	586,466.76	1,361,417.23	386.10
49+50.00	6" VALVE & ROADWAY BOX	586,462.15	1,361,416.81	386.10
49+50.00	FIRE HYDRANT (6'-0" BURY)	586,457.12	1,361,416.36	386.10
49+78.61	METER CONNECTION	586,464.17	1,361,445.73	387.05
50+20.00	0.50" HD COUPLING (VERT.)	586,460.41	1,361,486.95	388.44
50+79.92	METER CONNECTION	586,454.97	1,361,546.62	391.07
51+16.88	1.33" HD COUPLING (VERT.)	586,451.62	1,361,583.43	392.69

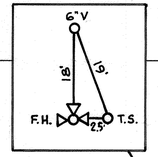
TEST PIT DATA

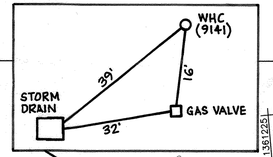
TEST PIT NUMBER	TYPE OF UTILITY	TOP DEPTH
TH 29G	(3) 1" ELECTRIC CABLES	3.28
TH 29G A	SEE TEST HOLE REPORT	DRY
TH 30G	8" DUCTILE IRON WATER PIPE	3.42
TH 31W	8" DUCTILE IRON WATER PIPE	4.34
TH 32G	1" WRAPPED STEEL GAS PIPE	2.66
TH 33G	1/2" PLASTIC GAS PIPE	3.78
TH 33G A	6" PLASTIC ELECTRIC CONDUIT	2.62

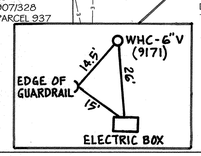


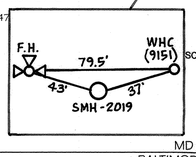
RECONNECT EXISTING WATER SERVICE. (TYP.) SEE THE WATER SERVICE TABLE ON SHEET 8 FOR ADDITIONAL INFORMATION REGARDING THE EXISTING WATER HOUSE CONNECTIONS.



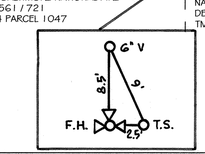


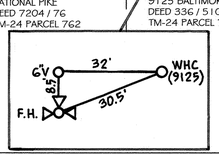


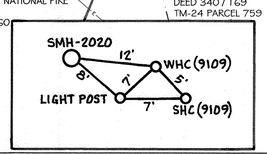


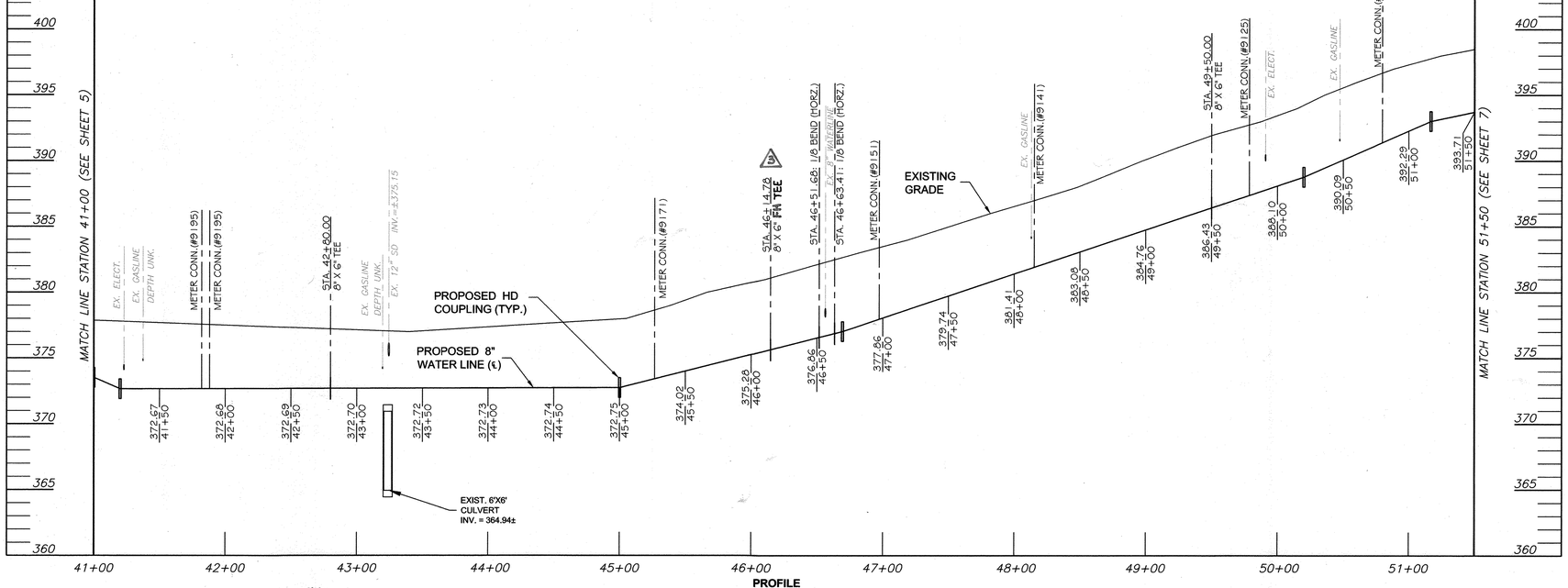


PLAN
SCALE: 1" = 50'









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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 3/13/13
CHIEF, BUREAU OF ENGINEERING — DATE 3/13/13
CHIEF, BUREAU OF UTILITIES — DATE 3/13/13
CHIEF, UTILITY DESIGN DIVISION — DATE 3/12/13

URS
MONTGOMERY PARK BUSINESS CENTER
1800 WASHINGTON BOULEVARD, SUITE 410
BALTIMORE, MARYLAND 21230
(410) 468-0875

STATE OF MARYLAND — NATHAN C. ATKINSON — 28817 — PROFESSIONAL ENGINEER

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. 28817, Expiration Date: 08/01/13.

DESIGN: NCA
DRAWN: BJW
CHK: EMT
DATE: 3/7/13

NO.	REVISION	DATE	BY
3	ADD PROF. 6" AND 8" VALVE AND ROADWAY BOX	11/15/2013	URS

8" WATER MAIN
PLAN AND PROFILE
STATION 41+00 - 51+50

600' SCALE MAP NO. 24 | BLOCK NO. 12

U.S. 40 WATER SERVICE MAIN REPLACEMENT
CAPITAL PROJECT NO. W-8311
CONTRACT NO. 44-4731
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN

SHEET 6 OF 13

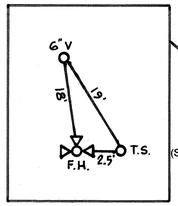
AS-BUILT 1/2015

WATER MAIN STAKE-OUT SCHEDULE

Station	Fitting	Northing	Easting	Invert
51+66.98	8"x6" TEE	586,447.07	1,361,633.32	393.73
51+67.06	6" VALVE AND ROADWAY BOX	586,441.34	1,361,632.88	393.73
51+74.47	TEST STATION	586,431.25	1,361,639.40	-
51+75.87	1/16 BEND (VERT.)	586,446.27	1,361,642.17	393.92
51+78.61	1/16 BEND (VERT.)	586,446.02	1,361,644.90	395.10
51+81.61	1/8 BEND (HOR.)	586,445.75	1,361,647.89	395.15
51+88.68	1/8 BEND (HOR.)	586,450.27	1,361,653.32	395.27
51+92.68	CONNECT TO EXISTING	586,449.91	1,361,657.30	395.39
52+12.85	CONNECT TO EXISTING	586,448.02	1,361,677.38	395.62
52+16.85	1/8 BEND (HOR.)	586,447.64	1,361,681.36	395.73
52+23.86	1/8 BEND (HOR.)	586,442.24	1,361,685.84	395.85
52+55.88	2.25° HD COUPLING (HOR.)	586,439.25	1,361,717.72	396.23
53+00.00	0.50° HD COUPLING (VERT.)	586,436.86	1,361,761.77	396.76
53+95.86	0.50° HD COUPLING (HOR.)	586,431.66	1,361,857.49	397.07
54+20.00	0.50° HD COUPLING (VERT.)	586,430.56	1,361,881.61	397.15
54+40.86	METER CONNECTION	586,429.61	1,361,902.45	397.04
54+54.29	TEST STATION	586,420.54	1,361,915.48	-
54+55.86	2.00° HD COUPLING (HOR.)	586,428.92	1,361,917.43	396.96
54+60.00	8"x6" TEE	586,428.88	1,361,921.57	396.94
54+60.00	6" VALVE AND ROADWAY BOX	586,424.25	1,361,921.52	396.94
54+60.00	FIRE HYDRANT (5'-0" BURY)	586,420.47	1,361,921.48	396.94
55+00.00	1.00° HD COUPLING (VERT.)	586,428.45	1,361,961.57	396.72
55+15.86	0.50° HD COUPLING (HOR.)	586,428.29	1,361,977.43	396.35
55+75.86	1.00° HD COUPLING (HOR.)	586,428.17	1,362,037.43	394.98
56+23.55	METER CONNECTION	586,428.91	1,362,085.11	393.89
56+35.86	1.00° HD COUPLING (HOR.)	586,429.10	1,362,097.42	393.61
56+40.00	2.00° HD COUPLING (VERT.)	586,429.24	1,362,101.56	393.51
56+62.37	METER CONNECTION	586,429.98	1,362,123.92	392.22
56+90.00	**2.25° HD COUPLING (VERT.)**	**586,430.89**	**1,362,151.53**	**390.62**
57+05.57	**8"x 6" TEE**	**586,431.40**	**1,362,167.09**	**390.33**
3 ~~57+05.57~~	~~6" VALVE & ROADWAY BOX~~	~~586,430.23~~	~~1,362,167.10~~	~~390.33~~
57+11.89	**TEST STATION**	**586,417.91**	**1,362,174.16**	**-**
57+40.00	**1.25° HD COUPLING (VERT.)**	**586,433.29**	**1,362,201.47**	**389.69**
57+57.97	METER CONNECTION	586,434.27	1,362,219.41	388.97
57+65.57	1.25° HD COUPLING (HOR.)	586,434.69	1,362,227.01	388.66
58+25.57	1.00° HD COUPLING (HOR.)	586,439.28	1,362,286.83	386.24
58+40.00	0.75° HD COUPLING (VERT.)	586,440.64	1,362,301.19	385.65
58+85.57	0.75° HD COUPLING (HOR.)	586,444.92	1,362,346.56	383.22
59+45.57	1.25° HD COUPLING (HOR.)	586,451.33	1,362,406.22	380.01
60+00.00	0.50° HD COUPLING (VERT.)	586,458.34	1,362,460.19	377.09
60+05.57	1.00° HD COUPLING (HOR.)	586,459.05	1,362,465.72	376.75
60+24+00	TEST STATION	586,450.69	1,362,485.58	-
60+30.00	8"x6" TEE	586,462.62	1,362,489.89	375.23
60+30.00	6" VALVE AND ROADWAY BOX	586,458.04	1,362,490.56	375.23
60+30.00	FIRE HYDRANT (5'-5" BURY)	586,451.57	1,362,491.52	375.23
60+41.23	1/8 BEND (HOR.)	586,464.25	1,362,501.00	374.53
60+46.74	1/8 BEND (HOR.)	586,468.68	1,362,504.28	374.18
60+50.69	CONNECT TO EXISTING	586,469.23	1,362,508.19	373.94

TEST PIT DATA

TEST PIT NUMBER	TYPE OF UTILITY	TOP DEPTH
TH 34E	4" STEEL ELECTRIC CONDUIT	2.70
TH 35T	(4) 4" PLASTIC TELEPHONE CONDUITS	5.04
TH 36G	6" WRAPPED STEEL GAS PIPE	4.68
TH 37W	8" DUCTILE IRON WATER PIPE	5.18
TH 38G	1" WRAPPED STEEL GAS PIPE	2.44
TH 38G A	4" PLASTIC ELECTRIC CONDUIT	1.74
TH 38G B	1" STEEL GAS PIPE	3.62
TH 39G	1" PLASTIC GAS PIPE	2.30
TH 40G	NO MISS UTILITY MARKS OR ELECTRONIC SIGNAL ON SECOND GAS LINE IN FIELD. PAINTED OVER FROM TH 39G AND FOUND NO UTILITY.	N/A
TH 41W	8" DUCTILE IRON WATER PIPE	3.96



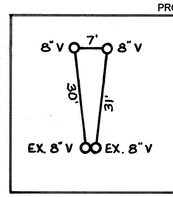
MATCH LINE STATION 51+50 (SEE SHEET 6)

RE-CONNECT TO EXISTING WATER LINE (SEE DETAIL THIS SHEET)

STA. 51+66.98
PROPOSED 8"X6" TEE
REMOVE EXISTING 6" VALVE AND ROADWAY BOX.
PROPOSED 6" WATERLINE (SOUTH)
PROPOSED 6" VALVE AND ROADWAY BOX.
RE-CONNECT TO EXISTING 6" WATERLINE.

STA. 51+74.47
PROPOSED TEST STATION

LIMITS OF MILL AND OVERLAY



INLAND AMERICAN 5T PORTFOLIO II LL
9080 BALTIMORE NATIONAL PIKE
TM-24 PARCEL 446

EMICON LLC
9050 BALTIMORE NATIONAL PIKE
DEED 7956 / 606
TM-24 PARCEL 36

UPTON PROPERTIES LLC
UPTON LN
DEED 13255 / 304
TM-24 PARCEL 1190

ST. JOHNS LANE

BALTIMORE NATIONAL PIKE 40

EX. 8" W (CONT. 14-1300-D)
EX. 12" S (CONT. 32-S)
EX. 24" W (CONT. 133-W)
EX. 8" W (CONT. 11-W)
EX. 8" S
EX. 15" W (CONT. 133-W)
EX. 12" S (CONT. 32-S)

MH 911
MH 910
MH 910A
MH 907

N 586600
N 586425
E 1362650
E 1362450

TIE INTO EX. CURB & GUTTER

2" Service Abandoned at main

54+00
55+00
56+00
57+00
58+00
59+00
60+00

STA. 54+60.00
PROPOSED 8"X6" TEE, 6" VALVE & ROADWAY BOX, AND FIRE HYDRANT ASSEMBLY

STA. 54+54.29
PROPOSED TEST STATION

SILT FENCE (TYP.)

LIMIT OF DISTURBANCE (TYP.)

POTOMAC ENERGY HOLDINGS LLC
9075/9091 BALTIMORE NATIONAL PIKE
DEED 11555 / 383
TM-24 PARCEL 112

PARTNERSHIP
IORE NATIONAL PIKE
DEED 1839 / 389
TM-24 PARCEL 853

STA. 57+05.57
PROPOSED 8"x6" FH TEE
PROP. 6" VALVE AND ROADWAY BOX
RE-CONNECT TO EXIST. 6" WATERLINE WITH RESTRAINED COUPLING

STA. 57+11.89
PROPOSED TEST STATION

STA. 60+41.23
PROPOSED 1/8 BEND

STA. 60+46.74
PROPOSED 1/8 BEND

8"x 6" TEE AND 6" VALVE ADDED

STA. 60+50.69
RE-CONNECT TO EXISTING 8"X8" TEE.
END PROPOSED 8" WATERLINE.

END LIMITS OF MILL AND OVERLAY

TIE INTO EX. CURB & GUTTER

STA. 60+30.00
PROPOSED 8"X6" TEE, 6" VALVE & ROADWAY BOX, AND FIRE HYDRANT ASSEMBLY

STA. 60+24.00
PROPOSED TEST STATION

EX. 6" SERVICE CONNECTED

ABANDON EXISTING 8" WATERLINE IN PLACE

PROPOSED 8" WATERLINE BY OPEN CUT

RECONNECT EXISTING WATER SERVICE (TYP.) SEE THE WATER SERVICE TABLE ON SHEET 8 FOR ADDITIONAL INFORMATION REGARDING THE EXISTING WATER HOUSE CONNECTIONS.

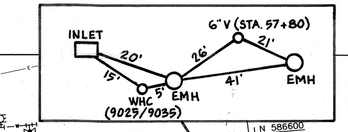
CURB INLET PROTECTION (TYP.)

EXISTING CURB & GUTTER (TYP.)

CHEVROLET DR

935 BALTIMORE NATIONAL PIKE LLC
925/9035 BALTIMORE NATIONAL PIKE
DEED 8461 / 286
M-24 PARCEL 1113

#9025



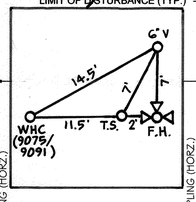
PLAN
SCALE: 1" = 50'

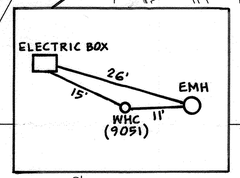
TRAVERSE COORDINATE SCHEDULE

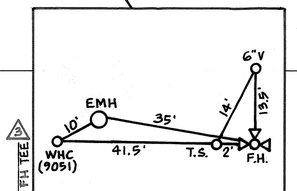
POINT	NORTHING	EASTING	ELEVATION
24CA	586,506.22	1,361,634.27	398.25
103	586,415.43	1,362,152.67	396.41

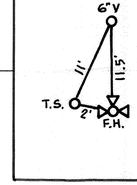
MD ROUTE 40
BALTIMORE NATIONAL PIKE

ST. JOHNS LANE









MATCH LINE STATION 51+50 (SEE SHEET 7)

EXISTING GRADE

PROPOSED 8" WATER LINE (℄)

PROPOSED HD COUPLING (VERT.)(TYP.)

STA. 51+66.98 8" X 6" TEE
EX. ELECT.
EX. PHONE DUCT BANK
EX. 8" WATER VALVE (TO REMAIN)
EX. 20" WATERLINE
EX. 8" WATER VALVE (TO REMAIN)
EX. GASLINE
HD COUPLING (HORZ.)

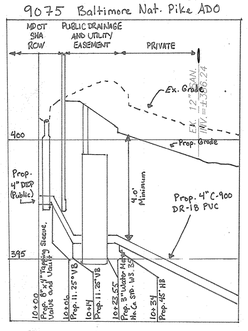
STA. 51+75.87: 1/16 BEND (VERT.)
STA. 51+78.61: 1/16 BEND (VERT.)
STA. 51+81.61: 1/8 BEND (HORZ.)
STA. 51+88.68: 1/8 BEND (HORZ.)
STA. 52+16.85: 1/8 BEND (HORZ.)
STA. 52+23.86: 1/8 BEND (HORZ.)

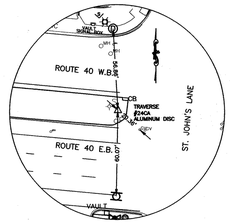
4" Connection (#9091)
METER CONN.(#9091)
STA. 54+60.00 8" X 6" TEE

EX. GASLINE
EX. ELECT.
METER CONN.(#9051)
STA. 57+05.57: 8" X 6" FH TEE
METER CONN.(#9035)
EX. GASLINE
EX. GASLINE DEPTH UNK.
EX. 18" SD INV=±384.01
STA. 54+60.00: 8" X 6" TEE
STA. 60+41.23: 1/8 BEND (HORZ.)
STA. 60+46.74: 1/8 BEND (HORZ.)
STA. 60+50.69: RE-CONNECT TO EXISTING WATER LINE

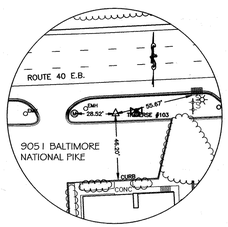
Manhole #	Invert			Rim Elevation
907	369.69	369.55		380.00 +/-
908	382.39			392.80 +/-
909	387.93	387.79	387.79	401.12 +/-
910	388.29	388.29		402.00 +/-
910A	388.71			388.71 +/-
911	390.40	389.93	389.70	400.89 +/-

9075 Baltimore Nat. Pike ADD



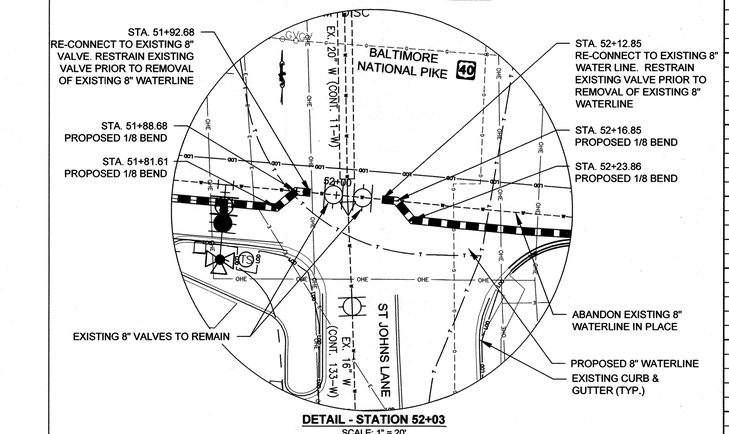


TRAV. #24CA



TRAV. #103

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



DETAIL - STATION 52+03
SCALE: 1" = 20'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 3/13/13
CHIEF, BUREAU OF ENGINEERING — DATE 3/13/13
CHIEF, BUREAU OF UTILITIES — DATE 3/13/13
CHIEF, UTILITY DESIGN DIVISION — DATE 3/12/13

URS
MONTGOMERY PARK BUSINESS CENTER
1800 WASHINGTON BOULEVARD, SUITE 410
BALTIMORE, MARYLAND 21230
(410) 468-0875

STATE OF MARYLAND — NATHAN C. ATKINSON — No. 28817 — PROFESSIONAL ENGINEER

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. 28817, Expiration Date: 08/01/13

DESIGN: NCA
DRAWN: BJW
CHK: EMT
DATE: 3/7/13

NO.	REVISION	DATE	BY
3	PROP. 6" VALVE AND ROADWAY BOX	11/15/2013	URS
4	AS-BUILTS	7/15/2024	WRA

8" WATER MAIN
PLAN AND PROFILE
STATION 51+50 - 60+51

600' SCALE MAP NO. 24 | BLOCK NO. 12

U.S. 40 WATER SERVICE MAIN REPLACEMENT
CAPITAL PROJECT NO. W-8311
CONTRACT NO. 44-4731
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN
SHEET 7 OF 13

AS-BUILT 1/2015

US ROUTE 40 WATER MAIN REPLACEMENT - WATER SERVICE TABLE

Address #	Road Name	WHC Size	As-Built WHC Size	Domestic Meter Size	As-Built WM Vault used based on Domestic Meter Size (if outside)	Fire Meter Size	Assumed Service length in public R/W	As-Built length in public R/W (lf)	Remarks	As-Built Remarks
9025	Baltimore National Pike	6" (shared)		1" (inside)			25		2 buildings on this parcel, it appears one 6" line from main may serve both buildings	
9035	Baltimore National Pike			5/8" (inside)						
				2" (inside)		6" (inside)				
9051	Baltimore National Pike	3/4"		5/8"			25		2 services to this parcel, mulitple bldgs	
		3/4"		5/8"			25			
9075	Baltimore National Pike	2"		2" (inside)			25			
9109	Baltimore National Pike	1"		3/4"			25			
9125	Baltimore National Pike	1"		3/4"			25			
9141	Baltimore National Pike	1 1/2"		1 1/2"			25			
9151	Baltimore National Pike	2"		2"			25		2 services to this parcel, 2 bldgs	
9171	Baltimore National Pike	6" (shared)		1 1/2" (inside)		6" (inside)	25			
9191	Baltimore National Pike	1 1/2"		1 1/2" (inside)			25		2 services to this parcel, 2 bldgs	
9195	Baltimore National Pike	1 1/2"		1 1/2" (inside)			25			
9235	Baltimore National Pike	1 1/2"		1" (inside)			25			
9245	Baltimore National Pike	1"		3/4" (inside)			25			
9251	Baltimore National Pike	1 1/2"		1 1/2" (outside)			25			
9267	Baltimore National Pike	2"		2" (inside)			25		possibly one tee, then split into 2 separate services on-site - curb stops not shown on plans	
9275	Baltimore National Pike	6" (shared)		1 1/2" (inside)		4" (inside)	25			
9291	Baltimore National Pike	n/a							**water served from Chatham Road WM**	
9309	Baltimore National Pike	1 1/2"		1 1/2" (outside)			25			
9319	Baltimore National Pike	1"		1" (outside)			25			
9335	Baltimore National Pike	3/4"		5/8" (inside)			25			
9337	Baltimore National Pike	3/4"		5/8" (inside)			25			
9339	Baltimore National Pike	2"		1 1/2" (inside)			25			
3410	Plumtree Drive	n/a							**water served from Plumtree Drive WM**	
9395	Baltimore National Pike	1"		3/4"			25			
9435	Baltimore National Pike	1"		3/4" (outside)			25			
9441	Baltimore National Pike	1 1/2"		1" (outside)			25			
9445	Baltimore National Pike	1"		3/4" (outside)			25			
9449	Baltimore National Pike	1"		3/4" (outside)			60		or 9461? (served thru R/W on 9455 parcel)	
9455	Baltimore National Pike	2"		2" (inside)			25			
9469	Baltimore National Pike	6"		2" (inside)		6" (inside)	25			

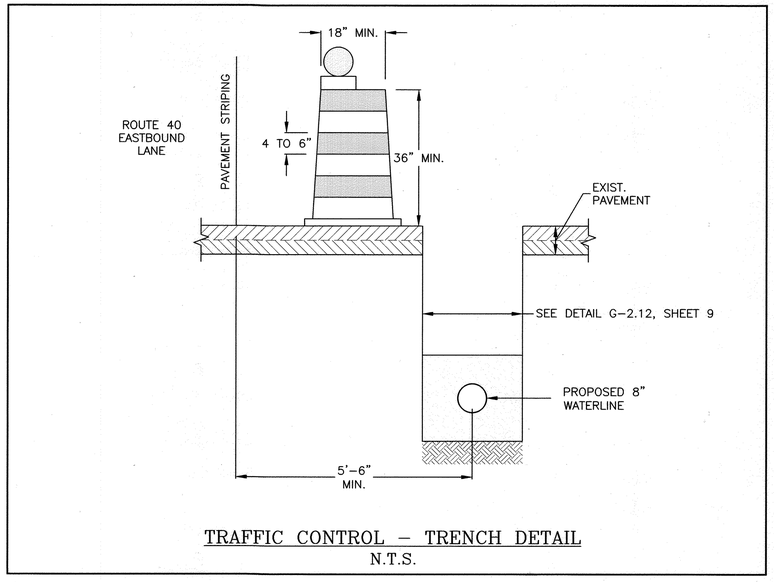
Notes:

1 Meter & WHC size information from meter cards obtained from Bureau of Utilities 2/25/2011.

2 If inside/outside meter not clarified, meter location unknown/ All meter locations must be field verified.

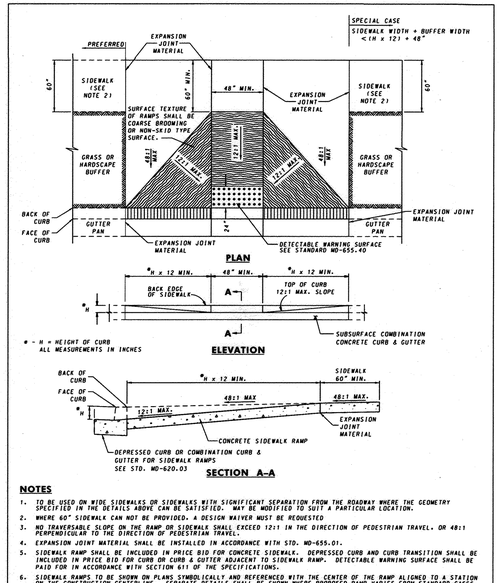
3 Outside Meter Note: Contractor shall reconnect all existing water services encountered to proposed 8" waterline. Provide new materials from water main to property owner side of water meter, including new piping, fittings, tapping saddle, corporation cock assembly, water meter vault, frame & cover, valves, meter setter assembly & couplings. Transfer existing water meter from existing meter vault to new meter vault. See Howard County Standard Details W3.27, W3.28, W3.29 & W3.34. Please note that only concrete meter vaults will be accepted (no polyethylene meter vaults).

4 Inside Meter Note: Contractor shall reconnect all existing water services encountered to proposed 8" waterline. Provide new materials from water main to property owner side of curb stop, including new piping, fittings, tapping saddle, corporation cock assembly, couplings, valves, and valve roadway box. See Howard County Standard Details W3.21.



TRAFFIC CONTROL – TRENCH DETAIL

N.T.S.



* - H = HEIGHT OF CURB
ALL MEASUREMENTS IN INCHES

NOTES

1. TO BE USED ON WIDE SIDEWALKS OR SIDEWALKS WITH SIGNIFICANT SEPARATION FROM THE ROADWAY WHERE THE GEOMETRY SPECIFIED IN THE DETAILS ABOVE CAN BE SATISFIED. MAY BE MODIFIED TO SUIT A PARTICULAR LOCATION.
2. WHERE 60" SIDEWALK CAN NOT BE PROVIDED, A DESIGN WAIVER MUST BE REQUESTED
3. NO TRAVERSABLE SLOPE ON THE RAMP OR SIDEWALK SHALL EXCEED 12:1 IN THE DIRECTION OF PEDESTRIAN TRAVEL, OR 48:1 PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.
4. EXPANSION JOINT MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH STD. MD-655.01.
5. SIDEWALK RAMP SHALL BE INCLUDED IN PRICE BID FOR CONCRETE SIDEWALK. DEPRESSED CURB AND CURB TRANSITION SHALL BE INCLUDED IN PRICE BID FOR CURB OR CURB & GUTTER ADJACENT TO SIDEWALK RAMP. DETECTABLE WARNING SURFACE SHALL BE PAID FOR IN ACCORDANCE WITH SECTION 611 OF THE SPECIFICATIONS.
6. SIDEWALK RAMPS TO BE SHOWN ON PLANS SYMBOLICALLY AND REFERENCED WITH THE CENTER OF THE RAMP ALIGNED TO A STATION ON THE CONSTRUCTION CENTERLINE. SEPARATE DETAILS SHALL BE SHOWN WHERE PROPOSED RAMP VARIES FROM STANDARD CASES.

SPECIFICATION	CATEGORY CODE ITEMS
603 & 611	

APPROVED Kat G. McCall
DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT

REVISIONS	APPROVAL + SHA	APPROVAL + FEDERAL HIGHWAY ADMINISTRATION
APPROVAL	3-10-04	3-31-04
REVISED	3-25-08	4-5-06
REVISED		
REVISED		

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

SIDEWALK RAMPS PERPENDICULAR

STANDARD NO. MD 655.11

SEQUENCE OF CONSTRUCTION

1. ENGINEER TO COORDINATE PRE-CONSTRUCTION MEETING.
2. PROVIDE VIDEO TAPE TO ENGINEER DOCUMENTING EXISTING CONDITIONS.
3. OBTAIN ALL REQUIRED PERMITS AND APPROVALS FROM APPROPRIATE AGENCIES. OBTAIN GRADING PERMIT PRIOR TO STARTING CONSTRUCTION.
4. NOTIFY HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION - SEDIMENT CONTROL (410)313-1855 SEVEN DAYS PRIOR TO STARTING CONSTRUCTION.
5. NOTIFY MDE INSPECTION AND COMPLIANCE (410) 537-3510 7 DAYS PRIOR TO STARTING CONSTRUCTION.
6. CONSTRUCT WATER SYSTEM IMPROVEMENTS FROM STATION 0+00 - 14+95.
   - 6.1. INSTALL TRAFFIC CONTROLS.
   - 6.2. INSTALL SEDIMENT CONTROLS.
   - 6.3. PROVIDE TEMPORARY WATER SERVICE CONNECTIONS IF SERVICES ENCOUNTERED.
   - 6.4. INSTALL NEW THRUST COLLARS ON EXISTING WATER MAIN AS REQUIRED.
   - 6.5. ISOLATE EXISTING WATERLINE AND REMOVE FROM SERVICE. CONTACT HOWARD COUNTY BUREAU OF UTILITIES (410) 313-4900 TO COORDINATE CLOSING OF VALVE UPSTREAM OF CONNECTION POINT. CONTRACTOR MUST COORDINATE CLOSING OF VALVE A MINIMUM OF 72 HOURS IN ADVANCE.
   - 6.6. REMOVE AND REPLACE EXISTING WATERLINE IN-KIND. INSTALL PROPOSED WATER MAIN AND WATER HOUSE CONNECTIONS. CONTRACTOR TO COORDINATE WATER METER LOCATION WITH HOME OWNER. LOCATION OF WATER METER AND WATER HOUSE CONNECTION IS SUBJECT TO APPROVAL BY THE COUNTY.
   - 6.7. PERFORM HYDROSTATIC PRESSURE AND LEAK TEST ON INSTALLED WATER MAIN AS PER THE LATEST EDITION OF THE HOWARD COUNTY VOLUME IV DESIGN MANUAL.
   - 6.8. DISINFECT AND BACTERIA TEST THE INSTALLED WATER MAIN. SEE HOWARD COUNTY VOLUME IV DESIGN MANUAL SECTIONS 1007 AND 1008.
   - 6.9. FLUSH NEW WATER MAIN IN PREPARATION FOR CONNECTION.
   - 6.10. CONNECT TO EXISTING WATER SYSTEM AND PLACE NEW WATERLINE INTO SERVICE.
   - 6.11. CHECK CONNECTIONS FOR LEAKS.
   - 6.12. RECONNECT EXISTING WATER SERVICES.
   - 6.13. RESTORE AREA TO ORIGINAL CONDITIONS AND REMOVE SEDIMENT & TRAFFIC CONTROLS, UPON APPROVAL FROM THE COUNTY.
7. CONSTRUCT WATER SYSTEM IMPROVEMENTS FROM STATION 14+95 - 33+15.
   - 7.1. INSTALL TRAFFIC CONTROLS.
   - 7.2. INSTALL SEDIMENT CONTROLS.
   - 7.3. INSTALL PROPOSED WATER MAIN AND WATER HOUSE CONNECTIONS. CONTRACTOR TO COORDINATE WATER METER LOCATION WITH HOME OWNER. LOCATION OF WATER METER AND WATER HOUSE CONNECTION IS SUBJECT TO APPROVAL BY THE COUNTY.
   - 7.4. PERFORM HYDROSTATIC PRESSURE AND LEAK TEST ON INSTALLED WATER MAIN AS PER THE LATEST EDITION OF THE HOWARD COUNTY VOLUME IV DESIGN MANUAL.
   - 7.5. DISINFECT AND BACTERIA TEST THE INSTALLED WATER MAIN. SEE HOWARD COUNTY VOLUME IV DESIGN MANUAL SECTIONS 1007 AND 1008.
   - 7.6. FLUSH NEW WATER MAIN IN PREPARATION FOR CONNECTION.
   - 7.7. INSTALL NEW THRUST COLLARS ON EXISTING WATER MAIN AS REQUIRED.
   - 7.8. CONNECT TO EXISTING WATER SYSTEM AND PLACE NEW WATERLINE INTO SERVICE.
   - 7.9. CHECK CONNECTIONS FOR LEAKS.
   - 7.10. RECONNECT EXISTING WATER SERVICES.
   - 7.11. ISOLATE EXISTING WATERLINE AND REMOVE FROM SERVICE.CONTACT HOWARD COUNTY BUREAU OF UTILITIES (410) 313-4900 TO COORDINATE CLOSING OF VALVE UPSTREAM OF CONNECTION POINT. CONTRACTOR MUST COORDINATE CLOSING OF VALVE A MINIMUM OF 72 HOURS IN ADVANCE
   - 7.12. ABANDON EXISTING WATERLINE IN PLACE.
   - 7.13. RESTORE AREA TO ORIGINAL CONDITIONS AND REMOVE SEDIMENT & TRAFFIC CONTROLS, UPON APPROVAL FROM THE COUNTY.
8. CONSTRUCT WATER SYSTEM IMPROVEMENTS FROM STATION 33+15 - 46+57.
   - 8.1. INSTALL TRAFFIC CONTROLS.
   - 8.2. INSTALL SEDIMENT CONTROLS.
   - 8.3. INSTALL PROPOSED WATER MAIN AND WATER HOUSE CONNECTIONS. CONTRACTOR TO COORDINATE WATER METER LOCATION WITH HOME OWNER. LOCATION OF WATER METER AND WATER HOUSE CONNECTION IS SUBJECT TO APPROVAL BY THE COUNTY.
   - 8.4. PERFORM HYDROSTATIC PRESSURE AND LEAK TEST ON INSTALLED WATER MAIN AS PER THE LATEST EDITION OF THE HOWARD COUNTY VOLUME IV DESIGN MANUAL.
   - 8.5. DISINFECT AND BACTERIA TEST THE INSTALLED WATER MAIN. SEE HOWARD COUNTY VOLUME IV DESIGN MANUAL SECTIONS 1007 AND 1008.
   - 8.6. FLUSH NEW WATER MAIN IN PREPARATION FOR CONNECTION.
   - 8.7. INSTALL NEW THRUST COLLARS ON EXISTING WATER MAIN AS REQUIRED.
   - 8.8. CONNECT TO EXISTING WATER SYSTEM AND PLACE NEW WATERLINE INTO SERVICE.
   - 8.9. CHECK CONNECTIONS FOR LEAKS.
   - 8.10. RECONNECT EXISTING WATER SERVICES.
   - 8.11. ISOLATE EXISTING WATERLINE AND REMOVE FROM SERVICE.CONTACT HOWARD COUNTY BUREAU OF UTILITIES (410) 313-4900 TO COORDINATE CLOSING OF VALVE UPSTREAM OF CONNECTION POINT. CONTRACTOR MUST COORDINATE CLOSING OF VALVE A MINIMUM OF 72 HOURS IN ADVANCE
   - 8.12. ABANDON EXISTING WATERLINE IN PLACE.
   - 8.13. RESTORE AREA TO ORIGINAL CONDITIONS AND REMOVE SEDIMENT & TRAFFIC CONTROLS, UPON APPROVAL FROM THE COUNTY.
9. CONSTRUCT WATER SYSTEM IMPROVEMENTS FROM STATION 46+57 - 51+97.
   - 9.1. INSTALL TRAFFIC CONTROLS.
   - 9.2. INSTALL SEDIMENT CONTROLS.
   - 9.3. INSTALL PROPOSED WATER MAIN AND WATER HOUSE CONNECTIONS. CONTRACTOR TO COORDINATE WATER METER LOCATION WITH HOME OWNER. LOCATION OF WATER METER AND WATER HOUSE CONNECTION IS SUBJECT TO APPROVAL BY THE COUNTY.
   - 9.4. TEMPORARILY RELOCATE EXISTING SERVICES ENCOUNTERED AND RECONNECT TO EXISTING WATERLINE.
   - 9.5. PERFORM HYDROSTATIC PRESSURE AND LEAK TEST ON INSTALLED WATER MAIN AS PER THE LATEST EDITION OF THE HOWARD COUNTY VOLUME IV DESIGN MANUAL.
   - 9.6. DISINFECT AND BACTERIA TEST THE INSTALLED WATER MAIN. SEE HOWARD COUNTY VOLUME IV DESIGN MANUAL SECTIONS 1007 AND 1008.
   - 9.7. FLUSH NEW WATER MAIN IN PREPARATION FOR CONNECTION.
   - 9.8. INSTALL NEW THRUST COLLARS ON EXISTING WATER MAIN AS REQUIRED.
   - 9.9. CONNECT TO EXISTING WATER SYSTEM AND PLACE NEW WATERLINE INTO SERVICE.
   - 9.10. CHECK CONNECTIONS FOR LEAKS.
   - 9.11. RECONNECT EXISTING WATER SERVICES.
   - 9.12. ISOLATE EXISTING WATERLINE AND REMOVE FROM SERVICE.CONTACT HOWARD COUNTY BUREAU OF UTILITIES (410) 313-4900 TO COORDINATE CLOSING OF VALVE UPSTREAM OF CONNECTION POINT. CONTRACTOR MUST COORDINATE CLOSING OF VALVE A MINIMUM OF 72 HOURS IN ADVANCE
   - 9.13. ABANDON EXISTING WATERLINE IN PLACE.
   - 9.14. RESTORE AREA TO ORIGINAL CONDITIONS AND REMOVE SEDIMENT & TRAFFIC CONTROLS, UPON APPROVAL FROM THE COUNTY.
10. CONSTRUCT WATER SYSTEM IMPROVEMENTS FROM STATION 51+97 - 60+51.
    - 10.1. INSTALL TRAFFIC CONTROLS.
    - 10.2. INSTALL SEDIMENT CONTROLS.
    - 10.3. INSTALL PROPOSED WATER MAIN AND WATER HOUSE CONNECTIONS. CONTRACTOR TO COORDINATE WATER METER LOCATION WITH HOME OWNER. LOCATION OF WATER METER AND WATER HOUSE CONNECTION IS SUBJECT TO APPROVAL BY THE COUNTY.
    - 10.4. TEMPORARILY RELOCATE EXISTING SERVICES ENCOUNTERED AND RECONNECT TO EXISTING WATERLINE.
    - 10.5. PERFORM HYDROSTATIC PRESSURE AND LEAK TEST ON INSTALLED WATER MAIN AS PER THE LATEST EDITION OF THE HOWARD COUNTY VOLUME IV DESIGN MANUAL.
    - 10.6. DISINFECT AND BACTERIA TEST THE INSTALLED WATER MAIN. SEE HOWARD COUNTY VOLUME IV DESIGN MANUAL SECTIONS 1007 AND 1008.
    - 10.7. FLUSH NEW WATER MAIN IN PREPARATION FOR CONNECTION.
    - 10.8. INSTALL NEW THRUST COLLARS ON EXISTING WATER MAIN AS REQUIRED.
    - 10.9. CONNECT TO EXISTING WATER SYSTEM AND PLACE NEW WATERLINE INTO SERVICE.
    - 10.10. CHECK CONNECTIONS FOR LEAKS.
    - 10.11. RECONNECT EXISTING WATER SERVICES.
    - 10.12. ISOLATE EXISTING WATERLINE AND REMOVE FROM SERVICE.CONTACT HOWARD COUNTY BUREAU OF UTILITIES (410) 313-4900 TO COORDINATE CLOSING OF VALVE UPSTREAM OF CONNECTION POINT. CONTRACTOR MUST COORDINATE CLOSING OF VALVE A MINIMUM OF 72 HOURS IN ADVANCE
    - 10.13. ABANDON EXISTING WATERLINE IN PLACE.
    - 10.14. RESTORE AREA TO ORIGINAL CONDITIONS AND REMOVE SEDIMENT & TRAFFIC CONTROLS, UPON APPROVAL FROM THE COUNTY.
11. MILL AND OVERLAY ASPHALT AND INSTALL PERMANENT PAVEMENT MARKINGS.
12. FINAL CLEANUP AND RESTORATION.
13. PROVIDE AS-BUILT RECORDS TO ENGINEER.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 3/13/13
CHIEF, BUREAU OF ENGINEERING — DATE 3/13/13
CHIEF, BUREAU OF UTILITIES — DATE 3/12/13
CHIEF, UTILITY DESIGN DIVISION — DATE 3/12/13

URS
MONTGOMERY PARK BUSINESS CENTER
1800 WASHINGTON BOULEVARD, SUITE 410
BALTIMORE, MARYLAND 21230
(410) 468-0875

STATE OF MARYLAND — NATHAN C. ATKINSON — PROFESSIONAL ENGINEER

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. 28817, Expiration Date: 08/01/13

DESIGN: NCA
DRAWN: BJW
CHK: EMT
DATE: 3/7/13

NO.	REVISION	DATE	BY

MISCELLANEOUS DETAILS AND SEQUENCE OF CONSTRUCTION

600' SCALE MAP NO. 24 | BLOCK NO. 12

U.S. 40 WATER SERVICE MAIN REPLACEMENT
CAPITAL PROJECT NO. W-8311
CONTRACT NO. 44-4731
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

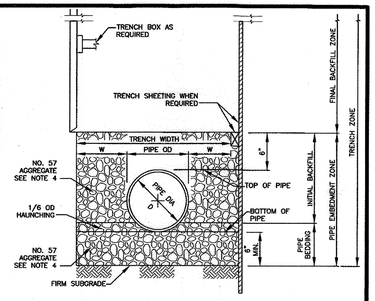
SCALE: AS SHOWN

SHEET 8 OF 13

AS-BUILT 1/2015

PLASTIC		
PIPE DIA "D"	"W"	TRENCH WIDTH
4	12	28
6	11	28
8	10	28
10	9	28
12	8	28

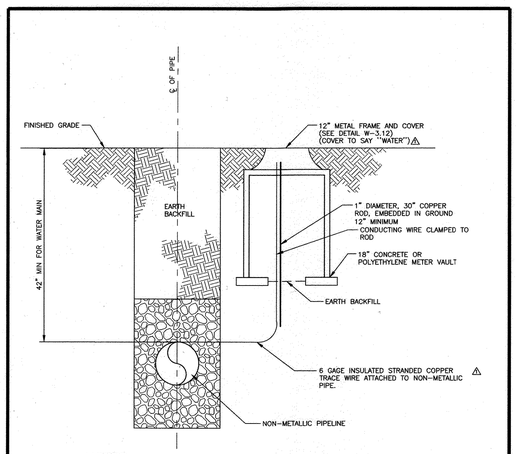
ALL DIMENSIONS IN INCHES



NOTES:

1. THE "W" DIMENSION SHALL BE USED TO CALCULATE MAXIMUM TRENCH PAY WIDTH.
2. FOR TRENCHES WHERE TRENCH BOX OR TRENCH SHEETING IS NOT REQUIRED, MEASUREMENT FOR CONTINGENT BORROW MATERIALS WILL BE BASED ON THE TRENCH WIDTH SHOWN.
3. FOR TRENCHES WHERE TRENCH BOX OR TRENCH SHEETING IS REQUIRED, MEASUREMENT FOR CONTINGENT BORROW MATERIALS WILL BE BASED ON THE TRENCH WIDTH SHOWN PLUS 24 INCHES.
4. FOR COPPER, PVC AND HDPE PIPE, 3 INCHES OR SMALLER:
   PIPE EMBEDMENT ZONE MATERIAL IS FINE AGGREGATE (SAND)
   "W" DIMENSION IS 6 INCHES MINIMUM AND BEDDING THICKNESS UNDER PIPE IS 4" MINIMUM.
   FOR TRENCHES IN ROCK, MINIMUM BEDDING THICKNESS IS 6 INCHES.
5. SPECIAL DESIGN IS REQUIRED AND SHALL BE SPECIFIED OR DETAILED IN THE CONTRACT DOCUMENTS FOR THE FOLLOWING PIPES:
   PVC AWWA C-905 LARGER THAN 12 INCHES
   PVC GRAVITY SANITARY SEWERS LARGER THAN 12 INCHES
   HDPE CORREGATED DRAIN PIPE
   STREAM CROSSINGS SEE DETAILS S-3.11 AND S-3.12

Revised / Revised / Approved	Howard County, Maryland Department of Public Works — Approved: Chief, Bureau of Engineering	Pipe Trench Plastic & Copper	Detail G-2.12



NOTES:

⚠ 1. TEST STATIONS SHALL BE USED FOR ALL NON-METALLIC PIPE EXCEPT GRAVITY SEWER MAINS UNLESS REQUIRED BY THE DPW.

⚠ 2. FOR SPLICING BETWEEN TEST STATIONS, SEE NOTE 4 ON DETAIL W-1.15.

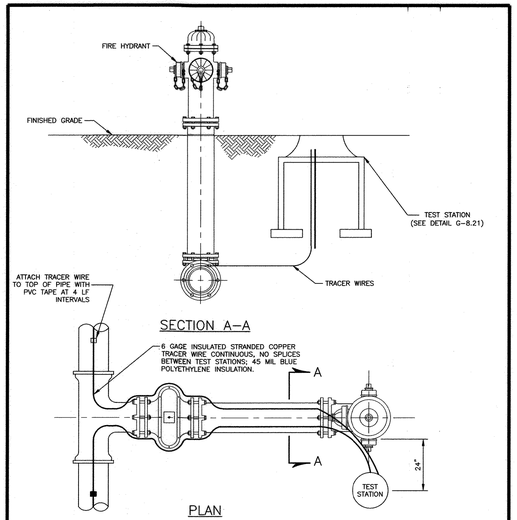
⚠ 3. TEST STATION SPACING SHALL BE A MAXIMUM OF 400 FEET, OR IMMEDIATELY ADJACENT TO FIRE HYDRANTS, WHICHEVER IS LESS. FOR RECLAIMED WATER OR PRESSURE SEWER, TEST STATION SPACING SHALL BE A MAXIMUM OF 400 FEET, AND PLACED ADJACENT TO EXISTING AT-GRADE STRUCTURES SUCH AS VALVES OR MANHOLES WHERE POSSIBLE.

4. TEST STATION SHALL BE INSTALLED IN NON-TRAFFIC BEARING AREAS. DO NOT INSTALL IN ROADWAY.

5. SEE DETAIL G-2.11 & G-2.12 FOR TRENCH BEDDING INFORMATION.

⚠ 6. REFER TO APPLICABLE SPECIFICATION SECTIONS 905,1002,1011,1017, AND 1018 FOR ADDITIONAL REQUIREMENTS.

Revised / ⚠ 6/30/2011 Revised / 5/7/2007 Approved	Howard County, Maryland Department of Public Works — Approved: Chief, Bureau of Engineering	Continuity Test Station	Detail G-8.21



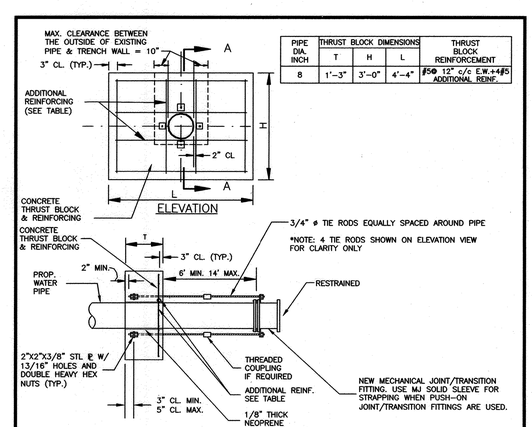
PLAN

NOTES:

1. TEST STATION MUST BE PLACED TO THE RIGHT OR LEFT SIDE OF THE FIRE HYDRANT.
2. VALVE VAULT FRAME AND COVER TO BE SET FLUSH WITH FINAL GRADE.
3. BUTTRESSES AND STRAPPING NOT SHOWN FOR CLARITY.

⚠ 4. NO SPLICES BETWEEN TEST STATIONS, UNLESS APPROVED BY HOWARD COUNTY. LATERAL SPLICES APPROVED BY THE COUNTY SHALL CONSIST OF A BRASS COMPRESSION NUT, WATERPROOF BINDER, AND UNDERGROUND ELECTRICAL TAPE. EXTENSION SPLICES SHALL BE MADE USING A CRIMP CONNECTOR AND SHRINK TUBING.

Revised / ⚠ 6/30/2011 Revised / 5/7/2007 Approved	Howard County, Maryland Department of Public Works — Approved: Chief, Bureau of Engineering	FIRE HYDRANT Continuity Test Station	Detail W-1.15

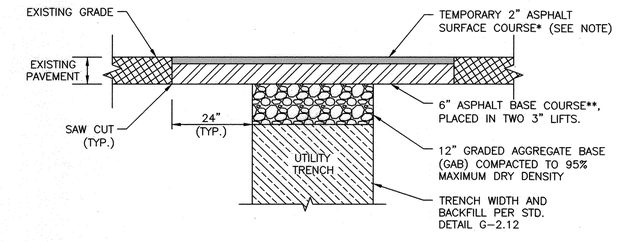


PIPE DIA. INCH	THRUST BLOCK DIMENSIONS T	H	L	THRUST BLOCK REINFORCEMENT
8	1'-3"	3'-0"	4'-4"	#5@ 12" c/c E.W.+4#5 ADDITIONAL REINF.

NOTES:

1. ALL CONCRETE SHALL BE f'c=4000 PSI @ 28 DAYS. PIPELINE SHALL NOT BE PRESSURIZED UNTIL CONCRETE STRENGTH REACHES 4000 PSI AND TRENCH HAS BEEN BACKFILLED.
2. ALL REBARS SHALL BE ASTM A615 GRADE 60.
3. STEEL PLATES SHALL BE ASTM A36.
4. MAINTAIN 2" CLEAR BETWEEN ALL REBARS AND PIPE.
5. COAT ALL EXPOSED STEEL WITH FIELD APPLIED COATING.
6. BOLT CIRCLE FOR 3/4" TIE RODS @ THRUST COLLAR EQUAL BOLT CIRCLE @ TIE BOLTS.
7. TIE RODS SHALL BE PARALLEL TO AXIS OF PIPE.
8. TIE COUPLING, IF NECESSARY, SHALL BE STAR NATIONAL PRODUCTS SUPER STAR TIE COUPLING NO. SS10.
9. DEPTH OF FINISHED GRADE TO TOP OF PIPE ASSUMED TO EQUAL 4'-0". IF SHALLOWER, SPECIAL BLOCK DESIGN IS REQUIRED.
10. ELEVATION OF GROUNDWATER TABLE ASSUMED TO BE BELOW BOTTOM OF BLOCK. IF GROUNDWATER IS ABOVE BOTTOM OF BLOCK, SPECIAL BLOCK DESIGN IS REQUIRED.
11. SOFT OR ORGANIC SOIL CONDITIONS REQUIRE SPECIAL BLOCK DESIGN.
12. REPLACE ALL DISTURBED SOIL BETWEEN NEW FITTING AND CONCRETE COLLAR WITH CRUSHED STONE COMPACTED AS STRUCTURAL FILL.
13. ALL COLLAR DIMENSION ARE BASED ON A STATIC WATER PRESSURE OF 150 PSI AND A MINIMUM SOIL BEARING PRESSURE OF 3,000 PSF. WHERE ACTUAL FIELD CONDITIONS ARE DIFFERENT, THE AREA OF BEARING SHALL BE INCREASED AS DETERMINED BY THE ENGINEER.

THRUST RESTRAINT COLLAR DETAIL

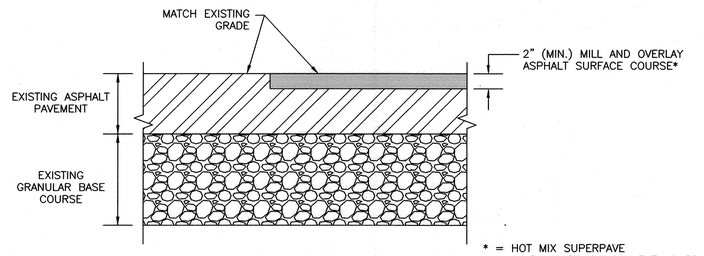


* = HOT MIX SUPERPAVE SURFACE COURSE
9.5 MM PG 64-22 LEVEL 2 OR
12.5 MM PG 76-22 LEVEL 2

** = HOT MIX SUPERPAVE BASE COURSE
19.0 MM PG 64-22 LEVEL 2

NOTE: CONTRACTOR SHALL REPAIR TRENCH AND PAVEMENT TO MATCH EXISTING ROAD GRADE. FOLLOWING COMPLETION OF WATER SYSTEM IMPROVEMENTS, CONTRACTOR SHALL MILL AND OVERLAY EXISTING ROADWAY TO LIMITS INDICATED ON THE DRAWINGS, INCLUDING TRENCH PAVEMENT REPAIR AREAS. NO SEPARATE PAVEMENT WILL BE MADE FOR TEMPORARY 2" SURFACE COURSE.

TRENCH PAVEMENT REPAIR DETAIL
NOT TO SCALE



* = HOT MIX SUPERPAVE
9.5 MM PG 64-22 LEVEL 2 OR
12.5 MM PG 76-22 LEVEL 2

MILL AND OVERLAY DETAIL
NOT TO SCALE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 3/13/13
CHIEF, BUREAU OF ENGINEERING — DATE 3/13/13
CHIEF, BUREAU OF UTILITIES — DATE 3/13/13
CHIEF, UTILITY DESIGN DIVISION — DATE 3/12/13

URS
MONTGOMERY PARK BUSINESS CENTER
1800 WASHINGTON BOULEVARD, SUITE 410
BALTIMORE, MARYLAND 21230
(410) 468-0875

STATE OF MARYLAND — NATHANIEL C. ATKINSON — No. 28817 — PROFESSIONAL ENGINEER

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. 28817, Expiration Date: 08/01/13.

DESIGN: NCA
DRAWN: BJW
CHK: EMT
DATE: 3/7/13

NO.	REVISION	DATE	BY

MISCELLANEOUS DETAILS

600' SCALE MAP NO. 24 — BLOCK NO. 12

U.S. 40 WATER SERVICE MAIN REPLACEMENT
CAPITAL PROJECT NO. W-8311
CONTRACT NO. 44-4731
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

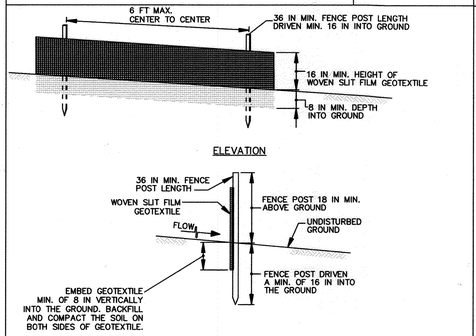
SCALE: AS SHOWN

SHEET 9 OF 13

AS-BUILT 1/2015

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF



1 OF 2

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF

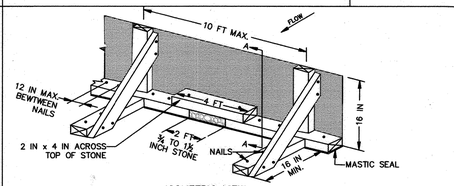
CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± ⅛ INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

2 OF 2

DETAIL E-2 SILT FENCE ON PAVEMENT

STANDARD SYMBOL: SFOP



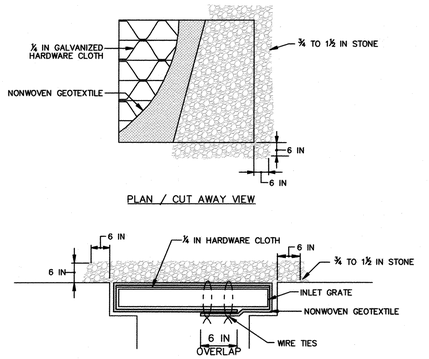
CONSTRUCTION SPECIFICATIONS

1. USE NOMINAL 2 INCH X 4 INCH LUMBER.
2. USE WOVEN SLIT FILM GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
3. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
4. SPACE UPRIGHT SUPPORTS NO MORE THAN 10 FEET APART.
5. PROVIDE A TWO FOOT OPENING BETWEEN EVERY SET OF SUPPORTS AND PLACE STONE IN THE OPENING OVER GEOTEXTILE.
6. KEEP SILT FENCE TAUT AND SECURELY STAPLE TO THE UPSLOPE SIDE OF UPRIGHT SUPPORTS. EXTEND GEOTEXTILE UNDER 2x4.
7. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, FOLD, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL. ATTACH LATHE.
8. PROVIDE A MASTIC SEAL BETWEEN PAVEMENT, GEOTEXTILE, AND 2x4 TO PREVENT SEDIMENT-LADEN WATER FROM ESCAPING BENEATH SILT FENCE INSTALLATION.
9. SECURE BOARDS TO PAVEMENT WITH 40D 5 INCH MINIMUM LENGTH NAILS.
10. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. MAINTAIN WATER TIGHT SEAL ALONG BOTTOM. REPLACE STONE IF DISPLACED.

DETAIL E-9-2 AT-GRADE INLET PROTECTION

STANDARD SYMBOL: AGIP

MAXIMUM DRAINAGE AREA = 1 ACRE



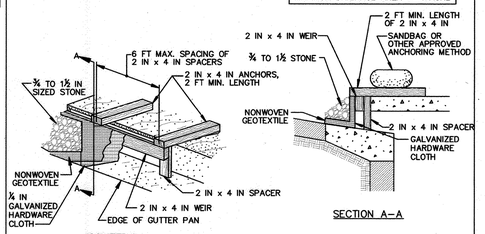
CONSTRUCTION SPECIFICATIONS

1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
2. LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
3. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
4. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

DETAIL E-9-3 CURB INLET PROTECTION

STANDARD SYMBOL: CIP

MAXIMUM DRAINAGE AREA = ¼ ACRE



CONSTRUCTION SPECIFICATIONS

1. USE NOMINAL 2 INCH x 4 INCH LUMBER
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
3. NAIL THE 2x4 WEIR TO 9 INCH LONG VERTICAL SPACERS (MAXIMUM 6 FEET APART).
4. ATTACH A CONTINUOUS PIECE OF ¼ INCH GALVANIZED HARDWARE CLOTH, WITH A MINIMUM WIDTH OF 30 INCHES AND A MINIMUM LENGTH OF 4 FEET LONGER THAN THE THROAT OPENING, TO THE 2x4 WEIR, EXTENDING 1' 2 FEET BEYOND THROAT ON EACH SIDE.
5. PLACE A CONTINUOUS PIECE OF NONWOVEN GEOTEXTILE OF THE SAME DIMENSIONS AS THE HARDWARE CLOTH OVER THE HARDWARE CLOTH AND SECURELY ATTACH TO THE 2x4 WEIR.
6. PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL TO 2x4 ANCHORS (MINIMUM 2 FEET LENGTH). EXTEND THE ANCHORS ACROSS THE INLET TOP AND HOLD IN PLACE BY SANDBAGS OR OTHER APPROVED ANCHORING METHOD.
7. INSTALL END SPACERS A MINIMUM OF 1 FOOT BEYOND THE ENDS OF THE THROAT OPENING.
8. FORM THE HARDWARE CLOTH AND THE GEOTEXTILE TO THE CONCRETE GUTTER AND FACE OF CURB TO SPAN THE INLET OPENING. COVER THE HARDWARE CLOTH AND GEOTEXTILE WITH CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE.
9. AT NON-SUMP LOCATIONS, INSTALL A TEMPORARY SANDBAG OR ASPHALT BERM TO PREVENT INLET BYPASS.
10. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL		
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

PERMANENT SEEDING NOTES

1. Apply to graded or cleared areas not subject to immediate further disturbance where a permanent long-lived vegetative cover is needed.
2. Seedbed Preparation: Loosen upper three inches of soil by raking, disking or other acceptab le means before seeding, if not previously loosened.
3. Soil Amendments : In lieu of soil test recommendations, use one of the following schedules :
4. Preferred -- Apply 2 tons/acre dolomitic limestone (92 lbs/1000 sq. ft.) and 600 lbs/acre 10-10-10 fertilizer (14 lbs/1000 sq. ft.) before seeding. Harrow or disk into upper three inches of soil. At time of seeding, apply 400 lbs/acre 30-0-0 ureaform fertilizer (9 lbs/1000 sq. ft.)
5. Acceptable -- Apply 2 tons/acre dolomitic limestone (92 lbs/1000 sq. ft.) and 1000 lbs/acre 10-10-10 fertilizer (23 lbs/1000 sq. ft.) before seeding. Harrow or disk into upper three inches of soil.
6. Seeding:
   A. For the periods March 1 -- April 30, and August 1 -- October 15, seed with 60 lbs/acre (1.4 lbs/1000 sq. ft.) of Kentucky 31 Tall fescue.
   B. For the period May 1 -- July 31, seed with 60 lbs Kentucky 31 Tall Fescue per acre and 2 lbs/acre (. 05 lbs/100() sq. ft.) of weeping lovegrass.
   C. During the period of October 16 -- February 28, protect site by:
   Option 1 -- Two tons per acre of well anchored straw mulch and seed as soon as possible in the spring.
   Option 2 -- Use sod.
   Option 3 -- Seer: with 60 lbs/acre Kentucky 30 Tall Fescue and mulch with 2 tons/acre well anchored straw.
7. Mulching -- Apply 1-1/2 to 2 tons per acre (70 to 90 lbs/1000 sq. ft.) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gallons per acre (5 gal/1000 sq. ft.) of emulsified asphalt on flat areas. On slope 8 feet or higher, use 348 gallons per acre (8 gal/1000 sq. ft.) for anchoring.
8. Maintenance -- Inspect all seeding areas and make needed repairs, replacements and reseedings.

TEMPORARY SEEDING NOTES

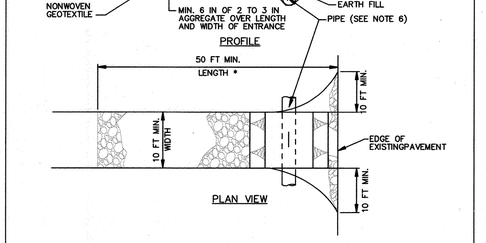
1. Apply to graded or cleared areas likely to be re-disturbed where a short-term vegetative cover is needed.
2. Seedbed preparation: -- Loosen upper three inches of soil by raking, disking or other acceptable means before seeding, if not previously loosened.
3. Soil Amendments : -- Apply 600 lbs/acre 10-10-10 fertilizer (14 lbs/1000 sq. ft.).
4. Seeding: -- For periods March 1 -- April 30 and from August 15 -- October 15, seed with 2-1/2 bushel per acre of annual rye (3. 2 lbs/1000 sq. ft.). For the period May 1 -- August 14, seed with 3 lbs/acre of weeping lovegrass (.07 lbs/1000 sq. ft.). For the period November 16 -- February 28, protect site by applying 2 tons/acre of well anchored straw mulch and seed as soon as possible in the spring, or use sod.
5. Mulching: -- App ly 1-1/2 to 2 tons/acre (70 to 90 lbs/1000 sq. ft.) of unrotted weed-free, small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gal. per acre (5 gal/1000 sq. ft.) of emulsified asphalt on flat areas. On slope 8 ft. or higher, use 348 gal. per acre (8gal/1000 sq. ft.) for anchoring.
6. Refer to the 2011 MD STANDARD AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for additional rates and methods not covered.

STANDARD SEDIMENT CONTROL NOTES

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (410) 313-1855.
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. STOCKPILING OF THE EXCAVATED MATERIAL IS TO BE PLACED ON THE UPHILL SIDE OF THE TRENCH.
5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC. 51), SOD (SEC. 54), TEMPORARY SEEDING (SEC. 50) AND MULCHING (SEC. 52). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
6. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
7. SITE ANALYSIS / RESTORATION SCHEDULE:
   A. TOTAL AREA OF SITE 2.3 ACRES
   B. AREA DISTURBED 2.3 ACRES
   C. AREA TO BE ROOFED OR PAVED 1.9 ACRES
   D. AREA TO BE VEGETATIVELY STABILIZED 0.4 ACRES
   E. TOTAL CUT N/A CU. YDS.
   F. TOTAL FILL N/A CU. YDS.
   G. OFF-SITE WASTE/BORROW AREA LOCATION: TO BE DETERMINED BY CONTRACTOR
8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
9. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
11. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORK DAY, WHICHEVER IS SHORTER.
12. CONTRACTOR SHALL PROVIDE A STABILIZED CONSTRUCTION ENTRANCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL		
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 3/13/13
CHIEF, BUREAU OF ENGINEERING — DATE 3/13/13
CHIEF, BUREAU OF UTILITIES — DATE 3/12/13
CHIEF, UTILITY DESIGN DIVISION — DATE 3/12/13

URS
MONTGOMERY PARK BUSINESS CENTER
1800 WASHINGTON BOULEVARD, SUITE 410
BALTIMORE, MARYLAND 21230
(410) 468-0875

STATE OF MARYLAND — NATHAN CHRISTOPHER ATKINSON — No. 28817 — PROFESSIONAL ENGINEER

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. 28817, Expiration Date: 08/01/13

NATHAN C. ATKINSON

DESIGN: NCA
DRAWN: BJW
CHK: EMT
DATE: 3/7/13

NO.	REVISION	DATE	BY

EROSION & SEDIMENT CONTROL DETAILS

600' SCALE MAP NO. 24 | BLOCK NO. 12

U.S. 40 WATER SERVICE MAIN REPLACEMENT
CAPITAL PROJECT NO. W-8311
CONTRACT NO. 44-4731
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN

SHEET 10 OF 13

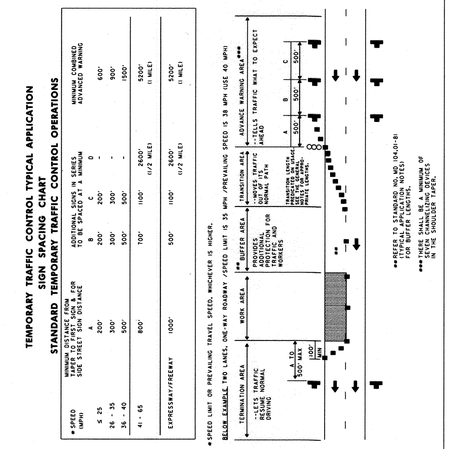
AS-BUILT 1/2015

TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION
SIGN SPACING CHART
STANDARD TEMPORARY TRAFFIC CONTROL OPERATIONS

* SPEED MPH	MINIMUM DISTANCE FROM START OF 1ST SIGN FOR SIGN SERIES, A, FOR GUIDANCE	ADDITIONAL SIGNS IN SERIES SPACED AT A MINIMUM OF:	MINIMUM COMBINED ADVANCE WARNING
	A	B	C
≤ 25	200'	200'	600'
26 - 35	350'	350'	900'
36 - 40	500'	500'	1500'
41 - 65	800'	700'	1100' 2600' (1/2 MILE)
EXPRESSWAY/FREEWAY	1000'	500'	1100' 2600' (1/2 MILE)

* SPEED LIMIT OR PREVAILING TRAVEL SPEED, WHICHEVER IS HIGHER.

BELOW EXAMPLE: TWO LANES, ONE-WAY ROADWAY /SPEED LIMIT IS 55 MPH /PREVAILING SPEED IS 30 MPH (USE 40 MPH)



SPECIFICATION	CATEGORY CODE ITEMS
APPROVED	DIRECTOR – OFFICE OF TRAFFIC AND SAFETY

REVISIONS	APPROVAL + SHA	APPROVAL + FEDERAL HIGHWAY ADMINISTRATION
APPROVAL	6-30-03	9-23-03
REVISED	8-11-10	7-29-10
REVISED		
REVISED		

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

SIGN SPACING CHART

STANDARD NO. MD 104.01-02

TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION
PLACEMENT OF REGULATORY SPEED SIGNS
PROJECT EQUAL TO OR LESS THAN 2 MONTHS IN DURATION

NOTE:
THE PLACEMENT OF THE REGULATORY SPEED SIGNS VARIES AS DIRECTED BY THE ENGINEER.

KEY:
- CHANNELIZING DEVICES
- SIGN SUPPORT
- FACE OF SIGN
- DIRECTION OF TRAFFIC
- WORK SITE
- ARROW PANEL

NOTE:
A MEMORANDUM OF ACTION (MOA) FOR TEMPORARY SPEED LIMIT REDUCTIONS IN WORK ZONES MUST BE IN EFFECT OR REGULATORY SIGNS ERECTED WITHIN THE WORK ZONE ARE NOT ENFORCEABLE. IN ORDER TO OBTAIN AN MOA FOR A TEMPORARY SPEED LIMIT REDUCTION WITHIN A WORK ZONE, THE FOLLOWING MUST BE COMPLETED:

- A TRAFFIC ENGINEERING STUDY THAT ANALYZES TRAFFIC CONDITIONS DURING CONSTRUCTION.
- A DETERMINATION OF THE CONDITIONS THAT NECESSITATE THE REDUCED SPEED LIMIT.
- A RECOMMENDATION OF THE APPROPRIATE SPEED LIMIT, BASED ON TRAFFIC CONDITIONS.
- A STATEMENT OF THE EXTENT OF THE WORK ZONE WHERE THE TEMPORARY SPEED LIMIT REDUCTION IS TO BE ENFORCED.

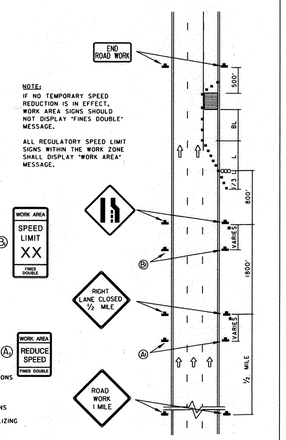
THE MOA FOR TEMPORARY SPEED LIMIT REDUCTIONS IS CONSIDERED "IN EFFECT" UPON APPROVAL OF THE DISTRICT ENGINEER.

- MAINTAIN MINIMUM 300' SPACING BETWEEN SIGNS

THERE SHALL BE A MINIMUM OF SEVEN CHANNELIZING DEVICES IN THE SHOULDER TAPER.

NOTE:
IF NO TEMPORARY SPEED REDUCTION IS IN EFFECT, WORK AREA SIGNS SHOULD NOT DISPLAY "FINES DOUBLE" MESSAGE.

ALL REGULATORY SPEED LIMIT SIGNS WITHIN THE WORK ZONE SHALL DISPLAY "WORK AREA" MESSAGE.



SPECIFICATION	CATEGORY CODE ITEMS
APPROVED	DIRECTOR – OFFICE OF TRAFFIC AND SAFETY

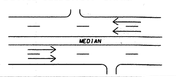
REVISIONS	APPROVAL + SHA	APPROVAL + FEDERAL HIGHWAY ADMINISTRATION
APPROVAL	6-30-03	9-23-03
REVISED	8-11-10	10-5-10
REVISED		
REVISED		

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

REGULATORY SPEED SIGNS

STANDARD NO. MD 104.01-06

TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION
TEMPORARY TRAFFIC CONTROL DEVICE SELECTION CHART



DIVIDED UNCONTROLLED

LOCATION OF WORK	SPEED	DURATION	FLAGGER	VEHICLES LOTS	SIGNS	ARROW PANEL	CHAN. DEVICES	PORTABLE VMS	NEXT-MILES	SIGN LOCATIONS: 2 MILES	1 MILE	½ MILE	1000 FT	500 FT	AHEAD **	BOTH SIDES	PROTECTION VEH
ON ROAD	> 40 MPH	> 12 HRS/DARK			X	X	X			X	X	X		X		X	****
		≤ 15 MIN-12 HRS/DAY			X	X	X				X	X		X		X	****
		< 15 MIN/LOC		X		X										X	
		MOVING SLOW *		X		X										X	
		MOVING NORMAL		X													
	≤ 40 MPH	> 12 HRS/DARK			X	X	X				X	X	X	X		X	
		≤ 15 MIN-12 HRS/DAY			X	X					X	X	X	X		X	
		< 15 MIN/LOC		X		X										X	
		MOVING SLOW *		X		X										X	
		MOVING NORMAL		X													
ADJ TO ROAD ***	> 40 MPH	> 12 HRS/DARK				X					X	X	X				
		≤ 15 MIN-12 HRS/DAY				X						X					
		< 15 MIN/LOC	X														
	≤ 40 MPH	> 12 HRS/DARK				X					X	X	X				
		≤ 15 MIN-12 HRS/DAY				X						X					
		< 15 MIN/LOC	X														

KEY : X -REQUIRED; / -OPTIONAL

- TRAVELING BELOW THE POSTED SPEED (BY MORE THAN 15 MPH)
- ** FOR MOVING OPERATIONS THE APPROPRIATE ADVANCE WARNING SIGNS MAY BE VEHICLE MOUNTED.
- *** WITHIN 15' OF THE EDGE LINE OR WITHIN 2' BEHIND THE FACE OF CURB
- **** PV IS REQUIRED ON FREEWAYS, EXPRESSWAYS, AND ROADWAYS WITH POSTED SPEEDS GREATER THAN OR EQUAL TO 55 MPH DURING THE INSTALLATION OF TEMPORARY TRAFFIC CONTROL DEVICES.

SPECIFICATION	CATEGORY CODE ITEMS
APPROVED	DIRECTOR – OFFICE OF TRAFFIC AND SAFETY

REVISIONS	APPROVAL + SHA	APPROVAL + FEDERAL HIGHWAY ADMINISTRATION
APPROVAL	6-30-03	9-23-03
REVISED	3-15-06	
REVISED	8-11-10	7-29-10
REVISED		

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

TEMPORARY TRAFFIC CONTROL DEVICE SELECTION CHART

STANDARD NO. MD 104.01-10

TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION

IMPORTANT:
THIS DRAWING SHALL BE USED IN COMBINATION WITH THE GENERAL NOTES MD 104.00-01 - MD 104.00-18 AND STANDARD DETAILS MD 104.01-01 - MD 104.01-81

NOTES:
DRUMS SHALL BE USED IN THE MERGING TAPER.

DRUMS, 36" CONES OR TALL WEIGHTED CONES * SHALL BE USED ADJACENT TO THE WORK AREA.

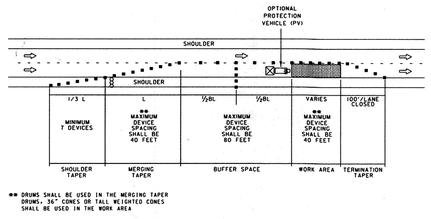
PROTECTION VEHICLE, WITH FLASHING LIGHTS, SHOULD BE USED TO PROTECT THE WORK AREA, AS SHOWN IN THE FIGURE, WHILE ALLOWING FOR THE ROLL AHEAD DISTANCE ANTICIPATED WITH IMPACTS.

REFER TO GENERAL NOTE 7-8 FOR GUIDANCE ON USING CHANNELIZING DEVICES TO DELINEATE THE EDGE OF THE ROADWAY.

* TALL WEIGHTED CONES - CONES 42" TALL WITH A NARROW, WEIGHTED BASE. SEE STANDARD SPECIFICATION 104.14.

THIS TYPICAL APPLICATION DOES NOT APPLY TO PAVING OPERATIONS, BUT CAN BE USED AT THE DISCRETION OF THE ENGINEER.

KEY:
- CHANNELIZING DEVICES
- SIGN SUPPORT
- FACE OF SIGN
- DIRECTION OF TRAFFIC
- WORK SITE
- ARROW PANEL
- TRUCK OR TRAILER-TRUCK MOUNTED ATTENUATOR
- APPROVED VEHICLE SAFETY LIGHT



** DRUMS SHALL BE USED IN THE MERGING TAPER DRUMS, 36" CONES OR TALL WEIGHTED CONES SHALL BE USED IN THE WORK AREA

SPECIFICATION	CATEGORY CODE ITEMS
APPROVED	DIRECTOR – OFFICE OF TRAFFIC AND SAFETY

REVISIONS	APPROVAL + SHA	APPROVAL + FEDERAL HIGHWAY ADMINISTRATION
APPROVAL	7-1-09	7-27-09
REVISED	8-11-10	7-29-10
REVISED		
REVISED		

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

CHANNELIZATION DEVICE SPACING GREATER THAN 40 MPH

STANDARD NO. MD 104.01-30 C

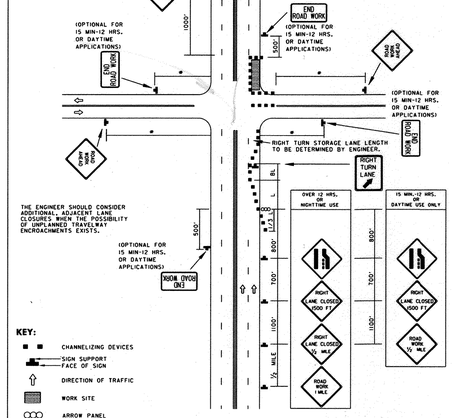
TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION

NOTES:
THE ARROW PANEL SHALL BE PLACED AS CLOSE TO THE BEGINNING OF THE TAPER AS POSSIBLE WHILE REMAINING WITHIN THE TAPER WHEN CURB EXIST.

* SEE SIGN SPACING CHART (MD 104.01-02) FOR APPROPRIATE DISTANCE.

THERE SHALL BE A MINIMUM OF SEVEN CHANNELIZING DEVICES IN THE SHOULDER TAPER.

IMPORTANT:
THIS DRAWING SHALL BE USED IN COMBINATION WITH THE GENERAL NOTES MD 104.00-01 - MD 104.00-18 AND STANDARD DETAILS MD 104.01-01 - MD 104.01-81



KEY:
- CHANNELIZING DEVICES
- SIGN SUPPORT
- FACE OF SIGN
- DIRECTION OF TRAFFIC
- WORK SITE
- ARROW PANEL

SPECIFICATION	CATEGORY CODE ITEMS
104	
APPROVED	DIRECTOR – OFFICE OF TRAFFIC AND SAFETY

REVISIONS	APPROVAL + SHA	APPROVAL + FEDERAL HIGHWAY ADMINISTRATION
APPROVAL	8-30-03	9-23-03
REVISED	8-11-10	10-5-10
REVISED		
REVISED		

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

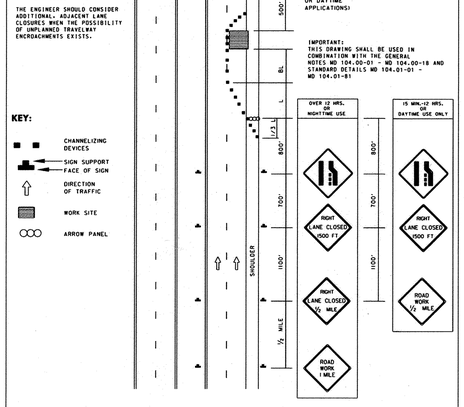
INTER. FAR-RIGHT LANE CLOSURE/ MULTILANE UNDIV. GREATER THAN 40 MPH

STANDARD NO. MD 104.03-11

TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION

NOTE:
THERE SHALL BE A MINIMUM OF SEVEN CHANNELIZING DEVICES IN THE SHOULDER TAPER.

THE ENGINEER SHOULD CONSIDER ADDITIONAL ADJACENT LANE CLOSURES WHEN THE POSSIBILITY OF UNPLANNED TRAVELWAY ENCROACHMENTS EXISTS.



KEY:
- CHANNELIZING DEVICES
- SIGN SUPPORT
- FACE OF SIGN
- DIRECTION OF TRAFFIC
- WORK SITE
- ARROW PANEL

SPECIFICATION	CATEGORY CODE ITEMS
104	
APPROVED	DIRECTOR – OFFICE OF TRAFFIC AND SAFETY

REVISIONS	APPROVAL + SHA	APPROVAL + FEDERAL HIGHWAY ADMINISTRATION
APPROVAL	8-30-03	9-23-03
REVISED	8-11-10	7-29-10
REVISED		
REVISED		

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

RIGHT LANE CLOSURE/DIVIDED UNCON. GREATER THAN 40 MPH

STANDARD NO. MD 104.04-05

TEMPORARY TRAFFIC CONTROL GENERAL NOTES

1. AT THE COMPLETION OF THE WORK ACTIVITY, CONDITIONS WITHIN THE PROJECT SITE SHALL BE FULLY RESTORED TO THOSE WHICH EXISTED PRIOR TO THE WORK ACTIVITY.

2. ALL WARNING SIGNS SHALL BE FULLY REFLECTORIZED WITH HIGH INTENSITY, REFLECTIVE SHEETING AS PER THE CURRENT EDITION AND REVISIONS OF THE FEDERAL HIGHWAY MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (M.U.T.C.D.).

3. ALL TRAFFIC CONTROLS MUST BE IN ACCORDANCE WITH THE CURRENT EDITION AND REVISIONS OF THE MARYLAND MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES (MdMUTCD).

4. AT THE DIRECTION OF THE ENGINEER, THE SPACING OF TEMPORARY SIGNING MAY BE ADJUSTED SLIGHTLY TO IMPROVE VISIBILITY OF THE SIGN.

5. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL LOCAL BUSINESSES AND BUILDINGS DURING CONSTRUCTION AND COORDINATE WITH LOCAL BUSINESSES ABOUT THE RESTRICTIONS ON INGRESS AND EGRESS TRAFFIC CONTROL.

6. THE CONTRACTOR IS RESPONSIBLE FOR THE REPLACEMENT OF ANY PAVEMENT MARKINGS REMOVED OR DESTROYED DURING CONSTRUCTION. ALL PAVEMENT MARKINGS REMOVED OR DESTROYED DURING CONSTRUCTION WILL BE REPLACED WITH EITHER LATEX PAINT OR THERMOPLASTIC TO MATCH EXISTING MARKINGS.

7. PROPERLY EQUIPPED FLAGGERS SHALL BE USED TO DIRECT TRAFFIC FOR A LANE CLOSURE OF A TWO-LANE STREET AND WHEN CONSTRUCTION VEHICLES ARE ENTERING AND EXITING THE WORK AREA OR AT OTHER LOCATIONS. FLAGGERS' CLOTHING AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITION OF THE M.U.T.C.D.

8. MUD AND CONSTRUCTION DEBRIS ON STREETS OR SIDEWALKS SHALL BE CLEANED OFF IMMEDIATELY.

9. TRAFFIC CONTROL DEVICES WHEN NOT IN USE SHALL BE COMPLETELY COVERED OR REMOVED FROM THE CONSTRUCTION SITE.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TRAFFIC CONTROL DEVICES ON AN AROUND THE CLOCK BASIS, WHETHER OR NOT WORK IS ACTIVELY BEING PURSUED AND ANY DEFICIENCIES NOTED SHALL BE CORRECTED IMMEDIATELY.

11. THE TRAFFIC CONTROL REQUIREMENTS SHOWN ON THESE PLANS ARE MINIMUM REQUIREMENTS ONLY AND DO NOT ATTEMPT TO ADDRESS IN DEPTH THE VARIETY OF SITUATIONS THAT MAY OCCUR ONCE CONSTRUCTION HAS STARTED. IN NO WAY DO THE REQUIREMENTS SHOWN ON THESE PLANS RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY FOR SELECTING THE PROPER TRAFFIC CONTROL DEVICES AND IMPLEMENTATION PROCEDURES THAT WILL ASSURE THE SAFETY OF MOTORIST, PEDESTRIANS, AND WORKERS AT ALL TIMES.

12. SHOULD THE CONTRACTOR FAIL TO ENFORCE THE TRAFFIC CONTROL PLAN OR FAIL TO CLEAN, REPAIR, REPLACE OR OTHERWISE MAINTAIN THE TRAFFIC CONTROL DEVICES WHEN DIRECTED TO DO SO BY THE ENGINEER OR HIS REPRESENTATIVE, HOWARD COUNTY MAY STOP THE WORK UNTIL DEFICIENCIES ARE CORRECTED.

13. ANY PERMANENT SIGN CONFLICTING WITH THIS TRAFFIC CONTROL PLAN SHALL BE COVERED OR REMOVED AS DIRECTED BY THE ENGINEER.

14. ACCESS SHALL BE MAINTAINED TO ALL DRIVES AND SIDE STREETS.

15. CONSTRUCTION VEHICLES SHALL BE PARKED ALONG STREETS SO AS NOT TO RESTRICT SIGHT DISTANCE FOR VEHICLES EXITING AT STREETS OR ANY DRIVES.

16. DURING ALL CONSTRUCTION PERIODS, THE CONTRACTOR SHALL HAVE AT THE JOBSITE ALL NECESSARY TRAFFIC CONTROL DEVICES (APPROPRIATE SIGNS, LIGHTED ARROW DISPLAY, CHANNELIZING DEVICES, ETC.) TO PROPERLY CLOSE AT LEAST ONE LANE OF TRAFFIC.

17. CONSTRUCTION SHALL BE SEQUENCED TO PROVIDE THE LEAST POSSIBLE ADVERSE EFFECT TO RESIDENCES.

18. THE CONTRACTOR IS RESPONSIBLE FOR AVOIDING ANY AND ALL UTILITIES WHEN SETTING SIGN POSTS AND WILL BE REQUIRED TO COORDINATE HIS ACTIVITIES WITH ANY AND ALL UTILITY COMPANIES WHETHER THEIR FACILITY IS INDICATED ON THE PLANS OR NOT.

19. TRENCH MUST BE BACKFILLED AND TEMPORARILY PATCHED DAILY OR STEEL PLATED PER SHA UTILITY PERMIT. STEEL PLATES, IF USED SHALL BE A36 CERTIFIED STEEL AT LEAST 1" THICK WITH LIFT HOOKS AND MUST BE PINNED AND COLD PATCHED DAILY. WHEN MORE THAN 1 STEEL PLATE IS USED AT A TIME THEY MUST BE TACK WELDED BY A CERTIFIED WELDER.

20. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING TEMPORARY PAVEMENT MARKINGS FOR ANY DOUBLE YELLOW OR EDGE LINES REMOVED OR DESTROYED DURING CONSTRUCTION.

21. THE CONTRACTOR SHALL COORDINATE ANY DISRUPTION OF TRAFFIC SIGNALS, SENSORS AND WIRING WITH MARYLAND STATE HIGHWAY ADMINISTRATION, OFFICE OF TRAFFIC AND SAFETY.

Formula for Determining Taper Length

Speed (S) in mph	Taper Length (L) in feet
40 mph or less	$L = \frac{WS^2}{60}$
45 mph or more	L = WS

Where: L = taper length in feet
W = width of offset in feet
S = posted speed limit

Guidelines for Length of Longitudinal Buffer Space	
Speed* (mph)	Length (feet)
20	35
25	55
30	85
35	120
40	170
45	220
50	280

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 3/13/13
CHIEF, BUREAU OF ENGINEERING — DATE 3/18/13
CHIEF, BUREAU OF UTILITIES — DATE 3/13/13
CHIEF, UTILITY DESIGN DIVISION — DATE 3/12/13

URS
MONTGOMERY PARK BUSINESS CENTER
1800 WASHINGTON BOULEVARD, SUITE 410
BALTIMORE, MARYLAND 21230
(410) 468-0875

STATE OF MARYLAND — NATHAN C. ATKINSON — No. 28817 — PROFESSIONAL ENGINEER
NATHAN C. ATKINSON

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. 28817, Expiration Date: 08/01/13.

DESIGN: NCA
DRAWN: BJW
CHK: EMT
DATE: 3/7/13

NO.	REVISION	DATE	BY

TRAFFIC CONTROL DETAILS

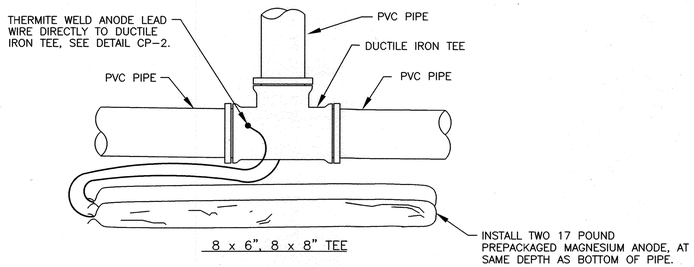
600' SCALE MAP NO. 24 | BLOCK NO. 12

U.S. 40 WATER SERVICE MAIN REPLACEMENT
CAPITAL PROJECT NO. W-8311
CONTRACT NO. 44-4731
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN

SHEET 11 OF 13

AS-BUILT 1/2015



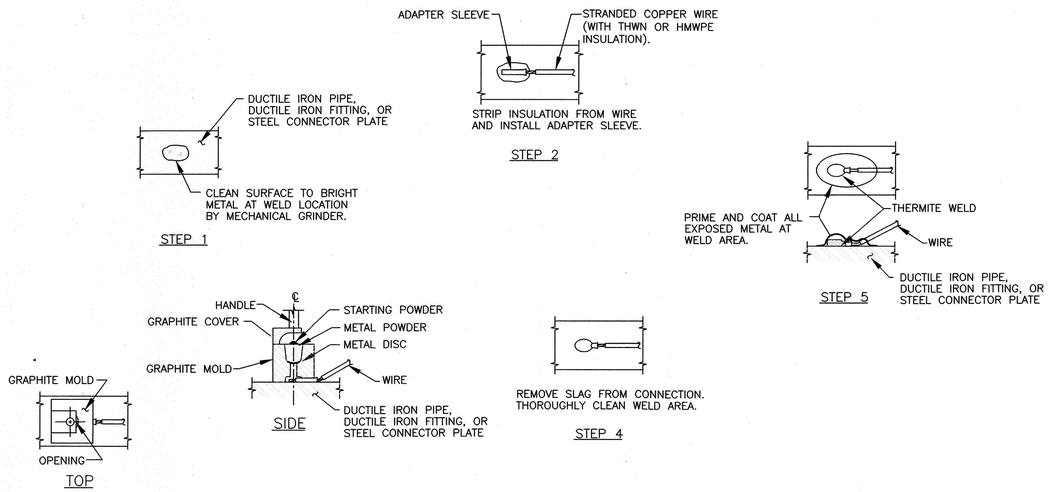
8 x 6", 8 x 8" TEE

NOTES:

1. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 12" FROM EDGE OF PIPE.
2. DO NOT THERMITE WELD TO PVC PIPE.

CP-1: CORROSION PROTECTION OF TEE FITTINGS

NOT TO SCALE



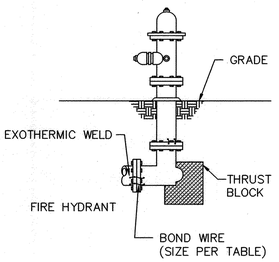
NOTES:

1. THERMITE WELDS SHALL BE COATED WITH A PREFABRICATED ONE PIECE PLASTIC CAP FILLED WITH ELASTOMERIC MATERIAL, ROYSTON HANDY-CAP OR APPROVED EQUAL.
2. DO NOT THERMITE WELD TO PVC PIPE.

CP-2: HORIZONTAL THERMITE WELD

SCALE: NONE

NOT TO SCALE

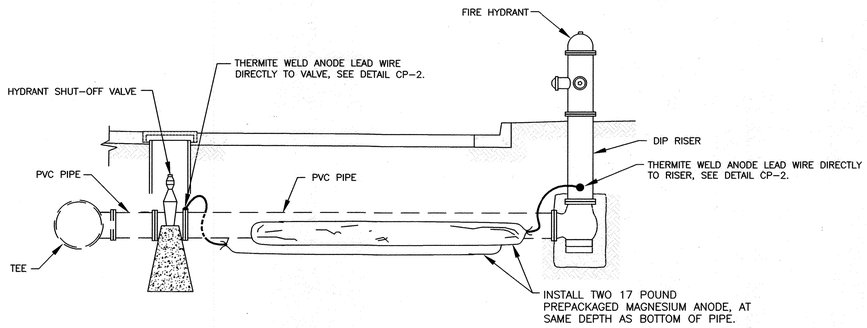


BOND WIRE SIZE	
PIPE DIAMETER	WIRE SIZE
3" THRU 18"	#4 AWG

CP-3: BONDING OF PIPE FITTINGS

SCALE: NONE

NOT TO SCALE

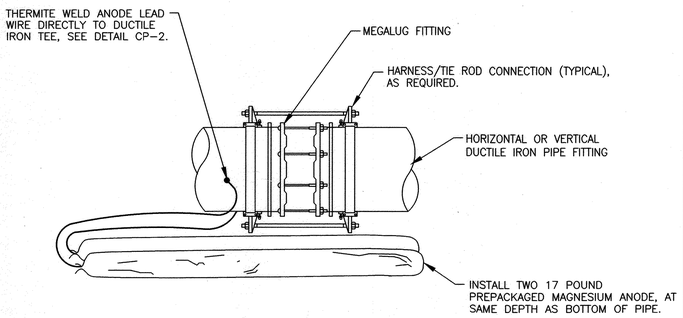


NOTES:

1. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 12" FROM EDGE OF PIPE.
2. DO NOT THERMITE WELD TO PVC PIPE.

CP-4: CORROSION PROTECTION AT FIRE HYDRANT

NOT TO SCALE



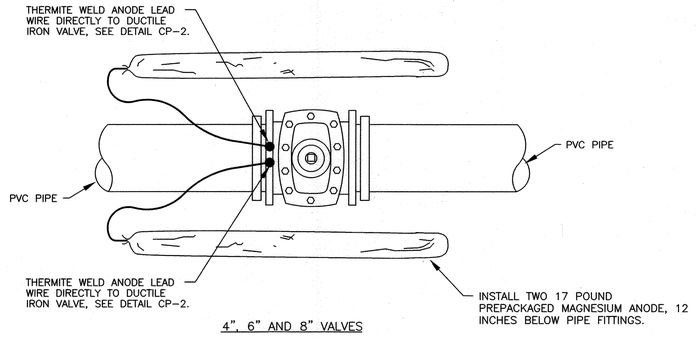
PLAN

NOTES:

1. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 12" FROM EDGE OF PIPE.
2. DO NOT THERMITE WELD TO PVC PIPE.
3. ANODE TO BE INSTALLED AND THERMITE WELDED TO METALLIC PIPE FITTING ONLY.
4. NO ANODES ARE RECOMMENDED FOR THE CORROSION PROTECTION OF MEGALUGS, THE MEGA LUGS SHOULD BE COATED BY MANUFACTURER.

CP-5: CORROSION PROTECTION OF HORIZONTAL AND VERTICAL PIPE FITTINGS

NOT TO SCALE



4", 6" AND 8" VALVES

NOTES:

1. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 12" FROM EDGE OF PIPE.
2. DO NOT THERMITE WELD TO PVC PIPE.

CP-6: CORROSION PROTECTION OF VALVES.

NOT TO SCALE

HOWARD SOIL CONSERVATION DISTRICT CERTIFICATION:

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

HOWARD SCD _____ DATE _____

URS
MONTGOMERY PARK BUSINESS CENTER
1800 WASHINGTON BOULEVARD, SUITE 410
BALTIMORE, MARYLAND 21230
(410) 468-0875

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 3/13/13
CHIEF, BUREAU OF ENGINEERING — DATE 3/13/13
CHIEF, BUREAU OF UTILITIES — DATE 3/13/13
CHIEF, UTILITY DESIGN DIVISION — DATE 3/12/13

RUSSELL CORROSION CONSULTANTS, INC.
Columbia, Maryland

STATE OF MARYLAND — DAVID A. SMITH — No. 22646 — PROFESSIONAL ENGINEER

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. 22646 Expiration Date: 09-25-2014

DESIGN: DAS
DRAWN: DAS
CHK:
DATE: 3/7/13

NO.	REVISION	DATE	BY

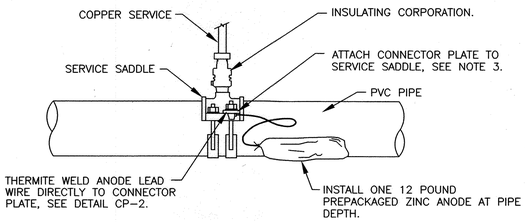
CORROSION PROTECTION DETAILS (CP-1)

600' SCALE MAP NO. 24 | BLOCK NO. 12

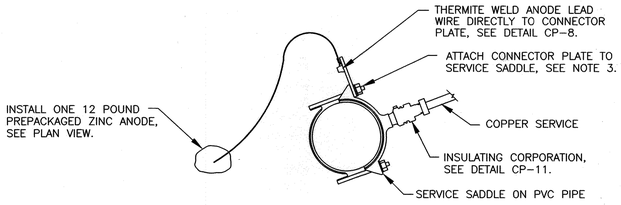
U.S. 40 WATER SERVICE MAIN REPLACEMENT
CAPITAL PROJECT NO. W-8311
CONTRACT NO. 44-4731
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN

SHEET 12 OF 13



PLAN VIEW



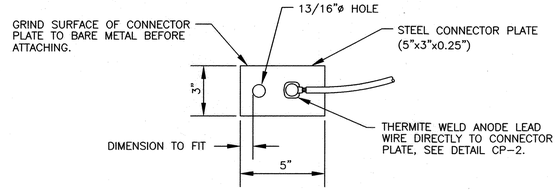
SECTION VIEW

NOTES:

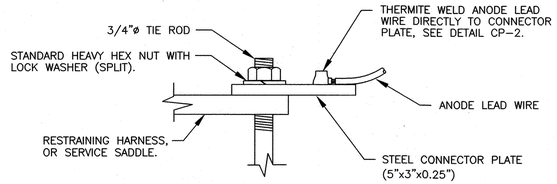
1. CONNECTOR PLATE TO BE THERMITE WELDED TO ANODE LEAD WIRE PRIOR TO ATTACHING CONNECTOR PLATE TO SERVICE SADDLE.
2. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 12" FROM EDGE OF PIPE.
3. REMOVE COATING FROM SERVICE SADDLE WHERE CONNECTOR PLATE IS TO BE MOUNTED. REMOVE COATING IMMEDIATELY PRIOR TO ATTACHING THE CONNECTOR PLATE.
4. PLASTIC SERVICE PIPING DOES NOT REQUIRE AN INSULATING CORPORATION, A NON-INSULATING CORPORATION MAY BE USED.
5. DO NOT THERMITE WELD TO PVC PIPE.

CP-7: CORROSION PROTECTION OF SERVICE SADDLE

NOT TO SCALE



PLAN VIEW



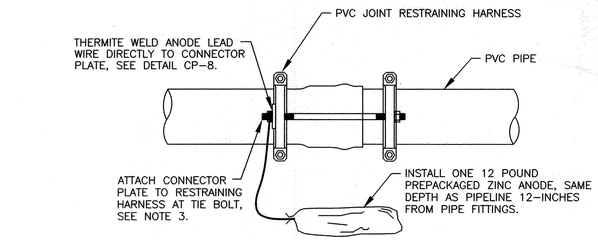
SIDE VIEW

NOTES:

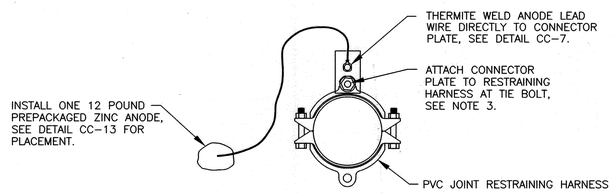
1. CONNECTOR PLATE TO BE THERMITE WELDED TO ANODE LEAD WIRE PRIOR TO ATTACHING CONNECTOR PLATE TO RESTRAINING HARNESS, OR SERVICE SADDLE.
2. THERMITE WELDS SHALL BE COATED WITH A PREFABRICATED ONE PIECE PLASTIC CAP FILLED WITH ELASTOMERIC MATERIAL, ROYSTON HANDY-CAP OR APPROVED EQUAL.

CP-8: CONNECTION PLATE DETAIL

NOT TO SCALE



PLAN VIEW



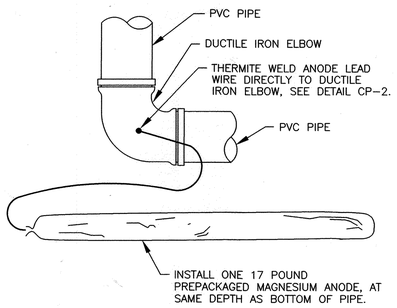
SECTION VIEW

NOTES:

1. CONNECTOR PLATE TO BE THERMITE WELDED TO ANODE LEAD WIRE PRIOR TO ATTACHING CONNECTOR PLATE TO RESTRAINING HARNESS.
2. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 12" FROM EDGE OF PIPE, SEE PLAN VIEW.
3. REMOVE COATING FROM RESTRAINING HARNESS WHERE CONNECTOR PLATE IS TO BE MOUNTED. REMOVE COATING IMMEDIATELY PRIOR TO ATTACHING THE CONNECTOR PLATE.
4. DO NOT THERMITE WELD TO PVC PIPE.

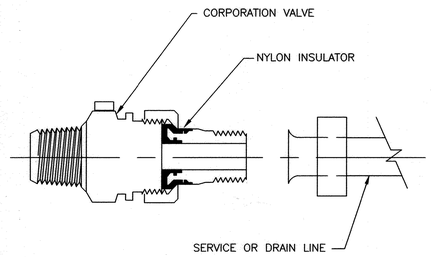
CP-9: CORROSION PROTECTION OF RESTRAINING HARNESS

NOT TO SCALE



ELBOW

CP-10: CORROSION PROTECTION OF ELBOW FITTINGS

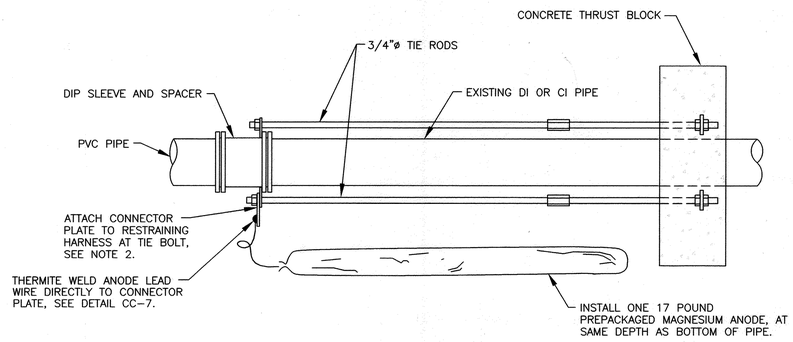


NOTES:

1. INSTALL ELECTRICAL ISOLATION ON ALL WATER SERVICE AND DRAIN LINE CONNECTIONS TO MAIN.
2. COAT EXTERIOR OF CORPORATION STOP, AND SERVICE PIPING AND/OR DRAIN LINE FOR A DISTANCE OF 12 INCHES WITH MASTIC COATING (ROYSTON ROSKOTE R28). MASTIC COATING TO BE MINIMUM OF 20 MILS IN THICKNESS.
3. INSULATED CORPORATION NOT REQUIRED FOR PLASTIC SERVICES.

CP-11: INSULATING CORPORATION

NOT TO SCALE



NOTES:

1. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 12" FROM EDGE OF PIPE.
2. REMOVE COATING FROM RESTRAINING HARNESS WHERE CONNECTOR PLATE IS TO BE MOUNTED. REMOVE COATING IMMEDIATELY PRIOR TO ATTACHING THE CONNECTOR PLATE.
3. DO NOT THERMITE WELD TO PVC PIPE.

CP-12: CORROSION PROTECTION AT IN-LINE THRUST BLOCK

NOT TO SCALE

HOWARD SOIL CONSERVATION DISTRICT CERTIFICATION:

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

HOWARD SCD — DATE

URS
MONTGOMERY PARK BUSINESS CENTER
1800 WASHINGTON BOULEVARD, SUITE 410
BALTIMORE, MARYLAND 21230
(410) 468-0875

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 3/13/13
CHIEF, BUREAU OF ENGINEERING — DATE 3/13/13
CHIEF, BUREAU OF UTILITIES — DATE 3/13/13
CHIEF, UTILITY DESIGN DIVISION — DATE 3/12/13

RUSSELL CORROSION CONSULTANTS, INC.
Columbia, Maryland

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. 22646 Expiration Date: 09-25-2014

STATE OF MARYLAND — CHRISTOPHER D. OLIVER — NO. 22646 — PROFESSIONAL ENGINEER

DESIGN: DAS
DRAWN: DAS
CHK:
DATE: 3/7/13

NO.	REVISION	DATE	BY

600' SCALE MAP NO. 24 | BLOCK NO. 12

CORROSION PROTECTION DETAILS (CP-2)

U.S. 40 WATER SERVICE MAIN REPLACEMENT
CAPITAL PROJECT NO. W-8311
CONTRACT NO. 44-4731
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN

SHEET 13 OF 13