

# GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND  
ENVIRONMENTAL CONSULTANTS

*A Practicing Geoprofessional Business Association Member Firm*



March 25, 2024

Delaware Department of Natural Resources and Environmental Control  
Delaware Coastal Programs  
100 West Water Street, Suite 7B  
Dover, Delaware 19904

Re: Coastal Zone Management Act Federal Consistency  
***Felton Loop***  
Kent County, Delaware

To Whom It May Concern:

On behalf of Eastern Shore Natural Gas (Applicant), Geo-Technology Associates, Inc. (GTA) is submitting this application for the construction of the of the proposed 3.7 mile long 16-inch diameter buried natural gas line. To facilitate the Application's review, GTA is submitting the following information for your review and processing:

1. Completed Coastal Zone Management Act Federal Consistency Form;
2. Site Location Map;
3. USGS Topographic Map; and,
4. 2022 Aerial Imagery;
5. Felton Loop 60% Plans

The applicant, Eastern Shore Natural Gas, is proposing to construct, own, operate, and maintain approximately 3.7 miles of 16-inch pipeline looping along the western side of the Norfolk Southern railroad from the end of a previous looping pipeline near Fence Post Lane and extending southward to a pre-determined location along the eastern side of South Dupont Highway (US-13) approximately 2,200 feet south of Midstate Road (SR-12), in the Felton area of Kent County, Delaware. No direct impact to wetlands or waterbodies are proposed

GTA is confident that the enclosed information for the Felton Loop satisfies the general and regional conditions for the Coastal Zone Management Act. Should you have any questions or need additional information, please contact this office at (410) 515 9446.

3445-A Box Hill Corporate Center Drive, Abingdon, MD 21009 (410) 515-9446

◆ Abingdon, MD ◆ Baltimore, MD ◆ Laurel, MD ◆ Frederick, MD ◆ Waldorf, MD ◆ New Castle, DE ◆ Georgetown, DE  
◆ Somerset, NJ ◆ NYC Metro ◆ Pittsburgh Metro ◆ Quakertown, PA ◆ Scranton/Wilkes-Barre, PA ◆ York, PA  
◆ Northeastern, OH ◆ Sterling, VA ◆ Nashville, TN ◆ Charlotte, NC ◆ Raleigh, NC ◆ Orlando, FL

Visit us on the web at [www.gtaeng.com](http://www.gtaeng.com)

Delaware Department of Natural Resources and Environmental Control

Re: ***Felton Loop***

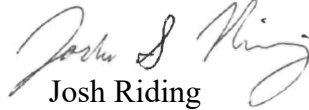
March 25, 2024

Page 2

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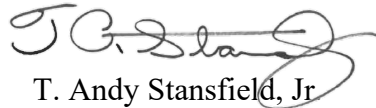
Sincerely,

**GEO-TECHNOLOGY ASSOCIATES, INC.**



Josh Riding

Environmental Scientist



T. Andy Stansfield, Jr

Vice President

JSR/TAS

22257

L:\Shared\Project Files\2023\22257 - Felton Loop\WET\Reports - Permitting\DE CZM\22257 CZM Cover Letter.doc

Completed Coastal Zone Management  
Act Federal Consistency Form



Initial Review: \_\_\_\_\_  
Updated On: \_\_\_\_\_  
Complete: \_\_\_\_\_  
Official Use Only

## Coastal Zone Management Act Federal Consistency Form

This document provides the Delaware Coastal Management Program (DCMP) with a Federal Consistency Determination or Certification for activities regulated under the Coastal Zone Management Act of 1972, as amended, and NOAA's Federal Consistency Regulations, 15 C.F.R. Part 930. Federal agencies and other applicants for federal consistency are not required to use this form; it is provided to applicants to facilitate the submission of a Consistency Determination or Consistency Certification. In addition, federal agencies and applicants are only required to provide the information required by NOAA's Federal Consistency Regulations.

**Project/Activity Name:** \_\_\_\_\_

### I. Federal Agency or Non-Federal Applicant Contact Information:

Contact Name/Title: \_\_\_\_\_

Federal Agency Contractor Name (if applicable): \_\_\_\_\_

Federal Agency: \_\_\_\_\_  
(either the federal agency proposing an action or the federal agency issuing a federal license/permit or financial assistance to a non-federal applicant)

Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

E-mail: \_\_\_\_\_ Telephone #: \_\_\_\_\_

### II. Federal Consistency Category:

Federal Activity or Development Project  
(15 C.F.R. Part 930, Subpart C)

Federal License or Permit Activity  
(15 C.F.R. Part 930, Subpart D)

Outer Continental Shelf Activity  
(15 C.F.R. Part 930, Subpart E)

Federal License or Permit Activity which occurs  
wholly in another state (interstate consistency  
activities identified in DCMP's Policy document)

Federal Financial Assistance  
(15 C.F.R. Part 930, Subpart F)

### III. Detailed Project Description (attach additional sheets if necessary):

**IV. General Analysis of Coastal Effects** (attach additional sheets if necessary):

**V. Detailed Analysis of Consistency with DCMP Enforceable Policies** (attach additional sheets if necessary):

**Policy 5.1: Wetlands Management**

**Policy 5.2: Beach Management**

**Policy 5.3: Coastal Waters Management** (includes wells, water supply, and stormwater management. Attach additional sheets if necessary)

**Policy 5.4: Subaqueous Land and Coastal Strip Management**

**Policy 5.5: Public Lands Management**

**Policy 5.6: Natural Lands Management**

**Policy 5.7: Flood Hazard Areas Management**

**Policy 5.8: Port of Wilmington**

**Policy 5.9: Woodlands and Agricultural Lands Management**

**Policy 5.10: Historic and Cultural Areas Management**

**Policy 5.11: Living Resources**

**Policy 5.12 Mineral Resources Management**

**Policy 5.13: State Owned Coastal Recreation and Conservation**

**Policy 5.14: Public Trust Doctrine**

**Policy 5.15: Energy Facilities**

**Policy 5.16: Public Investment**

**Policy 5.17: Recreation and Tourism**

**Policy 5.18: National Defense and Aerospace Facilities**

**Policy 5.19: Transportation Facilities**

**Policy 5.20: Air Quality Management**

**Policy 5.21: Water Supply Management**

**Policy 5.22: Waste Disposal Management**

**Policy 5.23: Development**

**Policy 5.24: Pollution Prevention**

**Policy 5.25: Coastal Management Coordination**

**VI. JPP and RAS Review** (Check all that apply):

Has the project been reviewed in a monthly Joint Permit Processing and/or Regulatory Advisory Service meeting?

JPP

RAS

None

\*If yes, provide the date of the meeting(s): \_\_\_\_\_



**VII. Statement of Certification/Determination and Signature** (Check one and sign below):

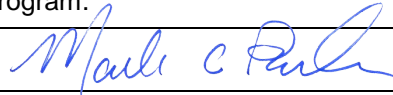
**FEDERAL AGENCY CONSISTENCY DETERMINATION.** Based upon the information, data, and analysis included herein, the federal agency, or its contracted agent, listed in (I) above, finds that this proposed activity is consistent to the maximum extent practicable with the enforceable policies of the Delaware Coastal Management Program.

OR

**FEDERAL AGENCY NEGATIVE DETERMINATION.** Based upon the information, data, and analysis included herein, the federal agency, or its contracted agent, listed in (I) above, finds that this proposed activity will not have any reasonably foreseeable effects on Delaware's coastal uses or resources (Negative Determination) and is therefore consistent with the enforceable policies of the Delaware Coastal Management Program.

OR

**NON-FEDERAL APPLICANT'S CONSISTENCY CERTIFICATION.** Based upon the information, data, and analysis included herein, the non-federal applicant for a federal license or permit, or state or local government agency applying for federal funding, listed in (I) above, finds that this proposed activity complies with the enforceable policies of the Delaware Coastal Management Program and will be conducted in a manner consistent with such program.

Signature:			
Printed Name:		Date:	

Pursuant to 15 C.F.R. Part 930, the Delaware Coastal Management Program must provide its concurrence with or objection to this consistency determination or consistency certification in accordance with the deadlines listed below. Concurrence will be presumed if the state's response is not received within the allowable timeframe.

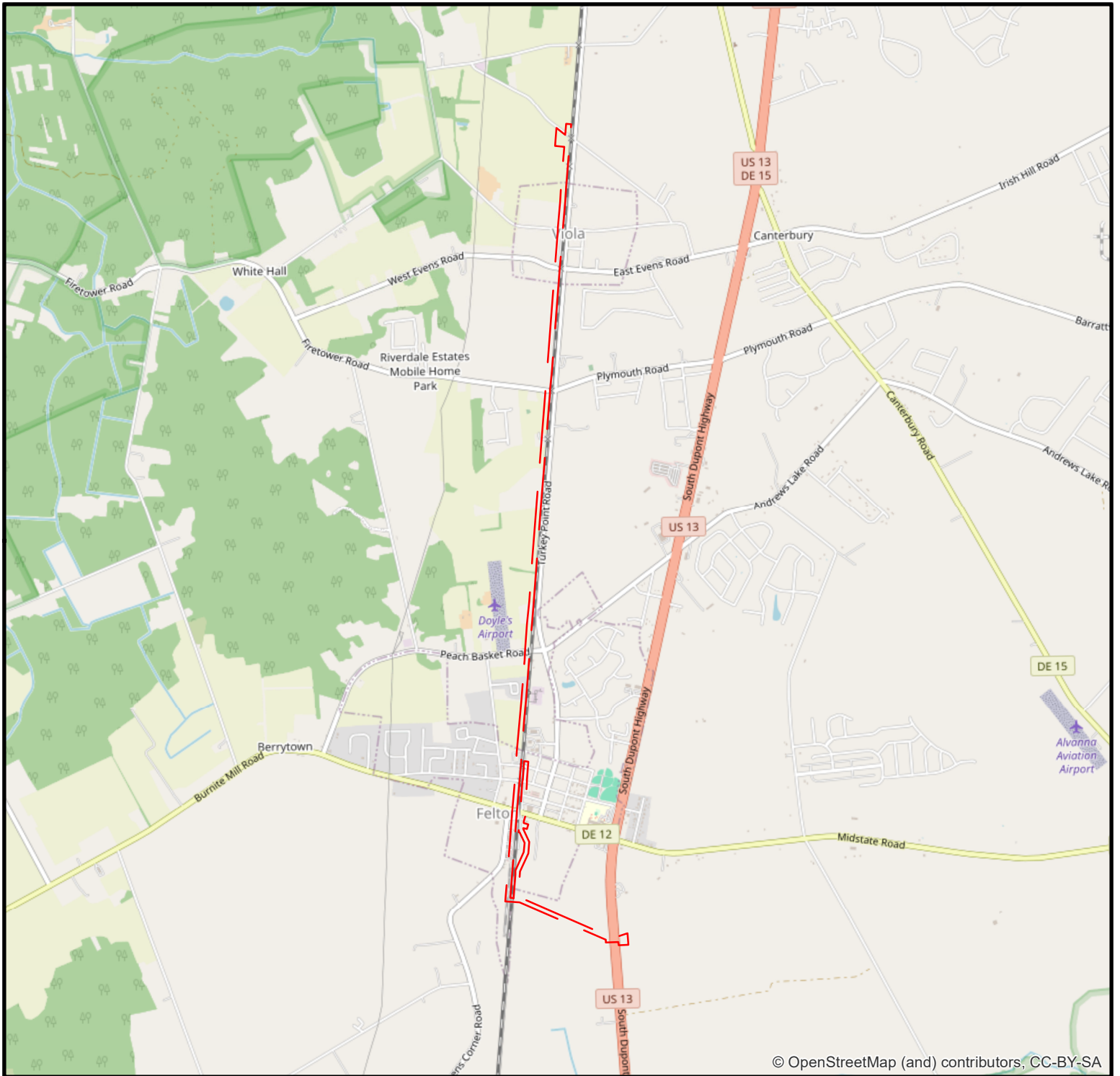
**Federal Consistency Review Deadlines:**

Federal Activity or Development Project (15 C.F.R. Part 930, Subpart C)	60 days with option to extend an additional 15 days or stay review (15 C.F.R. § 930.41)
Federal License or Permit (15 C.F.R. Part 930, Subpart D)	Six months, with a status letter at three months. The six month review period can be stayed by mutual agreement. (15 C.F.R. § 930.63)
Outer Continental Shelf Activity (15 C.F.R. Part 930, Subpart E)	Six months, with a status letter at three months. If three month status letter not issued, then concurrence presumed. The six month review period can be stayed by mutual agreement. (15 C.F.R. § 930.78)
Federal Financial Assistance to State or Local Governments (15 C.F.R. Part 930, Subpart F)	State Clearinghouse schedule

**OFFICIAL USE ONLY:**

Reviewed By:	Fed Con ID:	Date Received:
Public notice dates: _____ to _____	Comments Received: <input type="checkbox"/> NO <input type="checkbox"/> YES <i>[attach comments]</i>	
Decision type: <small>(objections or conditions attach details)</small>	Decision Date: _____	

## Site Location Map



**LEGEND**

— REVIEW AREA



**GEO-TECHNOLOGY ASSOCIATES, INC.**  
 GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3445-A BOX HILL CORPORATE CENTER DRIVE  
 ABINGDON, MARYLAND 21009  
 PHONE: 410-515-9446  
 FAX: 410-515-4895  
 WWW.GTAENG.COM

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**SITE LOCATION MAP  
 FELTON LOOP**

KENT COUNTY, DELAWARE

JOB NO.	22257	SCALE:	1"=3,000'	DATE:	MARCH 27, 2024	DRAWN BY:	JSR	REVIEW BY:	MAJ/TAS	FIGURE:	1
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# USGS Topographic Map



SOURCE: UNITED STATES GEOLOGICAL SURVEY (USGS), WYOMING AND HARRINGTON, DELAWARE QUADRANGLES, 7.5 MINUTE TOPOGRAPHIC MAP SERIES, DATED 2023

**LEGEND**

— REVIEW AREA



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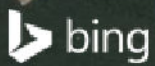
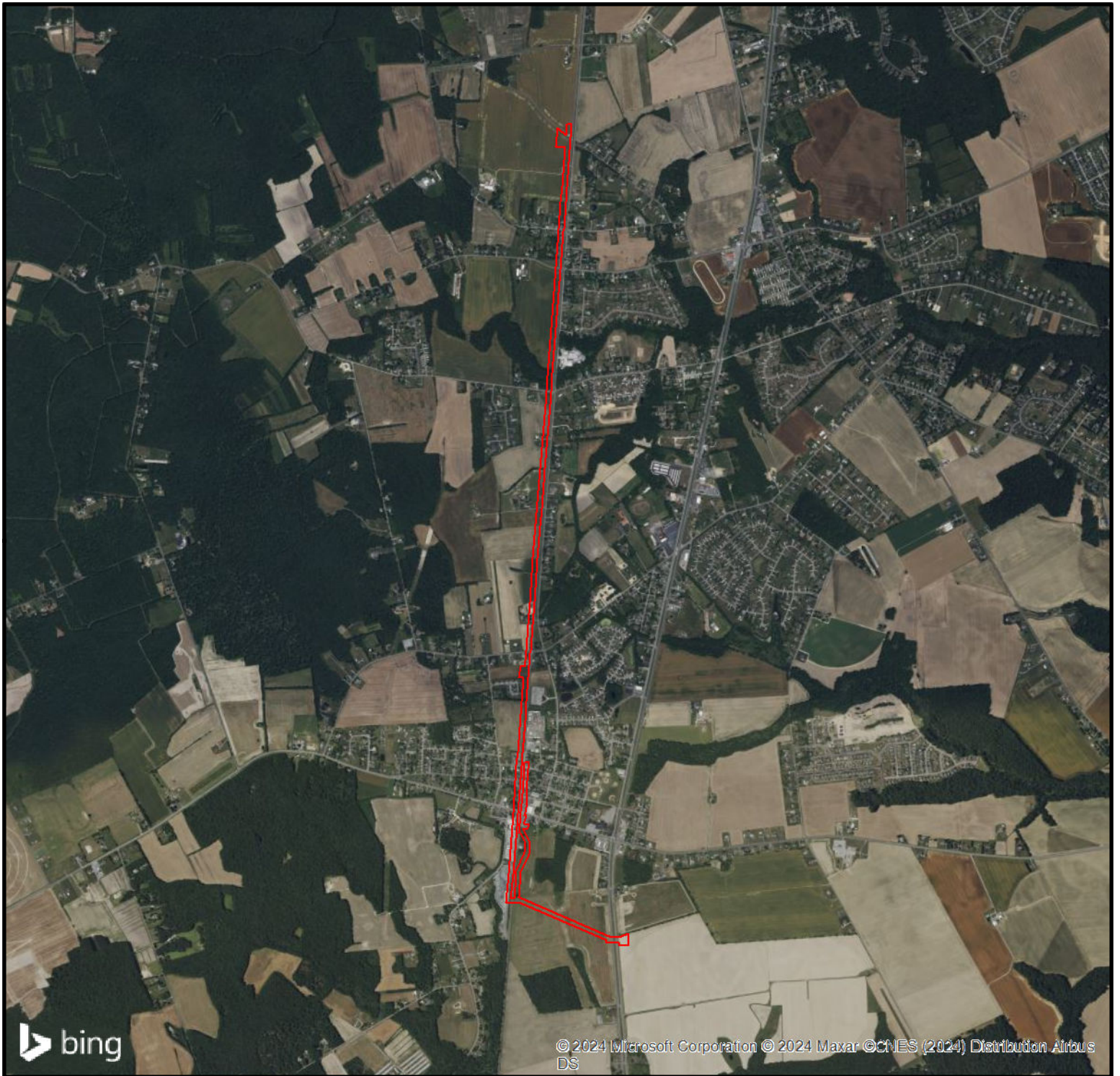
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**USGS TOPOGRAPHIC MAP  
 FELTON LOOP**

KENT COUNTY, DELAWARE

JOB NO.	22257	SCALE:	1"=3,000'	DATE:	MARCH 27, 2024	DRAWN BY:	JSR	REVIEW BY:	MAJ/TAS	FIGURE:	2
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# 2023 Aerial Imagery

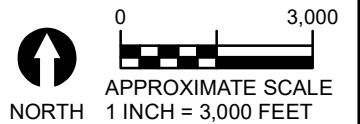


© 2024 Microsoft Corporation © 2024 Maxar © CNES (2024) Distribution Airbus DS

SOURCE: 2023 BASE AERIAL IMAGERY PROVIDED BY MICROSOFT CORPORATION.

**LEGEND**

— REVIEW AREA



**GEO-TECHNOLOGY ASSOCIATES, INC.**  
 GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS  
 3445-A BOX HILL CORPORATE CENTER DRIVE  
 ABINGDON, MARYLAND 21009  
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 FAX: 410-515-4895  
 WWW.GTAENG.COM  
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**2022 AERIAL IMAGERY  
 FELTON LOOP**

KENT COUNTY, DELAWARE

JOB NO.	22257	SCALE:	1"=3,000'	DATE:	MARCH 27, 2024	DRAWN BY:	JSR	REVIEW BY:	MAJ/TAS	FIGURE:	5
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## Felton Loop 60% Plans

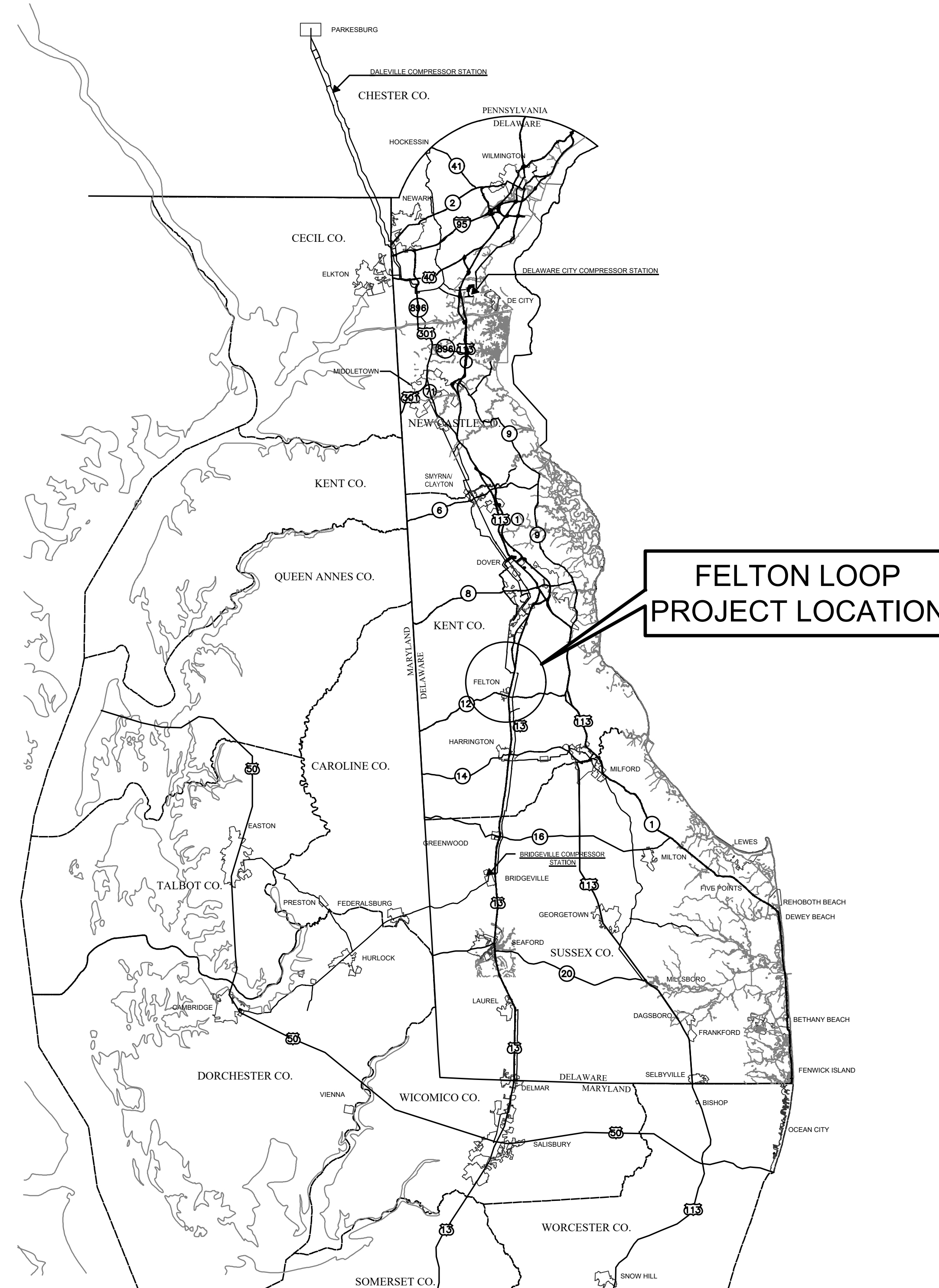


# EASTERN SHORE NATURAL GAS COMPANY FELTON LOOP

## PROPOSED 3.6± MILES OF 16" NATURAL GAS PIPELINE KENT COUNTY, DELAWARE

### DRAWING INDEX

SHEET	TITLE
1	COVER SHEET
2	DNREC COVER SHEET AND CERTIFICATIONS SHEET
3	EROSION & SEDIMENT CONTROL GENERAL NOTES
4 - 6	EROSION & SEDIMENT CONTROL DETAILS
7	TRAFFIC CONTROL DETAILS
8	NORTH TIE-IN
9	SOUTH TIE-IN
10 & 11	TIE-IN DETAILS
12	PIPING & INSTRUMENTATION DETAIL
13 - 26	PLAN & PROFILE



FELTON LOOP  
PROJECT LOCATION



REVISIONS			
NO.	DATE	DESCRIPTION	BY



**MORRIS & RITCHIE ASSOCIATES, INC.**  
ENGINEERS, PLANNERS, SURVEYORS AND  
LANDSCAPE ARCHITECTS  
111 RUTHAR DRIVE  
NEWARK, DE 19711  
(302) 326-2200  
FAX: (302) 526-5395  
MRA@GTA.COM  
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COVER SHEET	
16" PROPOSED PIPELINE FELTON LOOP KENT COUNTY, DE	
ESNG PROJ. CODE:	DATE: 3/8/2024
MRA PROJECT NO: 22257	SCALE: AS SHOWN
DESIGN/CHECK BY: JTH/CWB	SHEET: 1 OF 26

# EASTERN SHORE NATURAL GAS COMPANY FELTON LOOP SEDIMENT AND STORMWATER MANAGEMENT PLANS

## NORTH MURDERKILL AND SOUTH MURDERKILL HUNDRED MURDERKILL RIVER WATERSHED KENT COUNTY, DELAWARE

DELEGATED AGENCY APPROVAL:

**SEDIMENT AND STORMWATER CONSTRUCTION NOTES:**

1. THE DNREC SEDIMENT AND STORMWATER MANAGEMENT PROGRAM MUST BE NOTIFIED IN WRITING FIVE (5) DAYS PRIOR TO COMMENCING WITH CONSTRUCTION. FAILURE TO DO SO CONSTITUTES A VIOLATION OF THE APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLAN.
2. REVIEW AND OR APPROVAL OF THE SEDIMENT AND STORMWATER MANAGEMENT PLAN SHALL NOT RELIEVE THE CONTRACTOR FROM HIS OR HER RESPONSIBILITIES FOR COMPLIANCE WITH THE REQUIREMENTS OF THE SEDIMENT AND STORMWATER REGULATIONS, NOR SHALL IT RELIEVE THE CONTRACTOR FROM ERRORS OR OMISSIONS IN THE APPROVED PLAN.
3. IF THE APPROVED PLAN NEEDS TO BE MODIFIED, ADDITIONAL SEDIMENT AND STORMWATER CONTROL MEASURES MAY BE REQUIRED AS DEEMED NECESSARY BY DNREC.
4. FOLLOWING SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED FOR ALL PERIMETER SEDIMENT CONTROLS, SOIL STOCKPILES, AND ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE WITHIN FOURTEEN (14) CALENDAR DAYS UNLESS MORE RESTRICTIVE FEDERAL REQUIREMENTS APPLY.
5. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL COMPLY WITH THE DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.
6. AT ANY TIME A DEWATERING OPERATION IS USED, IT SHALL BE PREVIOUSLY APPROVED BY THE AGENCY CONSTRUCTION SITE REVIEWER FOR A NON-EROSIVE POINT OF DISCHARGE, AND A DEWATERING PERMIT SHALL BE APPROVED BY THE DNREC WELL PERMITTING BRANCH.
7. APPROVED PLANS REMAIN VALID FOR FIVE (5) YEARS FROM THE DATE OF APPROVAL.
8. POST CONSTRUCTION VERIFICATION DRAWINGS ARE TO BE SUBMITTED TO DNREC WITHIN SIXTY (60) DAYS OF STORMWATER MANAGEMENT FACILITY COMPLETION, IF APPLICABLE.
9. APPROVAL OF A SEDIMENT AND STORMWATER PLAN DOES NOT GRANT OR IMPLY A RIGHT TO DISCHARGE STORMWATER RUNOFF. THE OWNER/DEVELOPER IS RESPONSIBLE FOR ACQUIRING ANY AND ALL AGREEMENTS, EASEMENTS, ETC., NECESSARY TO COMPLY WITH STATE DRAINAGE AND OTHER APPLICABLE LAWS.
10. THE NOTICE OF INTENT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER A NPDES GENERAL PERMIT FOR THIS PROJECT IS ~~XXXXX~~. AT ANY TIME THE OWNERSHIP FOR THIS PROJECT CHANGES, A TRANSFER OF AUTHORIZATION OR A CO-PERMITTEE APPLICATION MUST BE SUBMITTED TO DNREC. THE PERMITTEE OF RECORD SHALL NOT BE RELIEVED OF THEIR RESPONSIBILITIES UNTIL A NOTICE OF TERMINATION HAS BEEN PROCESSED BY DNREC.
11. THE OWNER SHALL BE FAMILIAR WITH AND COMPLY WITH ALL ASPECTS OF THE NPDES CONSTRUCTION GENERAL PERMIT ASSOCIATED WITH THE PROJECT, INCLUDING, BUT NOT LIMITED TO, PERFORMING WEEKLY SITE INSPECTIONS DURING CONSTRUCTION AND AFTER RAIN EVENTS, AND MAINTAINING WRITTEN LOGS OF THESE INSPECTIONS.
12. BEFORE ANY EARTHWORK OR EXCAVATION TAKES PLACE, THE CONTRACTOR SHALL CALL MISS UTILITY AT 811 OR 1-800-282-8555 AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO CONSTRUCTION, TO HAVE ALL EXISTING UTILITIES MARKED ONSITE.
13. THE CONTRACTOR SHALL AT ALL TIMES PROTECT AGAINST SEDIMENT OF DEBRIS LADEN RUNOFF OR WIND FROM LEAVING THE SITE. PERIMETER CONTROLS SHALL BE CHECKED DAILY AND ADJUSTED AND/OR REPAIRED TO FULLY CONTAIN AND CONTROL SEDIMENT FROM LEAVING THE SITE. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT HAS REACHED HALF OF THE EFFECTIVE CAPACITY OF THE CONTROL. IN ADDITION, THE CONTRACTOR MAY NEED TO ADJUST OR ALTER MEASURES IN TIMES OF ADVERSE WEATHER CONDITIONS, OR AS DIRECTED BY THE AGENCY SITE REVIEWER.
14. BEST AVAILABLE TECHNOLOGY (BAT) SHALL BE EMPLOYED TO MANAGE TURBID DISCHARGES IN ACCORDANCE WITH REQUIREMENTS OF 7. DEL. C. CH 60, REGULATIONS GOVERNING THE CONTROL OF WATER POLLUTION, SECTION 41.02, KNOWN AS SPECIAL CONDITIONS FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES AND DEPARTMENT POLICIES, PROCEDURES, AND GUIDANCE.
15. DOCUMENTATION OF SOIL TESTING AND MATERIALS USED FOR TEMPORARY OR PERMANENT STABILIZATION INCLUDING BUT NOT LIMITED TO SOIL TEST RESULTS, SEED TAGS, SOIL AMENDMENT TAGS, ETC, SHALL BE PROVIDED TO THE DEPARTMENT OR DELEGATED AGENCY TO VERIFY THAT THE PERMANENT OR TEMPORARY STABILIZATION HAS BEEN COMPLETED IN ACCORDANCE WITH THE APPROVED PLAN.
16. THE DEPARTMENT OR THE DELEGATED AGENCY MAY REQUIRE ADDITIONAL SOIL TESTING AND REAPPLICATION OF PERMANENT OR TEMPORARY STABILIZATION IN ACCORDANCE WITH THE SPECIFICATIONS IN THE DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK, OR ALTERNATIVE MEASURES THAT PROVIDE FUNCTIONAL EQUIVALENCY.

**OWNER'S CERTIFICATION:**

"I, MARK PARKER, CERTIFY THAT ALL LAND CLEARING, CONSTRUCTION AND DEVELOPMENT SHALL BE DONE PURSUANT TO THE APPROVED PLAN AND THAT RESPONSIBLE PERSONNEL (I.E., BLUE CARD HOLDER) INVOLVED IN THE LAND DISTURBANCE WILL HAVE A CERTIFICATION OF TRAINING PRIOR TO INITIATION OF THE PROJECT, AT A DNREC SPONSORED OR APPROVED TRAINING COURSE FOR THE CONTROL OF EROSION AND SEDIMENT DURING CONSTRUCTION. IN ADDITION, I GRANT THE DNREC SEDIMENT AND STORMWATER PROGRAM AND/OR THE RELEVANT DELEGATED AGENCY THE RIGHT TO CONDUCT ON-SITE REVIEWS, AND I UNDERSTAND MY RESPONSIBILITIES UNDER THE NPDES CONSTRUCTION GENERAL PERMIT, AS REFERENCED ON THIS COVERSHEET."

MARK PARKER, P.E., SENIOR ENGINEER  
EASTERN SHORE NATURAL GAS  
500 ENERGY LANE, SUITE 200  
DOVER, DE 19901  
PHONE - (302) 213-7270  
FAX - (302) 734-6745

DATE

**WETLAND STATEMENT:**

GEO-TECHNOLOGY ASSOCIATES, INC. (GTA) HAS PERFORMED A FIELD REVIEW OF THE PROJECT AREA TO EVALUATE THE PRESENCE OF WATERS OF THE UNITED STATES, INCLUDING WETLANDS (SECTION 404 AND SECTION 10), STATE SUBAQUEOUS LANDS AND STATE REGULATED WETLANDS AS ESTABLISHED BY THE REVIEWING AGENCIES IN THE FORM OF MANUALS, POLICIES, AND PROCEDURES IN PLACE AT THE TIME THAT THE EVALUATION WAS PERFORMED. THE LIMITS OF JURISDICTIONAL WETLANDS WERE DELINEATED IN THE FIELD BY GTA PERSONNEL. A REQUEST FOR AUTHORIZATION UNDER NATIONWIDE PERMIT 12-UTILITY LINE ACTIVITIES WAS SUBMITTED TO THE UNITED STATES ARMY CORPS OF ENGINEERS (USACE), AND IN RESPONSE THE USACE ISSUED A LETTER STATING THAT NO PERMIT IS REQUIRED. EASTERN SHORE NATURAL GAS ALSO RECEIVED A SUBAQUEOUS LANDS PERMIT FROM DNREC.

T. ANDREW STANSFIELD, JR.  
GEO-TECHNOLOGY ASSOCIATES, INC.  
3445 BOX HILL CORPORATE CENTER DRIVE, SUITE A  
ABINGDON, MD 21009  
PHONE - (410) 515-4446  
FAX - (410) 515-4895

DATE

**SITE DESIGNER CERTIFICATION:**

"I, PHILLIP L. TOLLIVER, HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLIES WITH THE APPLICABLE STATE AND LOCAL REGULATIONS AND ORDINANCES."

PHILLIP L. TOLLIVER, P.E. - DELAWARE LIC. NO. 12484  
MORRIS & RITCHE ASSOCIATES, INC.  
16 BOULDEN CIRCLE, SUITE 36  
NEK CASTLE, DELAWARE 19720  
PHONE - (302) 326-2200  
FAX - (302) 326-2391

DATE

**DNREC COVER SHEET  
AND CERTIFICATIONS SHEET**

**16" PROPOSED PIPELINE  
FELTON LOOP  
KENT COUNTY, DE**

REVISIONS			
NO.	DATE	DESCRIPTION	BY



**MORRIS & RITCHE ASSOCIATES, INC.**  
ENGINEERS, PLANNERS, SURVEYORS AND  
LANDSCAPE ARCHITECTS  
111 RUTHAR DRIVE  
NEWARK, DE 19711  
(302) 326-2200  
FAX: (302) 326-2399  
MRA@GTA.COM  
© 2024 MORRIS & RITCHE ASSOCIATES, INC.



**EASTERN SHORE**  
NATURAL GAS  
500 ENERGY LANE, SUITE 200 DOVER, DE 19901  
TELEPHONE (302) 734-6710 - FAX (302) 734-6745

ESNG PROJ. CODE:	DATE:	3/8/2024
MRA PROJECT NO:	SCALE:	N/A
DESIGN/CHECK BY:	JTH/CWB	SHEET: 2 OF 26

**GENERAL ENVIRONMENTAL NOTES**

- EROSION/SEDIMENTATION CONTROL STRUCTURES TO BE INSTALLED AND MAINTAINED AS NECESSARY DURING CONSTRUCTION TO AVOID/MINIMIZE IMPACT TO WETLANDS AND WATERBODIES. THESE BARRIERS WILL REMAIN IN PLACE UNTIL REVEGETATION AND RESTORATION ARE DEEMED SUCCESSFUL.
- ANY TRENCH DEWATERING TO BE DIRECTED TO SEDIMENT FILTER BAG AND/OR DEWATERING STRUCTURE IN AN UPLAND AREA TO ENSURE THAT NO EROSION OR SEDIMENTATION OCCURS TO WETLANDS/WATERBODIES.
- PRE-CONSTRUCTION CONTOURS TO BE RE-ESTABLISHED FOR ALL DISTURBED AREAS. ALL DISTURBED AREAS TO BE RESTORED AND/OR REVEGETATED AS APPLICABLE.
- ALL DISTURBED AREAS TO BE RESTORED AND/OR REVEGETATED AS APPLICABLE. SEED, FERTILIZER, LIME AND MULCH TO BE APPLIED IN ACCORDANCE WITH RECOMMENDATIONS FROM LOCAL NATURAL RESOURCES CONSERVATION SERVICE (NRCS), AND LANDOWNER REQUIREMENTS (AGRICULTURAL AREAS). SEE SHEET 5 OF 26 FOR MULCH APPLICATION REQUIREMENTS.
- FOR NON-ROADWAY AREAS, UPLAND RE-SEEDING TO BE PERFORMED IN ACCORDANCE WITH THE VEGETATIVE STABILIZATION DETAILS (SEE SHEET 6 OF 26).
- CONSTRUCTION TO BE PERFORMED IN ACCORDANCE WITH REQUIREMENTS IN FERC UPLAND EROSION CONTROL, REVEGETATION AND MAINTENANCE PLAN AND FERC WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES.
- THE KENT CONSERVATION DISTRICT SEDIMENT AND STORMWATER MANAGEMENT PROGRAM MUST BE NOTIFIED IN WRITING FIVE (5) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION. FAILURE TO DO SO CONSTITUTES A VIOLATION OF THE APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLAN.
- REVIEW AND/OR APPROVAL OF THE SEDIMENT AND STORMWATER MANAGEMENT PLAN SHALL NOT RELIEVE THE CONTRACTOR FROM HIS OR HER RESPONSIBILITIES FOR COMPLIANCE WITH THE REQUIREMENTS OF THE SEDIMENT AND STORMWATER REGULATIONS, NOR SHALL IT RELIEVE THE CONTRACTOR FROM ERRORS OR OMISSIONS IN THE APPROVED PLAN.
- IF THE APPROVED PLAN NEEDS TO BE MODIFIED, ADDITIONAL SEDIMENT AND STORMWATER CONTROL MEASURES MAY BE REQUIRED AS DEEMED NECESSARY BY THE KENT CONSERVATION DISTRICT.
- FOLLOWING SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN 14 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER SEDIMENT CONTROLS, SOIL STOCKPILES, AND ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
- IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN AND REPAIR ALL EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT PRACTICES DURING CONSTRUCTION. THIS WILL BE MONITORED BY THE EASTERN SHORE NATURAL GAS (ESNG) ENVIRONMENTAL INSPECTOR. FOLLOWING CONSTRUCTION, ESNG WILL CONTINUE TO MONITOR THE EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT MEASURES, UNTIL REVEGETATION AND RESTORATION ARE DEEMED SUCCESSFUL. DURING THIS TIMEFRAME, ESNG WILL ARRANGE FOR ANY NECESSARY REPAIRS AND MAINTENANCE TO SUCH STRUCTURES AND MEASURES. ESNG WILL ALSO ARRANGE FOR ANY AND ALL NECESSARY ADDITIONAL REVEGETATION AND/OR RESTORATION MEASURES DURING THIS TIMEFRAME.
- REFER TO TYPICAL TOPSOIL SEGREGATION DETAIL FOR SUBSOIL/TOPSOIL PILE INFORMATION ON SHEET 6 OF 26.
- ALL STONE, WITH THE EXCEPTION OF CHECK DAMS, MUST BE UNDERLAIN WITH A GEOTEXTILE FABRIC (E.G., TEMPORARY CONSTRUCTION ENTRANCES OFF PUBLIC ROADWAYS). GEOTEXTILE FABRIC SPECIFICATIONS WILL BE PROVIDED FOR VARIOUS APPLICATIONS.
- EROSION CONTROL MATTING IS REQUIRED FOR RESTORATION ON SLOPES OF 3:1 OR GREATER.
- CONTRACTOR SHALL USE STREET SWEEPER AS REQUIRED TO MINIMIZE DUST AND SOIL ON ROADWAYS. IF DUST IN NON-ROADWAY AREAS BECOMES A PROBLEM, CONTRACTOR TO APPLY WATER TO CONSTRUCTION RIGHT-OF-WAY TO PROVIDE DUST CONTROL.
- TEMPORARY CONSTRUCTION ENTRANCES (ROCK AND GEOTEXTILE FABRIC) TO BE INSTALLED FOR ACCESS FROM PUBLIC ROADS TO TEMPORARY CONSTRUCTION WORK AREAS ADJACENT TO PUBLIC ROADS (SEE TEMPORARY CONSTRUCTION ENTRANCE DETAIL). CULVERT PIPES TO BE INSTALLED WHERE NECESSARY FOR ACCESS ACROSS DITCHES OR SWALES, TO MAINTAIN EXISTING DRAINAGE PATTERNS.
- TOPSOIL SHALL BE STRIPPED AND SEGREGATED PRIOR TO TRENCHING IN AGRICULTURAL AREAS (MAX. DEPTH 12 INCHES). AFTER COMPLETION OF SUBSOIL BACKFILL, TOPSOIL TO BE RETURNED TO REQUIRED AREAS AND GRADED. TOPSOIL SHALL ALSO BE SEGREGATED IN ALL TEMPORARY CONSTRUCTION WORKSPACE AREAS IN AGRICULTURAL AREAS. TOPSOIL SHALL ALSO BE SEGREGATED IN ALL AREAS WHERE THE PROPOSED PIPELINE IS INSTALLED IN UNPAVED ROAD RIGHT OF WAY AREAS. IF TOPSOIL IS NOT SEGREGATED IN THESE AREAS, THEN CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING NEW TOPSOIL TO ACTUAL DEPTH OF EXISTING TOPSOIL (MIN. 6" DEPTH/MAX. 12" DEPTH).

**STABILIZATION NOTES**

- FOR ROADWAY AREAS REFER TO DELDOT NOTES ON SHEET 7 OF 26.
- FOR NON-ROADWAY AREAS, REFER TO NOTES AND DETAILS ON RESTORATION SEEDING AND MULCHING. RESTORATION IN NON-ROADWAY AREAS (UPLANDS AND WETLANDS) WILL BE PERFORMED WITHIN 7 DAYS OF BACKFILL. IN STREAM AREAS, RESTORATION WILL BE PERFORMED WITHIN ONE TO TWO DAYS OF PIPELINE INSTALLATION AND BACKFILL. ALL DISTURBED SOIL SHALL BE STABILIZED AS THE CONTRACTOR PROGRESSES WITHIN 5 WORKING DAYS OF DISTURBANCE.

**CONSTRUCTION NOTES AND SEQUENCING**

**NOTIFICATION:**  
THE KENT CONSERVATION DISTRICT SEDIMENT AND STORMWATER MANAGEMENT PROGRAM MUST BE NOTIFIED IN WRITING FIVE (5) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION. FAILURE TO DO SO CONSTITUTES A VIOLATION OF THE APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLAN. PRIOR TO ANY CLEARING, INSTALLATION OF SEDIMENT CONTROL MEASURES OR GRADING, A PRE-CONSTRUCTION MEETING MUST BE SCHEDULED AND CONDUCTED WITH THE AGENCY CONSTRUCTION SITE REVIEWER, THE LANDOWNER/DEVELOPER, CONTRACTOR, AND CERTIFIED CONSTRUCTION REVIEWER ARE REQUIRED TO BE IN ATTENDANCE AT THE PRE-CONSTRUCTION MEETING; THE DESIGNER IS RECOMMENDED TO ATTEND.

**WORK AREAS:**  
CONSTRUCTION WORK AREAS TO BE CONFINED TO THE LIMITS SHOWN ON THE DRAWINGS. CONTRACTOR SHALL USE MATTING WHEN WORKING OVER EXISTING EASTERN SHORE FACILITIES AT NO ADDITIONAL COST TO EASTERN SHORE. CONTRACTOR SHALL TEST HOLE AND VERIFY EXISTING PIPELINE DEPTH PRIOR TO WORKING OVER EXISTING FACILITIES. CONTRACTOR SHALL PROVIDE BEARING CALCULATIONS TO DETERMINE NEED FOR MATTING OR LOW PRESSURE GROUND TRACKING EQUIPMENT AND CONFIRM WITH EASTERN SHORE THE METHODOLOGY PRIOR TO WORKING IN THAT AREA. ANY DAMAGE TO EXISTING EASTERN SHORE FACILITIES WILL BE REPAIRED AND/OR REPLACED AT THE CONTRACTOR'S EXPENSE.

**MATERIALS:**  
ALL PIPELINE COATING MATERIAL SHALL BE PROVIDED, STORED AND APPLIED BY CONTRACTOR PER ESNG CONSTRUCTION STANDARDS MANUAL AND APPROVED MATERIAL LIST.

**EROSION AND SEDIMENTATION CONTROLS:**  
ALL PERIMETER CONTROLS ARE TO BE REVIEWED BY THE AGENCY CONSTRUCTION SITE REVIEWER AND APPROVED PRIOR TO PROCEEDING WITH FURTHER SITE DISTURBANCE OR CONSTRUCTION. THE CONTRACTOR SHALL AT ALL TIMES PROTECT AGAINST SEDIMENT OR DEBRIS LADEN RUNOFF OR WIND FROM LEAVING THE SITE. PERIMETER CONTROLS SHOULD BE CHECKED DAILY AND ADJUSTED AND/OR REPAIRED TO FULLY CONTAIN AND CONTROL SEDIMENTATION ON THE SITE. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT HAS REACHED HALF OF THE EFFECTIVE CAPACITY OF THE CONTROL. IN ADDITION, THE CONTRACTOR MAY NEED TO ADJUST OR REPAIR MEASURES IN TIMES OF ADVERSE WEATHER CONDITIONS, OR AS DIRECTED BY THE AGENCY CONSTRUCTION SITE REVIEWER. EROSION AND SEDIMENTATION CONTROL BARRIERS (SILT FENCE) WILL BE INSTALLED AND MAINTAINED PRIOR TO EARTH DISTURBANCE TO AVOID/MINIMIZE IMPACT TO WETLANDS AND WATERBODIES. EROSION/SEDIMENT CONTROL BARRIERS ARE SHOWN ON THE DRAWINGS. ACTUAL SILT FENCE LOCATIONS SHALL BE FIELD DETERMINED BASED ON SITE CONDITIONS, AND SHALL BE AGREED TO/APPROVED BY ESNG CONSTRUCTION INSPECTION REPRESENTATIVES. THESE BARRIERS WILL REMAIN IN PLACE UNTIL REVEGETATION AND RESTORATION ARE DEEMED SUCCESSFUL (SEE GENERAL ENVIRONMENTAL NOTES THIS SHEET). EROSION AND SEDIMENT CONTROL DEVICES SHOULD BE REMOVED ONLY AFTER WORK IN AN AREA HAS BEEN COMPLETED AND STABILIZED, WITH WRITTEN APPROVAL FROM THE AGENCY CONSTRUCTION SITE REVIEWER.

**CLEARING OF VEGETATION:**  
TREE CLEARING WILL BE LIMITED TO THE MINIMUM NEEDED TO CONSTRUCT THE PIPELINE. ALL WOODED AREAS CLEARED FOR TEMPORARY WORK SPACE WILL BE ALLOWED TO NATURALLY REGENERATE.

**PIPELINE INSTALLATIONS BENEATH ROADWAY CULVERTS:**  
THE HDD CROSSINGS ARE PROPOSED TO BE PERFORMED WITHIN THE ROAD ROW OR PERMANENT EASEMENT AND WILL BE DESIGNED TO MEET ALL REQUIREMENTS AND SPECIFICATIONS OF DELAWARE DEPARTMENT OF TRANSPORTATION (DELDOT). THE DESIGNS WILL BE PERFORMED TO ENSURE THE COMPLETE STRUCTURAL INTEGRITY OF THE ROADWAY AND ADJACENT AREAS, WHILE ALSO MAINTAINING SUFFICIENT CLEARANCE UNDER UTILITIES, CULVERT STRUCTURES AND FOOTINGS. EROSION/SEDIMENT CONTROLS WILL BE INSTALLED AND MAINTAINED THROUGHOUT CONSTRUCTION TO ENSURE THAT NO SEDIMENTATION OCCURS TO WETLANDS OR WATERBODIES OUTSIDE THE ROADWAY. UPON COMPLETION OF CONSTRUCTION, ALL PITS AND OTHER AREAS WILL BE BACKFILLED AND COMPACTED TO ENSURE THE INTEGRITY OF THE STRUCTURES AND ROADWAY.

**TRENCH EXCAVATION AND BACKFILLING:**  
THE TRENCH REQUIRED FOR THE PIPELINE INSTALLATION WILL BE EXCAVATED TO ENSURE THE REQUIRED DEPTH OF COVER. IN GENERAL, A MINIMUM OF 4 FEET OF COVER WILL BE PLACED OVER THE PIPELINE, BACKFILLING WITH COMPACTED MATERIAL MEETING THE REQUIREMENTS OF DELDOT. IN PAVED AREAS TRENCHLINE IS TO BE SANICUT, AND PAVEMENT WILL BE DISPOSED OF AT AN APPROVED FACILITY. UPON COMPLETION OF THE PIPELINE INSTALLATION ACTIVITIES, THE GROUND SURFACE WILL BE GRADED TO PRE-CONSTRUCTION CONDITIONS. TRENCH WATER OR OTHER FORMS OF TURBID WATER WILL NOT BE DIRECTLY DISCHARGED ONTO EXPOSED SOIL SURFACES OR INTO ANY WETLAND OR STREAMS. GROUNDWATER SEEPAGE WILL BE PUMPED OUT OF THE TRENCH AND DIRECTED TO A PRE-MANUFACTURED FILTER BAG (OR EQUIVALENT) SIZED FOR THE EXPECTED VOLUME OF EFFLUENT, WHICH WILL BE PLACED IN AN UPLAND AREA, SURROUNDED BY A HAY BALE ENCLOSURE IF NECESSARY. SILT AND SEDIMENT WILL COLLECT IN THE FILTER BAG WHILE ALLOWING NON-TURBID WATER TO LEACH OUT AND INFILTRATE INTO THE GROUND. THE COLLECTED SILT, SEDIMENT, AND USED FILTER BAG WILL BE PROPERLY DISPOSED OFF-SITE.

**HYDROSTATIC TESTING OF THE PROPOSED PIPELINE:**  
IN COMPLIANCE WITH U.S. DEPARTMENT OF TRANSPORTATION PIPELINE SAFETY AND INTEGRITY REGULATIONS, EASTERN SHORE NATURAL GAS WILL HYDROSTATICALLY TEST THE PROPOSED NATURAL GAS PIPELINE PRIOR TO PLACING THE PROPOSED PIPELINE IN SERVICE. THE SOURCE OF WATER FOR THE HYDROSTATIC TEST WILL BE DETERMINED BEFORE THE TEST.

**HYDROSTATIC PRESSURE TESTING WATER THAT IS RELEASED TO AN UPLAND SILT FENCE AND HAY BALE CONTAINMENT AREA WILL BE DONE USING WORKSPACE IN AN UPLAND AREA AT THE BEGINNING OR ENDING LOCATION OF EACH SEGMENT (NO TREE CLEARING WILL BE INVOLVED IN THE HYDROSTATIC TEST WATER DISCHARGE). A SPLASH PLATE WILL BE USED TO DIFFUSE THE IMPACT OF THE RELEASED WATER. EASTERN SHORE NATURAL GAS WILL ENSURE THAT NO EROSION OR WATERBODY/WETLAND SEDIMENTATION OCCURS FROM THE TEST WATER RELEASE ACTIVITIES. THE RELEASE RATE WILL BE 500 - 1500 GALLONS PER MINUTE, OR AT A RATE SO AS NOT TO CAUSE ANY SCOURING.**

**PERMIT TERMINATION:**  
THE TERMINATION OF THE CONSTRUCTION GENERAL PERMIT WILL REQUIRE SUBMISSION AND ACCEPTANCE OF THE POST CONSTRUCTION VERIFICATION DOCUMENTS, INCLUDING FINAL STABILIZATION THROUGHOUT THE SITE, ALL ELEMENTS OF THE SEDIMENT AND STORMWATER MANAGEMENT PLAN IMPLEMENTED, AND ACCEPTANCE OF THE FINAL OPERATION AND MAINTENANCE PLAN.

- GENERAL:**
- THE CONTRACTOR SHALL CONTACT MISS UTILITY OF DELMARVA AT 1-800-292-8555 FOR UTILITY LOCATIONS WITHIN AND SURROUNDING CONSTRUCTION AREAS NOT LESS THAN 3 DAYS BEFORE PERFORMING ANY EXCAVATION.
  - THE LOCATION OF UNDERGROUND UTILITIES AS INDICATED ON PLANS HAS BEEN OBTAINED FROM EXISTING RECORDS. NEITHER THE OWNER OR THE ARCHITECT/ENGINEER ASSUMES ANY RESPONSIBILITY WHATSOEVER IN RESPECT TO ACCURACY, COMPLETENESS OR SUFFICIENCY OF THE INFORMATION SHOWN. THERE IS NO GUARANTEE EITHER EXPRESSED OR IMPLIED THAT THE LOCATIONS, SIZE AND TYPE OF MATERIALS OF EXISTING UNDERGROUND UTILITIES INDICATED ARE REPRESENTATIVE OF THOSE TO BE ENCOUNTERED DURING CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH UTILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE OWNER OF HIS OPERATIONAL PLANS. IN THE EVENT OF AN UNEXPECTED UTILITY INTERFERENCE DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER. ANY SUCH MAINS AND/OR SERVICES DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED IMMEDIATELY AT HIS EXPENSE.
  - PRIOR TO PERFORMING ANY EXCAVATION GREATER THAN 6 INCHES, THE CONTRACTOR SHALL COORDINATE WITH SOUTH DISTRICT PUBLIC WORKS AND ALL PRIVATE UTILITY COMPANIES TO DETERMINE THE LOCATION OF UNDERGROUND UTILITY LINES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH ALL ORGANIZATIONS THAT CONTROL EXISTING UNDERGROUND UTILITIES IN THE CONSTRUCTION AREA OR WOULD BE AFFECTED BY CONSTRUCTION WORK AROUND THE EXISTING UTILITIES.
  - THE CONTRACTOR SHALL NOT START EXCAVATION UNTIL ALL UTILITY LINE LOCATIONS HAVE BEEN STAKED OR OTHERWISE CLEARLY MARKED AND DOCUMENTATION FURNISHED TO THE OWNER. ALL MARKINGS SHALL BE CONSIDERED APPROXIMATE, AND UTILITIES OTHER THAN THOSE SHOWN SHALL BE CONSIDERED TO EXIST.
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DEFINITE LOCATION OF EACH UTILITY WITHIN THE WORK AREA. CARE SHOULD BE EXERCISED DURING EXCAVATION WORK TO AVOID DAMAGING OR DISRUPTING UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING (AT CONTRACTOR'S EXPENSE) DAMAGE TO ANY UTILITY CAUSED BY THE CONTRACTOR'S WORK.
  - WHERE EXISTING UNDERGROUND UTILITIES OR OTHER CONSTRUCTION ARE EXPECTED TO BE IN PROXIMITY TO PROPOSED CONSTRUCTION, OR WHEN APPROACHING EXISTING UTILITIES OR STRUCTURES FOR CONNECTIONS, THE CONTRACTOR SHALL DIG TEST PITS TO DETERMINE THE EXACT LOCATION AND INVERTS OF THE EXISTING UTILITY TO ALLOW FOR POSSIBLE CHANGES TO THE PROPOSED UTILITY IN LINE AND/OR GRADE. THE CONTRACTOR SHALL ALSO DIG TEST PITS IN THE LOCATION OF THE PROPOSED CONNECTIONS TO EXISTING UTILITIES AND SHALL MAKE ALL MEASUREMENTS NECESSARY TO ENSURE PROPER CONNECTION. ANY NECESSARY CHANGES IN LINE OR GRADE OF WORK CAUSED BY FAILURE TO TAKE SUCH PRECAUTIONS SHALL BE AT THE EXPENSE OF THE CONTRACTOR.
  - WHEN IT IS NECESSARY TO EXCAVATE NEAR OR INTERFERE WITH ANY SEWER LINE, WATER SERVICES, DRAIN PIPE, CATCH BASIN, CULVERT, OR OTHER STRUCTURES, THE CONTRACTOR SHALL MAINTAIN THE SAME IN WORKING ORDER AND SHALL REPAIR AND MAKE GOOD ANY DAMAGE DONE DURING THE PROGRESS OF THE WORK.
  - WHERE EXISTING UTILITIES CROSS THE TRENCH EXCAVATION, THEY SHALL BE ADEQUATELY SUPPORTED AND PROTECTED FROM DAMAGE DUE TO CONSTRUCTION. ALL METHODS FOR SUPPORTING AND MAINTAINING THESE UTILITIES SHALL BE SUBJECT TO REVIEW BY OWNER. CARE SHALL BE TAKEN TO ENSURE THAT THE EXISTING UTILITY GRADES AND ALIGNMENT ARE MAINTAINED AND THE PIPE JOINTS ARE NOT DISTURBED. BACKFILL SHALL BE CAREFULLY PLACED AND TAMPED TO PREVENT DAMAGE OR FUTURE SETTLEMENT. ANY DAMAGE OR MISALIGNMENT OF THE UTILITIES DUE TO CONSTRUCTION OR SETTLEMENT SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.
  - ANY UNPROTECTED CABLE (DIRECT BURIED) ENCOUNTERED THAT IS VERIFIED AS NOT ABANDONED IN PLACE SHALL BE PROTECTED. THE UTILITY OWNER MAY DIRECT THE CABLE BE PLACED IN SPLIT DUCT OF APPROPRIATE SIZE AND CONCRETE ENCASED THROUGH THE AREA OF CONSTRUCTION. CONTRACTOR SHALL TAKE ALL REASONABLE MEASURES TO AVOID HAVING TO CUT AND SPLICE DIRECT BURIED CABLE. THE CONTRACTOR SHALL NOTE SPLIT DUCT PORTIONS ON AS-BUILTS.
  - SHORING MAY BE REQUIRED TO PROTECT THE INTEGRITY OF THE ROADWAY IF TRENCH ENCROROACHES WITHIN 5' OF PAVEMENT OR IF UNDERMINING OCCURS.

**CONSTRUCTION SCHEDULE**

CONSTRUCTION IS SCHEDULED TO BEGIN IN **SUMMER OF 2024**. CONSTRUCTION IS SCHEDULED TO BE COMPLETED IN **FALL OF 2024**, IN ACCORDANCE WITH ESNG SCHEDULE. WORK WILL CONSIST OF THE FOLLOWING SEQUENTIAL OR CONCURRENT ACTIVITIES:

- THE KENT CONSERVATION DISTRICT SEDIMENT AND STORMWATER MANAGEMENT PROGRAM MUST BE NOTIFIED IN WRITING FIVE (5) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION. FAILURE TO DO SO CONSTITUTES A VIOLATION OF THE APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLAN.
- PRIOR TO ANY CLEARING, INSTALLATION OF SEDIMENT CONTROL MEASURE OR GRADING, A PRE-CONSTRUCTION MEETING SHALL BE SCHEDULED AND CONDUCTED WITH THE AGENCY CONSTRUCTION SITE REVIEWER, THE LANDOWNER / DEVELOPER, CONTRACTOR AND CERTIFIED CONSTRUCTION REVIEWER ARE REQUIRED TO BE IN ATTENDANCE AT THE PRE-CONSTRUCTION MEETING; THE DESIGNER IS RECOMMENDED TO ATTEND.
- ALL PERIMETER CONTROLS ARE TO BE REVIEWED BY THE AGENCY CONSTRUCTION SITE REVIEWER AND APPROVED PRIOR TO PROCEEDING WITH FURTHER SITE DISTURBANCE OR CONSTRUCTION.
- EROSION AND SEDIMENTATION CONTROL STRUCTURES WILL BE INSTALLED AND MAINTAINED AS NECESSARY (SEE ENVIRONMENTAL NOTES).
- TOPSOIL STRIPPING AND SEGREGATION WILL BE PERFORMED IN REQUIRED AREAS.
- CLEARING, GRADING AND GRUBBING WILL BE PERFORMED IN NON-ROADWAY AREAS, AS APPLICABLE.
- TRENCHING/DITCHING WILL BE PERFORMED TO ENSURE REQUIRED DEPTH OF COVER OVER PIPELINE PER THE DRAWINGS, (SUBSOIL WILL BE STOCKPILED WITHIN THE WORK AREA SEPARATE FROM TOPSOIL AS APPLICABLE).
- IN PAVED AREAS TRENCHLINE IS TO BE SANICUT, AND PAVEMENT WILL BE DISPOSED OF AT AN APPROVED FACILITY.
- BENDING, WELDING, AND COATING OF THE PIPELINE ALONG THE EDGE OF THE TRENCH.
- LOWERING THE PIPE INTO THE DITCH, PADDING, BACKFILL AND COMPACTION INCLUDING ROAD SUB-BASE IN PAVED ROADWAY AREAS), AS WELL AS CLEANUP AND RESTORATION.
- FILLING THE PIPE WITH WATER, HYDROSTATIC PRESSURE TESTING OF THE PIPE AND DEWATERING INTO THE UPLAND AREA.
- INSTALLATION OF VALVE ASSEMBLIES AS REQUIRED.
- FINAL TIE-IN OF THE PIPELINE AT BOTH ENDS, FINAL CLEANUP AND GRADING, ROAD RESURFACING WHERE APPLICABLE, AND SEEDING AND MULCHING WHERE APPLICABLE. SEE "STABILIZATION NOTES" FOR REQUIREMENTS RELATED TO STABILIZATION OF ROADWAY AND NON-ROADWAY AREAS.
- EROSION/SEDIMENT CONTROL BARRIERS SHALL REMAIN IN PLACE UNTIL FINAL REVEGETATION AND RESTORATION ARE DEEMED SUCCESSFUL AND AUTHORIZED FOR REMOVAL BY THE KENT CONSERVATION DISTRICT SEDIMENT & STORMWATER PROGRAM.
- THE TERMINATION OF THE CONSTRUCTION GENERAL PERMIT WILL REQUIRE SUBMISSION AND ACCEPTANCE OF THE POST CONSTRUCTION VERIFICATION DOCUMENTS, INCLUDING FINAL STABILIZATION THROUGHOUT THE SITE, ALL ELEMENTS OF THE SEDIMENT AND STORMWATER MANAGEMENT PLAN IMPLEMENTED, AND ACCEPTANCE OF THE FINAL OPERATION AND MAINTENANCE PLAN.

**LEGEND**

**COORDINATE SYSTEM AND VERTICAL DATUM**

**HORIZONTAL COORDINATE SYSTEM:**  
DELAWARE STATE PLANE, NORTH AMERICAN DATUM OF 1983 (NAD 83), U.S. SURVEY FOOT

**VERTICAL DATUM:**  
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), U.S. SURVEY FOOT



**Know what's below. Call before you dig.**

**PROTECT YOURSELF. GIVE THREE WORKING DAYS NOTICE.**  
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

**EROSION & SEDIMENT CONTROL GENERAL NOTES**

<b>16" PROPOSED PIPELINE FELTON LOOP KENT COUNTY, DE</b>	
ESNG PROJ. CODE:	DATE: 3/8/2024
MRA PROJECT NO: 22257	SCALE: N/A
DESIGN/CHECK BY: JTH/CWB	SHEET: 3 OF 26

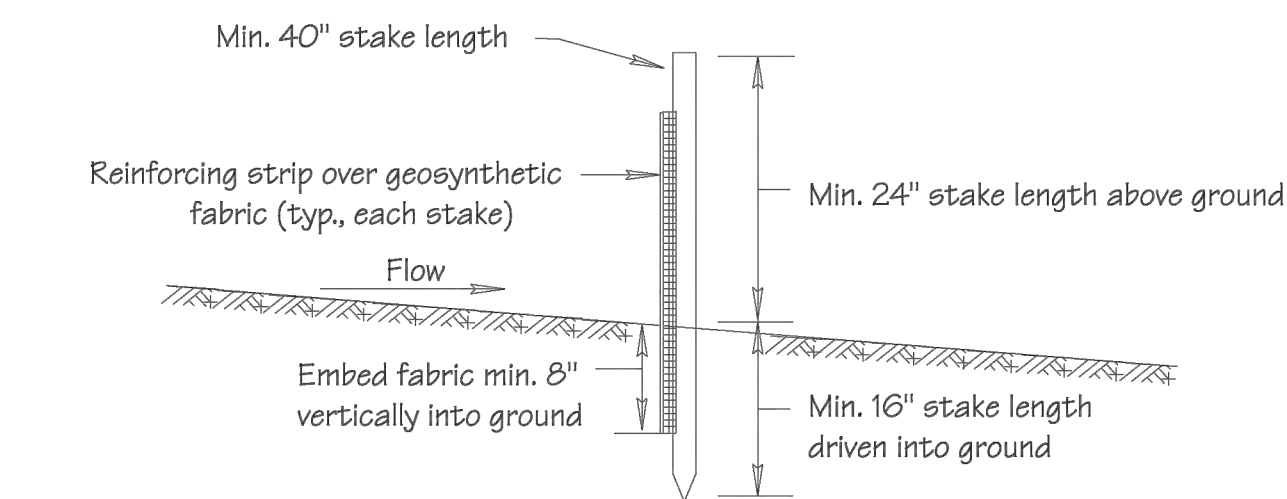
REVISIONS			
NO.	DATE	DESCRIPTION	BY

**MRA MORRIS & RITCHIE ASSOCIATES, INC.**  
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS  
111 RUTHAR DRIVE  
NEWARK, DE 19711  
(302) 326-2200  
FAX: (302) 326-2399  
MRA@MRA.COM  
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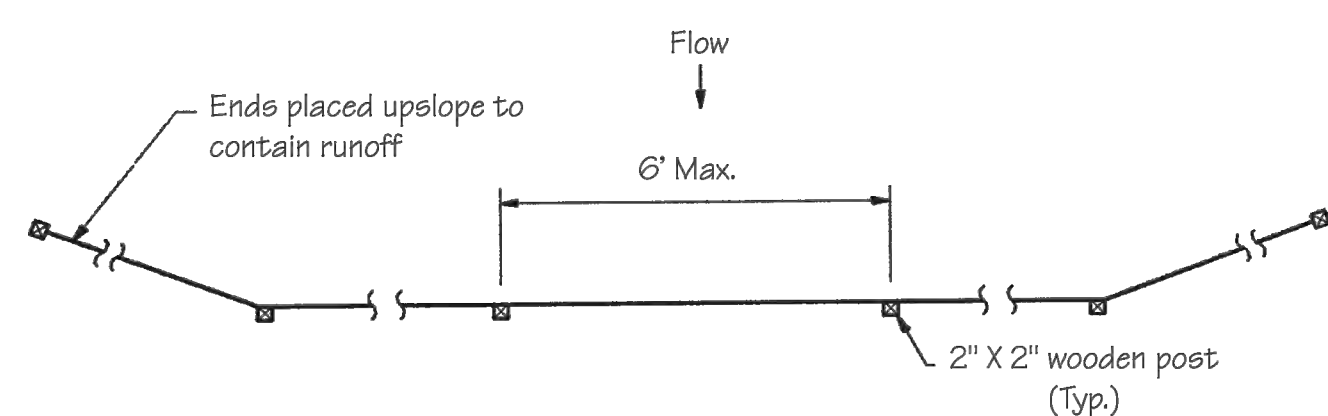
**EASTERN SHORE NATURAL GAS**  
500 ENERGY LANE, SUITE 200 DOVER, DE 19901  
TELEPHONE (302) 734-6710 - FAX (302) 734-6745

**Standard Detail & Specifications**

**Silt Fence**



Section

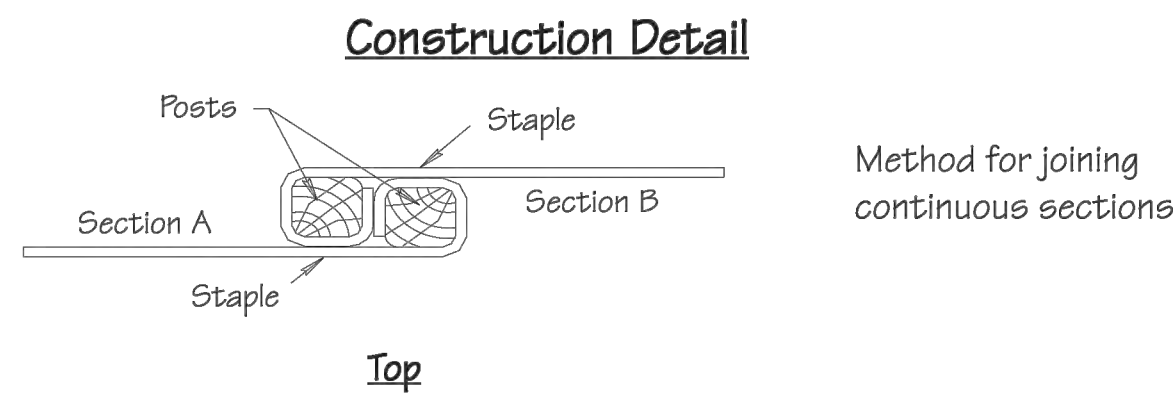


Plan

Source: Adapted from MD Stds. & Specs. for ESC	Symbol: <b>SF</b>	Detail No. <b>DE-ESC-3.1.2.1</b> Sheet 1 of 2 Effective July 2023
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**Standard Detail & Specifications**

**Silt Fence**



Method for joining continuous sections

**Construction Notes:**

1. Geosynthetic fabric to be fastened securely to fence posts with wire ties or staples.
2. When two sections of filter cloth adjoin each other they shall be overlapped by six inches and folded.
3. Maintenance shall be performed as needed and material removed when "bulges" develop in the silt fence.

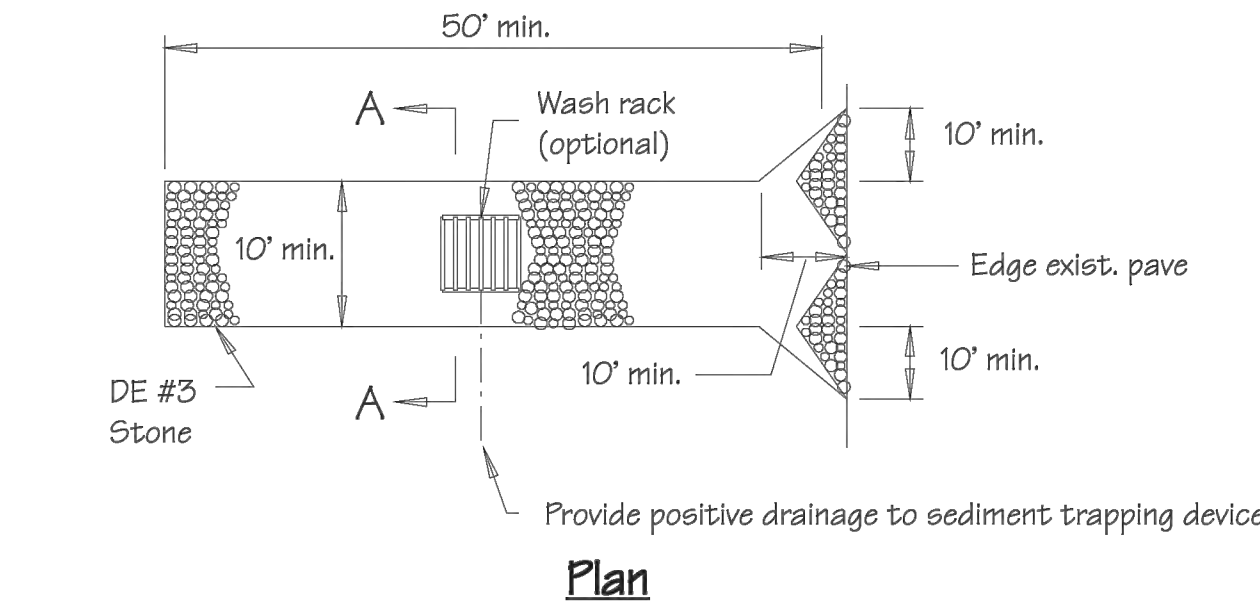
**Materials:**

1. **Stakes:** Steel (either T or U) or 2" x 2" hardwood
2. **Geosynthetic Fabric:** Type GD-I
3. **Reinforcing strip:** Wooden lath or plastic strip

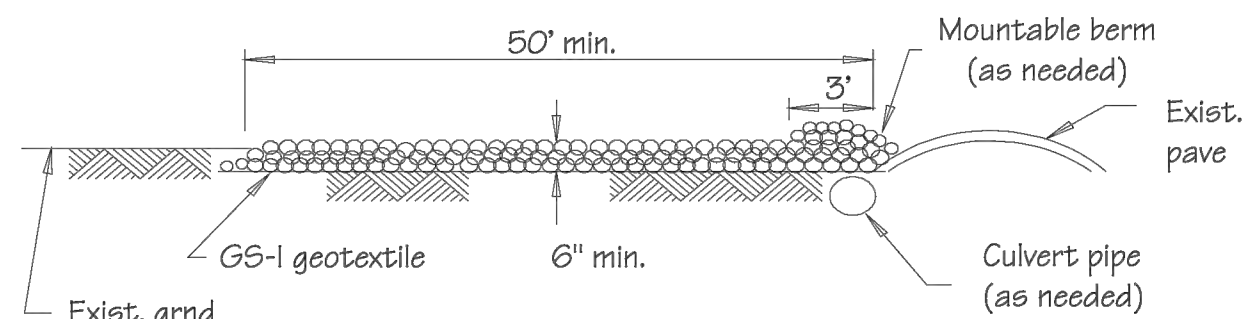
Source: Adapted from MD Stds. & Specs. for ESC	Symbol: <b>SF</b>	Detail No. <b>DE-ESC-3.1.2.1</b> Sheet 2 of 2 Effective July 2023
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**Standard Detail & Specifications**

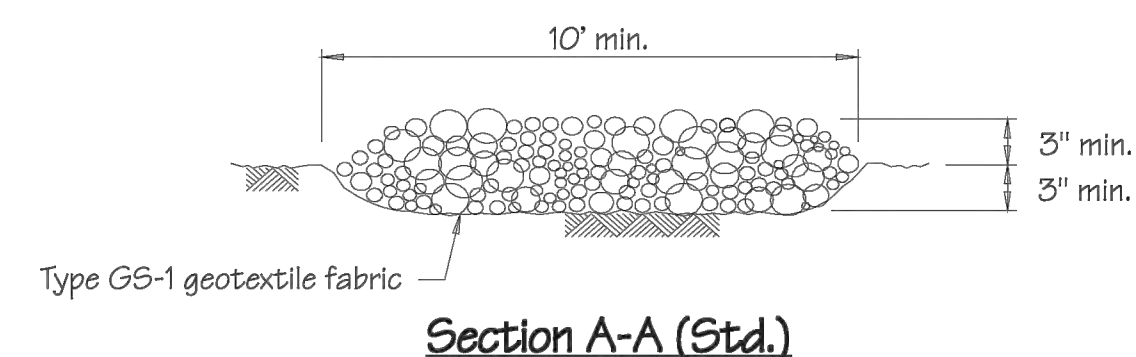
**Stabilized Construction Entrance**



Plan



Profile

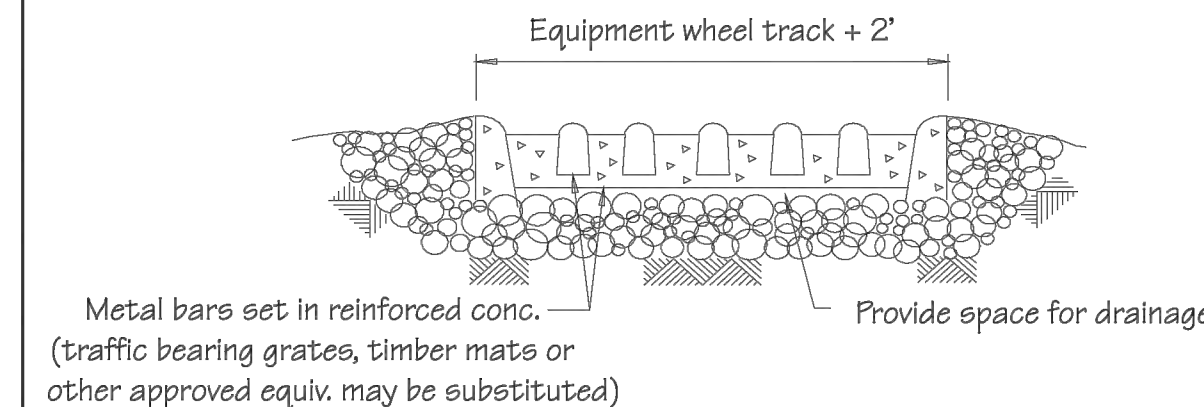


Section A-A (Std.)

Source: Adapted from VA ESC Handbook	Symbol: <b>SCE</b>	Detail No. <b>DE-ESC-3.4.7</b> Sheet 1 of 2 Effective July 2023
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**Standard Detail & Specifications**

**Stabilized Construction Entrance**



Section A-A (Opt.)

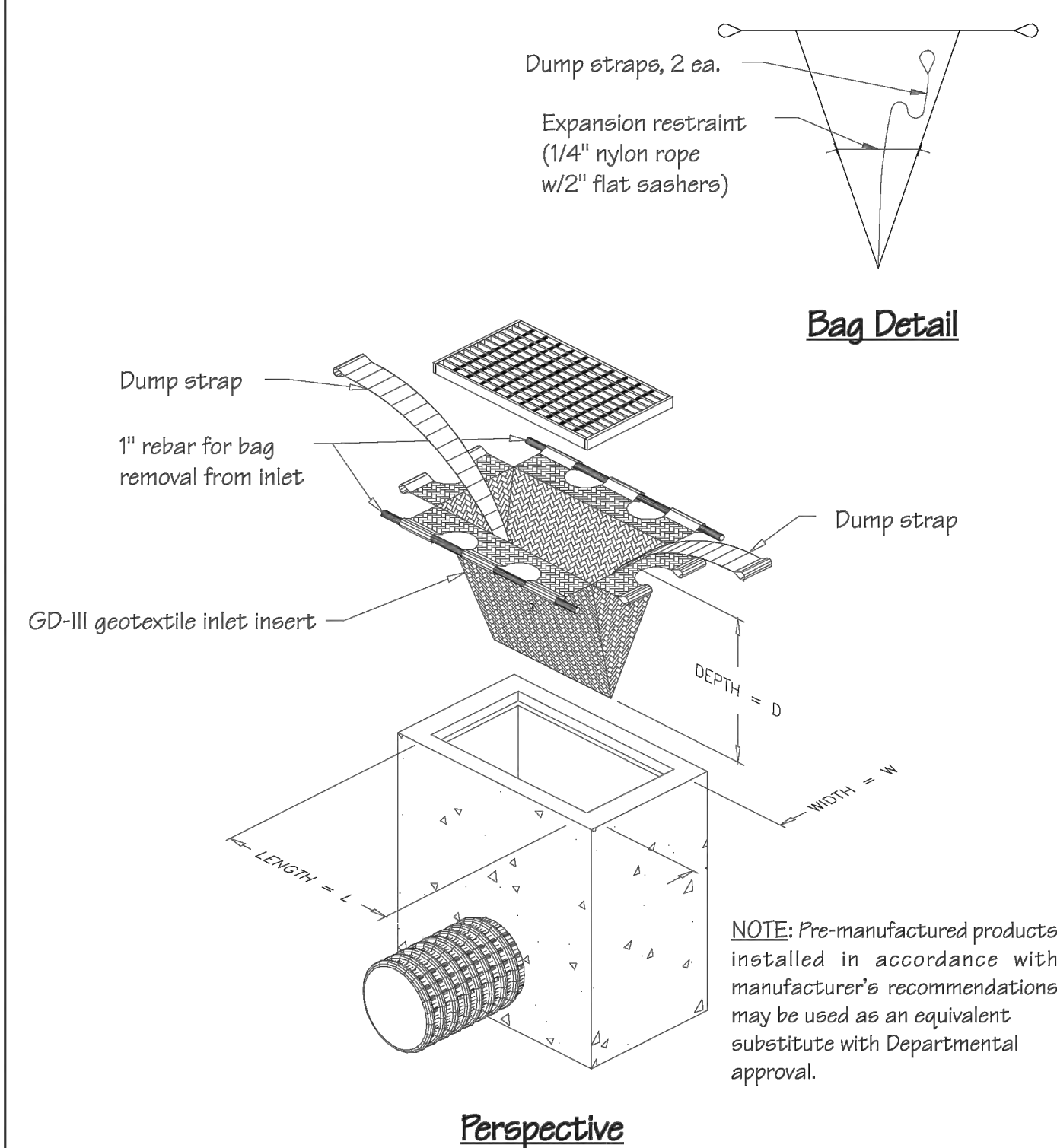
**Construction Notes:**

1. **Stone size** - Use DE #3 stone.
2. **Length** - As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum length would apply).
3. **Thickness** - Not less than size (6) inches.
4. **Width** - Ten (10) foot minimum, but not less than the full width at points where ingress or egress occurs.
5. **Geotextile** - Type GS-1; placed over the entire area prior to placing of stone.
6. **Surface Water** - All surface water flowing or diverted toward construction entrances shall be piped across the entrance. If piping is impractical, a mountable berm with 5:1 slopes will be permitted.
7. **Maintenance** - The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
8. **Washing** - Vehicle wheels shall be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with stone and which drains into an approved sediment trapping device.
9. **Inspection** - Periodic inspection and needed maintenance shall be provided after each rain.

Source: Adapted from VA ESC Handbook	Symbol: <b>SCE</b>	Detail No. <b>DE-ESC-3.4.7</b> Sheet 2 of 2 Effective July 2023
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**Standard Detail & Specifications**

**Inlet Protection - Type 2**



Perspective

Source: Adapted from ACF Products, Inc.	Symbol: <b>IP-2</b>	Detail No. <b>DE-ESC-3.1.5.2</b> Sheet 1 of 2 Effective July 2023
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**Standard Detail & Specifications**

**Inlet Protection - Type 2**

**Notes:**

1. This practice shall only be used in situations in which Inlet Protection - Type 1 cannot be used due to site constraints. These include, but are not limited to partially completed parking areas, streets, roads, etc.
2. It may be necessary to transition from Type 1 to Type 2 Inlet Protection as construction proceeds.
3. For areas where there is a concern for oil run-off or spills, insert shall meet one of the above specifications with an oil-absorbant pillow or shall be made completely from an oil-absorbant material with a woven pillow.

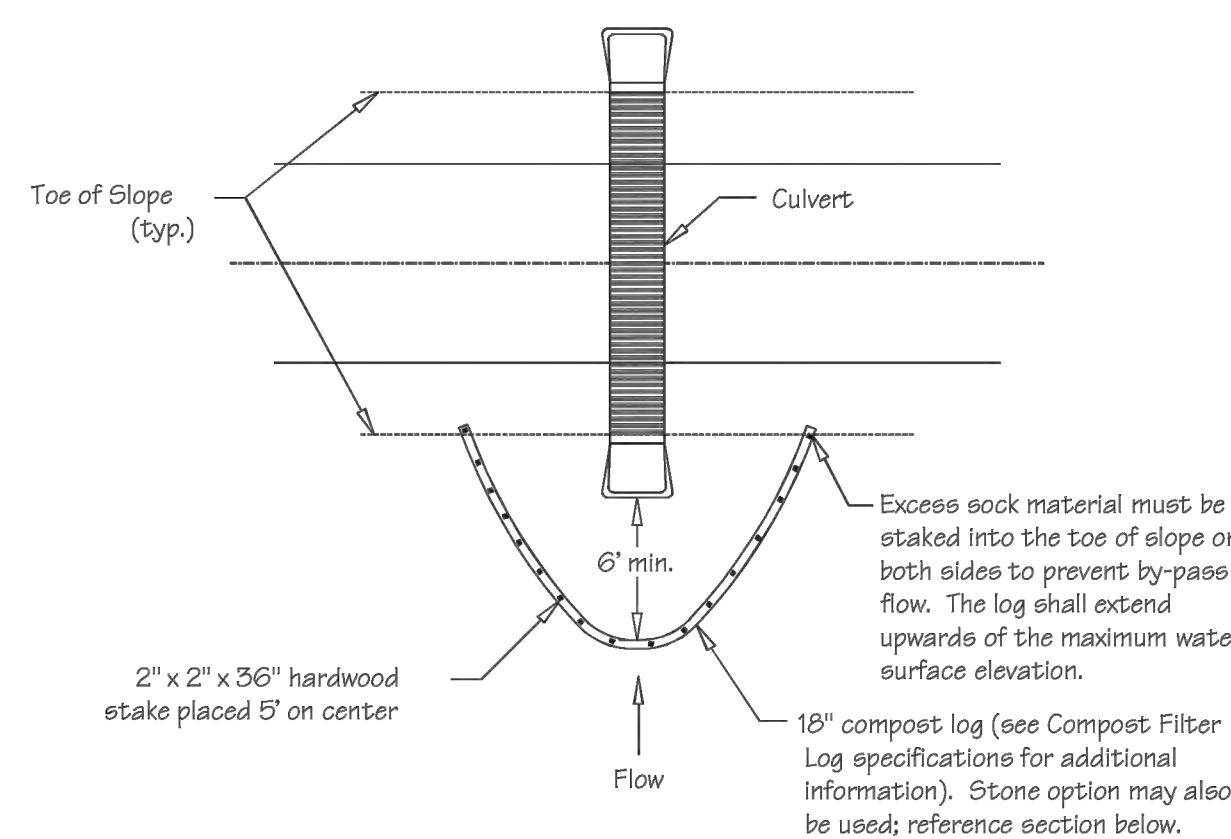
**Materials:**

The geotextile inlet insert shall meet or exceed the specifications of Type GD-III geotextile in accordance with Appendix A-3 of the Delaware Erosion & Sediment Control Handbook.

Source: Adapted from ACF Products, Inc.	Symbol: <b>IP-2</b>	Detail No. <b>DE-ESC-3.1.5.2</b> Sheet 2 of 2 Effective July 2023
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**Standard Detail & Specifications**

**Culvert Inlet Protection**



Plan View - Compost Log Option

Section View - Stone Option

Source: Adapted from VA ESC Handbook & Filtrrex International	Symbol: <b>CIP</b>	Detail No. <b>DE-ESC-3.1.6</b> Sheet 1 of 2 Effective July 2023
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**Standard Detail & Specifications**

**Culvert Inlet Protection**

**Construction Notes**

1. Compost logs shall be designed and installed in accordance with the Standard Detail and Specifications for Compost Logs (DE-ES-3.1.7).
2. If compost logs can not be installed properly or flow conditions exceed the design capabilities of the compost logs, the stone option shall be employed. Additional filtration may be provided by using a Type GD-II geotextile incorporated into the design as an option.
3. Placement of the compost log or stone barrier should be in a "horseshoe" shape and provide a minimum of 6 feet of clearance from the culvert inlet.

**Materials**

1. **Stakes:** 2" x 2" x 36" hardwood.
2. **Compost media:** See requirements in Standard Detail and Specifications for Compost Logs (DE-ES-3.1.7).
3. **Filter sock:** See requirements in Standard Detail and Specifications for Compost Logs (DE-ES-3.1.7).
4. **Geotextile:** Type GD-II for stone/riprap option.
5. **Stone:** DE No. 3 for stone/riprap option.
6. **Riprap:** R-6 for stone/riprap option.

Source: Adapted from VA ESC Handbook & Filtrrex International	Symbol: <b>CIP</b>	Detail No. <b>DE-ESC-3.1.6</b> Sheet 2 of 2 Effective July 2023
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REVISIONS			
NO.	DATE	DESCRIPTION	BY

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**EASTERN SHORE**  
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TELEPHONE (302) 734-6710 - FAX (302) 734-6745

16" PROPOSED PIPELINE FELTON LOOP KENT COUNTY, DE	
ESNC PROJ. CODE:	DATE: 3/8/2024
MIRA PROJECT NO: 22257	SCALE: N/A
DESIGN/CHECK BY: JTH/CWB	SHEET: 4 OF 26

EROSION & SEDIMENT CONTROL DETAILS

**Standard Detail & Specifications**  
**Construction Site Pollution Prevention**

**Delaware NPDES Discharge Permit**  
General Permit for Discharge of Stormwater from Construction Activities

((Project Name))

((NOI Permit Number))

((Agency Plan Approval ID))

((Contact Name & Number for Additional Site Information))

((Contact Name & Number to Obtain Copy of Approved Plan))

If you observe indicators of stormwater pollutants in the discharge or in the receiving waterbody, call the DNREC Spill Notification 24 HR Hotline at

**1-800-662-8802**

Example Construction General Permit (CGP) Signage

- NOTES:
- Minimum sign size 2' x 2'
  - Minimum text size 1"
  - Sign must be posted at a safe, publicly accessible location close to construction site
  - Sign must be visible from the public road nearest the active construction site
  - Signs posted within a DelDOT or other public road right-of-way (ROW) must be in accordance with all local and/or State requirements in regards to safety, location, orientation, etc.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		<b>DE-ESC-3.6.1</b> Sheet 1 of 4 Effective July 2023

**Standard Detail & Specifications**  
**Construction Site Pollution Prevention**

**Notes:**

The Construction Site Pollution Prevention Plan includes the following elements:

**1. Material Inventory**

Document the storage and use of the following materials:

- Concrete
- Detergents
- Paints (enamel and latex)
- Cleaning solvents
- Pesticides
- Wood scraps
- Fertilizers
- Petroleum based products

**2. Good housekeeping practices**

- Store only enough product required to do the job.
- Store all materials in a neat, orderly manner in their original labeled containers and covered.
- Do not mix different substances.
- When possible, use all of a product prior to disposal of the container.
- Manufacturers' instructions for disposal should be strictly adhered to.
- Designate someone to inspect all BMPs daily.

**3. Waste management practices**

- Collect and store all waste materials in securely lidded dumpsters in a location that does not drain to a waterbody.
- Salvage and/or recycle waste materials whenever possible.
- The dumpsters shall be emptied a minimum of twice per week, or more if necessary. The licensed trash hauler is responsible for cleaning out dumpsters.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		<b>DE-ESC-3.6.1</b> Sheet 2 of 4 Effective July 2023

**Standard Detail & Specifications**  
**Construction Site Pollution Prevention**

**Notes (cont.)**

- Dispose of all trash in accordance with all applicable Delaware laws.
  - Littering is strictly prohibited. Trash cans should be placed at all lunch spots and recycle bins should be placed near the construction trailer.
  - If fertilizer bags can not be stored in a weather-proof location, they should be kept on a pallet and covered with plastic sheeting which is overlapped and anchored.
- 4. Equipment maintenance practices**
- If possible, equipment should be taken to off-site commercial facilities for washing and maintenance.
  - If performed on-site, wash vehicles with high-pressure water spray without detergents in an area contained by an impervious berm.
  - Use drip pans for all equipment maintenance.
  - Inspect equipment for leaks on a daily basis.
  - Direct washout from concrete trucks into a temporary pit for hardening and proper disposal.
  - Equip fuel nozzles with automatic shut-off valves.
- 5. Spill prevention practices**
- Identify potential spill areas and contain them in covered areas with no connection to the storm drain system.
  - Post warning signs in hazardous material storage areas.
  - Perform preventive maintenance on all tanks, valves, pumps, pipes and other equipment as necessary.
  - Prioritize low or non-toxic substances for use.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		<b>DE-ESC-3.6.1</b> Sheet 3 of 4 Effective July 2023

**Standard Detail & Specifications**  
**Construction Site Pollution Prevention**

**Notes (cont.)**

- Prominently post contact information for reporting spills through the DNREC 24-Hour Toll Free Number.
- 6. Education**
- Include Best Management Practices (BMPs) for construction site pollution control as part of regular progress meetings.
  - Information regarding waste management, equipment maintenance and spill prevention should be prominently posted in the construction trailer.

**CONTACT INFORMATION**

**DNREC 24-Hour Toll Free Number** **800-662-8802**  
**DNREC Solid & Hazardous Waste Management Section** **302-739-9403**

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		<b>DE-ESC-3.6.1</b> Sheet 4 of 4 Effective July 2023

**Standard Detail & Specifications**  
**Mulching**

**1. Materials and Amounts**

- Straw** - Straw shall be unrotted small grain straw applied at the rate of 1-1/2 to 2 tons per acre, or 70 to 90 pounds (two bales) per 1,000 square feet. Mulch materials shall be relatively free of weeds and shall be free of noxious weeds such as; thistles, Johnsongrass, and quackgrass. Spread mulch uniformly by hand or mechanically. For uniform distribution of hand spread mulch, divide area into approximately 1,000 square feet sections and place 70-90 pounds (two bales) of mulch in each section.
- Wood chips** - Apply at the rate of approximately 6 tons per acre or 275 pounds per 1,000 square feet when available and when feasible. These are particularly well suited for utility and road rights-of-way. If wood chips are used, increase the application rate of nitrogen fertilizer by 20 pounds of N per acre (200 pounds of 10-10-10 or 66 pounds of 30-0-0 per acre).
- Hydraulically applied mulch** - The following conditions apply to hydraulically applied mulch:
  - Definitions:
    - Wood fiber mulch shall consist of specially prepared wood that has been processed to a uniform state, is packaged for sale as a hydraulic mulch for use with hydraulic seeding equipment, and consists of a minimum of 70% virgin or recycled wood fiber combined with 30% paper fiber and additives.
    - Blended fiber mulch shall consist of any hydraulic mulch that contains greater than 30% paper fiber. The paper component must consist of specially prepared paper that has been processed to a uniform fibrous state and is packaged for sale as a hydraulic mulch for use with hydraulic seeding equipment.
    - A bonded fiber matrix (BFM) consists of long strand, specially prepared wood fibers that have been processed to a uniform state held together by a water resistant bonding agent. BFMs shall contain no paper (cellulose) mulch but may contain small percentages of synthetic fibers to enhance performance.
    - Refer to **Figure 3.4.5a** for conditions and limitations of use for each of the above categories of hydraulic mulch.
  - All components of the hydraulically applied mulches shall be pre-packaged by the manufacturer to assure material performance. Field mixing of the mulch components is acceptable, but must be done per manufacturers recommendations to ensure the proper results.
  - Hydraulic mulches shall be applied with a viable seed and at manufacturer's recommended rates. Increased rates may be necessary based on site conditions.
  - Hydraulically applied mulches and additives shall be mixed according to manufacturers recommendations.
  - Materials within this category shall only be used when hydraulically applied mulch has been specified for use on the approved Sediment and Stormwater Plan, or supplemental approval from the plan approval agency has been obtained in writing for a specific area.

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrex™ International		<b>DE-ESC-3.4.5</b> Sheet 1 of 3 Effective July 2023

**Standard Detail & Specifications**  
**Mulching**

v. Application:

- Apply product to geotechnically stable slopes that have been designed and constructed to divert runoff away from the face of the slope.
  - Do not apply to saturated soils, or if precipitation is anticipated within 24-48 hours.
  - During the spring (March 1 to May 31) and fall (September 1 to November 30) seasons, hydraulic mulches may be applied in a one-step process where all components are mixed together in single-tank loads. It is recommended that the product be applied from opposing directions to achieve optimum soil coverage.
  - During the summer (June 1 to August 31) and winter (December 1 to February 28) seasons, the following two-step process is required:
    - Step One** - Mix and apply seed and soil amendments with a small amount of mulch for visual metering.
    - Step Two** - Mix and apply mulch at manufacturers recommended rates over freshly seeded surfaces. Apply from opposing directions to achieve optimum soil coverage.
  - Minimum curing temperature is 40°F (4°C). The best results and more rapid curing are achieved at temperatures exceeding 60°F (15°C). Curing times may be accelerated in high temperature, low humidity conditions on dry soils.
  - Recommended application rates are for informational purposes only. Conformance with this standard and specification shall be performance-based and requires **100% soil coverage**. Any areas with bare soil showing shall be top dressed until full coverage is achieved.
  - Compost blanket (CB)** - Loosely applied with a pneumatic blower so that a 1" compost blanket uniformly covers the soil with **100% coverage**. This application can be used with seed to promote germination by applying the approved seed mix directly into the loosely blown compost. The compost blanket performs best on slopes less than 2:1 and requires no mulch anchoring.
- 2. Anchoring mulch** - Mulch must be anchored immediately to minimize loss by wind or water. This may be done by one of the following methods, depending upon size of area, erosion hazard, and cost.
- Crimping** - A crimper is a tractor drawn implement designed to punch and anchor mulch into the top two (2) inches of soil. This practice affords maximum erosion control but is limited to flatter slopes where equipment can operate safely. On sloping land, crimping should be done on the contour whenever possible.
  - Tracking** - Tracking is the process of cutting mulch (usually straw) into the soil using a bulldozer or other equipment that runs on cleated tracks. Tracking is used primarily on slopes 3:1 or steeper and should be done up and down the slope with clear marks running across the slope.
  - Liquid mulch binders** - Applications of liquid mulch binders should be heavier at edges, in valleys, and at crests of banks and other areas where the mulch will be moved by wind or water. All other areas should have a uniform application of binder. The use of synthetic binders is the preferred method of mulch binding and should be applied at the rates recommended by the manufacturer.
  - Paper fiber** - The fiber binder shall be applied at a net dry weight of 750 lbs/ac. The wood cellulose fiber shall be mixed with water, and the mixture shall contain a maximum of 50 lbs. of wood cellulose fiber per 100 gallons.
  - Nettings** - Biodegradable nettings may be used to secure straw mulch. Install and secure according to the manufacturer's recommendations. Photodegradable or synthetic nettings are not acceptable.

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrex™ International		<b>DE-ESC-3.4.5</b> Sheet 2 of 3 Effective July 2023

**MULCHING MATERIAL SELECTION GUIDE**

Percent Slope	Type of Mulch / App. Rate*	Dec. 1 to Feb. 28(29)	March 1 to May 31	June 1 to Aug. 31	Sept. 1 to Nov. 30
Less than 2%	Blended Fiber @ 2000 lbs/ac. minimum	XXXXXXXXXXXXXXXXXX	OK (< 1 ac.)	XXXXXXXXXXXXXXXXXX	OK (< 1 ac.)
	Wood Fiber @ 2000 lbs/ac. min.	XXXXXXXXXXXXXXXXXX	OK	XXXXXXXXXXXXXXXXXX	OK
	BFM @ 3000 lbs/ac. min.	OK	OK	OK	OK
	Straw @ 2 Tons/ac. Min.	OK	OK	OK	OK
2% to 5.9%	Stabilization Matting**	OK	OK	OK	OK
	1" Compost Blanket (CB)	OK	OK	OK	OK
	Wood Fiber @ 2000 lbs/ac. min.	XXXXXXXXXXXXXXXXXX	OK	XXXXXXXXXXXXXXXXXX	OK
	BFM @ 3000-3500 lbs/ac. min.	OK	OK	OK	OK
6% to 10.9%	Straw @ 2 Tons/ac. min.	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
	1" Compost Blanket (CB)	OK	OK	OK	OK
	Wood Fiber @ 2000-2500 lbs/ac. min.	XXXXXXXXXXXXXXXXXX	OK	XXXXXXXXXXXXXXXXXX	OK
11% to 24.9%	BFM @ 3500-4000 lbs/ac. min.	OK	OK	OK	OK
	Straw @ 2 Tons/ac. min.	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
	1" Compost Blanket (CB)	OK	OK	OK	OK
25% to 33%	Wood Fiber @ 2500-3000 lbs/ac. min.	XXXXXXXXXXXXXXXXXX	OK	XXXXXXXXXXXXXXXXXX	OK
	BFM @ 4000 lbs/ac. min.	XXXXXXXXXXXXXXXXXX	OK	XXXXXXXXXXXXXXXXXX	OK
	Straw @ 2 Tons/ac. min.	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
33% and up	1" Compost Blanket (CB)	OK	OK	OK	OK
	BFM @ 4000-4500 lbs/ac. min.	XXXXXXXXXXXXXXXXXX	OK	XXXXXXXXXXXXXXXXXX	OK
	Straw @ 2 Tons/ac. min.***	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
	1" Compost Blanket (CB)	2:1 Max.	2:1 Max.	2:1 Max.	2:1 Max.

\* Note: Manufacturers Recommended Rates for informational purposes only. Performance standard requires 100% soil coverage.  
\*\* Note: Stabilization Matting must be applied in accordance with Section 3.4.6 of the Delaware ESC Handbook.  
\*\*\* Note: Straw applied on slopes greater than 33% must be netted (this does not apply to topsoil stockpiles).  
OK = Acceptable to use during this time period.  
XX = Not acceptable to use during this time period.  
All application rates are minimums

Source: Delaware ESC Handbook & Filtrex™ International

Symbol: DE-ESC-3.4.5 Sheet 3 of 3 Effective July 2023

Detail No. DE-ESC-3.4.5 Sheet 3 of 3 Effective July 2023

**Mulching**

**Standard Detail & Specifications**

REVISIONS			
NO.	DATE	DESCRIPTION	BY

**MIRA**

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<b>16" PROPOSED PIPELINE</b>	
<b>FELTON LOOP</b>	
<b>KENT COUNTY, DE</b>	
ESNG PROJ. CODE:	DATE: 3/8/2024
MRA PROJECT NO: 22257	SCALE: N/A
DESIGN/CHECK BY: JTH/CWB	SHEET: 5 OF 26

**EROSION & SEDIMENT CONTROL DETAILS**

**Standard Detail & Specifications**  
**Vegetative Stabilization**

TEMPORARY SEEDING BY RATES, DEPTHS AND DATES										
Mix #	Species <sup>5</sup>	Seeding Rate		Optimum Seeding Dates <sup>1</sup> O = Optimum Planting Period; A = Acceptable Planting Period						Planting Depth <sup>3</sup>
		lb/Ac <sup>4</sup>	lb/1000 sq. ft.	2/1-4/30	2 6/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31	
	<b>Certified Seed</b>			<b>Coastal Plain</b>		<b>Piedmont</b>		<b>All<sup>1</sup></b>		
1	Barley	125	4	O	A	O	O	A	O	1-2 inches 2-3" sandy soils
2	Oats	125	4	O	A	A	O	A	A	1-2 inches 2-3" sandy soils
3	Rye	125	4	O	A	O	O	A	O	1-2 inches 2-3" sandy soils
4	Perennial Ryegrass	125	4	O	A	O	O	A	O	0.5 inches 1-2" sandy soils
5	Annual Ryegrass	125	4	O	A	O	O	A	O	0.5 inches 1-2" sandy soils
6	Winter Wheat	125	4	O	A	O	O	A	O	1-2 inches 2-3" sandy soils
7	Foxtail Millet	30 PLS	0.7	O						0.5 inches 1-2" sandy soils
8	Pearl Millet	20 PLS	0.5	O						0.5 inches 1-2" sandy soils

1. Winter seeding requires 3 tons per acre of straw mulch for proper stabilization.
2. May be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
3. Applicable on slopes 3:1 or less.
4. Use varieties currently recommended for Delaware. Contact a County Extension Office for information.
5. Warm season grasses such as Millet may be used between 5/1 and 9/1 if desired. Seed at 3-5 lbs. per acre. Good on low fertility and acid areas. Seed after frost through summer at a depth of 0.5".

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

\* PREFERRED SEED MIX

Source:	Symbol:	Detail No.
Delaware ESC Handbook		<b>DE-ESC-3.4.3</b> Sheet 1 of 4 Effective July 2023

**Standard Detail & Specifications**  
**Vegetative Stabilization**

PERMANENT SEEDING AND SEEDING DATES												
Mix No.	Certified Seed <sup>2</sup>	Seeding Rate <sup>1</sup>		Optimum Seeding Dates <sup>2</sup> O = Optimum Planting Period A = Acceptable Planting Period						Remarks		
		lb/Ac	lb/1000 sq. ft.	2/1-4/30	5/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31		10/31-2/1	
	<b>Well Drained Soils</b>			<b>Coastal Plain</b>		<b>Piedmont</b>		<b>All<sup>1</sup></b>				
1	Tall Fescue Canada Wild Rye	140	3.2	A	O	A	O	A	O	Good erosion control mix Tolerant of low fertility soils Good for droughty sites		
2	Deergrass Sheep Fescue White Clover	30 30 10	0.69 0.69 0.35	A	O	A	O	A	O	Good erosion control mix Tolerant of low fertility soils Legume that fixes atmospheric Nitro soil		
3	Tall Fescue (Turftype) or Strong Creeping Red Fescue or Perennial Ryegrass	50 50 50	1.15 1.15 1.15	O	A <sup>1</sup>	O	O	A <sup>1</sup>	O	Good erosion control mix Tall Fescue for droughty conditions. Creeping Red Fescue for heavy shade. Flatpea to suppress woody vegetation.		
4	Strong Creeping Red Fescue Kentucky Bluegrass Perennial Ryegrass or Redtop plus White Clover <sup>3</sup>	100 70 15 5 3	2.3 1.61 0.35 0.11 0.07	O	A <sup>1</sup>	O	O	A <sup>1</sup>	O	Suitable waterway mix. Canada Bluegrass more drought tolerant. Use Redtop for increased drought tolerance.		
5	Switchgrass <sup>3,4</sup> or Coastal Panicgrass Big Bluestem Little Bluestem Indian Grass	10 10 5 5 5	0.23 0.23 0.11 0.11 0.1	O		O		O		Native warm-season mixture. Tolerant of low fertility soils. Drought tolerant. Poor shade tolerance. N fertilizer discouraged - weeds		
6	Tall Fescue (Turftype) (Blend of 3 cultivars)	150	3.5	O	A <sup>1</sup>	O	O	A <sup>1</sup>	O	Managed filter strip for nutrient uptake.		
7	Tall Fescue Ky. Bluegrass (Blend) Perennial Ryegrass	150 20 20	3.5 0.46 0.46	O	A <sup>1</sup>	O	O	A <sup>1</sup>	O	Three cultivars of Kentucky Bluegrass. Traffic tolerant.		
8	Big Bluestem <sup>5</sup> Indian Grass <sup>7</sup> Little Bluestem <sup>7</sup> Creeping Red Fescue plus one of: Partridge Pea Bush Clover Wild Indigo Showy Tick-Traill	10 10 8 30 5 3 3 2	0.23 0.23 0.18 0.69 0.11 0.07 0.07 0.05	O	A <sup>1</sup>	O	A <sup>1</sup>	O		All species are native. Indian Grass and Bluestem have fully seeds. Plant with a specialized native seed drill. Creeping Red Fescue will provide erosion protection while the warm season grasses get established.		

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		<b>DE-ESC-3.4.3</b> Sheet 2 of 4 Effective July 2023

**Standard Detail & Specifications**  
**Vegetative Stabilization**

PERMANENT SEEDING AND SEEDING DATES (cont.)												
Mix No.	Certified Seed <sup>2</sup>	Seeding Rate <sup>1</sup>		Optimum Seeding Dates <sup>2</sup> O = Optimum Planting Period A = Acceptable Planting Period						Remarks		
		lb/Ac	lb/1000 sq. ft.	2/1-4/30	5/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31		10/31-2/1	
	<b>Poorly Drained Soils</b>			<b>Coastal Plain</b>		<b>Piedmont</b>		<b>All<sup>1</sup></b>				
9	Redtop Creeping Bentgrass Sheep Fescue Rough Bluegrass	75 35 30 45	1.72 0.8 0.69 1	O	A <sup>1</sup>	O	O	A <sup>1</sup>	O	Quick stabilization of disturbed sites and waterways		
10	Switchgrass <sup>5</sup>	10	0.23	A		O	A			Good erosion control, wildlife cover and wetland revegetation.		
	<b>Residential Lawns</b>											
11	Tall Fescue Perennial Ryegrass Kentucky Bluegrass Blend	100 25 30	2.3 0.57 0.69	O	A <sup>1</sup>	O	O	A <sup>1</sup>	O	High value, high maintenance, light traffic, irrigation necessary. Well drained soils, full sun.		
12	Tall Fescue Perennial Ryegrass Sheep Fescue	100 25 25	2.3 0.57 0.57	O	A <sup>1</sup>	O	O	A <sup>1</sup>	O	Moderate value, low maintenance, traffic tolerant.		
13	Creeping Red Fescue Chewing Fescue Rough Bluegrass Kentucky Bluegrass	50 50 20 20	1.15 1.15 0.4 0.4	O	A <sup>1</sup>	O	O	A <sup>1</sup>	O	Shade tolerant, moderate traffic tolerance, moderate maintenance.		
14	Creeping Red Fescue Rough Bluegrass or Chewing Fescue	50 50	1.15 2.1	O	A <sup>1</sup>	O	O	A <sup>1</sup>	O	Shade tolerant, moisture tolerant.		
15	K-31 Tall Fescue	150	3.5	O	A <sup>1</sup>	O	O	A <sup>1</sup>	O	Monoculture, but performs well alone in lawns. Discouraged.		

1. When hydroseeding is the chosen method of application, the total rate of seed should be increased by 25%.
2. Winter seeding requires 3 tons per acre of straw mulch. Planting dates listed above are average for Delaware. These dates may require adjustment to reflect local conditions.
3. All seed shall meet the minimum purity and minimum germination percentages recommended by the Delaware Department of Agriculture. The maximum % of weed seeds shall be in accordance with Chapter 15, Title 3 of the Delaware Code.
4. Turftype species may be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
5. It is recommended that all leguminous seed be inoculated.
6. Warm season grass mix and Switchgrass cannot be mowed more than 4 times per year.
7. Warm season grasses require a soil temperature of at least 50 degrees in order to germinate and will remain dormant until then.

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

\* PREFERRED SEED MIX

Source:	Symbol:	Detail No.
Delaware ESC Handbook		<b>DE-ESC-3.4.3</b> Sheet 3 of 4 Effective July 2023

**Standard Detail & Specifications**  
**Vegetative Stabilization**

**Construction Notes:**

1. Site Preparation
  - a. Prior to seeding, install needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, grassed waterways, and sediment basins.
  - b. Final grading and shaping is not necessary for temporary seedings.

2. Seedbed Preparation

It is important to prepare a good seedbed to ensure the success of establishing vegetation. The seedbed should be well prepared, loose, uniform, and free of large clods, rocks, and other objectionable material. The soil surface should not be compacted or crusted.

3. Soil Amendments

- a. Lime - Apply liming materials based on the recommendations of a soil test in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply dolomitic limestone at the rate of 1 to 2 tons per acre. Apply limestone uniformly and incorporate into the top 4 to 6 inches of soil.
- b. Fertilizer - Apply fertilizer based on the recommendations of a soil test in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply a formulation of 10-10-10 at the rate of 600 pounds per acre. Apply fertilizer uniformly and incorporate into the top 4 to 6 inches of soils.

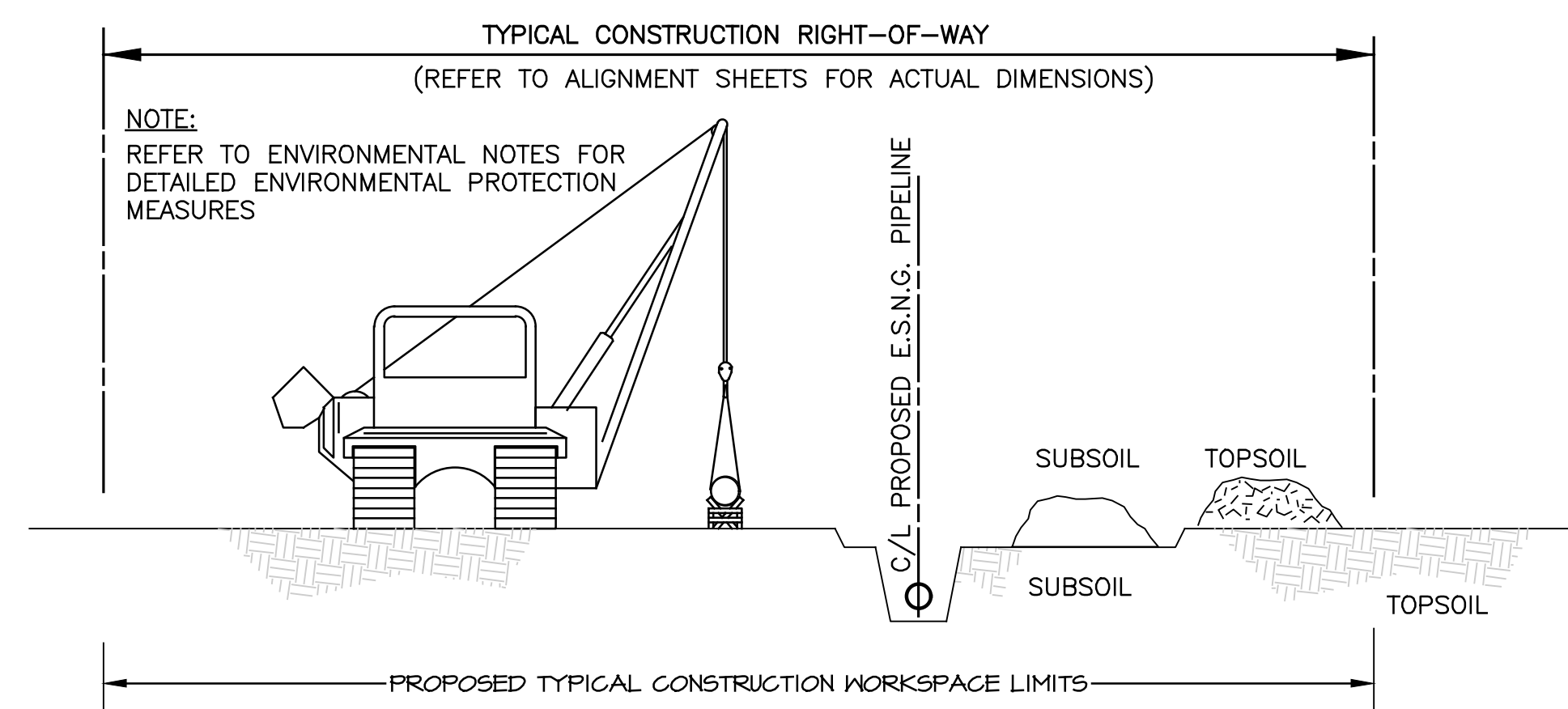
4. Seeding

- a. For temporary stabilization, select a mixture from Sheet 1. For a permanent stabilization, select a mixture from Sheet 2 or Sheet 3 depending on the conditions. Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.
- b. Apply seed uniformly with a broadcast seeder, drill, cultipacker seeder or hydroseeder. All seed will be applied at the recommended rate and planting depth.
- c. Seed that has been broadcast should be covered by raking or dragging and then lightly tamped into place using a roller or cultipacker. If hydroseeding is used and the seed and fertilizer is mixed, they will be mixed on site and the seeding shall be done immediately and without interruption.

5. Mulching

All mulching shall be done in accordance with detail DE-ESC-3.4.5.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		<b>DE-ESC-3.4.3</b> Sheet 4 of 4 Effective July 2023



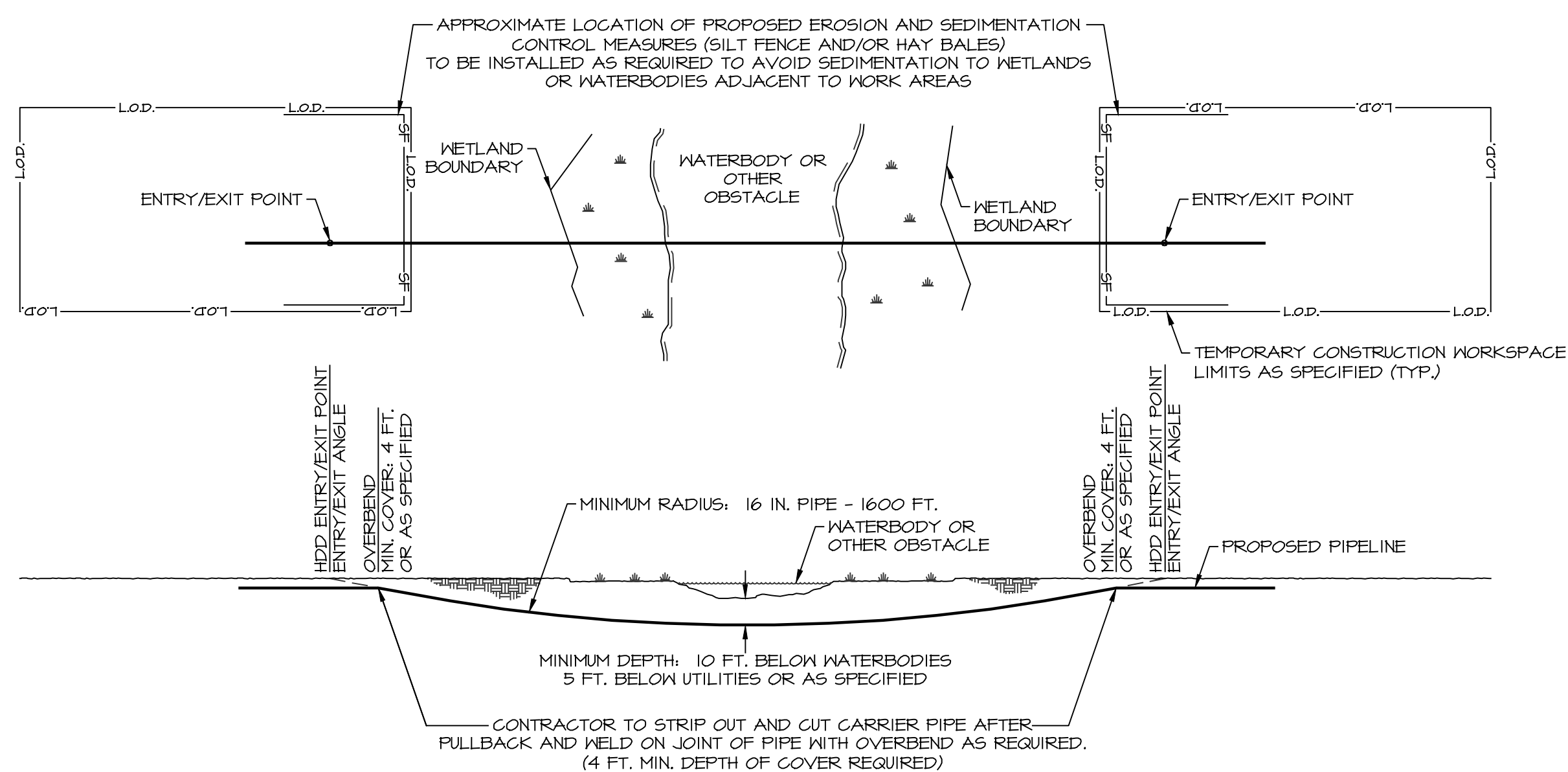
TYPICAL RIGHT-OF-WAY DETAIL  
NOT TO SCALE

NOTES:

1. RIGHT OF WAY CONFIGURATION VARIES, SEE PLAN AND PROFILE SHEETS
2. CONFIGURATION DOES NOT INCLUDE ADDITIONAL TEMPORARY WORKSPACE FOR STAGING, CROSSINGS AND PIPE STORAGE.

NOTES:

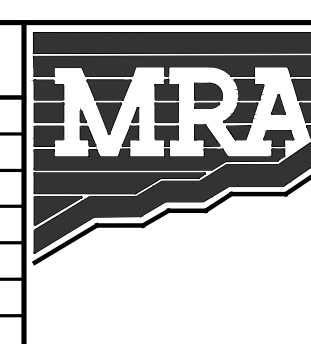
THE CONTRACTOR SHALL PERFORM SOIL BORES AND/OR TEST PITS AS REQUIRED TO ASSURE THE FEASIBILITY OF DRILLING OPERATIONS, ONCE FEASIBILITY HAS BEEN DETERMINED, THE CONTRACTOR ASSUMES RESPONSIBILITY FOR ANY ADDITIONAL EXPENSES DUE TO UNFORESEEN SOIL OR BEDROCK CONDITIONS. NO WETLAND OR WATERBODY SHALL BE IMPACTED BY A HORIZONTAL DIRECTIONAL DRILLING (HDD) OPERATION. ALL DRILLING MUD IS TO BE CONTAINED DURING CONSTRUCTION WITH BERMS, MUD PITS AND EROSION AND SEDIMENTATION CONTROLS DEEMED APPROPRIATE FOR THE SITE. ALL DRILLING MUD SHALL BE PROPERLY DISPOSED OF AT AN APPROVED FACILITY. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TRAFFIC CONTROL DEVICES FOR THE MAINTENANCE AND PROTECTION OF TRAFFIC, WHILE SEGREGATING TRAVEL LANES FROM WORK AREAS UTILIZED FOR HDD OPERATIONS.



TYPICAL HORIZONTAL DIRECTIONAL DRILL DETAIL  
NOT TO SCALE

**EROSION & SEDIMENT CONTROL DETAILS**

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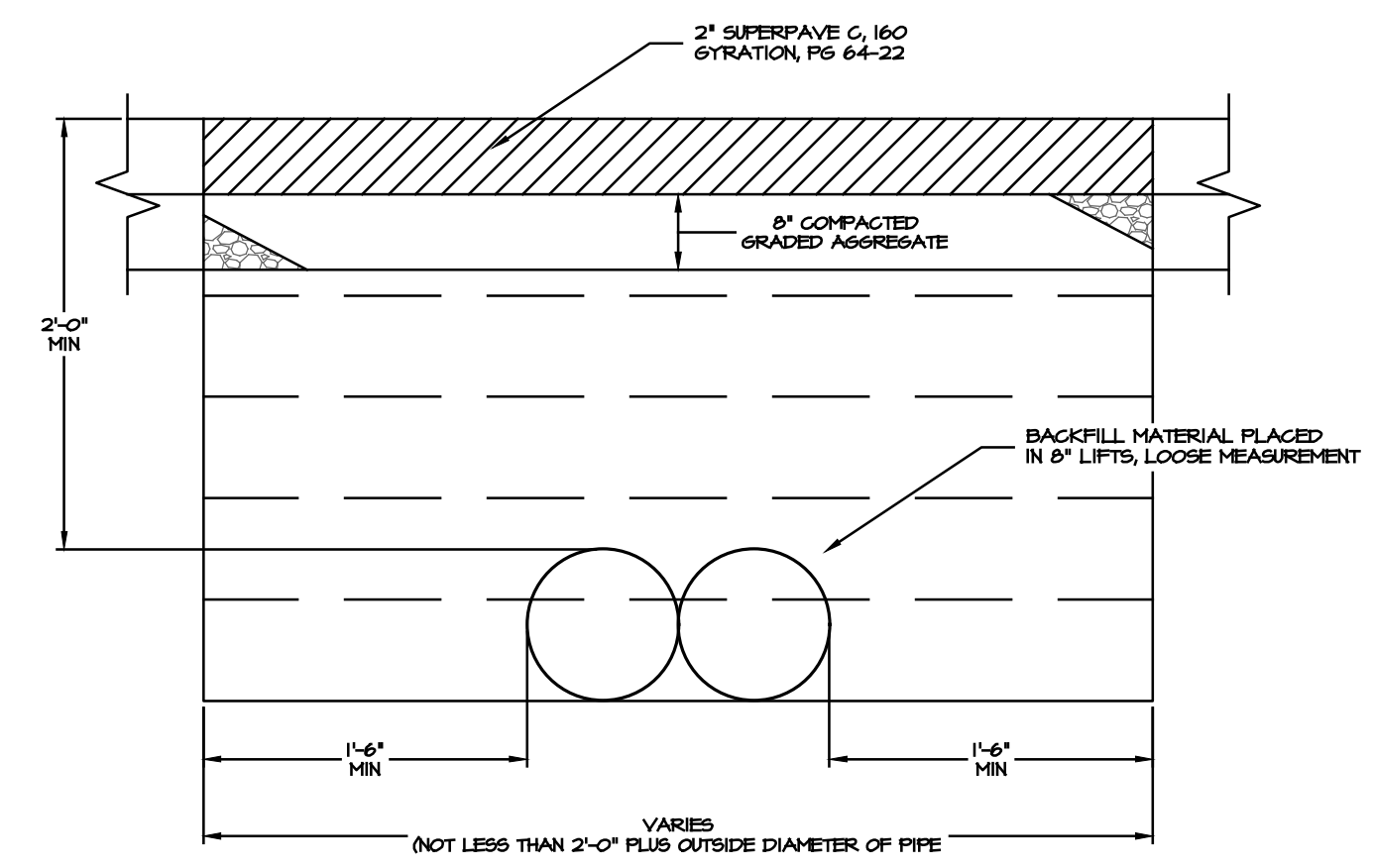
16" PROPOSED PIPELINE FELTON LOOP KENT COUNTY, DE	
ESNG PROJ. CODE:	DATE: 3/8/2024
MRA PROJECT NO: 22257	SCALE: N/A
DESIGN/CHECK BY: JTH/CWB	SHEET: 6 OF 26

**DELDOT UTILITY PLAN GENERAL NOTES**

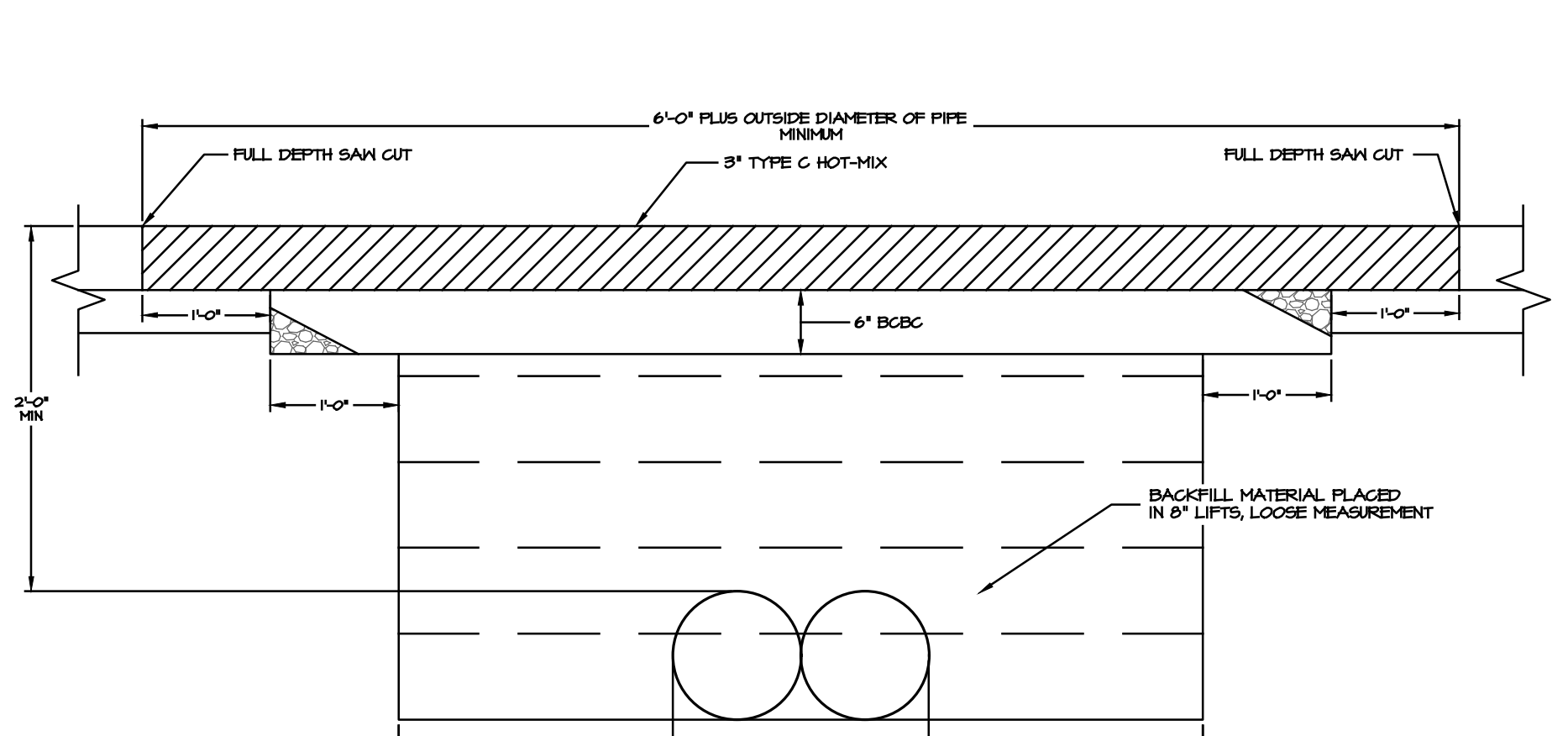
- PLANS ARE REVIEWED FOR GENERAL CONFORMITY. DELDOT IS NOT RESPONSIBLE FOR ERRORS OR OMISSIONS WITHIN THE PLAN SET. THE UTILITY OWNER IS RESPONSIBLE TO ENSURE ACCURACY OF PLANS AND CONFORMANCE WITH DELDOT STANDARDS.
- ALL BACKFILL MATERIAL IN EXISTING/PROPOSED ROADWAY SHALL CONFORM TO TYPE "C" BORROW. ALL BORROW BACKFILL SHALL BE COMPACTED TO 95% USING AASHTO T99 STANDARD FOR TESTINGS.
- GABC PLACED SHALL BE COMPACTED TO 100%.
- COMPACTION TESTING SHALL BE PERFORMED EVERY 100' AND TESTING SHALL BE TAKEN ON EACH LIFT OF MATERIAL PLACED. (WHEN UTILITY IS IN THE ROADWAY)
- TAR CHIPHOT MIXES ROADS, TRAVEL WAY PAVEMENT DISTURBED SHALL BE RESTORED AT THE END OF THE DAY PRIOR TO REOPENING TO TRAFFIC. HOT MIX SHALL BE PLACE PER TEMP PATCHING DETAIL 6'
- TAR CHIPHOT MIXES SHOULDERS, SHOULDERS DISTURBED MAY BE LEFT IN GABC TO FINISH GRADE OVERNIGHT BUT SHALL BE CLOSED USING APPROPRIATE SIGNING AND DRUMS. TEMP PAVEMENT SHALL BE PLACED FOR SHOULDERS AT THE END OF EACH WORK WEEK.
- IF THE REMAINING PORTION OF HOTMIX BETWEEN THE PIPE TRENCH EXCAVATION AND EDGE OF PAVEMENT IS LESS THAN 3' THE REMAINING SECTION SHALL BE REMOVED AND REPAVED AS PART OF THE FULL DEPTH PAVING RESTORATION.
- ALL AREAS DISTURBED OUTSIDE OF THE PAVEMENT SHALL BE GRADED EACH DAY TO ENSURE POSITIVE DRAINAGE AND SHALL BE PERMANENTLY RESTORED AT THE END OF EACH WEEK.
- ALL TEMPORARY HOT MIX SHALL BE PLACED TO PROVIDE A SMOOTH RIDABLE SURFACE TO DELDOT STANDARDS.
- A SAFETY EDGE IS REQUIRED ON ALL HOT MIX PLACED.
- ANY STRIPING DISTURBED SHALL BE PLACED AT THE END OF THE DAY PRIOR TO OPENING TO TRAFFIC.
- PROOF ROLL OF GABC SHALL BE PERFORMED USING A LOADED 10 WHEELER PRIOR TO PLACEMENT OF HOT MIX.
- ALL MATERIALS AND WORKMANSHIP WITHIN THE STATE R/M SHALL BE COMPLETED IN ACCORDANCE WITH CURRENT STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, SUPPLEMENTAL SPECIFICATIONS, STANDARD CONSTRUCTION DETAILS, UTILITY MANUAL, SPECIAL PROVISIONS AND DESIGN MEMORANDUMS.
- THERE IS A ONE YEAR WARRANTY ON ALL EARTH WORK AND CONCRETE, A THREE YEAR WARRANTY ON ALL HOT MIX INCLUDING SUBBASE/SUBGRADE ISSUES WITHIN THE PAVEMENT AREAS. WARRANTY DOES NOT START UNTIL ALL WORK IS COMPLETED AND A STAND OF GRASS HAS BEEN ESTABLISHED TO DELDOT STANDARDS AND A ACCEPTANCE LETTER HAS BEEN ISSUED.
- ALL DISTURBED AREAS WITHIN THE STATE RIGHT-OF-WAY, BUT NOT IN THE PAVEMENT, SHALL BE TOP-SOILED (6" MINIMUM), FERTILIZED, SEEDDED AND MULCHED. IF SOD IS USED NEXT TO SIDEWALK OR SHARED-USE PATH, CONTRACTOR SHALL GRADE TOPSOIL ADJACENT TO THE SIDEWALK OR SHARED-USE PATH PRIOR TO PLACEMENT OF SOD TO ENSURE THAT SOD IS PLACED FLUSH OR JUST BELOW EDGE OF SIDEWALK OR SHARED-USE PATH TO AVOID WATER PONDING ON THE SIDEWALK OR SHARED-USE PATH.
- A 12-HOUR (MINIMUM) NOTICE SHALL BE GIVEN TO THE DELDOT DISTRICT PERMIT SUPERVISOR PRIOR TO STARTING UTILITY CONSTRUCTION.
- A 48 HOUR NOTICE IS REQUIRED TO BE GIVEN TO THE DELDOT INSPECTOR PRIOR TO MATERIAL RELEASES.
- ALL CONCRETE/HOT MIX MATERIALS SHALL BE RELEASED BY THE INSPECTOR PRIOR TO PLACEMENT.
- MISS UTILITY OF DELAWARE SHALL BE NOTIFIED THREE (3) CONSECUTIVE WORKING DAYS PRIOR TO EXCAVATION, AT 1-800-282-8555.
- ALL SIGNING, STRIPING AND MAINTENANCE OF TRAFFIC IS THE CONTRACTOR'S RESPONSIBILITY AND SHALL FOLLOW THE GUIDELINES SHOWN IN THE DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (DE MUTCD) FOR STREETS AND HIGHWAYS (LATEST EDITION). THE OWNER OR MAINTENANCE CORPORATION SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL SIGNS INSTALLED AS PART OF THIS PROJECT.
- A COPY OF THE UP TO DATE APPROVED CONSTRUCTION DOCUMENTS AND DELDOT APPROVAL LETTERS SHALL BE MAINTAINED ON THE PROJECT SITE AT ALL TIMES AND BE AVAILABLE FOR INSPECTION BY DELDOT PERSONNEL.
- EXISTING UTILITIES ARE SHOWN IN ACCORDANCE WITH THE BEST AVAILABLE INFORMATION. COMPLETENESS OR CORRECTNESS THEREOF IS NOT GUARANTEED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE UTILITY COMPANIES INVOLVED IN ORDER TO SECURE THE MOST ACCURATE INFORMATION AVAILABLE AS TO UTILITY LOCATION AND ELEVATION. NO CONSTRUCTION AROUND OR ADJACENT TO UTILITIES SHALL BEGIN WITHOUT NOTIFYING THEIR OWNERS AT LEAST 48-HOURS IN ADVANCE. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE AND ANY DAMAGE DONE TO THEM DUE TO HIS/HER NEGLIGENCE SHALL BE IMMEDIATELY AND COMPLETELY REPAIRED AT THE CONTRACTOR'S EXPENSE. TO LOCATE EXISTING UTILITIES IN THE FIELD PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL CONTACT MISS UTILITY OF DELAWARE (SEE NOTE #5).
- SHOULD UTILITY RELOCATION BE REQUIRED, THE DEVELOPER MUST SUBMIT A UTILITY RELOCATION PLAN FOR DELDOT REVIEW ALONG WITH CORRESPONDENCE FROM THE UTILITY COMPANIES STATING PRELIMINARY APPROVAL TO THE RELOCATION AND DESIGN OF THE UTILITIES PRIOR TO THE DELDOT PRE-CONSTRUCTION MEETING. NO PHYSICAL CONSTRUCTION CAN OCCUR UNTIL THE UTILITY PLANS ARE APPROVED, THE INDIVIDUAL UTILITY COMPANIES ISSUE FINAL APPROVAL, AND A DELDOT UTILITY PERMIT IS ISSUED TO THE UTILITY COMPANY.
- DESIGN AND INSTALLATION OF ALL PAVEMENT MARKINGS AND STRIPING SHALL BE AS OUTLINED IN THE LATEST VERSION OF THE DE MUTCD. FOR FINAL PERMANENT PAVEMENT MARKINGS EPOXY RESIN PAINT SHALL BE REQUIRED FOR LONG LINE STRIPING, THERMO PLASTIC (EXTRUDED OR PREFORMED MATERIAL) WILL BE REQUIRED ON ASPHALT SURFACES, FOR SHORT LINE STRIPING, I.E. SYMBOLS/LEGENDS, PERMANENT PAVEMENT MARKING TAPE (PER DELDOT APPROVED MATERIALS LIST) WILL BE REQUIRED ON CONCRETE SURFACES, FOR SHORT LINE STRIPING, I.E. SYMBOLS/LEGENDS.
- BREAKAWAY POSTS SHALL BE USED WHEN INSTALLING ALL SIGNS. REFERENCE DELDOT STANDARD CONSTRUCTION DETAIL T-15.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSURE THAT PAVING WITHIN THE STATE OF DELAWARE RIGHT-OF-WAY IS INSTALLED TO THE ELEVATIONS SHOWN AND THAT NO PONDING OF WATER EXISTS AFTER PAVING IS COMPLETE.
- ALL PERSONS WORKING WITHIN THE STATE RIGHT-OF-WAY SHALL WEAR A MINIMUM OF AN ANSI CLASS II SAFETY VEST MEETING OR EXCEEDING THE ANSI 107-2004 REQUIREMENTS, AS SPECIFIED IN THE DELAWARE MUTCD.
- WITHIN THE MAINLINE WORK AREA, PERMANENT ADVANCE WARNING SIGNS WITH THE LEGENDS ROAD WORK 1500 FT, ROAD WORK 1000 FT AND ROAD WORK 500 FT SHALL BE INSTALLED IN ADVANCE OF THE WORK AREA IN BOTH DIRECTIONS. AN END ROAD WORK SIGN SHALL BE LOCATED 500 FEET DOWNSTREAM FROM THE WORK AREA. ON INTERSECTING ROADWAYS WITHIN THE PROJECT LIMITS, A ROAD WORK AHEAD SIGN SHALL BE PLACED AT A DISTANCE NOT LESS THAN 500 FEET IN ADVANCE OF THE WORK AREA AND AN END ROAD WORK SIGN SHALL BE LOCATED 500 FEET DOWNSTREAM OF THE WORK AREA. ALL PERMANENT ADVANCE WARNING SIGNS SHALL BE GRADING MOUNTED ON TWO INCH/350 OR MASH APPROVED BREAKAWAY POSTS AND SHALL BE MOUNTED IN COMPLIANCE WITH THE DELAWARE MUTCD. PERMANENT ADVANCE WARNING SIGNS SHALL BE MOUNTED AT A HEIGHT OF 7 FEET, MEASURED FROM THE ROADWAY TO THE BOTTOM OF THE SIGN. THE USE OF SKID MOUNTED SIGN SUPPORTS IS NOT ALLOWED UNLESS THE CONTRACTOR CAN DEMONSTRATE THAT A UTILITY CONFLICT EXISTS, WHICH SHALL BE VERIFIED BY THE ENGINEER, OR CONCRETE MEDIANS PREVENT THE INSTALLATION OF THE PERMANENT ADVANCE WARNING SIGNS IN THE APPROPRIATE LOCATION.
- CONTRACTOR TO PROVIDE CERTIFICATION OF COMPLIANCE WITH NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 FOR TRAFFIC CONTROL DEVICES OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
- LOOP DETECTORS: ADVANCE NOTICE TO BE PROVIDED TO DELDOT FOR CONSTRUCTION IN THE AREAS OF LOOP DETECTORS AT SIGNALIZED INTERSECTIONS. E.S.N.G. AND ITS CONTRACTOR WILL COORDINATE WITH DELDOT FOR LOOP DETECTOR REPAIRS (DEDOT WILL MAKE REPAIRS, AND DELDOT WILL INVOICE E.S.N.G. FOR THE REPAIRS).
- CONTRACTOR SHALL IMMEDIATELY REPAIR ANY DAMAGED EXISTING DRAINAGE TRENCHES OR UNDERDRAINS ENCOUNTERED DURING CONSTRUCTION.
- CONTRACTOR SHALL PROVIDE SHORING TO PROTECT THE ROAD FOR ANY EXCAVATION WITHIN 2 FEET OF THE EDGE OF PAVEMENT, PER DELDOT STANDARDS AND SPECIFICATIONS.
- ALL STORM DRAIN PIPES AND STRUCTURES IMPACTED BY PIPELINE INSTALLATION ARE TO BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.
- CONTRACTOR SHALL SCHEDULE WITH UTILITY COMPANY TO SHORE/HOLD ALL EXISTING UTILITY POLES WITH IN 5 FEET OF PIPELINE TRENCHING AT CONTRACTORS EXPENSE.
- TEST STATIONS SHALL NOT BE SET IN DITCH LINES OR SLOPES.
- HOT MIX DRIVEWAYS SHALL BE RESTORED WITH 6" GABC AND 2" TYPE "C" HOT MIX OR MATCH EXISTING (WHICHEVER IS GREATER) AND SHALL TIE INTO EDGE OF SHOULDER OF ROADWAY IF PATCHING IS LESS THAN 6 FEET FROM JOINT.
- STONE DRIVEWAYS SHALL BE RESTORED WITH 6" GABC OR MATCH EXISTING (WHICHEVER IS GREATER).
- COMMERCIAL ENTRANCES SHALL BE DIRECTIONAL DRILLED OR AS SHOWN ON THE PLAN.

**MAINTENANCE OF TRAFFIC / TEMPORARY TRAFFIC CONTROL PLAN - GENERAL NOTES**

- ALL WORK SHALL BE PERFORMED IN A MANNER THAT WILL REASONABLY PROVIDE THE LEAST PRACTICABLE OBSTRUCTION TO ROAD USERS, INCLUDING VEHICULAR TRAFFIC, BICYCLE TRAFFIC AND PEDESTRIAN TRAFFIC.
- ALL TEMPORARY TRAFFIC CONTROL AND TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, THE LATEST EDITION OF THE MANUAL TITLED "STATE OF DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)" (HEREINAFTER REFERRED TO AS THE "DELAWARE MUTCD"), CURRENT STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND SUPPLEMENTAL SPECIFICATIONS, INCLUDING ALL REVISIONS AS OF THE DATE OF THE PERMIT APPROVAL.
- THE DEPARTMENT RESERVES THE RIGHT TO STOP THE CONTRACTOR'S OPERATIONS, IF, IN THE OPINION OF THE DEPARTMENT'S REPRESENTATIVE, THE CONTRACTOR'S OPERATIONS ARE NOT IN COMPLIANCE WITH THE DELAWARE MUTCD, THE SPECIFICATIONS OR THE PLANS OF THE CONTRACTOR'S OPERATIONS ARE DEEMED UNSAFE.
- IF THE CONTRACTOR DESIRES TO DEVIATE FROM THE TEMPORARY TRAFFIC CONTROL PLAN (TTCP) PROVIDED IN THE PLAN SET OR DESIRES CHANGES TO THE PHASING OR SCOPE OF THE TTCP, THE CONTRACTOR SHALL SUBMIT A NEW TTCP TO THE DISTRICT SAFETY OFFICER FOR APPROVAL PRIOR TO THE START OF WORK AT EACH AND EVERY LOCATION. THE TTCP SHALL BE PREPARED, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF DELAWARE AND SHALL BE PREPARED IN ACCORDANCE WITH ALL APPLICABLE DELDOT STANDARDS. THE TTCP SHALL BE SUBMITTED 14 CALENDAR DAYS IN ADVANCE OF STARTING WORK.
- ALL ROADWAY CLOSURES OR LANE CLOSURES BEYOND THOSE SPECIFIED AND APPROVED IN THE PLANS SHALL BE APPROVED BY THE DISTRICT SAFETY OFFICER A MINIMUM OF TWO WEEKS IN ADVANCE OF THE PROPOSED RESTRICTION.
- TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE MAINTAINED IN GOOD CONDITION IN ACCORDANCE WITH THE BROCHURE ENTITLED "QUALITY GUIDELINES FOR TEMPORARY TRAFFIC CONTROL DEVICES", PUBLISHED BY THE AMERICAN TRAFFIC SAFETY SERVICES ASSOCIATION (ATSSA). ANY TEMPORARY TRAFFIC CONTROL DEVICES THAT DO NOT MEET THE QUALITY GUIDELINES SHALL BE REMOVED AND REPLACED WITH ACCEPTABLE DEVICES. FAILURE TO COMPLY WILL RESULT IN WORK STOPPAGE.
- TEMPORARY TRAFFIC CONTROL DEVICES USED ON ALL ROADWAYS OPEN TO THE PUBLIC IN DELAWARE SHALL CONFORM TO THE DELAWARE MUTCD AND SHALL BE IN NEW OR REFURBISHED CONDITION. ALL DEVICES SHALL BE CRASHWORTHY IN ACCORDANCE WITH THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 AND/OR IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) PUBLISHED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO). THE CONTRACTOR SHALL SUBMIT CERTIFICATION FOR ALL TEMPORARY TRAFFIC CONTROL DEVICES USED SPECIFICALLY ON THIS PROJECT TO THE DISTRICT SAFETY OFFICER AT OR PRIOR TO THE PRE-CONSTRUCTION MEETINGS. THE CONTRACTOR SHALL NOT BEGIN WORK OR PLACE ANY TEMPORARY TRAFFIC CONTROL DEVICES UNTIL THE CERTIFICATION OF DEVICES HAS BEEN APPROVED BY THE DISTRICT SAFETY OFFICER.
- ANY DEFICIENCIES RELATED TO TEMPORARY TRAFFIC CONTROL THAT ARE REPORTED TO THE CONTRACTOR IN WRITING SHALL BE CORRECTED WITHIN 24 HOURS OR AS DIRECTED BY THE DISTRICT SAFETY OFFICER. CORRECTIVE ACTIONS ON SEVERE DEFICIENCIES SHALL BE TAKEN IMMEDIATELY. FAILURE TO COMPLY WILL RESULT IN THE SUSPENSION OF WORK UNTIL DEVICES ARE BROUGHT BACK INTO COMPLIANCE.
- ACCESS TO ALL BUSINESSES AND RESIDENCES WITHIN THE PROJECT LIMITS SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THIS CONTRACT. ANY TEMPORARY CLOSURE OF A DRIVEWAY OR ENTRANCE FOR TIE-IN PURPOSES SHALL BE COORDINATED WITH THE ENGINEER AND THE PROPERTY OWNER IN ADVANCE OF THE CLOSURE.
- ACCESS TO ALL TRANSIT STOPS LOCATED WITHIN THE PROJECT LIMITS SHALL BE MAINTAINED UNLESS OTHERWISE DIRECTED BY THE PLANS OR THE ENGINEER. MAINTAINING ACCESS TO THE TRANSIT STOP SHALL INCLUDE MAINTAINING AN AREA FOR THE TRANSIT VEHICLE TO STOP TO PICK-UP AND DISCHARGE PASSENGERS AND ALSO AN ACCESSIBLE PATH FOR PEDESTRIANS TO SAFELY ACCESS THE TRANSIT STOP.
- THE CONTRACTOR SHALL PROVIDE ALL PROPERTY OWNERS AND RESIDENTS WHO LIVE ADJACENT TO THE WORK ZONE WITH WRITTEN NOTICE, 48 HOURS IN ADVANCE OF THE START OF CONSTRUCTION WORK. THIS NOTIFICATION SHALL INCLUDE THE SCOPE OF WORK, WORKING HOURS, ANTICIPATED START AND COMPLETION DATES; A SUMMARY OF CONSTRUCTION ACTIVITIES WHICH MAY INTERFERE WITH ACCESS TO THE PROPERTY INCLUDING A SCHEDULE AND ACCESS COORDINATION PLAN; CONTRACTOR'S NAME AND ADDRESS AND A DELDOT CONTACT PHONE NUMBER. FAILURE TO GIVE PROPER NOTICE WILL RESULT IN A SUSPENSION OF THE WORK, UNTIL PROPER NOTICE IS PROVIDED. THE CONTRACTOR SHALL PROVIDE WRITTEN VERIFICATION TO THE ENGINEER THAT THE PROPERTY OWNERS AND RESIDENTS WERE NOTIFIED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE LOCAL 911 CENTER, LOCAL SCHOOLS AND THE DELDOT PUBLIC INFORMATION CENTER OF ALL ROADS AND LANES TO BE CLOSED A MINIMUM OF SEVEN CALENDAR DAYS BEFORE THE CLOSURE.
- THE CONTRACTOR SHALL NOTIFY THE LOCAL 911 CENTER IF ACCESS TO A FIRE HYDRANT IS TEMPORARILY RESTRICTED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE TRANSPORTATION MANAGEMENT CENTER IS NOTIFIED EACH AND EVERY DAY WHEN WORK IS BEING PERFORMED IN STATE RIGHT-OF-WAY. THE CONTRACTOR SHALL IDENTIFY THE TYPE OF WORK, ANY LANES OR SHOULDERS CLOSED, THE LENGTH OF TIME FOR WORK, WHEN THE LANE RESTRICTIONS ARE LIFTED, CONTACT PERSON/PHONE NUMBER AND STATE INSPECTOR. THE TRANSPORTATION MANAGEMENT CENTER CAN BE REACHED AT (302) 694-4600.
- AT THE END OF EACH WORKDAY, THE CONTRACTOR SHALL CORRECT ALL VERTICAL DIFFERENCES IN ACCORDANCE WITH TABLE 66-1 OF THE DELAWARE MUTCD.
- AT THE END OF EACH DAY'S OPERATION AND BEFORE TRAFFIC IS RETURNED TO UNRESTRICTED ROADWAY USE, TEMPORARY PAVEMENT MARKINGS SHALL BE APPLIED IN ACCORDANCE WITH THE DELAWARE MUTCD AND DELDOT'S TEMPORARY PAVEMENT MARKINGS POLICY.
- WHEN SIDE ROADS INTERSECT THE WORK ZONE, ADDITIONAL TRAFFIC CONTROL DEVICES SHALL BE ERECTED INCLUDING ADVANCED WARNING SIGNS.
- ALL STORAGE OF EQUIPMENT AND MATERIAL SHALL COMPLY WITH SECTION 66.21 OF THE DELAWARE MUTCD.
- ALL FLAGGERS SHALL COMPLY WITH CHAPTER 6E OF THE DELAWARE MUTCD AND MUST BE AMERICAN TRAFFIC SAFETY SERVICES ASSOCIATION (ATSSA) CERTIFIED IN THE STATE OF DELAWARE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS/HER WORK WITH OTHER CONTRACTORS IN THE AREA.
- ALL PAVEMENT MARKINGS THAT ARE NO LONGER IN USE AND CONFLICT WITH TEMPORARY PAVEMENT MARKINGS SHALL BE REMOVED AND COMPLETELY OBLITERATED BY A METHOD APPROVED BY THE ENGINEER. PAINTING OVER THE CONFLICTING PAVEMENT MARKINGS WILL NOT BE ACCEPTED AS A METHOD OF REMOVAL.
- THE CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE OF EXISTING PAVEMENT WITHIN THE PROJECT LIMITS FOR THE DURATION OF THE CONTRACT OR AS DIRECTED BY THE ENGINEER.
- ALL ROADWAYS AND ENTRANCES NOT OPEN TO TRAFFIC SHALL BE CLOSED USING TYPE III BARRICADES AND SHALL BE INSTALLED PER THE DELAWARE MUTCD. IF THE ROADWAY OR ENTRANCE IS CLOSED FOR MORE THAN ONE MONTH, THE CONTRACTOR SHALL ERECT PERMANENT BARRICADES AS DIRECTED IN PART 3 OF THE DELAWARE MUTCD.
- ALL ROADS LEADING INTO THE WORK ZONE SHALL HAVE "UTILITY WORK AHEAD" AND "END UTILITY WORK" SIGNS.
- STABILIZED CONSTRUCTION ENTRANCES SHALL BE USED TO REDUCE OFF-SITE SEDIMENTATION BY ELIMINATING THE TRACKING OF EXCESS SOIL ONTO PAVED PUBLIC ROADWAYS. ALL ROADWAYS SHALL BE KEPT CLEAN OF SEDIMENT AND DEBRIS. THE CONTRACTOR SHALL UTILIZE A STREET SWEEPER TO MINIMIZE DUST AND SOIL ON ROADWAYS AND ACCESS LOCATIONS SHALL BE SWEEP ONCE EACH DAY AS A MINIMUM.
- INDIVIDUAL CONSTRUCTION ENTRANCE LOCATIONS SHALL BE KEPT TO A MINIMUM AND DETERMINED IN THE FIELD BY THE CONTRACTOR. DELDOT SHALL BE NOTIFIED OF ALL LOCATIONS PRIOR TO INSTALLATION.
- AS AN ADVANCE WARNING, THE TRUCK SYMBOL (M10-I) SIGN SHALL BE INSTALLED IN EITHER APPROACH DIRECTION FOR EACH STABILIZED CONSTRUCTION ENTRANCE AND REMAIN IN PLACE FOR THE DURATION OF THE DRIVEWAY USE. CONSTRUCTION WARNING SIGNS SHALL BE BLACK LEGEND ON ORANGE BACKGROUND AND WHEN UTILIZED FOR EXTENDED DURATIONS SHALL BE INSTALLED ON BREAKAWAY POSTS PER DELDOT STANDARD CONSTRUCTION DETAIL T-15.
- WORK WITHIN A SIGNALIZED INTERSECTION OR IMPACT TO A SIGNALIZED INTERSECTION SHALL FOLLOW THE DELDOT MUTCD, TEMPORARY TRAFFIC CONTROL INTERIM GUIDANCE "TRAFFIC CONTROL WITHIN INTERSECTIONS", AND WILL REQUIRE A UNIFORMED TRAFFIC OFFICER.
- THE DEPARTMENT RESERVES THE RIGHT TO RESTRICT LANE/SHOULDER CLOSURES IN CASE A SPECIAL EVENT IS SCHEDULED TO CROSS OR PROCEED THROUGH A WORK ZONE. IF SUCH A RESTRICTION IS DEEMED NECESSARY, THE DEPARTMENT SHALL PROVIDE THE PERMIT HOLDER A MINIMUM 2 WEEK ADVANCE NOTIFICATION.
- ALL STABILIZED CONSTRUCTION ENTRANCE LOCATIONS SHALL BE APPROVED BY DELDOT PRIOR TO INSTALLATION.
- CONTRACTOR SHALL UTILIZE THE FOLLOWING TRAFFIC CONTROL FROM THE DELAWARE MUTCD MOST CURRENT ADDITION.
  - TYPICAL APPLICATION 3, FIGURE 6H-3, WORK ON THE SHOULDER OF A MULTI-LANE, DIVIDED HIGHWAY
- ALL STABILIZED CONSTRUCTION ENTRANCE LOCATIONS SHALL BE APPROVED BY DELDOT PRIOR TO INSTALLATION.
- MESSAGE BOARDS ARE REQUIRED 10 DAYS IN ADVANCE OF CONSTRUCTION.



- NOTES:
- TEMPORARY PATCHES FROM WINTER MONTHS SHALL BE PERMANENTLY RESTORED BY MAY 15.
  - IN LIEU OF GABC, ROTOMILLING OR CRUSHED CONCRETE CAN BE USED IF THE FOLLOWING REQUIREMENTS ARE MET:
  - ROTOMILLING SPECIAL PROVISION 802914 SHOWN IN APPENDIX L.
  - CRUSHED CONCRETE SUPPLEMENTAL SPECIFICATIONS 802 AND 826.
  - THE BACKFILL MATERIAL SHALL MEET THE REQUIREMENTS FOR BORROW TYPE C AS PER SECTION 204 OF THE STANDARD SPECIFICATIONS.
  - COMPACTION SHALL MEET THE REQUIREMENTS AS PER SECTION 204 OF THE STANDARD SPECIFICATIONS.
  - FLOWABLE FILL IS ALLOWABLE AS A BACKFILL MATERIAL. FLOWABLE FILL SHALL MEET THE REQUIREMENTS OF SPECIAL PROVISION 200500 AS SHOWN IN APPENDIX F.
  - ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL MEET THE REQUIREMENTS SET FORTH IN THE CURRENT DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.



- NOTES:
- PATCHES MUST HAVE A MINIMUM LENGTH OF 6'-0" PLUS OUTSIDE DIAMETER OF PIPE (AS MEASURED ALONG THE ROADWAY CENTERLINE) AND THE WIDTH OF THE LANE OR LANES DISTURBED.

**TEMPORARY PATCH**

(SOURCE: DELDOT UTILITIES MANUAL - FIGURE 2-9)  
MINIMUM DESIGN REQUIREMENTS  
(DISTRICT ENGINEER MAY CHANGE REQUIREMENTS IN SPECIAL CASES)

**PERMANENT PATCH**

(SOURCE: DELDOT UTILITIES MANUAL FIGURE 2-4)

**ROADWAY CONSTRUCTION & RESTORATION DETAILS**

**TRAFFIC CONTROL DETAILS**

REVISIONS			
NO.	DATE	DESCRIPTION	BY

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16" PROPOSED PIPELINE FELTON LOOP KENT COUNTY, DE	
ESNG PROJ. CODE:	DATE: 3/8/2024
MRA PROJECT NO: 22257	SCALE: N/A
DESIGN/CHECK BY: JTH/CWB	SHEET: 7 OF 26

NORTH TIE-IN

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16" PROPOSED PIPELINE  
FELTON LOOP  
KENT COUNTY, DE

ESNG PROJ. CODE:	DATE:	3/8/2024
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SOUTH TIE-IN

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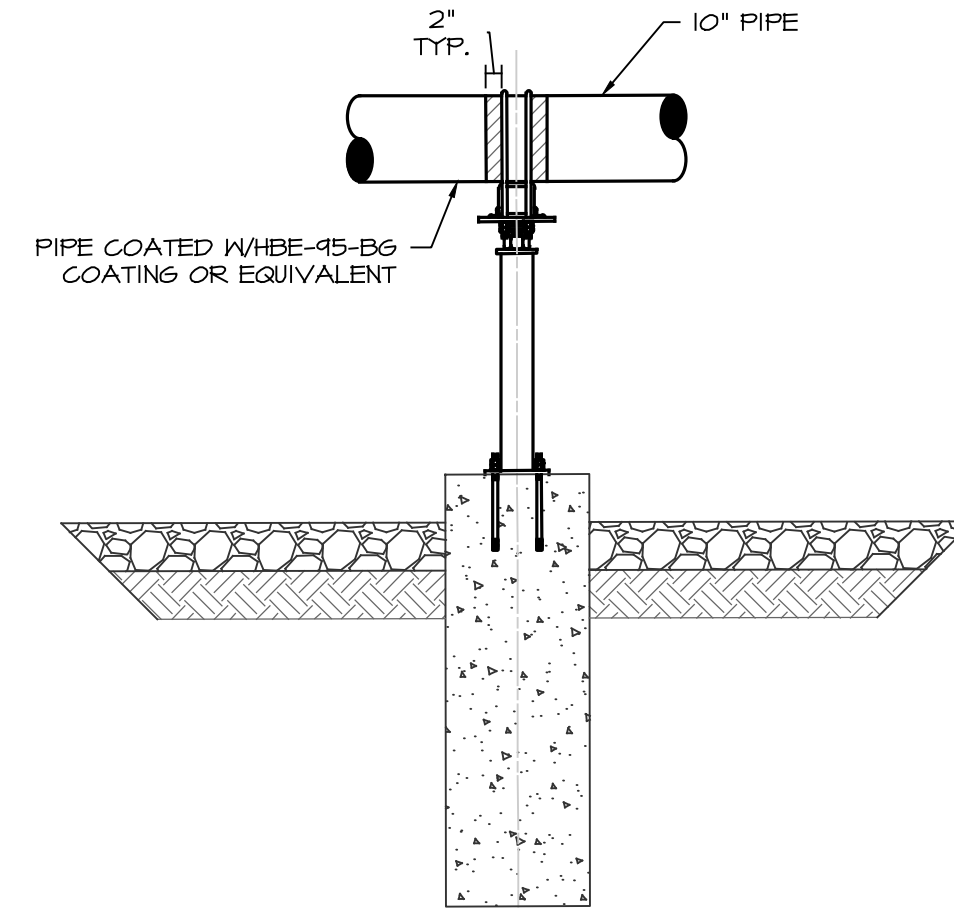


16" PROPOSED PIPELINE  
FELTON LOOP  
KENT COUNTY, DE

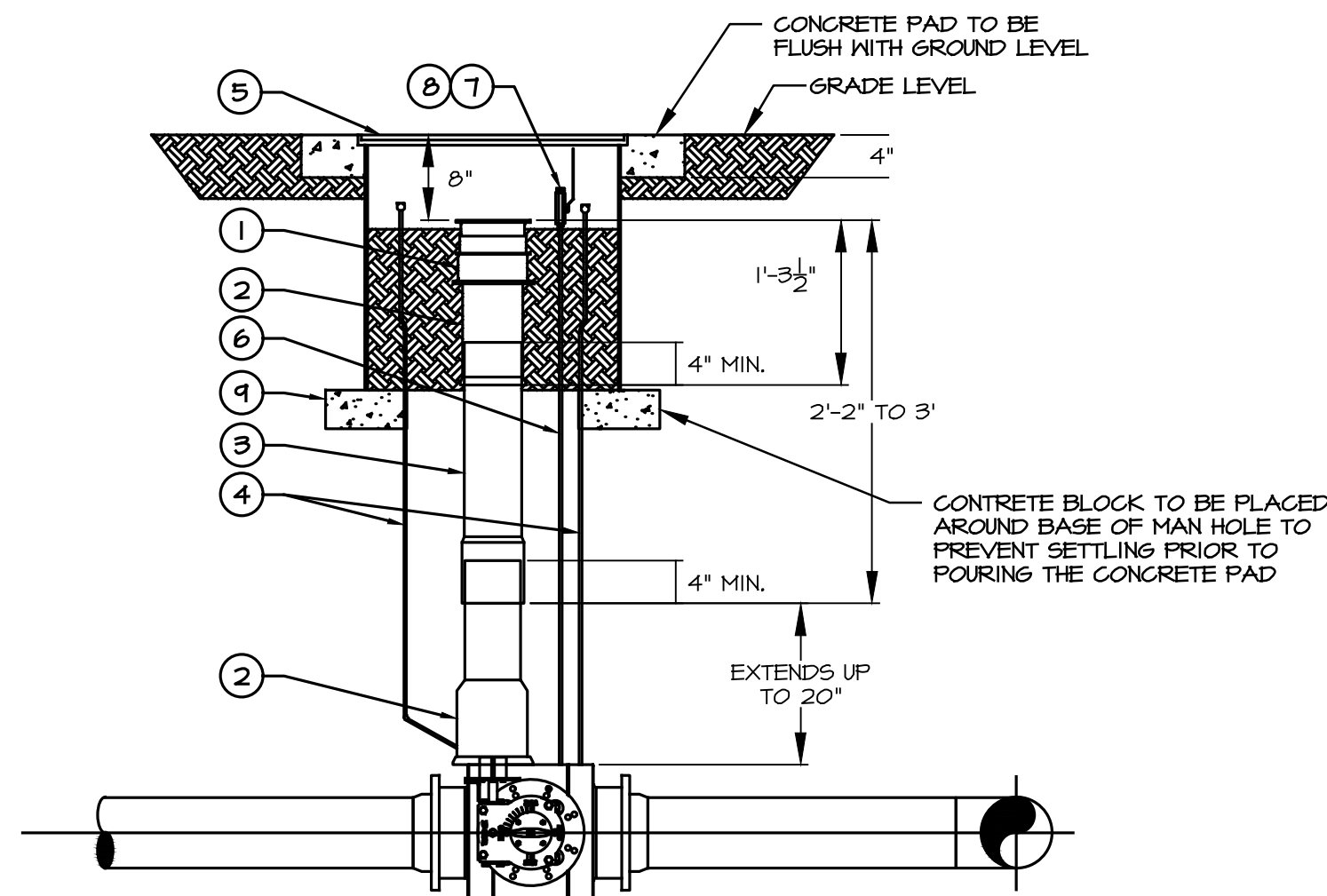
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MRA PROJECT NO:	SCALE:	AS SHOWN
DESIGN/CHECK BY:	JTH/CWB	SHEET: 9 OF 26

**COATING APPLICATION FOR R45, TWO PART EPOXY COATING, OR AS APPROVED BY ESNG**

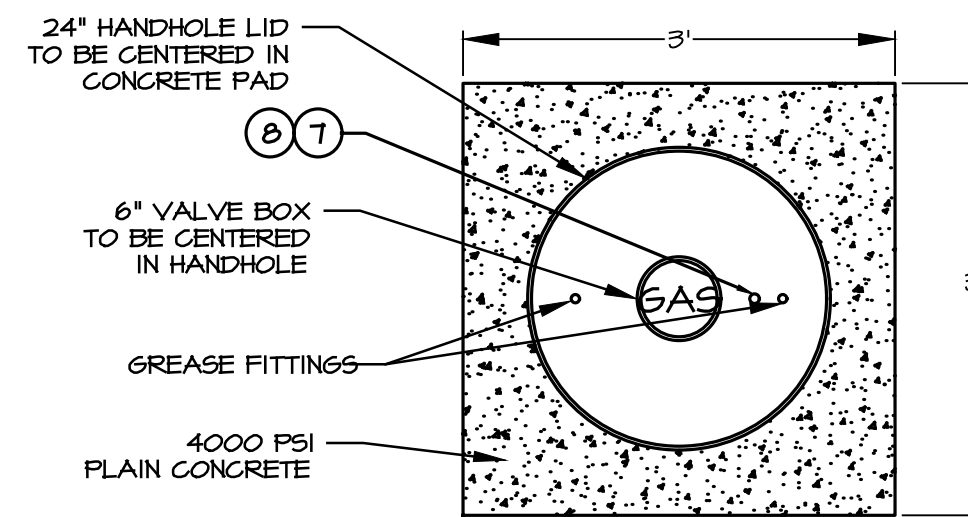
1. VERIFY PIPE TEMPERATURE IS AT LEAST 5°F ABOVE THE DEW POINT BEFORE CLEANING OF PIPE. (IF APPLICABLE).
2. POWER BRUSH OR ABRASIVE BLAST PIPE UNTIL FREE OF RUST, DIRT, AND OTHER FOREIGN MATTER (NEAR WHITE, SSPC-SP-10, NACE No.2 FINISH).
3. CLEAN TOTAL DESIRED SECTION OF PIPE THAT WILL BE COATED.
4. APPLY R45, TWO PART EPOXY COATING ON ALL SIDES OF PIPE SUPPORT 2" TYPICAL.
5. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURE RECOMMENDATION.



PIPE SUPPORT WITH COATING DETAIL  
NOT TO SCALE

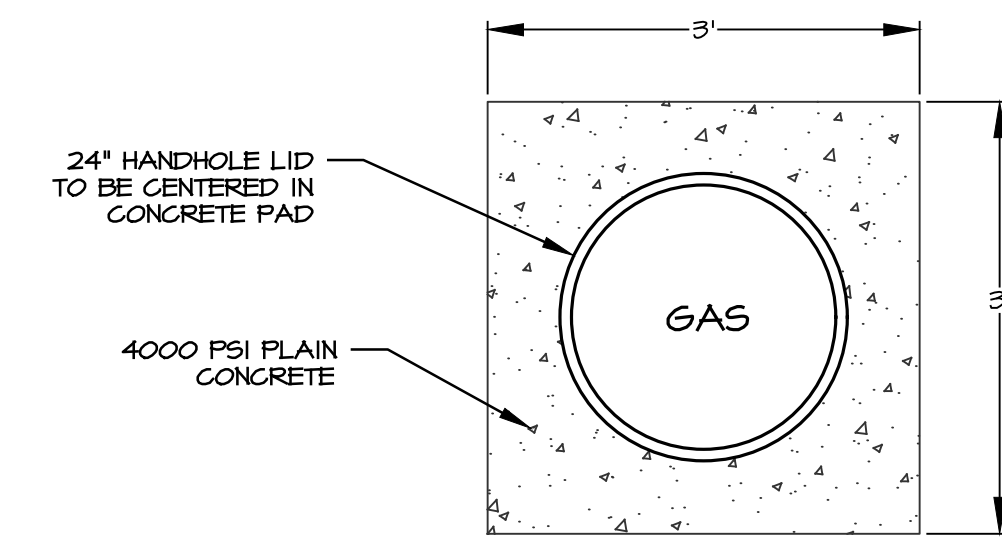
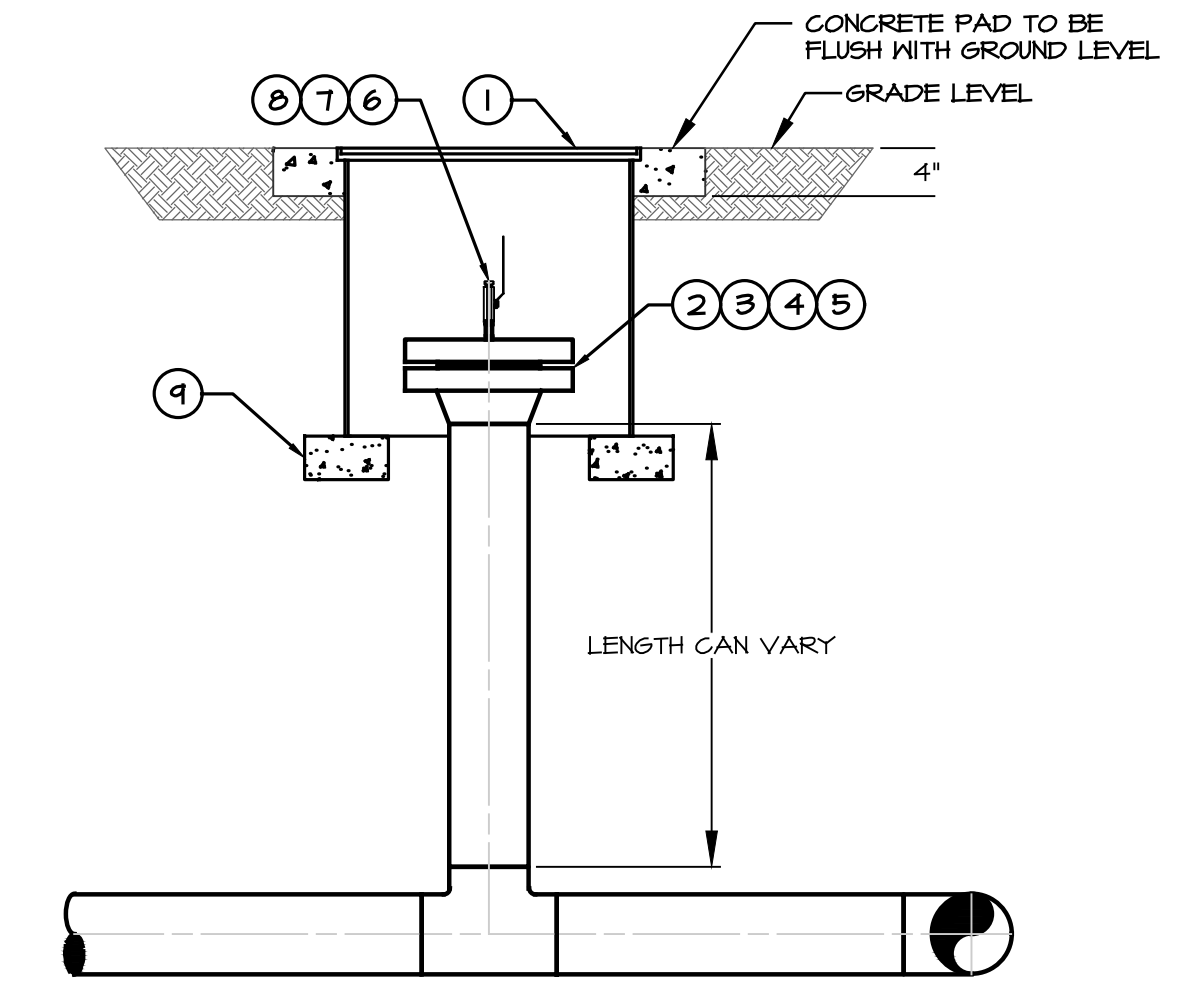


NOTES:  
1) MUST HAVE A 4" OVERLAP JOINING EXTENSION WITH VALVE BOX.  
2) USE TOP AND BOTTOM OF VALVE BOX FIRST. IF NOT LONG ENOUGH ADD EXTENSION No. P-65 TO THE MIDDLE OF ORIGINAL VALVE BOX.



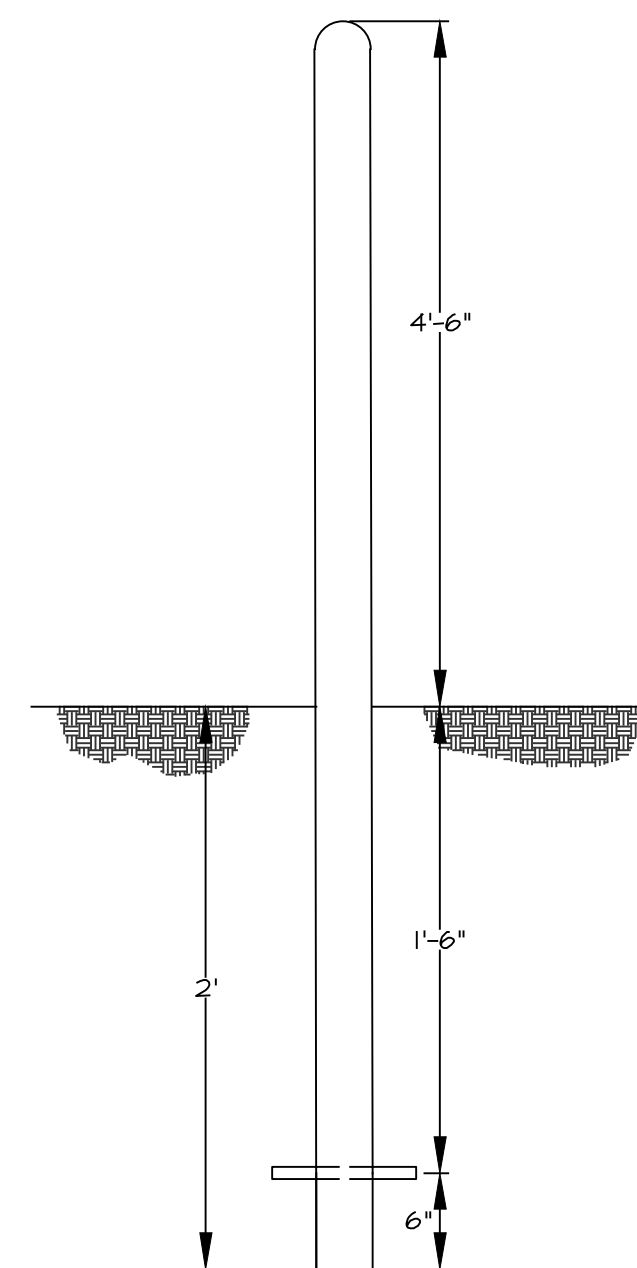
VALVE BOX DETAIL

PART #	PART NAME	DESCRIPTION
1	No. P-11B	CAST IRON LID ATTACHED TO No. 8250.
2	No. 8250	6" PLASTIC VALVE BOX. COMES IN TWO PARTS. BELL NUMBER 101.
3	No. P-65	6" PLASTIC VALVE BOX EXTENSION. IF NEEDED, INSTALL IN BETWEEN THE TOP AND BOTTOM PIECES OF No. 8250.
4	GREASE FITTINGS	GREASE FITTINGS ATTACHED TO THE VALVE AND EXTENDS INTO THE PEMCO VALVE BOX.
5	PEMCO 24" VALVE BOX	PEMCO 24" X 24" ROUND VALVE BOX.
6	BODY BLEED TUBING	TUBING TIES INTO THE BACK SIDE OF THE VALVE.
7	APOLLO 1/2" BALL VALVE	1/2" BALL VALVE FOR BODY BLEED.
8	1/2" PLUG	1/2" PLUG ATTACHED TO THE BALL VALVE.
9	CONCRETE BLOCK	COMMON: 4" X 8" X 16" OR EQUIVALENT BLOCK



BLOW OFF VALVE BOX DETAIL

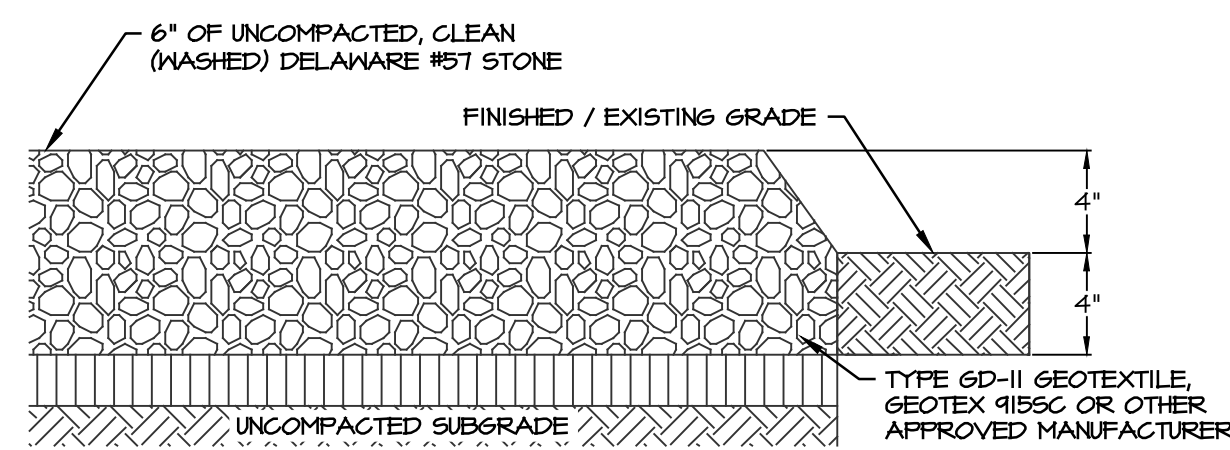
PART #	PART NAME	DESCRIPTION
1	PEMCO 24" VALVE BOX	PEMCO 24" X 24" ROUND VALVE BOX.
2	WN FLANGE	WN FLANGE CAN BE UP TO 20".
3	BLIND FLANGE	BLIND FLANGE CAN BE UP TO 20".
4	GASKET	SPIRAL WOUND GASKET CAN BE UP TO 20".
5	STUDS	VARIES BASED ON FLANGE SIZE AND ANSI RATING
6	PIPE NIPPLE	PIPE, NIPPLE, 3/4" DIAMETER X 3', 0.147" WALL THICKNESS, ASTM A-106 GRADE B
7	APOLLO 1/2" BALL VALVE	1/2" BALL VALVE FOR BODY BLEED.
8	1/2" PLUG	1/2" PLUG ATTACHED TO THE BALL VALVE.
9	CONCRETE BLOCK	COMMON: 4" X 8" X 16" OR EQUIVALENT BLOCK



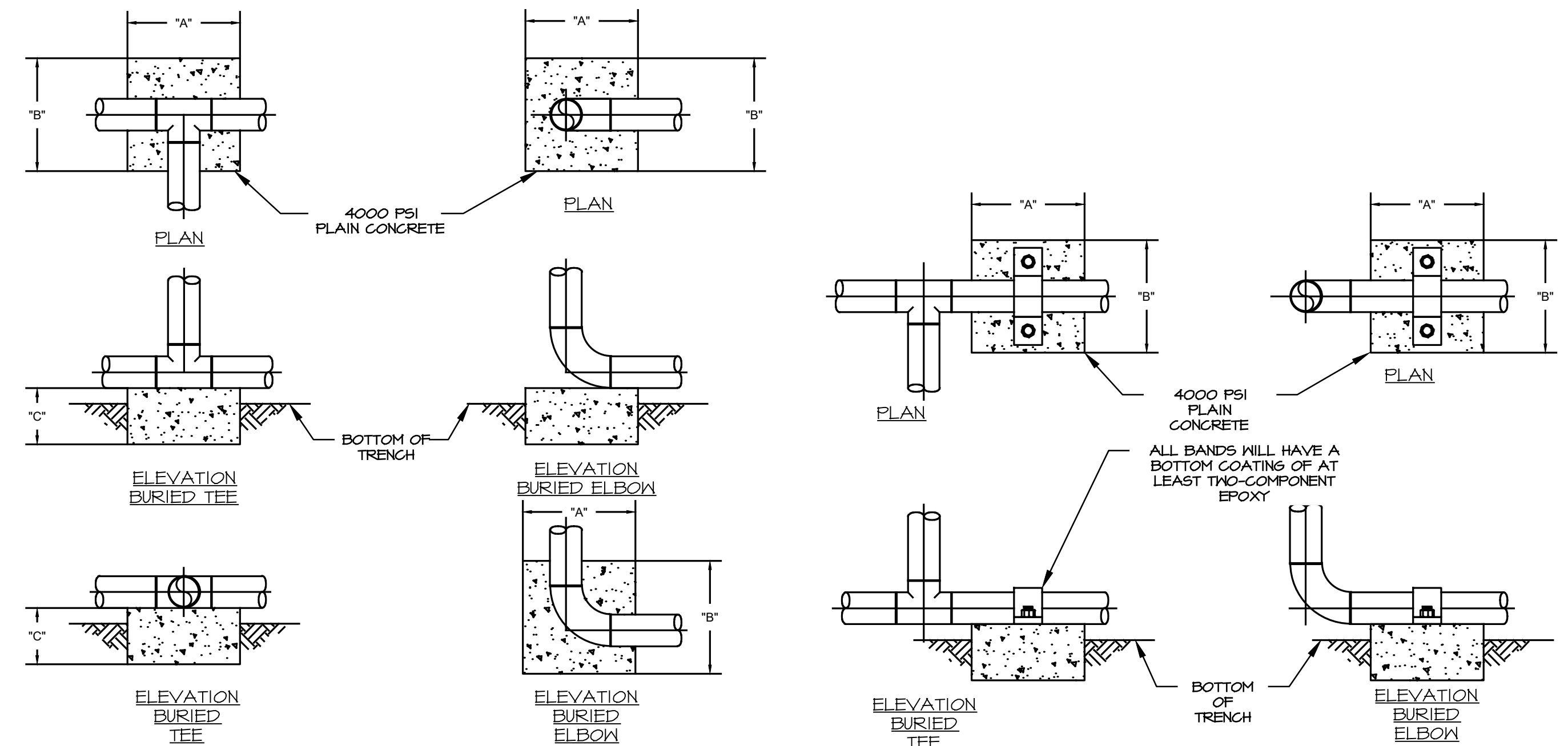
NOTES:

1. COMPANY TO FURNISH MARKER POSTS, TYPICALLY 3-1/2" x 6'-6" POLY PIPE WITH 3/4" x 4" ANCHOR BAR 6" FROM BOTTOM.
2. POLY PIPE TO BE PLACED 2'-0" UNDER FINISH GRADE WITH 4'-6" OF POLY PIPE EXPOSED ABOVE GROUND.
3. LOCATION OF PIPELINE MARKER POSTS TO BE PROVIDED BY ESNG.
4. PIPE LINE MARKERS SHOULD INCLUDE "CAUTION GAS PIPELINE DO NOT DIG." IN ADDITION THE 811 LOGO AND NUMBER SHOULD BE ABOVE THE EASTERN SHORE NATURAL GAS LOGO.

PIPELINE MARKER POST  
NOT TO SCALE



IMPERVIOUS GRAVEL DETAIL  
NOT TO SCALE



NOMINAL PIPE SIZE	"A"	"B"	"C"
2"	12"	12"	6"
3"	12"	12"	6"
4"	12"	12"	6"
6"	18"	18"	9"
8"	18"	18"	9"
10"	24"	24"	12"
12"	24"	24"	12"
14"	30"	30"	18"
16"	30"	30"	18"
18"	36"	36"	18"
20"	36"	36"	18"
24"	42"	42"	24"

CONCRETE FOOTER DETAILS  
NOT TO SCALE

GENERAL NOTES:

1. CONTRACTOR TO FURNISH ALL MATERIALS.
2. CLEAN, COAT AND WRAP FITTINGS AND PIPE WHICH WILL COME IN CONTACT WITH CONCRETE.
3. PIPE AND FITTINGS SHALL BE WRAPPED WITH "CONNED PIPE SAVER" OR EQUAL POLYETHYLENE MESH.
4. CONCRETE TO BE POURED TO CENTERLINE OF PIPING.
5. NO BACKFILL SHALL BE PLACED ON TOP OF CONCRETE UNTIL THE CONCRETE HAS HAD TIME TO SET UP.
6. BOTTOM OF CONCRETE SHALL BE PLACED ON SOLID FOOTING.
7. RIGID FORM WORK WILL NOT BE REQUIRED.
8. THIS SUPPORT IS NOT DESIGNED NOR INTENDED FOR A THRUST BLOCK.
9. CONTRACTOR TO USE 4000 PSI PLAIN CONCRETE OR "QUIKCRETE".

TIE-IN DETAILS

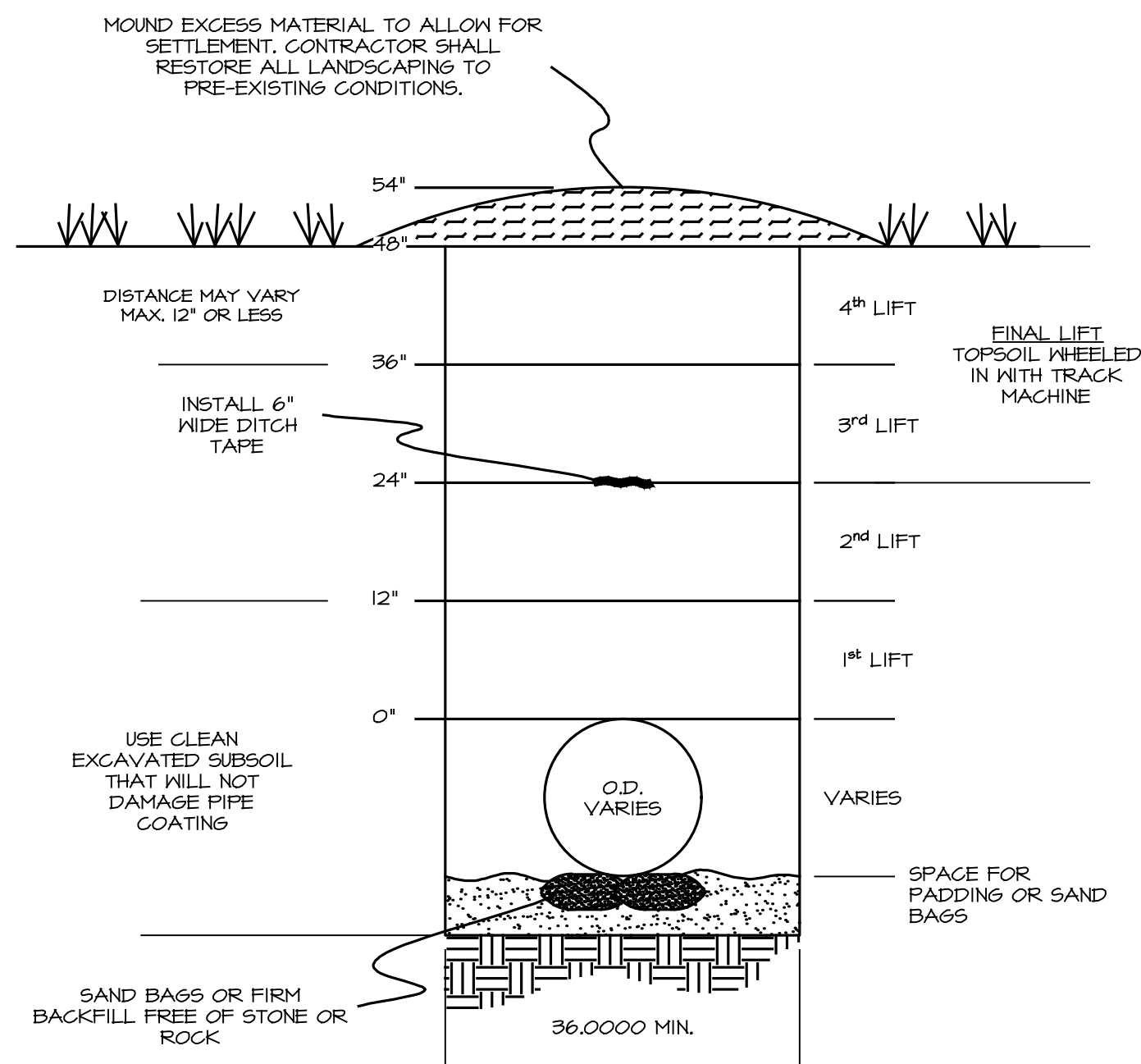
REVISIONS			
NO.	DATE	DESCRIPTION	BY



**MORRIS & RITCHIE ASSOCIATES, INC.**  
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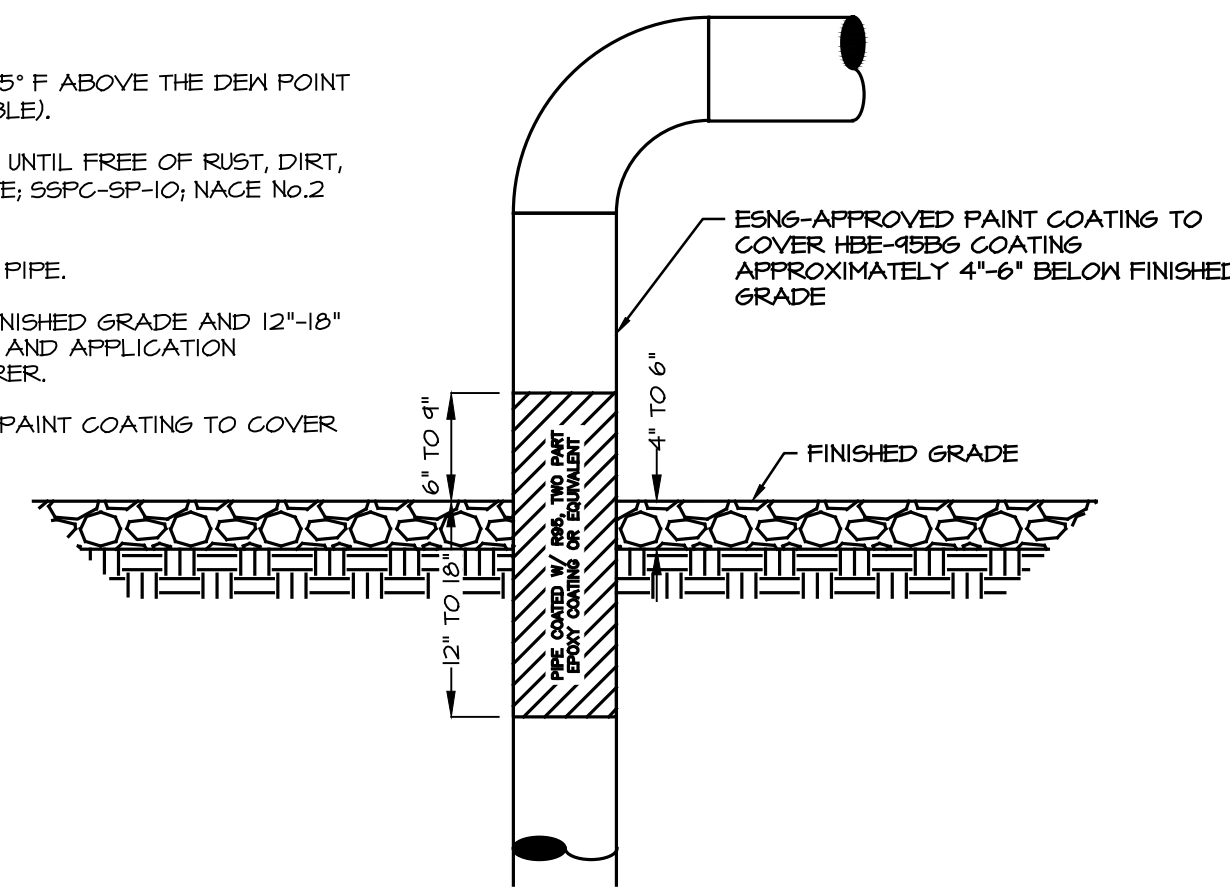


16" PROPOSED PIPELINE FELTON LOOP KENT COUNTY, DE			
ESNG PROJ. CODE:		DATE:	3/8/2024
MRA PROJECT NO:	22257	SCALE:	AS SHOWN
DESIGN/CHECK BY:	JTH/CWB	SHEET:	10 OF 26

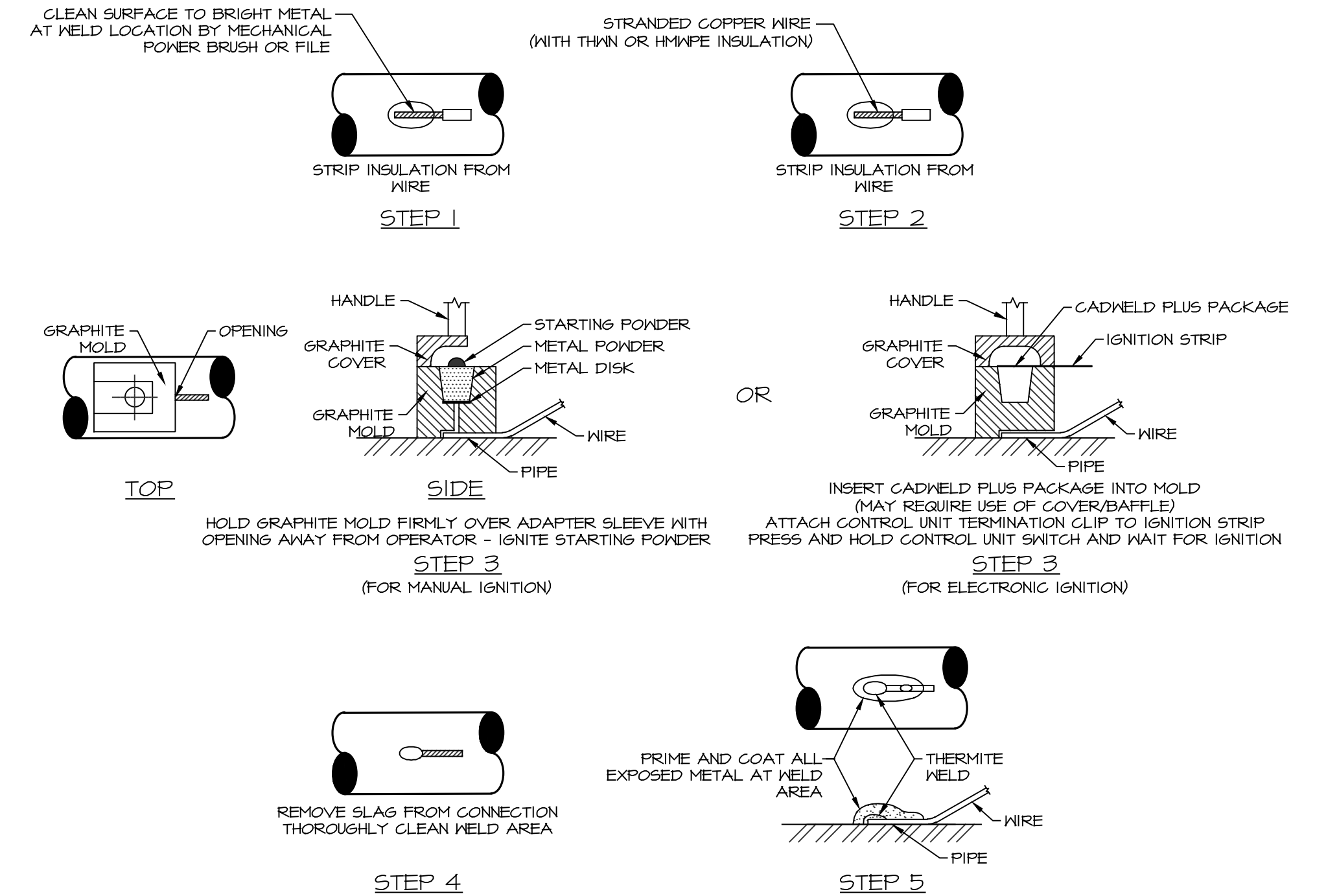


TRENCH BACK FILL DETAIL  
N.T.S.

1. VERIFY PIPE TEMPERATURE IS AT LEAST 5° F ABOVE THE DEW POINT BEFORE CLEANING OF PIPE. (IF APPLICABLE).
2. POWER BRUSH OR ABRASIVE BLAST PIPE UNTIL FREE OF RUST, DIRT, AND OTHER FOREIGN MATTER (NEAR WHITE; SSPG-SF-10; NACE No.2 FINISH).
3. CLEAN TOTAL OF 18" TO 21" SECTION OF PIPE.
4. COATING TO BE APPLIED 6"-4" ABOVE FINISHED GRADE AND 12"-18" BELOW FINISHED GRADE. FOLLOW MIXING AND APPLICATION INSTRUCTIONS PROVIDED BY MANUFACTURER.
5. SAFETY WHITE OR COMPANY APPROVED PAINT COATING TO COVER HBE-45B6 TO BELOW STONE GRADE



COATING APPLICATION FOR RISER  
NOT TO SCALE

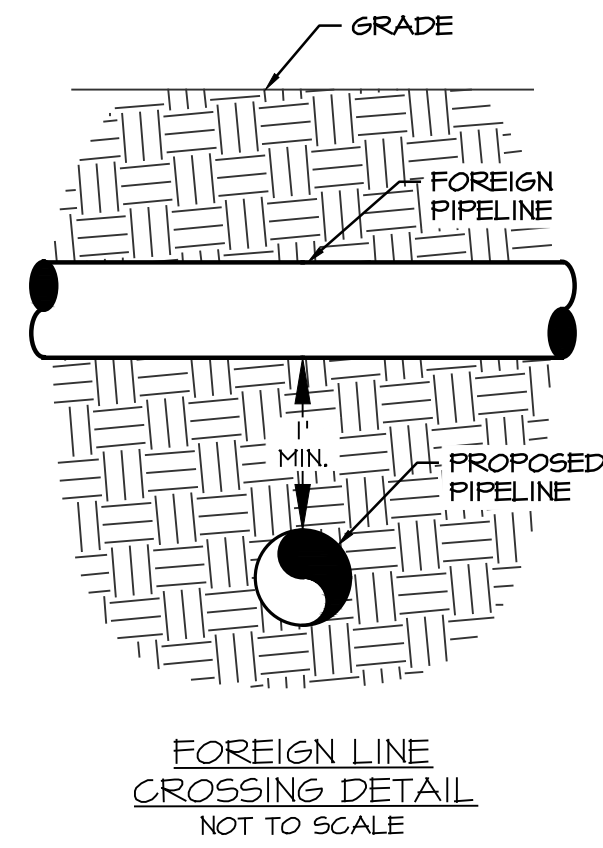


- NOTES:
1. THERMITE WELDS MADE TO GAS MAIN SHALL BE COATED WITH A PREFABRICATED ONE PIECE PLASTIC CAP FILLED WITH ELASTOMERIC MATERIAL, USE TWO PART EPOXY, THREE PART MAX TAPE OR APPROVED EQUAL.
  2. REPAIR PIPE COATING WITH MANUFACTURERS RECOMMENDATIONS.

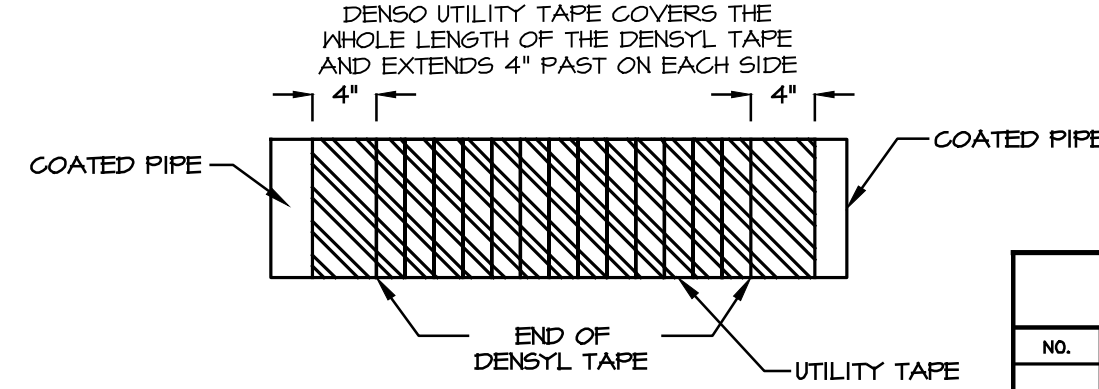
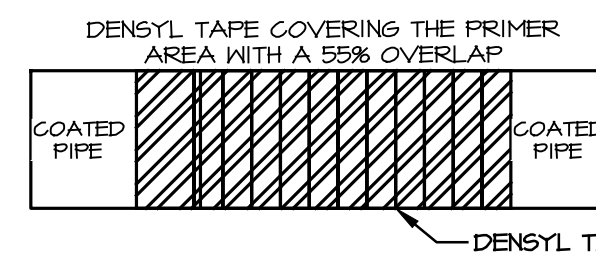
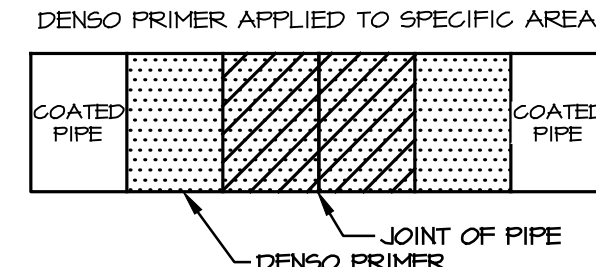
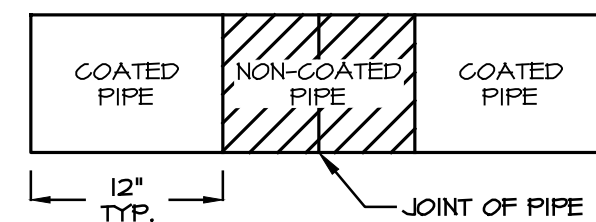
THERMITE WELD DETAIL  
NOT TO SCALE

Material Schedule			
Item #	Quantity	Units	Description
1	1	EA	SERIES 503S116 UTILITY MARKER W/ ESNG GRAPHIC #2622, 3" OD X 72" LENGTH, BISON 11-TERMINAL STAINLESS STEEL TEST STATION AND CAP #CTCUL303B5YEL
2	40	FT	WIRE NO. 8 AWG STRANDED COPPER BLACK, THHN
3	40	FT	WIRE NO. 8 AWG STRANDED COPPER WHITE, THHN
4	4	EA	THERMITE CARTRIDGE NO. 15 GRAM MAX

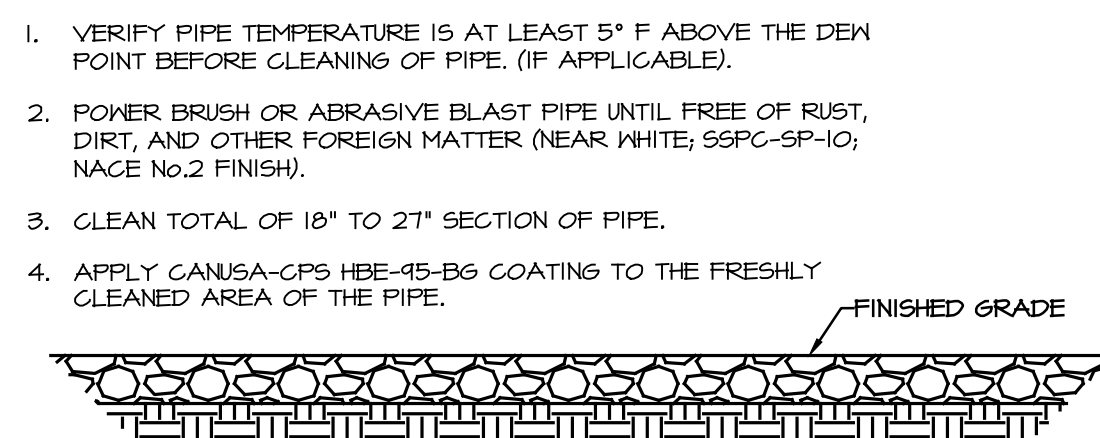
Material Schedule			
Item #	Quantity	Units	Description
1	1	EA	SERIES 503S116 UTILITY MARKER W/ ESNG GRAPHIC #2622, 3" OD X 72" LENGTH, BISON 11-TERMINAL STAINLESS STEEL TEST STATION AND CAP #CTCUL303B5YEL
2	40	FT	WIRE NO. 8 AWG STRANDED COPPER BLACK, THHN
4	2	EA	THERMITE CARTRIDGE NO. 15 MAX, OR PIN BRAZE



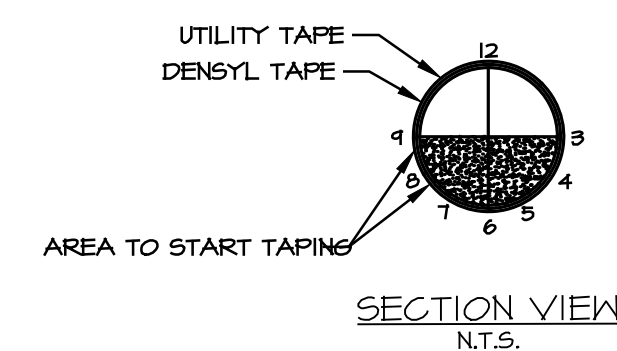
1. BEFORE CLEANING OF PIPE MAKE SURE PIPE TEMPERATURE IS AT LEAST 5° F ABOVE THE DEW POINT. (IF APPLICABLE).
2. POWER BRUSH OR SAND BLAST (NACE No.3 FINISH) PIPE UNTIL FREE OF RUST, DIRT, AND OTHER FOREIGN MATTER.
3. APPLY DENSO PRIMER TO SPECIFIED AREA WHERE THE DENSO DENSYL TAPE WILL BE APPLIED.
4. APPLY DENSO DENSYL TAPE UNTIL THE DENSO PRIMER IS COMPLETELY COVERED BY THE DENSYL TAPE. MAKE SURE TO APPLY THE TAPE WITH A 50% OVERLAP. ALSO MAKE SURE NO PRIMER CAN BE SEEN AFTER APPLYING THE WAX TAPE.
5. APPLY DENSO UTILITY TAPE OVER THE DENSO MAX TAPE. START WRAPPING THE TAPE 4" BEFORE THE MAX TAPE STARTS AND END 4" AFTER IT ENDS.
6. REFER TO DENSO PRODUCT SPECIFICATIONS GUIDE FOR SPECIFICATION & INSTALLATION DETAILS.



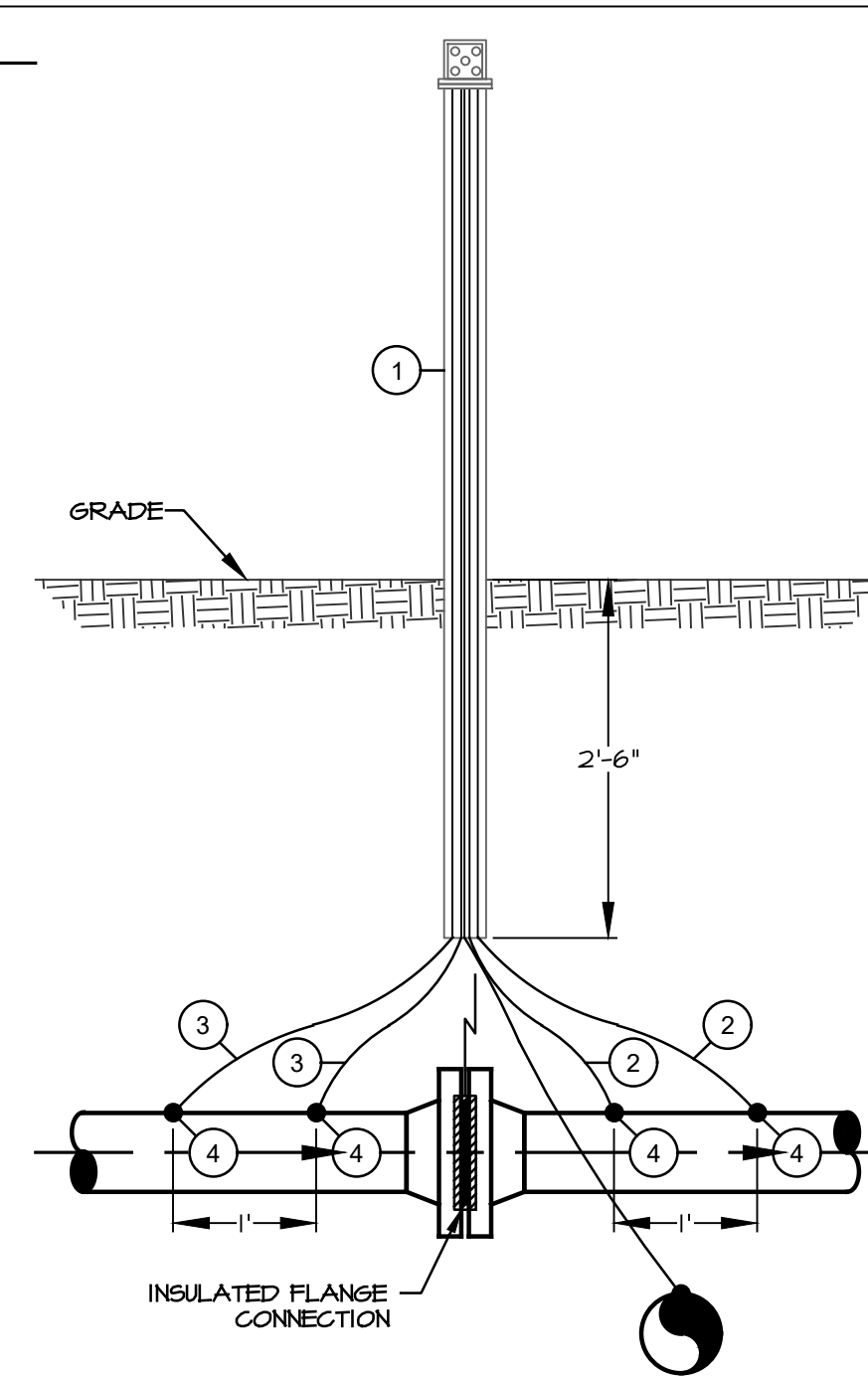
COATING APPLICATION FOR DENSO TAPE COATING  
NOT TO SCALE



COATING APPLICATION FOR HBE-45-B6 OR ESNG APPROVED EQUIVALENT  
NOT TO SCALE

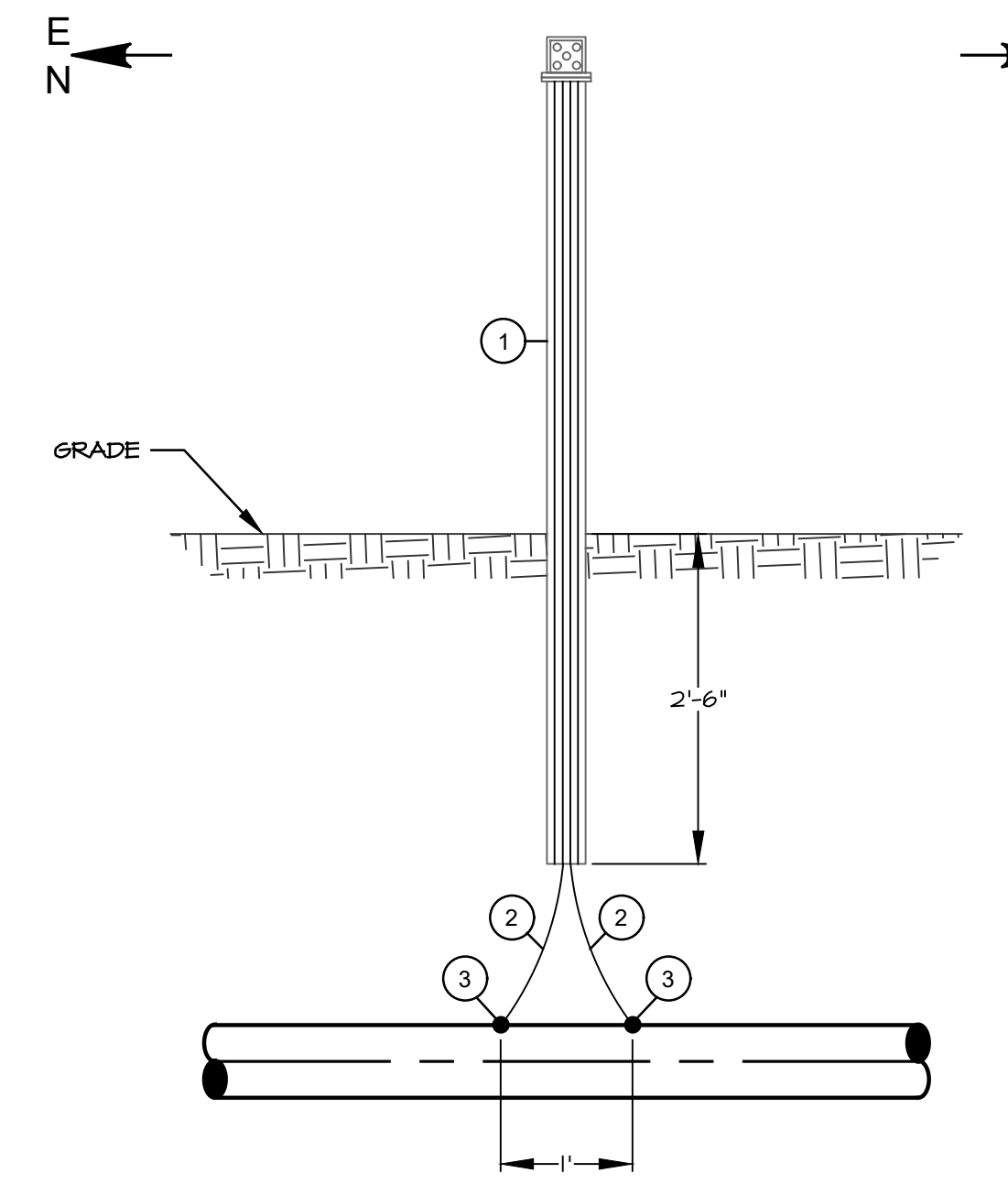


SECTION VIEW  
N.T.S.



TEST STATION TS-03A-1

- NOTES:
- 1) No. 8 AWG STRANDED COPPER WIRES THERMITE WELDED (MAX SIZE NO. 15 CARTRIDGE).
  - 2) 3-PART MAX TAPE OR COMPANY APPROVED EQUIVALENT.
  - 3) ALL TEST WIRES TO EXTEND 2' BEYOND TOP OF TEST BOX.
  - 4) ANY AND ALL CHANGES TO BE APPROVED BY EASTERN SHORE NATURAL GAS.



TEST STATION TS-02A

- NOTES:
- 1) No. 8 AWG STRANDED COPPER WIRES THERMITE WELDED (MAX SIZE NO. 15 CARTRIDGE) OR PIN BRAZED TO STEEL CARRIER PIPE.
  - 2) WELD TO BE COATED WITH 2-PART EPOXY, 3-PART MAX TAPE OR COMPANY APPROVED EQUIVALENT.
  - 3) ALL TEST WIRES TO EXTEND 2' BEYOND TOP OF TEST BOX.
  - 4) WIRES TO BE PLACED AT A NOMINAL DEPTH OF 3' FROM GRADE AND PROTECTED BY 3/4" CONDUIT PROVIDED BY ESNG.

TIE-IN DETAILS

REVISIONS			
NO.	DATE	DESCRIPTION	BY

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**EASTERN SHORE**  
NATURAL GAS  
500 ENERGY LANE, SUITE 200 DOVER, DE 19901  
TELEPHONE (302) 734-6710 - FAX (302) 734-6745

16" PROPOSED PIPELINE  
FELTON LOOP  
KENT COUNTY, DE

ESNG PROJ. CODE:	DATE:	3/8/2024
MRA PROJECT NO:	SCALE:	AS SHOWN
DESIGN/CHECK BY:	JTH/CWB	SHEET: 11 OF 26

PIPING &  
INSTRUMENTATION DETAIL

16" PROPOSED PIPELINE  
FELTON LOOP  
KENT COUNTY, DE

ESNG PROJ. CODE:	DATE:	3/8/2024
MRA PROJECT NO:	SCALE:	AS SHOWN
DESIGN/CHECK BY:	JTH/CWB	SHEET: 12 OF 26



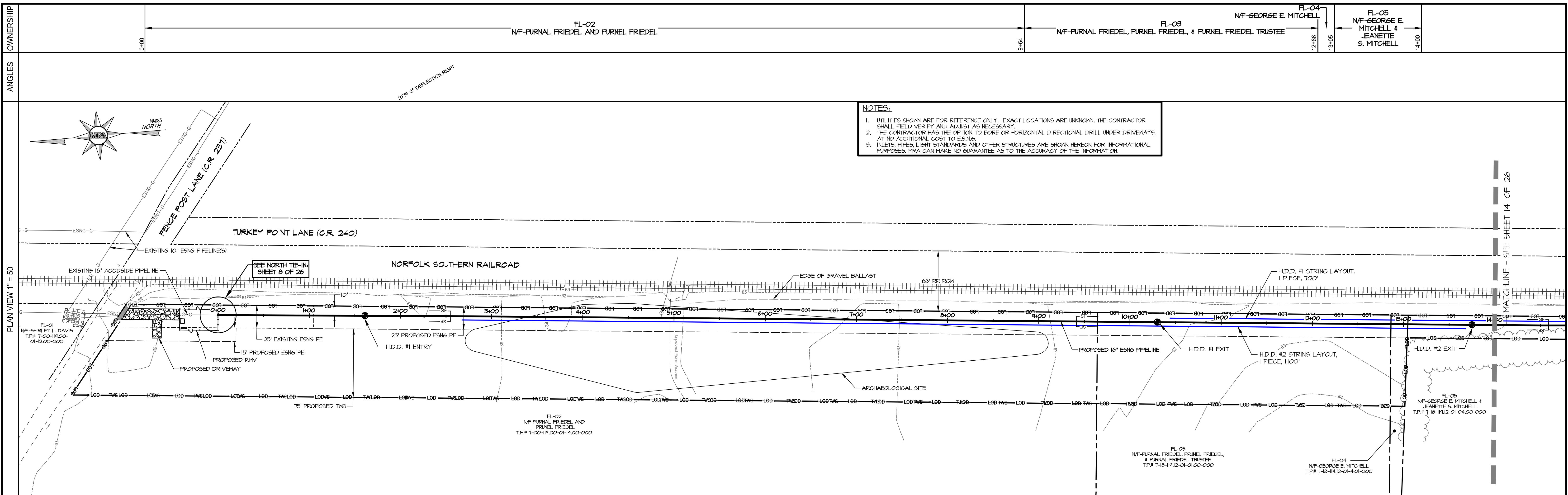
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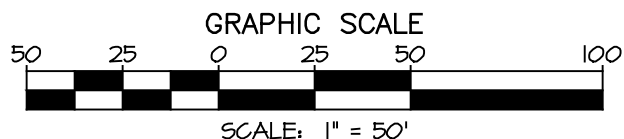
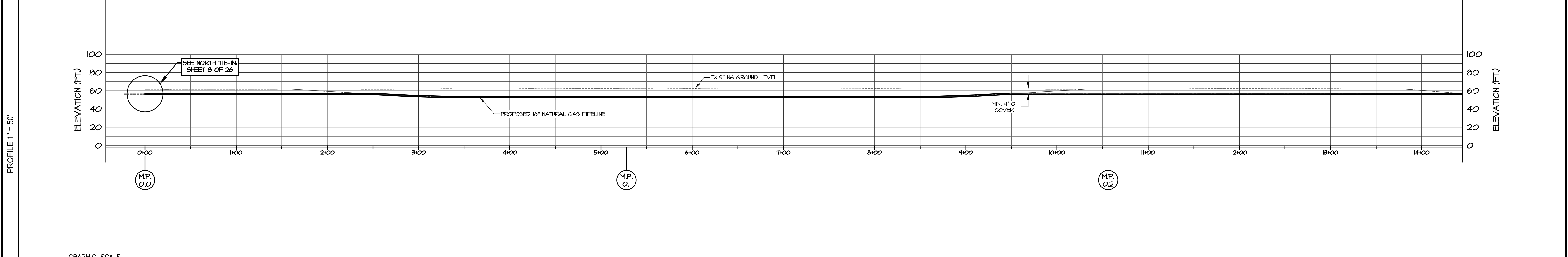
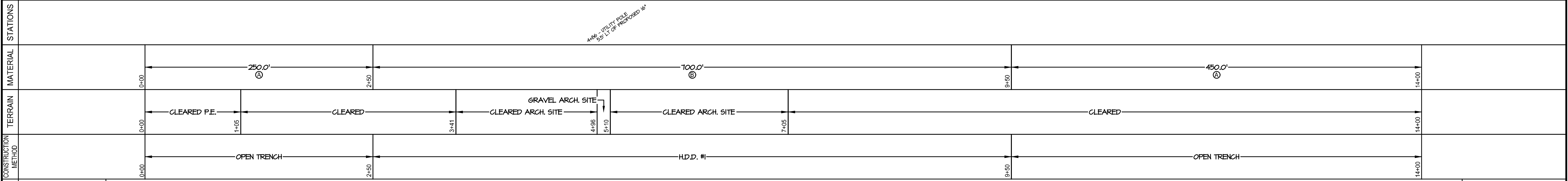
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REVISIONS			
NO.	DATE	DESCRIPTION	BY



**NOTES:**

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- THE CONTRACTOR HAS THE OPTION TO BORE OR HORIZONTAL DIRECTIONAL DRILL UNDER DRIVEWAYS, AT NO ADDITIONAL COST TO E.S.N.G.
- INLETS, PIPES, LIGHT STANDARDS AND OTHER STRUCTURES ARE SHOWN HEREON FOR INFORMATIONAL PURPOSES. MRA CAN MAKE NO GUARANTEE AS TO THE ACCURACY OF THE INFORMATION.



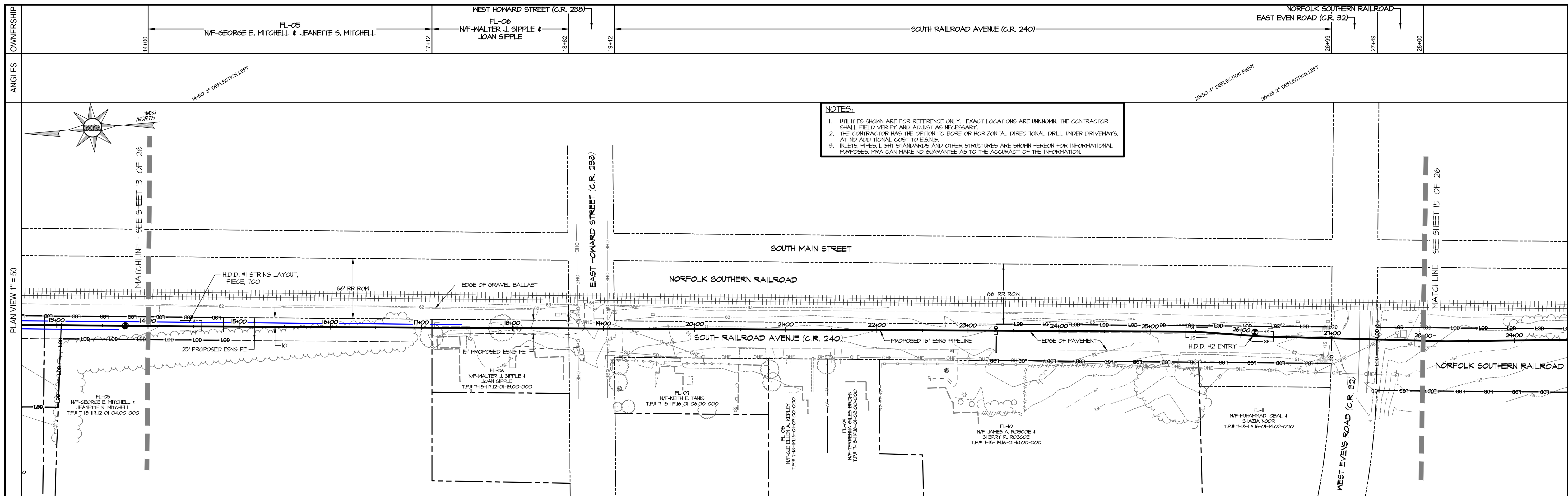
**PLAN & PROFILE**

MATERIAL SPECIFICATIONS				TEST LEAD/STATIONS				REFERENCE DRAWINGS		REVISIONS	
ITEM	DESCRIPTION	QTY	ITEM	DESCRIPTION	QTY	STATION	TYPE	DESCRIPTION	DRAWING NUMBER	NO.	DATE
A	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE	700'									
B	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL POWERCORTE	700'									
C	ELBOW, 16" x 0.312" X-60 3R, 90° BEND	N/A									
D	ELBOW, 16" x 0.312" X-60 3R, 45° BEND SEGMENTABLE	N/A									

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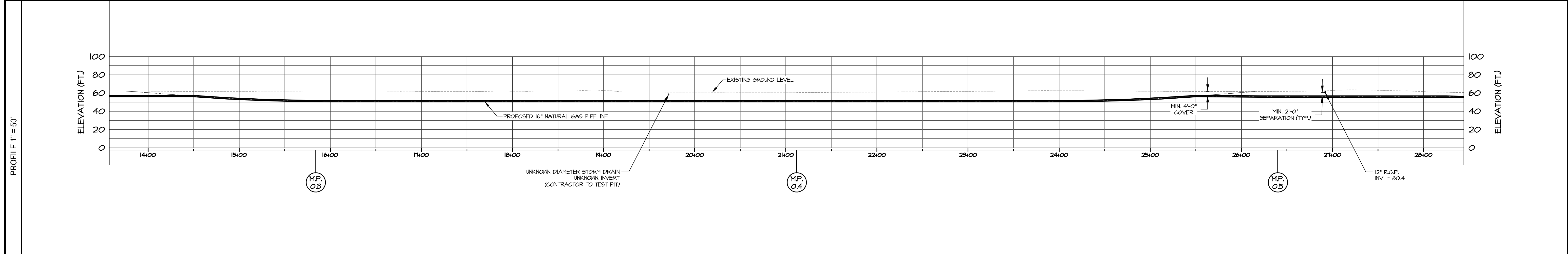
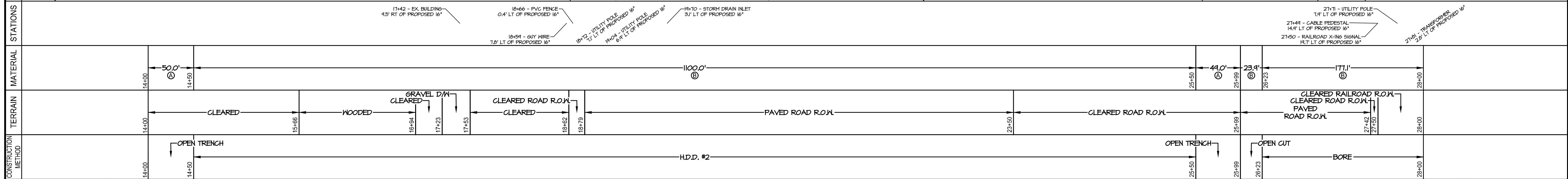
**EASTERN SHORE**  
 NATURAL GAS  
 500 ENERGY LANE, SUITE 200 DOVER, DE 19901  
 TELEPHONE (302) 734-6710 - FAX (302) 734-6745

16" PROPOSED PIPELINE FELTON LOOP KENT COUNTY, DE	
ESNG PROJECT CODE:	DATE: 3/8/2024
MRA PROJECT NO: 22257	SCALE: 1" = 50'
DESIGN/CHECK BY: JTH/CWB	SHEET: 13 OF 26



**NOTES:**

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**PLAN & PROFILE**

MATERIAL SPECIFICATIONS			
ITEM	DESCRIPTION	QTY	ITEM
A	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE	99'	
B	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE, 40 MIL POWERCORE	1301'	
C	ELBOW, 16" x 0.312" X-60 3R, 90° BEND	N/A	
D	ELBOW, 16" x 0.312" X-60 3R, 45° BEND SEGMENTABLE	N/A	

TEST LEAD/STATIONS			
STATION	TYPE	STATION	TYPE

REFERENCE DRAWINGS		
DESCRIPTION	DRAWING NUMBER	NO. DATE

REVISIONS	
DESCRIPTION	BY

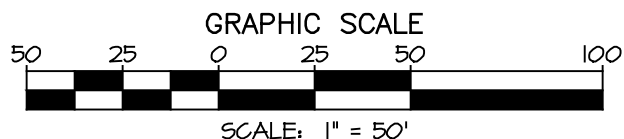
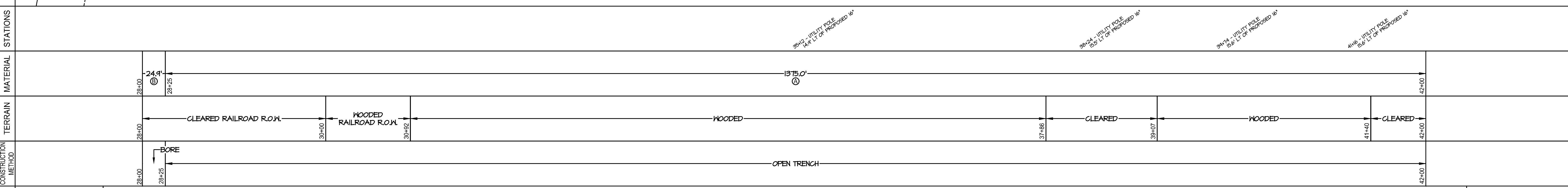
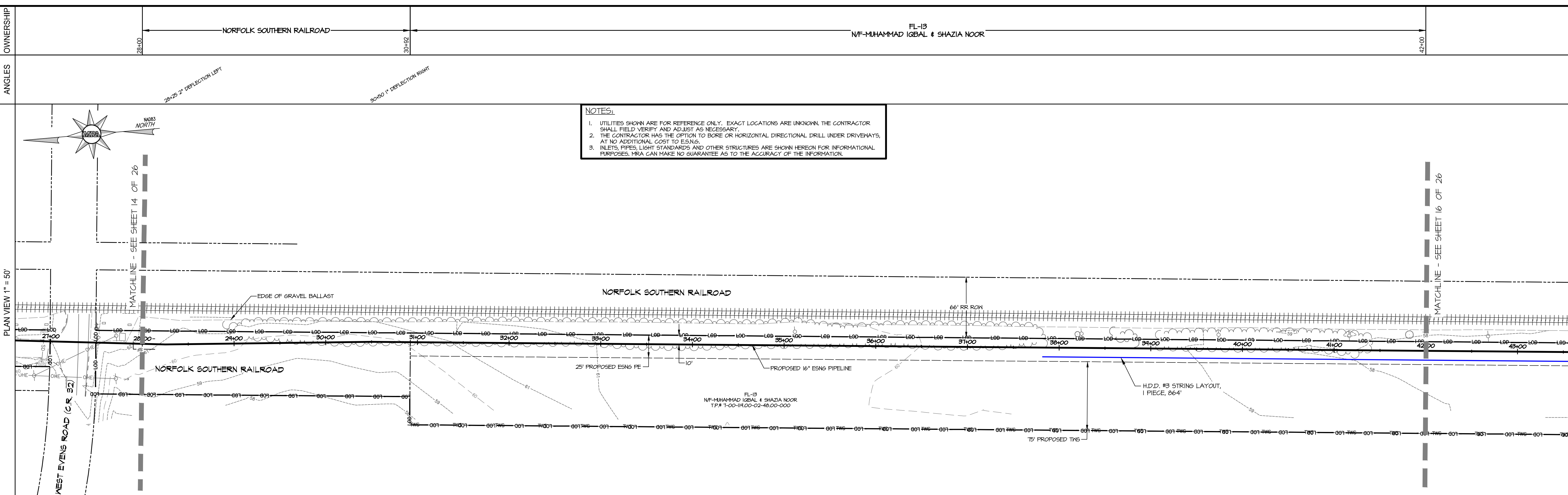
**MRA**  
**MORRIS & RITCHIE ASSOCIATES, INC.**  
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**EASTERN SHORE**  
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<b>16" PROPOSED PIPELINE</b>	
<b>FELTON LOOP</b>	
<b>KENT COUNTY, DE</b>	
ESNG PROJECT CODE:	DATE: 3/8/2024
MRA PROJECT NO: 22257	SCALE: 1" = 50'
DESIGN/CHECK BY: JTH/CWB	SHEET: 14 OF 26

**NOTES:**

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- INLETS, PIPES, LIGHT STANDARDS AND OTHER STRUCTURES ARE SHOWN HEREON FOR INFORMATIONAL PURPOSES. MRA CAN MAKE NO GUARANTEE AS TO THE ACCURACY OF THE INFORMATION.



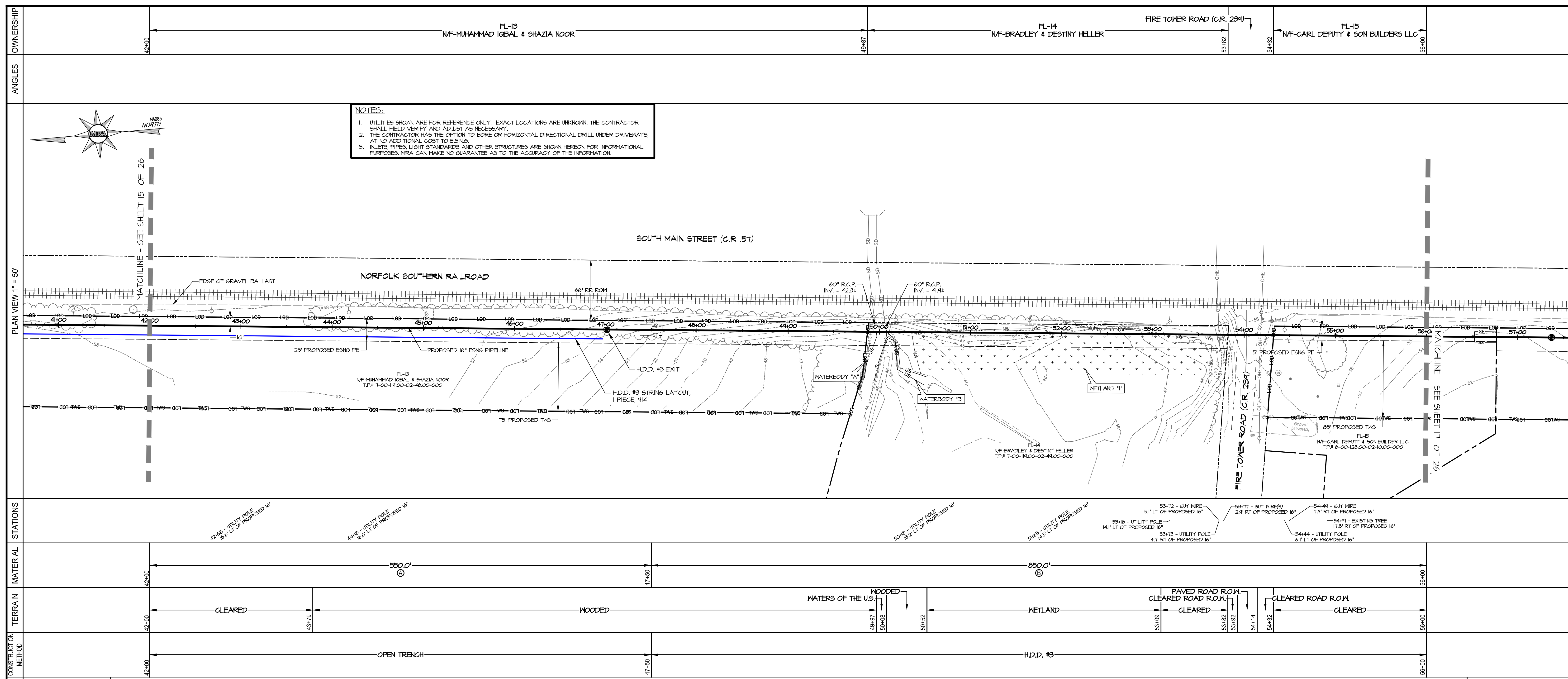
**PLAN & PROFILE**

MATERIAL SPECIFICATIONS				TEST LEAD/STATIONS				REFERENCE DRAWINGS		REVISIONS	
ITEM	DESCRIPTION	QTY.	ITEM	DESCRIPTION	QTY.	STATION	TYPE	STATION	TYPE	DESCRIPTION	BY
A	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE	1375'									
B	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE, 40 MIL POWERCOATE	25'									
C	ELBOW, 16" x 0.312" X-60 3R, 90° BEND	N/A									
D	ELBOW, 16" x 0.312" X-60 3R, 45° BEND SEGMENTABLE	N/A									

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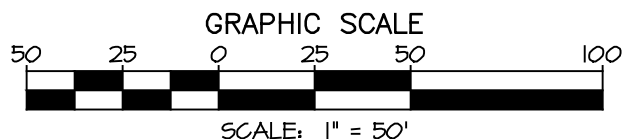
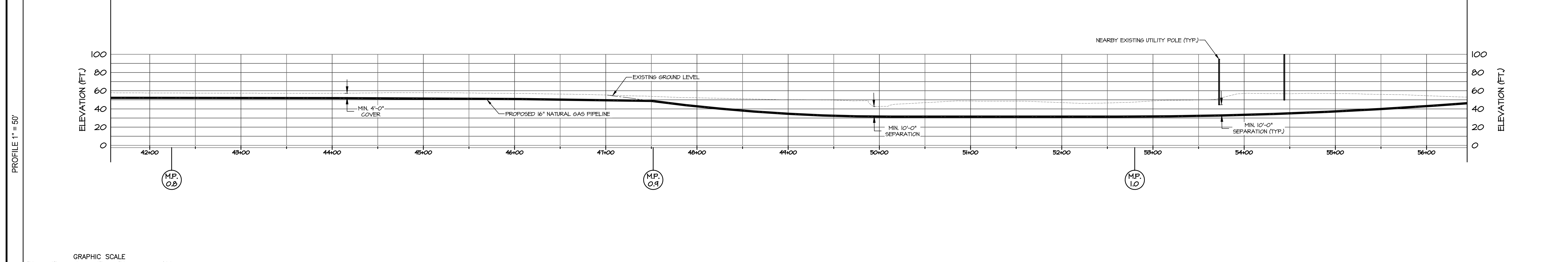
**EASTERN SHORE**  
 NATURAL GAS  
 500 ENERGY LANE, SUITE 200 DOVER, DE 19901  
 TELEPHONE (302) 734-6710 - FAX (302) 734-6745

<b>16" PROPOSED PIPELINE</b>		<b>FELTON LOOP</b>		<b>KENT COUNTY, DE</b>	
ESNG PROJECT CODE:	22257	DATE:	3/8/2024	SCALE:	1" = 50'
MRA PROJECT NO:	22257	DESIGN/CHECK BY:	JTH/CWB	SHEET:	15 OF 26



**NOTES:**

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- THE CONTRACTOR HAS THE OPTION TO BORE OR HORIZONTAL DIRECTIONAL DRILL UNDER DRIVEWAYS, AT NO ADDITIONAL COST TO E.S.N.G.
- INLETS, PIPES, LIGHT STANDARDS AND OTHER STRUCTURES ARE SHOWN HEREON FOR INFORMATIONAL PURPOSES. MRA CAN MAKE NO GUARANTEE AS TO THE ACCURACY OF THE INFORMATION.



PLAN & PROFILE

MATERIAL SPECIFICATIONS				TEST LEAD/STATIONS				REFERENCE DRAWINGS		REVISIONS	
ITEM	DESCRIPTION	QTY	UNIT	STATION	TYPE	STATION	TYPE	DESCRIPTION	DRAWING NUMBER	NO.	DATE
A	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE	600'									
B	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE, 40 MIL POWERCORETE	800'									
C	ELBOW, 16" x 0.312" Y-60 3R, 90° BEND	N/A									
D	ELBOW, 16" x 0.312" Y-60 3R, 45° BEND SEGMENTABLE	N/A									



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FAX: (302) 326-2399  
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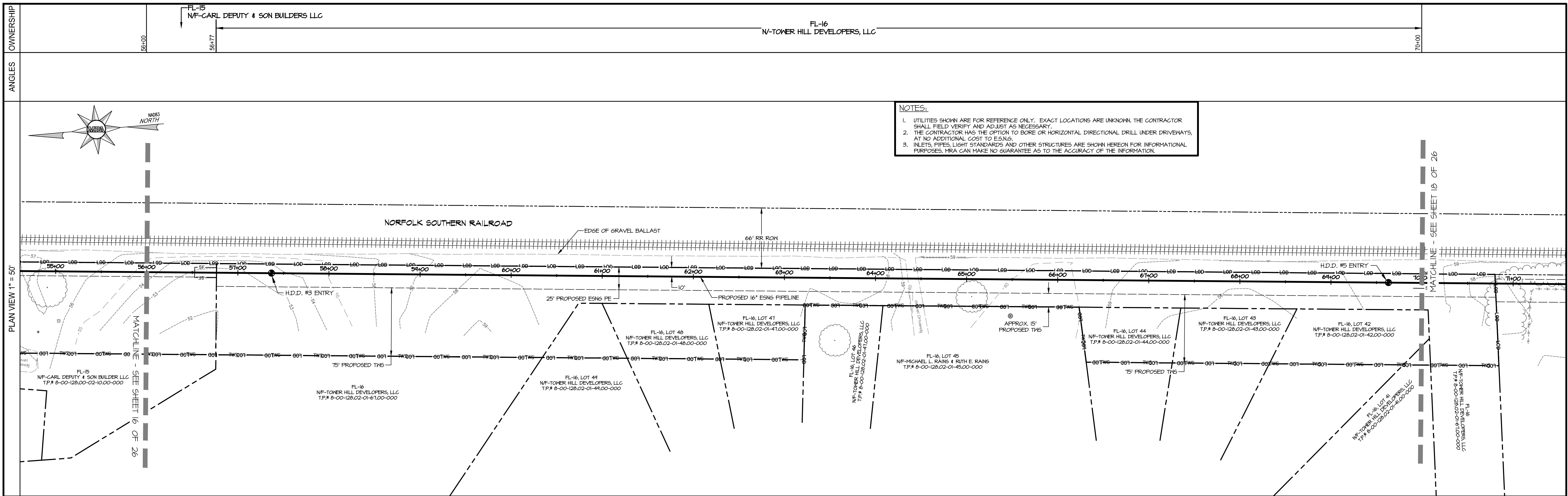


**EASTERN SHORE**  
NATURAL GAS  
500 ENERGY LANE, SUITE 200 DOVER, DE 19901  
TELEPHONE (302) 734-6710 - FAX (302) 734-6745

**16" PROPOSED PIPELINE**  
FELTON LOOP  
KENT COUNTY, DE

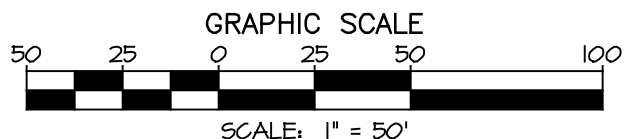
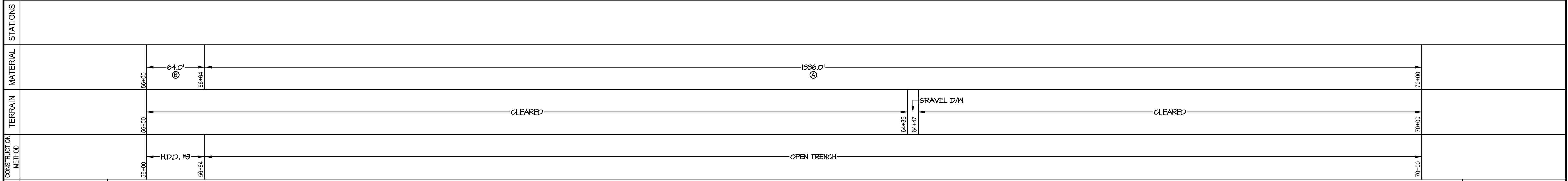
ESNG PROJECT CODE:	DATE:
MRA PROJECT NO: 22257	SCALE: 1" = 50'
DESIGN/CHECK BY: JTH/CWB	SHEET: 16 OF 26





**NOTES:**

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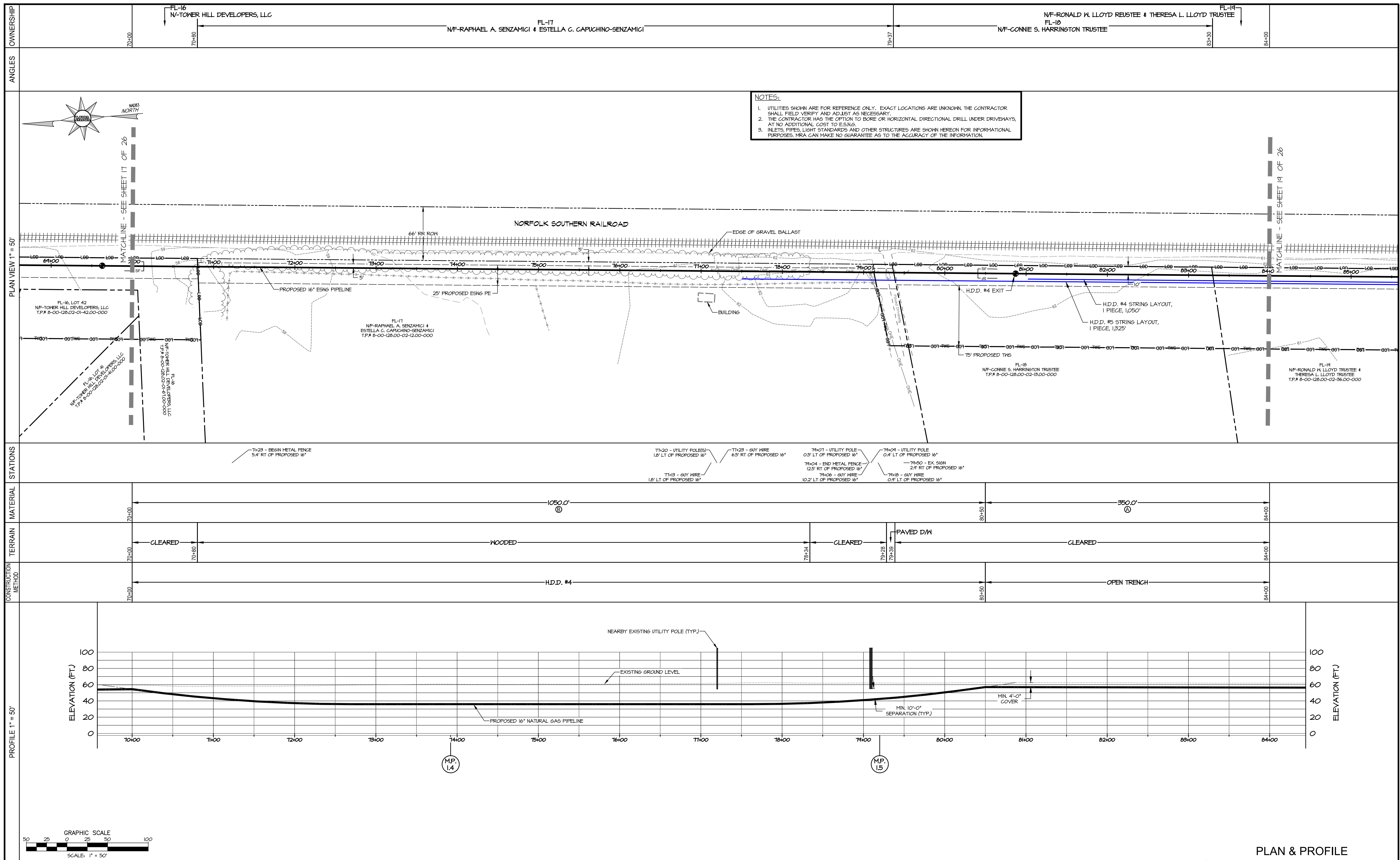
**PLAN & PROFILE**

MATERIAL SPECIFICATIONS				TEST LEAD/STATIONS				REFERENCE DRAWINGS		REVISIONS	
ITEM	DESCRIPTION	QTY	ITEM	DESCRIPTION	QTY	STATION	TYPE	STATION	TYPE	DESCRIPTION	BY
A	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE	1336'									
B	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE, 40 MIL POWERCOATE	64'									
C	ELBOW, 16" x 0.312" Y-60 3R, 90° BEND	N/A									
D	ELBOW, 16" x 0.312" Y-60 3R, 45° BEND SEGMENTABLE	N/A									

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<b>16" PROPOSED PIPELINE</b>		<b>FELTON LOOP</b>		<b>KENT COUNTY, DE</b>	
ESNG PROJECT CODE:	DATE:	22257	3/8/2024	SCALE:	1" = 50'
MRA PROJECT NO:	DESIGN/CHECK BY:	JTH/CWB	SHEET:	17	OF 26



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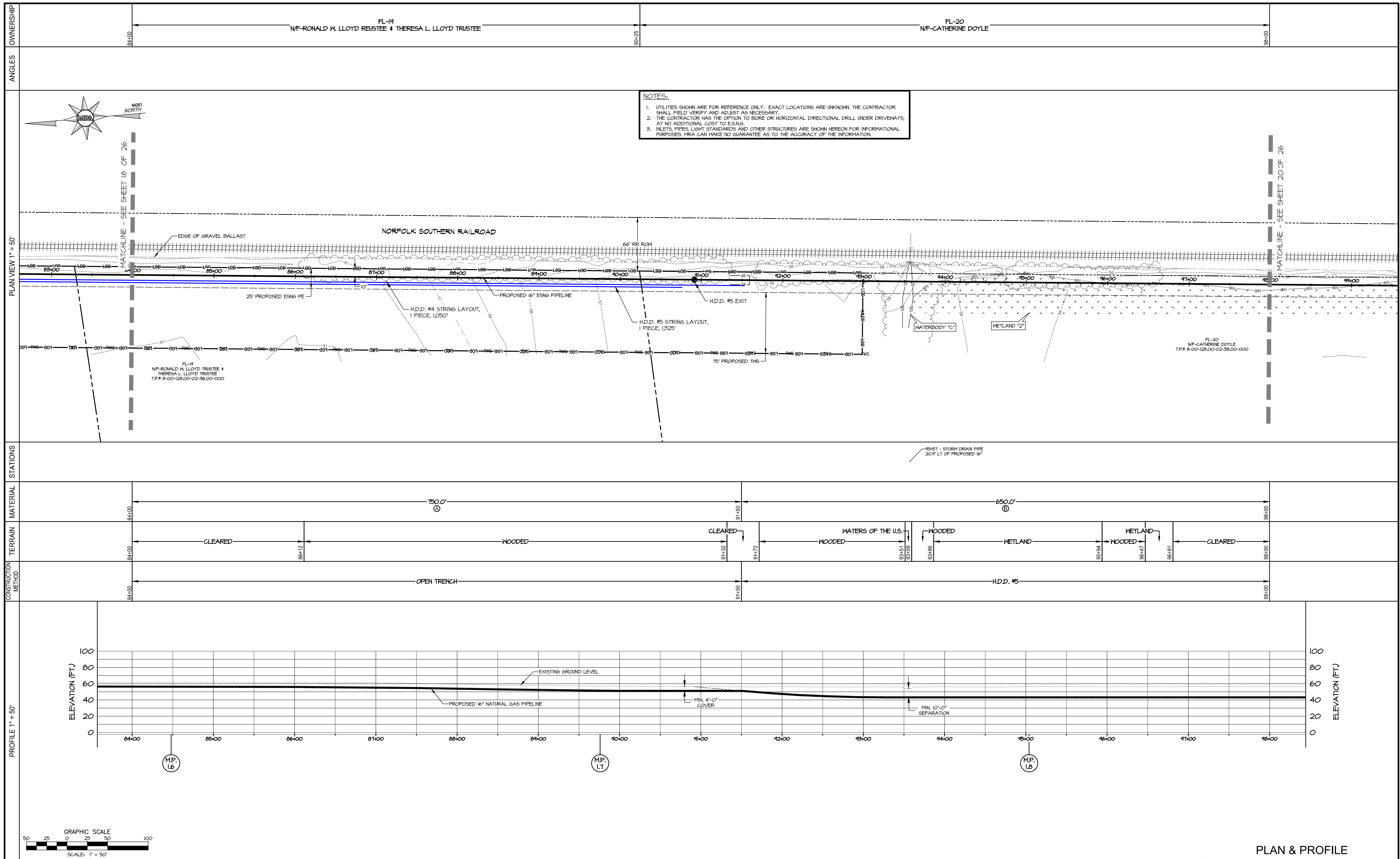
**PLAN & PROFILE**

MATERIAL SPECIFICATIONS				TEST LEAD/STATIONS				REFERENCE DRAWINGS		REVISIONS			
ITEM	DESCRIPTION	QTY	ITEM	DESCRIPTION	QTY	STATION	TYPE	DESCRIPTION	DRAWING NUMBER	NO.	DATE	DESCRIPTION	BY
A	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE	350'											
B	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL POWERCORETE	1050'											
C	ELBOW, 16" x 0.312" X-60 3R, 90° BEND	N/A											
D	ELBOW, 16" x 0.312" X-60 3R, 45° BEND SEGMENTABLE	N/A											

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<b>16" PROPOSED PIPELINE</b>		<b>FELTON LOOP</b>		<b>KENT COUNTY, DE</b>	
ESNG PROJECT CODE:	22257	DATE:	3/8/2024	SCALE:	1" = 50'
DESIGN/CHECK BY:	JTH/CWB	SHEET:	18 OF 26		



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**PLAN & PROFILE**

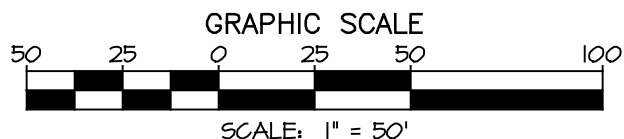
**16" PROPOSED PIPELINE  
FELTON LOOP  
KENT COUNTY, DE**

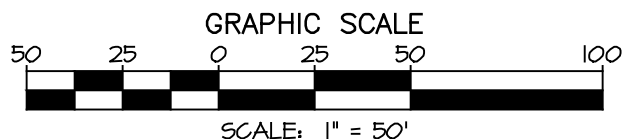
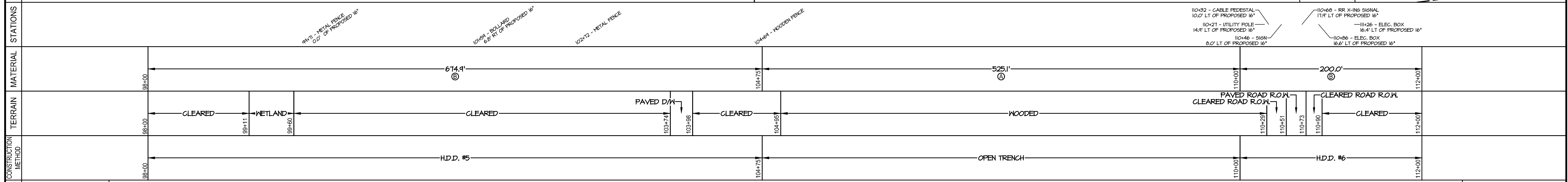
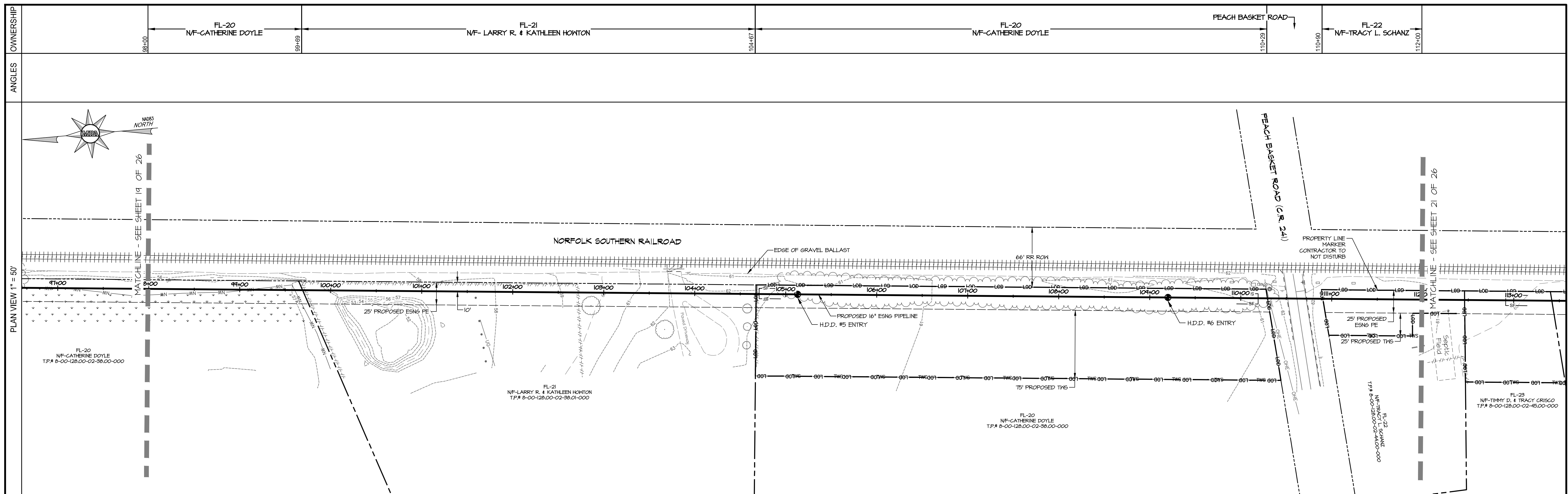
MATERIAL SPECIFICATIONS				TEST LEAD/STATIONS				REFERENCE DRAWINGS		REVISIONS	
ITEM	DESCRIPTION	QTY.	ITEM	DESCRIPTION	QTY.	STATION	TYPE	DESCRIPTION	DRAWING NUMBER	NO.	DATE
A	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE										
B	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE, 40 MIL POWDERCOATE										
C	ELBOW, 16" x 0.312" X-60 3R, 90° BEND										
D	ELBOW, 16" x 0.312" X-60 3R, 45° BEND SEGMENTABLE										

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ESNG PROJECT CODE:	DATE:
MRA PROJECT NO: 22257	SCALE: 1" = 50'
DESIGN/CHECK BY: JTH/CWB	SHEET: 19 OF 26





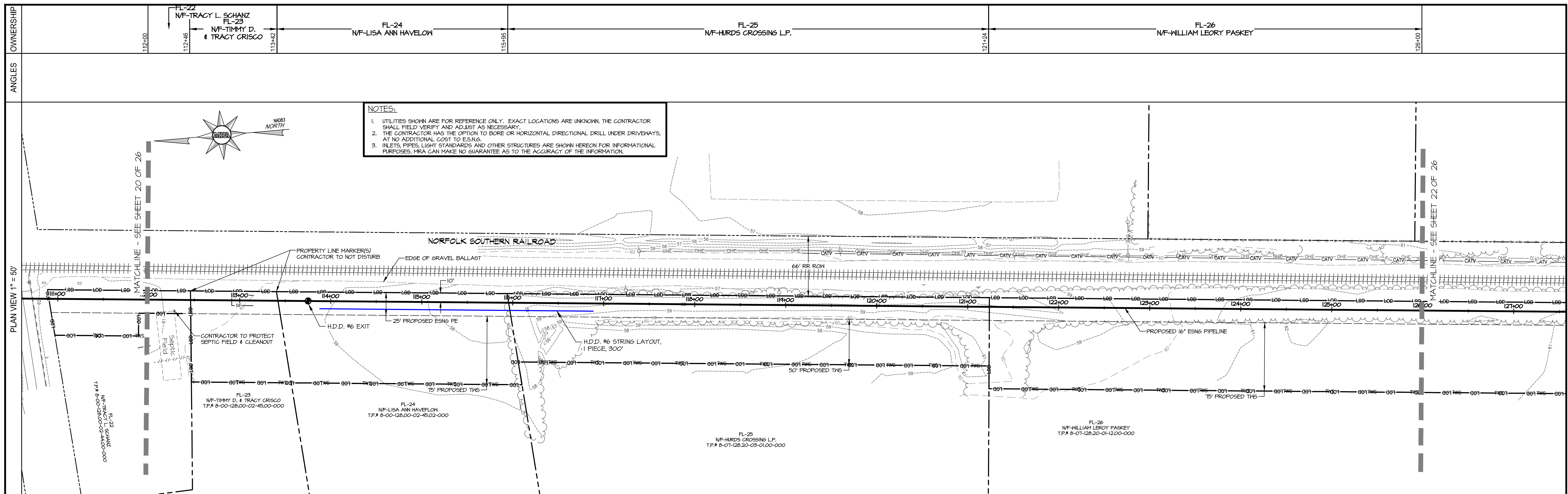
PLAN & PROFILE

MATERIAL SPECIFICATIONS				TEST LEAD/STATIONS				REFERENCE DRAWINGS		REVISIONS			
ITEM	DESCRIPTION	QTY	ITEM	DESCRIPTION	QTY	STATION	TYPE	DESCRIPTION	DRAWING NUMBER	NO.	DATE	DESCRIPTION	BY
A	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE	525'											
B	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE, 40 MIL POWERCOATE	875'											
C	ELBOW, 16" x 0.312" Y-60 3R, 90° BEND	N/A											
D	ELBOW, 16" x 0.312" Y-60 3R, 45° BEND SEGMENTABLE	N/A											

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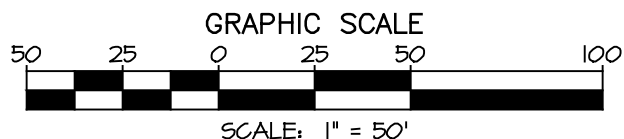
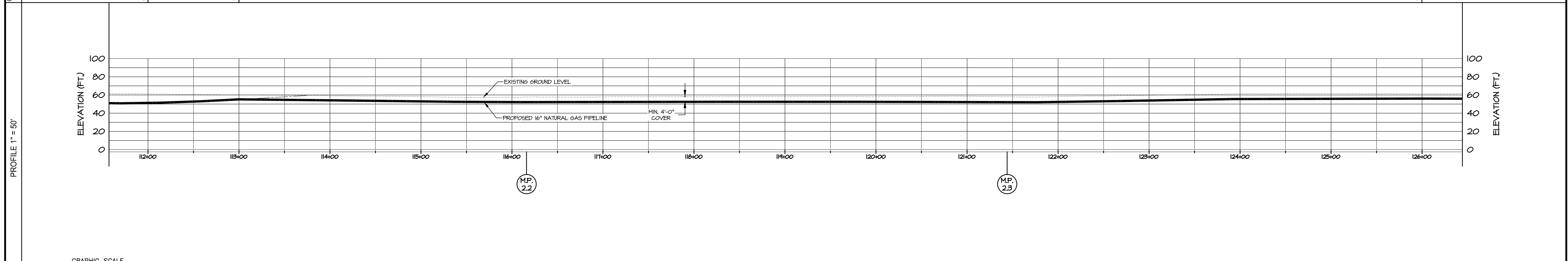
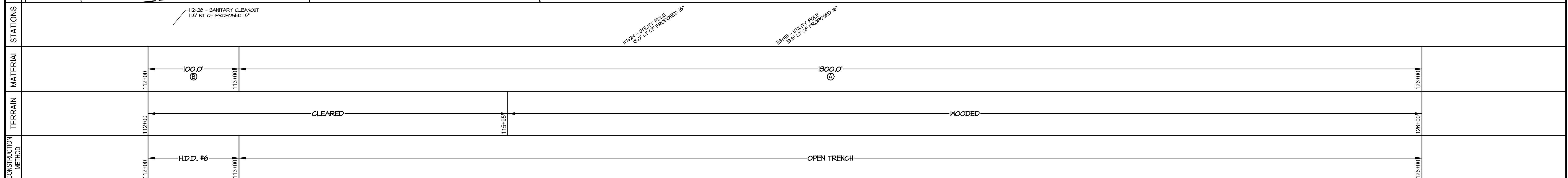
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16" PROPOSED PIPELINE FELTON LOOP KENT COUNTY, DE	
ESNG PROJECT CODE:	DATE: 3/8/2024
MRA PROJECT NO: 22257	SCALE: 1" = 50'
DESIGN/CHECK BY: JTH/CWB	SHEET: 20 OF 26



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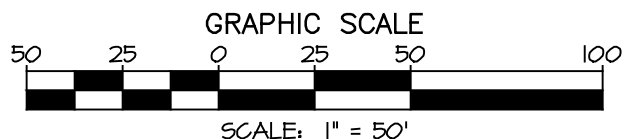
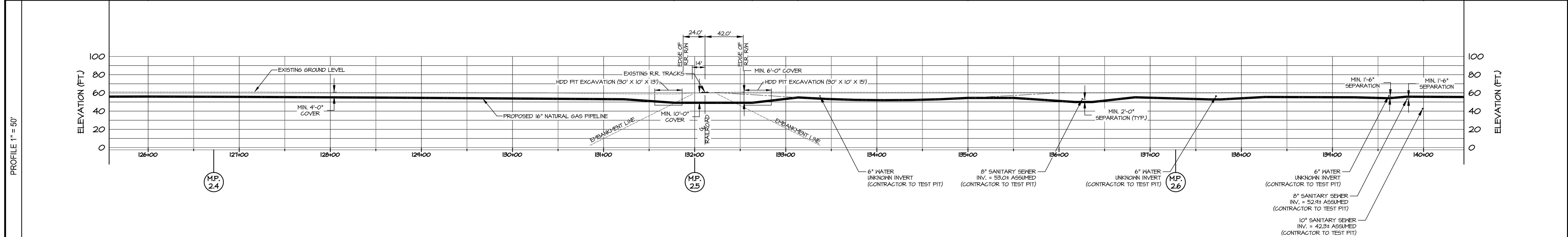
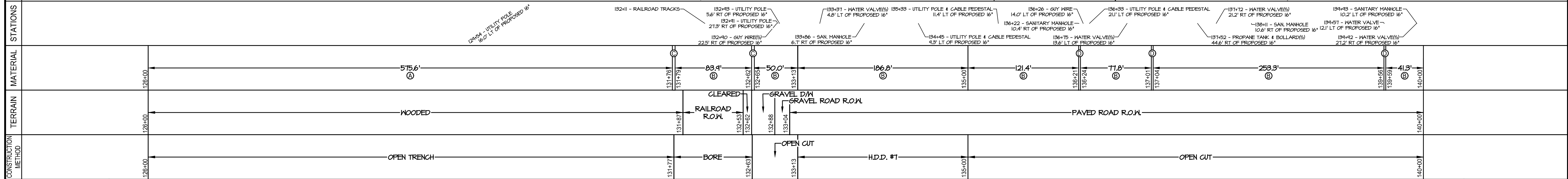
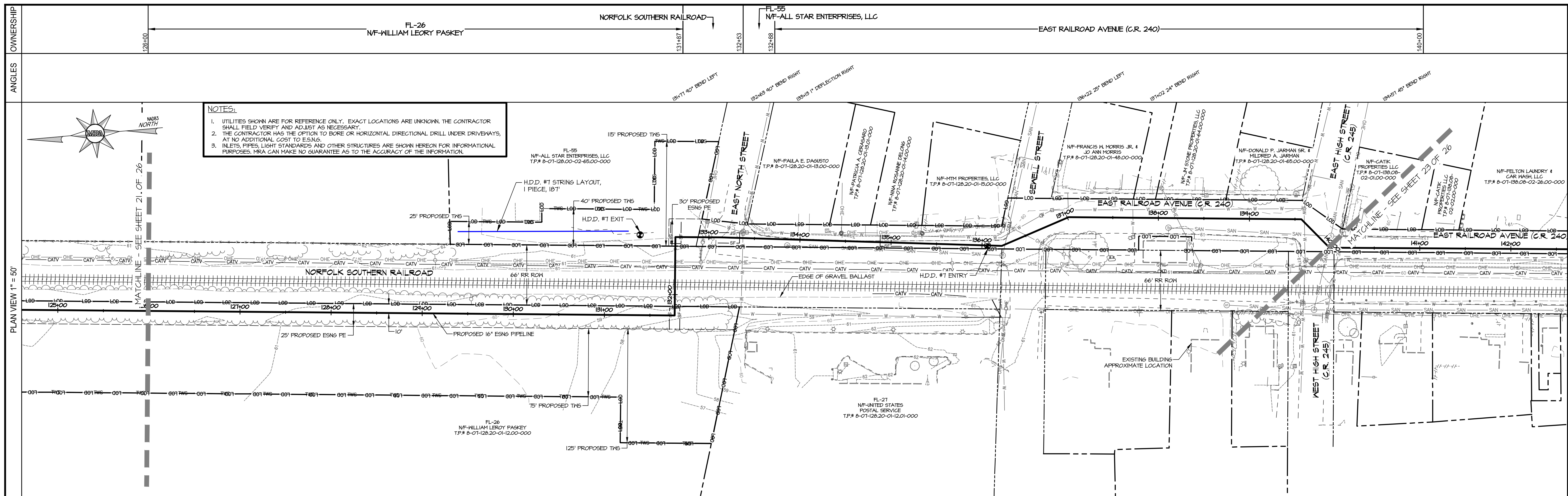
**PLAN & PROFILE**

MATERIAL SPECIFICATIONS				TEST LEAD/STATIONS				REFERENCE DRAWINGS		REVISIONS	
ITEM	DESCRIPTION	QTY	ITEM	DESCRIPTION	QTY	STATION	TYPE	DESCRIPTION	DRAWING NUMBER	NO.	DATE
A	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE	1300'									
B	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE, 40 MIL POWDERCOATE	100'									
C	ELBOW, 16" x 0.312" Y-60 3R, 90° BEND	N/A									
D	ELBOW, 16" x 0.312" Y-60 3R, 45° BEND SEGMENTABLE	N/A									

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<b>16" PROPOSED PIPELINE</b>		<b>FELTON LOOP</b>		<b>KENT COUNTY, DE</b>	
ESNG PROJECT CODE:	22257	DATE:	3/8/2024	SCALE:	1" = 50'
MRA PROJECT NO:	22257	DESIGN/CHECK BY:	JTH/CWB	SHEET:	21 OF 26



PLAN & PROFILE

MATERIAL SPECIFICATIONS		
ITEM	DESCRIPTION	QTY.
A	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE	576'
B	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL POWERCOATE	812'
C	ELBOW, 16" x 0.312" Y-60 3R, 90° BEND	2
D	ELBOW, 16" x 0.312" Y-60 3R, 45° BEND SEGMENTABLE	3

TEST LEAD/STATIONS			
STATION	TYPE	STATION	TYPE
126+00		126+00	
127+00		127+00	
128+00		128+00	
129+00		129+00	
130+00		130+00	
131+00		131+00	
132+00		132+00	
133+00		133+00	
134+00		134+00	
135+00		135+00	
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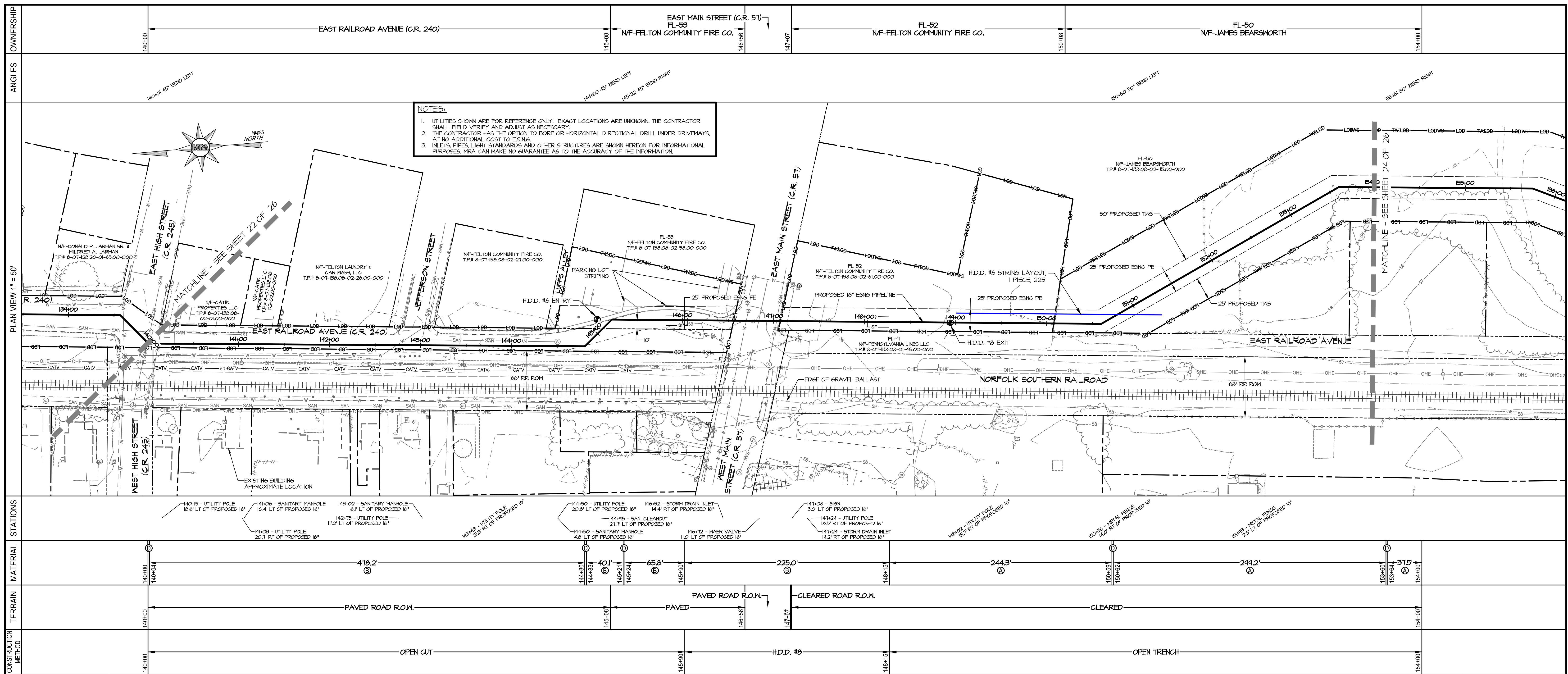
REFERENCE DRAWINGS			
DESCRIPTION	DRAWING NUMBER	NO.	DATE

REVISIONS	
DESCRIPTION	BY

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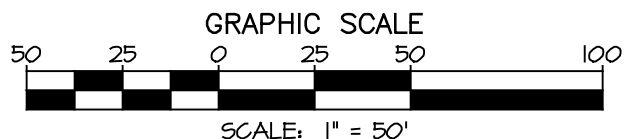
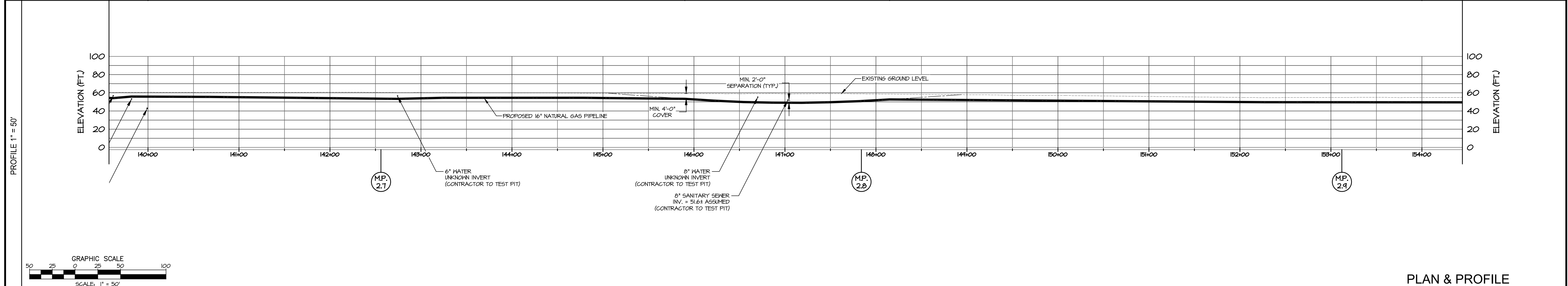
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16" PROPOSED PIPELINE FELTON LOOP KENT COUNTY, DE	
ESNG PROJECT CODE:	DATE: 3/8/2024
MRA PROJECT NO: 22257	SCALE: 1" = 50'
DESIGN/CHECK BY: JTH/CWB	SHEET: 22 OF 26



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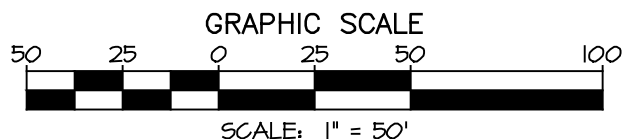
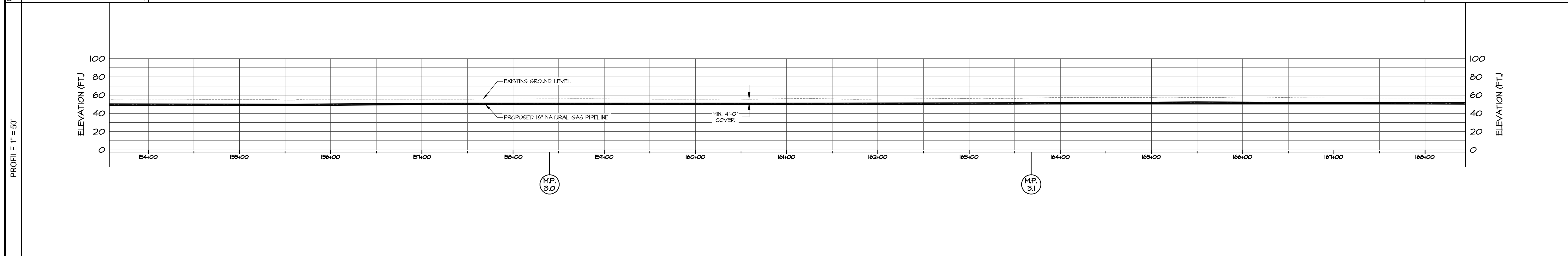
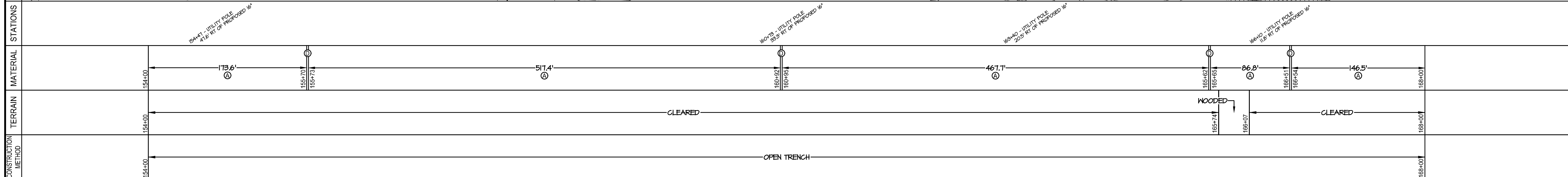
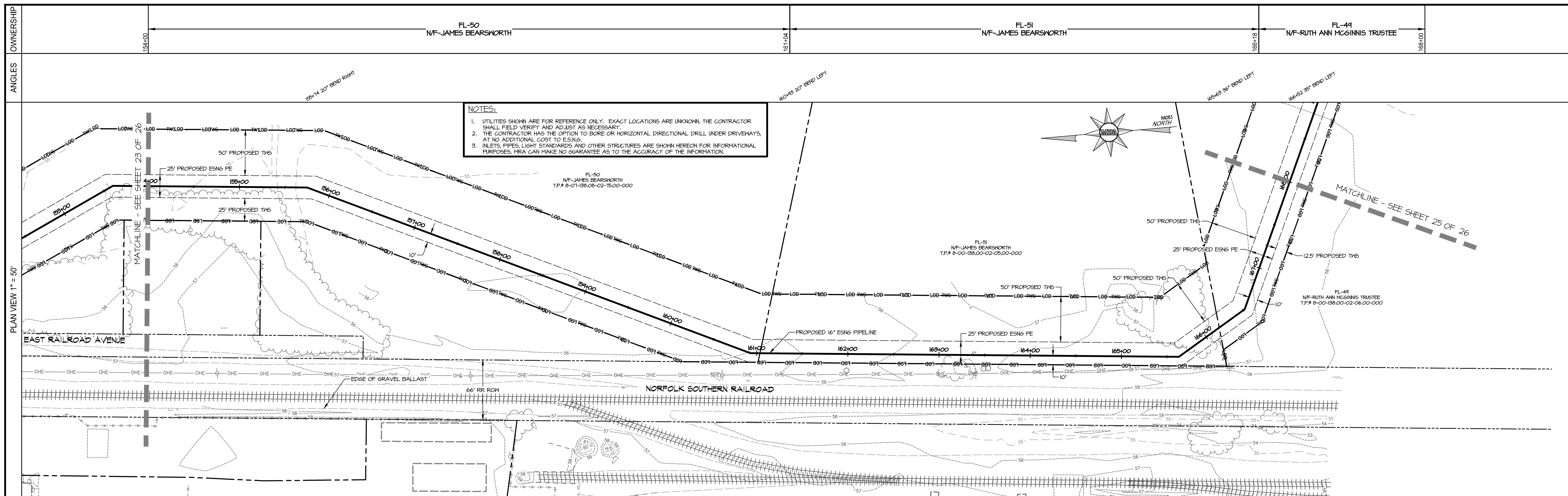
MATERIAL SPECIFICATIONS				TEST LEAD/STATIONS				REFERENCE DRAWINGS			REVISIONS		
ITEM	DESCRIPTION	QTY	UNIT	STATION	TYPE	STATION	TYPE	DESCRIPTION	DRAWING NUMBER	NO.	DATE	DESCRIPTION	BY
A	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE	581'											
B	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE, 40 MIL POWERCORETE	809'											
C	ELBOW, 16" x 0.312" Y-60 3R, 90° BEND	N/A											
D	ELBOW, 16" x 0.312" Y-60 3R, 45° BEND SEGMENTABLE	5											

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**16" PROPOSED PIPELINE  
 FELTON LOOP  
 KENT COUNTY, DE**

ESNG PROJECT CODE:	DATE:	3/8/2024
MRA PROJECT NO:	SCALE:	1" = 50'
DESIGN/CHECK BY:	JTH/CWB	SHEET: 23 OF 26



PLAN & PROFILE

MATERIAL SPECIFICATIONS				TEST LEAD/STATIONS				REFERENCE DRAWINGS		REVISIONS	
ITEM	DESCRIPTION	QTY	ITEM	DESCRIPTION	QTY	STATION	TYPE	DESCRIPTION	DRAWING NUMBER	NO.	DATE
A	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE	1392'									
B	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL POWERCORETE	N/A									
C	ELBOW, 16" x 0.312" Y-60 3R, 90° BEND	N/A									
D	ELBOW, 16" x 0.312" Y-60 3R, 45° BEND SEGMENTABLE	4									

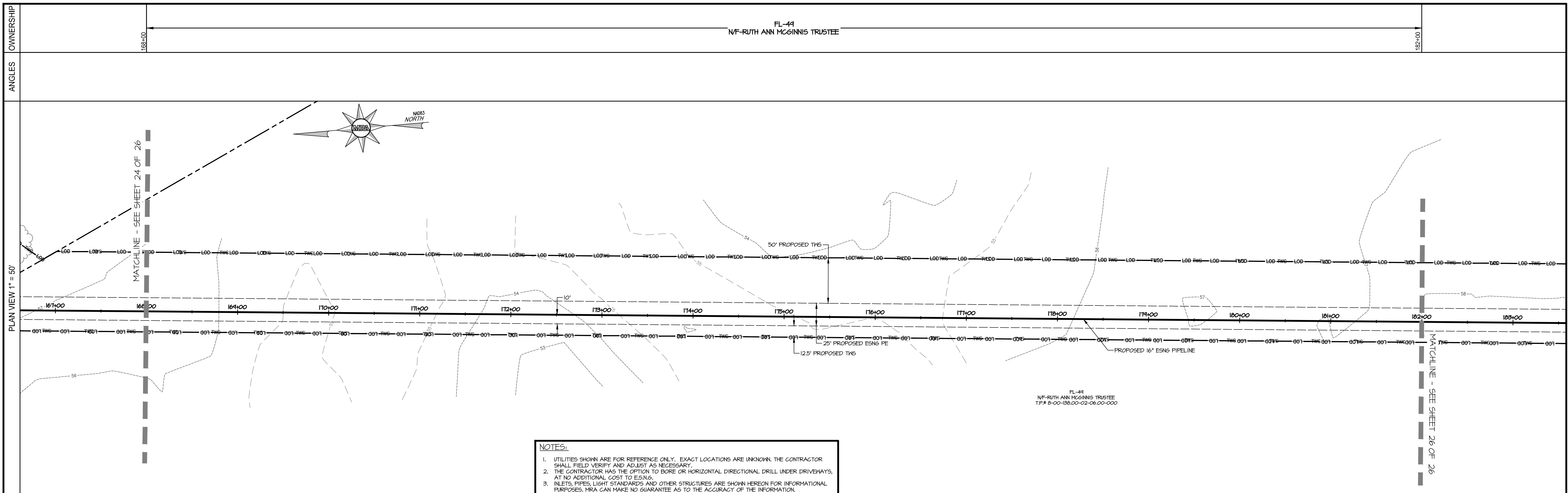
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16" PROPOSED PIPELINE  
 FELTON LOOP  
 KENT COUNTY, DE

ESNG PROJECT CODE:	DATE:
MRA PROJECT NO: 22257	SCALE: 1" = 50'
DESIGN/CHECK BY: JTH/CWB	SHEET: 24 OF 26

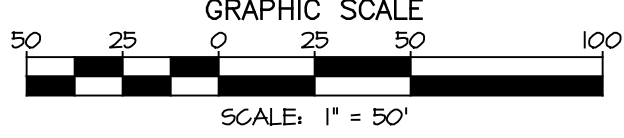
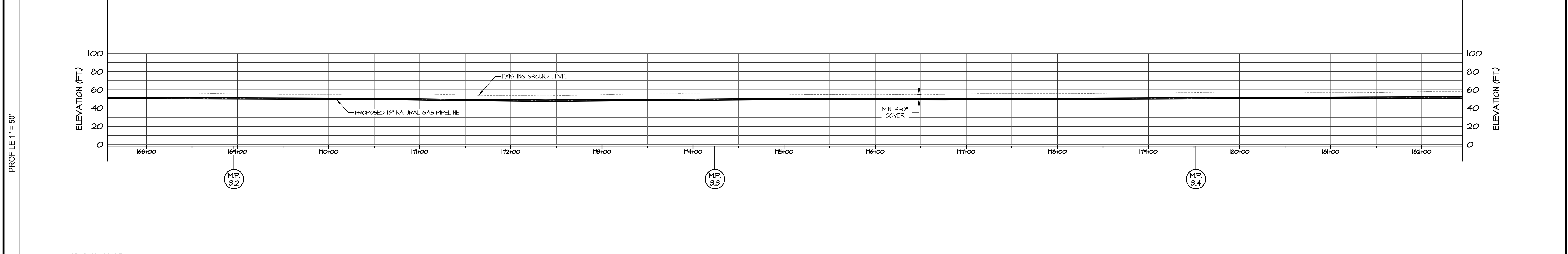




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STATIONS	MATERIAL	TERRAIN	CONSTRUCTION METHOD
168+00	1400.0' (A)	CLEARED	OPEN TRENCH
182+25.1			



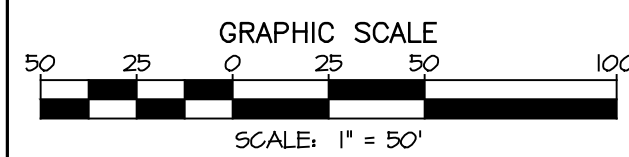
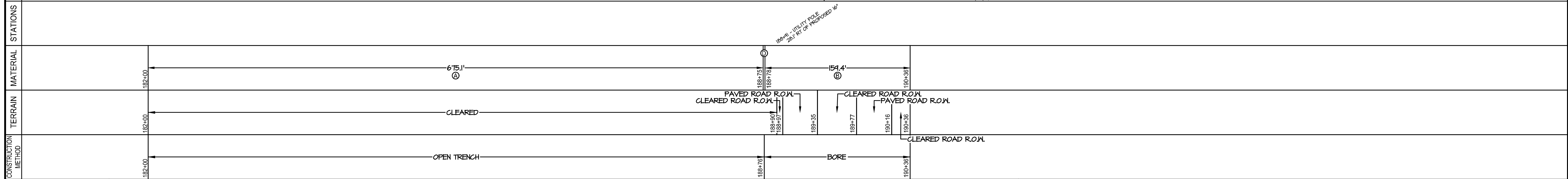
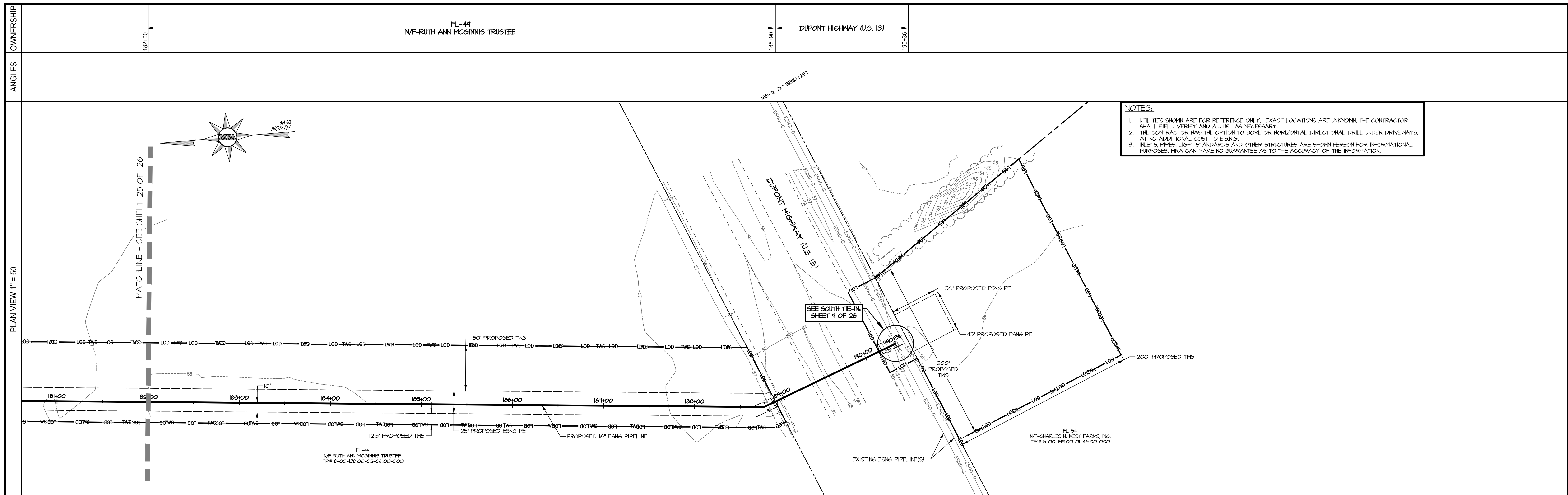
**PLAN & PROFILE**

MATERIAL SPECIFICATIONS				TEST LEAD/STATIONS				REFERENCE DRAWINGS		REVISIONS	
ITEM	DESCRIPTION	QTY.	ITEM	DESCRIPTION	QTY.	STATION	TYPE	DESCRIPTION	DRAWING NUMBER	NO.	DATE
A	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE	1400'									
B	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE, 40 MIL POWERCOATE	N/A									
C	ELBOW, 16" x 0.312" Y-60 3R, 90° BEND	N/A									
D	ELBOW, 16" x 0.312" Y-60 3R, 45° BEND SEGMENTABLE	N/A									

**MRA**  
**MORRIS & RITCHIE ASSOCIATES, INC.**  
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS  
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 (302) 326-2200  
 FAX: (302) 326-2399  
 MRA@TA.COM  
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**EASTERN SHORE**  
 NATURAL GAS  
 500 ENERGY LANE, SUITE 200 DOVER, DE 19901  
 TELEPHONE (302) 734-6710 - FAX (302) 734-6745

<b>16" PROPOSED PIPELINE</b>	
FELTON LOOP	
KENT COUNTY, DE	
ESNG PROJECT CODE:	DATE: 3/8/2024
MRA PROJECT NO: 22257	SCALE: 1" = 50'
DESIGN/CHECK BY: JTH/CWB	SHEET: 25 OF 26



PLAN & PROFILE

MATERIAL SPECIFICATIONS				TEST LEAD/STATIONS				REFERENCE DRAWINGS		REVISIONS		MRA		EASTERN SHORE NATURAL GAS		16" PROPOSED PIPELINE FELTON LOOP KENT COUNTY, DE	
ITEM	DESCRIPTION	QTY	ITEM	DESCRIPTION	QTY	STATION	TYPE	STATION	TYPE	DESCRIPTION	DRAWING NUMBER	NO.	DATE	DESCRIPTION	BY	ESNG PROJECT CODE:	DATE:
A	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE	675'														22257	3/8/2024
B	PIPE, 16" x 0.312" X-60 W/ 14-16 MIL FBE, 40 MIL POWERCOATE	160'															SCALE: 1" = 50'
C	ELBOW, 16" x 0.312" Y-60 3R, 90° BEND	N/A															
D	ELBOW, 16" x 0.312" Y-60 3R, 45° BEND SEGMENTABLE	1															SHEET: 26 OF 26

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