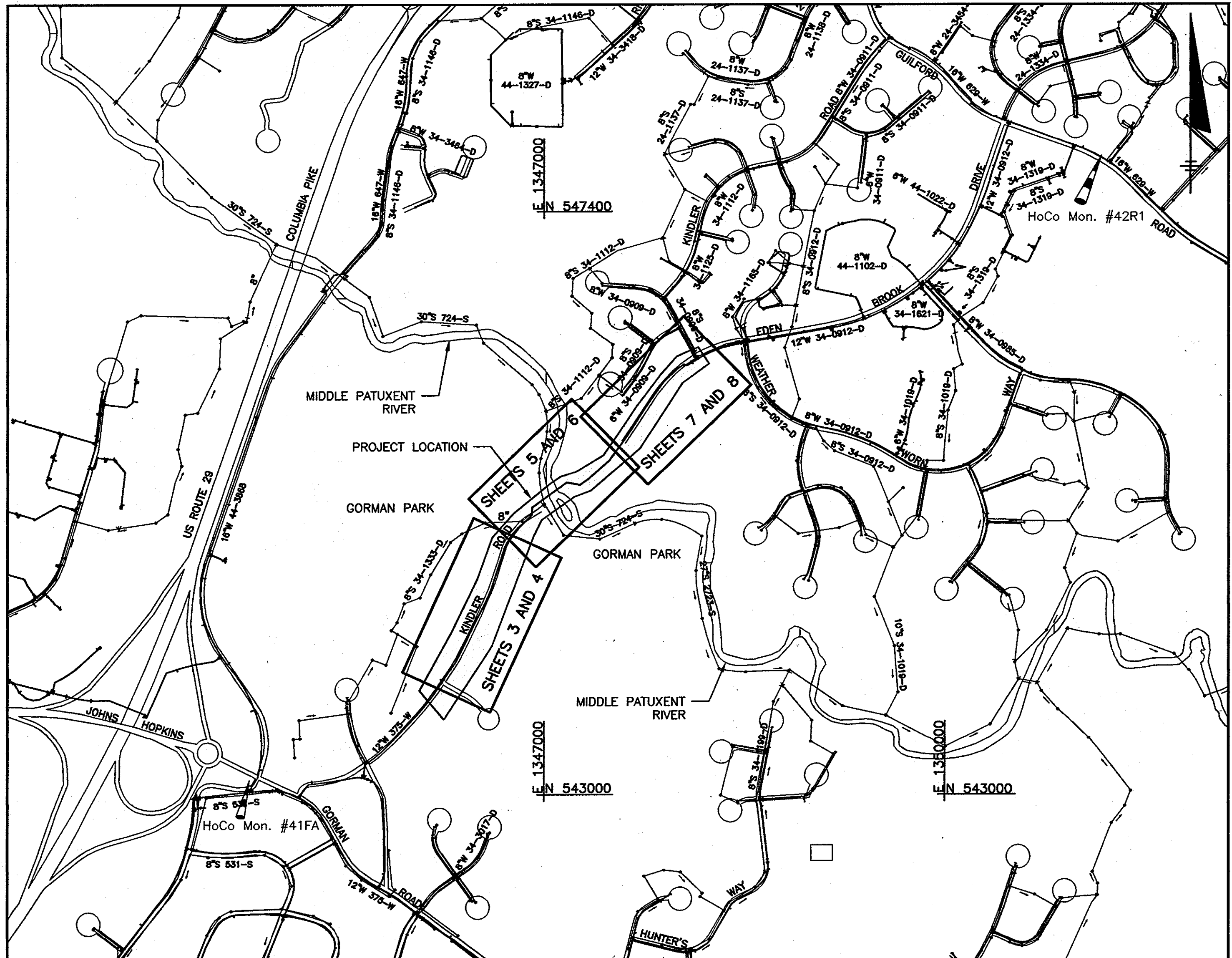


I:\HOWARD-CO-2343\45452-KINDLER-ROAD\DWG SHEETS\45452-001.DWG

GENERAL NOTES:

- THE LOCATIONS, ELEVATIONS, OR STATIONING SHOWN FOR EXISTING MAINS AND UTILITIES ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE EXISTENCE (INCLUDING LOCATION AND ELEVATION) OF ALL BURIED UTILITIES. NOTE ALSO THAT OTHER EXISTING BURIED UTILITIES MAY EXIST WITHIN THE WORK AREA THAT ARE NOT 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.
- TOPOGRAPHIC FIELD SURVEY PERFORMED ON DECEMBER, 2009 BY NXL CONSTRUCTION SERVICES, INC. THE COORDINATES SHOWN ON THE DRAWINGS ARE BASED ON THE MARYLAND STATE REFERENCE SYSTEM NAD '83/'91 AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 41FA AND NO. 42R1.
- ALL VERTICAL CONTROLS ARE BASED ON NAVD '88. VERTICAL CONTROLS PROVIDED ON THE DRAWINGS ARE MAGNETIC NAILS IN PAVEMENT OR IRON ROD WITH CAP IN GROUND.
- ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- CLEAR ALL UTILITIES BY A MINIMUM OF 12 INCHES. CLEAR ALL POLES BY 5'-0" MINIMUM OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. THE OWNER HAS CONTACTED THE UTILITY COMPANIES AND HAS MADE ARRANGEMENTS FOR BRACING OF 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 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.
- 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.
- 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 PITS IS INCLUDED ON THE DRAWINGS OR WITHIN THE SPECIFICATIONS. AT THE IN-LOCATIONS TO THE EXISTING MAIN AND FOR 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.
- 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).....410-850-4620
 BGE (EMERGENCY).....410-685-1400
 BUREAU OF UTILITIES.....410-313-4900
 COLONIAL PIPELINE COMPANY.....410-795-1390
 MISS UTILITY.....1-800-257-7777
 STATE HIGHWAY ADMINISTRATION.....410-531-5533
 VERIZON.....1-800-743-0033/410-224-9210
 TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS LOCATED WITHIN THE CONSTRUCTION STRIP ARE NOT TO BE REMOVED OR DAMAGED BY THE CONTRACTOR.
- CONTRACTOR SHALL REMOVE TREES, STUMPS, AND ROOTS ALONG LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF THE MAIN.
- 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.
- TOPS OF ALL WATER MAINS SHALL HAVE A MINIMUM OF 4'-0" OF COVER UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL NOT OPERATE ANY WATER MAIN VALVES ON THE EXISTING WATER SYSTEM.
- ALL TIE-INS TO EXISTING WATER MAINS SHALL BE COORDINATED WITH THE HOWARD COUNTY BUREAU OF UTILITIES AT LEAST 10 WORKING DAYS PRIOR TO SCHEDULING WORK.
- EXISTING STORM DRAINS DISTURBED BY THE CONSTRUCTION SHALL BE REPLACED IN KIND AT THE SAME LINE, GRADE, AND SHAPE AS THE EXISTING STORM DRAINS OR SWALES, INCLUDING RIP-RAP LINING IF PREVIOUSLY EXISTING.
- SALVAGEABLE VALVES AND APPURTENANCES TO BE REMOVED SHALL BE DELIVERED TO THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS - BUREAU OF UTILITIES AS DIRECTED BY THE ENGINEER OR COUNTY.
- IN ACCORDANCE WITH 10 STATE STANDARD REQUIREMENTS - ALL CROSSINGS OF THE NEW WATER MAIN WITH EXISTING SANITARY OR STORM SEWER PIPING (RESULTING IN LESS THAN 18" OF SEPARATION) SHALL BE ACCOMPLISHED BY CENTERING A FULL LENGTH OF THE NEW WATER MAIN PIPING AT THE CROSSING TO MAXIMIZE THE DISTANCE OF ANY WATER MAIN JOINT FROM THE CROSSING.
- NO WATER SHALL BE DISCHARGED FROM THE EXISTING WATER MAIN TO THE ENVIRONMENT, WITHOUT FIRST DECHLORINATING. THE CONTRACTOR SHALL SUBMIT THE DECHLORINATION METHOD TO THE OWNER AND ITS ENGINEER FOR REVIEW.
- ALL PROPOSED PVC C900 WATER MAIN PIPING SHALL BE PRESSURE CLASS 200 (DR 14).
- ALL HYDRANTS, MAINLINE GATE VALVES, WATER SERVICE VALVES AND PIPING, AND SIMILAR (FOR BOTH PERMANENT AND TEMPORARY INSTALLATIONS) SHALL BE RATED FOR A MINIMUM OPERATING PRESSURE OF 250 PSI.
- PVC WATER MAINS SHALL BE ALLOWED TO CHANGE VERTICAL OR HORIZONTAL DIRECTION ONLY AT PVC HIGH DEFLECTION (HD) COUPLINGS, 5-DEGREE SWEEPS OR STANDARD BENDS. DEFLECTIONS MADE AT STANDARD PIPE JOINTS AND/OR PIPE LENGTHS BENT TO ACHIEVE CURVATURE OF THE WATER MAIN SHALL NOT BE ALLOWED UNDER ANY CIRCUMSTANCES.
- THE SOIL AROUND THE HIGH-DEFLECTION COUPLINGS AND 5-DEGREE SWEEPS SHALL BE BEDDED AND THOROUGHLY COMPACTED IN ACCORDANCE WITH SECTION 1000.03.07 OF THE HOWARD COUNTY VOLUME IV DESIGN MANUAL STANDARD SPECIFICATIONS OR SHALL BE RESTRAINED TO THE ADJOINING PIPE.
- HIGH DEFLECTION COUPLINGS ARE LIMITED TO A MAXIMUM DEFLECTION OF 3 DEGREES. WHEN NOT RESTRAINED, BELL STOPS (EBAA IRON, INC. MEGA-STOP SERIES 5000 OR APPROVED EQUAL) SHALL BE PROVIDED ON EACH SIDE OF THE HD COUPLINGS FOR THE PREVENTION OF "OVER-INSERTION".
- FIVE (5) DEGREE BENDS SHALL BE ACCOMPLISHED USING SWEEPS, WHICH ALONG WITH HIGH DEFLECTION COUPLINGS, SHALL BE THE PVC PUSH-ON TYPE WITH RUBBER GASKETED JOINTS APPROPRIATE FOR PVC C900 WATER MAIN PIPE (INJECTION MOLDED PER AWWA C907-04 FOR PRESSURE CLASS 150 PVC PIPE; FABRICATED PER AWWA C900 FOR PRESSURE CLASS 200 PVC PIPE).
- TEES, CROSSES, CAPS, BENDS GREATER THAN 5 DEGREES, AND SIMILAR FITTINGS THAT REQUIRE RESTRAINED JOINTS SHALL BE DUCTILE IRON MECHANICAL JOINT (AWWA C153) FITTINGS APPROPRIATE FOR PVC C900 WATER MAIN PIPE. ALL DUCTILE IRON FITTINGS SHALL BE FUSION BONDED EPOXY INSIDE AND OUTSIDE.



WATER AND SEWER CODE FOR COUNTY USE ONLY:

NO. OF WATER CONNECTIONS:	0
NO. OF SEWER CONNECTIONS:	N/A
DRAINAGE AREA:	MIDDLE PATUXENT
TYPE OF BUILDING:	N/A
NO. OF PARCELS:	N/A

VICINITY MAP
SCALE: 1" = 600'

KINDLER ROAD-EDEN BROOK DRIVE WATER MAIN CONNECTION

CAPITAL PROJECT: W-8297 CONTRACT NO.: 44-4675 HOWARD COUNTY, MARYLAND DEPARTMENT OF PUBLIC WORKS

QUANTITIES				
ITEM	ESTIMATED QUANTITY	AS-BUILT	MATERIAL	SUPPLIER
WATER MAINS				
12" PVC PIPE	3,032	L.F.		
12" GATE VALVE	3	EA.		
FIRE HYDRANT ASSEMBLIES	5	EA.		

GENERAL NOTES: (CONTINUED)

- PIPE RESTRAINT SHALL BE PROVIDED IN THE FOLLOWING MANNER USING SYSTEMS MANUFACTURED BY EBAA IRON, INC. OR APPROVED EQUAL:
 - ALL DUCTILE IRON MECHANICAL JOINT FITTINGS (INCLUDING MECHANICAL JOINT HYDRANT CONNECTIONS) SHALL BE RESTRAINED USING THE SERIES 2000 PVC MECHANICAL JOINT FITTING RESTRAINT SYSTEM.
 - ALL FIVE (5) DEGREE SWEEPS SHALL BE RESTRAINED USING THE SERIES 1500 PVC FITTING RESTRAINT SYSTEM.
 - HIGH DEFLECTION COUPLINGS AND PUSH-ON BELL AND SPIGOT PIPE JOINTS SHALL BE RESTRAINED (WHERE NOTED ON THE PROFILES) USING THE SERIES 1500 PVC FITTING RESTRAINT SYSTEM. BEND HARNESSING RODS TO MATCH THE ANGLE AT THE HD COUPLINGS.
- INSTALL CONCRETE ANCHOR COLLARS WHERE SHOWN, SPECIFIED, OR DIRECTED, AND WHEN SUFFICIENT ROOM EXISTS (AS DETERMINED BY THE ENGINEER), INSTALL CONCRETE BUTTRESSING AT ALL FITTINGS/DEFLECTIONS GREATER THAN 5 DEGREES, TEES, CAPS, HORIZONTAL AND VERTICAL BENDS, AND HYDRANT INSTALLATIONS SHOWN WITH OR WITHOUT HARNESSING RESTRAINT PER HOWARD COUNTY DETAILS W-2.1, W-2.2 AND W-2.3.
- MAINLINE VALVES SHALL BE STRAPPED TO ADJACENT TEES OR CROSSES PER HOWARD CO STD. DET W-2.13. MAINLINE VALVES WHICH ARE NOT SHOWN ADJACENT TO TEES OR CROSSES SHALL BE ANCHORED TO A CONCRETE BLOCK IN ACCORDANCE WITH HOWARD CO. STD. DETAIL W-5.01. VALVES ON HYDRANT LEADS SHALL BE RESTRAINED USING THE SERIES 2000 PVC M.J. FITTING RESTRAINT SYSTEM BY EBAA IRON, INC. OR APPROVED EQUAL.
- FIRE HYDRANTS SHALL BE SET TO THE BURY LINE ELEVATION SHOWN ON THE DRAWINGS (TO THE NEAREST 6" INCREMENT THAT PLACES THE HYDRANT BREAKAWAY FLANGE AT OR ABOVE GRADE). ALL FIRE HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD DETAILS. THE SOIL AROUND THE FIRE HYDRANT SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 1000 AND SECTION 1005 OF THE STANDARD SPECIFICATIONS. FIRE HYDRANTS SHALL BE INSTALLED PER HOWARD COUNTY STANDARD DETAIL NOS. W-1.11 TO W-1.12.
- CONTINUITY TEST STATIONS SHALL BE PLACED ADJACENT TO EACH FIRE HYDRANT. REFER TO THE HOWARD COUNTY STANDARD FIRE HYDRANT CONTINUITY TEST STATION DETAIL W-1.15.
- PIPE TRENCHING AND PAVEMENT REPLACEMENT SHALL BE PERFORMED IN ACCORDANCE WITH HOWARD COUNTY STANDARDS, INCLUDING STANDARD DETAIL G-2.12, "PIPE TRENCH PLASTIC AND COPPER" AND STANDARD DETAIL G-4.01, "UTILITY TRENCH ROADWAY REPAIRING", RESPECTIVELY.
- TEMPORARY PAVING PATCH FOR UTILITY TRENCH REPAIR OF HMA PAVED ROADS AND DRIVEWAYS SHALL CONSIST OF 18-INCHES OF DAMPENED AND COMPACTED NO. 57 AGGREGATE SUB-BASE OVERLAYED WITH TWO INCHES OF HMA BASE COURSE PLACED FLUSH WITH THE ADJOINING PAVEMENT SURFACE. REFILL ALL DEPRESSIONS AND SETTLEMENT (AS THEY DEVELOP) WITH THE SPECIFIED MATERIALS. PRIOR TO PLACEMENT OF THE PERMANENT PAVING SECTION, REMOVE THE TOP SIX INCHES OF MATERIAL, SCARIFY, RECOMPACT, AND TACK COAT THE REMAINING 12-INCH MINIMUM NO. 57 AGGREGATE SUB-BASE, AND REPAVE THE UTILITY TRENCH (AND WHERE REQUIRED, THE REMAINING PORTION OF THE TRAVEL LANE) ALL IN ACCORDANCE WITH HOWARD COUNTY STANDARD DETAIL G-4.01. THE HMA MATERIALS SHALL MEET THE TYPICAL SUPERPAVE MIX SPECIFIED IN HOWARD COUNTY STANDARD DETAIL R-2.01, PG 64-22, LEVEL 1 (EASL).
- PIPE TEST PRESSURE SHALL BE IN ACCORDANCE WITH HOWARD COUNTY STANDARD SPECIFICATION SECTION 1006.02. THE PIPELINE DESIGN IS IN ACCORDANCE WITH HOWARD COUNTY STANDARD SPECIFICATION SECTION 1002. THRUST RESTRAINT SHOULD BE IN ACCORDANCE WITH HOWARD COUNTY STANDARD DETAILS W-2.21, W-2.22 AND W-2.23.
- SEE DEPARTMENT OF RECREATION AND PARKS GENERAL CONDITIONS OF RIGHT-OF-ENTRY ON SHEET 2.
- 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 INSTALLED UNDER THIS CONTRACT. ALL PVC PIPE SHALL CONTAIN MARKINGS TO ALLOW CROSS REFERENCING OF THE LOG SUPPLIED TO THE TEST RECORDS RECEIVED.

INDEX OF DRAWINGS	
TITLE	DRAWING NUMBER
COVER SHEET	1
LEGEND, ABBREVIATIONS, TABLES, AND SCHEDULES	2
PLAN - STA. 0+00 TO STA. 10+50	3
PROFILE - STA. 0+00 TO STA. 10+50	4
PLAN - STA. 10+50 TO STA. 22+50	5
PROFILE - STA. 10+50 TO STA. 22+50	6
PLAN - STA. 22+50 TO STA. 30+32	7
PROFILE - STA. 22+50 TO STA. 30+32	8
GENERAL DETAILS	9
NOT USED	10
CATHODIC PROTECTION LAYOUT	11
CATHODIC PROTECTION DETAILS	12
CATHODIC PROTECTION DETAILS	13
EROSION AND SEDIMENT CONTROL KEY PLAN	14
EROSION AND SEDIMENT CONTROL SITE PLAN	15
EROSION AND SEDIMENT CONTROL SITE PLAN	16
EROSION AND SEDIMENT CONTROL NOTES AND DETAILS	17
EROSION AND SEDIMENT CONTROL NOTES AND DETAILS	18
STREAM DIVERSION PLANS	19
STREAM DIVERSION CONSTRUCTION DETAILS	20

EP-13-020

DEPARTMENT OF RECREATION AND PARKS
HOWARD COUNTY, MARYLAND

John R. Boyd 10/7/13
DIRECTOR OF RECREATION AND PARKS DATE

OWNERS/DEVELOPER 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 INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.

Heidi Dismore 9/24/13
Signature of Developer Date

HOWARD SOIL CONSERVATION DISTRICT CERTIFICATION:

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

John R. Robertson 10/8/13
Howard Soil Conservation District Date

ENGINEERS 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] 22749 9-30-13
Signature of Engineer - Registration Number Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 10/17/13
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 9/24/13
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 9/24/13
CHIEF, UTILITY DESIGN DIVISION DATE

G O BRIEN & G E R E

4201 MITCHELLVILLE ROAD
SUITE 500
BOWIE, MD 20716
PHONE: 301-731-5622

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. 18523, EXPIRATION DATE 12/08/2013

DSN. BY: SSD					
DRN. BY: RPW					
CHK. BY: RJD					
DATE: AUG, 2013	RJD	0	AS ISSUED FOR BID	09/13	
	BY	NO.	REVISION	DATE	

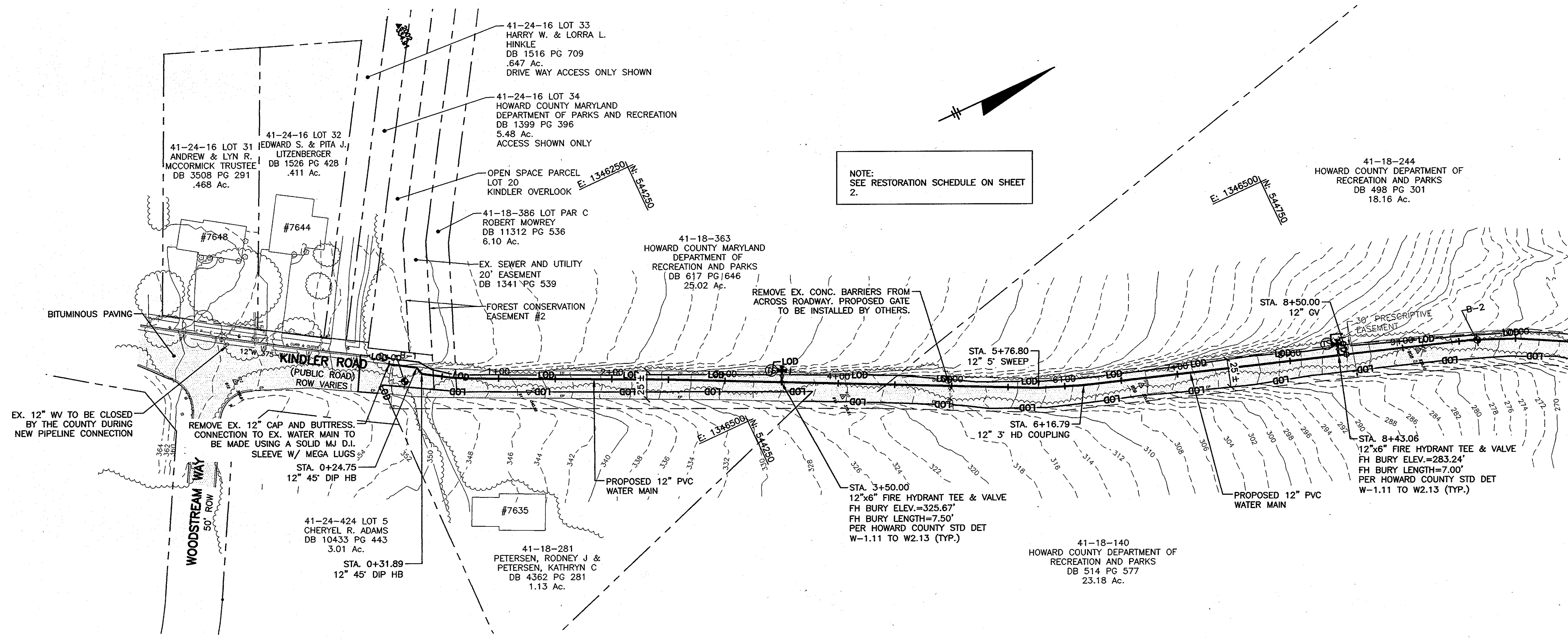
COVER SHEET

**KINDLER ROAD - EDEN BROOK DRIVE
WATER MAIN CONNECTION**

CAPITAL PROJECT: W-8297
CONTRACT NO.: 44-4675
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

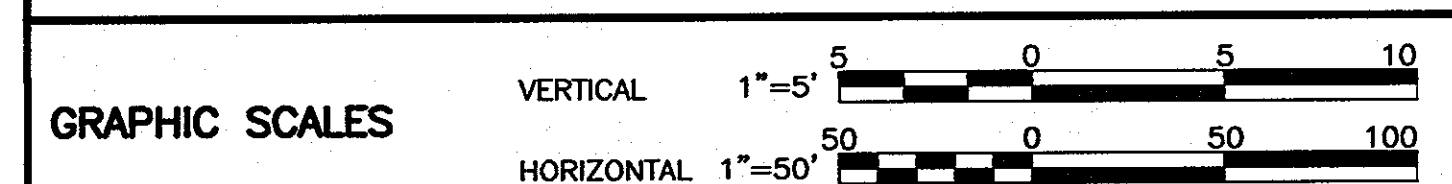
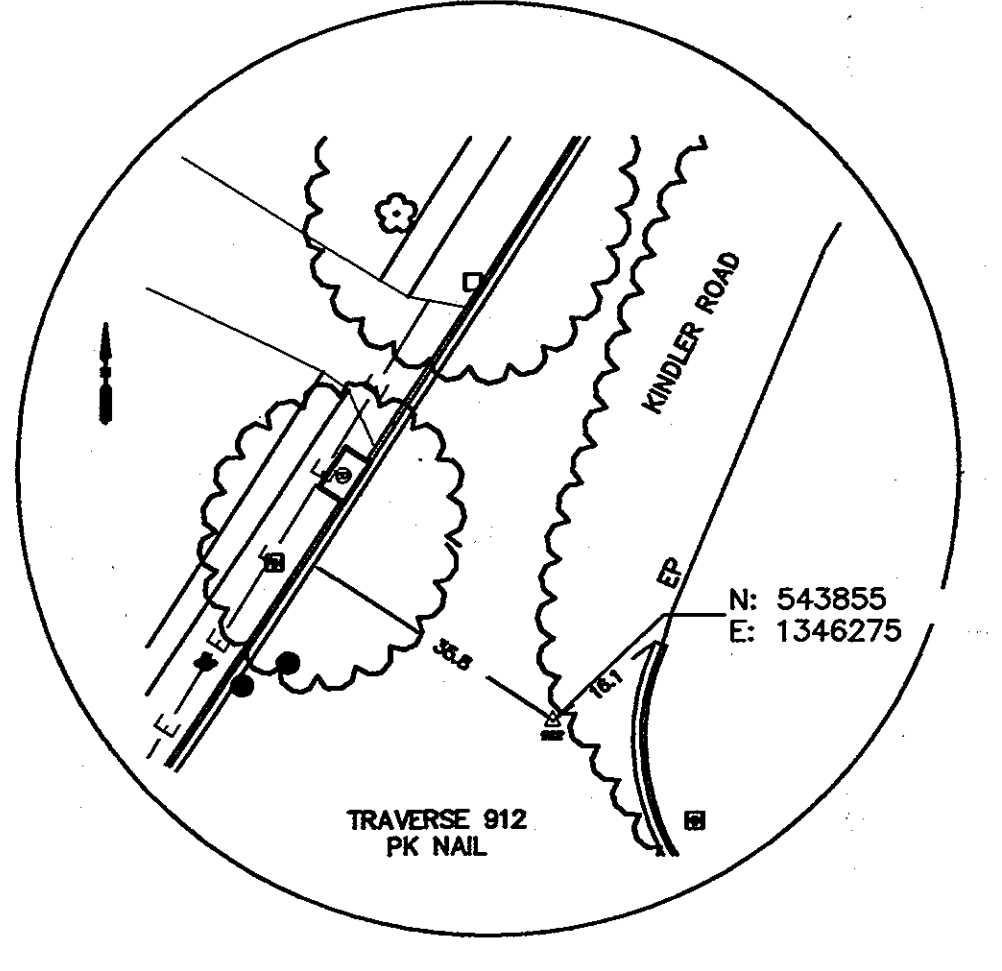
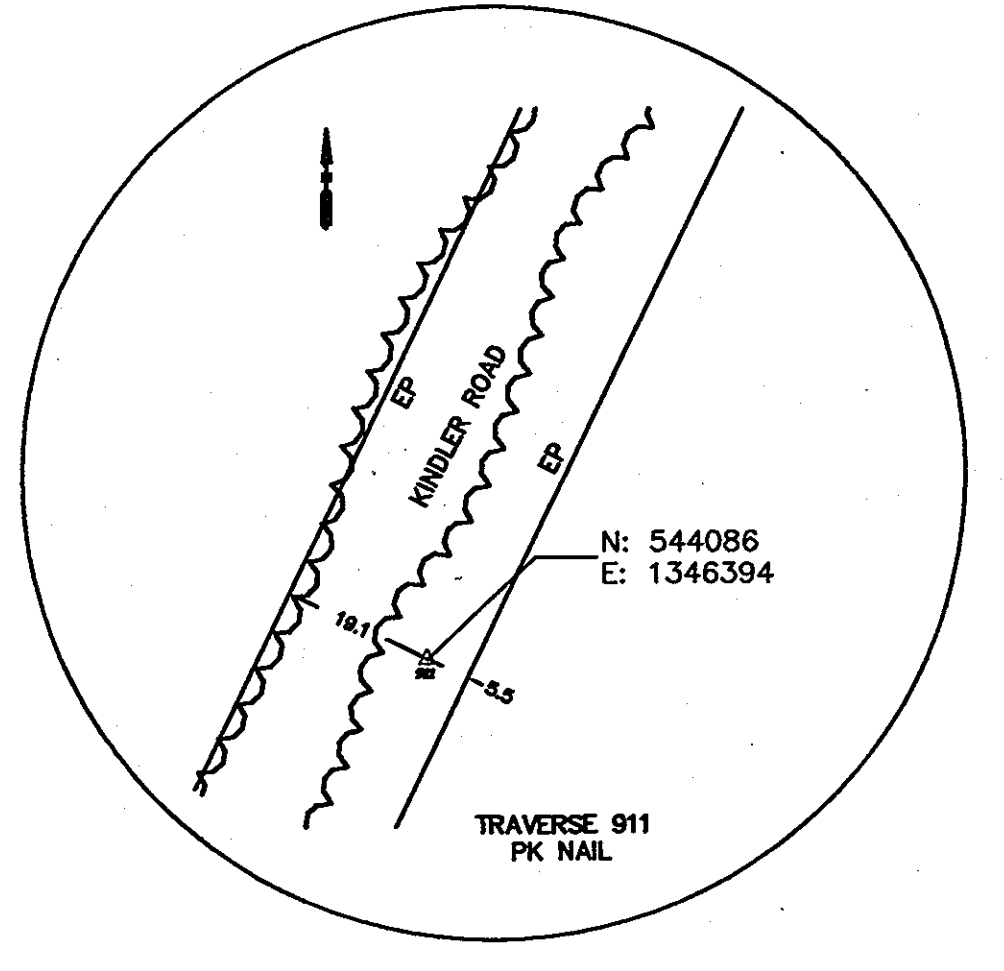
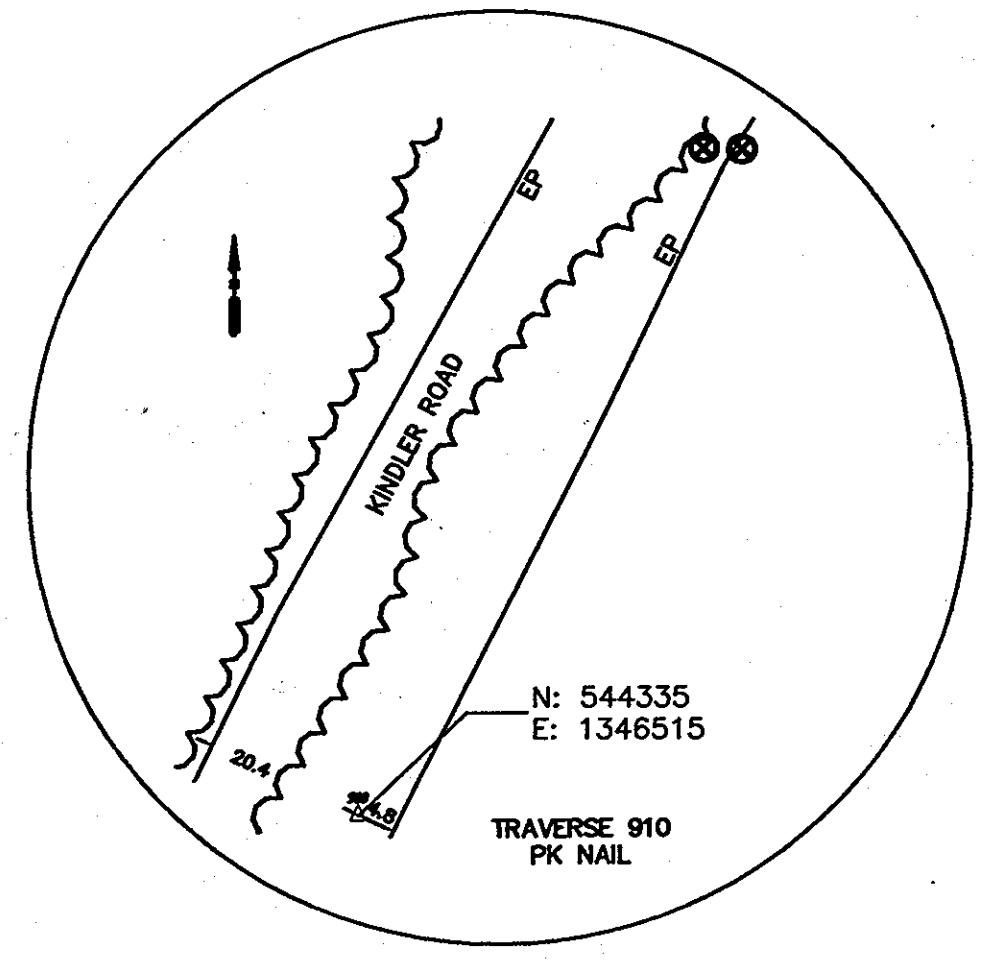
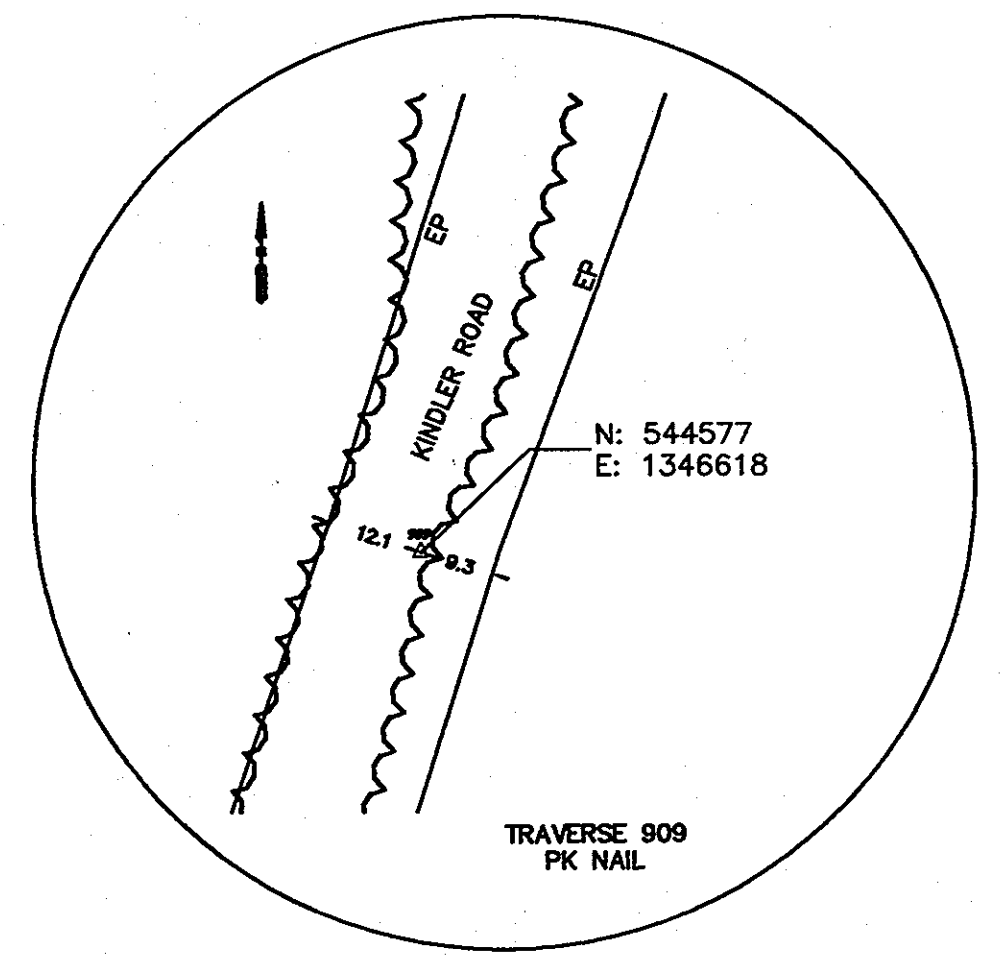
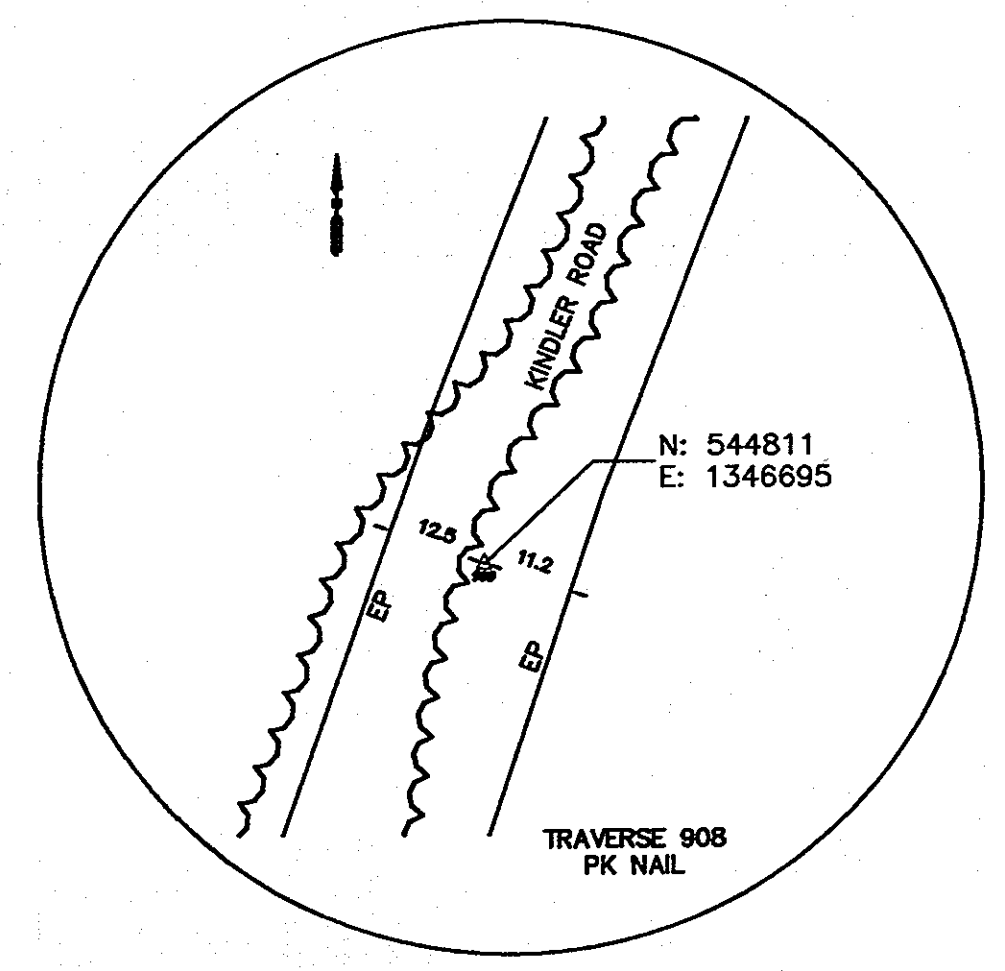
600' SCALE MAP NO. 42 BLOCK NO. 7

SCALE AS SHOWN
SHEET 1 OF 20



NOTE:
SEE RESTORATION SCHEDULE ON SHEET 2.

MATCH LINE STA. 10+50
FOR CONTINUATION SEE SHEET 5



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 10/6/13
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 9/24/13
CHIEF - BUREAU OF ENGINEERING DATE

[Signature] 10/11/13
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 9/24/13
CHIEF, UTILITY DESIGN DIVISION DATE

G O BRIEN & GERE

4201 MITCHELLVILLE ROAD
SUITE 500
BOWIE, MD 20716
PHONE: 301-731-5622

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. 18523, EXPIRATION DATE 12/08/2013

[Signature]
PROFESSIONAL ENGINEER

DSN. BY:	RPW				
DRN. BY:	RPW				
CHK. BY:	RJD				
DATE:	AUG, 2013	RJD	0	AS ISSUED FOR BID	09/13
		BY	NO.	REVISION	DATE

PLAN
STA. 0+00 TO STA. 10+50

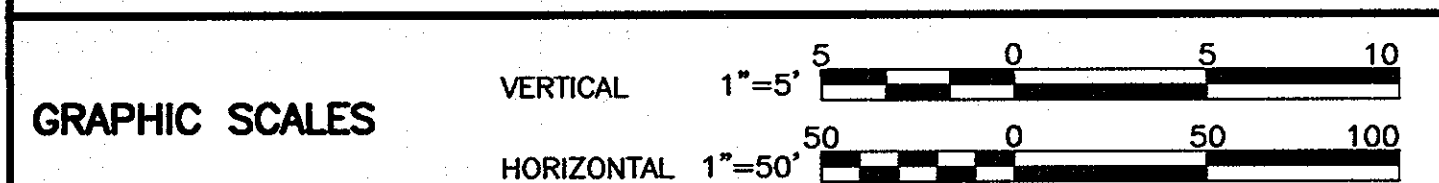
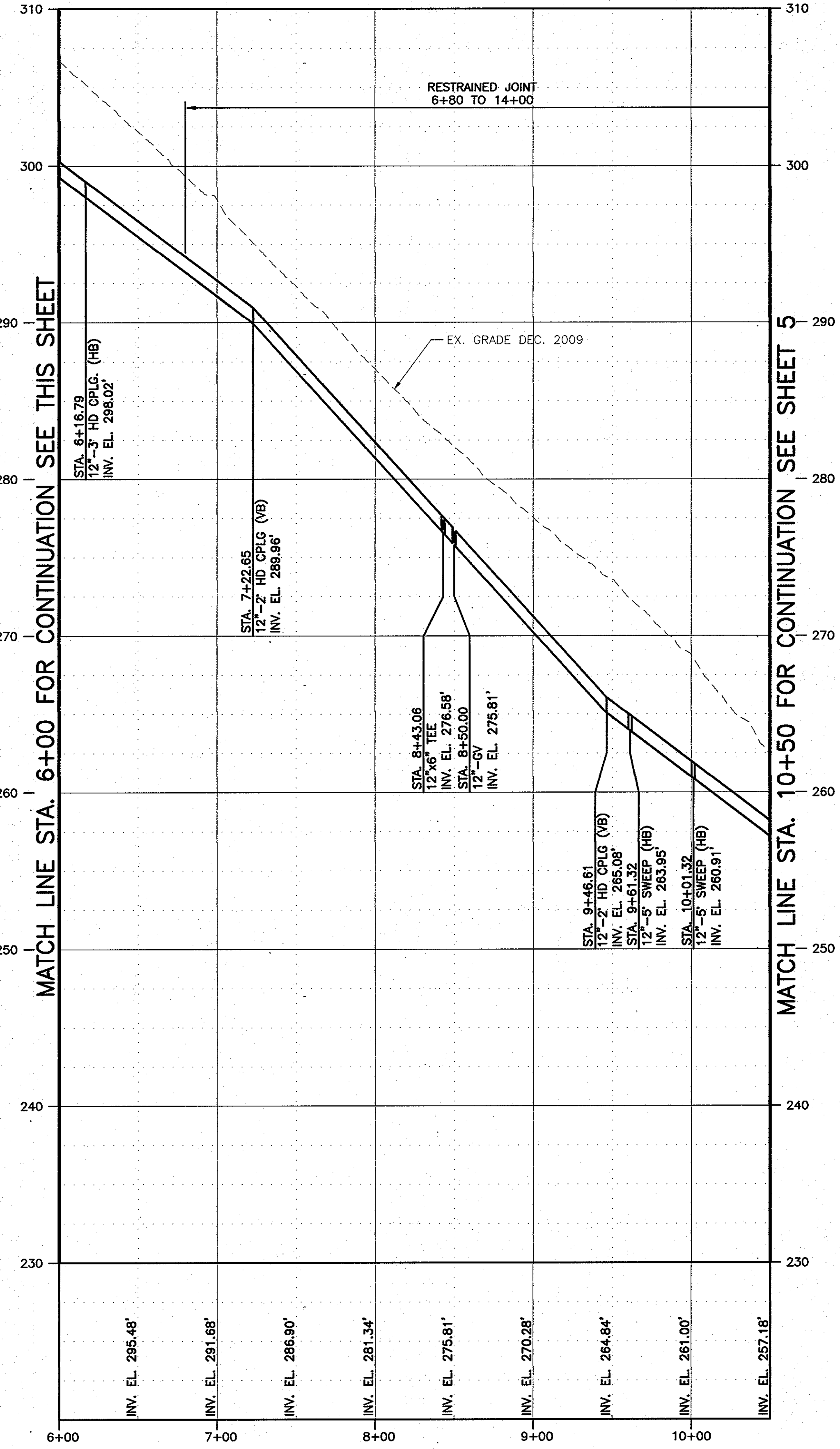
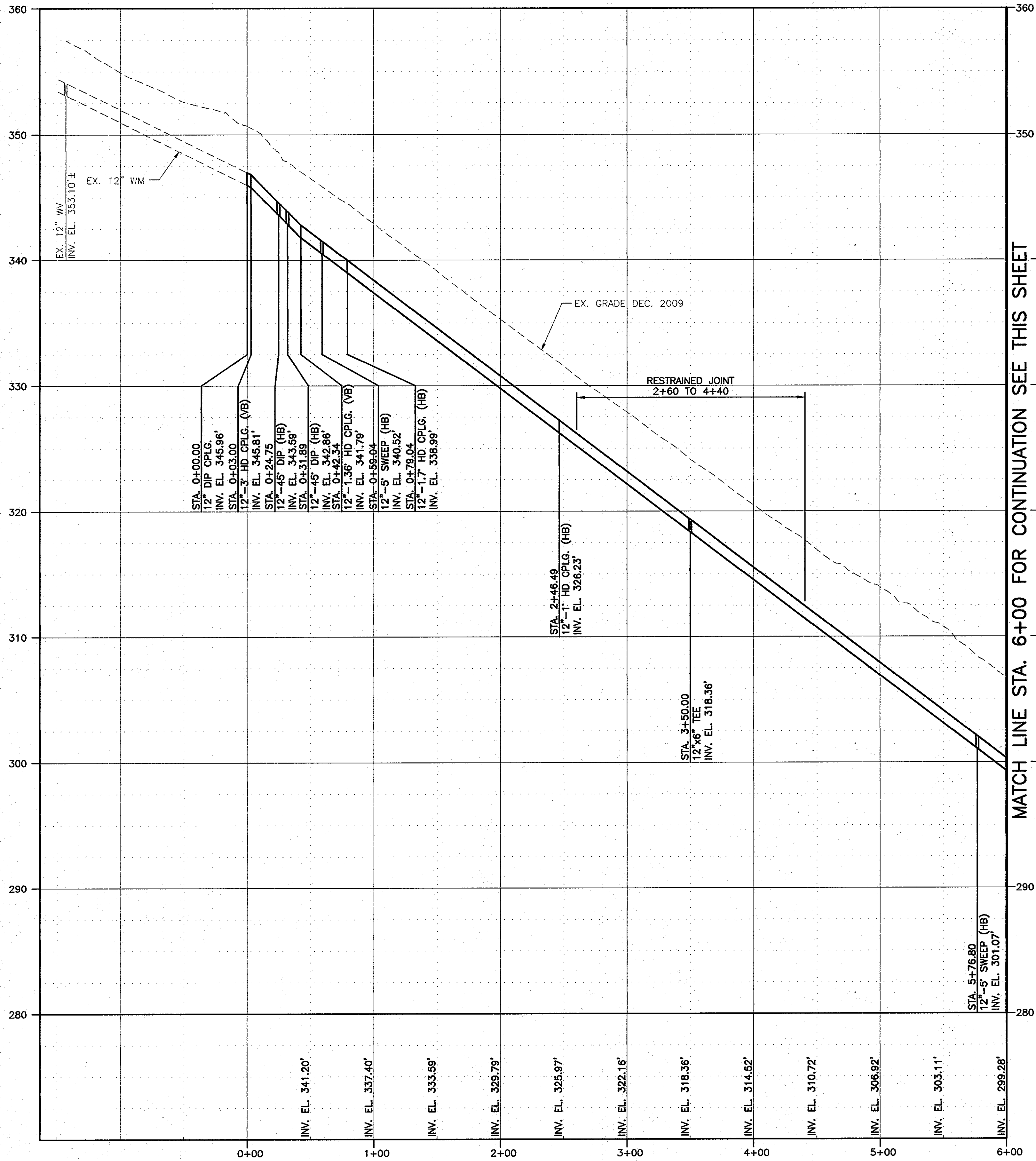
600' SCALE MAP NO. 42 BLOCK NO. 7

KINDLER ROAD - EDEN BROOK DRIVE
WATER MAIN CONNECTION

CAPITAL PROJECT: W-8297
CONTRACT NO.: 44-4675
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 3 OF 20



DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Joseph J. ... 10/7/13
 DIRECTOR OF PUBLIC WORKS DATE

Marcus B. Rutledge 9/24/13
 CHIEF - BUREAU OF ENGINEERING DATE

... 9/24/13
 CHIEF, UTILITY DESIGN DIVISION DATE

G O BRIEN & GERE
 4201 MITCHELLVILLE ROAD
 SUITE 500
 BOWIE, MD 20716
 PHONE: 301-731-5622

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. 18823, EXPIRATION DATE 12/08/2013.

Robert John Dyer
 PROFESSIONAL ENGINEER

DSN. BY:	RPW			
DRN. BY:	RPW			
CHK. BY:	RJD			
DATE:	AUG, 2013			
BY	NO.	AS ISSUED FOR BID	09/13	
		REVISION		

PROFILE
 STA. 0+00 TO STA. 10+50

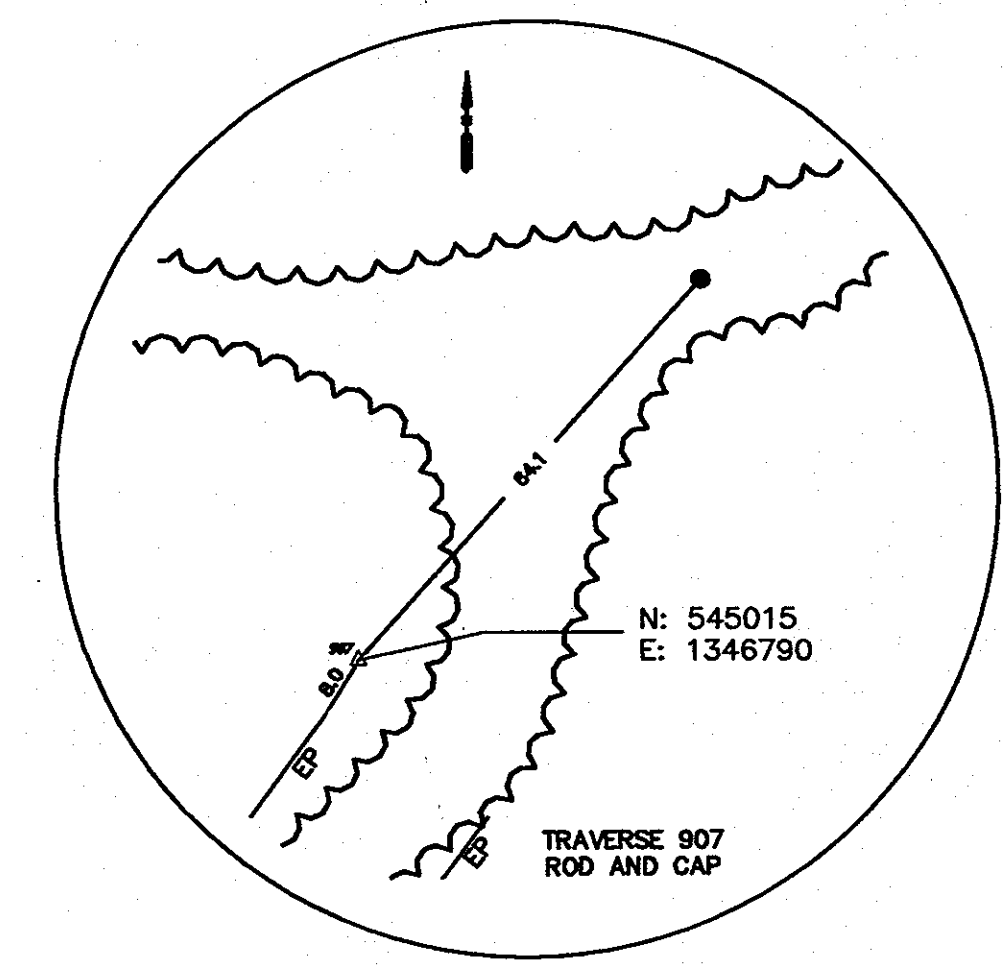
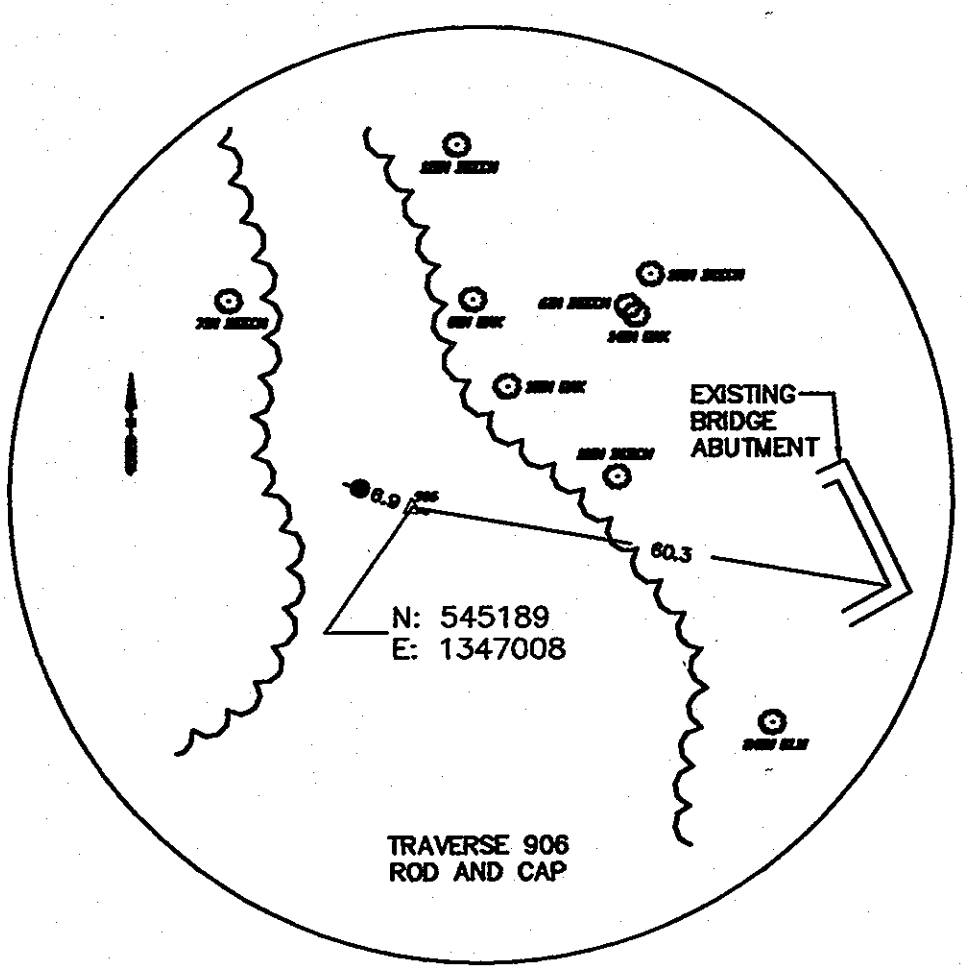
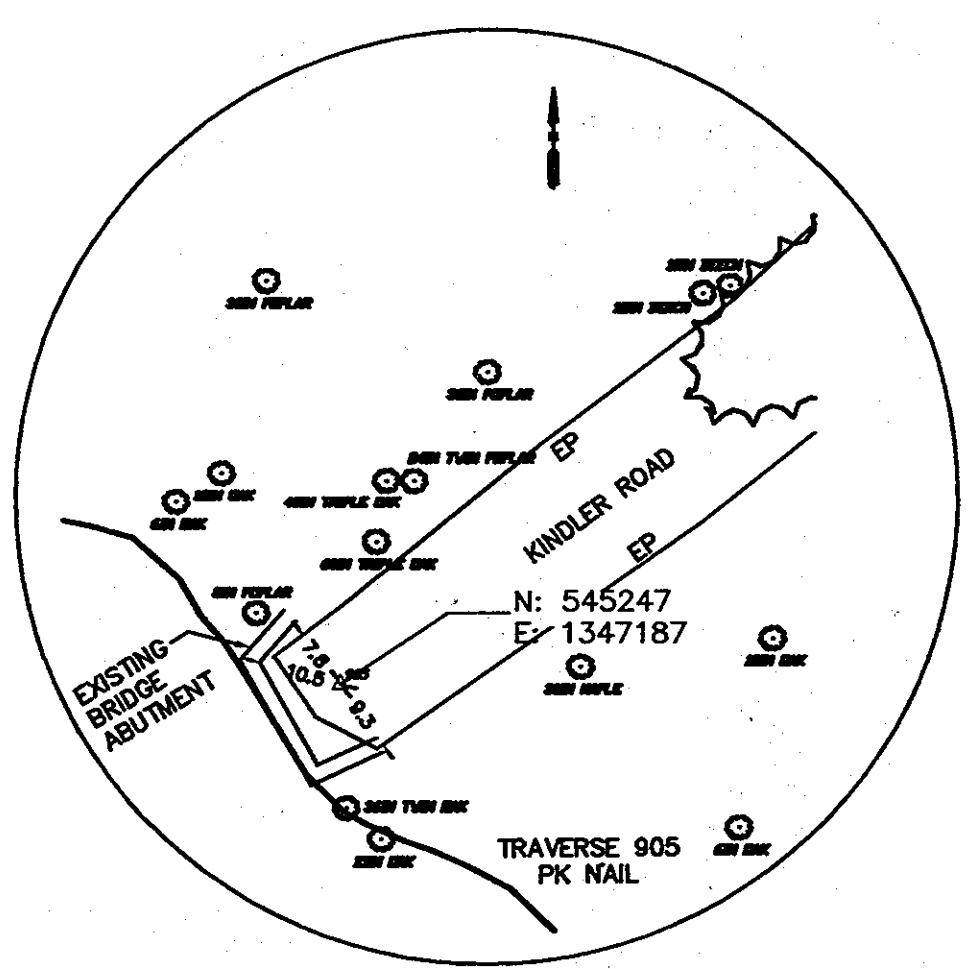
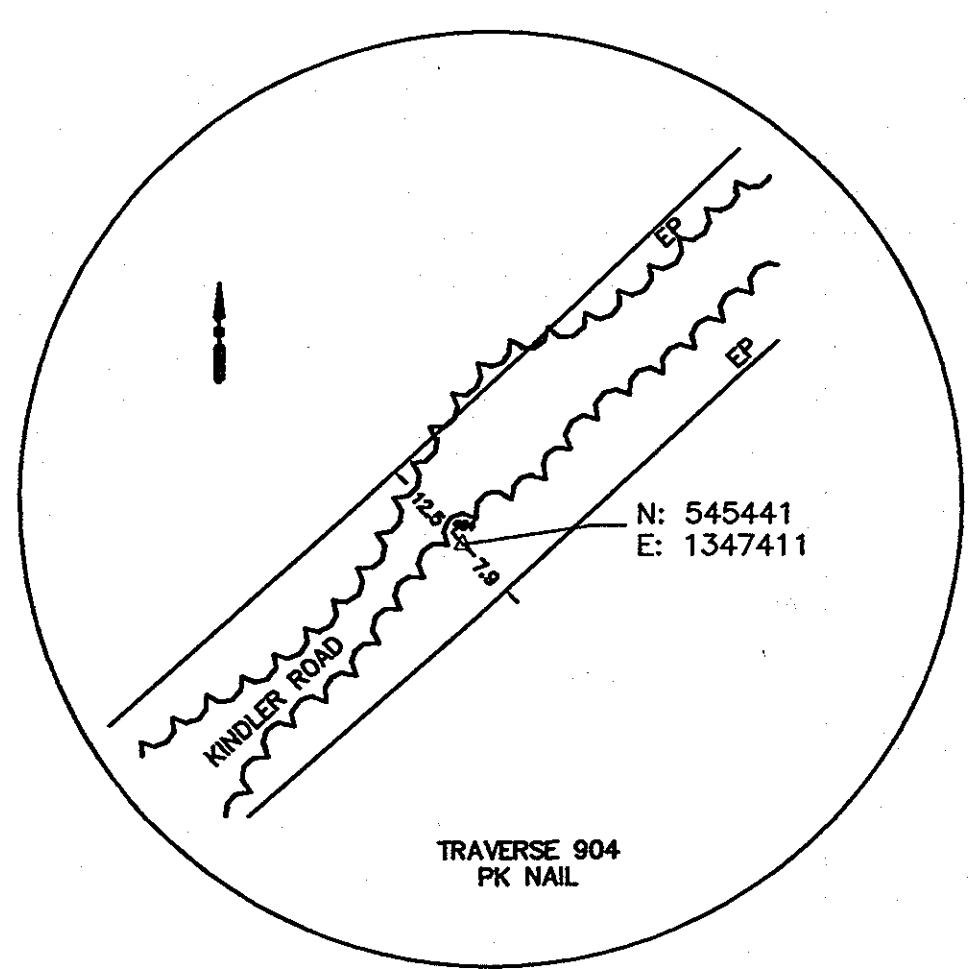
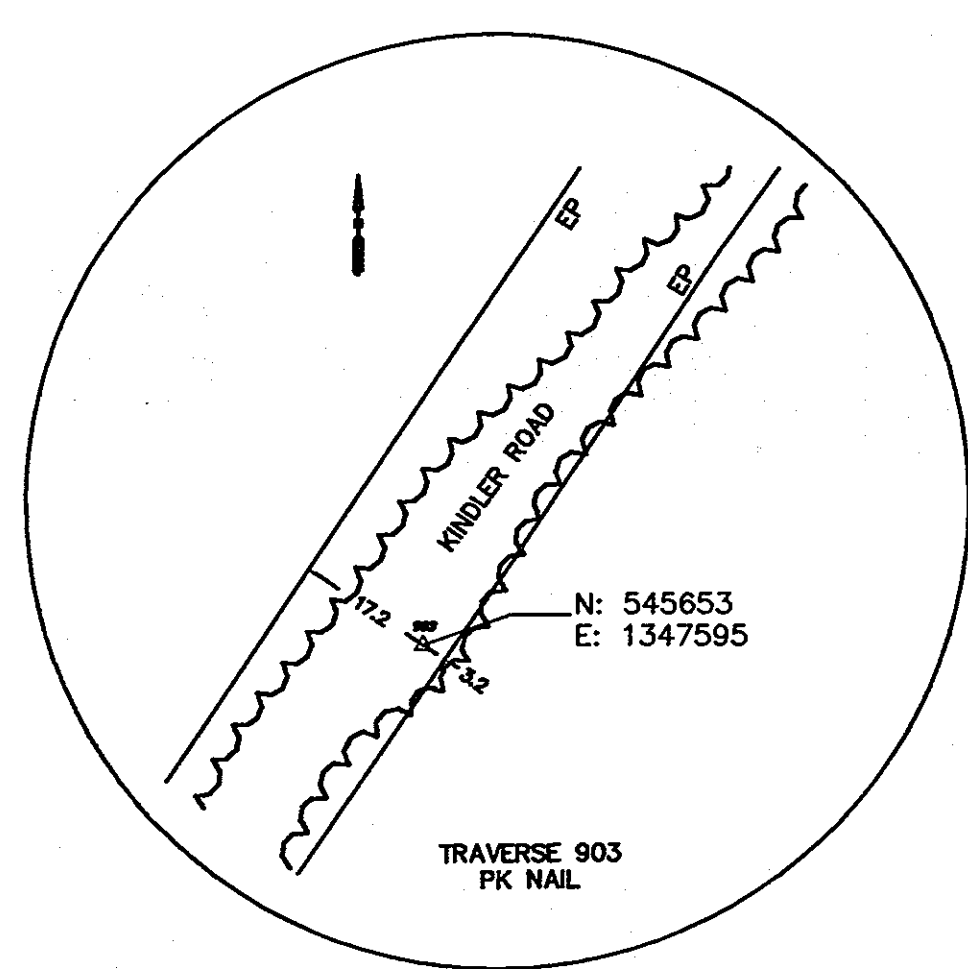
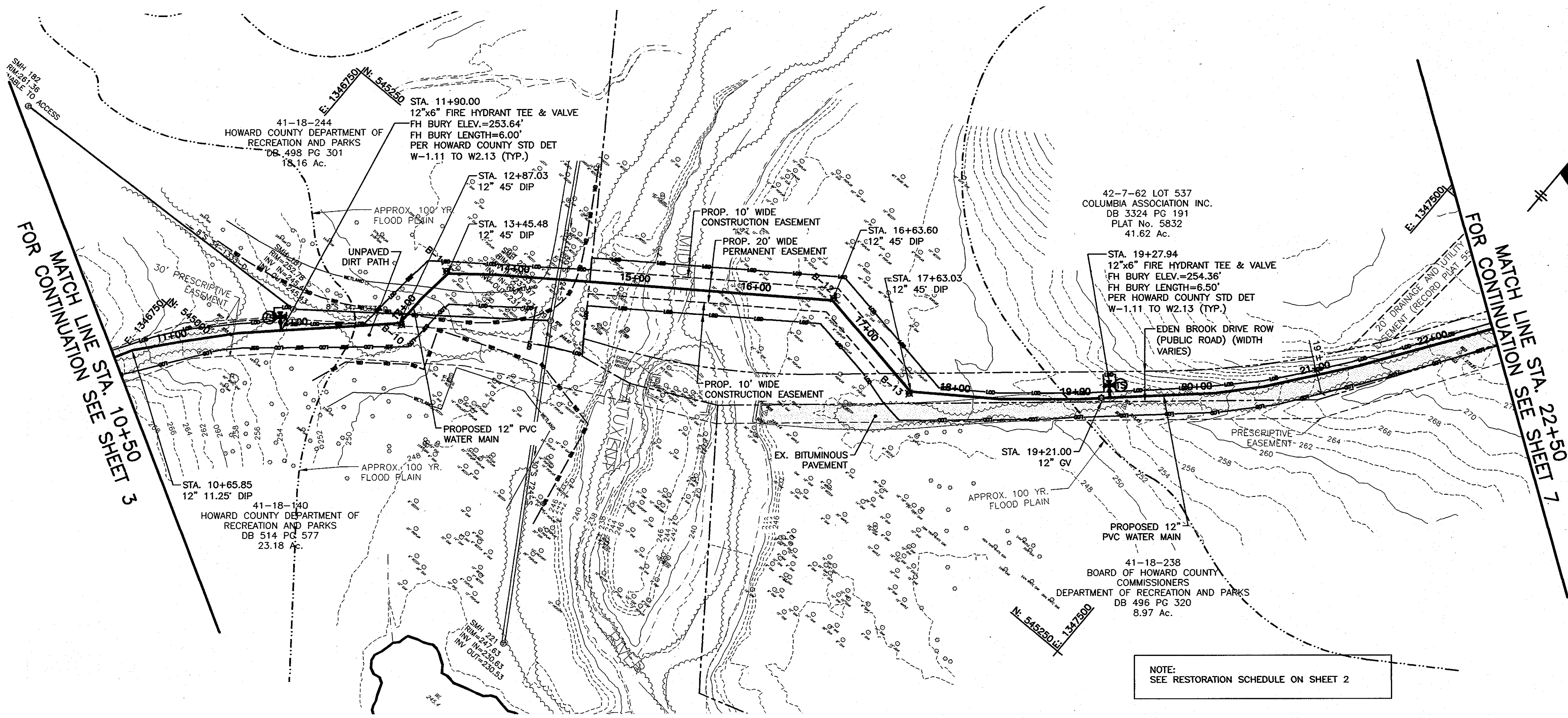
600' SCALE MAP NO. 42 BLOCK NO. 7

KINDLER ROAD - EDEN BROOK DRIVE
 WATER MAIN CONNECTION

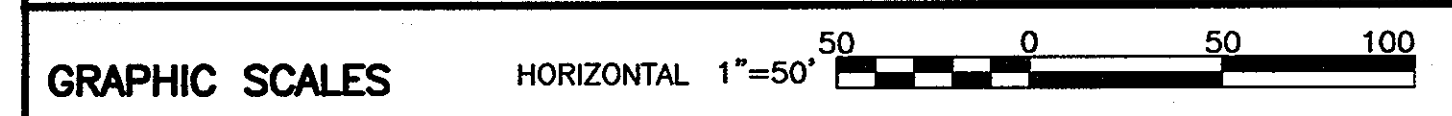
CAPITAL PROJECT: W-8297
 CONTRACT NO.: 44-4675
 ELECTION DISTRICT: 6
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 4 OF 20

I:\HOWARD-CO.2343\45452-KINDLER-ROAD\DOCS\DWG\SHEETS\45452-C108.DWG



NOTE:
SEE RESTORATION SCHEDULE ON SHEET 2



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 10/7/13
 Chief - Bureau of Engineering: *[Signature]* 9/24/13
 Chief, Bureau of Utilities: *[Signature]* 10/1/13
 Chief, Utility Design Division: *[Signature]* 9/24/13

OBIEN & GERE
4201 MITCHELLVILLE ROAD
SUITE 500
BOWIE, MD 20716
PHONE: 301-731-5622

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. 18523, EXPIRATION DATE 12/08/2013

STATE OF MARYLAND
JOHN W. CASPER
REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	RPW				
DRN. BY:	RPW				
CHK. BY:	RJD				
DATE:	AUG, 2013				
BY NO.	RJD 0	AS ISSUED FOR BID	09/13		
		REVISION			

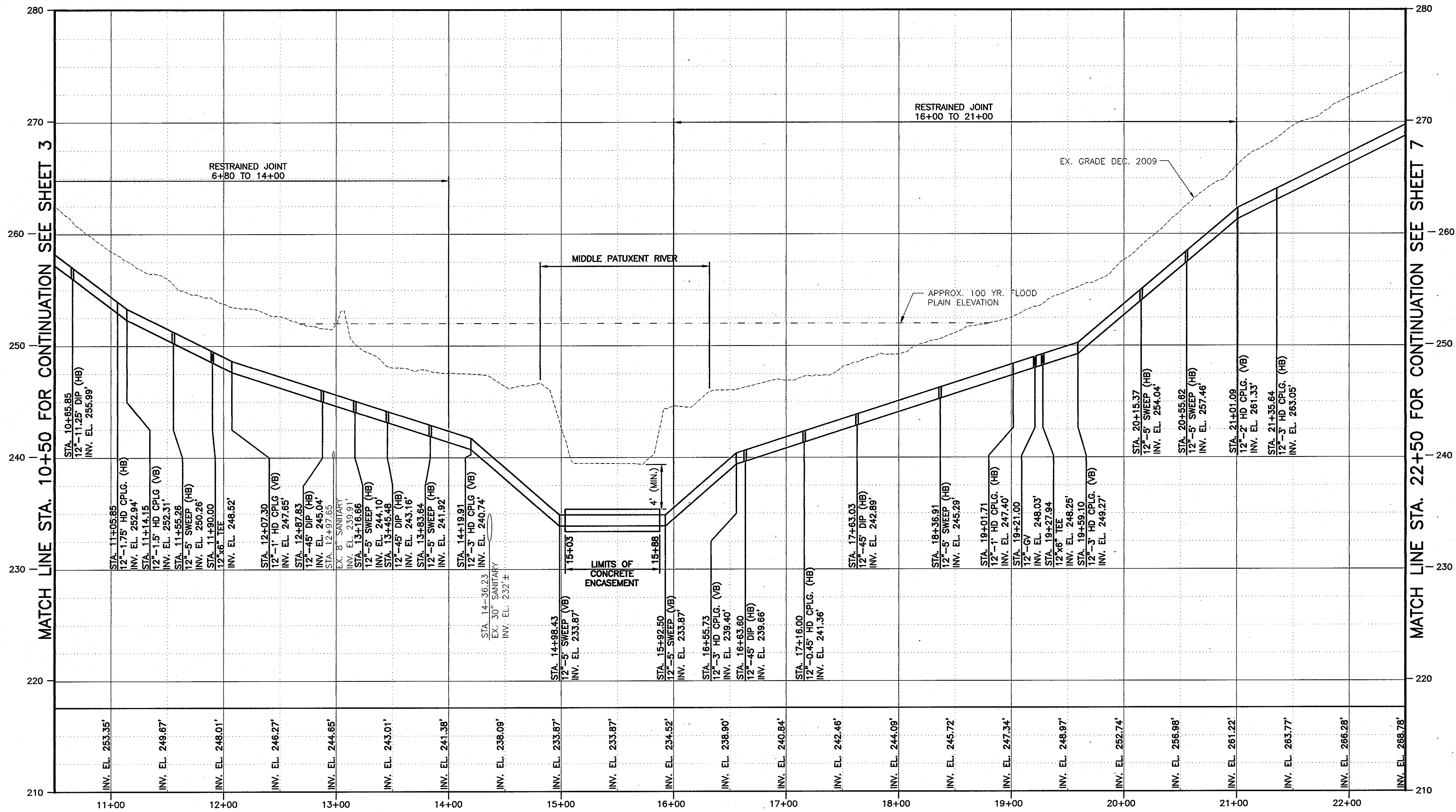
PLAN
STA. 10+50 TO STA. 22+50

600' SCALE MAP NO. 42 BLOCK NO. 7

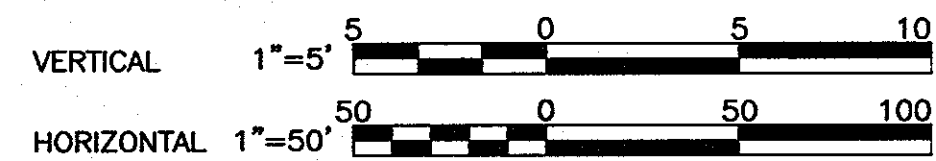
KINDLER ROAD - EDEN BROOK DRIVE WATER MAIN CONNECTION

CAPITAL PROJECT: W-8297
 CONTRACT NO.: 44-4675
 ELECTION DISTRICT: 6
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 5 OF 20



GRAPHIC SCALES



DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Director of Public Works: *[Signature]* 10/2/13
 Chief - Bureau of Engineering: *[Signature]* 9/24/13
 Chief, Bureau of Utilities: *[Signature]* 10/1/13
 Chief, Utility Design Division: *[Signature]* 9/24/13

G OBRIEN & GERE
 4201 MITCHELLVILLE ROAD
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 PHONE: 301-731-5622

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. 18823, EXPIRATION DATE 12/08/2013

DSN. BY:	RPW			
DRN. BY:	RPW			
CHK. BY:	RJD			
DATE:	AUG, 2013	RJD 0	AS ISSUED FOR BID	09/13
BY:	NO.		REVISION	DATE

PROFILE
 STA. 10+50 TO STA. 22+50

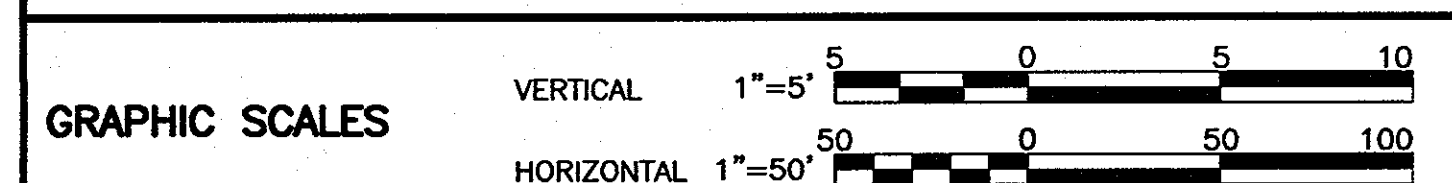
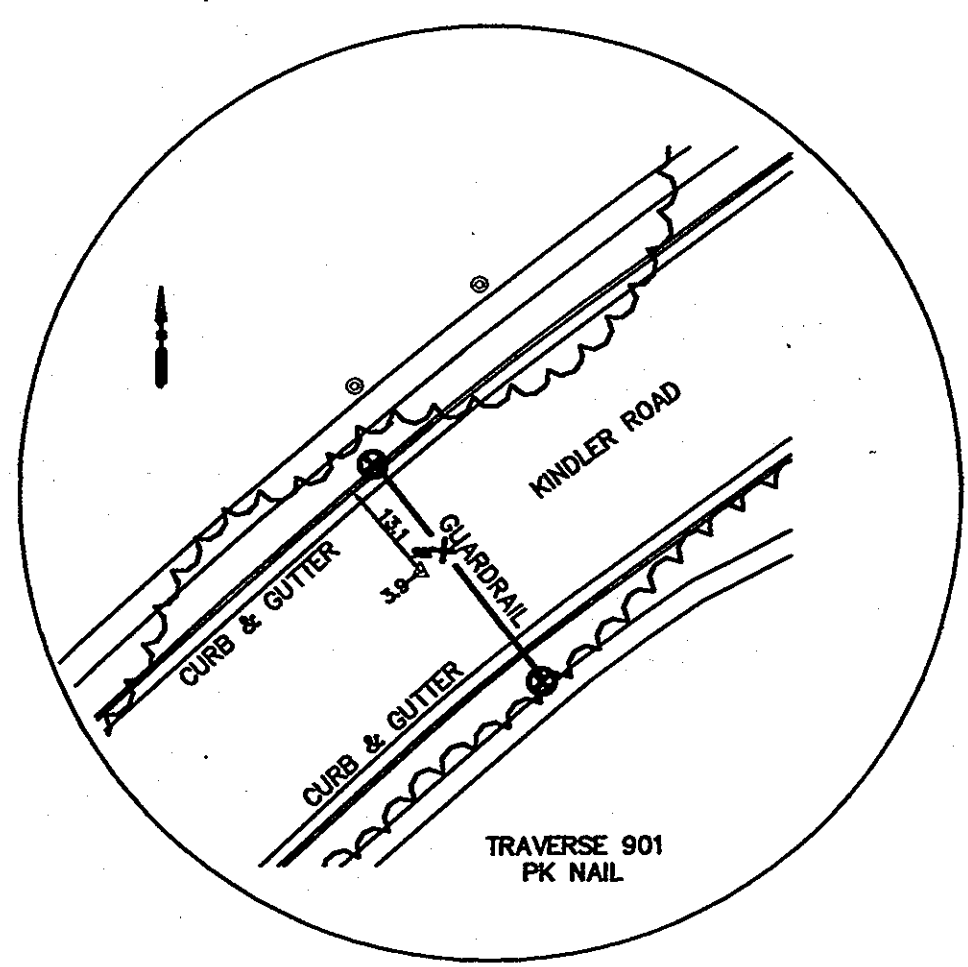
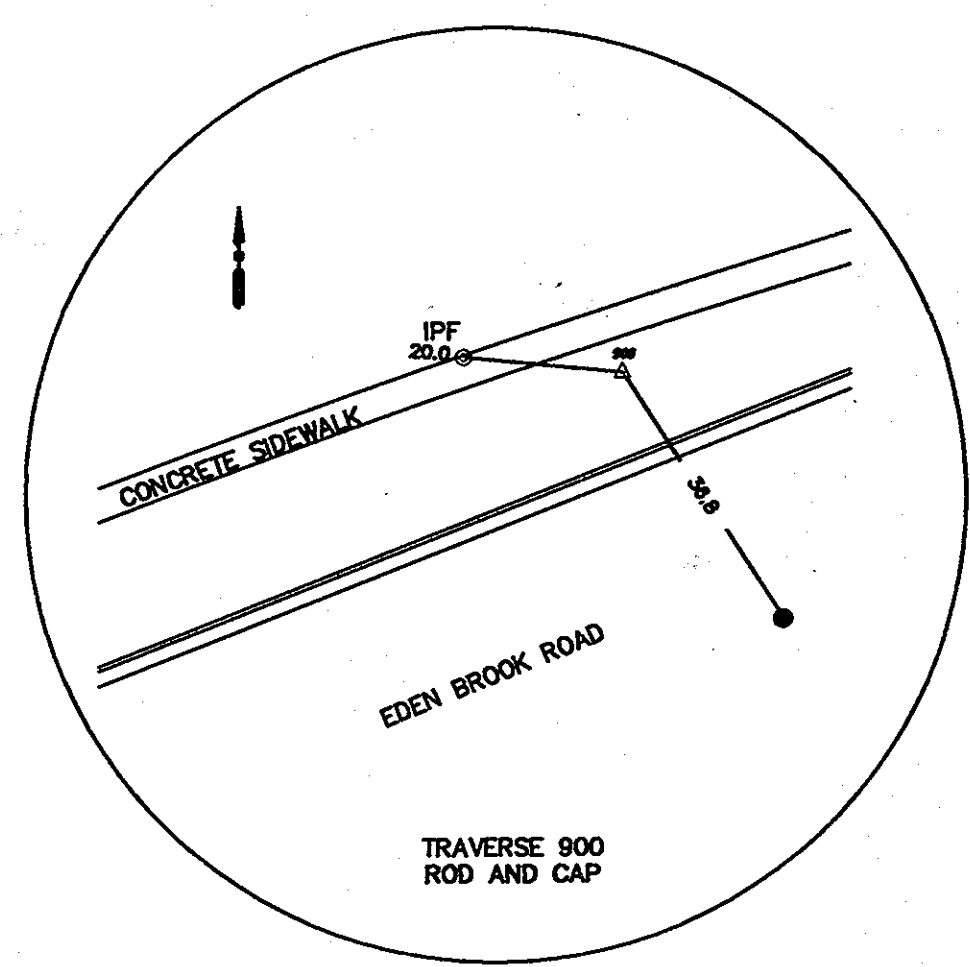
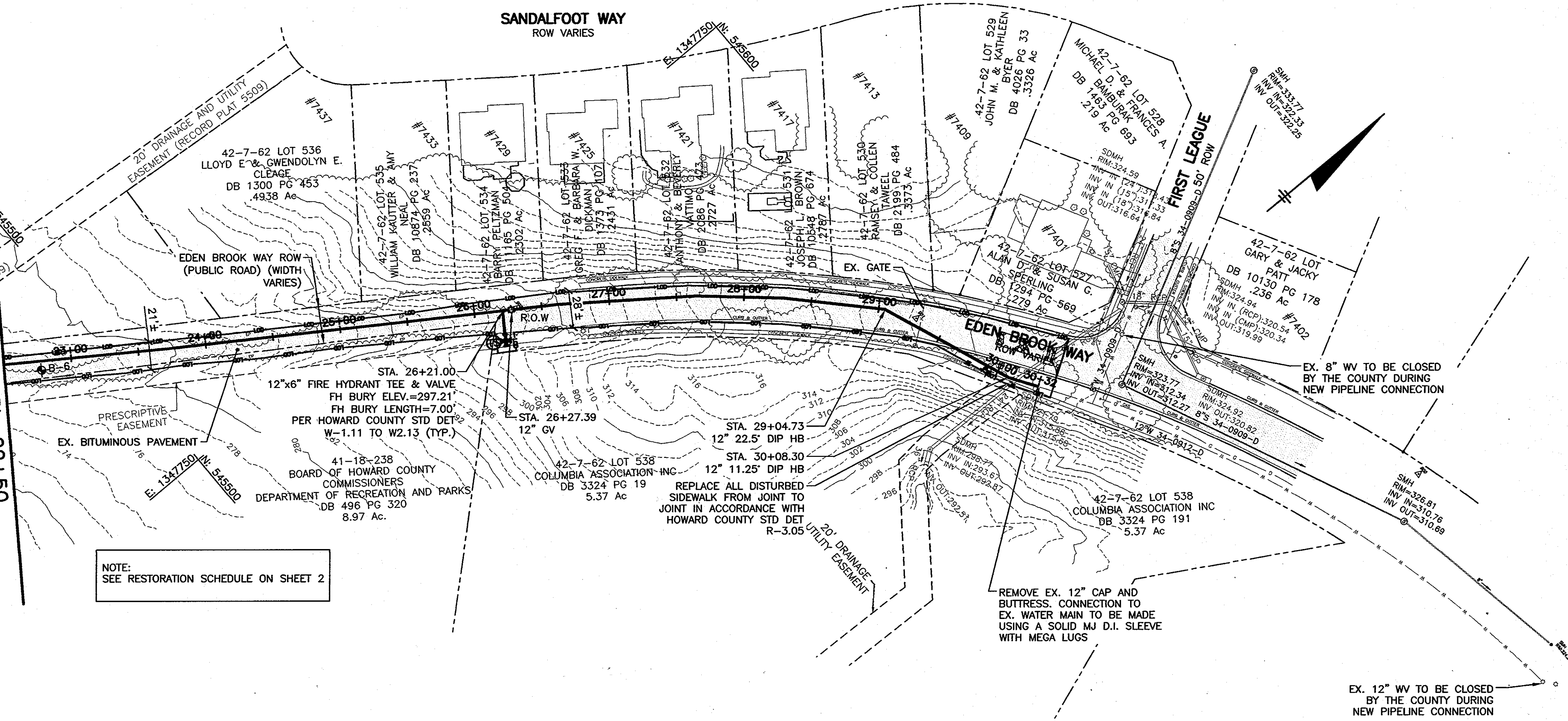
600' SCALE MAP NO. 42 BLOCK NO. 7

KINDLER ROAD - EDEN BROOK DRIVE
 WATER MAIN CONNECTION
 CAPITAL PROJECT: W-8297
 CONTRACT NO.: 44-4675
 ELECTION DISTRICT: 6
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 6 OF 20

MATCH LINE STA. 22+50 FOR CONTINUATION SEE SHEET 5

NOTE:
SEE RESTORATION SCHEDULE ON SHEET 2



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James W. ... 10/7/13
DIRECTOR OF PUBLIC WORKS DATE

Thomas S. ... 9/24/13
CHIEF - BUREAU OF ENGINEERING DATE

... 9/24/13
CHIEF, BUREAU OF UTILITIES DATE

... 9/24/13
CHIEF UTILITY DESIGN DIVISION DATE

O BRIEN & GERE
4201 MITCHELLVILLE ROAD
SUITE 500
BOWIE, MD 20716
PHONE: 301-731-5622

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...
PROFESSIONAL ENGINEER

DSN. BY:	RPW			
DRN. BY:	RPW			
CHK. BY:	RJD			
DATE:	AUG, 2013	RJD 0	AS ISSUED FOR BID	09/13
BY NO.			REVISION	DATE

PLAN
STA. 22+50 TO STA. 30+32

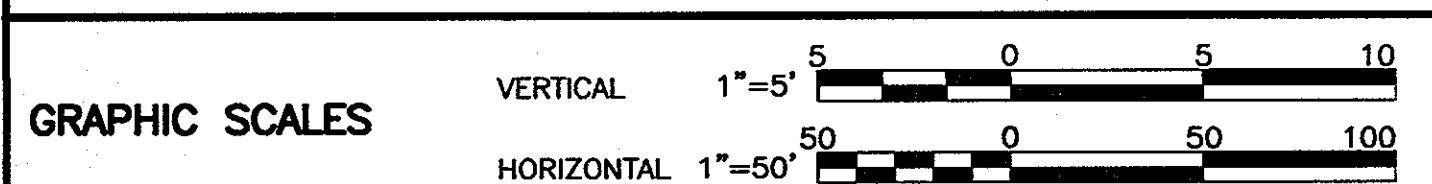
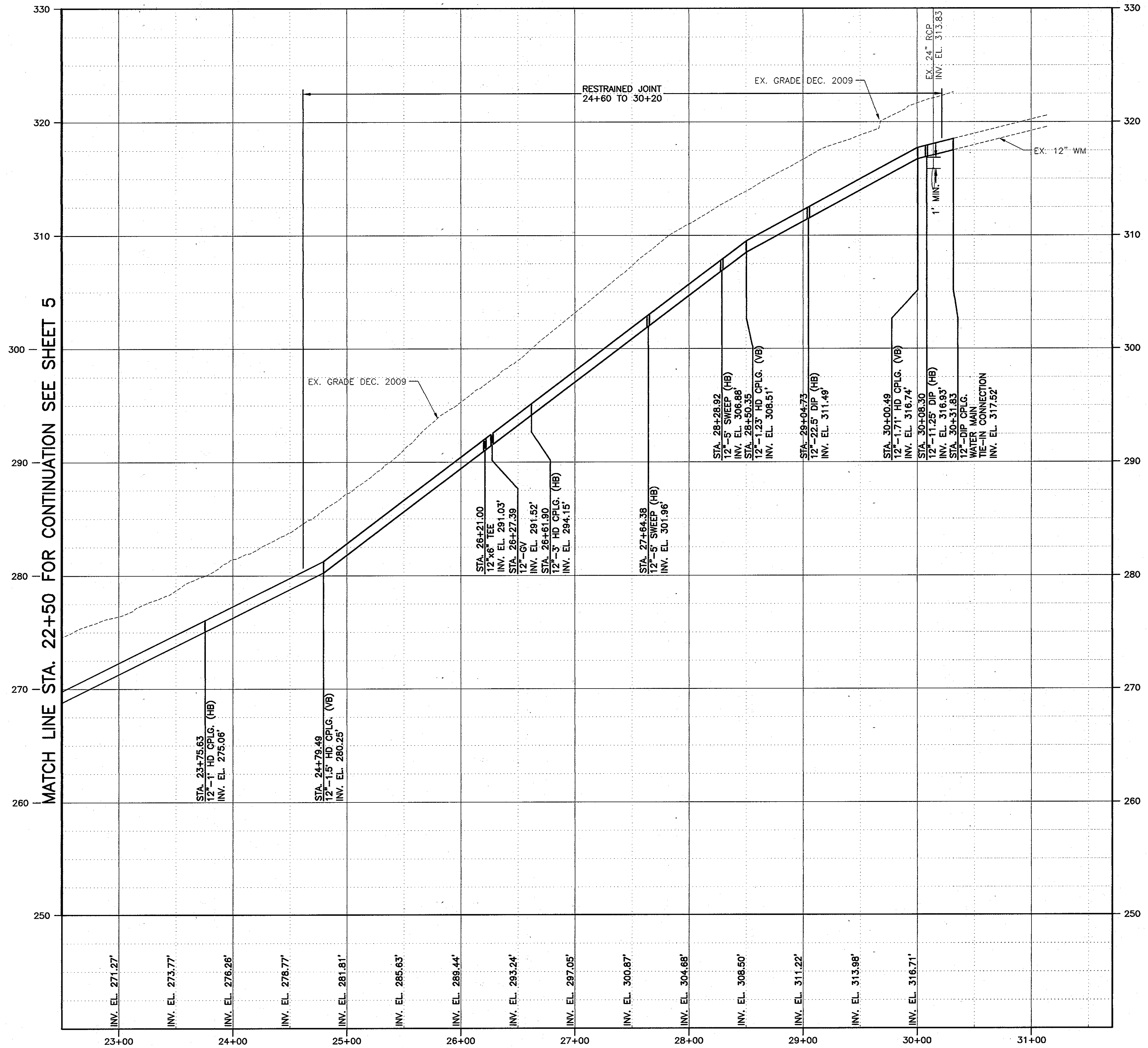
600' SCALE MAP NO. 42 BLOCK NO. 7

KINDLER ROAD - EDEN BROOK DRIVE
WATER MAIN CONNECTION

CAPITAL PROJECT: W-8297
CONTRACT NO.: 44-4675
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 7 OF 20



DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

James G. [Signature] 10/6/13
 DIRECTOR OF PUBLIC WORKS DATE
Thomas G. [Signature] 9/24/13
 CHIEF - BUREAU OF ENGINEERING DATE
Steve [Signature] 10/1/13
 CHIEF, BUREAU OF UTILITIES DATE
[Signature] 9/24/13
 CHIEF, UTILITY DESIGN DIVISION DATE

G OBIEN & GERE
 4201 MITCHELLVILLE ROAD
 SUITE 500
 BOWIE, MD 20716
 PHONE: 301-731-5622

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[Professional Seal]

DSN. BY:	RPW		
DRN. BY:	RPW		
CHK. BY:	RJD		
DATE:	AUG, 2013		
RJD	0	AS ISSUED FOR BID	09/13
BY	NO.	REVISION	DATE

PROFILE
 STA. 22+50 TO STA. 30+32

600' SCALE MAP NO. 42 BLOCK NO. 7

KINDLER ROAD - EDEN BROOK DRIVE
WATER MAIN CONNECTION

CAPITAL PROJECT: W-8297
 CONTRACT NO.: 44-4675
 ELECTION DISTRICT: 6
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 8 OF 20

I:\HOWARD_CO_23431452.KINDLER-ROAD\DWG\DWG3\SH-SHEETS\452-C112.DWG

MINIMUM DIMENSIONS OF BUTTRESS FOR HORIZONTAL BENDS*

DIAMETER (D)	4" & 6"	8"	10"	12"
BEND				
1/2 (11.25")	A 1'-10"	2'-0"	3'-0"	3'-2"
	B 6"	9"	10"	1'-0"
	C 1'-0"	1'-3"	1'-6"	1'-6"
5/8 (22.5")	A 2'-6"	3'-0"	3'-7"	4'-2"
	B 9"	1'-0"	1'-3"	1'-6"
	C 1'-6"	1'-6"	1'-6"	2'-0"
3/4 (45")	A 3'-7"	4'-10"	6'-0"	6'-2"
	B 1'-0"	1'-3"	1'-6"	2'-0"
	C 1'-6"	2'-6"	3'-0"	3'-0"

AREA OF BEARING = A x 2B

BUTTRESS FOR HORIZONTAL BENDS AND VERTICAL LOWER BENDS

MINIMUM DIMENSIONS OF BUTTRESS FOR CAPS AND PLUGS*

SIZE	4" & 6"	8"	10"	12"
D	4" & 6"	8"	10"	12"
E	1'-0"	1'-0"	1'-0"	1'-0"
F	2'-0"	3'-0"	3'-6"	4'-0"
G	4'-10"	5'-3"	6'-5"	8'-0"

AREA OF BEARING = F x C

BUTTRESS FOR CAPS AND PLUGS

ALL BUTTRESS DIMENSIONS ARE BASED ON A TEST PRESSURE OF 200 PSI AND A MINIMUM SOIL BEARING PRESSURE OF 1,000 PSF.

REVISIONS:

Revised	Howard County, Maryland Department of Public Works	WATER MAIN Buttress Cap & Horizontal Bend	Detail W-2.21
Approved	<i>[Signature]</i> Chief, Bureau of Engineering		

ANCHORAGE FOR UPPER VERTICAL BEND

TABLE 'A'

SIZE (D)	1/4 (5")	1/2 (11.25")	3/4 (22.5")
6"	3-#4	3-#4	3-#4
8"	3-#4	3-#4	3-#4
10"	3-#4	3-#4	3-#4
12"	3-#4	3-#4	3-#4

TABLE 'B'

DIAMETER (D)	4" & 6"	8"	10"	12"
BEND				
5"	A 3'-0"	3'-0"	3'-0"	3'-0"
	B 1'-3"	1'-6"	1'-6"	2'-0"
	C 1'-6"	2'-0"	2'-6"	3'-2"
1/2 (11.25")	A 3'-0"	3'-0"	3'-0"	4'-0"
	B 1'-7"	2'-0"	2'-0"	2'-0"
	C 2'-6"	3'-4"	5'-0"	5'-4"
3/4 (22.5")	A 3'-0"	3'-0"	3'-6"	4'-0"
	B 2'-0"	2'-6"	3'-0"	3'-6"
	C 3'-10"	5'-3"	5'-6"	5'-10"

MAXIMUM UPPER VERTICAL BEND SHALL BE 22 1/2°.

REVISIONS:

Revised	Howard County, Maryland Department of Public Works	WATER MAIN Buttress & Anchorage Vertical Bend	Detail W-2.22
Approved	<i>[Signature]</i> Chief, Bureau of Engineering		

TEE & 1/4 BEND

REVISIONS:

Revised	Howard County, Maryland Department of Public Works	WATER MAIN Buttress Tee & 1/4 Bend	Detail W-2.23
Approved	<i>[Signature]</i> Chief, Bureau of Engineering		

PAVEMENT REPAIR DETAIL
NOT TO SCALE

2" MIN. ASPHALT SURFACE COURSE (12.5 MM SUPERPAVE)
3" MIN. ASPHALT BASE COURSE (25.0 MM SUPERPAVE)
COMPACTED 8" GRADED AGGREGATE BASE

NOTES:

- REMOVE EXISTING PAVEMENT TO FULL DEPTH.
- ROLL EXISTING GRADED AGGREGATE BASE TO ACHIEVE MAXIMUM DENSITY.
- INSTALL 3" MINIMUM ASPHALT VASE COURSE, PROVIDED A TACK COAT OF AE-4 EMULSION APPLIED AT THE RATE OF 0.05 GAL/SQ YD. AND INSTALL 2" MINIMUM ASPHALT SURFACE COURSE.
- SAWCUT JOINTS FULL DEPTH OF ASPHALT COURSES, TACK COAT JOINTS IN SURFACE COURSE.
- FOOTPATH SHALL BE REPLACED TO THE EXISTING WIDTH. CONTRACTOR SHALL USE SELECT FILL AS REQUIRED WHERE EXISTING PAVEMENT HAS BEEN REMOVED.

PATHWAY RESTORATION DETAIL
TYPICAL SECTION
NOT TO SCALE

3:1 MAX. SLOPE
SEED & MULCH
4" BITUMINOUS CONCRETE BAND, BF
6" CR-6 COMPACTED & ROLLED COMPACTED SUBGRADE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 10/6/13
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 9/24/13
CHIEF - BUREAU OF ENGINEERING DATE

[Signature] 10/14/13
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 9/24/13
CHIEF, UTILITY DESIGN DIVISION DATE

O BRIEN & GERE

4201 MITCHELLVILLE ROAD
SUITE 500
BOWIE, MD 20716
PHONE: 301-731-5622

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I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 18523
EXPIRATION DATE 12/08/2013

STATE OF MARYLAND
JOHN D. BROWN
PROFESSIONAL ENGINEER

DSN. BY: SSD
DRN. BY: RPW
CHK. BY: RJD
DATE: AUG, 2013

RJD 0
BY NO.

AS ISSUED FOR BID 09/13
REVISION DATE

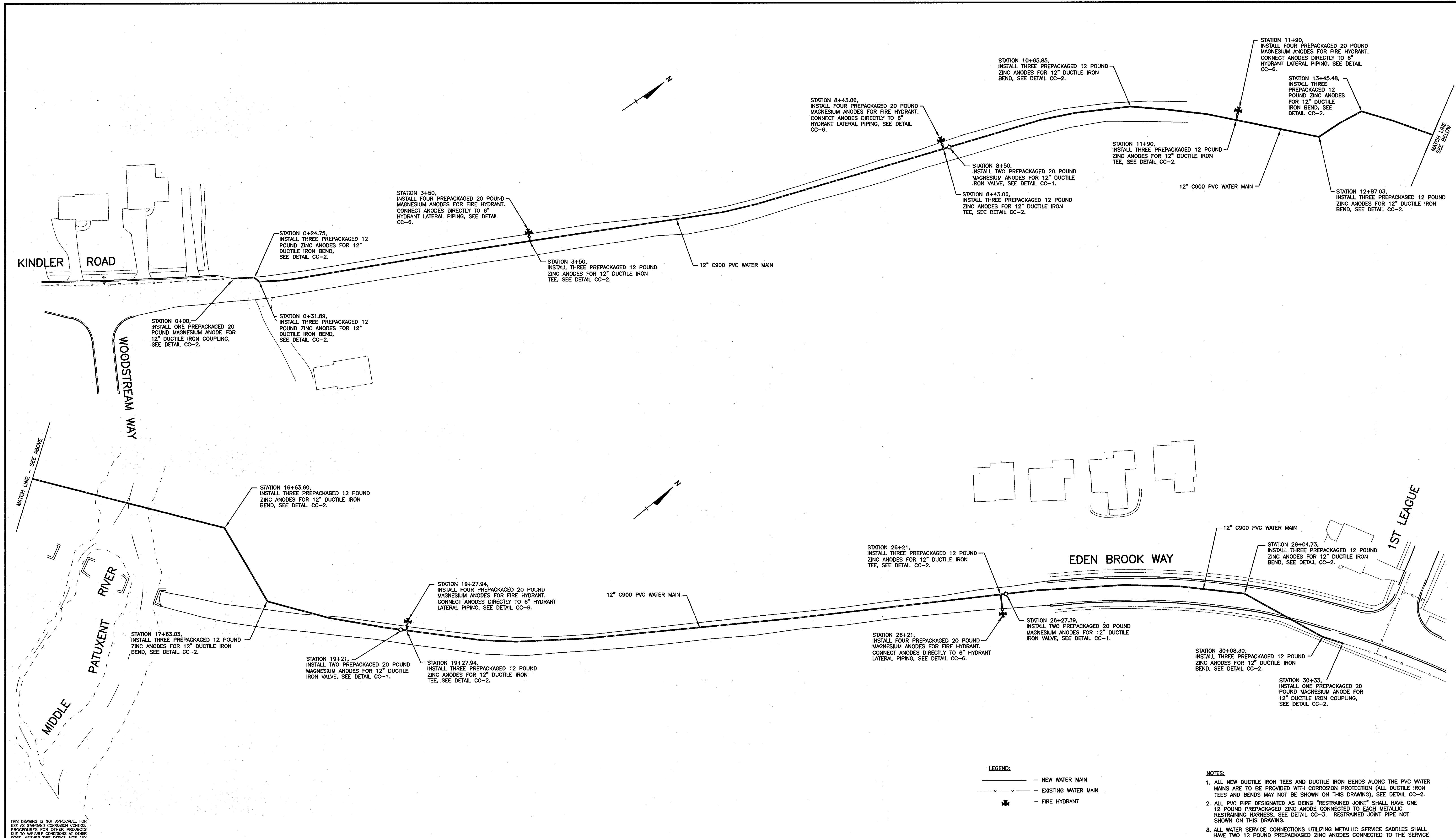
GENERAL DETAILS

600' SCALE MAP NO. 42 BLOCK NO. 7

KINDLER ROAD - EDEN BROOK DRIVE
WATER MAIN CONNECTION

CAPITAL PROJECT: W-8297
CONTRACT NO.: 44-4675
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 9 OF 20



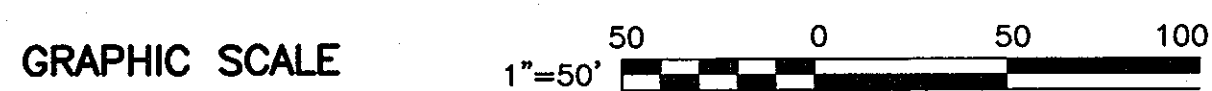
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CATHODIC PROTECTION LAYOUT

SCALE: 1"=50'

- LEGEND:**
- NEW WATER MAIN
 - - - EXISTING WATER MAIN
 - ⊕ FIRE HYDRANT

- NOTES:**
1. ALL NEW DUCTILE IRON TEES AND DUCTILE IRON BENDS ALONG THE PVC WATER MAINS ARE TO BE PROVIDED WITH CORROSION PROTECTION (ALL DUCTILE IRON TEES AND BENDS MAY NOT BE SHOWN ON THIS DRAWING). SEE DETAIL CC-2.
 2. ALL PVC PIPE DESIGNATED AS BEING "RESTRAINED JOINT" SHALL HAVE ONE 12 POUND PREPACKAGED ZINC ANODE CONNECTED TO EACH METALLIC RESTRAINING HARNESS. SEE DETAIL CC-3. RESTRAINED JOINT PIPE NOT SHOWN ON THIS DRAWING.
 3. ALL WATER SERVICE CONNECTIONS UTILIZING METALLIC SERVICE SADDLES SHALL HAVE TWO 12 POUND PREPACKAGED ZINC ANODES CONNECTED TO THE SERVICE SADDLE (SEE DETAIL CC-4), AND AN INSULATING CORPORATION INSTALLED TO ELECTRICALLY ISOLATE THE COPPER SERVICE FROM THE SERVICE SADDLE (SEE DETAIL CC-8). ALL WATER SERVICES MAY NOT BE SHOWN ON THIS DRAWING.
 4. DO NOT THERMITE WELD TO PVC PIPE.
 5. POLYETHYLENE ENCASUREMENT SHALL NOT BE INSTALLED ON ANY DUCTILE IRON PIPE OR FITTINGS.



DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Director of Public Works: *Ray J. ...* 10/16/13
 Chief, Bureau of Engineering: *Thomas E. ...* 9/24/13
 Chief, Bureau of Utilities: *Steve ...* 10/16/13
 Chief, Utility Design Division: *...* 9/24/13

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. 17083, EXPIRATION DATE 9/27/2014

DSN. BY: DJD					
DRN. BY: DJD					
CHK. BY: MJS					
DATE: AUGUST 2013	BY	NO.	REVISION	DATE	

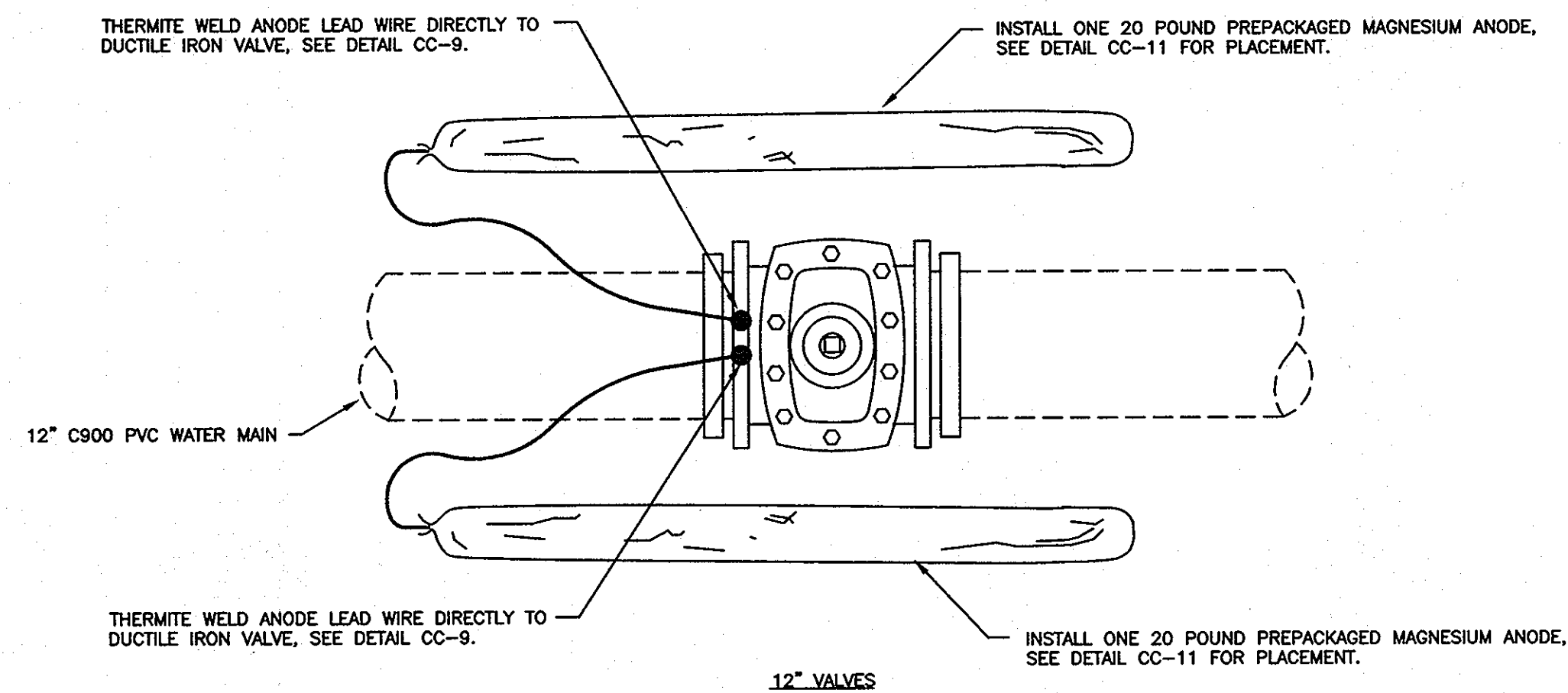
CATHODIC PROTECTION LAYOUT

600' SCALE MAP NO. _____ BLOCK NO. _____

KINDLER ROAD - EDEN BROOK DRIVE WATER MAIN CONNECTION

CAPITAL PROJECT: W-8297
 CONTRACT NO.: 44-4675
 ELECTION DISTRICT: 6
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 11 OF 20
 FILE NO. 45452-

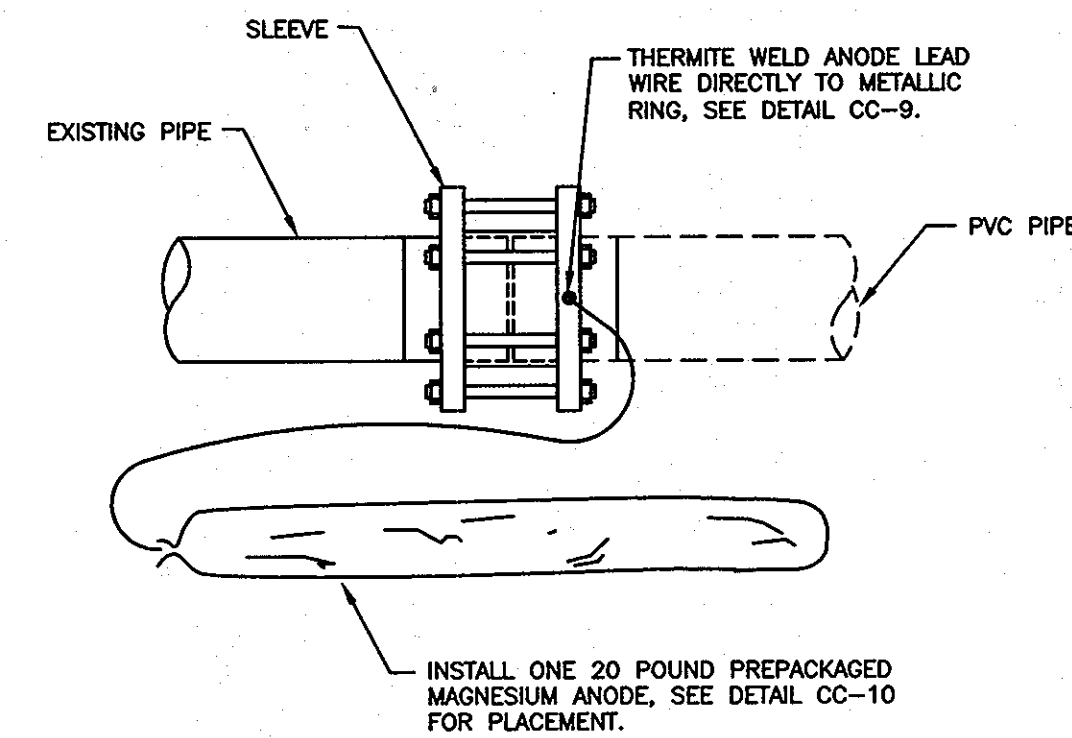


NOTES:

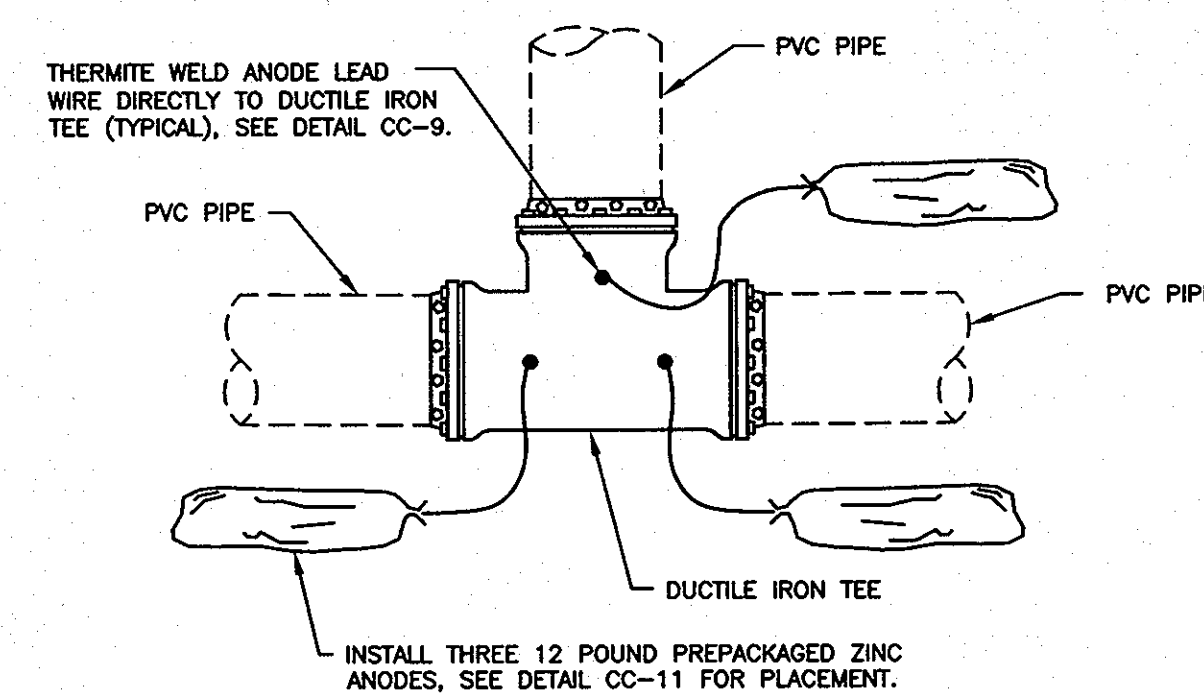
1. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 12" FROM EDGE OF PIPE, SEE DETAIL CC-11.
2. DO NOT THERMITE WELD TO PVC PIPE.

CC-1: CORROSION PROTECTION FOR DUCTILE IRON VALVES

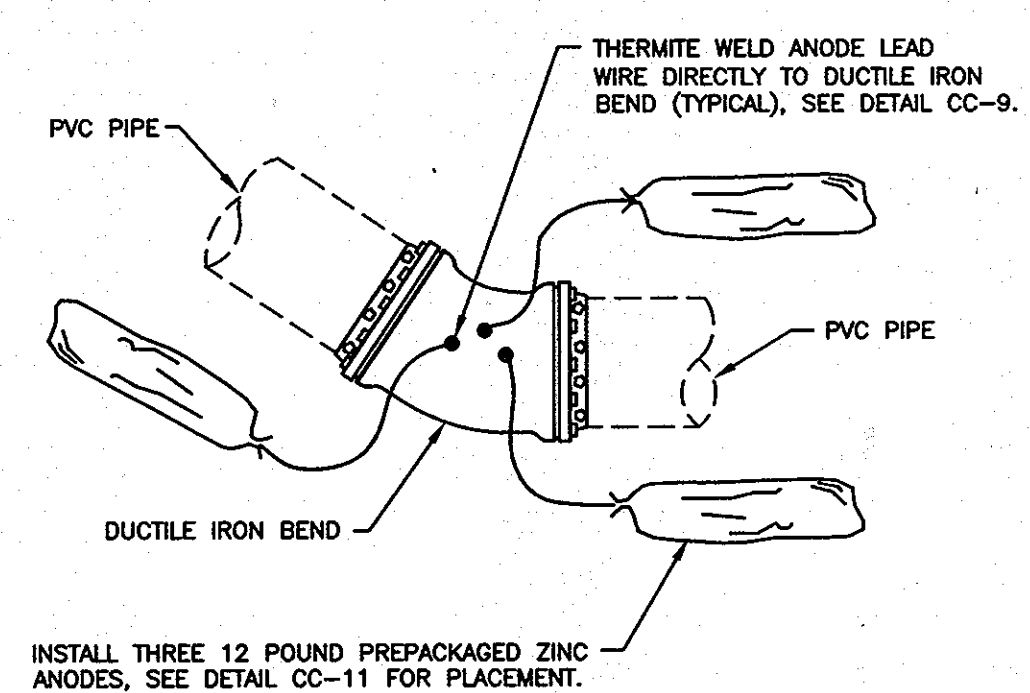
NOT TO SCALE



COUPLING



TEE



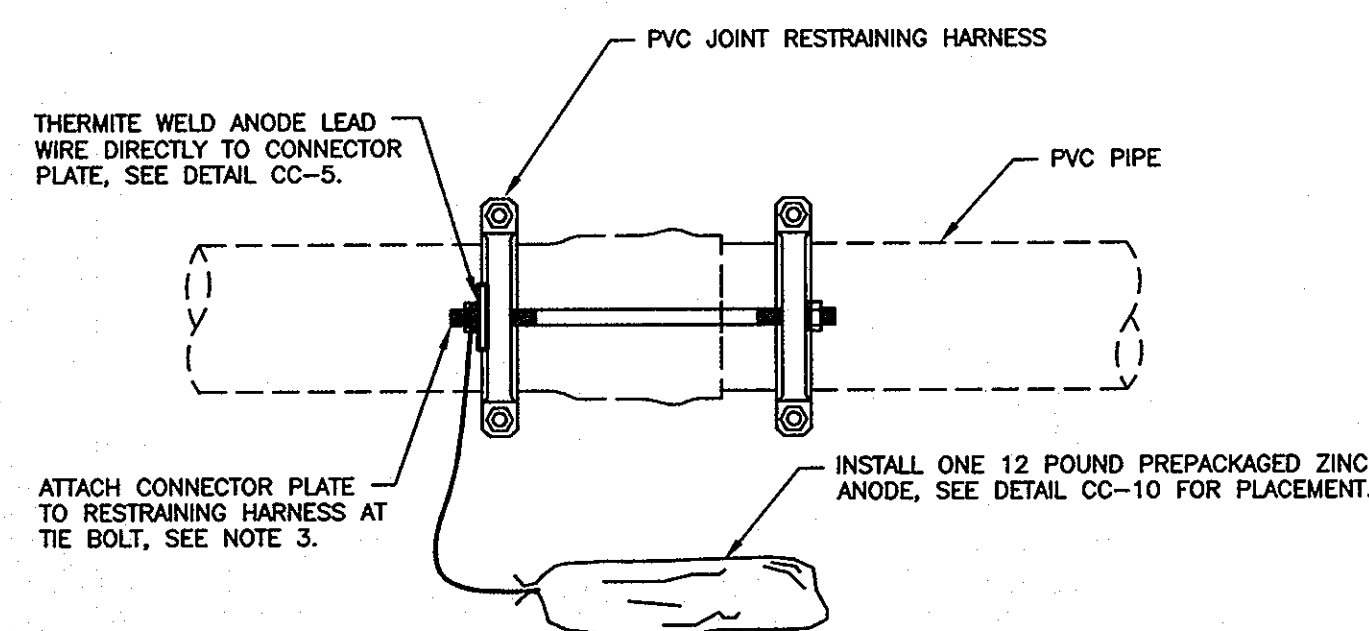
BEND

NOTES:

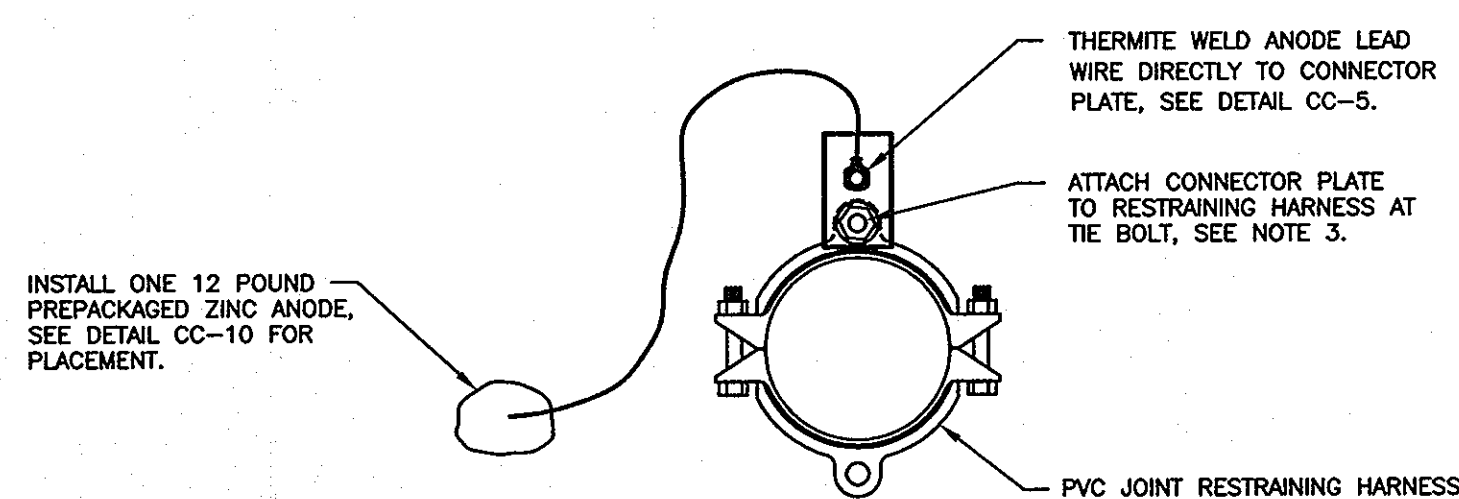
1. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 12" FROM EDGE OF PIPE, SEE DETAILS CC-10 AND CC-11.
2. DO NOT THERMITE WELD TO PVC PIPE.

CC-2: CORROSION PROTECTION FOR DUCTILE IRON FITTINGS

NOT TO SCALE



PLAN VIEW



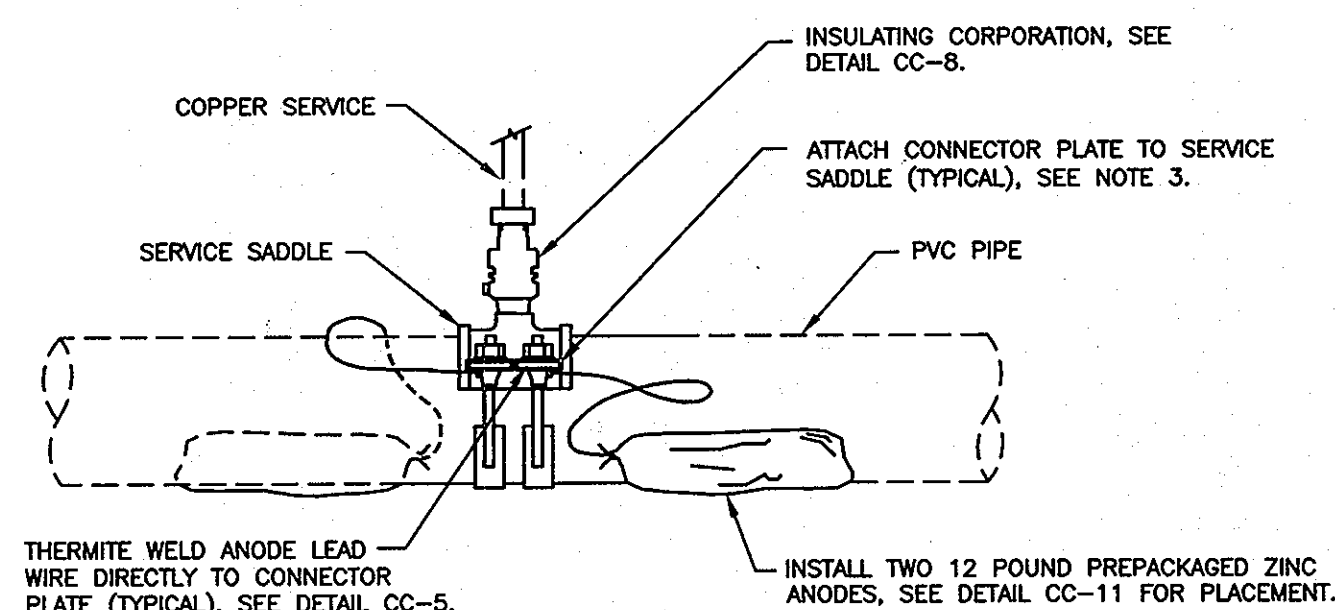
SECTION VIEW

NOTES:

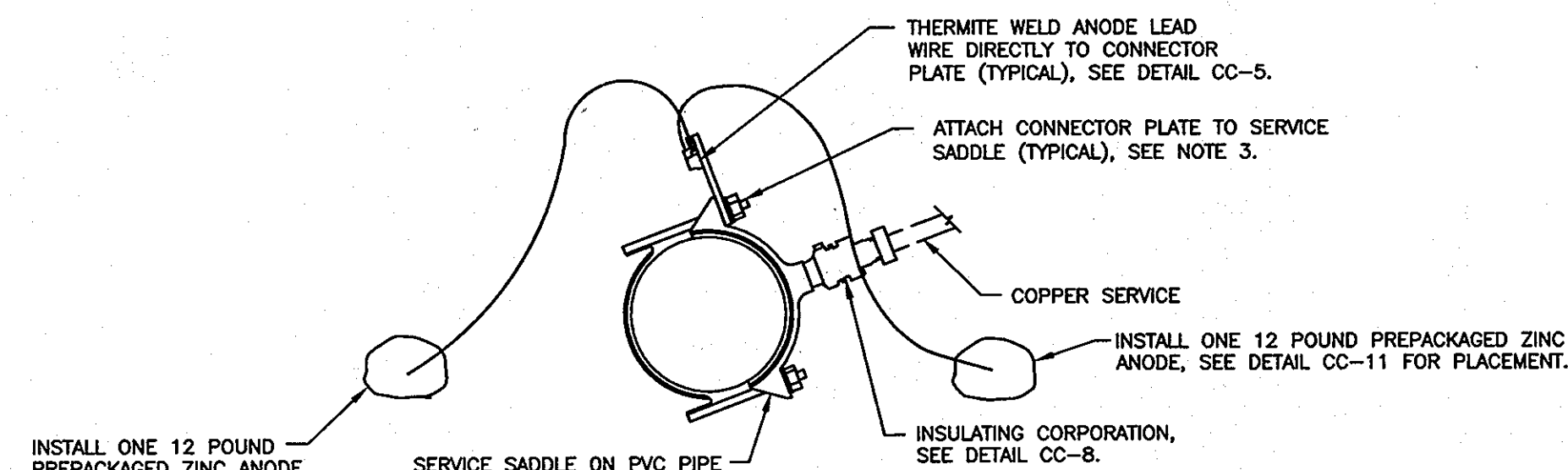
1. ANODE LEAD WIRE TO BE THERMITE WELDED TO CONNECTOR PLATE PRIOR TO ATTACHING CONNECTOR PLATE TO RESTRAINING HARNESS.
2. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 12" FROM EDGE OF PIPE, SEE DETAIL CC-10.
3. REMOVE COATING FROM RESTRAINING HARNESS WHERE CONNECTOR PLATE IS TO BE MOUNTED. REMOVE COATING IMMEDIATELY PRIOR TO ATTACHING THE CONNECTOR PLATE.
4. DO NOT THERMITE WELD TO PVC PIPE.

CC-3: CORROSION PROTECTION OF RESTRAINING HARNESS

NOT TO SCALE



PLAN VIEW



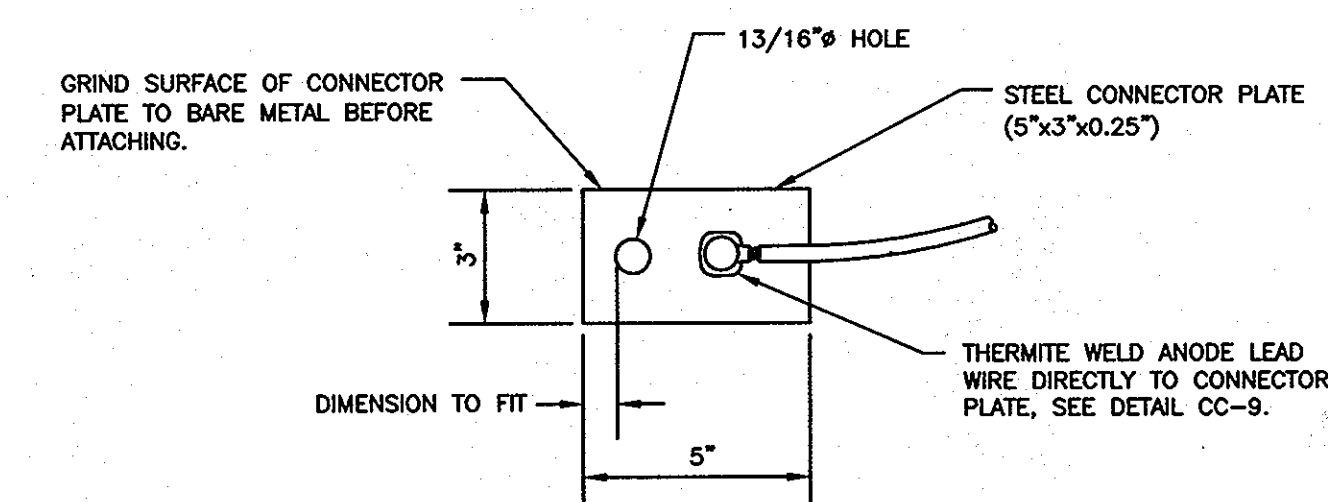
SECTION VIEW

NOTES:

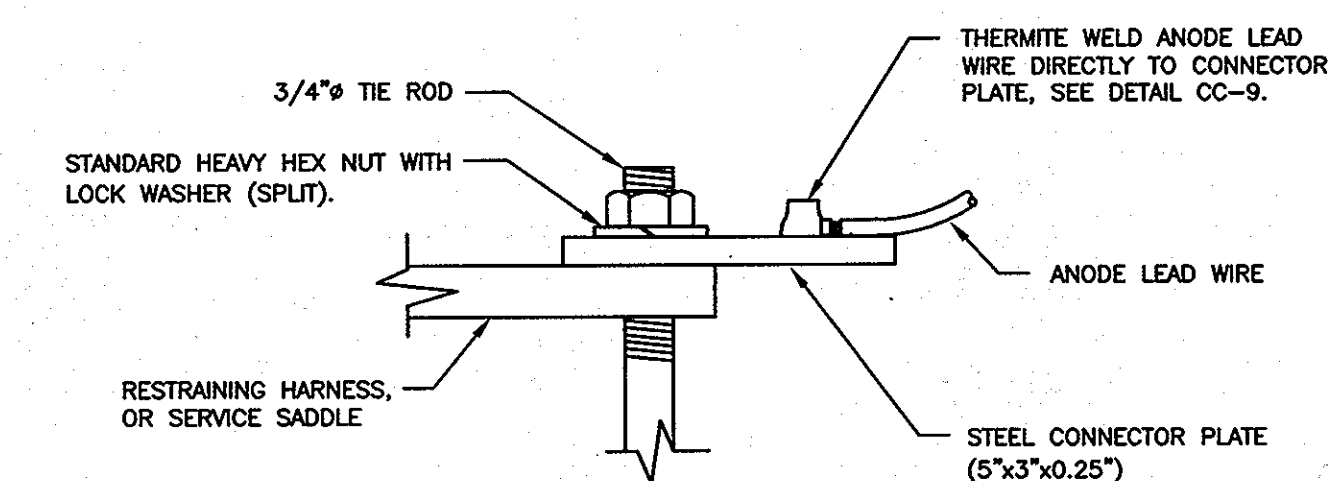
1. ANODE LEAD WIRES TO BE THERMITE WELDED TO CONNECTOR PLATES PRIOR TO ATTACHING CONNECTOR PLATES TO SERVICE SADDLE.
2. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 12" FROM EDGE OF PIPE, SEE DETAIL CC-11.
3. REMOVE COATING FROM SERVICE SADDLE WHERE CONNECTOR PLATE IS TO BE MOUNTED. REMOVE COATING IMMEDIATELY PRIOR TO ATTACHING THE CONNECTOR PLATE.
4. DO NOT THERMITE WELD TO PVC PIPE.

CC-4: CORROSION PROTECTION OF SERVICE SADDLE

NOT TO SCALE



PLAN VIEW



SIDE VIEW

NOTES:

1. ANODE LEAD WIRE TO BE THERMITE WELDED TO CONNECTOR PLATE 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.

CC-5: CONNECTOR PLATE DETAIL

NOT TO SCALE

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DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Director of Public Works: *John J. ...* 10/2/13
 Chief, Bureau of Engineering: *Marcus P. ...* 7/24/13
 Chief, Bureau of Utilities: *...* 10/2/13
 Chief, Utility Design Division: *...* 7/24/13

RUSSELL CORROSION CONSULTANTS, INC.
 Columbia, Maryland

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DSN. BY: DJD					
DRN. BY: DJD					
CHK. BY: MJS					
DATE: AUGUST 2013	BY	NO.	REVISION	DATE	

CATHODIC PROTECTION DETAILS - 1

600' SCALE MAP NO. _____ BLOCK NO. _____

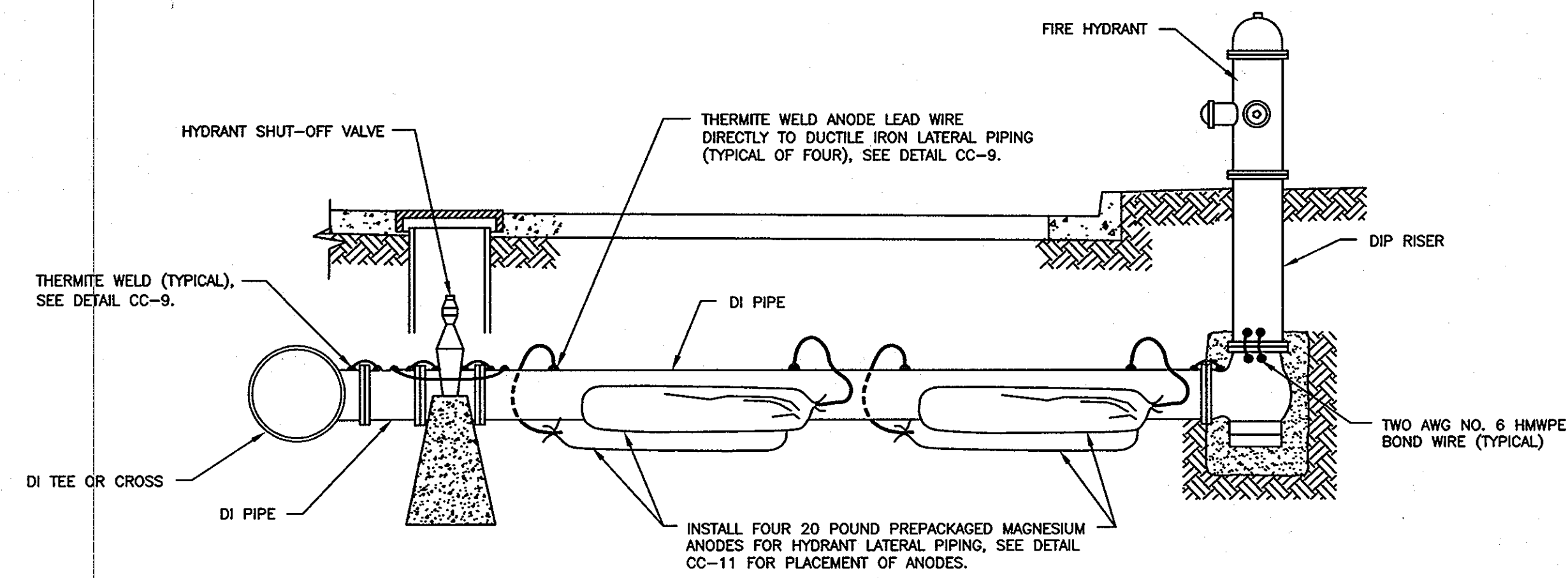
KINDLER ROAD - EDEN BROOK DRIVE WATER MAIN CONNECTION

CAPITAL PROJECT: W-8297
 CONTRACT NO.: 44-4675
 ELECTION DISTRICT: 6
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 12 OF 20

FILE NO. 45452-

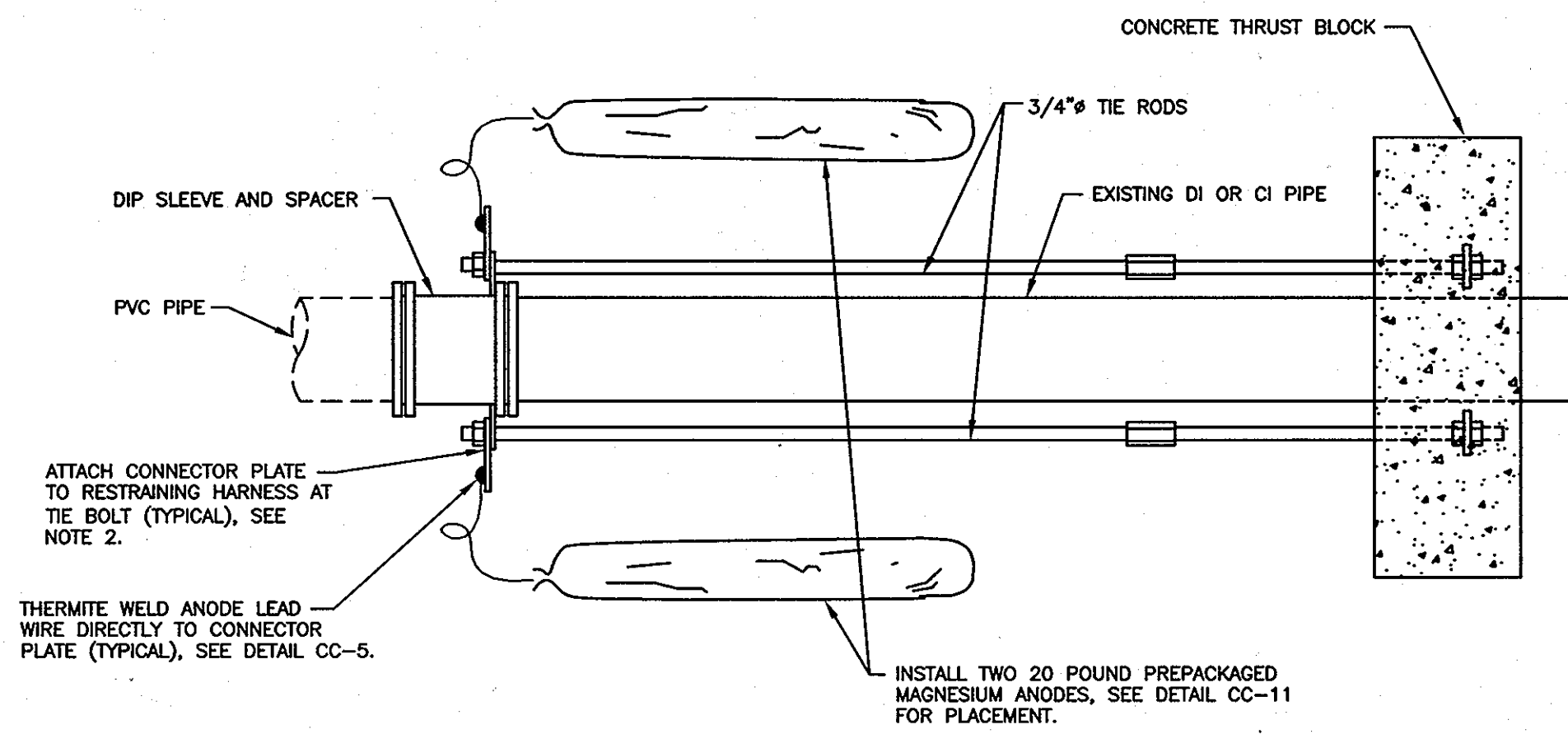


NOTES:

1. BOND ALL DUCTILE IRON COMPONENTS TOGETHER WITH AWG NO. 6 HMWPE CABLES. INSTALL A MINIMUM OF TWO BOND CABLES ACROSS EACH DUCTILE IRON PIPE JOINT.
2. INSTALL BOND WIRES ON TOP OF DUCTILE IRON PIPE OR DUCTILE IRON FITTING WHERE POSSIBLE.
3. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 12 INCHES FROM EDGE OF PIPE, SEE DETAIL CC-11.
4. INSTALL BOND CABLES ON HYDRANT RISER PIPE AND RISER BEND BEFORE INSTALLING HYDRANT.
5. DO NOT THERMITE WELD TO PVC PIPE.

CC-6: CORROSION PROTECTION AT FIRE HYDRANT

SCALE: NONE

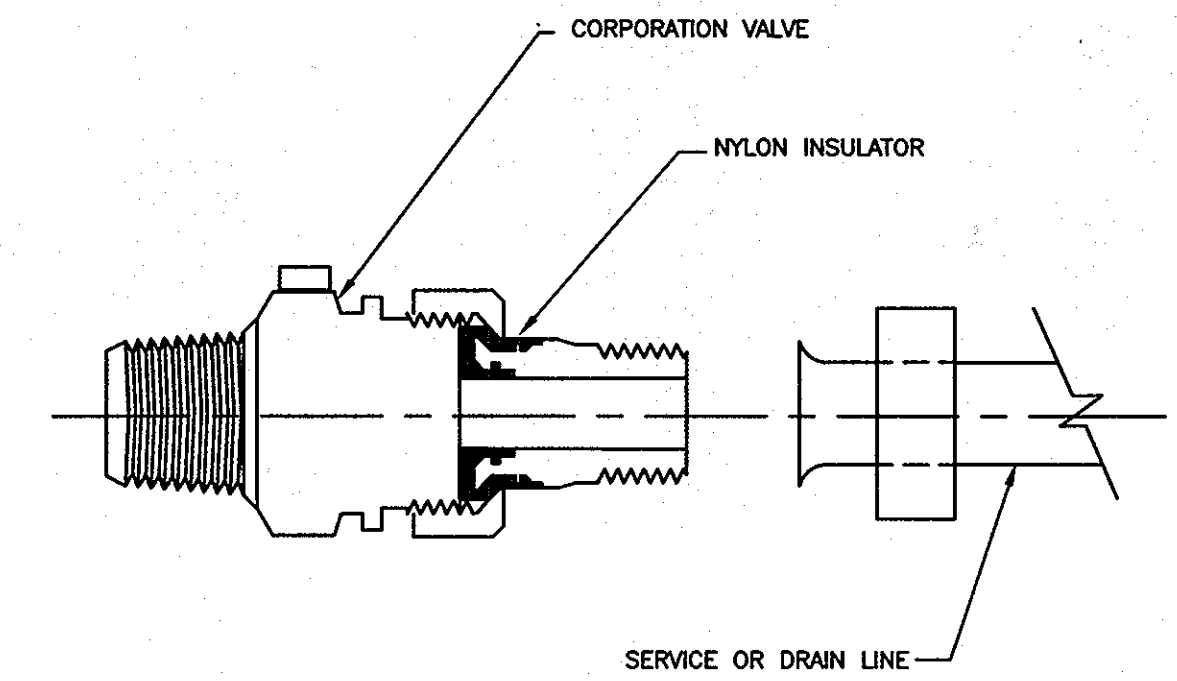


NOTES:

1. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 12" FROM EDGE OF PIPE, SEE DETAIL CC-11.
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.

CC-7: CORROSION PROTECTION AT IN-LINE THRUST BLOCK

NOT TO SCALE

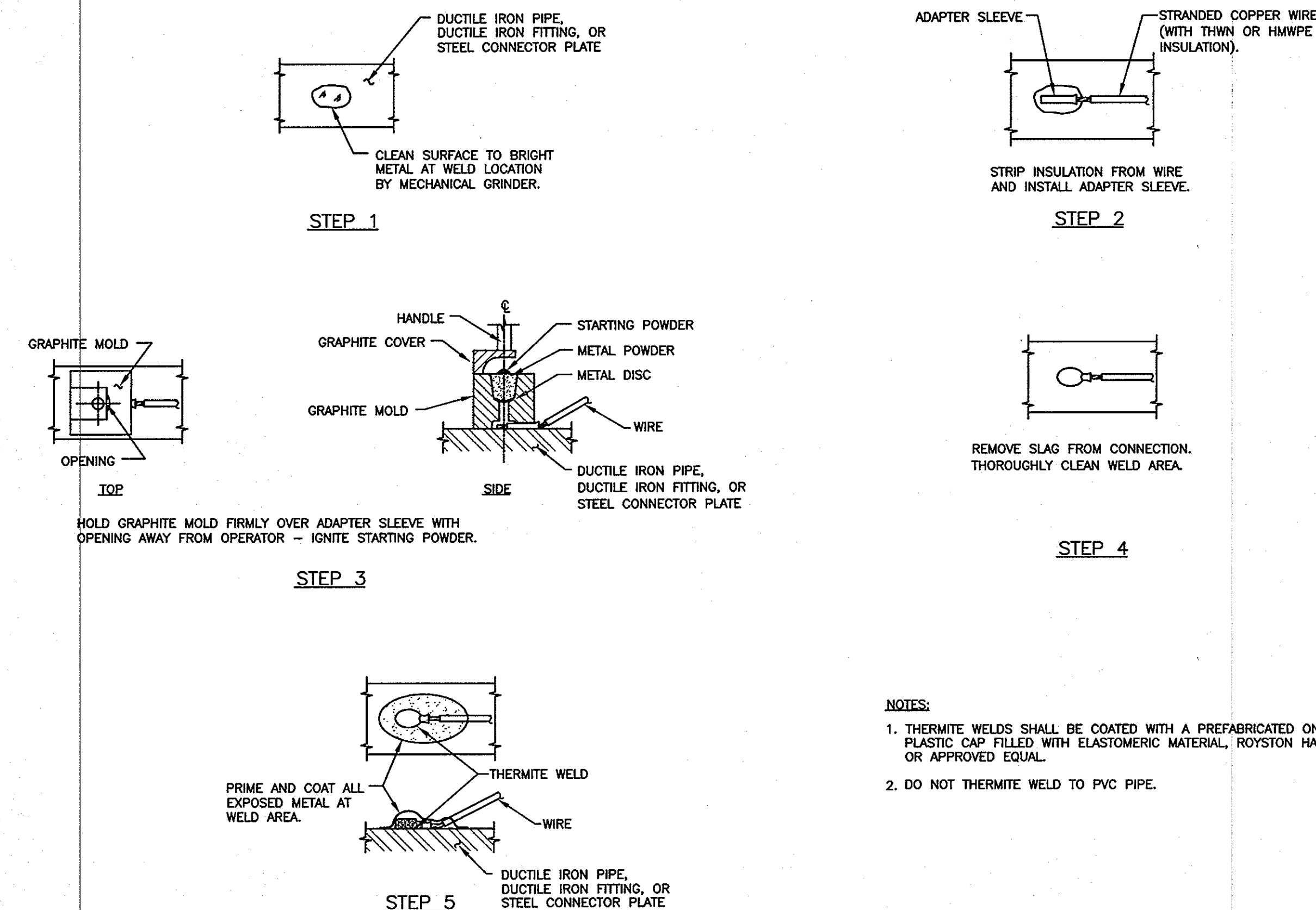


NOTES:

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.

CC-8: INSULATING CORPORATION

NOT TO SCALE

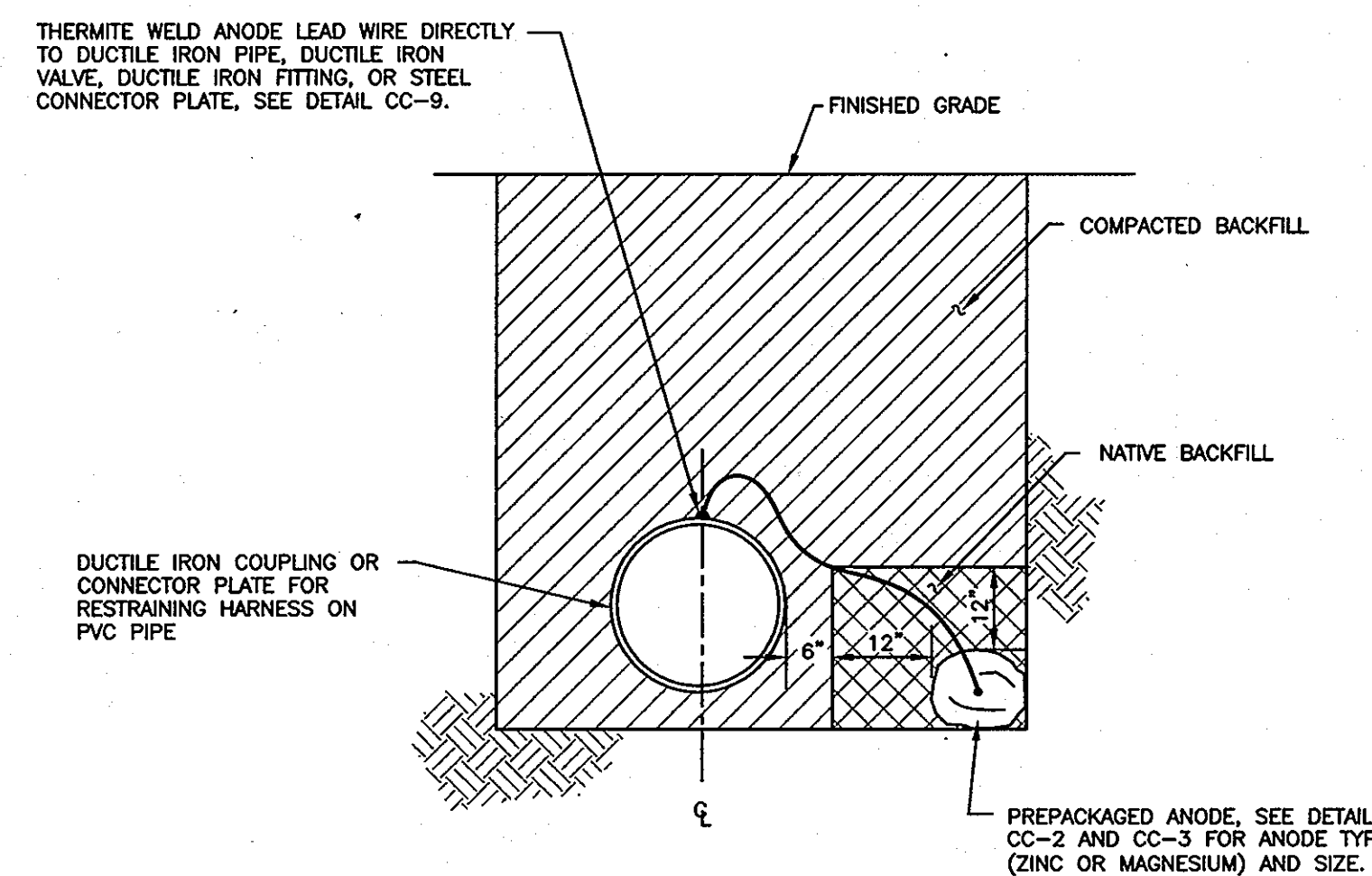


NOTES:

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.

CC-9: HORIZONTAL THERMITE WELD

SCALE: NONE

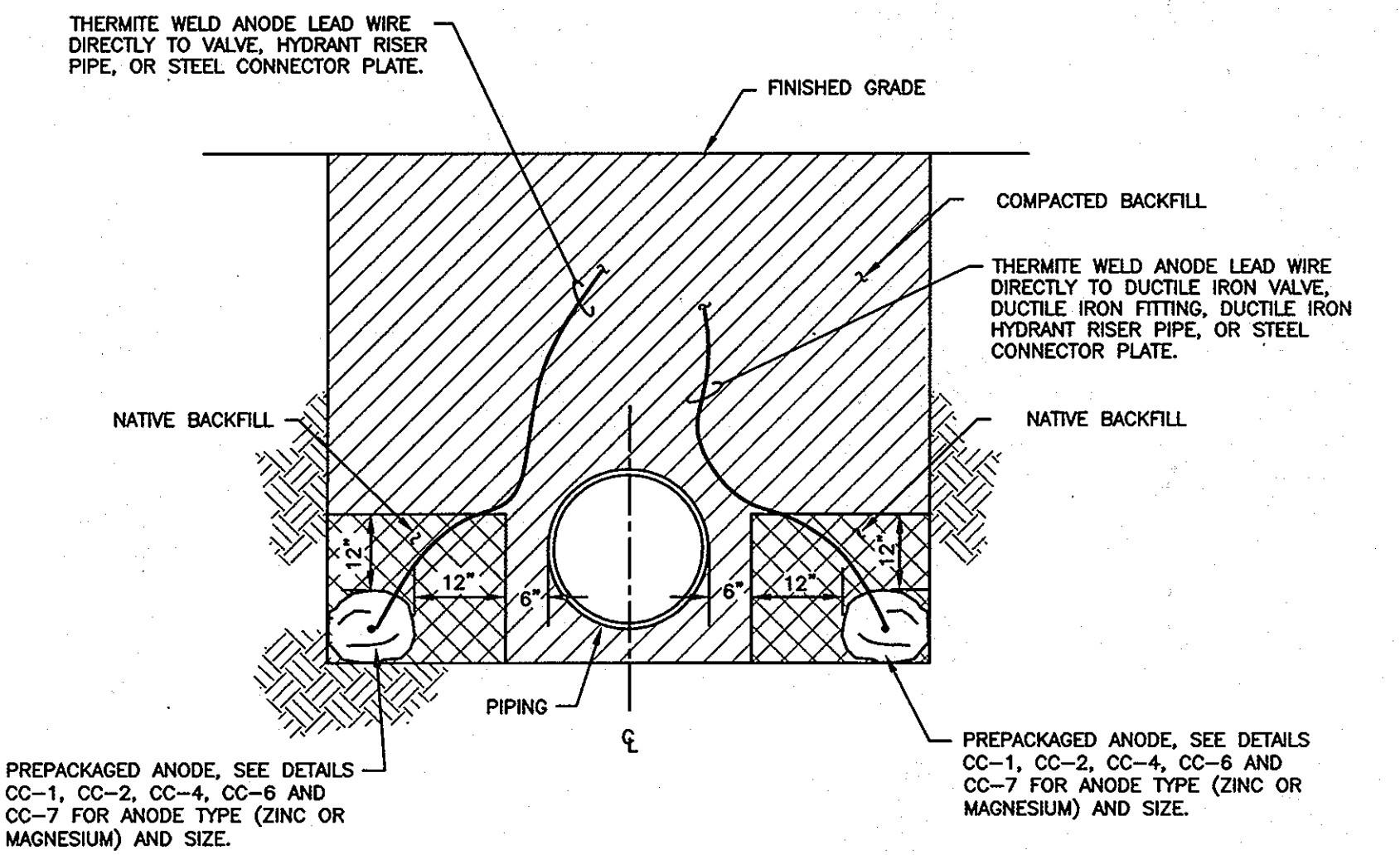


NOTES:

1. INSTALL ANODE IN NATIVE SOIL. DO NOT BACKFILL ANODE WITH SAND OR STONE.
2. DO NOT THERMITE WELD TO PVC PIPE.

CC-10: SINGLE ANODE PLACEMENT

NOT TO SCALE



NOTES:

1. WHEN INSTALLING ANODES AT HYDRANTS, ATTACH ANODE LEADS TO HYDRANT LATERAL PIPE, SEE DETAIL CC-6.
2. INSTALL ANODES A MINIMUM OF 12 INCHES FROM PIPE.
3. BACKFILL ANODES WITH NATIVE SOIL FOR A MINIMUM OF 12 INCHES ON ALL SIDES. DO NOT BACKFILL ANODES WITH SAND OR STONE.
4. DO NOT THERMITE WELD TO PVC PIPE.

CC-11: DOUBLE ANODE PLACEMENT

NOT TO SCALE

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John J. ... 10/2/13
DIRECTOR OF PUBLIC WORKS DATE

Thomas R. ... 7/21/13
CHIEF - BUREAU OF ENGINEERING DATE

... 9/21/13
CHIEF, UTILITY DESIGN DIVISION DATE

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. 17083, EXPIRATION DATE 9/27/2014.

DSN. BY: DJD			
DRN. BY: DJD			
CHK. BY: MJS			
DATE: AUGUST 2013	BY NO.	REVISION	DATE

CATHODIC PROTECTION DETAILS - 2

600' SCALE MAP NO. _____ BLOCK NO. _____

KINDLER ROAD - EDEN BROOK DRIVE WATER MAIN CONNECTION

CAPITAL PROJECT: W-8297
CONTRACT NO.: 44-4675
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

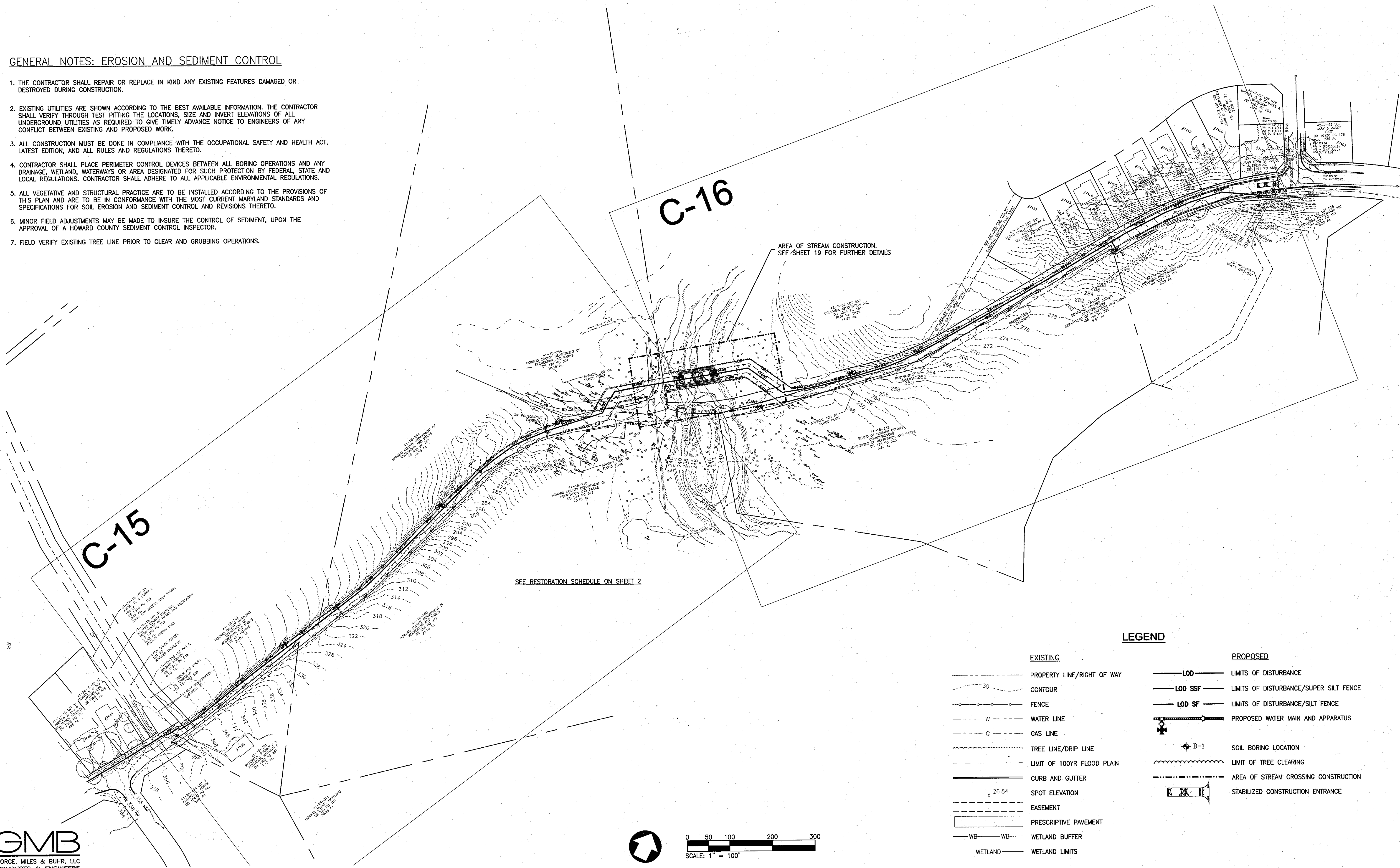
SHEET 13 OF 20

FILE NO. 45452-

G:\GMB\STORED\1\VOL2\PROJECTS\2010\100070 KINDLER RD WATER MAIN DRAWINGS\WORKING SETS\FINAL SITE PLANS\C-14 EROSION & SEDIMENT CONTROL KEY PLAN.DWG

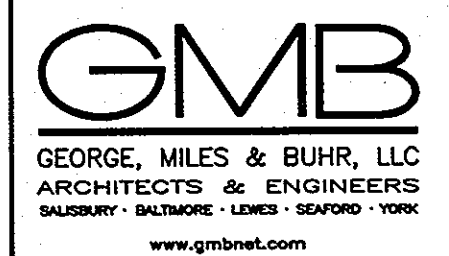
GENERAL NOTES: EROSION AND SEDIMENT CONTROL

1. THE CONTRACTOR SHALL REPAIR OR REPLACE IN KIND ANY EXISTING FEATURES DAMAGED OR DESTROYED DURING CONSTRUCTION.
2. EXISTING UTILITIES ARE SHOWN ACCORDING TO THE BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL VERIFY THROUGH TEST PITTING THE LOCATIONS, SIZE AND INVERT ELEVATIONS OF ALL UNDERGROUND UTILITIES AS REQUIRED TO GIVE TIMELY ADVANCE NOTICE TO ENGINEERS OF ANY CONFLICT BETWEEN EXISTING AND PROPOSED WORK.
3. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT, LATEST EDITION, AND ALL RULES AND REGULATIONS THERETO.
4. CONTRACTOR SHALL PLACE PERIMETER CONTROL DEVICES BETWEEN ALL BORING OPERATIONS AND ANY DRAINAGE, WETLAND, WATERWAYS OR AREA DESIGNATED FOR SUCH PROTECTION BY FEDERAL, STATE AND LOCAL REGULATIONS. CONTRACTOR SHALL ADHERE TO ALL APPLICABLE ENVIRONMENTAL REGULATIONS.
5. ALL VEGETATIVE AND STRUCTURAL PRACTICE 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.
6. MINOR FIELD ADJUSTMENTS MAY BE MADE TO INSURE THE CONTROL OF SEDIMENT, UPON THE APPROVAL OF A HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
7. FIELD VERIFY EXISTING TREE LINE PRIOR TO CLEAR AND GRUBBING OPERATIONS.



LEGEND

- | EXISTING | PROPOSED |
|--------------------------------|--|
| --- PROPERTY LINE/RIGHT OF WAY | — LOD — LIMITS OF DISTURBANCE |
| --- CONTOUR | — LOD SSF — LIMITS OF DISTURBANCE/SUPER SILT FENCE |
| --- FENCE | — LOD SF — LIMITS OF DISTURBANCE/SILT FENCE |
| --- W --- WATER LINE | --- PROPOSED WATER MAIN AND APPARATUS |
| --- G --- GAS LINE | ◆ B-1 SOIL BORING LOCATION |
| --- TREE LINE/D RIP LINE | --- LIMIT OF TREE CLEARING |
| --- LIMIT OF 100YR FLOOD PLAIN | --- AREA OF STREAM CROSSING CONSTRUCTION |
| --- CURB AND GUTTER | --- STABILIZED CONSTRUCTION ENTRANCE |
| x 26.84 SPOT ELEVATION | |
| --- EASEMENT | |
| --- PRESCRIPTIVE PAVEMENT | |
| --- WB --- WETLAND BUFFER | |
| --- WETLAND --- WETLAND LIMITS | |



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John A. ... 10/26/13
 DIRECTOR OF PUBLIC WORKS DATE

Morgan & Butler 9/24/13
 CHIEF - BUREAU OF ENGINEERING DATE

Sandra ... 10/21/13
 CHIEF, BUREAU OF UTILITIES DATE

Or ... 9/24/13
 CHIEF UTILITY DESIGN DIVISION DATE

G O BRIEN & GERE
 4201 MITCHELLVILLE ROAD
 SUITE 500
 BOWIE, MD 20716
 PHONE: 301-731-5622

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. 22749, EXPIRATION DATE 6/22/2014.

STATE OF MARYLAND
 PROFESSIONAL ENGINEER
 JOHN J. ...

DSN. BY: JJS			
ORN. BY: RFT			
CHK. BY: SLM			
DATE: AUGUST 2013	BY: SLM	NO: 0	AS ISSUED FOR BID 08/13
	BY: NO.		REVISION DATE

EROSION & SEDIMENT CONTROL KEY PLAN

600' SCALE MAP NO. 42 BLOCK NO. 7

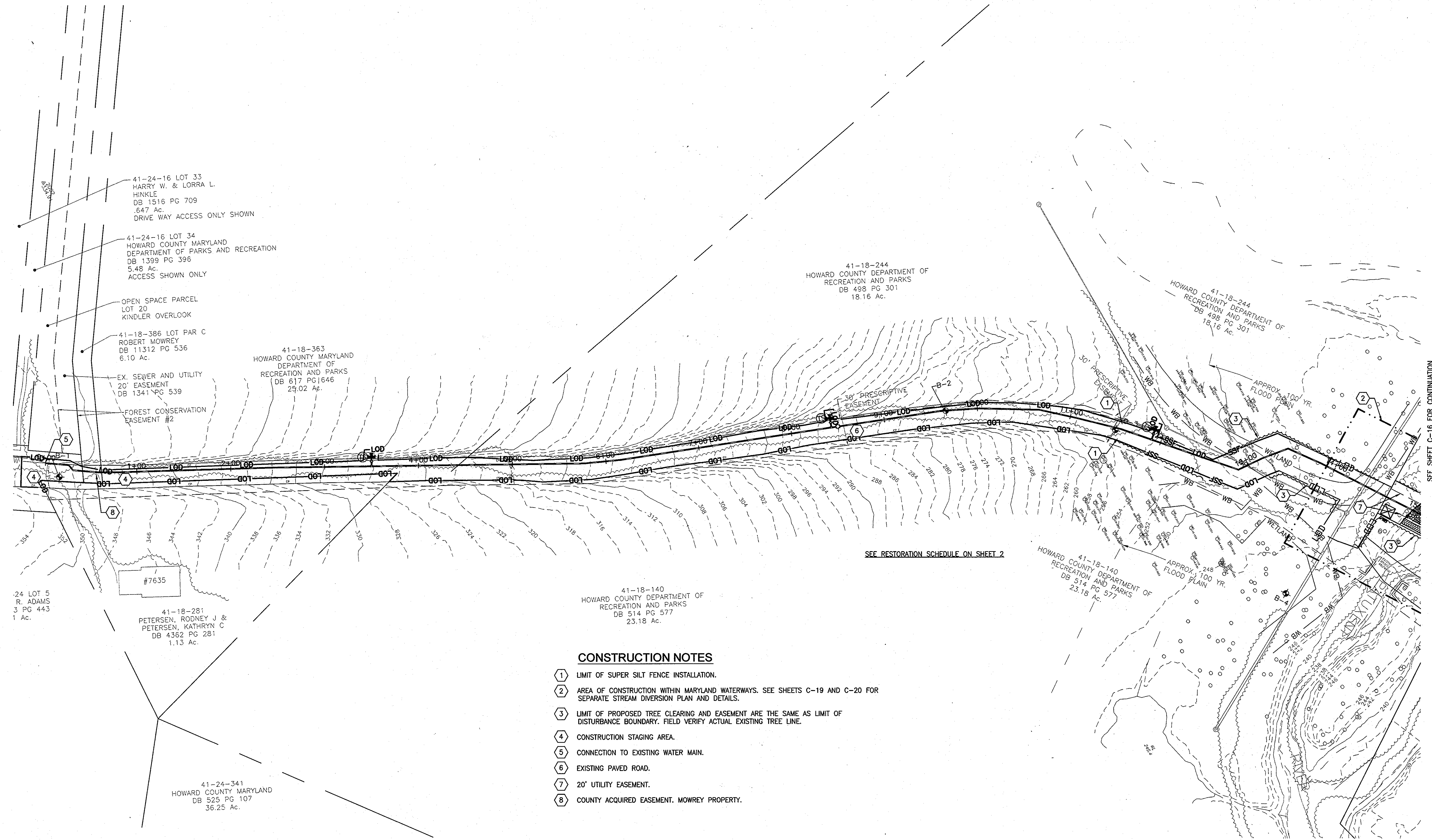
KINDLER ROAD - EDEN BROOK DRIVE
 WATER MAIN CONNECTION

CAPITAL PROJECT: W-8297
 CONTRACT NO.: 44-4675
 ELECTION DISTRICT: 6
 HOWARD COUNTRY, MARYLAND

C-14
 SHEET
 14 OF 20

GMB FILE NO. 100070 KINDLER ROAD WATER MAIN

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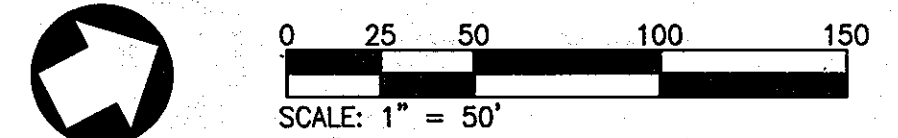


SEE SHEET C-16 FOR CONTINUATION

CONSTRUCTION NOTES

- ① LIMIT OF SUPER SILT FENCE INSTALLATION.
- ② AREA OF CONSTRUCTION WITHIN MARYLAND WATERWAYS. SEE SHEETS C-19 AND C-20 FOR SEPARATE STREAM DIVERSION PLAN AND DETAILS.
- ③ LIMIT OF PROPOSED TREE CLEARING AND EASEMENT ARE THE SAME AS LIMIT OF DISTURBANCE BOUNDARY. FIELD VERIFY ACTUAL EXISTING TREE LINE.
- ④ CONSTRUCTION STAGING AREA.
- ⑤ CONNECTION TO EXISTING WATER MAIN.
- ⑥ EXISTING PAVED ROAD.
- ⑦ 20' UTILITY EASEMENT.
- ⑧ COUNTY ACQUIRED EASEMENT. MOWREY PROPERTY.

SEE RESTORATION SCHEDULE ON SHEET 2



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Jay W. ... 10/6/13
DIRECTOR OF PUBLIC WORKS DATE

Thomas G. Butler 7/24/13
CHIEF - BUREAU OF ENGINEERING DATE

Stefan ... 10/4/13
CHIEF, BUREAU OF UTILITIES DATE

... 9/21/13
CHIEF UTILITY DESIGN DIVISION DATE

O'BRIEN & GERE
4201 MITCHELLVILLE ROAD
SUITE 500
BOWIE, MD 20716
PHONE: 301-731-5622

PROFESSIONAL CERTIFICATION:
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DSN. BY: JJS					
DRN. BY: RFT					
CHK. BY: SLM					
DATE: AUGUST 2013	SLM	0	AS ISSUED FOR BID	08/13	
	BY	NO.	REVISION	DATE	

EROSION & SEDIMENT CONTROL SITE PLAN

600' SCALE MAP NO. 42 BLOCK NO. 7

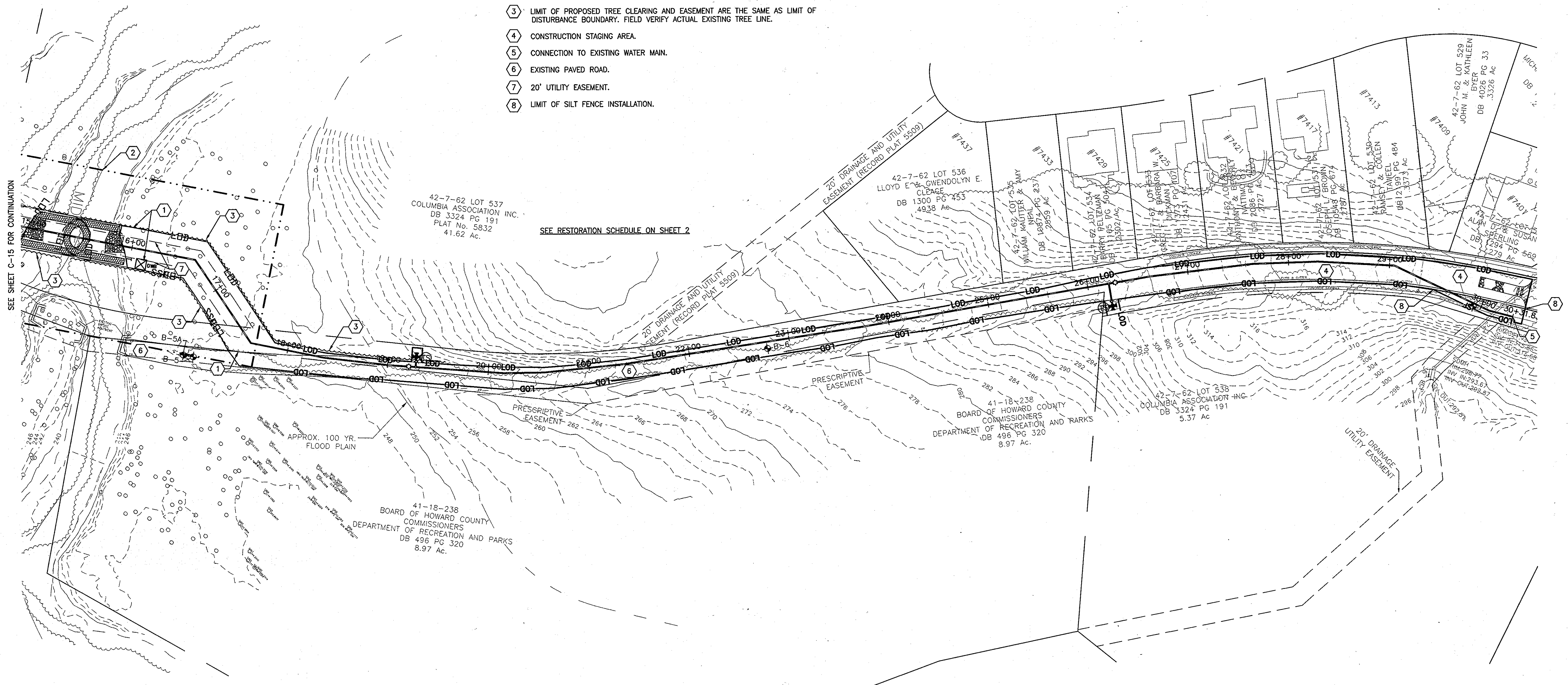
KINDLER ROAD - EDEN BROOK DRIVE
WATER MAIN CONNECTION

CAPITAL PROJECT: W-8297
CONTRACT NO.: 44-4675
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

C-15
SHEET
15 OF 20

GMB FILE NO. 100070 KINDLER ROAD WATER MAIN

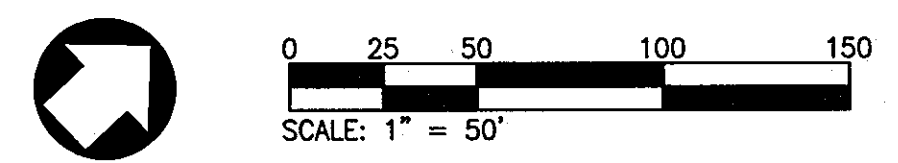
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CONSTRUCTION NOTES

- ① LIMIT OF SUPER SILT FENCE INSTALLATION.
- ② AREA OF CONSTRUCTION WITHIN MARYLAND WATERWAYS. SEE SHEETS C-19 AND C-20 FOR SEPARATE STREAM DIVERSION PLAN AND DETAILS.
- ③ LIMIT OF PROPOSED TREE CLEARING AND EASEMENT ARE THE SAME AS LIMIT OF DISTURBANCE BOUNDARY. FIELD VERIFY ACTUAL EXISTING TREE LINE.
- ④ CONSTRUCTION STAGING AREA.
- ⑤ CONNECTION TO EXISTING WATER MAIN.
- ⑥ EXISTING PAVED ROAD.
- ⑦ 20' UTILITY EASEMENT.
- ⑧ LIMIT OF SILT FENCE INSTALLATION.

SEE RESTORATION SCHEDULE ON SHEET 2



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

J. J. Sullivan 10/6/13
DIRECTOR OF PUBLIC WORKS DATE

M. J. Sullivan 9/24/13
CHIEF - BUREAU OF ENGINEERING DATE

S. J. Sullivan 10/14/13
CHIEF, BUREAU OF UTILITIES DATE

O. J. Sullivan 9/24/13
CHIEF, UTILITY DESIGN DIVISION DATE

O BRIEN & GERE
4201 MITCHELLVILLE ROAD
SUITE 500
BOWIE, MD 20716
PHONE: 301-731-5622

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. 22746, EXPIRATION DATE 6/22/2014

DSN. BY:	JJS				
DRN. BY:	RFT				
CHK. BY:	SLM				
DATE:	AUGUST 2013	SLM	0	AS ISSUED FOR BID	08/13
		BY	NO.	REVISION	DATE

EROSION & SEDIMENT CONTROL SITE PLAN

600' SCALE MAP NO. 42 BLOCK NO. 7

KINDLER ROAD - EDEN BROOK DRIVE WATER MAIN CONNECTION

CAPITAL PROJECT: W-8297
CONTRACT NO.: 44-4675
ELECTION DISTRICT: 6
HOWARD COUNTRY, MARYLAND

C-16
SHEET
16 OF 20

GMB FILE NO. 100070 KINDLER ROAD WATER MAIN

\\GMBESP\STORE01\VOL2\PROJECTS\100070_100070 KINDLER RD WATER MAIN DRAWINGS\WORKING SETS\FINAL SITE PLANS\C-17 EROSION & SEDIMENT CONTROL NOTES & DETAILS.DWG

TEMPORARY STABILIZATION

DEFINITION

TO STABILIZE DISTURBED SOILS WITH VEGETATION FOR UP TO 6 MONTHS.

PURPOSE

TO USE FAST GROWING VEGETATION THAT PROVIDES COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES

EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR A PERIOD OF 6 MONTHS OR LESS. FOR LONGER DURATION OF TIME, PERMANENT STABILIZATION PRACTICES ARE REQUIRED.

CRITERIA

- 1. SELECT ONE OR MORE OF THE SPECIES OR SEED MIXTURES LISTED IN TABLE B.1 FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3), AND ENTER THEM IN THE TEMPORARY SEEDING SUMMARY BELOW ALONG WITH APPLICATION RATES, SEEDING DATES AND SEEDING DEPTHS. IF THIS SUMMARY IS NOT PUT ON THE PLAN AND COMPLETED, THEN TABLE B.1 PLUS FERTILIZER AND LIME RATES MUST BE PUT ON THE PLAN.
2. FOR SITES HAVING SOIL TESTS PERFORMED, USE AND SHOW THE RECOMMENDED RATES BY THE TESTING AGENCY. SOIL TESTS ARE NOT REQUIRED FOR TEMPORARY SEEDING.
3. WHEN STABILIZATION IS REQUIRED OUTSIDE OF A SEEDING SEASON, APPLY SEED AND MULCH OR STRAW MULCH ALONE AS PRESCRIBED IN SECTION B-4.3.A.1.B AND MAINTAIN UNTIL THE NEXT SEEDING SEASON.

PERMANENT STABILIZATION

DEFINITION

TO STABILIZE DISTURBED SOILS WITH PERMANENT VEGETATION.

PURPOSE

TO USE LONG-LIVED PERENNIAL GRASSES AND LEGUMES TO ESTABLISH PERMANENT GROUND COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES

EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR 6 MONTHS OR MORE.

CRITERIA

- A. SEED MIXTURES
1. GENERAL USE
a. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED IN TABLE B.3 FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3) AND BASED ON THE SITE CONDITION OR PURPOSE FOUND ON TABLE B.2, ENTER SELECTED MIXTURE(S), APPLICATION RATES, AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
b. ADDITIONAL PLANTING SPECIFICATIONS FOR EXCEPTIONAL SITES SUCH AS SHORELINES, STREAM BANKS, OR DUNES OR FOR SPECIAL PURPOSES SUCH AS WILDLIFE OR AESTHETIC TREATMENT MAY BE FOUND IN USDA-NRCS TECHNICAL FIELD OFFICE GUIDE, SECTION 342 - CRITICAL AREA PLANTING.
c. FOR SITES HAVING DISTURBED AREA OVER 5 ACRES, USE AND SHOW THE RATES RECOMMENDED BY THE SOIL TESTING AGENCY.
d. FOR AREAS RECEIVING LOW MAINTENANCE, APPLY UREA FORM FERTILIZER (46-0-0) AT 3 1/2 POUNDS PER 1000 SQUARE FEET (150 POUNDS PER ACRE) AT THE TIME OF SEEDING IN ADDITION TO THE SOIL AMENDMENTS SHOWN IN THE PERMANENT SEEDING SUMMARY.
2. TURFGRASS MIXTURES
a. AREAS WHERE TURFGRASS MAY BE DESIRED INCLUDE LAWNS, PARKS, PLAYGROUNDS, AND COMMERCIAL SITES WHICH WILL RECEIVE A MEDIUM TO HIGH LEVEL OF MAINTENANCE.
b. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED BELOW BASED ON THE SITE CONDITIONS OR PURPOSE. ENTER SELECTED MIXTURE(S), APPLICATION RATES, AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
i. KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN AREAS THAT RECEIVE INTENSIVE MANAGEMENT. IRRIGATION REQUIRED IN THE AREAS OF CENTRAL MARYLAND AND EASTERN SHORE. RECOMMENDED CERTIFIED KENTUCKY BLUEGRASS CULTIVARS SEEDING RATE: 1.5 TO 2.0 POUNDS PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT.
ii. KENTUCKY BLUEGRASS/PERENNIAL RYE: FULL SUN MIXTURE: FOR USE IN FULL SUN AREAS WHERE B.2.2 RAPID ESTABLISHMENT IS NECESSARY AND WHEN TURF WILL RECEIVE MEDIUM TO INTENSIVE MANAGEMENT. CERTIFIED PERENNIAL RYEGRASS CULTIVARS (CERTIFIED KENTUCKY BLUEGRASS SEEDING RATE: 2 POUNDS MIXTURE PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT.
iii. TALL FESCUE/KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN DROUGHT PRONE AREAS AND/OR FOR AREAS RECEIVING LOW TO MEDIUM MANAGEMENT IN FULL SUN TO MEDIUM SHADE. RECOMMENDED MIXTURE INCLUDES: CERTIFIED TALL FESCUE CULTIVARS 95 TO 100 PERCENT, CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 0 TO 5 PERCENT. SEEDING RATE: 5 TO 8 POUNDS PER 1000 SQUARE FEET. ONE OR MORE CULTIVARS MAY BE BLENDED.
iv. KENTUCKY BLUEGRASS/FINE FESCUE: SHADE MIXTURE: FOR USE IN AREAS WITH SHADE IN BLUEGRASS LAWNS. FOR ESTABLISHMENT IN HIGH QUALITY, INTENSIVELY MANAGED TURF AREA. MIXTURE INCLUDES: CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 30 TO 40 PERCENT AND CERTIFIED FINE FESCUE AND 60 TO 70 PERCENT. SEEDING RATE: 1 1/2 TO 3 POUNDS PER 1000 SQUARE FEET.
NOTES:
SELECT TURFGRASS VARIETIES FROM THOSE LISTED IN THE MOST CURRENT UNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MEMO #77, "TURFGRASS CULTIVAR RECOMMENDATIONS FOR MARYLAND" CHOOSE CERTIFIED MATERIAL. CERTIFIED MATERIAL IS THE BEST GUARANTEE OF CULTIVAR PURITY. THE CERTIFICATION PROGRAM OF THE MARYLAND DEPARTMENT OF AGRICULTURE, TURF AND SEED SECTION, PROVIDES A RELIABLE MEANS OF CONSUMER PROTECTION AND ASSURES A PURE GENETIC LINE.
c. IDEAL TIMES OF SEEDING FOR TURF GRASS MIXTURES
WESTERN MD: MARCH 15 TO JUNE 1, AUGUST 1 TO OCTOBER 1 (HARDINESS ZONES: 5B, 6A)
CENTRAL MD: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONE: 6B)
SOUTHERN MD, EASTERN SHORE: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONES: 7A, 7B)
d. TILL AREAS TO RECEIVE SEED BY DISKING OR OTHER APPROVED METHODS TO A DEPTH OF 2 TO 4 INCHES, LEVEL AND RAKE THE AREAS TO PREPARE A PROPER SEEDBED. REMOVE STONES AND DEBRIS OVER 1 1/2 INCHES IN DIAMETER. THE RESULTING SEEDBED MUST BE IN SUCH CONDITION THAT FUTURE MOWING OF GRASSES WILL BE WITHOUT DIFFICULTY.
e. IF SOIL MOISTURE IS DEFICIENT, SUPPLY NEW SEEDINGS WITH ADEQUATE WATER FOR PLANT GROWTH (1/2 TO 1 INCH EVERY 3 TO 4 DAYS DEPENDING ON SOIL TEXTURE) UNTIL THEY ARE FIRMLY ESTABLISHED. THIS IS ESPECIALLY TRUE WHEN SEEDINGS ARE MADE LATE IN THE PLANTING SEASON, IN ABNORMALLY DRY OR HOT SEASONS, OR ON ADVERSE SITES.

Table with 4 columns: NO., SPECIES, APPL. RATE (lbs/ac), SEEDING DATES, SEEDING DEPTHS, FERTILIZER RATE (10-20-20), LIME RATE. Row 1: 1, RYE, 140, 2/1 to 4/30, 8/15 to 11/30, 1 to 2, 43lbs/ac, 10lbs/1000sf, 2 Tons/ac, 90lb/1000sf

PERMANENT SEEDING SUMMARY

SEE TABLE

- B. SOD: TO PROVIDE QUICK COVER ON DISTURBED AREAS (2:1 GRADE OR FLATTER).
1. GENERAL SPECIFICATIONS
a. CLASS OF TURFGRASS SOD MUST BE MARYLAND STATE CERTIFIED. SOD LABELS MUST BE MADE AVAILABLE TO THE JOB FOREMAN AND INSPECTOR.
b. SOD MUST BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF 3/4 INCH, PLUS OR MINUS 1/8 INCH. AT THE TIME OF CUTTING, MEASUREMENT FOR THICKNESS MUST EXCLUDE TOP GROWTH AND THATCH. BROKEN PADS AND TORN OR UNEVEN ENDS WILL NOT BE ACCEPTABLE.
c. STANDARD SIZE SECTIONS OF SOD MUST BE STRONG ENOUGH TO SUPPORT THEIR OWN WEIGHT AND RETAIN THEIR SIZE AND SHAPE WHEN SUSPENDED VERTICALLY WITH A FIRM GRASP ON THE UPPER 10 PERCENT OF THE SECTION.
d. SOD MUST NOT BE HARVESTED OR TRANSPORTED WHEN MOISTURE CONTENT (EXCESSIVELY DRY OR WET) MAY ADVERSELY AFFECT ITS SURVIVAL.
e. SOD MUST BE HARVESTED, DELIVERED, AND INSTALLED WITHIN A PERIOD OF 36 HOURS. SOD NOT TRANSPORTED WITHIN THIS PERIOD MUST BE APPROVED BY AN AGRONOMIST OR SOIL SCIENTIST PRIOR TO ITS INSTALLATION.
2. SOD INSTALLATION
a. DURING PERIODS OF EXCESSIVELY HIGH TEMPERATURE OR IN AREAS HAVING DRY SUBSOIL, LIGHTLY IRRIGATE THE SUBSOIL IMMEDIATELY PRIOR TO LAYING THE SOD.
b. LAY THE FIRST ROW OF SOD IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO IT AND TIGHTLY WEDGED AGAINST EACH OTHER. STAGGER LATERAL JOINTS TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH. ENSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE AIR DRYING OF THE ROOTS.
c. WHEREVER POSSIBLE, LAY SOD WITH THE LONG EDGES PARALLEL TO THE CONTOUR AND WITH STAGGERING JOINTS. ROLL AND TAMP, PEG OR OTHERWISE SECURE THE SOD TO PREVENT SLIPPAGE ON SLOPES. ENSURE SOLID CONTACT EXISTS BETWEEN SOD ROOTS AND THE UNDERLYING SOIL SURFACE.
d. WATER THE SOD IMMEDIATELY FOLLOWING ROLLING AND TAMPING UNTIL THE UNDERSIDE OF THE NEW SOD PAD AND SOIL SURFACE BELOW THE SOD ARE THOROUGHLY WET. COMPLETE THE OPERATIONS OF LAYING, TAMPING AND IRRIGATING FOR ANY PIECE OF SOD WITHIN EIGHT HOURS.
3. SOD MAINTENANCE
a. IN THE ABSENCE OF ADEQUATE RAINFALL, WATER DAILY DURING THE FIRST WEEK OR AS OFTEN AND SUFFICIENTLY AS NECESSARY TO MAINTAIN MOIST SOIL TO A DEPTH OF 4 INCHES. WATER SOD DURING THE HEAT OF THE DAY TO PREVENT WILTING.
b. AFTER THE FIRST WEEK, SOD WATERING IS REQUIRED AS NECESSARY TO MAINTAIN ADEQUATE MOISTURE CONTENT.
c. DO NOT MOW UNTIL THE SOD IS FIRMLY ROOTED. NO MORE THAN 1/2 OF THE GRASS LEAF MUST BE REMOVED BY THE INITIAL CUTTING OR SUBSEQUENT CUTTINGS. MAINTAIN A GRASS HEIGHT OF AT LEAST 3 INCHES UNLESS OTHERWISE SPECIFIED.

PERMANENT SEED MIXTURE FOR HARDINESS ZONE 7B (FROM TABLE B.3 AND FIGURE B.3). Table with 7 columns: NO., SPECIES, APPL. RATE (lbs/ac), SEEDING DATES, SEEDING DEPTH, FERTILIZER RATE (N, P205, K20), LIME RATE. Rows include Tall Fescue (85%), Perennial Rye Grass (10%), and Kentucky Bluegrass (5%).

ENGINEERS CERTIFICATION:

"I, STEPHEN L. MARSH, P.E., HEREBY 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 Stephen L. Marsh, P.E., dated 8/16/2013.

ENGINEER: GEORGE, MILES & BUHR, LLC, 206 WEST MAIN STREET, SALISBURY, MD 21801

CONTACT: STEPHEN L. MARSH, P.E., PHONE: 410-742-3115, FAX: 410-548-5790

DEVELOPER/OWNER 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."

Signature of Kevin Dinsmore, dated 9/24/2013.

DEVELOPER/OWNER: HOWARD COUNTY DEPT. PUBLIC WORKS, 3430 COURT HOUSE DRIVE, ELLICOTT CITY, MD 21043

CONTACT: PHONE: 410 313 4400

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 (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) 3 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 7 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL SEDIMENT TRAPA/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 12 OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 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:
TOTAL AREA OF SITE: 1.85 ACRES
AREA DISTURBED: 1.85 ACRES
AREA TO BE ROOFED OR PAVED: 1.20 ACRES
(PAVEMENT RESTORATION)
AREA TO BE VEGETATIVELY STABILIZED: 0.65 ACRES
TOTAL CUT: N/A CU. YDS.
TOTAL FILL: N/A CU. YDS.
OFFSITE WASTE/BORROW AREA LOCATION: N/A
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.

Table B.1: Temporary Seeding for Site Stabilization

Table with 5 columns: Plant Species, Seeding Rate (lb/ac, lb/1000 ft²), Seeding Depth (inches), Recommended Seeding Dates by Plant Hardiness Zone (5b and 6a, 6b, 7a and 7b). Rows include Cool-Season Grasses (Annual Ryegrass, Barley, Oats, Wheat, Cereal Rye), Warm-Season Grasses (Foxtail Millet, Pearl Millet).

NOTES: 1/ Seeding rates for the warm-season grasses are in pounds of Pure Live Seed (PLS). Actual planting rates shall be adjusted to reflect percent seed germination and purity, as tested. Adjustments are usually not needed for the cool-season grasses.

2/ Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixes, use 1/3 of the seeding rate listed above for barley, oats, and wheat. For smaller-seeded grasses (annual ryegrass, pearl millet, foxtail millet), do not exceed more than 5% (by weight) of the overall permanent seeding mix. Cereal rye generally should not be used as a nurse crop, unless planting will occur in very late fall beyond the seeding dates for other temporary seedings. Cereal rye has allelopathic properties that inhibit the germination and growth of other plants. If it must be used as a nurse crop, seed at 1/3 of the rate listed above.

Oats are the recommended nurse crop for warm-season grasses.

3/ For sandy soils, plant seeds at twice the depth listed above.
4/ The planting dates listed are averages for each Zone and may require adjustment to reflect local conditions, especially near the boundaries of the zones.

SOIL INFORMATION

Table with 3 columns: SYMBOL, NAME, HYDROLOGIC SOIL GROUP. Rows include Co (CODORUS AND HATBORO SILT LOAM), GhB (GLENELG-URBAN LAND COMPLEX), GcC (GLENELG-URBAN LAND COMPLEX), CoB (GLENVILLE-CODORUS SILT LOAM), Ho (HATBORO-CODORUS SILT LOAM), MoB (MANOR LOAM), MoC (MANOR LOAM), MoD (MANOR LOAM), MfF (MANOR-BRINKLOW COMPLEX).

SOIL CLASSIFICATION OBTAINED FROM USDA-SCS SOIL SURVEY OF HOWARD COUNTY

SEQUENCE OF OPERATIONS

GENERAL NOTES

- 1. ACQUIRE ALL NECESSARY STATE AND LOCAL PERMITS INCLUDING A GRADING PERMIT.
2. NOTIFY THE HOWARD COUNTY DEPARTMENT OF INSPECTION, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION. FORTY EIGHT (48) HOURS PRIOR TO COMMENCING OF CONSTRUCTION ACTIVITIES.
3. GREAT CARE SHALL BE TAKEN TO ENSURE THAT NO SEDIMENT LADEN RUNOFF WILL BE DISCHARGED OUTSIDE OF THE LIMITS OF DISTURBANCE.

PERIMETER CONTROLS

- 4. SURVEY AND STAKEOUT PERIMETER CONTROLS AS SHOWN ON THE PLANS.
5. CLEAR AND GRUB AREAS FOR PERIMETER CONTROL INSTALLATION ONLY. WETLANDS AND CONSERVATION AREAS SHALL BE CLEARLY MARKED IN THE FIELD.
6. INSTALL PERIMETER CONTROLS AS SHOWN ON THE PLANS. WHERE DEEMED NECESSARY, THE CONTRACTOR SHALL INSTALL EROSION CONTROL PRACTICES IN ADDITION TO WHAT IS SHOWN ON THE PLANS TO ENSURE PROPER SEDIMENT CONTROL. ADDITIONAL SEDIMENT CONTROLS MAY ALSO BE DIRECTED BY THE SEDIMENT CONTROL INSPECTOR AS NECESSARY.

SITE WORK

- 7. INSTALL FILTER LOGS PERPENDICULAR TO PIPE LAYOUT IMMEDIATELY DOWN STREAM OF ANTICIPATED END OF WORK DAY EXCAVATION AREA. THE FILTER LOGS SHALL BE MOVED TO THE NEXT WORK AREA PRIOR TO THE NEXT WORK DAY.
8. EXCAVATE, INSTALL WATER MAIN AND APPURTENANCES, AND BACKFILL WORK AREA. WHERE WATER IS ENCOUNTERED DURING EXCAVATION, DEWATERING OPERATIONS SHALL BE APPLIED. SEDIMENT LADEN WATER SHALL BE PUMPED THROUGH AN APPROVED STATE AND LOCAL TEMPORARY SEDIMENT PRACTICES (DEWATERING BAG). SEE SEPARATE NOTES AND DETAIL FOR STREAM CROSSING CONSTRUCTION.
9. STOCKPILE EXCAVATED MATERIALS ON AREAS WITH LITTLE OR NO SLOPE. IF NOT POSSIBLE, PLACE MATERIALS UP SLOPE OF THE TRENCH OPENING.
10. ALL OPEN TRENCHES SHALL BE BACKFILLED AT THE END OF EACH WORKING DAY. ALL DISTURBED AREAS SHALL BE STABILIZED AND RESTORED TO THEIR ORIGINAL GRADES.
11. AT THE END OF EACH WORK DAY, ALL SEDIMENT CONTROL DEVICES SHALL BE INSPECTED TO ENSURE PROPER WORKING CONDITIONS.

FINAL STABILIZATION

- 12. AT THE END OF THE CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED, REMOVE SEDIMENT CONTROL MEASURES UPON THE APPROVAL OF A HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.

START OF CONSTRUCTION: JUNE 2013 (TENTATIVE)
END OF CONSTRUCTION: JUNE 2014

Appendix G: Best Management Practices for Working in Nontidal Wetlands, Wetland Buffers, Waterways, and 100-Year Floodplains

- 1) No excess fill, construction material, or debris shall be stockpiled or stored in nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
2) Place materials in a location and manner which does not adversely impact surface or subsurface water flow into or out of nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
3) Do not use the excavated material as backfill if it contains waste metal products, unsightly debris, toxic material, or any other deleterious substance. If additional backfill is required, use clean material free of waste metal products, unsightly debris, toxic material, or any other deleterious substance.
4) Place heavy equipment on mats or suitably operate the equipment to prevent damage to nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
5) Repair and maintain any serviceable structure or fill so there is no permanent loss of nontidal wetlands, nontidal wetland buffers, or waterways, or permanent modification of the 100-year floodplain in excess of that lost under the originally authorized structure or fill.
6) Rectify any nontidal wetlands, wetland buffers, waterways, or 100-year floodplain temporarily impacted by any construction.
7) All stabilization in the nontidal wetland and nontidal wetland buffer shall consist of the following species: Annual Ryegrass (Lolium multiflorum), Millet (Setaria italica), Barley (Hordeum sp.), Oats (Avena sativa), and/or Rye (Secale cereale). These species will allow for the stabilization of the site while also allowing for the voluntary revegetation of natural wetland species. Other non-persistent vegetation may be acceptable, but must be approved by the Nontidal Wetlands and Waterways Division. Kentucky 31 fescue shall not be utilized in wetland or buffer areas. The area should be seeded and mulched to reduce erosion after construction activities have been completed.
8) After installation has been completed, make post-construction grades and elevations the same as the original grades and elevations in temporarily impacted areas.
9) To protect aquatic species, in-stream work is prohibited as determined by the classification of the stream:
Use I waters: In-stream work shall not be conducted during the period March 1 through June 15, inclusive, during any year.
Use III waters: In-stream work shall not be conducted during the period October 1 through April 30, inclusive, during any year.
Use IV waters: In-stream work shall not be conducted during the period March 1 through May 31, inclusive, during any year.
10) Stormwater runoff from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.
11) Culverts shall be constructed and any riprap placed so as not to obstruct the movement of aquatic species, unless the purpose of the activity is to impound water.



DEPARTMENT OF PUBLIC WORKS

HOWARD COUNTY, MARYLAND

Director of Public Works: Stephen L. Marsh, dated 10/6/13
Chief, Bureau of Engineering: Thomas J. Subler, dated 9/24/13
Chief, Bureau of Utilities: Steve C. ... dated 9/21/13

O'Brien & Gere logo and address: 4201 MITCHELLVILLE ROAD, SUITE 500, BOWIE, MD 20716, PHONE: 301-731-5622

Professional Engineer seal for Stephen L. Marsh, State of Maryland, License No. 12777, expires 6/22/2014.

Table with 4 columns: DSN. BY, DRN. BY, CHK. BY, DATE. Includes revision table with columns: AS ISSUED FOR BID, REVISION, DATE, BLOCK NO., 7.

EROSION & SEDIMENT CONTROL NOTES & DETAILS

KINDLER ROAD - EDEN BROOK DRIVE WATER MAIN CONNECTION
CAPITAL PROJECT: W-8297
CONTRACT NO.: 44-4675
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

C-17 SHEET 17 OF 20

GMB FILE NO. 100070 KINDLER ROAD WATER MAIN

\\G:\MSB\STORE01\VOL-2\PROJECTS\2010\100070 KINDLER RD WATER MAIN DRAWINGS\WORKING SETS\FINAL SITE PLANS\C-18 EROSION & SEDIMENT CONTROL NOTES & DETAILS.DWG

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1 1/2 x 1 1/2 x 3/4 INCH 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.

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

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: SSF

CONSTRUCTION SPECIFICATIONS

1. INSTALL 2 1/2 INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2 1/2 INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR RUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER 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 SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN, IF UNDERMINING OCCURS, REINSTALL FENCE.

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

DETAIL E-6 FILTER LOG

STANDARD SYMBOL: FL-18
DESIGNATION FL-18 REFERS TO 18 INCH DIAMETER FILTER LOG

CONSTRUCTION SPECIFICATIONS

1. PRIOR TO INSTALLATION, CLEAR ALL OBSTRUCTIONS INCLUDING ROCKS, CLODS, AND DEBRIS GREATER THAN ONE INCH THAT MAY INTERFERE WITH PROPER FUNCTION OF FILTER LOG.
2. FILL LOG UNIFORMLY WITH COMPOST (IN ACCORDANCE WITH SECTION H-1 MATERIALS), OR OTHER APPROVED BIODEGRADABLE MATERIAL TO DESIRED LENGTH SUCH THAT LOGS DO NOT DEFORM.
3. INSTALL FILTER LOGS PERPENDICULAR TO THE FLOW DIRECTION AND PARALLEL TO THE SLOPE WITH THE BEGINNING AND END OF THE INSTALLATION POINTING SLIGHTLY UP THE SLOPE CREATING A "J" SHAPE AT EACH END TO PREVENT BYPASS.
4. FOR UNTRRENCHED INSTALLATION BLOW OR HAND PLACE MULCH OR COMPOST ON UPHILL SIDE OF THE SLOPE ALONG LOG.
5. STAKE FILTER LOG EVERY 4 FEET OR CLOSER ALONG ENTIRE LENGTH OF LOG OR TRENCH LOG INTO GROUND A MINIMUM OF 4 INCHES AND STAKE LOG EVERY 8 FEET OR CLOSER.
6. USE STAKES WITH A MINIMUM NOMINAL CROSS SECTION OF 2X2 INCH AND OF SUFFICIENT LENGTH TO ATTAIN A MINIMUM OF 12 INCHES INTO THE GROUND AND 3 INCHES PROTRUDING ABOVE LOG.
7. WHEN MORE THAN ONE LOG IS NEEDED, OVERLAP ENDS 12 INCHES MINIMUM AND STAKE.
8. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO A DEPTH OF 1/2 THE EXPOSED HEIGHT OF LOG AND REPLACE MULCH. REPLACE FILTER LOG IF TORN. REINSTALL FILTER LOG IF UNDERMINING OR DISLOCATING OCCURS. REPLACE CLOGGED FILTER LOGS. FOR PERMANENT APPLICATIONS, ESTABLISH AND CONTINUOUSLY MEET REQUIREMENTS FOR APPROPRIATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

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

DETAIL F-4 FILTER BAG

STANDARD SYMBOL: FB

CONSTRUCTION SPECIFICATIONS

1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
2. PLACE FILTER BAG ON SUITABLE BASE (E.G. MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4633
FLOW RATE	70 GAL/MIN/FT²	ASTM D-4491
PERMITTIVITY (SEC⁻¹)	1.2 SEC⁻¹	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4555
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632

6. REPLACE FILTER BAG IF BAG CLOSURE HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

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

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1 1/2 x 1 1/2 x 3/4 INCH 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.

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

DETAIL B-4-D PERMANENT SOIL STABILIZATION MATTING SLOPE APPLICATION

STANDARD SYMBOL: PSSMS - * lb/ft²
(* INCLUDE SHEAR STRESS)

CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON-DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-HARMFUL TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1 1/2 INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND MINIMUM 4 INCH HEAD. WOOD STAPLES MUST BE ROUGH-SAWN HARDWOOD, 5/8 TO 2 1/4 INCHES IN LENGTH, 3/4 INCH IN CROSS SECTION, AND WEDGE SHAPE AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDING PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH OPERATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS, UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING DOWN SLOPE. LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDING SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT EDGES OF MATTING ROLLS PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
7. KEY IN THE TOP OF SLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. IF SPECIFIED BY THE DESIGNER OR MANUFACTURER AND DEPENDING ON THE TYPE OF MAT BEING INSTALLED, ONCE THE MATTING IS KEYED AND STAPLED IN PLACE, FILL THE MAT VOIDS WITH TOP SOIL OR GRANULAR MATERIAL AND LIGHTLY COMPACT OR ROLL TO MAXIMIZE SOIL/MAT CONTACT WITHOUT CRUSHING MAT.
10. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

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

DETAIL E-6 FILTER LOG

STANDARD SYMBOL: FL-18
DESIGNATION FL-18 REFERS TO 18 INCH DIAMETER FILTER LOG

CONSTRUCTION SPECIFICATIONS

1. PRIOR TO INSTALLATION, CLEAR ALL OBSTRUCTIONS INCLUDING ROCKS, CLODS, AND DEBRIS GREATER THAN ONE INCH THAT MAY INTERFERE WITH PROPER FUNCTION OF FILTER LOG.
2. FILL LOG UNIFORMLY WITH COMPOST (IN ACCORDANCE WITH SECTION H-1 MATERIALS), OR OTHER APPROVED BIODEGRADABLE MATERIAL TO DESIRED LENGTH SUCH THAT LOGS DO NOT DEFORM.
3. INSTALL FILTER LOGS PERPENDICULAR TO THE FLOW DIRECTION AND PARALLEL TO THE SLOPE WITH THE BEGINNING AND END OF THE INSTALLATION POINTING SLIGHTLY UP THE SLOPE CREATING A "J" SHAPE AT EACH END TO PREVENT BYPASS.
4. FOR UNTRRENCHED INSTALLATION BLOW OR HAND PLACE MULCH OR COMPOST ON UPHILL SIDE OF THE SLOPE ALONG LOG.
5. STAKE FILTER LOG EVERY 4 FEET OR CLOSER ALONG ENTIRE LENGTH OF LOG OR TRENCH LOG INTO GROUND A MINIMUM OF 4 INCHES AND STAKE LOG EVERY 8 FEET OR CLOSER.
6. USE STAKES WITH A MINIMUM NOMINAL CROSS SECTION OF 2X2 INCH AND OF SUFFICIENT LENGTH TO ATTAIN A MINIMUM OF 12 INCHES INTO THE GROUND AND 3 INCHES PROTRUDING ABOVE LOG.
7. WHEN MORE THAN ONE LOG IS NEEDED, OVERLAP ENDS 12 INCHES MINIMUM AND STAKE.
8. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO A DEPTH OF 1/2 THE EXPOSED HEIGHT OF LOG AND REPLACE MULCH. REPLACE FILTER LOG IF TORN. REINSTALL FILTER LOG IF UNDERMINING OR DISLOCATING OCCURS. REPLACE CLOGGED FILTER LOGS. FOR PERMANENT APPLICATIONS, ESTABLISH AND CONTINUOUSLY MEET REQUIREMENTS FOR APPROPRIATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

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

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 (50 FEET FOR SINGLE RESIDENCE LOTS), 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. MAINTAIN 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



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 HOWARD COUNTY, MARYLAND

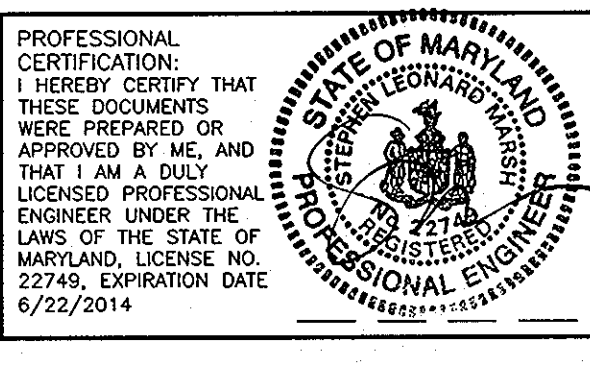
John J. ... 10/17/13
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Thomas E. ... 7/24/13
 CHIEF - BUREAU OF ENGINEERING DATE

Steve C. ... 10/18/13
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CHK. BY:	SLM				
DATE:	AUGUST 2013	SLM	0	AS ISSUED FOR BID	07/13
		BY	NO.	REVISION	DATE

EROSION & SEDIMENT CONTROL NOTES & DETAILS

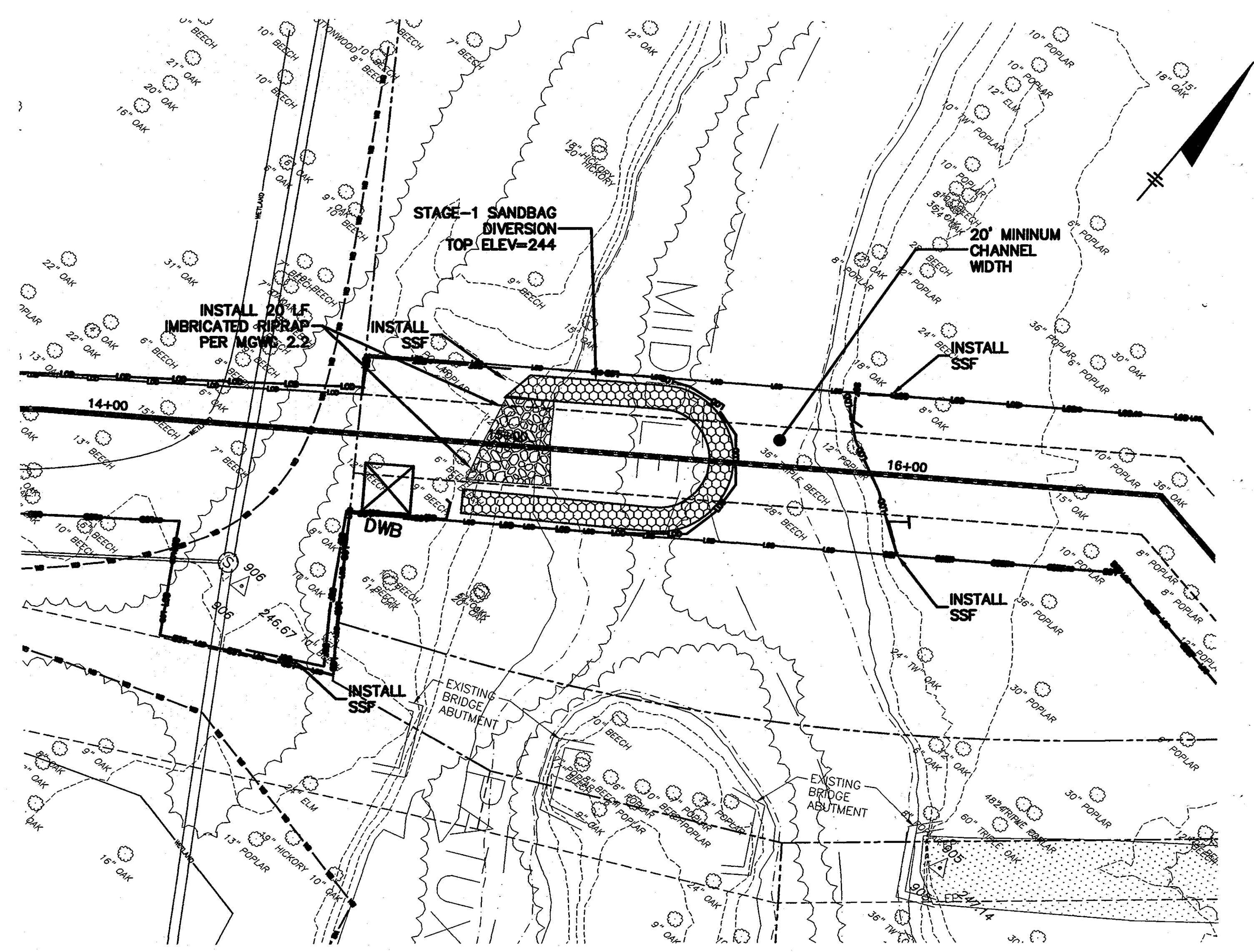
600' SCALE MAP NO. 42 BLOCK NO. 7

KINDLER ROAD - EDEN BROOK DRIVE
 WATER MAIN CONNECTION

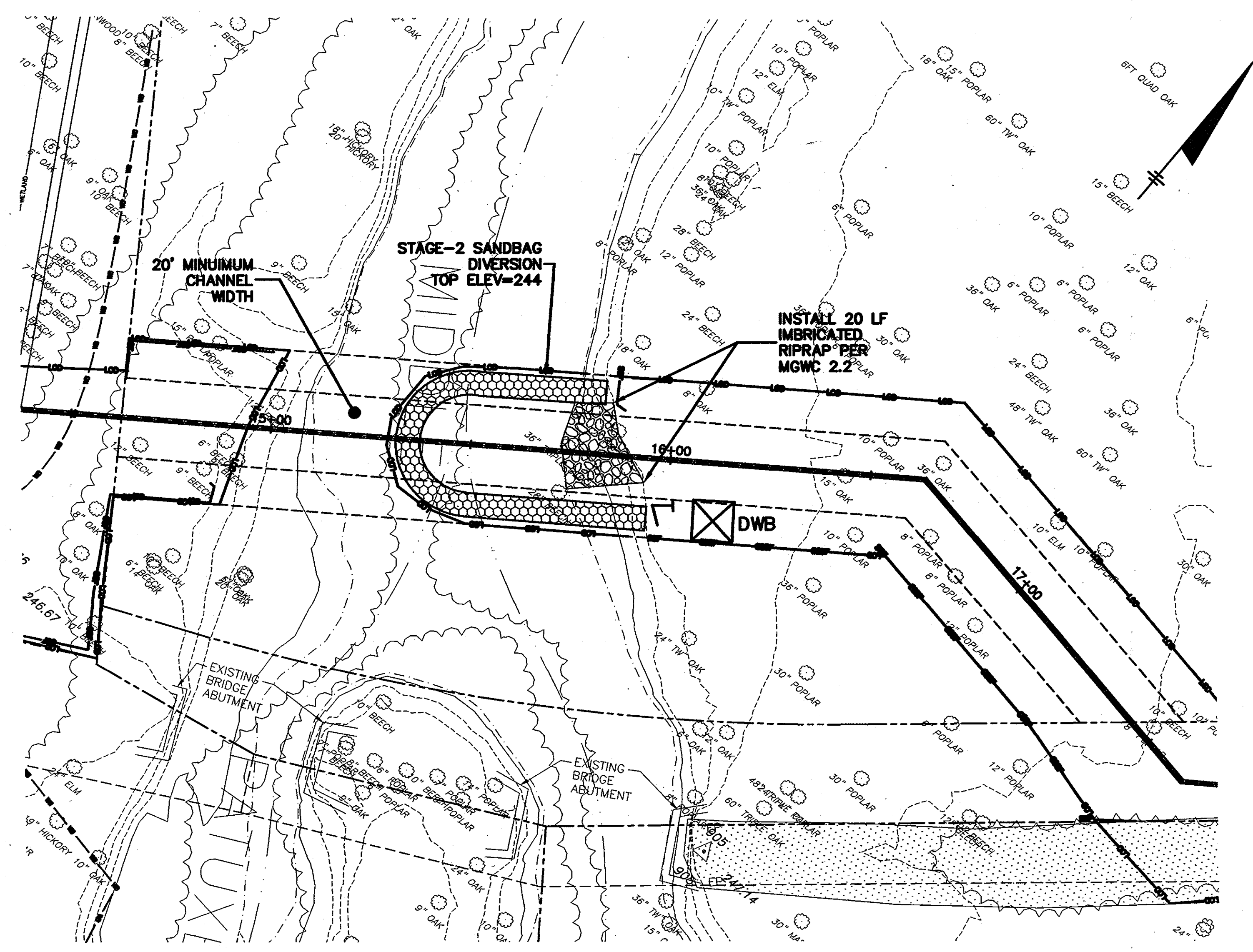
CAPITAL PROJECT: W-8297
 CONTRACT NO.: 44-4675
 ELECTION DISTRICT: 6
 HOWARD COUNTY, MARYLAND

C-18
 SHEET
 18 OF 20

GMB FILE NO. 100070 KINDLER ROAD WATER MAIN



PLAN - DIVERSION CHANNEL STAGE 1
SCALE: 1"=20'



PLAN - DIVERSION CHANNEL STAGE 2
SCALE: 1"=20'

STREAM DIVERSION SEQUENCE OF CONSTRUCTION - STAGE-1:

1. INSTALL DEWATERING BASIN(S) AS SHOWN IN ACCORDANCE WITH MGWC DETAIL 1.1 ON SHEET 20.
2. INSTALL STAGE-1 STONE/SANDBAG DIVERSION IN ACCORDANCE WITH THE MGWC DETAIL 1.5 ON SHEET 20.
3. CONSTRUCT WATER LINE ACROSS THE STREAM DIVERSION UP TO THE LOCATION OF THE STAGE-1 DIVERSION. THE STREAM CHANNEL CONSTRUCTION SHALL BE IN ACCORDANCE WITH MGWC DETAILS 4.2(a) AND 4.2(b) ON SHEET 20.
4. ONCE THE STAGE-1 WATER LINE IS INSTALLED, STABILIZE THE STREAM BANK WITH IMBRICATED RIPRAP IN ACCORDANCE MGWC DETAIL 2.2 ON SHEET 20.
5. ONCE THE STAGE-1 STREAM BANK RIPRAP IS INSTALLED AND THE STREAM CHANNEL IS STABILIZED, WITH THE APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR, REMOVE THE STAGE-1 DIVERSION AND PROCEED WITH STAGE-2.

NOTES:

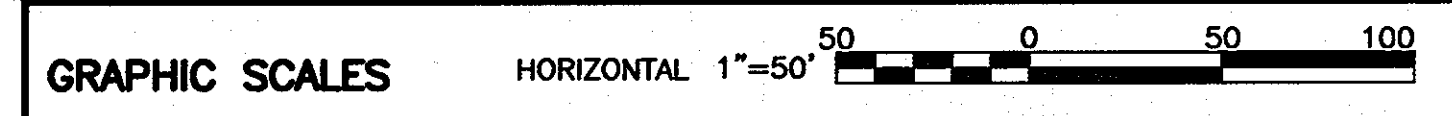
1. CONSTRUCTION OF THE WATER LINE SHALL BE LIMITED TO THAT WHICH CAN BE BACKFILLED AND STABILIZED AT THE END OF EACH WORK DAY.
2. ADDITIONAL INSTALLATION OF STABILIZED CONSTRUCTION ENTRANCE IF NEEDED, SHALL BE LOCATED BY THE INSPECTOR.
3. FINAL UTILITY ACCESS AREAS TO BE DETERMINED IN THE FIELD WITH APPROVAL FROM INSPECTOR.
4. ALL EXCESS SOIL GENERATED DUE TO THE EXCAVATION OF THE WATERLINE AND ITS BACKFILL MUST BE REMOVED FROM THE 100-YEAR FLOODPLAIN. STOCKPILING AT THE SITE IS NOT PERMITTED.
5. SEE SHEET C-17 FOR CONDITIONS AND MANAGEMENT PRACTICES FOR WORK IN NONTIDAL WETLANDS AND BUFFERS.
6. SEE SHEET C-17 FOR OVERALL SEQUENCE OF CONSTRUCTION AND THIS SHEET FOR STREAM DIVERSION SEQUENCE OF CONSTRUCTION.

STREAM DIVERSION SEQUENCE OF CONSTRUCTION - STAGE-2:

1. REBUILD THE STONE/SANDBAG DIVERSION FOR STAGE-2 IN ACCORDANCE MGWC DETAIL 1.5 ON SHEET 20.
2. COMPLETE THE CONSTRUCTION OF THE WATER LINE ACROSS THE STREAM DIVERSION. THE STREAM CHANNEL CONSTRUCTION SHALL BE IN ACCORDANCE WITH MGWC DETAIL 4.2(a) AND 4.2(b) ON SHEET 20.
3. ONCE THE WATER LINE IS CONSTRUCTED BEYOND THE STREAM BANK, INSTALL IMBRICATED RIPRAP ALONG THE STREAM BANK IN ACCORDANCE WITH MGWC DETAIL 2.2 ON SHEET 20.
4. ONCE THE STREAM CHANNEL AND STREAM BANK IS STABILIZED, WITH THE APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR, REMOVE THE STAGE-2 STREAM DIVERSION AND STABILIZED ANY REMAINING DISTURBED AREAS.

LEGEND - SEDIMENT CONTROL

- LIMIT OF DISTURBANCE
- SILT FENCE
- SUPER SILT FENCE
- TREE PROTECTION
- DEWATERING BASIN



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Jay-Lee 10/2/13
DIRECTOR OF PUBLIC WORKS DATE

Thomas J. Butler 9/24/13
CHIEF - BUREAU OF ENGINEERING DATE

Steve Cline 10/1/13
CHIEF, BUREAU OF UTILITIES DATE

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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. 18523, EXPIRATION DATE 12/08/2013

Robert John Pappas
REGISTERED PROFESSIONAL ENGINEER

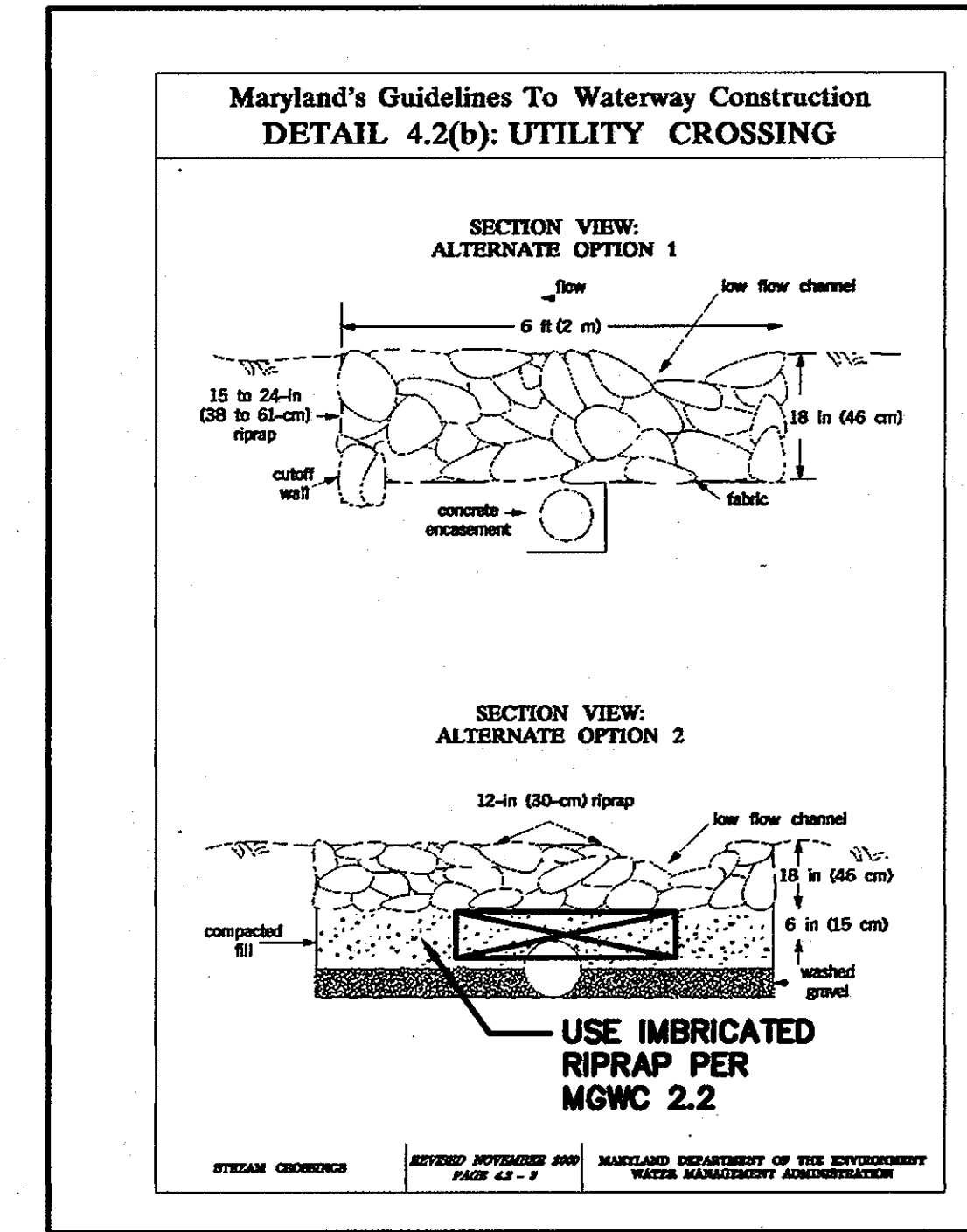
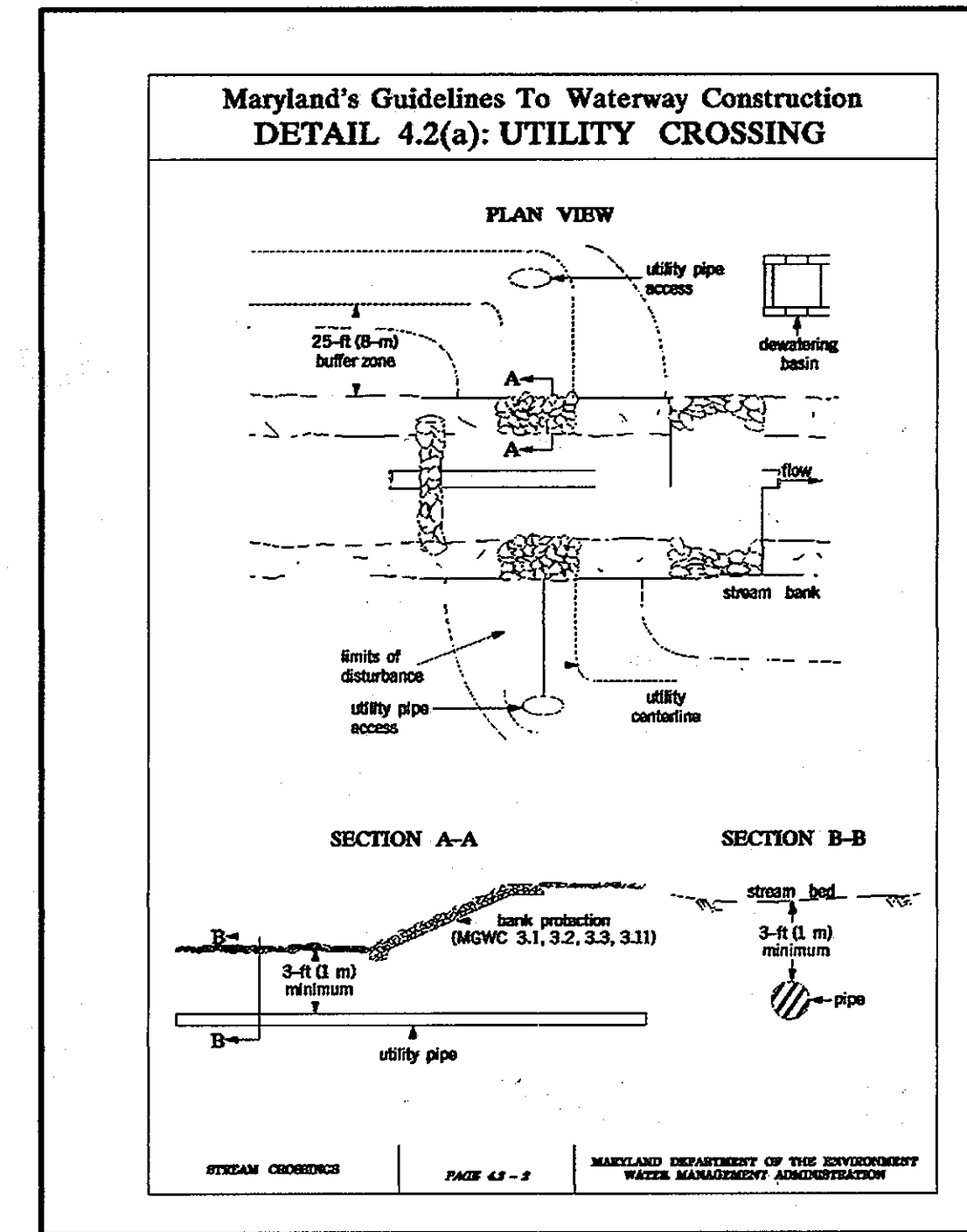
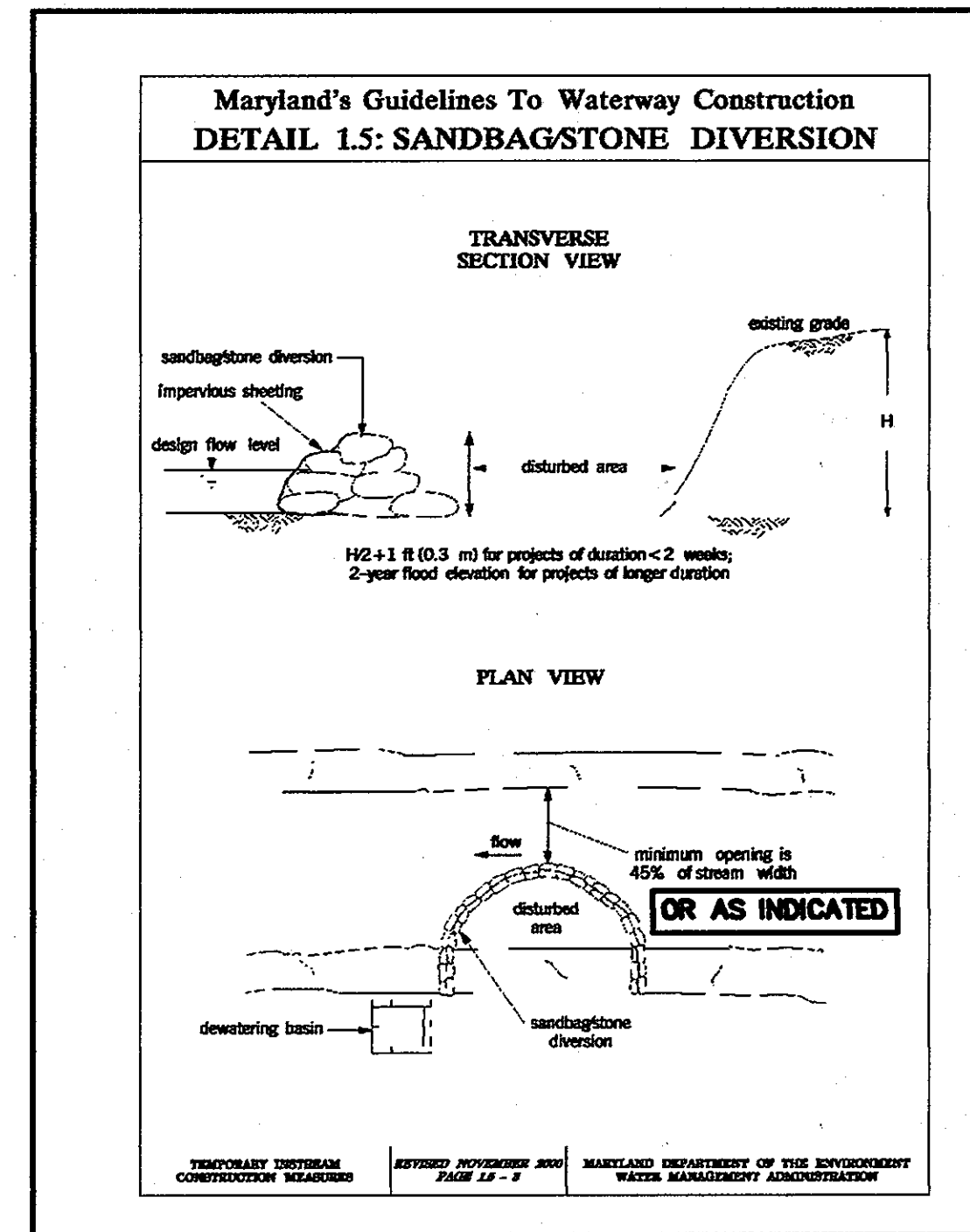
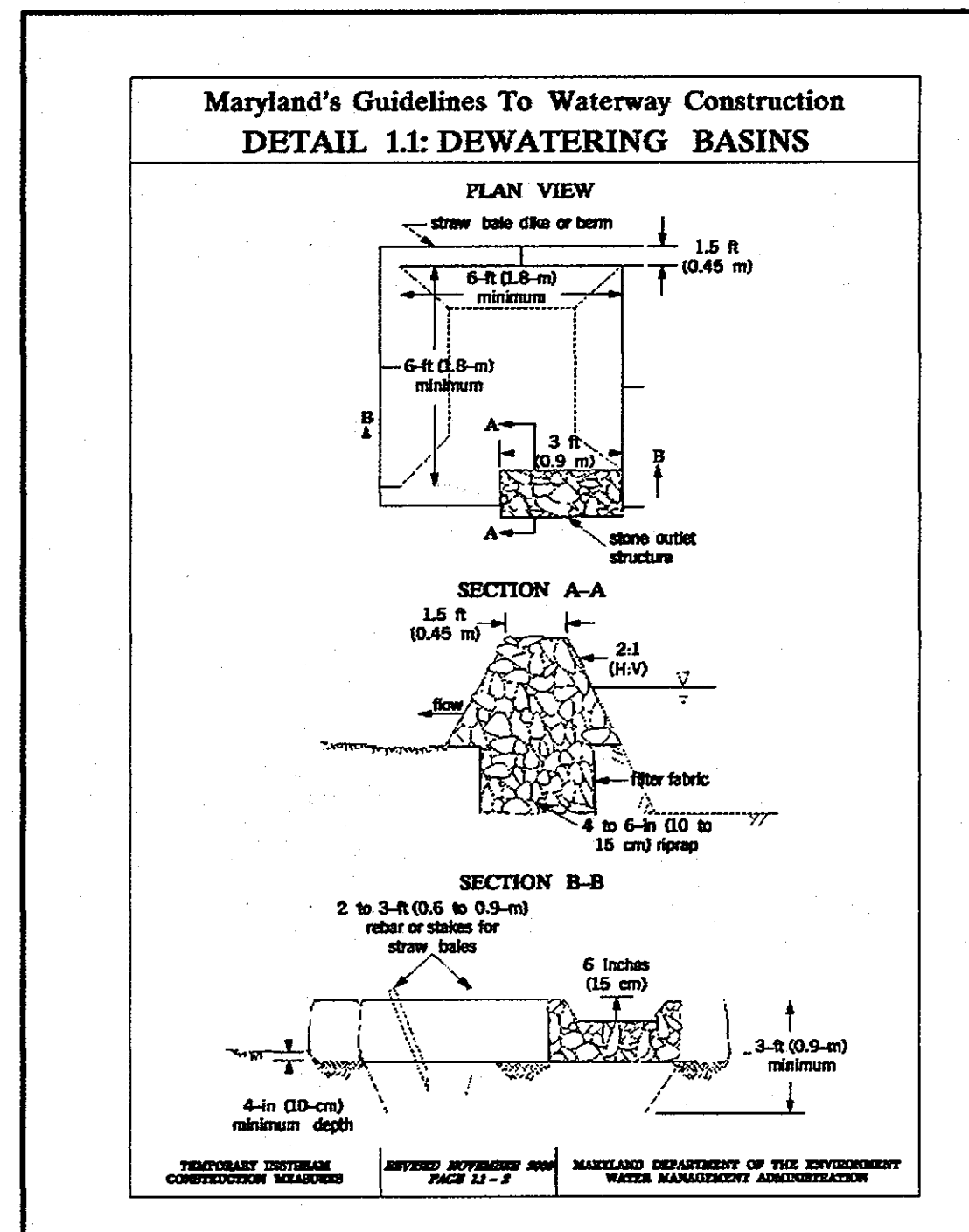
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CHK. BY:				
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		BY NO.	REVISION	DATE

STREAM DIVERSION PLANS

600' SCALE MAP NO. 42 BLOCK NO. 7

KINDLER ROAD - EDEN BROOK DRIVE WATER MAIN CONNECTION

CAPITAL PROJECT: W-8297
CONTRACT NO.: 44-4675
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND



MGWC 2.2: IMBRICATED RIPRAP

Rapid engineering technique for bank stabilization

DESCRIPTION
Imbricated riprap is used to protect and stabilize embankment soils from the erosive forces of flowing water and piping forces resulting from groundwater seepage. A well-engineered imbricated riprap revetment should consist of the following:
• a filter layer of gravel or cloth designed to prevent soil movement into or through the riprap layer while allowing water to drain from the embankment, and
• a stone wall of appropriate size and positioning to resist the shearing forces of channelized water and the lateral earth pressures of the embankment bank.

EFFECTIVE LIMITS & LIMITATIONS
When properly designed and installed, imbricated riprap revetments resist lateral earth pressure to some extent and can be an effective method of bank armoring where soil conditions, water turbulence and velocity, expected vegetative cover, and groundwater conditions are such that the soil may erode under the design flow conditions and lateral infiltration or seepage is not a concern.
Filter cloth should only be utilized when the back material is a cohesive material such as sand or gravel.

MATERIAL SPECIFICATIONS
Materials for imbricated riprap construction and installation should meet the following requirements:
• Filter: Synthetic filter fabric may be used occasionally based on the 1994 MS Standards and Specifications for Soil Erosion and Sediment Control. Whenever possible, however, geotextile filters with a minimum thickness of 6 mils (15 microns) should be used with a gradation as found in Table 2.2.

Percent Less Than	U.S. Standard Sieve Size
100	2 (12.5 mm)
85-100	16 (25 mm)
60-100	12 (25 mm)
30-70	No. 10
20-50	No. 40
10-20	No. 200

• The riprap: The maximum diameter or weight of stones for toe riprap should be based upon the bank full stream channel velocity as detailed in the MGWC 2.1: Riprap and Figure 2.1.
• Imbrication: Imbricated riprap should be angular and blocky in shape such that they are stackable and should be sufficiently large to resist displacement by both the design storm event and the non-specific lateral earth stresses. Therefore, the length of the longest axis of each stone should be the greater of 1/3 the height of the proposed wall and the size necessary to resist the design stream flow according to MSWC 2.1: Riprap. A typical minimum area length is 24 inches (61 cm).

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION
PAGE 2.2-1

MGWC 2.2: IMBRICATED RIPRAP

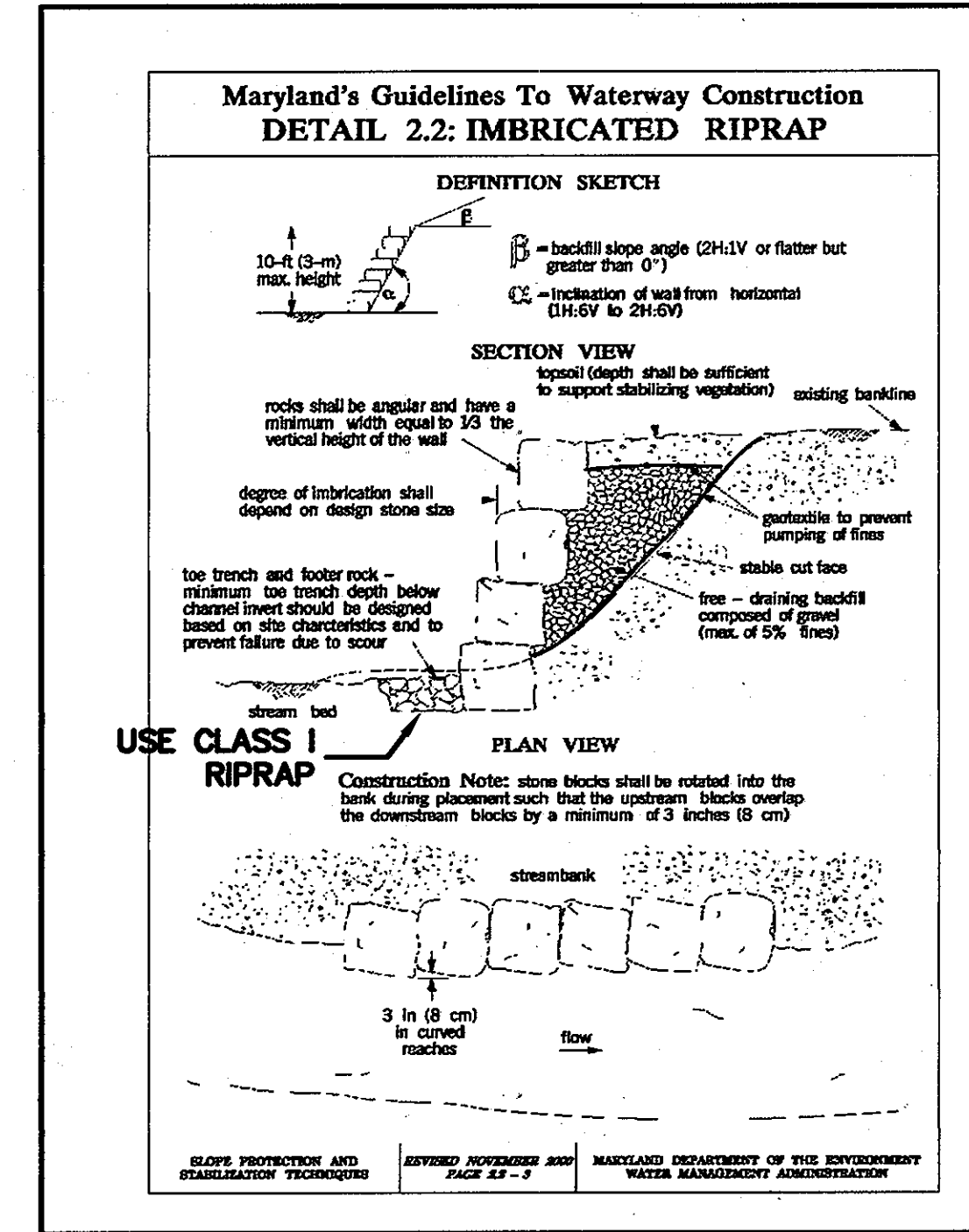
INSTALLATION GUIDELINES

All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. The recommended construction procedure for imbricated riprap is as follows (refer to Detail 2.2):

- The stream should be diverted according to a WMA recommended procedure (see Section 1, Temporary Stream Construction Measures, Maryland's Guidelines to Waterway Construction), and the construction area should be dewatered.
- All excavation should be made in reasonably close conformity with the existing stream slope and bed. The slope of the cut face should be in the range of 1H:1V to 2H:1V. Loose material at the toe of the embankment should be excavated until a stable foundation is reached, usually within 3 to 5 feet (0.9 to 1.5 meters) of the surface. The surface should be smooth, firm, and free from protruding objects or voids that would affect the proper positioning of the filter fabric.
- A graded granular filter or filter fabric should be placed on the face of the cut slope to prevent the migration of fine materials through the revetment. If filter fabric is used, it should be carefully and loosely placed on the prepared slope and secured. Additional steps should be taken to ensure a minimum of 9 inches (23 cm) of the filter fabric is not or damaged. It should be replaced or replaced.
- The rock layers should be evenly stacked with staggered joints so that each stone rests only on two stones in the layer below. Additionally, smaller stones should be used to fill voids so that each rock rests solidly on the previous and layer with minimal opportunity for movement. Upon completion of the first layer of stones, the toe trench should be filled with Class II riprap placed according to MGWC 2.1: Riprap or additional imbricated stones. Two footer stones should be used where high potential for channel incision exists. The height of the imbricated revetment is dictated by the size of the stone used, and the height should not exceed 1 times the length of the longest axis and should not be greater than 10 feet (3 meters).
- Placement of the granular backfill should occur concurrently with the stone placement. The backfill slope angle should be 2H:1V or flatter but should be greater than 9 degrees to facilitate installation. Once all of the backfill is in place, it should be covered with a filter layer and a layer of topsoil sufficient to support a native vegetation cover.
- The disturbed sections of the channel, including the slopes and stream bed, should be stabilized with methods approved by the WMA.

Note: The use of rock armor (MGWC 3.3: Rock Armor) should be considered to dissipate excessive toe velocities.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION
PAGE 2.2-2



MGWC 2.1: RIPRAP

Table 2.1: Stone Gradations for Riprap Stone Classes

Class	Size	% Total Weight < Given Size
I	1.50 in (38 mm)	100
	2 ft (1 ft)	10 max
II	700 lb (320 kg)	100
	20 ft (10 kg)	10 max
III	2000 lb (910 kg)	100
	50 ft (25 kg)	10 max

Uniform riprap grade should incorporate angular rock to promote interlocking.
Approximate Cost (\$1979)

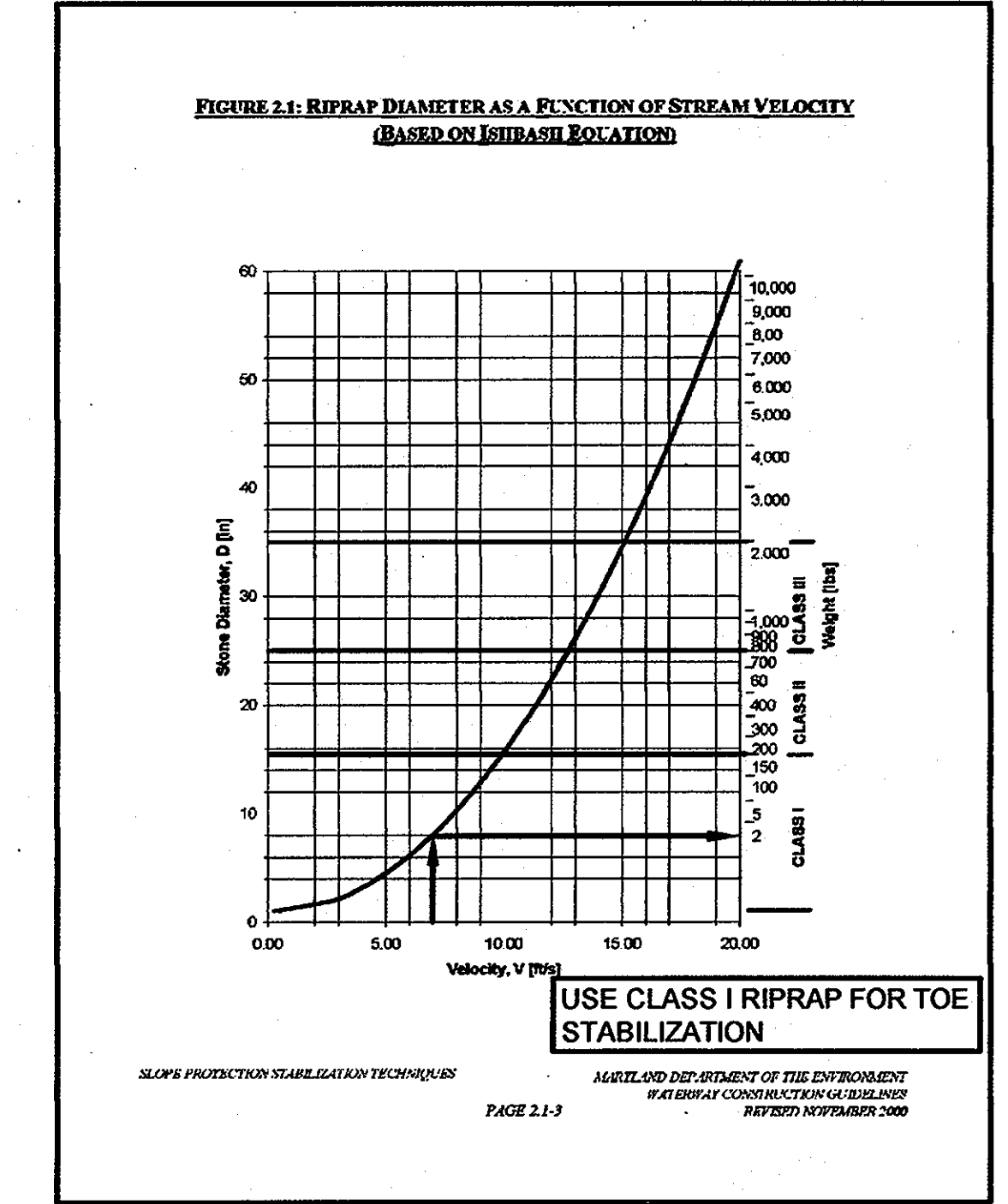
INSTALLATION GUIDELINES

All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. Once a slope stabilization project is initiated, preparation and placement of the riprap should immediately follow the initial disturbance to maintain the channel for further slope degradation. The recommended construction procedure for riprap is as follows beginning with initial slope preparation (refer to Detail 2.1):

- The contractor should install all erosion and sediment control devices as the first order of business.
- Dewatering should be made in reasonably close conformity with the existing stream slope and bed.
- All fill in the subgrade should be compacted to a density approximating that of the surrounding undisturbed material.
- This riprap must be stable to resist the stream bed so as to provide protection against undermining. If this cannot be accomplished by creating a toe trench, an alternative method of protection must receive prior written approval from the WMA or local authority.
- The filter layer or blanket should be placed immediately after slope preparation.
 - The stone for granular filter should be spread in a uniform layer to the specified depth. Where more than one layer is employed, they should be spread such that there is minimal mixing.
 - When cloth filters are used, special care should be taken not to damage the fabric during riprap placement.
- Riprap placement should begin with the toe. The larger stones, as specified by the design gradation, should be placed at the toe and along the perimeter of the slope and channel protection. The riprap should be placed with suitable equipment so that stones are produced a reasonably graded mass of stones with some top height. The placing of stones that cause extreme segregation is not allowed. Where appropriate, a low flow channel should be constructed through the riprap.
- Any excavation voids existing along the edges of the completed slope and channel protection should be backfilled and compacted.
- All disturbed areas should be permanently stabilized in accordance with an approved sediment and erosion control plan.

Note: The use of rock armor (MGWC 3.3: Rock Armor) should be considered to redirect high-velocity flow at the toe.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION
PAGE 2.1-2



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HOWARD COUNTY, MARYLAND

James J. ... 10/1/13
DIRECTOR OF PUBLIC WORKS DATE

Thomas E. ... 9/24/13
CHIEF - BUREAU OF ENGINEERING DATE

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STATE OF MARYLAND
ROBERT JOHN DEWEY
PROFESSIONAL ENGINEER

DSN. BY: _____
DRN. BY: _____
CHK. BY: _____
DATE: AUG, 2013

RJD 0 AS ISSUED FOR BID 09/13
BY NO. REVISION DATE

600' SCALE MAP NO. 42 BLOCK NO. 7

KINDLER ROAD - EDEN BROOK DRIVE
WATER MAIN CONNECTION

CAPITAL PROJECT: W-8297
CONTRACT NO.: 44-4675
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 20 OF 20