GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND
ENVIRONMENTAL CONSULTANTS

A Practicing Geoprofessional Business Association Member Firm

August 28, 2025

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
Route 40 Replacement project
New Castle 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 natural gas connector line and rupture mitigation valve installation, filed as part of Federal Energy Regulatory Commission's (FERC) Annual Certificate Report (Form No. 537) under Section 157.208 – Construction, Acquisition, Operation, Replacement & Miscellaneous Rearrangement of Facilities.

Ground disturbance will take place to replace piping and valves, construct fence and install stone within the fenced areas. No direct impact to wetlands or waterbodies are proposed. 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. *Route 40 Replacement 30% Plans,* Prepared by Morris & Ritchie Associates, Inc.

The proposed project site is an approximately 800 foot pipeline installation route located along Route 40 in the Glasgow area of New Castle County, Delaware.

GTA is confident that the enclosed information for the ESNG Route 40 Replacement project 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.

Sincerely,
GEO-TECHNOLOGY ASSOCIATES, INC.

Joshua Riding
Senior Project Scientist

T. Andy Stansfield, Jr.
Vice President

KJS/JSR/MAJ
23289
L:\Shared\Project Files\2025\23289 - Route 40 Replacement Project\WET\Reports - Permitting\CZM\23289 CZM Cover Letter.doc

Completed Coastal Zone Management Act Federal Consistency Form

Delaware Department of Natural Resources and Environmental Control
Delaware Coastal Management Program

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:	Route 40 Replacement Project

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

Contact Name/Title: Nicholas Hammond

Federal Agency Contractor Name (if applicable): _____

Federal Agency: Federal Energy Regulatory Commission
(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: 500 Energy Lane, Suite 200

City: Dover State: DE Zip Code: 19901

E-mail: nhammond@chpk.com Telephone #: 302-593-1929

II. Federal Consistency Category:

- ○ Federal Activity or Development Project (15 C.F.R. Part 930, Subpart C)
- ○ Outer Continental Shelf Activity (15 C.F.R. Part 930, Subpart E)
- ○ Federal Financial Assistance (15 C.F.R. Part 930, Subpart F)
- ◉ Federal License or Permit Activity (15 C.F.R. Part 930, Subpart D)
- ○ Federal License or Permit Activity which occurs wholly in another state (interstate consistency activities identified in DCMP's Policy document)

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

The applicant, Eastern Shore Natural Gas, is proposing to replace a natural gas connector line. Ground disturbance will take place to replace existing piping and valves. The proposed project location is along Pulaski Highway (DE Route 40) near the People's Plaza in the Glasgow area of New Castle County, Delaware.

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

The proposed work will have minimal or no effect on coastal resources, as outlined below in accordance with policies from Delaware Coastal Management Program, Comprehensive Update and Routine Program Implementation (CURPI), dated November 2018, and published by the Delaware Department of Natural Resources and Environmental Control (DNREC).

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

Policy 5.1: Wetlands Management

Impacts to nontidal wetlands or waterways are not anticipated, wetlands or waterbodies were not observed within the review area.

Policy 5.2: Beach Management

This project does not propose to impact public or private beaches.

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

Impacts to nontidal wetlands or waterways are not anticipated. Construction of the proposed facilities will be performed in accordance with approved grading, sediment, erosion control, and stormwater plans to protect adjacent waterbodies from sediment.

Policy 5.4: Subaqueous Land and Coastal Strip Management

The project is not located within the Coastal Strip. The proposed activities will be performed in accordance with applicable grading, sediment, erosion control, and stormwater BMPs.

Policy 5.5: Public Lands Management

No public lands will be impacted by the project.

Policy 5.6: Natural Lands Management

The proposed project does not disturb nature preserves. The project is located within the Christiana River Watershed. The proposed activities will be performed in accordance with applicable grading, sediment, erosion control, and stormwater BMPs.

Policy 5.7: Flood Hazard Areas Management

No portions of the proposed project are located within the Federal Emergency Management Agency (FEMA) 100-year floodplain, per FEMA Flood Insurance Rate Map (FIRM) number 10003C0225L effective January 22 2020.

Policy 5.8: Port of Wilmington

The proposed project is not located near the port of Wilmington.

Policy 5.9: Woodlands and Agricultural Lands Management

The proposed project is located in rights-of-way and other previously disturbed, maintained areas, and would therefore not significantly impact woodlands.

Policy 5.10: Historic and Cultural Areas Management

Since the proposed project is primary located within previously disturbed areas, impacts to historic or cultural resources are not anticipated.

Policy 5.11: Living Resources

GTA contacted the United States Fish and Wildlife Service (USFWS) inquiring about the possible presence of threatened or endangered species within the project area. The USFWS Official Species List listed the proposed endangered Tricolored Bat and proposed threatened Monarch Butterfly. Based on the proposed project, a determination of no effect was issued for both species and consistency letters were generated. GTA also contacted the Delaware Department of Natural Resources & Environmental Control's (DNREC) Division of Fish & Wildlife (DFW) inquiring about the possible presence of rare, threatened, or endangered species within the project area. Per the DNREC response letter, "A review of our database indicates that there are currently no records of state-rare or federally- listed plants, animals or natural communities at this project site."

Policy 5.12 Mineral Resources Management

The proposed project does not propose the extraction and/or production of minerals. Furthermore, the project should not create significant air, water, or other pollution; should not significantly impact marine life or wildlife; and should not significantly or permanently impact State lands with drainage of oil, gas, or other minerals or objectionable substances.

Policy 5.13: State Owned Coastal Recreation and Conservation

The proposed project does not propose to impact state-owned lands whose natural condition or present state of use would maintain important recreational areas and wildlife habitat, or would maintain or enhance the conservation of natural, cultural, or historic resources.

Policy 5.14: Public Trust Doctrine

The public has a right of navigation and fishery on all streams where the tide ebbs and flows. This project does not propose to impact navigation or access to tidal waterways within the State of Delaware.

Policy 5.15: Energy Facilities

The proposed project does not propose heavy industry uses of any kind; offshore gas and liquid or solid bulk product transfer facilities; the construction of new petroleum refineries; the construction of offshore deepwater ports, production, or exploration facilities; the construction of off-shore pipelines; the construction of outer continental shelf energy facilities; storage tanks connected to outer continental shelf facilities; or construction of a nuclear power plant.

Policy 5.16: Public Investment

The proposed project does not involve the use of State or other public funds.

Policy 5.17: Recreation and Tourism

The proposed project is not directly related to recreation and tourism.

Policy 5.18: National Defense and Aerospace Facilities

The proposed project is not a national defense or aerospace facility.

Policy 5.19: Transportation Facilities

The proposed project is not applicable to the expansion and development of the Port of Wilmington; activities involving the transfer of petroleum products; the construction, maintenance, and improvement of transportation systems; transportation alternatives to private motor vehicles and highways; railroad networks; public transit systems; or new or expanded port facilities.

Policy 5.20: Air Quality Management

Negligible air emissions will be associated with the operation of the project. Potential air quality impacts will be temporary and associated with the construction phase of the project. As proposed, the project will not require State or Federal air permits.

Policy 5.21: Water Supply Management

The proposed project will not require the construction of groundwater wells, or underground injections of material. Surface or groundwater withdraws are not anticipated, but if required for the construction of the project, will be appropriately permitted.

Policy 5.22: Waste Disposal Management

The proposed project does not propose to generate wastewater on-site, collect or treat wastes on-site, generate or dispose of solid wastes on-site, or generate or store hazardous wastes on-site. Cleanup of hazardous substances is not applicable to the proposed project. The project does not propose to utilize underground storage tanks (USTs), and no known USTs are located within the project area.

Policy 5.23: Development

The proposed project is not a community development project, commercial strip development project, major commercial development project, highway oriented development project, industrial site development or redevelopment project, a future site for a marine terminal, or a future site for a bulk transfer facility. The proposed project consists of a buried natural gas main, with the majority of the work proposed within existing rights-of-way, and previously disturbed/maintained areas.

Policy 5.24: Pollution Prevention

Disposal of solid waste is not anticipated for this project. If generated, the generation of waste will be reduced or eliminated as expeditiously as possible, and waste that is generated will be recovered, reused, recycled, treated, or disposed of in a manner that minimizes present or future threats to human health or the environment. Furthermore, it is understood that industries are encouraged to utilize the DNREC Pollution Prevention Program's services, including non-regulatory technical assistance and information, to ensure that the potential for degradation of the quality of air, land, and water is minimal.

Policy 5.25: Coastal Management Coordination

The proposed project is not being proposed by a State Agency that is required to coordinate coastal management.

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:	Nicholas Hammond	Date:	8/29/2025

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.

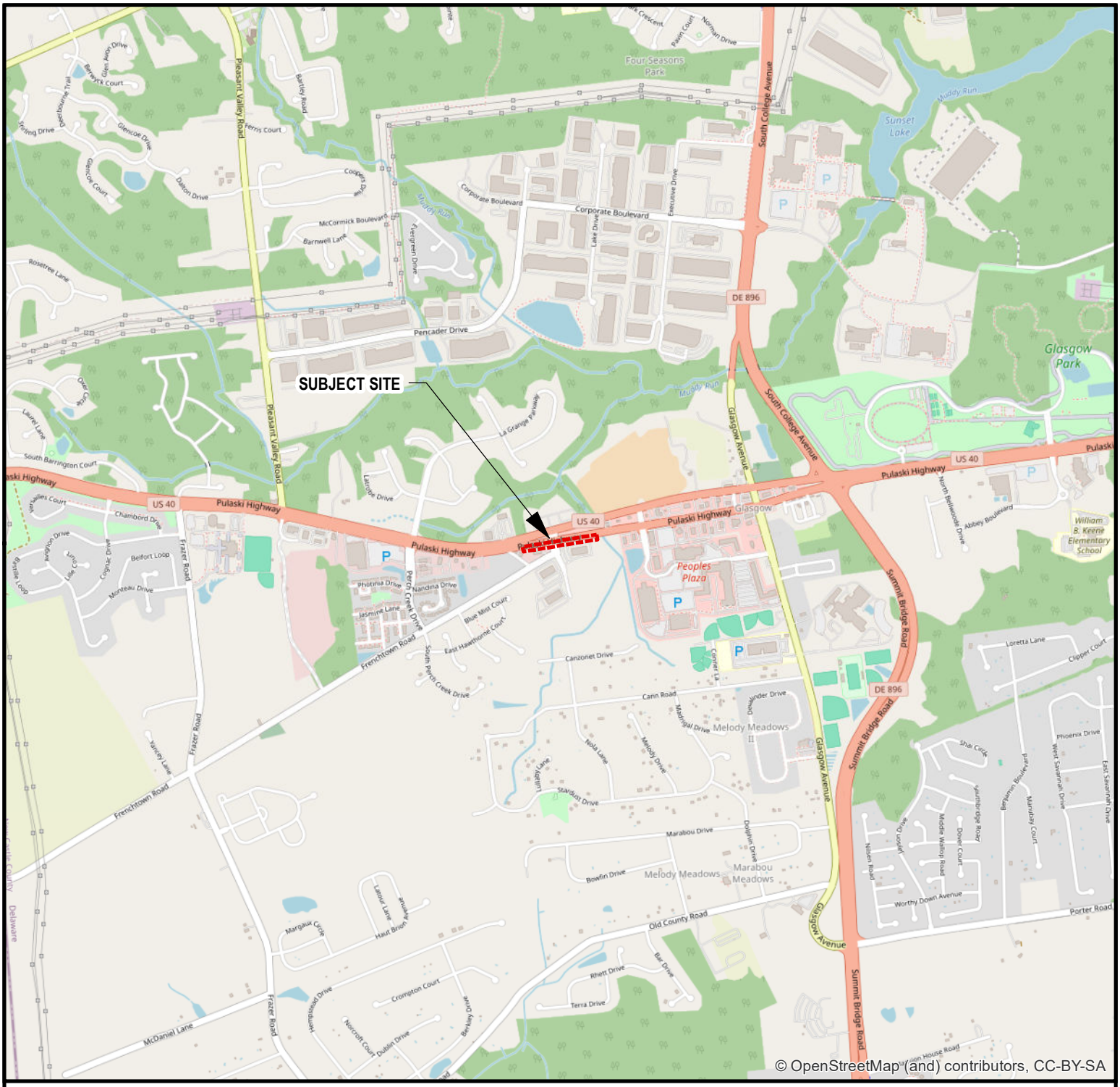
Federal Consistency Review Deadlines:

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: ☐ NO ☐ YES *[attach comments]*	
Decision type: *(objections or conditions attach details)*	_ Decision Date:	

Site Location Map



LEGEND

SUBJECT SITE

NORTH

0 2,000

APPROXIMATE SCALE
1 INCH = 2,000 FEET

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

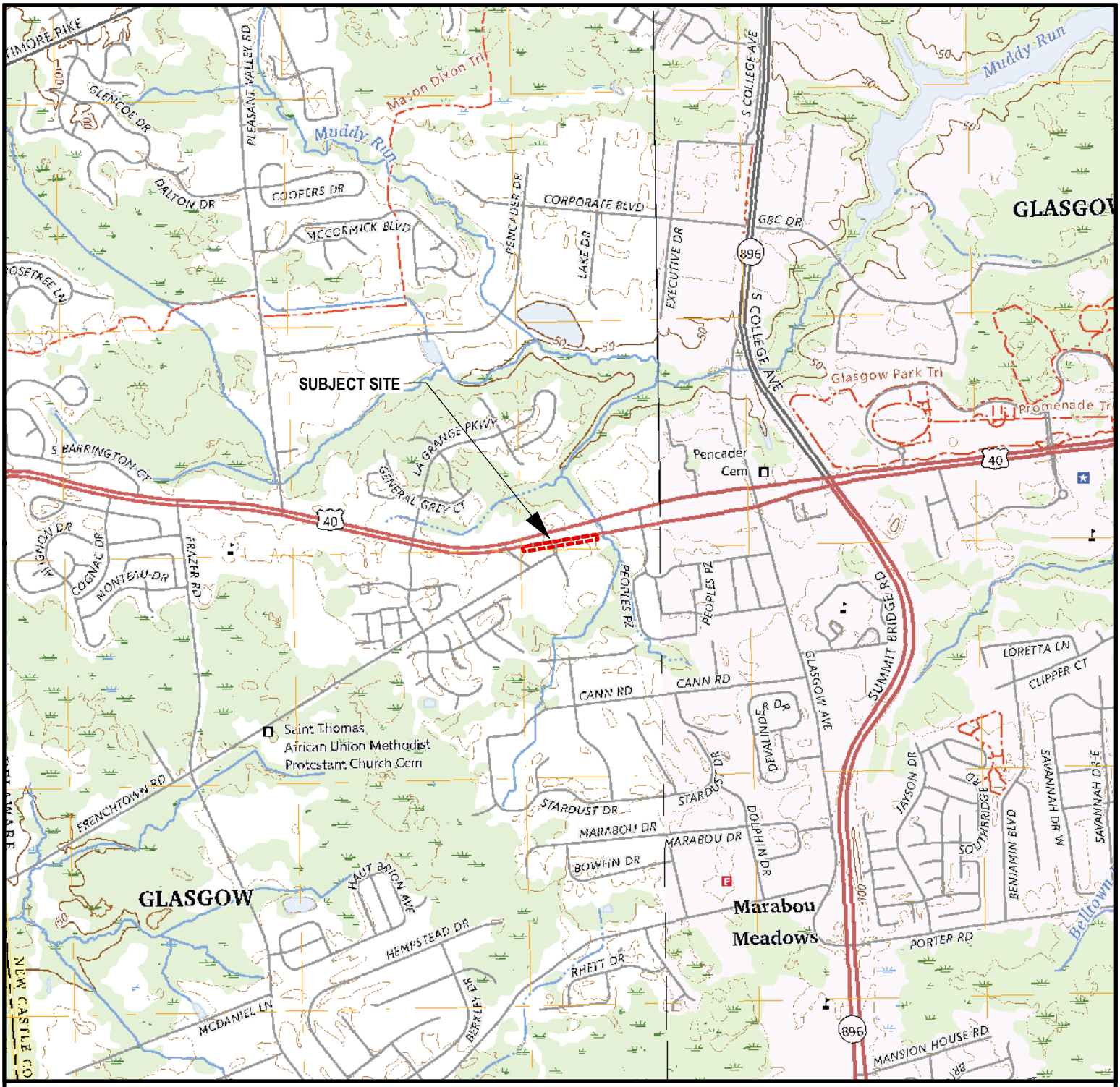
3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
PHONE: 410-515-9446
FAX: 410-515-4895
WWW.GTAENG.COM

SITE LOCATION MAP
ESNG ROUTE 40 REPLACEMENT PROJECT

NEW CASTLE COUNTY, DELAWARE

JOB NO.	SCALE:	DATE:	DRAWN BY:	REVIEW BY:	FIGURE:
23289	1"=2,000'	AUGUST 01, 2025	KJS	MAJ	1

USGS Topographic Map



SOURCE: UNITED STATES GEOLOGICAL SURVEY (USGS), ELKTON, MD AND SAINT GEORGES, DE QUADRANGLES, 7.5 MINUTE TOPOGRAPHIC MAP SERIES, BOTH DATED 2023.

NORTH

0 2,000

APPROXIMATE SCALE
1 INCH = 2,000 FEET

LEGEND

SUBJECT SITE

GEO-TECHNOLOGY ASSOCIATES, INC.
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USGS TOPOGRAPHIC MAP

ESNG ROUTE 40 REPLACEMENT PROJECT

NEW CASTLE COUNTY, DELAWARE

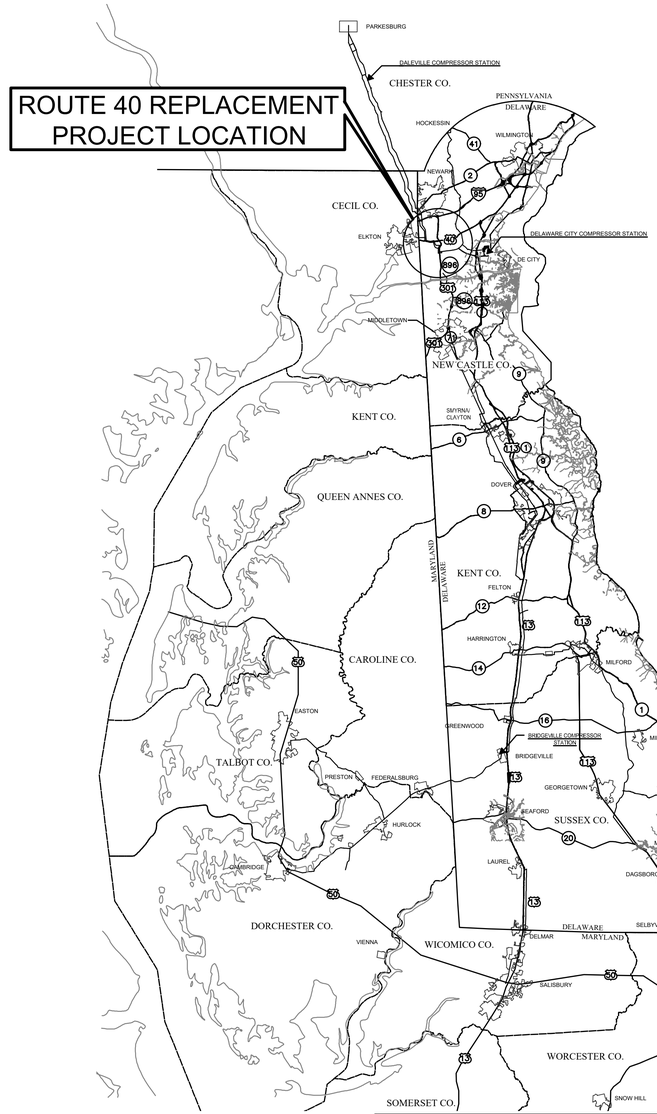
JOB NO.	SCALE:	DATE:	DRAWN BY:	REVIEW BY:	FIGURE:
23289	1"=2,000'	AUGUST 01, 2025	KJS	MAJ	2

Site Sketches

DRAWING INDEX

EASTERN SHORE NATURAL GAS COMPANY
ROUTE 40 REPLACEMENT

PROPOSED 0.14± MILES OF 8" NATURAL GAS PIPELINE
NEW CASTLE COUNTY, DELAWARE
PROJECT NUMBER: ES XXXX
MOC: XXXX-XX



ROUTE 40 REPLACEMENT
PROJECT LOCATION

1,000 500 0 500 1,000 2,000
SCALE: 1" = 1,000'

MATERIAL NOTES AND SPECIFICATIONS

1)	COMMODITY DESCRIPTION:	NATURAL GAS
2)	MAXIMUM OPERATING PRESSURE:	XXX PSIG
3)	PIPE AND MATERIAL GRADE:	X-52
4)	MATERIAL SPECIFICATION:	API-5L
5)	SEAM TYPE:	ELECTRIC RESISTANCE WELDED (ERW)
6)	SPECIFIED MINIMUM YIELD STRENGTH:	XXXXX PSI
7)	PERCENTAGE OF MAX ALLOWABLE HOOP STRESS AT MAOP:	XXX% (XXX PSIG)
8)	PIPE OUTSIDE DIAMETER:	8.625"
9)	WALL THICKNESS:	0.322"
10)	MINIMUM FITTING RATING:	ANSI XXX
11)	CATHODIC PROTECTION:	IMPRESSED CURRENT
12)	AC MITIGATION RISK LEVEL:	XX
13)	PROTECTIVE COATING:	FBE/POWERCRETE
14)	DESIGN PRESSURE:	XXXX PSIG
15)	TEST PRESSURE:	MIN = XXXX PSIG MAX = XXXX PSIG NOTE: FINAL TEST PRESSURE WILL BE DETERMINED PRIOR TO ACCEPTANCE OF CONTRACTOR'S TESTING PROCEDURE
16)	DESIGN CLASS	CLASS X

811
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.

REVISIONS

NO.	DATE	DESCRIPTION	BY

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
111 RUTHAR DRIVE
NEWARK, DE 19711
(302) 326-2200
MRAGTA.COM

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

COVER SHEET

8" PROPOSED PIPELINE
ROUTE 40 REPLACEMENT
NEW CASTLE COUNTY, DE

ESNG PROJ. CODE:		DATE:	8/19/2025
MRA PROJECT NO:	23289	SCALE:	AS SHOWN
DESIGN/CHECK BY:	JTH/CWB	SHEET:	1 OF 16

GENERAL ENVIRONMENTAL NOTES

1. 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.

2. 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.

3. PRE-CONSTRUCTION CONTOURS TO BE RE-ESTABLISHED FOR ALL DISTURBED AREAS UNLESS OTHERWISE NOTED ON THE PLANS. ALL DISTURBED AREAS TO BE RESTORED AND/OR REVEGETATED AS APPLICABLE.

4. 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 4 OF 16 FOR MULCH APPLICATION REQUIREMENTS.

5. FOR NON-ROADWAY AREAS, UPLAND RE-SEEDING TO BE PERFORMED IN ACCORDANCE WITH THE VEGETATIVE STABILIZATION DETAILS (SEE SHEET 5 OF 16).

6. 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.

7. THE NEW CASTLE 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.

8. 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.

9. IF THE APPROVED PLAN NEEDS TO BE MODIFIED, ADDITIONAL SEDIMENT AND STORMWATER CONTROL MEASURES MAY BE REQUIRED AS DEEMED NECESSARY BY THE NEW CASTLE CONSERVATION DISTRICT.

10. 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.

11. 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.

12. REFER TO TYPICAL TOPSOIL SEGREGATION DETAIL FOR SUBSOIL/TOPSOIL PILE INFORMATION ON SHEET 3 OF 16.

13. 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.

14. EROSION CONTROL MATTING IS REQUIRED FOR RESTORATION ON SLOPES OF 3:1 OR GREATER.

15. 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.

16. 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.

17. UNLESS NOTED IN THE CONSTRUCTION LINE LIST, 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

1. FOR ROADWAY AREAS REFER TO DELDOT NOTES ON SHEET 6 OF 16.

2. 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.

OWNER'S CERTIFICATION:

"I, NICK HAMMOND, 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."

NICK HAMMOND, ENGINEER II — **DATE**
EASTERN SHORE NATURAL GAS
500 ENERGY LANE, SUITE 200
DOVER, DE 19901
PHONE - (302) 543-1121
EMAIL - NHAMMOND@CHPK.COM

CONSTRUCTION NOTES AND SEQUENCING

NOTIFICATION:
THE NEW CASTLE 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 CONTRACTORS 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 R.O.W. 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 SAWCUT, 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.

HORIZONTAL DIRECTIONAL DRILLING:
CONTRACTOR SHALL UTILIZE A BENDING MACHINE PER COMPANY STANDARDS TO ACHIEVE PROPER COVER AND BREAK-OVER AT HORIZONTAL DIRECTIONAL DRILL ENTRY AND EXIT LOCATIONS. ADDITIONAL FITTINGS SHALL BE UTILIZED AT CONTRACTOR'S EXPENSE.

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 - 1,500 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:
1. THE CONTRACTOR SHALL CONTACT MISS UTILITY OF DELMARVA AT 1-800-282-8555 FOR UTILITY LOCATIONS WITHIN AND SURROUNDING CONSTRUCTION AREAS NOT LESS THAN 3 DAYS BEFORE PERFORMING ANY EXCAVATION.
2. 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 WHATEVER 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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 THE CONTRACTOR'S EXPENSE.
9. 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.
10. SHORING MAY BE REQUIRED TO PROTECT THE INTEGRITY OF THE ROADWAY IF TRENCH ENCROACHES WITHIN 5' OF PAVEMENT OR IF UNDERMINING OCCURS.

CONSTRUCTION SCHEDULE

CONSTRUCTION IS SCHEDULED TO BEGIN IN FALL 2025. CONSTRUCTION IS SCHEDULED TO BE COMPLETED IN WINTER 2026, IN ACCORDANCE WITH ESNG SCHEDULE. WORK WILL CONSIST OF THE FOLLOWING SEQUENTIAL OR CONCURRENT ACTIVITIES.

1. THE NEW CASTLE 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.
2. 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.
3. ALL PERIMETER CONTROLS ARE TO BE REVIEWED BY THE AGENCY CONSTRUCTION SITE REVIEWER AND APPROVED PRIOR TO PROCEEDING WITH FURTHER SITE DISTURBANCE OR CONSTRUCTION.
4. EROSION AND SEDIMENTATION CONTROL STRUCTURES WILL BE INSTALLED AND MAINTAINED AS NECESSARY (SEE ENVIRONMENTAL NOTES).
5. TOPSOIL STRIPPING AND SEGREGATION WILL BE PERFORMED IN REQUIRED AREAS.
6. CLEARING, GRADING AND GRUBBING WILL BE PERFORMED IN NON-ROADWAY AREAS, AS APPLICABLE.
7. 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).
8. IN PAVED AREAS TRENCHLINE IS TO BE SAWCUT, AND PAVEMENT WILL BE DISPOSED OF AT AN APPROVED FACILITY.
9. BENDING, WELDING, AND COATING OF THE PIPELINE ALONG THE EDGE OF THE TRENCH.
10. LOWERING THE PIPE INTO THE DITCH, PADDING, BACKFILL AND COMPACTION INCLUDING ROAD SUB-BASE IN PAVED ROADWAY AREAS), AS WELL AS CLEANUP AND RESTORATION.
11. FILLING THE PIPE WITH WATER, HYDROSTATIC PRESSURE TESTING OF THE PIPE AND DEWATERING INTO THE UPLAND AREA.
12. 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.
13. EROSION/SEDIMENT CONTROL BARRIERS SHALL REMAIN IN PLACE UNTIL FINAL REVEGETATION AND RESTORATION ARE DEEMED SUCCESSFUL AND AUTHORIZED FOR REMOVAL BY THE NEW CASTLE CONSERVATION DISTRICT SEDIMENT & STORMWATER PROGRAM.
14. 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

PROPOSED PIPELINE — 3+00 STATION LABELS
MILE MARKER — M.P. 0.0
PERMANENT EASEMENT
TEMPORARY WORKSPACE (TWS) — TWS / SWL / TWS
LIMITS OF DISTURBANCE — LOD
LIMITS OF DISTURBANCE / TWS — LOD / TWS
APPROXIMATE LOCATION OF PROPOSED EROSION/SEDIMENT CONTROL STRUCTURES SILT FENCE - TO BE INSTALLED AS REQUIRED (SEE ENVIRONMENTAL NOTES AND PLAN & PROFILE SHEETS) — SF
PROPERTY LINE
RIGHT-OF-WAY LINE
EXISTING CONTOUR (MAJOR) — 40
EXISTING CONTOUR (MINOR) — 41
EXISTING EDGE OF PAVEMENT
EXISTING TREELINE
EXISTING GUIDERAIL
EXISTING CHAINLINK FENCE — X
EXISTING STORM SEWER — SD
EXISTING WATER LINE — W
EXISTING SANITARY SEWER — SAN
EXISTING E.S.N.G. NATURAL GAS PIPELINE — ESNG-G
EXISTING GAS PIPELINE (OTHERS) — UG
OVERHEAD ELECTRIC TRANSMISSION LINE — OHE
WATERS OF U.S. — US
WETLAND AREA — NW
EXISTING GAS METER — GM
EXISTING WATER VALVE — W.V.
EXISTING GAS VALVE — G.V.
EXISTING ELECTRIC TRANSFORMER — Elec. Transf.
EXISTING UTILITY MANHOLE
EXISTING CABLE/TELEPHONE PEDESTAL
EXISTING DRAINAGE STRUCTURE
EXISTING LIGHT STANDARD — L.S.
EXISTING UTILITY POLE — Guy / Utility / Hyd.
EXISTING FIRE HYDRANT
EXISTING WELL (PRIVATE) — Well
EXISTING MAILBOX
EXISTING STREET SIGN
EXISTING BUILDING/STRUCTURE
PROPOSED H.D.D. ENTRY / EXIT LOCATION

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

811 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

REVISIONS			
NO.	DATE	DESCRIPTION	BY

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
111 RUTHAR DRIVE
NEWARK, DE 19711
(302) 328-2200
MRAGTA.COM

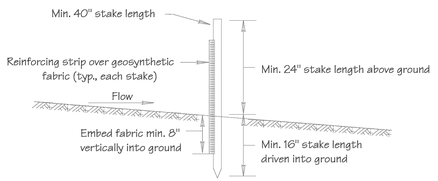
EASTERN SHORE NATURAL GAS
500 ENERGY LANE, SUITE 200 DOVER, DE 19901
TELEPHONE (302) 734-6710 - FAX (302) 734-6745

8" PROPOSED PIPELINE
ROUTE 40 REPLACEMENT
NEW CASTLE COUNTY, DE

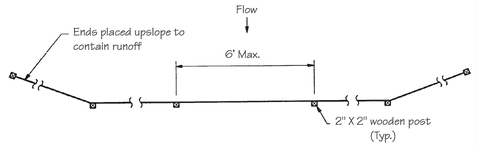
ESNG PROJ. CODE:		DATE:	8/19/2025
MRA PROJECT NO:	23289	SCALE:	N/A
DESIGN/CHECK BY:	JTH/CWB	SHEET:	2 OF 16

Standard Detail & Specifications

Silt Fence



Section



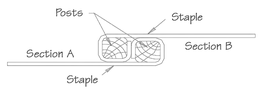
Plan

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	SF	DE-ESC-3.1.2.1 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Silt Fence

Construction Detail



Top

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.

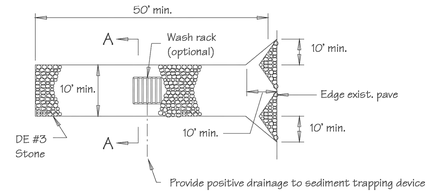
Materials:

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

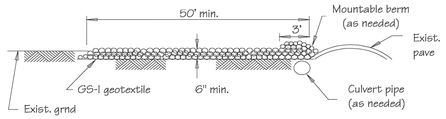
Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	SF	DE-ESC-3.1.2.1 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

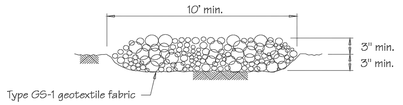
Stabilized Construction Entrance



Plan



Profile

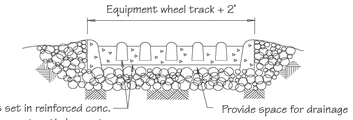


Section A-A (Std.)

Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SCE	DE-ESC-3.4.7 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Stabilized Construction Entrance



Section A-A (Opt.)

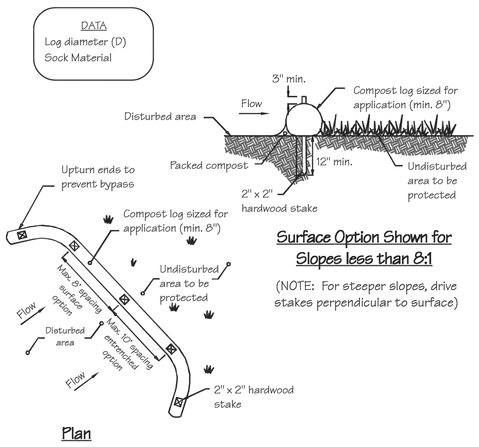
Construction Notes:

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-I; 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:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SCE	DE-ESC-3.4.7 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Compost Filter Log



Surface Option Shown for Slopes less than 8:1

(NOTE: For steeper slopes, drive stakes perpendicular to surface)

Plan

NOTE: Manufacturer's recommendations supersede any installation details shown for this practice

Source:	Symbol:	Detail No.
Adapted from MD Stds & Specs for ESC & Filtrexx™ International	CFL	DE-ESC-3.1.7 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Compost Filter Log

Construction Notes:

1. Prior to installation, clear bedding area of obstructions including rocks or debris larger than 1 inch and fill in any sharp depression areas.
2. If socks are prepared on-site, fill the sock fabric using a pneumatic blower so that the logs are rigid and do not deform. Terminate at the desired length.
3. For trenched applications, excavate 2 to 4 inches below grade along the width and length of the compost filter log.
4. Install the compost filter logs perpendicular to the flow direction and parallel to the slope with the beginning and end of the installation pointing up the slope a minimum of 1 foot elevation difference. On sites where this is not possible, upturn at a minimum length of 10' at a 30 degree angle to prevent runoff bypass.
5. For untrenched applications, blow or hand pack soil, mulch, or compost on the upslope side of the log, filling the bottom void area.
6. Stake the filled log every 10 feet maximum through the center of the sock for trenched applications, or every 8 feet for untrenched. The stake shall be a 2" by 2" hardwood. It should extend 12" below grade and protrude at least 3" above the top of the sock. If located on a slope greater than 8:1, the stake shall be angled downslope at a 45 degree angle to prevent the force of the water from dislodging to log.
7. When the length of the compost filter log needed exceeds the available compost filter sock length, the next sock shall be overlapped a minimum of 12" before being filled, and a stake placed through both socks at the overlap.
8. Remove accumulated sediment when it has reached half of the effective height of the log.
9. Inspect weekly and after rain event. If sock is degrading or the sock is failing, vegetate to secure the compost, replace the log, or reinforce with an additional log. If the log has been crushed due to construction equipment, it can be "fluffed" back to its effective height. If the effective height can no longer be restored, the log shall be replaced or reinforced with an additional compost filter log.

Source:	Symbol:	Detail No.
Adapted from MD Stds & Specs for ESC & Filtrexx™ International	CFL	DE-ESC-3.1.7 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Topsoiling

Construction Notes:

1. **Site Preparation** (Where Topsoil is to be added)

   Note: When topsoiling, maintain needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, waterways and sediment basins.

   a. Grading - Grades on the areas to be topsoiled which have been previously established shall be maintained.

   b. Liming - Where the topsoil is either highly acid or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet). Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.

   c. Tilling - After the areas to be topsoiled have been brought to grade, and immediately prior to dumping and spreading the topsoil, the subgrade shall be loosened by discing or by scarifying to a depth of a least 3 inches to permit bonding of the topsoil to the subsoil. Pack by passing a bulldozer up and down over the entire surface area of the slope to create horizontal erosion check slots to prevent topsoil from sliding down the slope.

2. **Topsoil Material and Application**

   Note: Topsoil salvaged from the existing site may often be used but it should meet the same standards as set forth in these specifications. The depth of topsoil to be salvaged shall be no more than the depth described as a representative profile for that particular soil type as described in the soil survey published by USDA-SCS in cooperation with Delaware Agricultural Experimental Station.

Source:	Symbol:	Detail No.
USDA - NRCS		DE-ESC-3.4.1 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Topsoiling

Construction Notes (cont.)

a. Materials - Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand or other soil as approved by an agronomist or soil scientist. It shall not have a mixture of contrasting textured subsoil and contain no more than 5 percent by volume of cinders, stones, slag, coarse fragment, gravel, sticks, roots, trash or other extraneous materials larger than 1-1/2 inches in diameter. Topsoil must be free of plants or plant parts of bermudagrass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistles, or others as specified. All topsoil shall be tested by a reputable laboratory for organic matter content, pH and soluble salts. A pH of 6.0 to 7.5 and an organic content of not less than 1.5 percent by weight is required. If pH value is less than 6.0 lime shall be applied and incorporated with the topsoil to adjust the pH to 6.5 or higher. Topsoil containing soluble salts greater than 500 parts per million shall not be used.

Note: No sod or seed shall be placed on soil which has been treated with soil sterilant or chemicals used for weed control until sufficient time has elapsed to permit dissipation of toxic materials.

b. Grading - The topsoil shall be uniformly distributed and compacted to a minimum of four (4) inches. Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets. Topsoil shall not be placed while in a frozen or muddy condition, when the subgrade is excessively wet, or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

Note: Topsoil substitutes or amendments as approved by a qualified agronomist or soil scientist, may be used in lieu of natural topsoil. Compost material used to improve the percentage of organic matter shall be provided by a certified supplier.

Compost amendments that are intended to meet specific post-construction stormwater management goals shall further meet the requirements of **Appendix 3.06.2 Post Construction Stormwater Management BMP Standards and Specifications, Section 14.0 Soil Amendments.**

Source:	Symbol:	Detail No.
USDA - NRCS		DE-ESC-3.4.1 Sheet 2 of 2 Effective July 2023

EROSION & SEDIMENT CONTROL DETAILS

REVISIONS			
NO.	DATE.	DESCRIPTION	BY

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8" PROPOSED PIPELINE
ROUTE 40 REPLACEMENT
NEW CASTLE COUNTY, DE

ESNG PROJ. CODE:		DATE:	8/19/2025
MRA PROJECT NO:	23289	SCALE:	N/A
DESIGN/CHECK BY:	JTH/CWB	SHEET:	3 OF 16

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:
1. Minimum sign size 2' x 2'
2. Minimum text size 1"
3. Sign must be posted at a safe, publicly accessible location close to construction site
4. Sign must be visible from the public road nearest the active construction site
5. 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		**DE-ESC-3.6.1** 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:
   a. Concrete
   b. Detergents
   c. Paints (enamel and latex)
   d. Cleaning solvents
   e. Pesticides
   f. Wood scraps
   g. Fertilizers
   h. Petroleum based products

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

3. **Waste management practices**
   a. Collect and store all waste materials in securely lidded dumpsters in a location that does not drain to a waterbody.
   b. Salvage and/or recycle waste materials whenever possible.
   c. 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		**DE-ESC-3.6.1** Sheet 2 of 4 Effective July 2023

Standard Detail & Specifications

Construction Site Pollution Prevention

Notes (cont.)

   d. Dispose of all trash in accordance with all applicable Delaware laws.
   e. Littering is strictly prohibited. Trash cans should be placed at all lunch spots and recycle bins should be placed near the construction trailer.
   f. 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**
   a. If possible, equipment should be taken to off-site commercial facilities for washing and maintenance.
   b. If performed on-site, wash vehicles with high-pressure water spray without detergents in an area contained by an impervious berm.
   c. Use drip pans for all equipment maintenance.
   d. Inspect equipment for leaks on a daily basis.
   e. Direct washout from concrete trucks into a temporary pit for hardening and proper disposal.
   f. Equip fuel nozzles with automatic shut-off valves.
   g. Dispose of all used products such as oil, antifreeze, solvents and tires in accordance with manufacturers' recommendations and local, state and federal laws and regulations.

5. **Spill prevention practices**
   a. Identify potential spill areas and contain them in covered areas with no connection to the storm drain system.
   b. Post warning signs in hazardous material storage areas.
   c. Perform preventive maintenance on all tanks, valves, pumps, pipes and other equipment as necessary.
   d. Prioritize low or non-toxic substances for use.

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

Standard Detail & Specifications

Construction Site Pollution Prevention

Notes (cont.)

   e. Prominently post contact information for reporting spills through the DNREC 24-Hour Toll Free Number.

6. **Education**
   a. Include Best Management Practices (BMPs) for construction site pollution control as part of regular progress meetings.
   b. 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		**DE-ESC-3.6.1** Sheet 4 of 4 Effective July 2023

Standard Detail & Specifications

Mulching

1. **Materials and Amounts**
   a. *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.

   b. *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).
   c. *Hydraulically applied mulch* -The following conditions apply to hydraulically applied mulch:
      i. Definitions:
         a. 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.
         b. 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.
         c. 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.
         d. Refer to **Figure 3.4.5a** for conditions and limitations of use for each of the above categories of hydraulic mulch.
      ii. 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.
      iii. Hydraulic mulches shall be applied with a viable seed and at manufacturer's recommended rates. Increased rates may be necessary based on site conditions.
      iv. Hydraulically applied mulches and additives shall be mixed according to manufacturers recommendations.
      iv. 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 & Filtrexx™ International		**DE-ESC-3.4.5** Sheet 1 of 3 Effective July 2023

Standard Detail & Specifications

Mulching

   v. Application:
      a. Apply product to geotechnically stable slopes that have been designed and constructed to divert runoff away from the face of the slope.
      b. Do not apply to saturated soils, or if precipitation is anticipated within 24-48 hours.
      c. 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.
      d. 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.
      e. 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.
   vi. 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.
   d. *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.
   a. *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.
   b. *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 cleat marks running across the slope.
   c. *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.
   d. *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.
   e. *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 & Filtrexx™ International		**DE-ESC-3.4.5** Sheet 2 of 3 Effective July 2023

Standard Detail & Specifications

Mulching

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	xxxxxxxxxxxxxxxx	OK (< 1 ac.)	xxxxxxxxxxxxxxxx	OK (< 1 ac.)
	Wood Fiber @ 2000 lbs/ac. min.	xxxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxxx	OK
	BFM @ 3000 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
2% to 5.9%	Wood Fiber @ 2000 lbs/ac. min.	xxxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxxx	OK
	BFM @ 3000-3500 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
6% to 10.9%	Wood Fiber @ 2000-2500 lbs/ac. min.	xxxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxxx	OK
	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
11% to 24.9%	Wood Fiber @ 2500-3000 lbs/ac. min.	xxxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxxx	OK
	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.	xxxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxxx	OK
	BFM @ 4000 lbs/ac. min.	xxxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxxx	OK
	Straw @ 2 Tons/ac. min.	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
	1" Compost Blanket (CB)	OK	OK	OK	OK
33% and up	BFM @ 4000-4500 lbs/ac. min.	xxxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxxx	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.
xxx = Not acceptable to use during this time period.
All application rates are minimums

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrexx™ International		**DE-ESC-3.4.5** Sheet 3 of 3 Effective July 2023

Standard Detail & Specifications

Mulching

EROSION & SEDIMENT CONTROL DETAILS

REVISIONS			
NO.	DATE	DESCRIPTION	BY

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TELEPHONE (302) 734-6710 - FAX (302) 734-6745

8" PROPOSED PIPELINE
ROUTE 40 REPLACEMENT
NEW CASTLE COUNTY, DE

ESNG PROJ. CODE:		DATE:	8/19/2025
MRA PROJECT NO:	23289	SCALE:	N/A
DESIGN/CHECK BY:	JTH/CWB	SHEET:	4 OF 16

Standard Detail & Specifications

Vegetative Stabilization

TEMPORARY SEEDING BY RATES, DEPTHS AND DATES

Mix #	Species[5]	Seeding Rate		Optimum Seeding Dates [1] O = Optimum Planting Period; A = Acceptable Planting Period							Planting Depth[3]
				Coastal Plain			Piedmont			All	
	Certified Seed	lb/Ac.[4]	lb/1000 sq.ft.	2/1-4/30	[2] 5/1-8/14	8/15-10/31	3/1-4/30	[2]5/1-7/31	8/1-10/31	10/31-2/1	
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	A	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	A	0.5 inches 1-2" sandy soils
6	Winter Wheat	125	4	O	A	O	O	A	O	A	1-2 inches 2-3" sandy soils
7	Foxtail Millet	30 PLS	0.7		O			O			0.5 inches 1-2" sandy soils
8	Pearl Millet	20 PLS	0.5		O			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		**DE-ESC-3.4.3** Sheet 1 of 4 Effective July 2023

Standard Detail & Specifications

Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES

Mix No.	Seeding Mixtures: Certified Seed[3] / Well Drained Soils	Seeding Rate[1] lb/Ac	lb/1000 sq.ft.	Optimum Seeding Dates [2] O = Optimum Planting Period A = Acceptable Planting Period: Coastal Plain 2/1-4/30	Coastal Plain 5/1-8/14	Coastal Plain 8/15-10/31	Piedmont 3/1-4/30	Piedmont 5/1-7/31	Piedmont 8/1-10/31	All[4] 10/31-2/1	Remarks
1	Tall Fescue	140	3.2	A	O	A	A	O	A	Add 100 lbs./ac Winter Rye	Good erosion control mix Tolerant of low fertility soils
	Canada Wild Rye	10	0.23								Good for droughty sites
2	Deertongue	30	0.69	A	O	A	A	O	A	Add 100 lbs./ac Winter Rye	Good erosion control mix Tolerant of low fertility soils
	Sheep Fescue	30	0.69								Legume that fixes atmospheric N into soil
	White Clover	10	0.35								
* 3	Tall Fescue (Turf-type) **or**	50	1.15	O	A[6]	O	O	A[6]	O	Add 100 lbs./ac. Winter Rye	Good erosion control mix Tall Fescue for droughty conditions. Creeping Red Fescue for heavy shade. Flatpea to suppress woody vegetation.
	Strong Creeping Red Fescue **or**	50	1.15								
	Perennial Ryegrass	50	1.15								
	plus Flatpea[5]	15	0.34								
4	Strong Creeping Red Fescue	100	2.3	O	A[6]	O	O	A[6]	O	Add 100 lbs./ac. Winter Rye	Suitable waterway mix. Canada Bluegrass more drought tolerant. Use Redtop for increased drought tolerance.
	Kentucky Bluegrass	70	1.61								
	Perennial Ryegrass **or**	15	0.35								
	Redtop	5	0.11								
	plus White Clover[5]	3	0.07								
5	Switchgrass[6,7] **or**	10	0.23		O			O			Native warm-season mixture. Tolerant of low fertility soils. Drought tolerant. Poor shade tolerance. N fertilizer discouraged - weeds
	Coastal Panicgrass	10	0.23								
	Big Bluestem	5	0.11								
	Little Bluestem	5	0.11								
	Indian Grass	5	0.1								
6	Tall Fescue (turf-type) (Blend of 3 cultivars)	150	3.5	O	A[6]	O	O	A[6]	O		Managed filter strip for nutrient uptake.
7	Tall Fescue	150	3.5	O	A[6]	O	O	A[6]	O		Three cultivars of Kentucky Bluegrass. Traffic tolerant.
	Ky. Bluegrass (Blend)	20	0.46								
	Perennial Ryegrass	20	0.46								
8	Big Bluestem[7]	10	0.23	O	A[6]			O	A[6]		All species are native. Indian Grass and Bluestem have fluffy seeds. Plant with a specialized native seed drill.
	Indian Grass[7]	10	0.23								
	Little Bluestem[7]	8	0.18								
	Creeping Red Fescue	30	0.69								
	plus one of:										
	Partridge Pea	5	0.11								Creeping Red Fescue will provide erosion protection while the warm season grasses get established.
	Bush Clover	3	0.07								
	Wild Indigo	3	0.07								
	Showy Tick-Trefoil	2	0.05								

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

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 2 of 4 Effective July 2023

Standard Detail & Specifications

Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES (cont.)

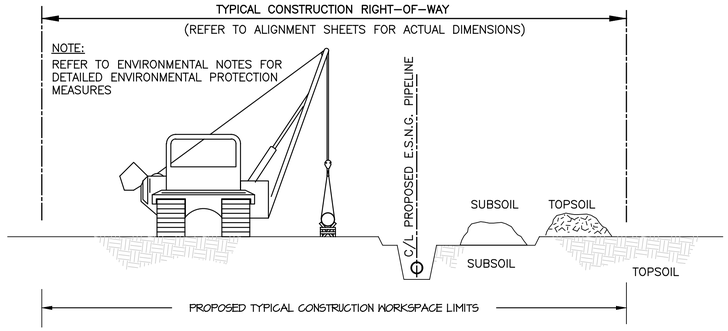
Mix No.	Seeding Mixtures: Certified Seed[3] / Poorly Drained Soils	Seeding Rate[1] lb/Ac	lb/1000 sq.ft.	Optimum Seeding Dates [2] O = Optimum Planting Period A = Acceptable Planting Period: Coastal Plain 2/1-4/30	Coastal Plain 5/1-8/14	Coastal Plain 8/15-10/31	Piedmont 3/1-4/30	Piedmont 5/1-7/31	Piedmont 8/1-10/31	All[4] 10/31-2/1	Remarks
9	Redtop	75	1.72	O	A[6]	O	O	A[6]	O	Add 100 lbs./ac. Winter Rye	Quick stabilization of disturbed sites and waterways
	Creeping Bentgrass	35	0.8								
	Sheep Fescue	30	0.69								
	Rough Bluegrass	45	1								
10	Switchgrass[6]	10	0.23	A		O	A		O		Good erosion control, wildlife cover and wetland revegetation.
	Residential Lawns										
* 11	Tall Fescue	100	2.3	O	A[6]	O	O	A[6]	O		High value, high maintenance, light traffic, irrigation necessary. Well drained soils, full sun.
	Perennial Ryegrass	25	0.57								
	Kentucky Bluegrass Blend	30	0.69								
12	Tall Fescue	100	2.3	O	A[6]	O	O	A[6]	O		Moderate value, low maintenance, traffic tolerant.
	Perennial Ryegrass	25	0.57								
	Sheep Fescue	25	0.57								
13	Creeping Red Fescue	50	1.15	O	A[6]	O	O	A[6]	O		Shade tolerant, moderate traffic tolerance, moderate maintenance.
	Chewings Fescue	50	1.15								
	Rough Bluegrass	20	0.4								
	Kentucky Bluegrass	20	0.4								
14	Creeping Red Fescue	50	1.15	O	A[6]	O	O	A[6]	O		Shade tolerant, moisture tolerant.
	Rough Bluegrass **or**	90	2.1								
	Chewings Fescue										
15	K-31 Tall Fescue	150	3.5	O	A[6]	O	O	A[6]	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. Turf-type 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		**DE-ESC-3.4.3** Sheet 3 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.

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

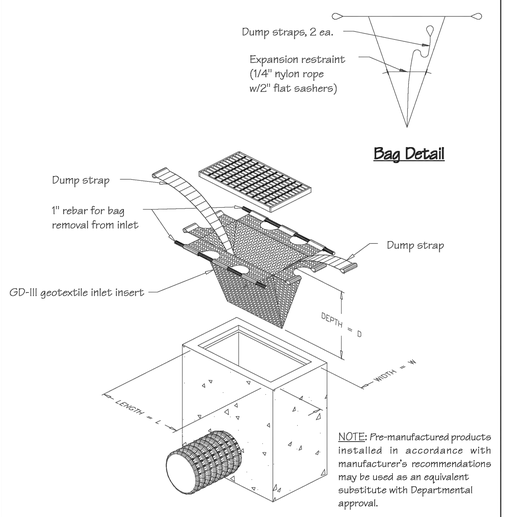
   It is important to prepare a good seedbed to ensure the success of establishing vegetation. The seedbed should be well prepared, loose, uniform, and free of large clods, rocks, and other objectionable material. The soil surface should not be compacted or crusted.
3. Soil Amendments
   a. Lime - Apply 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		**DE-ESC-3.4.3** Sheet 4 of 4 Effective July 2023

Standard Detail & Specifications

Inlet Protection - Type 2



Source:	Symbol:	Detail No.
Adapted from ACF Products, Inc.	IP-2	**DE-ESC-3.1.5.2** Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Inlet Protection - Type 2

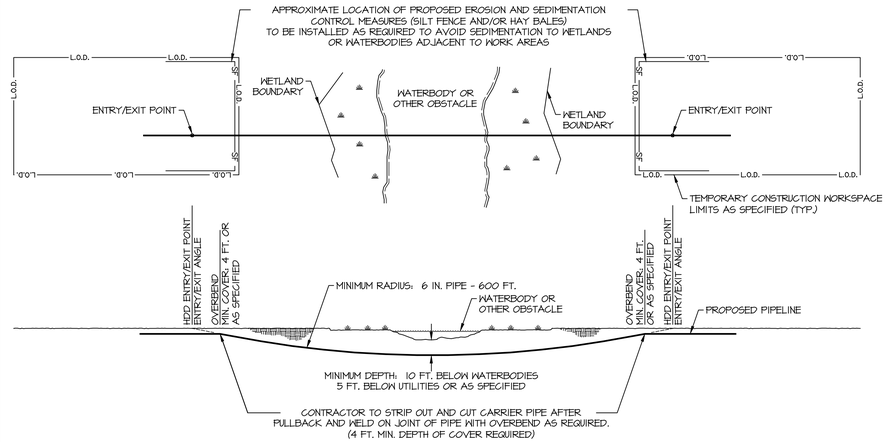
Notes:

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:	Symbol:	Detail No.
Adapted from ACF Products, Inc.	IP-2	**DE-ESC-3.1.5.2** Sheet 2 of 2 Effective July 2023



TYPICAL HORIZONTAL DIRECTIONAL DRILL DETAIL
NOT TO SCALE

EROSION & SEDIMENT CONTROL DETAILS

REVISIONS			
NO.	DATE	DESCRIPTION	BY

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
111 RUTHAR DRIVE
NEWARK, DE 19711
(302) 326-2200
MRAGTA.COM

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

8" PROPOSED PIPELINE
ROUTE 40 REPLACEMENT
NEW CASTLE COUNTY, DE

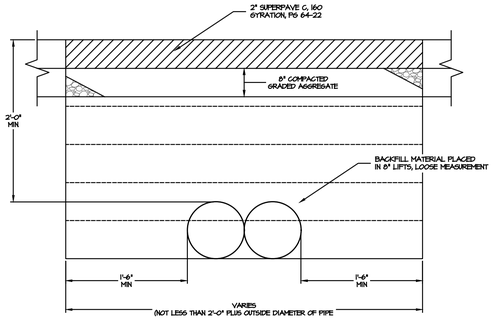
ESNG PROJ. CODE:		DATE:	8/19/2025
MRA PROJECT NO:	23289	SCALE:	N/A
DESIGN/CHECK BY:	JTH/CWB	SHEET:	5 OF 16

DELDOT UTILITY PLAN GENERAL NOTES

1. 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.
2. 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 TESTING.
3. GABC PLACED SHALL BE COMPACTED TO 98%.
4. COMPACTION TESTING SHALL BE PERFORMED EVERY 100' AND TESTING SHALL BE TAKEN ON EACH LIFT OF MATERIAL PLACED. (WHEN UTILITY IS IN THE ROADWAY)
5. TAR CHIP/HOT 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" GABC AND 2" TYPE "C" HOT MIX.
6. TAR CHIP/HOT 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.
7. 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.
8. 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.
9. ALL TEMPORARY HOT MIX SHALL BE PLACED TO PROVIDE A SMOOTH RIDABLE SURFACE TO DELDOT STANDARDS.
10. A SAFETY EDGE IS REQUIRED ON ALL HOT MIX PLACED.
11. ANY STRIPING DISTURBED SHALL BE PLACED AT THE END OF THE DAY PRIOR TO OPENING TO TRAFFIC.
12. PROOF ROLL OF GABC SHALL BE PERFORMED USING A LOADED 10 WHEELER PRIOR TO PLACEMENT OF HOT MIX.
13. ALL MATERIALS AND WORKMANSHIP WITHIN THE STATE R/A 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.
14. 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.
15. ALL DISTURBED AREAS WITHIN THE STATE RIGHT-OF-WAY, BUT NOT IN THE PAVEMENT, SHALL BE TOP-SOILED (6" MINIMUM), FERTILIZED, SEEDED 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.
16. A 72-HOUR (MINIMUM) NOTICE SHALL BE GIVEN TO THE DELDOT DISTRICT PERMIT SUPERVISOR PRIOR TO STARTING UTILITY CONSTRUCTION.
17. A 48 HOUR NOTICE IS REQUIRED TO BE GIVEN TO THE DELDOT INSPECTOR PRIOR TO MATERIAL RELEASES.
18. ALL CONCRETE/HOT MIX MATERIALS SHALL BE RELEASED BY THE INSPECTOR PRIOR TO PLACEMENT.
19. MISS UTILITY OF DELAWARE SHALL BE NOTIFIED THREE (3) CONSECUTIVE WORKING DAYS PRIOR TO EXCAVATION, AT 1-800-282-8555.
20. 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.
21. 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.
22. 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).
23. 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.
24. 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.
25. BREAKAWAY POSTS SHALL BE USED WHEN INSTALLING ALL SIGNS. REFERENCE DELDOT STANDARD CONSTRUCTION DETAIL T-15.
26. 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.
27. 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.
28. 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 GROUND MOUNTED ON TWO NCHRP-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.
29. 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).
30. 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 (DELDOT WILL MAKE REPAIRS, AND DELDOT WILL INVOICE E.S.N.G. FOR THE REPAIRS).
31. CONTRACTOR SHALL IMMEDIATELY REPAIR ANY DAMAGED EXISTING DRAINAGE TRENCHES OR UNDERDRAINS ENCOUNTERED DURING CONSTRUCTION.
32. CONTRACTOR SHALL PROVIDE SHORING TO PROTECT THE ROAD FOR ANY EXCAVATION WITHIN 2 FEET OF THE EDGE OF PAVEMENT, PER DELDOT STANDARDS AND SPECIFICATIONS.
33. ALL STORM DRAIN PIPES AND STRUCTURES IMPACTED BY PIPELINE INSTALLATION ARE TO BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.
34. CONTRACTOR SHALL SCHEDULE WITH UTILITY COMPANY TO SHORE/HOLD ALL EXISTING UTILITY POLES WITH IN 5 FEET OF PIPELINE TRENCHING AT CONTRACTORS EXPENSE.
35. TEST STATIONS SHALL NOT BE SET IN DITCH LINES OR SLOPES.
36. 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.
37. STONE DRIVEWAYS SHALL BE RESTORED WITH 6" GABC OR MATCH EXISTING (WHICHEVER IS GREATER).
38. COMMERCIAL ENTRANCES SHALL BE DIRECTIONAL DRILLED OR AS SHOWN ON THE PLAN.

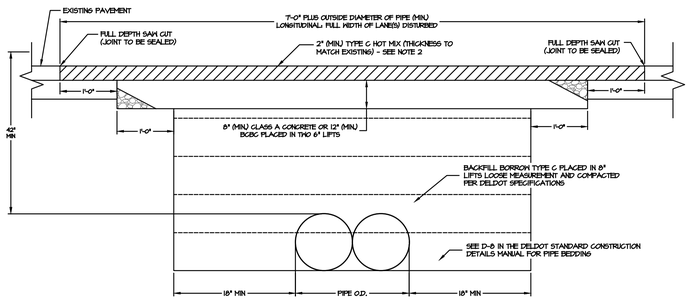
MAINTENANCE OF TRAFFIC / TEMPORARY TRAFFIC CONTROL PLAN - GENERAL NOTES

1. 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.
2. 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.
3. 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 OR IF THE CONTRACTOR'S OPERATIONS ARE DEEMED UNSAFE.
4. 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.
5. 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.
6. 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.
7. 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 MEETING. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. THE CONTRACTOR SHALL NOTIFY THE LOCAL 911 CENTER IF ACCESS TO A FIRE HYDRANT IS TEMPORARILY RESTRICTED.
14. 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 LANE(S) OR SHOULDERS CLOSED, THE LENGTH OF TIME FOR WORK, WHEN THE LANE RESTRICTIONS ARE IN PLACE AND WHEN LANE RESTRICTIONS ARE LIFTED, CONTACT PERSON/PHONE NUMBER AND STATE INSPECTOR. THE TRANSPORTATION MANAGEMENT CENTER CAN BE REACHED AT (302) 659-4600.
15. AT THE END OF EACH WORKDAY, THE CONTRACTOR SHALL CORRECT ALL VERTICAL DIFFERENCES IN ACCORDANCE WITH TABLE 6G-1 OF THE DELAWARE MUTCD.
16. 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.
17. WHEN SIDE ROADS INTERSECT THE WORK ZONE, ADDITIONAL TRAFFIC CONTROL DEVICES SHALL BE ERECTED INCLUDING ADVANCED WARNING SIGNS.
18. ALL STORAGE OF EQUIPMENT AND MATERIAL SHALL COMPLY WITH SECTION 6G.21 OF THE DELAWARE MUTCD.
19. 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.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS/HER WORK WITH OTHER CONTRACTORS IN THE AREA.
21. 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 IS NOT ACCEPTABLE AS A METHOD OF REMOVAL.
22. 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.
23. 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.
24. ALL ROADS LEADING INTO THE WORK ZONE SHALL HAVE "UTILITY WORK AHEAD" AND "END UTILITY WORK" SIGNS.
25. 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 SWEPT ONCE EACH DAY AS A MINIMUM.
26. 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.
27. AS AN ADVANCE WARNING, THE TRUCK SYMBOL (W11-10) 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.
28. 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.
29. 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.
30. ALL STABILIZED CONSTRUCTION ENTRANCE LOCATIONS SHALL BE APPROVED BY DELDOT PRIOR TO INSTALLATION.
30. CONTRACTOR SHALL UTILIZE THE FOLLOWING TRAFFIC CONTROL FROM THE DELAWARE MUTCD MOST CURRENT ADDITION.
    A. TYPICAL APPLICATION 3, FIGURE 6H-3:WORK ON THE SHOULDER OF A TWO LANE ROAD
31. MESSAGE BOARDS ARE REQUIRED 10 DAYS IN ADVANCE OF CONSTRUCTION.



NOTES:
1. TEMPORARY PATCHES FROM WINTER MONTHS SHALL BE PERMANENTLY RESTORED BY MAY 15.
2. IN LIEU OF GABC, ROTOMILLINGS OR CRUSHED CONCRETE CAN BE USED IF THE FOLLOWING REQUIREMENTS ARE MET:
3. - ROTOMILLINGS SPECIAL PROVISION 302254 SHOWN IN APPENDIX L.
4. - CRUSHED CONCRETE SUPPLEMENTAL SPECIFICATIONS 302 AND 821.
5. THE BACKFILL MATERIAL SHALL MEET THE REQUIREMENTS FOR BORROW, TYPE C AS PER SECTION 204 OF THE STANDARD SPECIFICATIONS.
6. COMPACTION SHALL MEET THE REQUIREMENTS AS PER SECTION 204 OF THE STANDARD SPECIFICATIONS.
7. FLOWABLE FILL IS ALLOWABLE AS A BACKFILL MATERIAL. FLOWABLE FILL SHALL MEET THE REQUIREMENTS OF SPECIAL PROVISION 2028500 AS SHOWN IN APPENDIX F.
8. ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL MEET THE REQUIREMENTS SET FORTH IN THE CURRENT DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGES CONSTRUCTION.

TEMPORARY PATCH
N.T.S.
(SOURCE: DELDOT UTILITIES MANUAL - FIGURE 2-3)
MINIMUM DESIGN REQUIREMENTS
(DISTRICT ENGINEER MAY CHANGE REQUIREMENTS IN SPECIAL CASES)



NOTES:
1. PATCH WIDTHS ARE MEASURED ALONG THE ROADWAY CENTERLINE AND SHALL BE THE FULL WIDTH OF THE LANE OR LANES DISTURBED.
2. THIS IS A MINIMUM PATCH. IF THE EXISTING ROADWAY HAS A HEAVIER CROSS SECTION THAN SHOWN HERE, IT WILL BE REPLACED WITH THAT CROSS SECTION, OR AS DIRECTED BY THE ENGINEER.

PERMANENT PATCH
N.T.S.
SOURCE: DELDOT STANDARD CONSTRUCTION DETAIL SHEET NO. P-4

TRAFFIC CONTROL DETAILS

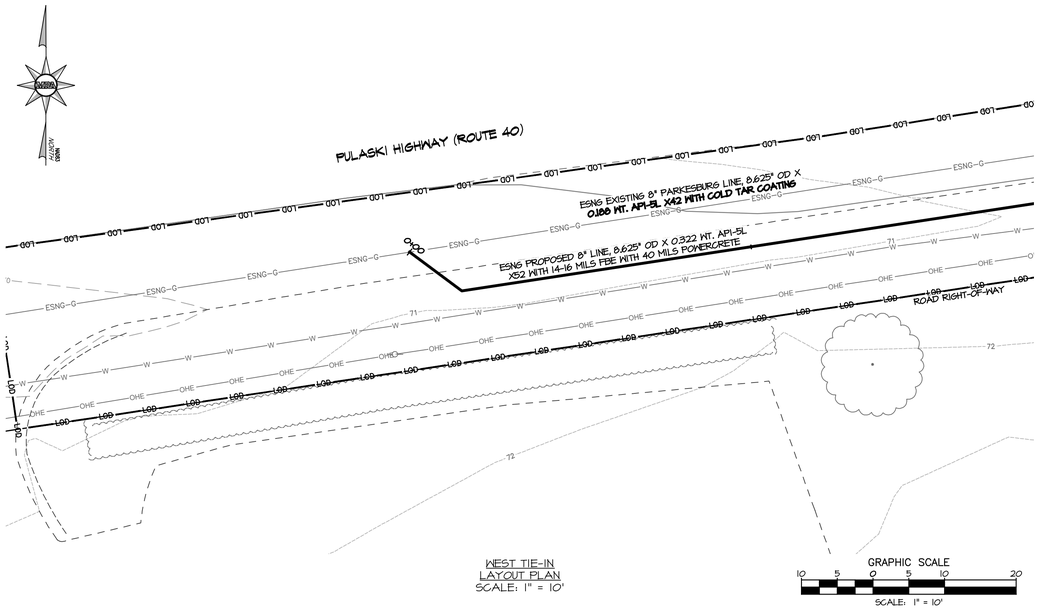
REVISIONS			
NO.	DATE	DESCRIPTION	BY

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
111 RUTHAR DRIVE
NEWARK, DE 19711
(302) 328-2200
MRAGTA.COM

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

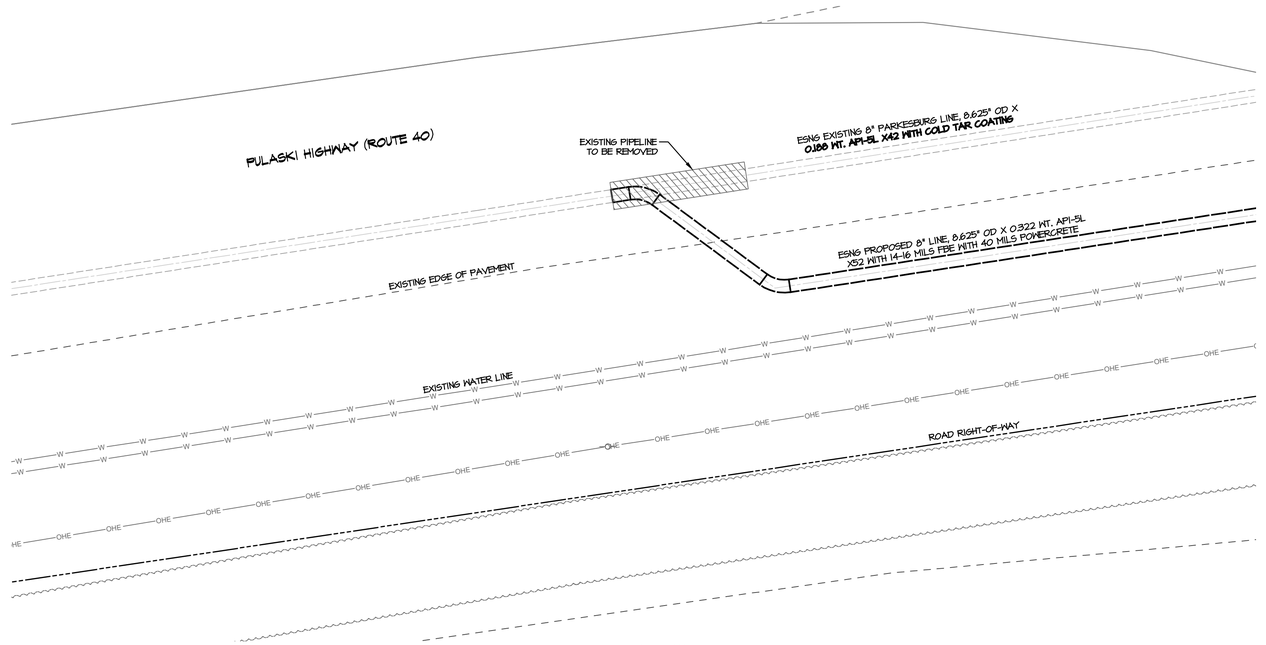
8" PROPOSED PIPELINE
ROUTE 40 REPLACEMENT
NEW CASTLE COUNTY, DE

ESNG PROJ. CODE:		DATE:	8/19/2025
MRA PROJECT NO:	23289	SCALE:	N/A
DESIGN/CHECK BY:	JTH/CWB	SHEET:	6 OF 16



WEST TIE-IN
LAYOUT PLAN
SCALE: 1" = 10'

GRAPHIC SCALE
10 5 0 5 10 20
SCALE: 1" = 10'



WEST TIE-IN PLAN
SCALE: 1/4" = 1'

NOTE:

1. CONTRACTOR SHALL VERIFY VERTICAL AND HORIZONTAL LOCATIONS OF ALL EXISTING FACILITIES PRIOR TO TIE-IN FABRICATION.
2. EXCAVATE WITH CAUTION!!! EXACT LOCATION OF EXISTING UNDERGROUND PIPES & UTILITIES IS UNKNOWN.
3. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION.

REVISIONS			
NO.	DATE	DESCRIPTION	BY

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WEST TIE-IN

8" PROPOSED PIPELINE ROUTE 40 REPLACEMENT
NEW CASTLE COUNTY, DE

ESNG PROJ. CODE:		DATE:	8/19/2025
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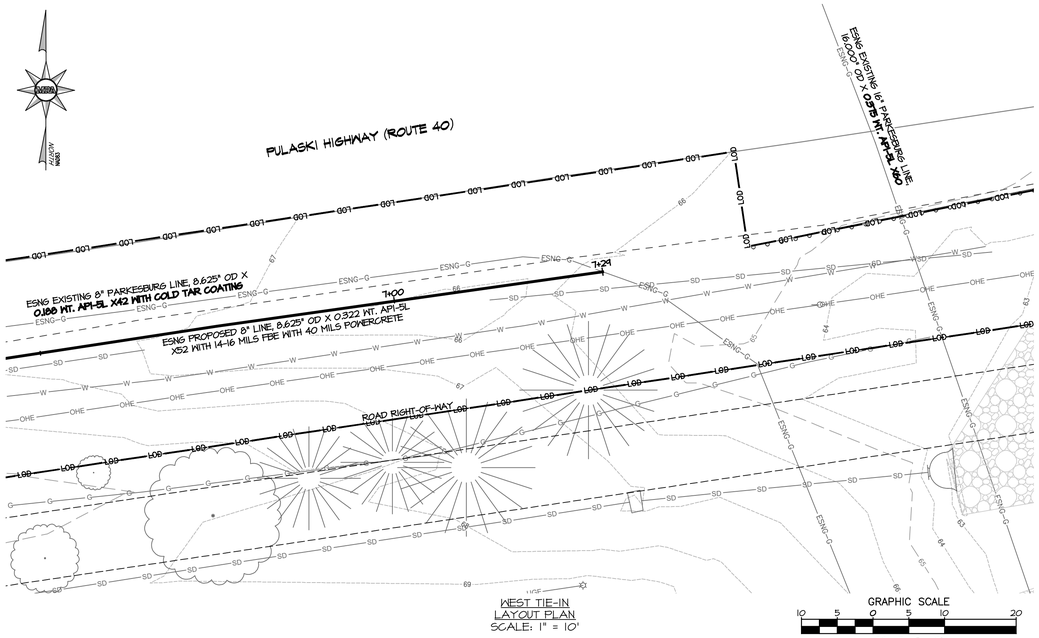

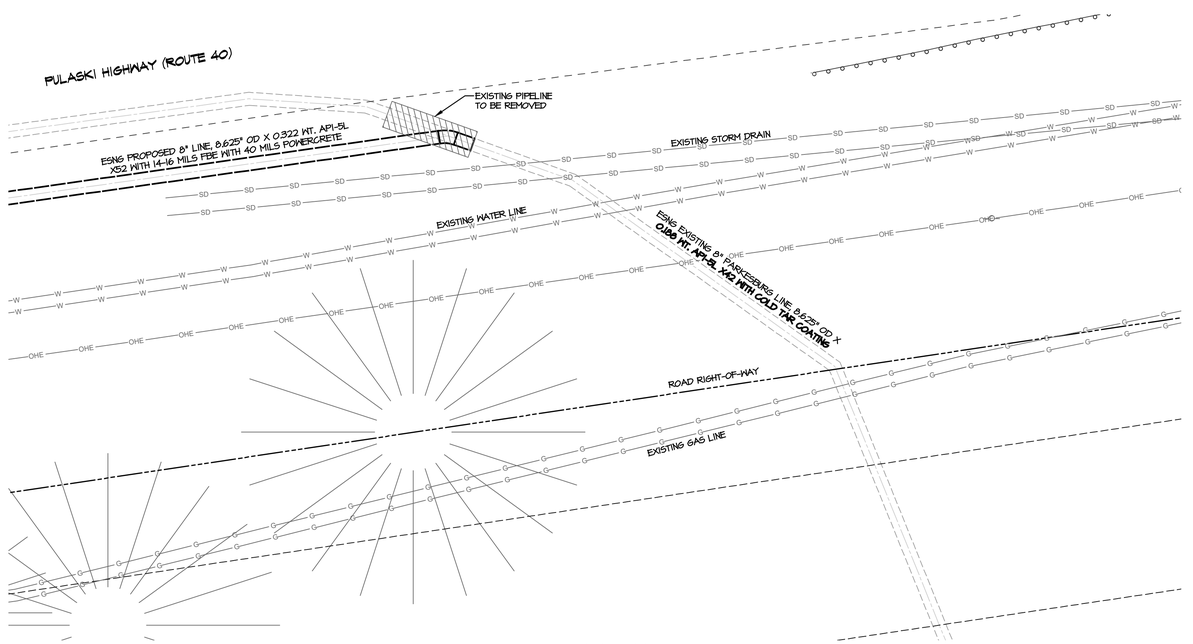

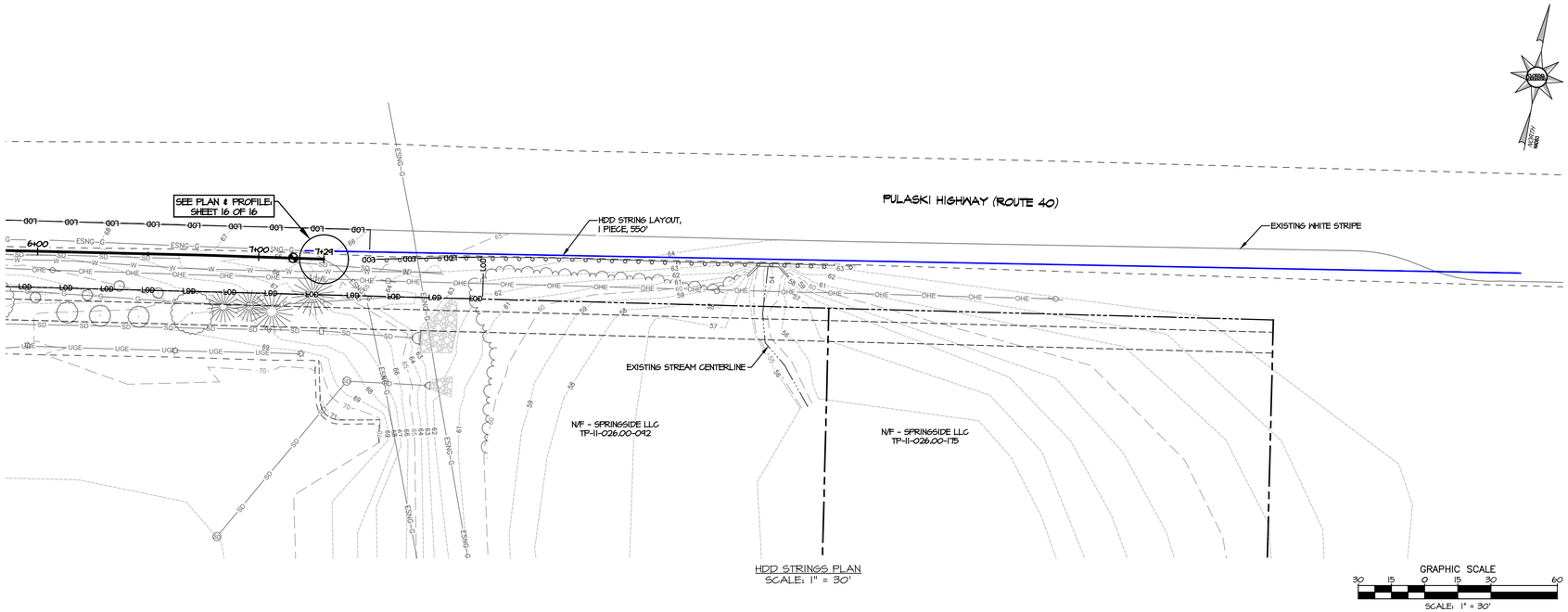

NOTE:

1. CONTRACTOR SHALL VERIFY VERTICAL AND HORIZONTAL LOCATIONS OF ALL EXISTING FACILITIES PRIOR TO TIE-IN FABRICATION.
2. EXCAVATE WITH CAUTION!!! EXACT LOCATION OF EXISTING UNDERGROUND PIPES & UTILITIES IS UNKNOWN.
3. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION.

REVISIONS			
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EAST TIE-IN

8" PROPOSED PIPELINE ROUTE 40 REPLACEMENT NEW CASTLE COUNTY, DE

ESNG PROJ. CODE:		DATE:	8/19/2025
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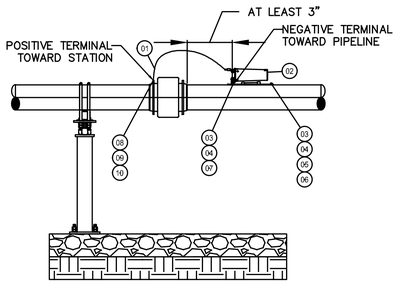
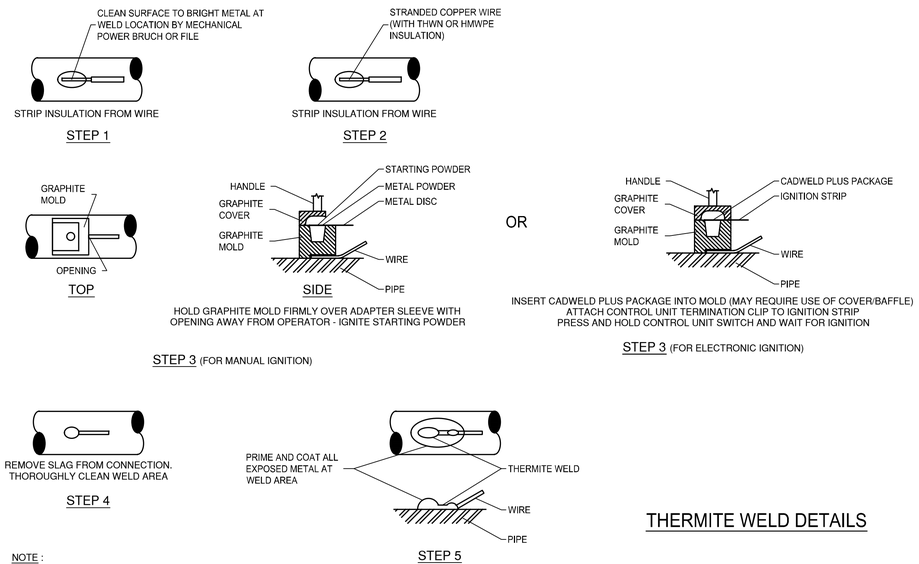


BILL OF MATERIALS- SSD INSTALLATION DETAIL #1		
NO.	QUANTITY	DESCRIPTION
1	1	SSD CONDUCTORS, MTL-6-36-B-X, - #6 AWG WIRE, FURNISHED WITH COMPRESSION TERMINALS
2	1	DAIRYLAND SOLID-STATE DECOUPLER SSD-(-3/+1)-1.2-100
3	2	M8 THREADED STUD PIN BRAZING KIT, BAC PART #278-190-0430
4	2	CERAMIC FERRULE FOR THREADED PINS
5	1	HEX NUT, M8-1.25, 316-SS OR APPROVED EQUIVALENT
6	1	FLAT WASHER, 5/16" DIAMETER, 316-SS OR APPROVED EQUIVALENT
7	1	SSD MOUNTING HARDWARE, DAIRYLAND STUD MOUNTING KIT: HCN-M8
8	1	HEX NUT, 3/8-16, 316-SS OR APPROVED EQUIVALENT
9	1	FLAT WASHER, 3/8" DIAMETER, 316-SS OR APPROVED EQUIVALENT
10	1	STUD, 3/8"-16, 316-SS OR APPROVED EQUIVALENT

NOTES:
1. M8 PINS TO BE PIN-BRAZED ONTO PIPE, NO CLOSER THAN 3" FROM ANY WELD. SSD BRACKET TO BE MOUNTED ON PINS.
2. CONDUCTORS TO BE CUT TO SHORTEST LENGTH POSSIBLE & RUN IN THE MOST DIRECT MANNER BETWEEN THE SSD TERMINAL AND THE CONNECTION POINT.
3. CONNECT THE NEGATIVE TERMINAL OF THE DECOUPLING DEVICE TO CATHODICALLY PROTECTED PIPE AND THE POSITIVE TERMINAL TO STATION SIDE PIPE.
4. EXACT ORIENTATION OF SSD IS TO BE DETERMINED IN THE FIELD.
5. SURFACE IS TO BE PREPPED AND PAINTED ACCORDING TO ESNG SPECIFICATIONS FOR ANY PIN-BRAZING.
6. ALL CRIMPED RING TERMINALS ON CONDUCTORS ARE TO BE COVERED WITH HEAT SHRINK WRAP.

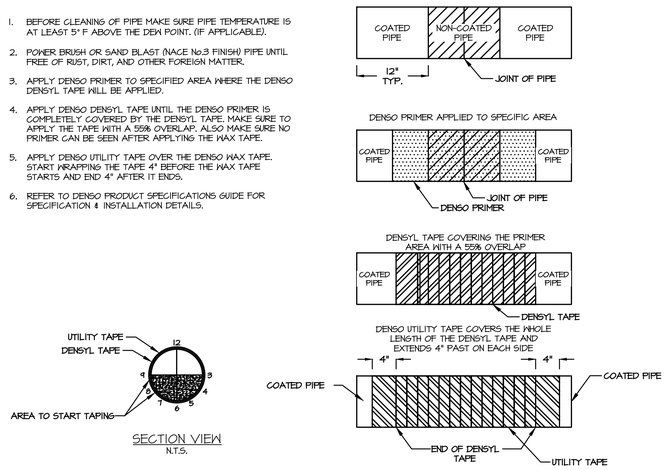
SSD INSTALLATION DETAIL#1:
INSTALLATION ACROSS A HORIZONTALLY INSTALLED MONOLITHIC INSULATOR
NOT TO SCALE



THERMITE WELD DETAILS

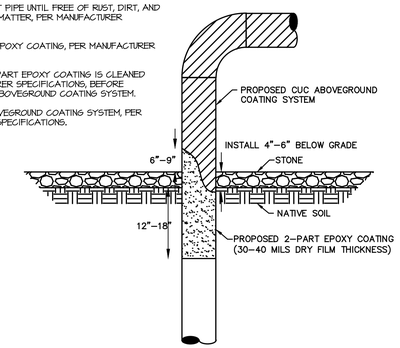
NOTE :
1. THERMITE WELDS MADE TO GAS MAIN SHALL BE COATED WITH TWO PART EPOXY OR THREE PART WAX TAP OR APPROVED EQUAL.
2. REPAIR PIPE COATING IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

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 55% OVERLAP. ALSO MAKE SURE NO PRIMER CAN BE SEEN AFTER APPLYING THE WAX TAPE.
5. APPLY DENSO UTILITY TAPE OVER THE DENSO WAX TAPE. START WRAPPING THE TAPE 4" BEFORE THE WAX TAPE STARTS AND END 4" AFTER IT ENDS.
6. REFER TO DENSO PRODUCT SPECIFICATIONS GUIDE FOR SPECIFICATION & INSTALLATION DETAILS.



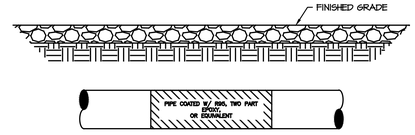
COATING APPLICATION FOR DENSO TAPE COATING
NOT TO SCALE

1. VERIFY PIPE TEMPERATURE IS AT LEAST 5°F ABOVE THE DEW POINT BEFORE CLEANING OF PIPE.
2. ABRASIVE BLAST PIPE UNTIL FREE OF RUST, DIRT, AND OTHER FOREIGN MATTER, PER MANUFACTURER SPECIFICATIONS.
3. APPLY 2-PART EPOXY COATING, PER MANUFACTURER SPECIFICATIONS.
4. ENSURE THAT 2-PART EPOXY COATING IS CLEANED PER MANUFACTURER SPECIFICATIONS, BEFORE APPLYING CUC ABOVEGROUND COATING SYSTEM.
5. APPLY CUC ABOVEGROUND COATING SYSTEM, PER MANUFACTURER SPECIFICATIONS.

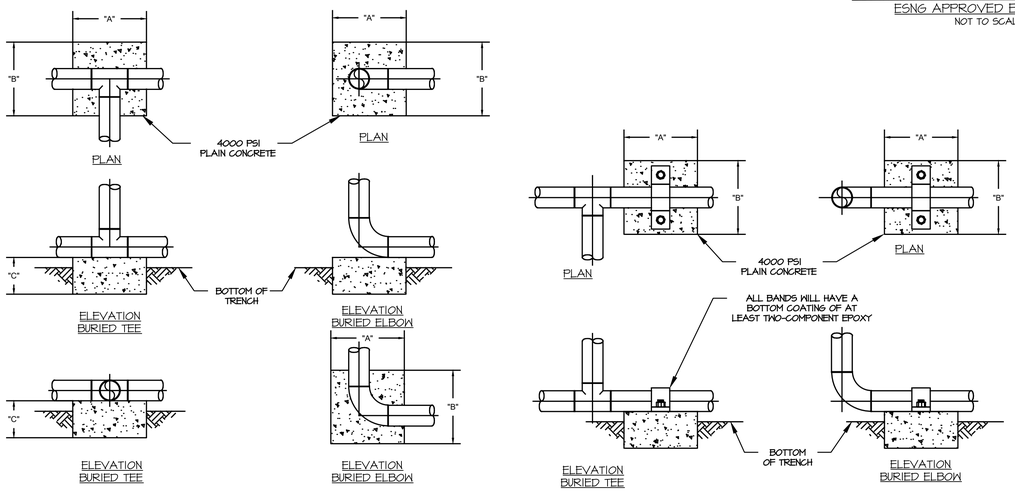


COATING APPLICATION FOR RISER
NOT TO SCALE

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 OF 18" TO 27" SECTION OF PIPE.
4. APPLY CANUSA-CPS HBE-95-BG COATING TO THE FRESHLY CLEANED AREA OF THE PIPE.



COATING APPLICATION FOR HBE-95-BG OR ESNG APPROVED EQUIVALENT
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"

NOTE: CONTRACTOR TO SUPPLY ALL MATERIAL REQUIRED TO FABRICATE SUPPORTS ON THIS DRAWING.

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 "CONWED 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".

CONSTRUCTION DETAILS

REVISIONS			
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ESNG PROJ. CODE:		DATE:	8/19/2025
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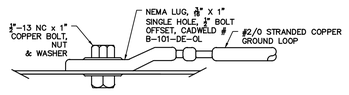
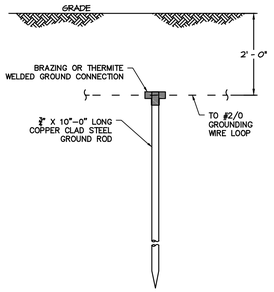


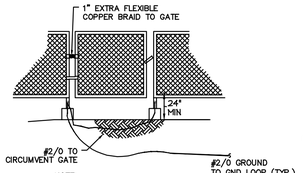
TYPICAL EQUIPMENT BOLTED
GROUND LUG CONNECTION

(NOT TO SCALE)



GROUND ROD INSTALLATION

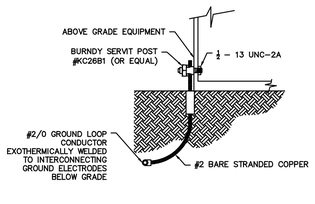
(NOT TO SCALE)



NOTE:
ONLY ONE LEAF SHOWN. TYPICAL BOTH
LEAVES IF APPLICABLE.
SPECIFICATION GRADE COPPER
GROUNDING CLAMP. COORDINATE
PROPER SIZE WITH FENCE CONTRACTOR.

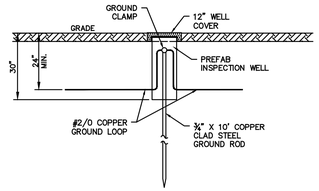
GATE & FENCE GROUNDING

(NOT TO SCALE)



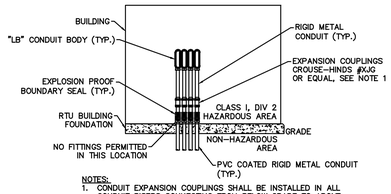
TYPICAL GROUND CONNECTION

(NOT TO SCALE)



DETAIL #10
GROUND ROD INSPECTION WELL

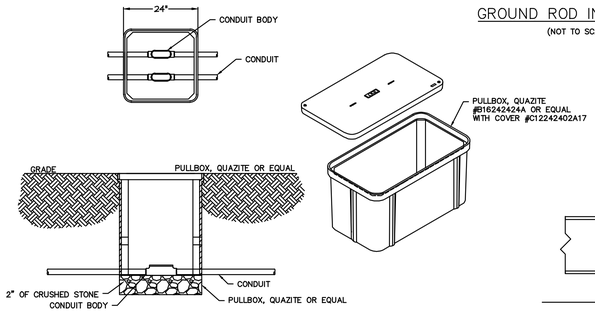
(NOT TO SCALE)



NOTES:
1. CONDUIT EXPANSION COUPLINGS SHALL BE INSTALLED IN ALL CONDUIT RISERS CONNECTING FROM BELOW GRADE TO ABOVE GRADE STRUCTURES. EXPANSION COUPLINGS SHALL BE LOCATED ABOVE HAZARDOUS AREA BOUNDARY SEALS IN ALL RISERS WHERE SUCH SEALS ARE USED.

DETAIL #3
EXTERIOR CONDUIT TO BUILDING INSTALLATION

(NOT TO SCALE)



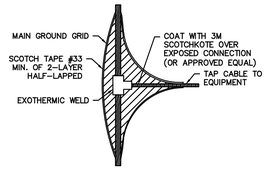
OPEN BOTTOM PULL BOX – TYPICAL

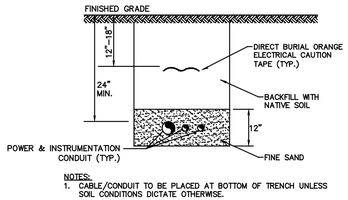
(NOT TO SCALE)

NOTES:
1. THIS DETAIL IS FOR USE WITHIN FENCED ESNG FACILITIES ONLY. ANY PULL BOX INSTALLED IN DELDOT MAINTAINED ROW MUST BE A MINIMUM OF TIER 22 RATED.

GROUNDING DETAILS
CADWELD TAP CONNECTION
TYPICAL

CABLE SIZE		CADWELD CONNECTION	
RUN	TAP	MOLD NUMBER	WELD METAL
#2/0	#2/0	TAC-2G2G	#90
#2/0	#2	TAC-2G1V	#45

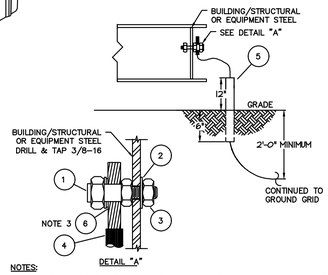




NOTES:
1. CABLE/CONDUIT TO BE PLACED AT BOTTOM OF TRENCH UNLESS SOIL CONDITIONS DICTATE OTHERWISE.

DETAIL #2
UNDERGROUND CABLE/CONDUIT BURIAL

(NOT TO SCALE)

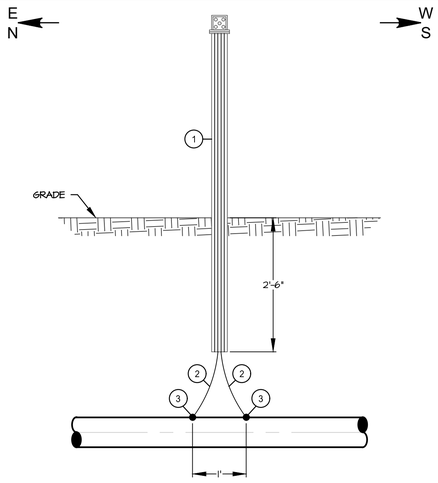


NOTES:
1. CONDUIT STRAPS TO BE USED WNEN CONDUIT STUBS-UP ABOVE GRADE 6" OR MORE.
2. 1" PVC CONDUIT SLEEVE SHALL EXTEND BELOW GRADE 12" MINIMUM.
3. LUBRICATE ALL GROUNDING TERMINATIONS WITH PENETROX A-13.
4. IF SQUARE TUBING IS USED ON THE STRUCTURE INSTEAD OF I-BEAM, ITEMS 2&3 ON BACK SIDE OF BEAM WILL NOT BE USED. SERVIT POST WILL SCREW INTO STRUCTURE ONLY.

MATERIAL		
ITEM	QUANTITY	DESCRIPTION
1	1	GROUNDING CONNECTOR, SERVIT PST, #2 AWG TO FLAT SURFACE, BURNDY TYPE KC
2	1	WASHER, 3/8", SPLIT LOCKWASHER, SILICON BRONZE, BURNDY TYPE 38-SW-BOX
3	1	NUT, 3/8-16, SILICON BRONZE, BURNDY TYPE 38C-HEN-BOX
4	AS REQ'D	WIRE, #2 AWG, STRANDED HMWPE INSULATED GREEN COPPER.
5	AS REQ'D	CONDUIT SLEEVE, 1" SCH. 80 PVC
6	AS REQ'D	OXIDE-INHIBITING JOINT COMPOUND, BURNDY TYPE PENETROX A-13

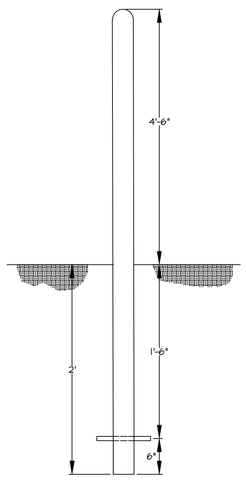
GROUNDING DETAILS
SKID/STRUCTURE GROUNDING TYPICAL

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 #CTCUL30385YEL
2	40	FT	WIRE No. 8 AWG STRANDED COPPER BLACK, THHN
4	2	EA	THERMITE CARTRIDGE No. 15 MAX, OR PIN BRAZE



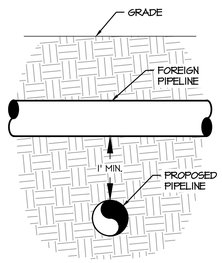
TEST STATION TS-02A

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 WAX 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.

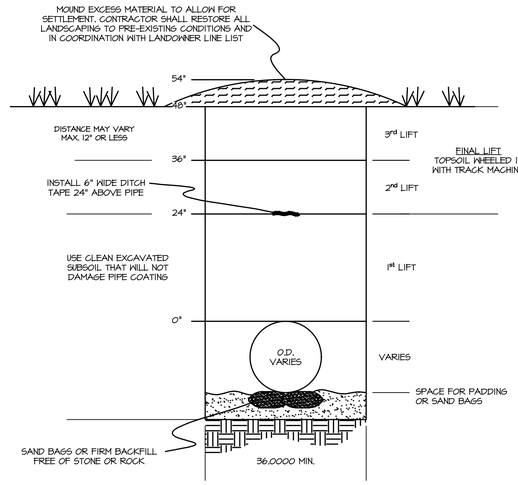


NOTES:
1. COMPANY TO FURNISH MARKER POSTS, TYPICALLY 3-1/2" x 6'-6" POLY PIPE WITH 3/4" x 9" ANCHOR BAR 6" FROM BOTTOM.
2. POLY PIPE TO BE PLACED 2'-0" UNDER FINISH GRADE WITH 4'-6" OF POLY PIPE EXPOSED ABOVE GROUND.
3. LOCATION OF PIPELINE MARKER POSTS TO BE PROVIDED BY ESNG.
4. PIPE LINE MARKERS SHOULD INCLUDE "CAUTION GAS PIPELINE DO NOT DIG." IN ADDITION THE BII LOGO AND NUMBER SHOULD BE ABOVE THE EASTERN SHORE NATURAL GAS LOGO.

PIPELINE MARKER POST
NOT TO SCALE



FOREIGN LINE
CROSSING DETAIL
NOT TO SCALE



NOTES:
1. BELL HOLES AND BORE PITS TO BE MECHANICALLY TAMPED ONCE 24-INCHES OF BACKFILL MATERIAL COVERS PIPE.
2. CONTRACTOR SHALL FOLLOW STATE OR LOCAL REQUIREMENTS FOR BACKFILL WITHIN STATE OR LOCAL RIGHT-OF-WAY OR RAILROAD PROPERTY.

TRENCH BACK FILL DETAIL FOR
AGRICULTURAL OR RESIDENTIAL APPLICATION
N.T.S.

CONSTRUCTION DETAILS

REVISIONS			
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ROUTE 40 REPLACEMENT
NEW CASTLE COUNTY, DE

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EXISTING MAINLINE PIPING AND INSTRUMENTATION DETAILS

REVISIONS			
NO.	DATE	DESCRIPTION	BY

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8" PROPOSED PIPELINE
ROUTE 40 REPLACEMENT
NEW CASTLE COUNTY, DE

ESNG PROJ. CODE:		DATE:	8/19/2025
MRA PROJECT NO:	23289	SCALE:	AS SHOWN
DESIGN/CHECK BY:	JTH/CWB	SHEET:	11 OF 16

PROPOSED MAINLINE PIPING
AND INSTRUMENTATION DETAILS

REVISIONS			
NO.	DATE	DESCRIPTION	BY

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LINE TYPES

TABLE 1

- PRIMARY PROCESS (MAJOR)
- SECONDARY PROCESS (MINOR)
- PACKAGE/SKID LIMITS
- INSTRUMENT OR PROCESS
- PNEUMATIC SIGNAL
- ELECTRIC SIGNAL
- HYDRAULIC SIGNAL
- CAPILLARY TUBE
- LOGIC–SYSTEM LINK SOFTWARE OR DATA LINK

LINE TYPES

TIE–IN PROCEDURE

- PRESSURIZED (GREEN)
- DE–PRESSURIZED (RED)
- LOCATION (CYAN)
- REMOVING (RED)

VALVE POSITION

- OPEN
- CLOSED

VALVE CONNECTION DESIGNATIONS

- THREADED
- FLANGED
- SOCKET WELD
- BUTT WELD

VALVE SYMBOL SIZES

TABLE 3

- > 2" PIPE SIZE
- < 2" PIPE SIZE

CONTINUATION ARROWS

TABLE 4

- XXXXX UNIDIRECTIONAL
- XXXXX BIDIRECTIONAL

PRIMARY FLOW DEVICES

TABLE 5

- FLOW SIGHT GLASS (FG 0000)
- ROTAMETER (FI XX)
- ORIFICE PLATE IN QUICK–CHANGE FITTING
- VORTEX METER
- TURBINE METER
- AVERAGING PITOT TUBE (ANNUBAR)
- PITOT TUBE OR PITOT–VENTURI TUBE
- MASS FLOW (CORIOLIS)
- POSITIVE DISPLACEMENT METER
- ULTRASONIC METER
- FLOW CONDITIONER
- VENTURI TUBE
- FLOW NOZZLE
- RESTRICTION ORIFICE FLANGE SET

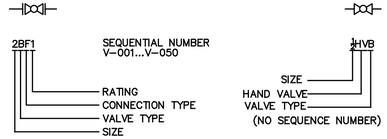
VALVE & ACTUATOR SYMBOLS

- GATE VALVE (UNDEFINED VALVE)
- BALL VALVE
- PLUG VALVE
- GLOBE VALVE
- CHECK VALVE
- NEEDLE VALVE
- BUTTERFLY VALVE
- EXCESS FLOW VALVE
- ANGLE VALVE
- 3–WAY VALVE
- 4–WAY VALVE
- DOUBLE BLOCK & BLEED VALVE
- BLOCK & BLEED VALVE (INSTRUMENT)
- PRESSURE RELIEF VALVE
- PRESSURE RELIEF VALVE
- VACUUM RELIEF VALVE
- PRESSURE AND VACUUM RELIEF VALVE
- PILOT OPERATED RELIEF VALVE
- RUPTURE DISC (PRESSURE)
- RUPTURE DISC (VACUUM)
- QUICK EXHAUST VALVE
- SHUTTLE VALVE
- 3–WAY SOLENOID OPERATED VALVE VENTS WHEN DE–ENERGIZED
- 3–WAY SOLENOID OPERATED VALVE WITH MANUAL RESET
- PISTON OPERATED VALVE, SINGLE ACTING
- PISTON OPERATED VALVE, DOUBLE ACTING
- DOUBLE ACTING PISTON, SPRING RETURN
- SOLENOID ACTUATED VALVE
- MOTOR ACTUATED VALVE
- GAS ACTUATED VALVE
- GAS–HYDRAULIC ACTUATED VALVE
- ELECTRO–HYDRAULIC ACTUATED VALVE
- AIR–HYDRAULIC ACTUATED VALVE
- DIAPHRAGM ACTUATED VALVE
- PISTON OPERATED VALVE
- DIAPHRAGM ACTUATED VALVE W/MANUAL OVERRIDE
- PRESSURE REDUCING REGULATOR W/EXTERNAL PRESSURE TAP
- BACK PRESSURE REGULATOR
- PRESSURE–REDUCING REGULATOR
- 3–WAY TEMPERATURE REGULATOR SELF CONTAINED
- DIAPHRAGM ACTUATED VALVE W/POSITIONER (AS POS)
- 3–WAY PILOT OPERATED VALVE VENTS WHEN DE–ENERGIZED
- MOTOR OPERATOR / CONTROL VALVES

MANUAL VALVE IDENTIFICATION

TABLE 7

VALVES 2" AND ABOVE



VALVES BELOW 2"

VALVE TYPE

CODE	TYPE
A	ANGLE
B	BALL
C	CHECK
D	DOUBLE BLOCK/BLEED
F	BUTTERFLY
G	GLOBE
N	NEEDLE
P	PLUG
S	SOLENOID
U	GATE / UNDEFINED
Z	SPECIAL

CONNECTION TYPE

CODE	TYPE
F	FLANGED
W	BUTTWELD
T	THREADED
Z	SOCKETWELD
X	WELD X FLANGE

RATING

CODE	TYPE
1	ANSI 150#
3	ANSI 300#
6	ANSI 600#
9	ANSI 900#
15	ANSI 1500#
AA	WOG 600#
A	WOG 800#
B	WOG 2000#
C	WOG 3000#
D	WOG 6000#

NOTES:

1. REFERENCE ISA STANDARD, "INSTRUMENTATION SYMBOLS AND IDENTIFICATION". ANSI/ISA–S5.1 (LATEST EDITION).
2. REFERENCE NISOURCE GAS TRANSMISSION & STORAGE PIPING MATERIAL LINE CLASS SPECIFICATIONS FOR COMPLETE SPECIFICATION IDENTIFICATION LISTING. (SWEET NATURAL GAS SERIVCE ONLY).

MISCELLANEOUS SYMBOLS

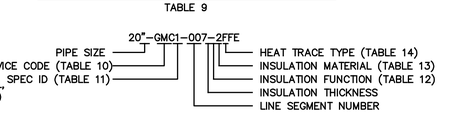
TABLE 8

- REDUCER (CONCENTRIC)
- REDUCER (ECCENTRIC)
- SWAGE
- FLANGE
- BLIND FLANGE (DRILL & TAP)
- UNION
- INSULATING FLANGES
- INSULATING UNION
- INSULATING JOINT (IJ)
- SPECTACLE BLIND (OPEN) (3)
- SPECTACLE BLIND (CLOSED) (5)
- WELD CAP
- THREADED CAP
- THREADED PLUG (ON VALVE)
- HOSE CONNECTION
- PIG SIGNAL
- CLAPPER TYPE VENT (RAIN CAP)
- BLOW OFF CLOSURE
- GOOSE NECK VENT
- SPACER
- FILTER OR BASKET STRAINER
- STRAINER ("Y" TYPE)
- STRAINER ("T" TYPE)
- TS = TEMPORARY STRAINER (XX)
- CS = CONE STRAINER
- EXPANSION JOINT
- EXPANSION LOOP
- FLEXIBLE CONNECTION
- TEST RING W/VALVE (BLEED RING)
- BLANKING CAP
- NOZZLE (XX")
- MULTIPLE COUPLINGS AROUND PIPE
- COUPLING
- PIPE TAP (O–LET)
- SPHERICAL TEE
- FLOW ARROW
- TYPICAL INSTRUMENT VALVE

- TIE–IN POINT (TP)
- IDENTIFIES CHANGE SUCH AS SPEC ID, INSULATION MATERIAL, (ABOVE/BELOW GRADE SHOWN) (AG – BG)
- HORIZONTAL IDENTIFIER (AB 150# – ESNG 600#)
- STEAM OR DRAIN TRAP (T)
- FILTER–DRYER (INSTRUMENT) (D)
- FILTER–DRYER W/REGULATOR(S) [INSTRUMENT] (DR)
- FILTER (INSTRUMENT) (F)
- THREE PORT NEEDLE VALVE (3)
- FIVE PORT NEEDLE VALVE (5)
- HORN
- SPECIALTY ITEM (THIEF HATCH SHOWN) (SP – THIEF HATCH)
- CORROSION COUPON (CC)
- EQUIPMENT CONNECTION POINT X = CONNECTION ID PER VENDOR DRAWINGS (X)
- OPEN DRAIN
- BARRED TEE
- STOPPLE
- NODE FOR PFD ONLY CORROSPONDS TO LDT (1)
- THICKNESS
- INSULATION FUNCTION & MATERIAL (TABLES 12 & 13)
- TYPE INSULATED & HEAT TRACED PIPE (X"F E/T)
- HEAT TRACE TYPE (TABLE 14) [ELECTRICAL TRACE SHOWN]

LINE NUMBER IDENTIFICATION

TABLE 9



SERVICE CODES

TABLE 10

CODE	SERVICE	CODE	SERVICE
AC	AIR, COMBUSTION	MD	METHANOL, DRIP
AI	AIR, INSTRUMENT	MI	METHANOL, INJECTION
AP	AIR, PLANT		
AS	AIR, STARTING	OH	OIL, HYDRAULIC
AU	AIR, UTILITY	OI	OIL, INJECTION
		OL	OIL, LUBRICATING
C	CONDENSATE	OS	OIL, SEALING
DL	DEHY, LINE	SL	STEAM SERVICE
EP	EXHAUST PIPING	SS	SANITARY SEWER
FD	FLUID, DRAIN	WC	WATER, COOLING
FP	FLUID, PIPELINE LIQUIDS	WD	WATER, DRAIN
		WH	WATER, HEATING
GB	GAS, BYPASS	V	VENT
GD	GAS, DISCHARGE		
GE	GAS, EFFLUENT		
GF	GAS, FUEL		
GM	GAS, MEASUREMENT		
GN	GAS, NATURAL		
GS	GAS, SUCTION		
GT	GAS, TRANSMISSION		
GV	GAS, VENT		
GW	GAS, WELL LINE		
GX	GAS, STARTING		
GZ	GAS, SEAL		

SPEC ID EXAMPLES

TABLE 11 NOTE 2

SPECIFICATION NUMBER	CODE	DESIGN TEMPERATURE	DESIGN PRESSURE	
B	B31.8	–20^ to 140^ F	275 PSIG	CL 150 (C.S)
C	B31.8	–20^ to 130^ F	720 PSIG	CL 300 (C.S)
H	B31.8	–20^ to 200^ F	1350 PSIG	CL 600 (C.S)
J1	B31.3	300^ F	175 PSIG	CL 150 (S.S)
J3	B31.3	–20^ to 130^ F	500 PSIG	CL 300 (S.S)
K	IPC	100^ F	160 PSIG	CL 150 (GALV)
L	IPC	100^ F	160 PSIG	CL 150 (PVC)

INSULATION FUNCTION

TABLE 12

CODE	FUNCTION
C	COLD CONSERVATION
F	FREEZE PROTECTION
G	GENERAL PURPOSE HEAT
H	CONSERVATION
P	PERSONNEL PROTECTION
S	SOUND ATTENUATION

INSULATION MATERIAL

TABLE 13

CODE	MATERIAL
C	CALCIUM SILICATE
F	FIBERGLASS
G	CELLULAR GLASS (FOAM GLASS)
M	MINERAL WOOL
O	OTHER (SPECIFY)
U	URETHANE

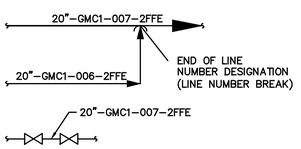
HEAT TRACE TYPE

TABLE 14

CODE	TYPE
E	ELECTRICAL TRACE
O	HOT OIL TRACE
G	GLYCOL TRACE
S	STEAM TRACE
N	NONE USED

LINE NUMBER EXAMPLES

TABLE 15



LINE SEGMENT NUMBER

TABLE 16

NUMBER	SERVICE
100–199	GB–GAS BYPASS GD–GAS DISCHARGE GS–GAS SUCTION
200–299	GN– GAS NATURAL GV– GAS VENT
300–399	GB– GAS BYPASS (FUEL GAS) GF– GAS FUEL GV– GAS VENT (FUEL GAS)
400–499	OL– OIL LUBE OS– OIL SEAL GV– GAS VENT (LUBE OIL)
500–599	AI– AIR INSTRUMENT AB– AIR BYPASS AS– AIR STARTING AU– AIR UTILITY AP– AIR PLANT AV– AIR VENT
600–699	WC– WATER COOLING WP– WATER PIPING
700–799	FD– FLUID DRAIN FP– FLUID P/L LIQUIDS

INSTRUMENT ABBREVIATIONS

(INSIDE INSTRUMENT BALLOONS)

AA*	ANALYSIS ALARM
AC	ANALYSIS CONTROLLER (SAMPLER)
AE	ANALYSIS ELEMENT (SAMPLER)
AI	ANALYSIS INDICATOR
AIC	ANALYSIS INDICATING CONTROLLER
AIS*	ANALYSIS INDICATING SWITCH
AIT	ANALYSIS INDICATING TRANSMITTER
AP	ANALYSIS POINT (CHROMATOGRAPH)
AR	ANALYSIS RECORDER
AS*	ANALYSIS SWITCH
AT	ANALYSIS TRANSMITTER (CHROMATOGRAPH)
AV	ANALYSIS CONTROL VALVE
AY	ANALYSIS RELAY
BA*	BURNER ALARM
BE	BURNER ELEMENT
BS	BURNER SWITCH
EI	VOLTAGE INDICATOR
ES*	VOLTAGE SWITCH
FA*	FLOW ALARM
FC	FLOW CONDITIONER
FCV	FLOW CONTROL VALVE
FE	FLOW ELEMENT
FFC	FLOW RATIO CONTROLLER
FI	FLOW INDICATOR
FIC	FLOW INDICATING CONTROLLER
FIT	FLOW INDICATING TRANSMITTER
FLP	FAIL LAST POSITION
FO	FLOW ORIFICE (RESTRICTION ORIFICE)
FQ	FLOW TOTALIZER/FLOW COMPUTER
FQI	FLOW TOTALIZING INDICATOR
FQS*	FLOW TOTALIZING SWITCH
FR	FLOW RECORDER
FRCV	FLOW RECORDING CONTROL VALVE
FS*	FLOW SWITCH
FT	FLOW TRANSMITTER
FV	FLOW VALVE
FX	FLOW STRAIGHTENING VANE
FY	FLOW RELAY
FYY	FLOW COMPUTING RELAY (MASS)
HC	HAND CONTROLLER
HCV	HAND CONTROL VALVE
HS	HAND SWITCH
HV	HAND VALVE
GU	INSTRUMENT GAS SUPPLY COLUMN
L	LEVEL DEVICE
LA*	LEVEL ALARM
LC	LEVEL CONTROLLER
LCV	LEVEL CONTROL VALVE
LG	LEVEL GAUGE GLASS
LI	LEVEL INDICATOR (OTHER THAN LG)
LIC	LEVEL INDICATING CONTROLLER
LR	LEVEL RECORDER
LS*	LEVEL SWITCH
LT	LEVEL TRANSMITTER
LV	LEVEL VALVE
MA*	MOISTURE ALARM
MC	MOISTURE CONTROLLER
ME	MOISTURE ELEMENT
MI	MOISTURE INDICATOR
MR	MOISTURE RECORDER
MS*	MOISTURE SWITCH
MT	MOISTURE ANALYZER/TRANSMITTER
OPPV	OVER PRESSURE PROTECTION VALVE
OSA*	OVER SPEED ALARM
OSS*	OVER SPEED SWITCH
PA*	PRESSURE ALARM
PC	PRESSURE CONTROLLER
PCV	PRESSURE CONTROL VALVE (SELF–CONTAINED)
PDIA	PRESSURE DIFFERENTIAL INDICATING ALARM
PDCV	PRESSURE DIFFERENTIAL CONTROL VALVE
PDI	PRESSURE DIFFERENTIAL INDICATOR
PDIC	PRESSURE DIFFERENTIAL INDICATING CONTROLLER
PDIS	PRESSURE DIFFERENTIAL INDICATING SWITCH
PDR	PRESSURE DIFFERENTIAL RECORDER
PDT	PRESSURE DIFFERENTIAL TRANSMITTER
PDIT	PRESSURE DIFFERENTIAL INDICATING TRANSMITTER
PEV	PRESSURE EQUALIZATION VALVE
PI	PRESSURE INDICATOR
PIC	PRESSURE INDICATING CONTROLLER
PIT	PRESSURE INDICATING TRANSMITTER
PR	PRESSURE RECORDER
PRC	PRESSURE RECORDING CONTROLLER
PRV	PRESSURE REGULATING VALVE
PSH	PRESSURE SWITCH
PSE	PRESSURE SAFETY HEAD
PSV	PRESSURE SAFETY/RELIEF VALVE
PT	PRESSURE TRANSMITTER
PV	PRESSURE CONTROL VALVE
PY	PRESSURE RELAY
RSI	REMOTE SHUT–IN
SA*	SPEED ALARM
SDV	SHUTDOWN VALVE
SE	SPEED ELEMENT (TACHOMETER PICK–UP)
SS*	SPEED SWITCH
ST	SPEED TRANSMITTER
STR	STRAINER
SVC	SOLENOID VALVE CLOSED
SVO	SOLENOID VALVE OPEN
TA*	TEMPERATURE ALARM
TC	TEMPERATURE CONTROLLER
TCV	TEMPERATURE CONTROL VALVE (SELF–CONTAINED)
TDI	TEMPERATURE DIFFERENTIAL INDICATOR
TE	TEMPERATURE ELEMENT (WITH THERMOWELL)
TI	TEMPERATURE INDICATOR (WITH THERMOWELL)
TIC	TEMPERATURE INDICATING CONTROLLER
TICV	TEMPERATURE INDICATING CONTROL VALVE
TR	TEMPERATURE RECORDER
TRC	TEMPERATURE RECORDING CONTROLLER
TRCV	TEMPERATURE RECORDING CONTROL VALVE
TS*	TEMPERATURE SWITCH
TT	TEMPERATURE TRANSMITTER
TIT	TEMPERATURE INDICATING TRANSMITTER
TV	TEMPERATURE CONTROL VALVE
TW	TEMPERATURE TEST CONNECTION (THERMOWELL)
VA*	VIBRATION ALARM
VE	VIBRATION ELEMENT
VS*	VIBRATION SWITCH
XA*	RESERVED FOR SHUTDOWN DEVICE ANNUNCIATOR POINT
XI	PIG PASSAGE INDICATOR
XII	PIG SIG INDICATOR
XS	DIGITAL PROGRAMMABLE SWITCH TO SPECIAL RELAY (USUALLY A SOLENOID)
XY	SPECIAL RELAY (USUALLY A SOLENOID)
ZA*	DEVICE: I/P, SDV, RELAY, ETC.
ZE	POSITION ALARM (MOTION)
ZI	POSITION DETECTOR (MOTION)
ZIC	POSITION INDICATOR
ZIO	POSITION INDICATOR LAMP (VALVE CLOSED)
ZS*	POSITION INDICATOR LAMP (VALVE OPEN)
ZSC	POSITION SWITCH (MOTION)
ZSO	POSITION INDICATOR SWITCH (VALVE CLOSED)
ZT	POSITION INDICATOR SWITCH (VALVE OPEN)
	POSITION TRANSMITTER

* ALARMS, SWITCHES AND ANNUNCIATORS MAY HAVE SUFFIX LETTERS AS FOLLOWS:

L	DENOTES LOW ALARM
LL	DENOTES LOW SHUTDOWN
H	DENOTES HIGH ALARM
HH	DENOTES HIGH SHUTDOWN

NOTE:
INDENTIFICATION OF INSTRUMENTS NOT COVERED IN THE LISTINGS ABOVE SHALL CONFORM TO ANSI/ISA S5.1 "INSTRUMENT SYMBOLS AND IDENTIFICATION".

ABBREVIATIONS

TABLE 16

AG	ABOVE GROUND
ALM	ALARM
APU	AUXILIARY POWER UNIT
A/M	AUTO–MANUAL SELECTOR
AS	AIR SUPPLY
ASV	ANTI–SURGE VALVE
ASC	ANTI–SURGE CONTROLLER
ATM	ATMOSPHERE
ATS	AUTO TRANSFER SWITCH
BD	BLOW DOWN
BF	BLIND FLANGE
BIF	BURIED ISOLATING FLANGE
BG	BELOW GROUND
CC	CORROSION COUPON
CE	CORROSION COUPON/PROBE
CL	CLOSE
CS	CONE STRAINER
CSC	CAR SEAL CLOSED
CSO	CAR SEAL OPEN
DE	DE–ENERGIZE
DR	DRYER REGULATOR
EFM	ELECTRONIC FLOW MEASUREMENT
EL	ELEVATION
ES	ELECTRIC SUPPLY
ESD	EMERGENCY SHUTDOWN
(F)	FURNISHED WITH EQUIPMENT
FB	FULL BORE
FI	FAIL INTERMEDIATE
FE	FLANGED END
FC	FAIL CLOSED
FO	FAIL OPEN
FL	FAIL LAST
F/S	FAST SLOW SELECTOR
GOV	GAS OPERATED VALVE
GS	GAS SUPPLY
HOA	HAND–OFF–AUTOMATIC SELECTOR
IC	INSPECTION CLOSURE
IJ	INSULATING JOINT
INS	INSULATING
LB	LINE BREAK
LC	LOCKED CLOSED
LDT	LINE DESIGNATION TABLE
L/L	LEAD LAG SELECTOR
LO	LOCKED OPEN
LPC	LOW PRESSURE CONTROLLER
L/R	LOCAL–REMOTE SELECTOR
LSP	LOWER SET POINT
MAOP	MAXIMUM ALLOWABLE OPERATING PRESSURE
MCC	MOTOR CONTROL CENTER
MOP	MAXIMUM OPERATING PRESSURE
MW	MANWAY
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OP	OPEN
O/C	OPEN–CLOSE SELECTOR
OSC	OPEN–STOP–CLOSE SELECTOR
PLC	PROGRAMMABLE LOGIC CONTROLLER
PLT–G	PILOT GAS
PG	POWER GAS
POS	POSITIONER
RA	REVERSE ACTING
RCP	REMOTE CONTROL PANEL
RCV	RECYCLE CONTROL VALVE
RO	RESTRICTION ORIFICE
ROC	FISHER ROC FLOW CONTROLLER
RTD	RESISTENCE TYPE TEMPERATURE ELEMENT
RTU	REMOTE TELEMETRY UNIT
RSP	RAISE SET POINT
SC	SAMPLE CONNECTION
SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
SCP	STATION CONTROL PANEL
SIR	STATION INTERFACE RACK
SP	SET POINT
SPFB	SET POINT FEEDBACK
SR	STRESS RELIEF
SSD	STATION SHUTDOWN
S/S	START–STOP SELECTOR
STA	STATION
TBG	TUBING
TP	TIE–IN POINT
TS	TEMPORARY STRAINER
T/T	TANGENT TO TANGENT
TYP	TYPICAL
UCP	UNIT CONTROL PANEL
USD	UNIT SHUTDOWN
VFD	VARIABLE FREQUENCY DRIVE
VTA	VENT TO ATMOSPHERE
W/	WITH

P&ID SYMBOLS AND LEGENDS

REVISIONS

NO.	DATE	DESCRIPTION	BY

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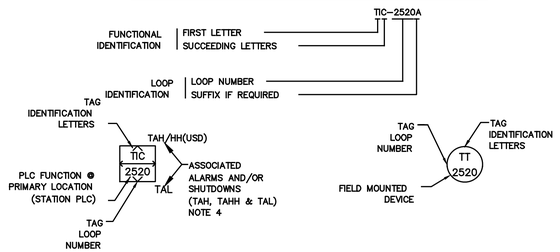
INSTRUMENT IDENTIFICATION LETTERS

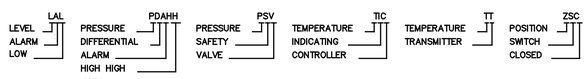
TABLE 17 NOTE 1

	FIRST–LETTER		SUCCEEDING–LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE			CONTROL	CLOSE
D	USER'S CHOICE	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE	MOMENTARY			MIDDLE, INTERMEDIATE
N	UNIT		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE, RESTRICTION		OPEN
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	STATION	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

INSTRUMENT TAG NUMBER LEGEND



INSTRUMENT IDENTIFICATION LETTER EXAMPLES



MISCELLANEOUS

TABLE 18

SHUTDOWN SYSTEM DESIGNATIONS

ESD	FACILITY EMERGENCY SHUTDOWN
USD	UNIT SHUTDOWN
SSD	STATION SHUTDOWN

SSD

A= F.L., CLOSE & LATCH ON ESD, PLC OPERATED
B= F.L., PLC OPERATED
C= F.O., OPEN & LATCH ON ESD, PNEUMATIC ONLY
D= F.C., PLC OPERATED
E= F.L., OPEN & LATCH ON ESD, PLC OPERATED
F= MAN OPEN; CLOSE & LATCH ON ESD
G= PLC CLOSE, PNEUMATIC OPEN ON 5psi DP

HAND SWITCH DESIGNATIONS

HOA F/S	FAST SLOW
HOA	HAND OFF AUTO
S/S	START STOP
L/L	LEAD LAG
L/R	LOCAL REMOTE
O/C	OPEN CLOSED
OSC	OPEN STOP CLOSE

NOTES:

1. REFERENCE ISA STANDARD, "INSTRUMENTATION SYMBOLS AND IDENTIFICATION". ANSI/ISA–S5.1 (LATEST EDITION).
2. EQUIPMENT SYMBOLS SHOWN DO NOT COVER MAJOR ENGINEERED EQUIPMENT.
3. SEE TO ISA STANDARD REFERENCED IN NOTE 1 FOR COMPLETE LISTING OF FUNCTION DESIGNATIONS.
4. HIGH HIGH AND LOW LOW ALARMS TRIP SHUTDOWNS AND ARE GIVEN SHUTDOWN SYSTEM DESIGNATIONS PER TABLE 18.
5. EQUIPMENT TAG NUMBERS SEQUENCED BY DIVISIONS OF 10 OR MORE TO

GENERAL INSTRUMENT OR FUNCTION SYMBOLS

TABLE 19 NOTE 1

LOCATION/ACCESSIBILITY	DISCRETE INSTRUMENTS	SHARED DISPLAY AND CONTROL (DCS)	PROGRAMMABLE LOGIC CONTROL (PLC)	COMPUTER FUNCTION (RTU)
FIELD MOUNTED	○	○	◇	⬡
PRIMARY LOCATION NORMALLY ACCESSIBLE TO AN OPERATOR	⊖	⊖	◈	⬡
PRIMARY LOCATION NORMALLY INACCESSIBLE TO AN OPERATOR	⊖	⊖	FUNC / TAG	FUNC / TAG
AUXILIARY LOCATION NORMALLY ACCESSIBLE TO AN OPERATOR	FUNC / TAG	FUNC / TAG	FUNC / TAG	FUNC / TAG
AUXILIARY LOCATION NORMALLY INACCESSIBLE TO AN OPERATOR	FUNC / TAG	FUNC / TAG	FUNC / TAG	FUNC / TAG
L/LL, H/HH–INSTRUMENTS WITH OUTPUTS FOR ALARMS, TRIPS, PILOT LIGHTS OR INTERLOCK WITH OTHER INSTRUMENT CONTROLS.				

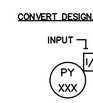
COMPUTED OR RELAY FUNCTION DESIGNATIONS

TABLE 20

FUNCTION DESIGNATIONS NOTE 3

>	= HIGH SELECTOR
<	= LOW SELECTOR
Σ	= SUMMING
√	= ROOT EXTRACTION
2:1	= PROPORTIONAL
∫	= INTEGRAL
Δ	= DIFFERENTIAL
AVE	= AVERAGE
I	= INTERLOCK
I/P	= CURRENT TO PNEUMATIC
X^n	= EXPONENTIAL
f(x)	= CHARACTERIZE
√	= EXTRACT SQUARE ROOT
%	= PERCENT
?	= BIAS (+ OR –)
1:1	= BOOST
1:3	= GAIN
d/dt	= DERIVATIVE
REV	= REVERSE

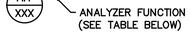
CONVERT DESIGNATIONS



DESIGNATION	SIGNAL
A	ANALOG
B	BINARY
D	DIGITAL
E	VOLTAGE
H	HYDRAULIC
I	CURRENT (ELECTRICAL)
O	ELECTROMAGNETIC OR SONIC
P	PNEUMATIC
R	RESISTANCE (ELECTRICAL)

ANALYSIS DESIGNATIONS

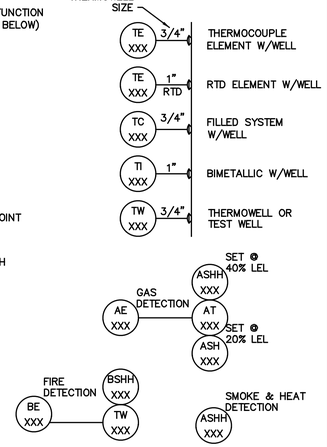
TABLE 21



IDENTIFIER	DESCRIPTION
C_1	METHANE
C_2	ETHANE
C_3	PROPANE
C_4	BUTANE
C_5+	GASOLINE
DENSITY	DENSITY
O_2	OXYGEN
HCDP	HYDROCARBON DEWPOINT
SG	SPECIFIC GRAVITY
GC	GAS CHROMATOGRAPH
N_2	NITROGEN
CO	CARBON MONOXIDE
CO_2	CARBON DIOXIDE
H_2O	WATER (DEW POINT)
H_2S	HYDROGEN SULFIDE

PRIMARY TEMPERATURE DEVICES

TABLE 22

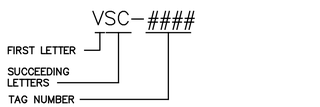


EQUIPMENT TAGGING LEGEND

TABLE 23

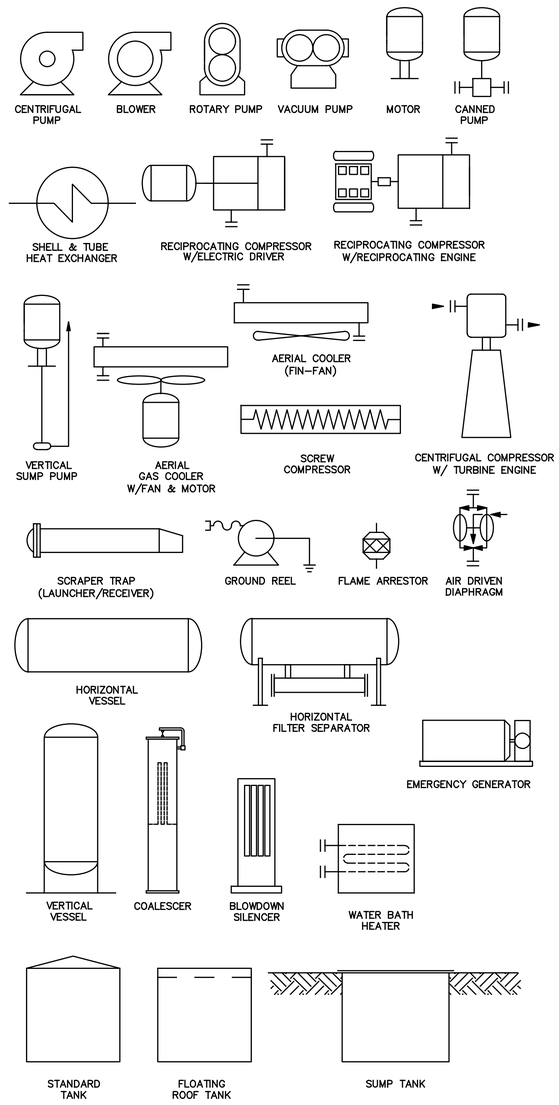
CATEGORY		TYPE		TAG NUMBER SERIES
FIRST LETTER(S) DESIGNATION	DESCRIPTION	FIRST OR SUCCEEDING LETTER(S) DESIGNATION	DESCRIPTION	
NONE	CAVERNS	CV	CAVERNS	
NONE	ROTATING EQUIPMENT			
		B	BLOWERS	
		C	COMPRESSORS	
		M	MOTOR, ELECTRIC	
		F	FANS	
		G	GENERATOR, ELECTRICAL	
		GT	GAS TURBINES	
		P	PUMPS	
		RE	RECIPROCATING ENGINE	
		ST	STEAM TURBINES	
	PRESSURE VESSELS			
		A	ACCUMULATOR	
		C	COALESCER	
		D	DRIERS/DEHYDRATORS	
		F	FILTERS	
		FC	FILTER/COALESCER	
		FS	FILTER SEPARATOR	
		KO	KNOCKOUT	
		PC	PACKED COLUMN/TOWER	
		PD	PULSATION DAMPENERS	
		RX	REACTOR	
		S	SEPARATOR	
		SC	SCRUBBER	
		SL	SLUG CATCHER	
		SP	SPHERES	
		ST	STORAGE/SURGE TANKS (PRESSURE RETAINING)	
		TC	TRAYED COLUMN/TOWER	
		V	VESSELS	
	HEAT EXCHANGERS			
		NONE	SPACE HEATER	
		AC	AIR COOLED	
		DP	DOUBLE PIPE	
		MT	MULTI–TUBE	
		PF	PLATE & FRAME	
		ST	SHELL AND TUBE	
F	FIRED EQUIPMENT			
		B	BOILER	
		BH	BATH	
		CA	CATALYTIC HEATER	
		CH	COIL HEATER	
		EL	ELECTRIC HEATER	
		F	FURNACE	
		FA	FORCED AIR SPACE HEATER	
		H	HEATER	
		IN	INCINERATOR	
		L	FLARE	
		TH	THERMOXIDIZER	
		WH	WATER HEATER	
T	TANKS (ATMOSPHERIC PRESSURE)			
M	MIXING EQUIPMENT			
		A	AGITATOR	
		J	JET MIXER	
		S	STATIC IN–LINE MIXER	
SK	SKIDDED/PACKAGED EQUIPMENT	ALL	ALL	
NONE	OTHER			
		FA	FLAME ARRESTOR	
		BD	BUILDING	
		L	LAUNCHER/SCRAPER TRAP	
		MR	METER RUNS	
		O	ODERIZER	
		PV	PROVERS	
		R	RECEIVER/SCRAPER TRAP	
		S	SILENCER	
		STR	STRAINER	
		SV	STRAIGHTENING VANE	
		XFMR	TRANSFORMER	

EQUIPMENT TAGGING EXAMPLE



EQUIPMENT SYMBOLS

TABLE 24 NOTE 2



P&ID SYMBOLS AND LEGENDS

REVISIONS

NO.	DATE	DESCRIPTION	BY

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
111 RUTHAR DRIVE
NEWARK, DE 19711
(302) 326-2200
MRAGTA.COM

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

8" PROPOSED PIPELINE
ROUTE 40 REPLACEMENT
NEW CASTLE COUNTY, DE

ESNG PROJ. CODE:		DATE:	8/19/2025
MRA PROJECT NO:	23289	SCALE:	AS SHOWN
DESIGN/CHECK BY:	JTH/CWB	SHEET:	14 OF 16

ROUTE 40 RMV PIPING &
INSTRUMENTATION PLAN

REVISIONS			
NO.	DATE	DESCRIPTION	BY

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
111 RUTHAR DRIVE
NEWARK, DE 19711
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DESIGN/CHECK BY:	JTH/CWB	SHEET:	15 OF 16

OWNERSHIP

PULASKI HIGHWAY (ROUTE 40)

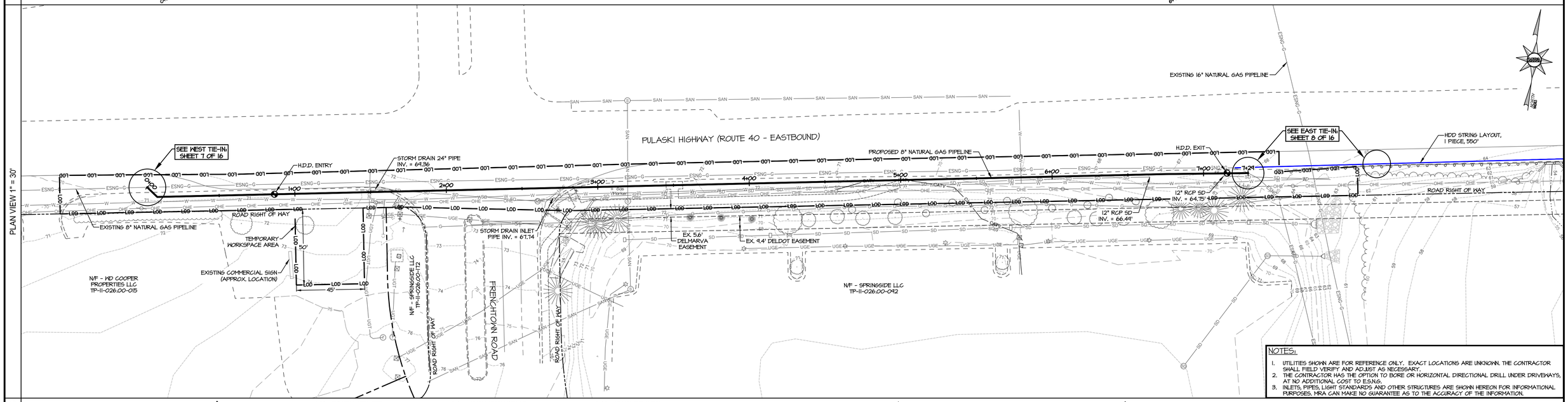
0+00 — 7+29

ANGLES

0+09 45° BEND LEFT

6+75 1° DEFLECTION RIGHT

PLAN VIEW 1" = 30'



STATIONS

0+07 - UTILITY POLE 12.7' RT OF PROPOSED 10"
1+59 - UTILITY POLE 6.9' RT OF PROPOSED 10"
1+68 - ELECTRIC STRUCTURE 13.4' RT OF PROPOSED 10"
1+50 - STORM DRAIN INLET 1.1' LT OF PROPOSED 10"
1+69 - CROSSWALK SIGNAL 10.6' RT OF PROPOSED 10"
2+14 - ELECTRIC BOX 17.9' RT OF PROPOSED 10"
2+60 - STORM DRAIN MANHOLE 8.7' RT OF PROPOSED 10"
2+70 - STORM DRAIN INLET 9.8' RT OF PROPOSED 10"
2+86 - CROSSWALK SIGNAL 2.3' RT OF PROPOSED 10"
2+97 - UTILITY POLE 8.2' RT OF PROPOSED 10"
3+20 - SAN SEWER MANHOLE 9.9' RT OF PROPOSED 10"
4+57 - UTILITY POLE 6.5' RT OF PROPOSED 10"
6+07 - UTILITY POLE 8.4' RT OF PROPOSED 10"

MATERIAL

0+00	0+09	0+10	1+25	6+75	7+29
	9.1' (B)	114.9' (A)	550.0' (B)	54.4' (A)	

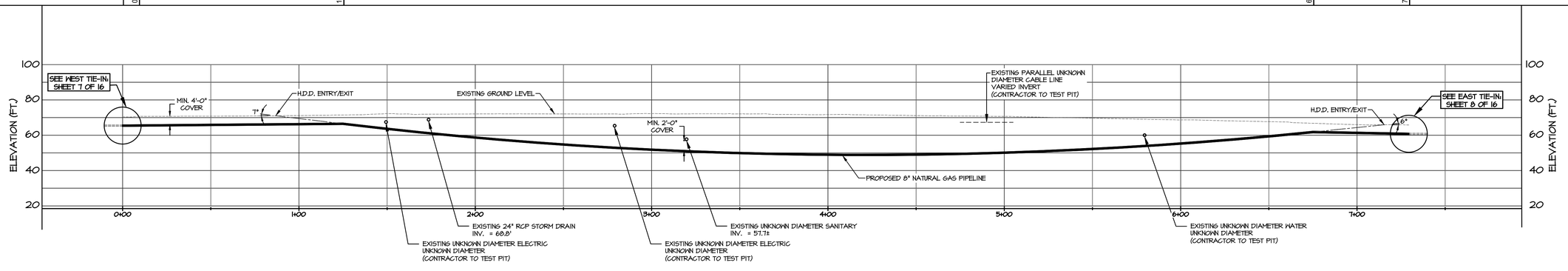
TERRAIN

0+00	0+05	1+65	2+82	3+45	3+56	7+29
PAVED ROAD R.O.W.	CLEARED ROAD R.O.W.	PAVED ROAD R.O.W.	CONCRETE SIDEWALK	CLEARED ROAD R.O.W.	CLEARED ROAD R.O.W.	

CONSTRUCTION METHOD

0+09	1+25	6+75	7+29
OPEN CUT / OPEN TRENCH	H.D.D.	OPEN TRENCH	

PROFILE 1" = 30'



GRAPHIC SCALE
30 15 0 15 30 60
SCALE: 1" = 30'

MATERIAL SPECIFICATIONS

ITEM	DESCRIPTION	QTY	ITEM	DESCRIPTION	QTY.
A	PIPE, 8" x 0.322 X-52, 14-16 MILS FBE	170'			
B	PIPE, 8" x 0.322 X-52, 14-16 MILS FBE W/ 40 MILS POWERCRETE	560'			
C	ELBOW, 8" x 0.322 W.T., Y-52, 3R 90° BEND SEGMENTABLE	N/A			
D	ELBOW, 8" x 0.322 W.T., Y-52, 3R 45° BEND SEGMENTABLE	1			

TEST LEAD/STATIONS

STATION	TYPE	STATION	TYPE

REFERENCE DRAWINGS

DESCRIPTION	DRAWING NUMBER

REVISIONS

NO.	DATE	DESCRIPTION	BY

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
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TELEPHONE (302) 734-6710 - FAX (302) 734-6745

PLAN & PROFILE

8" PROPOSED PIPELINE ROUTE 40 REPLACEMENT NEW CASTLE COUNTY, DE

ESNG PROJ. CODE:		DATE:	8/19/2025
MRA PROJECT NO:	23289	SCALE:	1" = 30'
DESIGN/CHECK BY:	JTH/CWB	SHEET:	16 OF 16