

# **PUBLIC NOTICE**

## **REQUEST FOR PERMISSION TO ALTER A U.S. ARMY CORPS OF ENGINEERS PROJECT UNDER SECTION 408**

**TITLE:** New Jersey American Water, Inc. – Installation of New Water Main Utility Line beneath the Rancocas Creek Federal Navigation Channel between Delanco Township and Riverside Township, both in Burlington County, New Jersey

**PUBLIC NOTICE IDENTIFICATION NUMBER:** 408-NAP-2025-0011

### **PUBLIC NOTICE COMMENT PERIOD:**

Begins: **08 May 2025**

Expires: **23 May 2025**

Interested parties are hereby notified that an application has been received for a Department of the Army Section 408 permission for certain work at or near a federal project of the United States, as described below and shown on attached figures. Written comments are being solicited from anyone having an interest in the requested alteration. Comments will become part of the U.S. Army Corps of Engineers' (USACE's) administrative record and will be considered in determining whether to approve the request. Comments supporting, opposing, or identifying concerns that should be considered by the USACE in its decision process are all welcome.

This public notice is not a paid advertisement and is for public information only. Issuance of this notice does not imply USACE endorsement of the project as described.

**1. REQUESTOR:** In compliance with 33 USC 408 (Section 14 of the Rivers and Harbors Act of 1899; hereinafter Section 408), New Jersey American Water, Inc. has requested permission to install new water main utility line infrastructure with a submarine crossing beneath the Rancocas Creek Federal Navigation Channel.

**2. LOCATION:** The proposed project will cross Rancocas Creek (north to south) just east of the Riverside-Delanco Bridge between Delanco Township and Riverside Township, both in Burlington County, New Jersey; approximate center coordinates 40.044488, -74.957231.

**3. LOCATION MAP(S)/DRAWING(S):** Please see attached Project Plan Sheets 1 - 8.

**4. REQUESTER'S PROPOSED ACTION:** The proposed action entails the installation of approximately 1,399.0.0-linear feet of high-density polyethylene (HDPE) water main utility line infrastructure, with an approximately 450.0-linear foot, 18.0-inch diameter portion of piping installed beneath Rancocas Creek via the horizontal directional drilling (HDD) method. The 450.0-linear foot submarine crossing of Rancocas Creek includes its 200.0-linear foot

wide Federal Navigation Channel. As measured from the top of the pipe, the water main piping will cross beneath the Rancocas Creek Federal Navigation Channel at a depth of 19.5-feet beneath the existing creek bottom, corresponding to -35.89-foot Mean Lower Low Water (MLLW), -36.20-foot Mean Low Water (MLW), and -42.45-foot Mean High Water (MHW). The stated purpose of the project is to form an interconnection between Riverside Township and Delanco Township to allow for better hydraulics in the water main system as well as increased capacity to serve the surrounding communities.

**5. REGULATORY AUTHORITY:** This request will be reviewed according to the provisions of Section 14 of the Rivers and Harbors Act of 1899 (33 U.S.C. 408). A requestor has the responsibility to acquire all other permissions or authorizations required by federal, state, and local laws or regulations, including any required permits from the USACE Regulatory Program under Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403), Section 404 of the Clean Water Act (33 USC Section 1344) and/or Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 USC 1413). Any Section 10/404/103 permit decision associated with the proposed alteration is separate from and will not be included in the Section 408 permission decision. An approval under Section 408 does not grant any property rights or exclusive privileges nor does it authorize any injury to the property or rights of others.

**6. ENVIRONMENTAL COMPLIANCE:** A decision on a Section 408 request is a federal action, and therefore subject to the National Environmental Policy Act (NEPA) and other environmental compliance requirements. While ensuring compliance is the responsibility of USACE, the requester is providing all information that the Philadelphia District identifies as necessary to satisfy all applicable federal laws, executive orders, regulations, policies, and ordinances. Based on information provided by the applicant to date, current Corps regulations governing NEPA implementation, and/or the contents of existing NEPA documentation if available, it is likely that the proposed action will be determined to be categorically excluded from the need to prepare an Environmental Assessment (EA) or Environmental Impact Statement (EIS). This determination will be finalized following completion of agency coordination and prior to issuance of the Section 408 Permission Decision.

**7. EVALUATION:** As part of its evaluation, USACE will first make a determination that the submittal from the requestor is complete. The Philadelphia District is working closely with the requestor to ensure that all required technical plans, maps, drawings, and specifications are provided and are complete. Once the package is complete, a District-led review will be conducted to determine, in accordance with Engineering Circular (EC) 1165-2-216, whether the proposed alteration will impair the usefulness of the USACE Project or be injurious to the public interest, as follows:

- A. *Impair the Usefulness of the Project Determination.* The Philadelphia District's Section 408 review team will determine if the proposed alteration will limit the ability of the federally authorized project to function as authorized, or will compromise or change any authorized project conditions, purposes or outputs.
- B. *Injurious to the Public Interest Determination.* Proposed alterations will be reviewed to determine the probable impacts, including cumulative impacts, on the public

interest. Evaluation of the probable impacts that the proposed alteration to the USACE project may have on the public interest requires a careful weighing of all those factors that are relevant in each particular case. Factors that may be relevant to the public interest depend upon the type of USACE project being altered and may include, but are not limited to, such things as conservation, economic development, historic properties, cultural resources, environmental impacts, water supply, water quality, flood hazards, floodplains, residual risk, induced damages, navigation, shore erosion or accretion, and recreation. The decision whether to approve an alteration will be determined by the consideration of whether benefits are commensurate with risks. If the potential detriments are found to outweigh the potential benefits, then it may be determined that the proposed alteration is injurious to the public interest.

**8. SOLICITATION OF COMMENTS:** The USACE is soliciting comments from the public; federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of the proposed activity. Any comments received will be considered by USACE to determine whether to issue, modify, condition, or deny a permission for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and other public interest factors listed above. Comments are considered in making a final determination whether the proposed action will be categorically excluded from the need to prepare further NEPA documentation. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

- A. It should be noted that materials submitted as part of the Section 408 request become part of the public record and are thus available to the general public under the procedures of the Freedom of Information Act (FOIA). Individuals may submit a written request to the Philadelphia District Corps of Engineers, Office of Counsel to obtain copies of said materials under the FOIA.
- B. It is presumed that all parties viewing this notice will wish to respond to this public notice; therefore, a lack of response will be interpreted as meaning that there is no objection to the project as described.

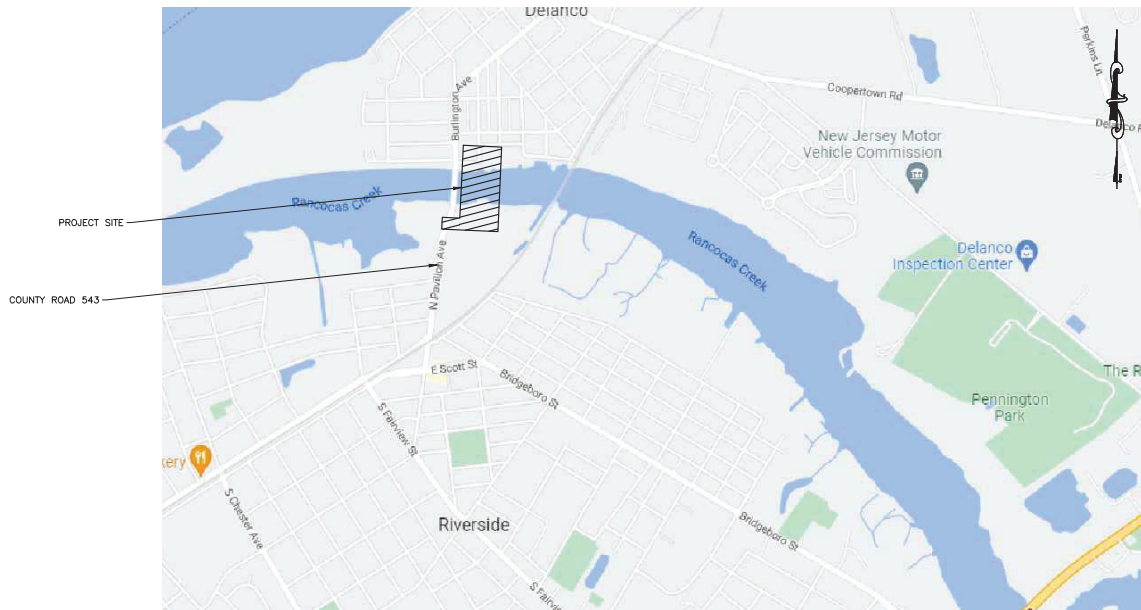
**9. COMMENT SUBMISSION AND ADDITIONAL INFORMATION:** Written comments on the described work should reference the USACE Public Notice Identification Number found on the first page of this notice. Comments must reach this office no later than the stated expiration date of the Public Notice to become part of the record and be considered in the decision. Comments or requests for additional information should be emailed or mailed to the following address:

Email: [Bishel.Baby@usace.army.mil](mailto:Bishel.Baby@usace.army.mil)  
U.S. Army Corps of Engineers  
Philadelphia District  
Attn: Bishel B. Baby  
1650 Arch Street, 7th Floor  
Philadelphia, PA 19103-2004



NEW JERSEY  
AMERICAN WATER

**BURLINGTON WATER MAIN CROSSING  
RANCOCAS CREEK HORIZONTAL DIRECTIONAL DRILL  
TOWNSHIPS OF RIVERSIDE AND DELANCO  
BURLINGTON COUNTY, NEW JERSEY**



**DRAWING INDEX**

- No. G1 TITLE SHEET
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REVISIONS	
1	PER SESC COMMENTS DATED 11.3.2023
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REVISIONS	
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REMINGTON  
& VERNICK  
ENGINEERS  
2059 SPRINGDALE ROAD  
CHERRY HILL, NJ 08003  
(609) 795-9395, FAX (609) 795-1882  
WEB SITE ADDRESS: WWW.RVE.COM  
Certification of Authorization: 24 CA 2002200  
--ENGINEERING EXCELLENCE--

STEPHANIE CUTHBERT  
*Stephanie Cuthbert*  
DATE: 5-2-2025  
NJ LICENSED PROFESSIONAL ENGINEER  
NO. 42136

AMERICAN WATER ENGINEERING  
1 WATER STREET  
CAMDEN, NJ 08102  
**AMERICAN WATER**  
DRAWN BY: SYDNEY IATAROLA  
PROJECT ENG'R: SYDNEY IATAROLA  
DATE: 2.2023  
PROJECT: 3595X070

TITLE SHEET  
BURLINGTON WATER MAIN CROSSING  
RANCOCAS CREEK HORIZONTAL DIRECTIONAL DRILL  
TOWNSHIPS OF RIVERSIDE AND DELANCO, NEW JERSEY

NEW JERSEY AMERICAN WATER		USE DIMENSIONS ONLY SCALE AS SHOWN
85% COMPLETE DRAWINGS, NOT FOR CONSTRUCTION PURPOSES		G1

# SURVEYOR LEGEND:

	SIGN
	SANITARY VALVE
	WATER VALVE
	GAS VALVE
	GUY ANCHOR
	PARKING STALL COUNT
	WATER MANHOLE
	SANITARY MANHOLE
	STORM MANHOLE
	CLEAN OUT
	UTILITY POLE
	EXISTING TREE
	SOIL BORING LOCATION
	FIRE HYDRANT
	ELECTRICAL
	GAS
	WATER
	STORM
	SANITARY
	SANITARY FORCE MAIN
	TELEPHONE
	COMMUNICATIONS
	OVERHEAD WIRE
	WETLANDS
	TRANSITION AREA LIMIT
	EDGE OF WATER
	EDGE OF STREAM
	100YR FLOOD
	RIPIARIAN ZONE LIMIT
	TOP OF BANK
	SOIL BOUNDARY
	RIGHT OF WAY LINE
	PROPERTY LINE
	SET BACK LINES
	SIGHT TRIANGLE
	EASEMENT
	CONCRETE CURB
	EDGE OF PAVEMENT (EXISTING)
	PAVEMENT CENTERLINE
	GUIDE RAIL
	FENCE
	EXISTING MINOR CONTOUR LINES
	EXISTING MAJOR CONTOUR LINES
	TREE LINE
	FULL DEPTH ASPHALT PAVEMENT
	CONCRETE
	GRAVEL
	DIRT ROAD

# LEGEND:

	SIGN
	SANITARY GATE VALVE
	WATER VALVE
	GAS VALVE
	GUY ANCHOR
	PARKING STALL COUNT
	WATER MANHOLE
	SANITARY SEWER MANHOLE
	STORM MANHOLE
	CLEAN OUT
	UTILITY POLE
	EXISTING TREE
	SOIL BORING LOCATION
	STORM INLET PROTECTION
	FIRE HYDRANT
	ELECTRICAL
	GAS
	WATER
	STORM
	SANITARY
	SANITARY FORCE MAIN
	TELEPHONE
	COMMUNICATIONS
	OVERHEAD WIRE
	WETLANDS
	TRANSITION AREA LIMIT
	EDGE OF WATER
	EDGE OF STREAM
	100YR FLOOD
	RIPIARIAN ZONE LIMIT
	TOP OF BANK
	SOIL BOUNDARY
	RIGHT OF WAY LINE
	PROPERTY LINE
	SET BACK LINES
	SIGHT TRIANGLE
	EASEMENT
	CONCRETE CURB
	EDGE OF PAVEMENT (PROPOSED)
	EDGE OF PAVEMENT (EXISTING)
	GUIDE RAIL
	FENCE
	EXISTING MINOR CONTOUR LINES
	EXISTING MAJOR CONTOUR LINES
	TREE LINE
	FULL DEPTH ASPHALT PAVEMENT
	CONCRETE
	GRAVEL
	DIRT ROAD
	ROCK CONSTRUCTION ENTRANCE (RCE)
	TOP OF SLOPE BERM (TDS-X)
	TRANSITION AREA LIMIT
	LIMIT OF DISTURBANCE (L.O.D.)
	SLT FENCE
	TREE PROTECTION FENCE
	WEIGHTED SEDIMENT FILTER (WSF-XX)
	STOCK PILE / STAGING AREA
	COMPOST FILTER SOCK (CFS-XX)

# GENERAL NOTES:

- ALL WATER AND SANITARY FACILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH NEW JERSEY AMERICAN WATER COMPANY (NAJAW) BURLINGTON CO. SOIL AND WATER CONSERVATION DISTRICT & NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION (NJDEP) STANDARDS.
- CONTRACTOR SHALL CONTACT NJ ONE CALL PRIOR TO CONSTRUCTION.
- THE EXISTING UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON AVAILABLE INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL UTILITIES BEFORE COMMENCING WORK AND FOR ANY DAMAGES WHICH OCCUR BY HIS FAILURE TO LOCATE OR PRESERVE THESE UNDERGROUND UTILITIES. IF DURING CONSTRUCTION OPERATIONS THE CONTRACTOR SHOULD ENCOUNTER UTILITIES OTHER THAN THOSE SHOWN ON THE PLANS, HE SHALL IMMEDIATELY NOTIFY THE ENGINEER AND TAKE NECESSARY AND PROPER STEPS TO PROTECT THE FACILITY AND ASSURE CONTINUANCE OF SERVICE.
- THE CONTRACTOR IS CAUTIONED THAT ALL SANITARY LATERALS, WATER SERVICES AND UTILITY SERVICES HAVE NOT BEEN LOCATED. WHEN THE CONTRACTOR ENCOUNTERS AN OBSTRUCTION AND CANNOT ADJUST THE ALIGNMENT USING ALLOWABLE JOINT DEFLECTION, THE CONTRACTOR SHALL INSTALL NECESSARY FITTINGS TO MAKE REQUIRED CONNECTION. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE PROMPT REPAIR OF DAMAGED UTILITIES, AND SHALL MAINTAIN ON SITE AN ADEQUATE SUPPLY OF REPAIR MATERIALS.
- EXCAVATIONS OR TRENCHING WITHIN CLOSE PROXIMITY TO UNDERGROUND FACILITIES OR UTILITY POLES WILL REQUIRE PROTECTION TO PREVENT DAMAGE OR INTERRUPTION OF SERVICE TO UNDERGROUND FACILITIES. THE COST TO PROVIDE THIS PROTECTION WILL BE BORNE BY THE CONTRACTOR.
- CONTRACTOR SHALL COORDINATE THE INSTALLATION OF WATER FACILITIES IN THE VICINITY OF UTILITY POLES WITH THE RESPECTIVE UTILITY PROVIDER. UTILITY POLES SHALL BE RESTRAINED AS MAY BE REQUIRED DURING CONSTRUCTION, AND CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CHARGES OR FEES FROM THE UTILITY COMPANY.
- ALL WATER MAINS REQUIRE A MINIMUM OF FOUR FEET (4'-0") COVER UNLESS OTHERWISE APPROVED BY NAJAW.
- WATER AND SANITARY SEWER LINES SHALL HAVE A MINIMUM OF TEN (10) FEET HORIZONTAL SEPARATION OTHERWISE ALL WATER MAIN JOINTS SHALL BE FULLY RESTRAINED.
- WATER AND STORM SEWER LINES SHALL HAVE A MINIMUM OF FOUR (4) FEET HORIZONTAL SEPARATION UNLESS OTHERWISE APPROVED BY NAJAW.
- SANITARY AND STORM SEWER LINES SHALL HAVE A MINIMUM OF EIGHTEEN (18) INCH VERTICAL SEPARATION FROM THE WATER LINE UNLESS OTHERWISE APPROVED BY NAJAW.
- ONLY NAJAW PERSONNEL SHALL OPERATE MAIN LINE VALVES FOR THE CONTRACTOR.
- CONTRACTOR TO COORDINATE SHUTDOWN OF WATER WITH NAJAW AND FIELD VERIFY ALL APPURTENANCES AND RESTRAINTS PRIOR TO CONNECTION.
- CONCRETE THRUST BLOCKS SHALL BE FORMED TO PREVENT COVERING ANY PORTION OF THE JOINT MATERIALS.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO PROTECT EXISTING THRUST BLOCKS WHICH ARE RESTRAINING EXISTING UTILITIES. EXISTING THRUST BLOCKS SHALL NOT BE DAMAGED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND DISPOSAL OF ALL EXCESS EXCAVATED MATERIAL TO AN OFF-SITE LOCATION IN A LEGAL MANNER AT NO ADDITIONAL COST TO OWNER.
- ALL TRENCHES SHALL BE BACKFILLED WITHOUT DELAY. OPEN TRENCHES SHALL BE KEPT TO A MINIMUM. OPEN TRENCHES SHALL BE STEEL PLATED. UPON BACKFILLING THE CONTRACTOR SHALL BROOM SWEEP STREETS AND USE APPROPRIATE METHODS TO CONTROL DUST AND EXCESS SEDIMENT. IF REQUIRED, CONTRACTOR SHALL USE STREET SWEEPING MACHINES AND WATER TRUCKS AT THE END OF EACH DAY TO CONTROL DUST.
- NAJAW SHALL FURNISH ALL UNDERGROUND DUCTILE IRON PIPE, FITTINGS AND VALVES FOR THE WATER IMPROVEMENTS.
- THE CONTRACTOR SHALL PROTECT ALL STRUCTURES, ROADS, PIPELINES, TREES, SHRUBBERY, GRASS AREA, ETC. DURING THE PROGRESS OF THE WORK AND SHALL REMOVE DAILY FROM THE SITE ALL DEBRIS AND UNUSED MATERIALS. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL RESTORE THE SITE TO ITS ORIGINAL CONDITION.
- ALL BURIED STEEL RESTRAINING RODS AND BOLTS SHALL BE COATED WITH TWO COATS OF BITUMASTIC COATING. ALL RESTRAINING RODS SHALL BE PROVIDED WITH DOUBLE NUTS AT EACH END. ZINC CAPS ARE ACCEPTABLE IN LIEU OF BITUMASTIC COATING.
- GUARD RAILS, FENCES, DRAINAGE PIPES, MAILBOXES, HEADWALLS AND OTHER FEATURES WHICH REQUIRE REINSTALLATION BUT ARE FOUND NOT TO BE REUSABLE OR WHICH ARE DAMAGED DURING REMOVAL, SHALL BE REPLACED WITH NEW MATERIAL AT NO ADDITIONAL COST TO NAJAW.
- THE CONTRACTOR MUST CONSULT WITH NAJAW FIELD PERSONNEL FOR THE INSTALLATION OF WATER MAIN AT DEPTHS GREATER THAN 4 FEET. IT IS AT THE DISCRETION OF NAJAW FIELD PERSONNEL WHEN BENDS SHOULD BE INSTALLED VERSUS DEFLECTING PIPE GRADUALLY.
- NAJAW FIELD PERSONNEL ARE REQUIRED TO BE PRESENT DURING THE TIE-IN TO EXISTING MAINS.
- WATER MAIN DEPTH CAN BE ADJUSTED TO ACCOMMODATE CROSSING OTHER FACILITIES WITH PRIOR APPROVAL FROM NAJAW. IF DEPTH GREATER THAN 72" IS REQUIRED, 45 DEGREE BENDS MUST BE USED TO DROP MAIN BELOW CONFLICTING FACILITY AS PER SPECIFICATIONS.
- ANY EXCAVATION OVER 60" IN DEPTH MUST BE PROPERLY SHORED OR SHELED PER OSHA REGULATIONS.
- CONTRACTOR MUST HAVE AN EMPLOYEE ON-SITE WHO HAS COMPLETED THE OSHA REQUIRED COMPETENT PERSON TRAINING.
- THRUST BLOCKS AND MEGALUGS TO BE PROVIDED AT ALL BENDS AND FITTINGS (NOT SHOWN ON DRAWINGS FOR DRAWING CLARITY).
- MAIN LINE VALVE OPERATING NUTS GREATER THAN 48" IN DEPTH SHALL HAVE AN APPROVED EXTENSION SHAFT INSTALLED TO WITHIN 36" OF ROAD GRADE.

OPERATING NUT SIZE	SHOE SIZE	DIRECTION OF OPEN	DEPTH OF BURY	VALVE OPENING
1-1/2" PENTAGON	4" M/J	LEFT	4'-6"	4-1/2"

- REPORT IMMEDIATELY TO THE OWNER ANY BREAK OR LEAK ON ITS LINES, OR DENT, GOUGE, GROOVE, OR OTHER DAMAGE TO SUCH LINES OR TO THEIR COATING OR CATHODIC PROTECTION, MADE OR DISCOVERED IN THE COURSE OF THE EXCAVATION OR DEMOLITION WORK.
- CONTRACTOR TO IMMEDIATELY ALERT OWNER/OCCUPANTS OF NEARBY PREMISES OF ANY EMERGENCY OR UNSAFE CONDITIONS THAT MAY ARISE DURING EXECUTION OF THIS WORK.
- NO UNPAVED TRENCH, SIDEWALK OR CURB MAY BE ALLOWED BY THE END OF THE BUSINESS DAY FRIDAY.
- CONTRACTOR IS TO TEMPORARILY REMOVE EXISTING CHAIN LINK FENCE FOR ACCESS TO SITE. UPON COMPLETION OF THE WORK, THE CONTRACTOR IS TO REINSTALL THE FENCE.
- CONTRACTOR IS TO TAKE EXTRA PRECAUTION AS TO NOT DISTURB ANY TREE'S LOCATED NEAR THE WATER'S EDGE IN ANY WAY.
- CONTRACTOR IS TO APPLY FOR AND PROCURE BURLINGTON COUNTY ROAD OPENING PERMIT.



REVISIONS	
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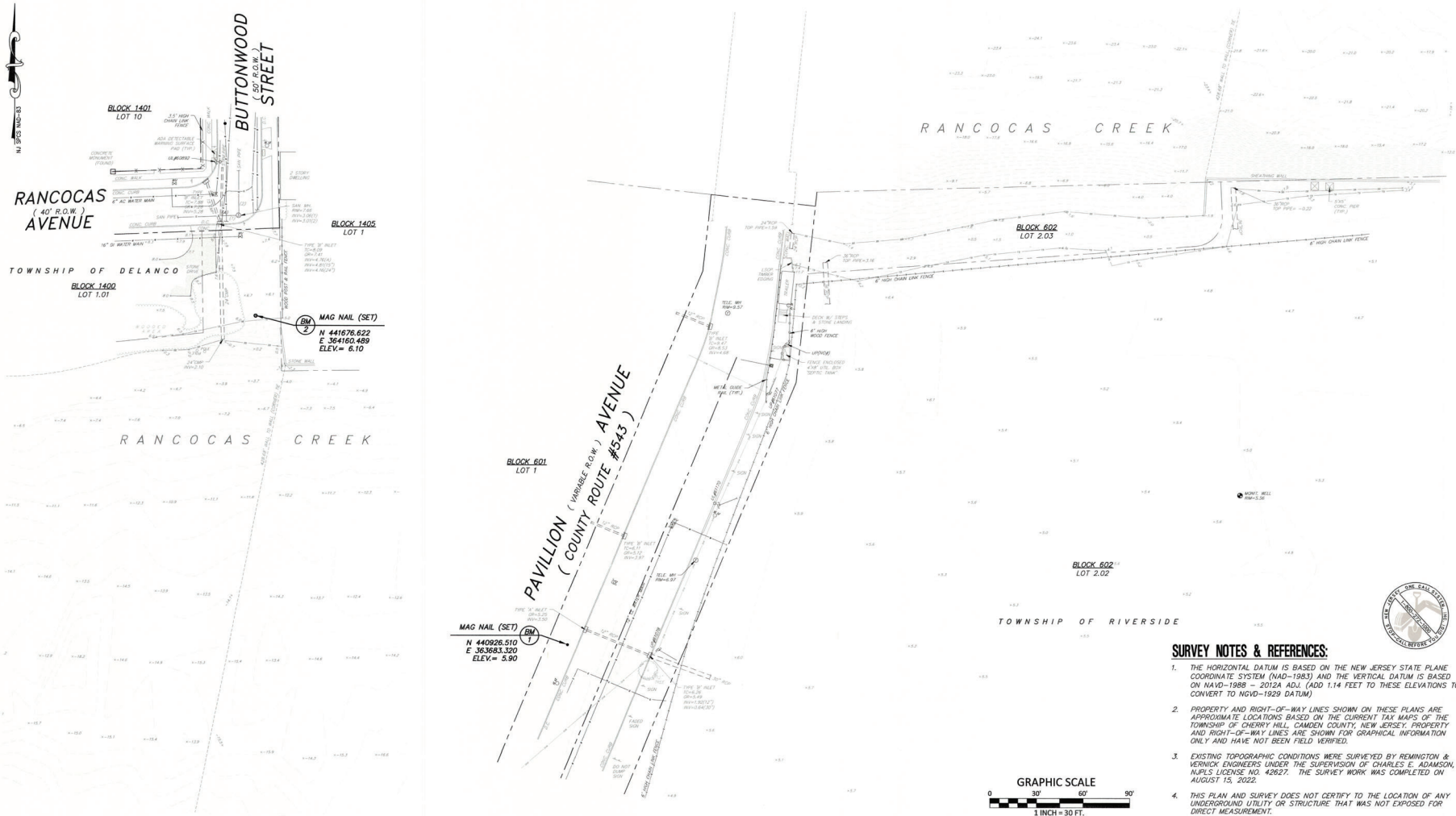
**REMINGTON & VERNICK ENGINEERS**  
2039 SPRINGDALE ROAD  
CHERRY HILL, NJ 08003  
(856) 795-9595, FAX (856) 795-1882  
WEB SITE ADDRESS: WWW.RVE.COM  
Certification of Authorization: 24 CA 20032031  
—ENGINEERING EXCELLENCE—

**STEPHANIE CUTHBERT**  
*Stephanie Cuthbert*  
exp. 5-2-2025  
NJ LICENSED PROFESSIONAL ENGINEER  
NO. 42136

**AMERICAN WATER ENGINEERING**  
1 WATER STREET  
CAMDEN, NJ 08102  
  
DRAWN BY SYDNEY IATAROLA  
PROJECT ENG'R SYDNEY IATAROLA  
DATE 2.2023  
PROJECT 3595X070

**LEGEND & GENERAL NOTES**  
BURLINGTON WATER MAIN CROSSING  
RANOCAS CREEK HORIZONTAL DIRECTIONAL DRILL  
TOWNSHIPS OF RIVERSIDE AND DELANCO, NEW JERSEY

NEW JERSEY AMERICAN WATER	USE DIMENSIONS ONLY SCALE AS SHOWN
85% COMPLETE DRAWINGS, NOT FOR CONSTRUCTION PURPOSES	G2



# **SURVEY NOTES & REFERENCES:**

1. THE HORIZONTAL DATUM IS BASED ON THE NEW JERSEY STATE PLANE COORDINATE SYSTEM (NAD-1983) AND THE VERTICAL DATUM IS BASED ON NAVD-1988 - 2012A ADJ. (ADD 1.14 FEET TO THESE ELEVATIONS TO CONVERT TO NGVD-1929 DATUM)
2. PROPERTY AND RIGHT-OF-WAY LINES SHOWN ON THESE PLANS ARE APPROXIMATE LOCATIONS BASED ON THE CURRENT TAX MAPS OF THE TOWNSHIP OF CHERRY HILL, CAMDEN COUNTY, NEW JERSEY. PROPERTY AND RIGHT-OF-WAY LINES ARE SHOWN FOR GRAPHICAL INFORMATION ONLY AND HAVE NOT BEEN FIELD VERIFIED.
3. EXISTING TOPOGRAPHIC CONDITIONS WERE SURVEYED BY REMINGTON & VERNICK ENGINEERS UNDER THE SUPERVISION OF CHARLES E. ADAMSON, N.J.P.L. LICENSE NO. 42627. THE SURVEY WORK WAS COMPLETED ON AUGUST 15, 2022.
4. THIS PLAN AND SURVEY DOES NOT CERTIFY TO THE LOCATION OF ANY UNDERGROUND UTILITY OR STRUCTURE THAT WAS NOT EXPOSED FOR DIRECT MEASUREMENT.



REVISIONS	REVISIONS

**REMINGTON & VERNICK ENGINEERS**  
 2059 SPRINGDALE ROAD  
 CHERRY HILL, NJ 08003  
 (856) 795-5055, FAX (856) 795-1882  
 WEB SITE ADDRESS: WWW.RVE.COM  
 Certificate of Authorization: 24 (A) 00023001  
 (UNEXPIRED) 05/20/2024 (EXPIRY)

CHARLES E. ADAMSON  
*Charles E. Adamson*  
 1/26/23  
 N.J. LICENSED PROFESSIONAL ENGINEER  
 NO. 42627

**AMERICAN WATER ENGINEERING**  
 1 WATER STREET  
 CAMDEN, NJ 08102

**AMERICAN WATER**

DRAWN BY: JAMES SAVAGE  
 PROJECT ENG'R: STENLEY IATAROLA

DATE 1.2023

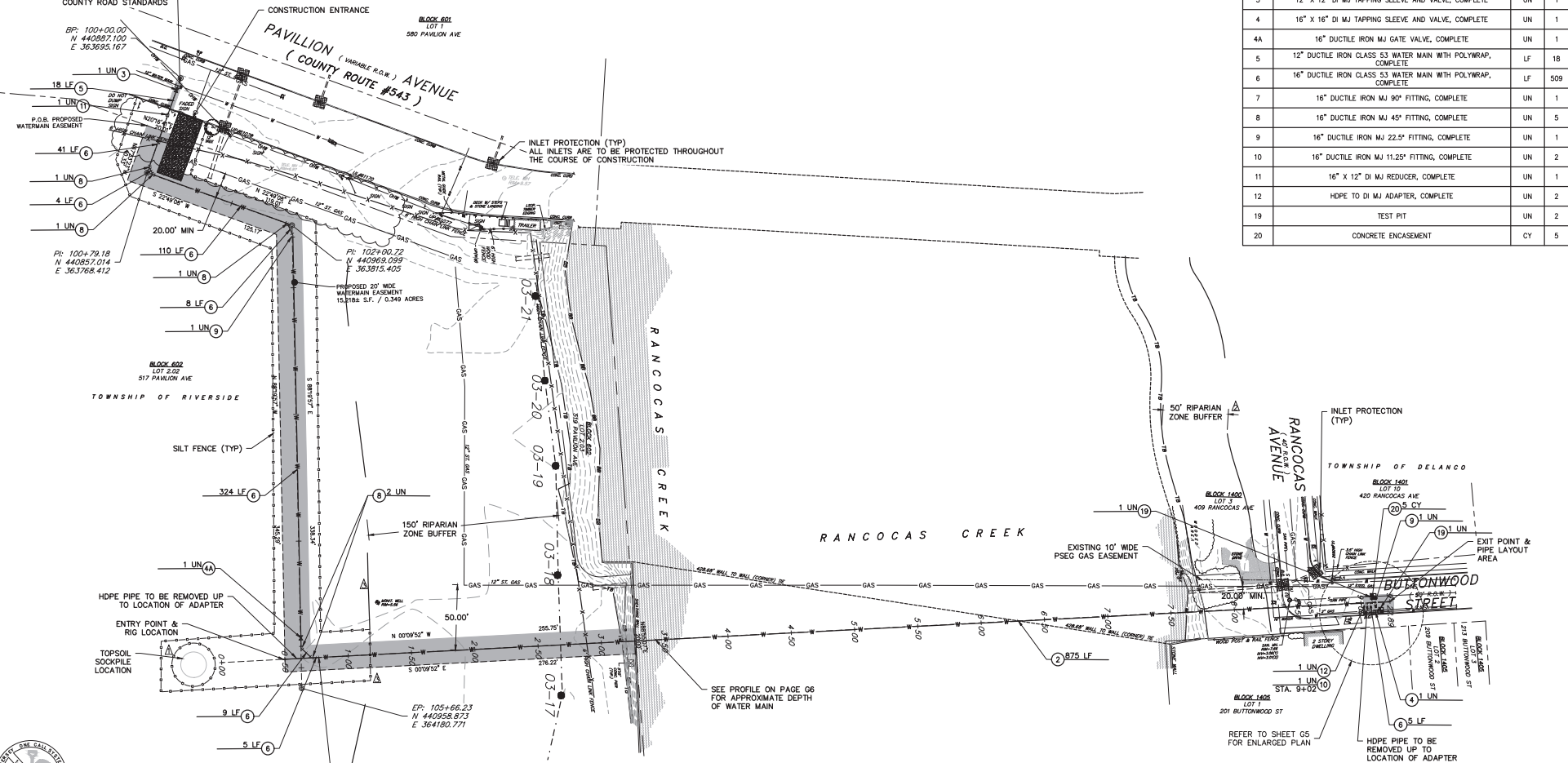
PROJECT 3595X070

EXISTING CONDITIONS PLAN BURLINGTON WATER MAIN CROSSING RANCOCAS CREEK HORIZONTAL DIRECTIONAL DRILLING TOWNSHIP OF RIVERSIDE/DELANCO, NEW JERSEY			
NEW JERSEY AMERICAN WATER	USE APPROVED DRAWINGS ONLY FOR CONSTRUCTION PURPOSES	USE DIMENSIONS ONLY SCALE: AS SHOWN	G3



NJ SPES NAD-83

4' X 20' OPENING FOR WATER MAIN  
INSTALLATION TO BE RESTORED IN  
ACCORDANCE WITH BURLINGTON COUNTY  
COUNTY ROAD STANDARDS



**NOTES:**

1. THE WETLANDS FLAGGING AND DELINEATION LINE IS PER THE N.J.D.E.P. L.O.I. DATED MARCH 31, 2006, LAST REVISED JUNE 19, 2006, PREPARED BY PAULUS SOKOLOWSKI AND SARTOR, CONSULTING ENGINEERS. THE WETLANDS LINE IS BASED SOLELY ON THE L.O.I.

GRAPHIC SCALE



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**REVISIONS**




**REMINGTON & VERNICK ENGINEERS**  
2039 SPRINGDALE ROAD  
CHERRY HILL, NJ 08003  
(609) 795-9595, FAX (609) 795-1882  
WEB SITE ADDRESS: WWW.RVE.COM  
Certification of Authorization: 24 (CA 2000200)  
—ENGINEERING EXCELLENCE—

STEPHANIE CUTHBERT

AMERICAN WATER ENGINEERING  
1 WATER STREET  
CAMDEN, NJ 08102  
DATE: 5-2-2025  
NJ LICENSED PROFESSIONAL ENGINEER  
NO. 42136

AMERICAN WATER ENGINEERING

1 WATER STREET  
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DRAWN BY: SYDNEY IATAROLA  
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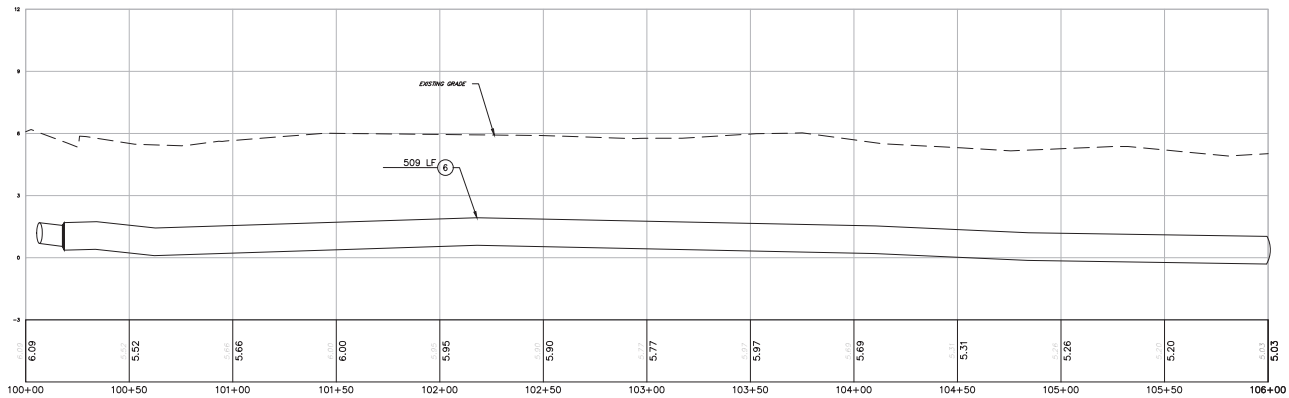
PROPOSED WATER MAIN IMPROVEMENTS PLAN & SESC PLAN  
BURLINGTON WATER MAIN CROSSING  
RANCOCAS CREEK HORIZONTAL DIRECTIONAL DRILL  
TOWNSHIPS OF RIVERSIDE AND DELANCO, NEW JERSEY

NEW JERSEY AMERICAN WATER

85% COMPLETE DRAWINGS, NOT  
FOR CONSTRUCTION PURPOSES

USE DIMENSIONS ONLY  
SCALE AS SHOWN

G4



**PROFILE--A**  
 SCALE:  
 HORIZ. 1"=40'  
 VERT. 1"=3'



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REVISIONS	

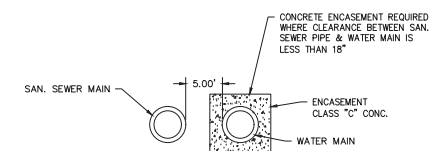


**STEPHANIE CUTHBERT**  
*Stephanie Cuthbert*  
 DATE: 5-2-2025  
 NJ LICENSED PROFESSIONAL ENGINEER  
 NO. 42136

**AMERICAN WATER ENGINEERING**  
 1 WATER STREET  
 CAMDEN, NJ 08102  
  
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 PROJECT ENG'R: SYDNEY IATAROLA  
 DATE: 2.2023  
 PROJECT: 3595X070

<b>PROPOSED WATER MAIN IMPROVEMENTS PROFILE A</b> BURLINGTON WATER MAIN CROSSING RANCOCAS CREEK HORIZONTAL DIRECTIONAL DRILL TOWNSHIPS OF RIVERSIDE AND DELANCO, NEW JERSEY			USE DIMENSIONS ONLY SCALE AS SHOWN
NEW JERSEY AMERICAN WATER	95% COMPLETE DRAWINGS, NOT FOR CONSTRUCTION PURPOSES		G5

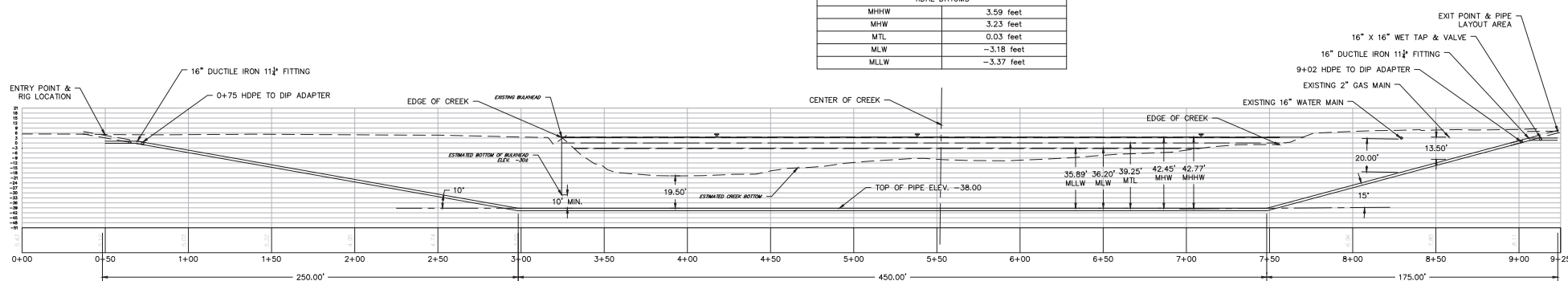




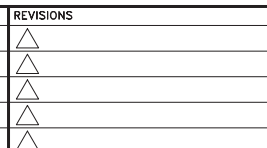
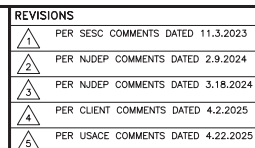
NTS

SCALE: 1"=10'

TIDAL DATUMS	
MHHW	3.59 feet
MHW	3.23 feet
MTL	0.03 feet
MLW	-3.18 feet
MLLW	-3.37 feet



SCALE:  
HORIZ. 1"=30'  
VERT. 1"=3'



**REMINGTON  
& VERNICK  
ENGINEERS**  
2059 SPRINGDALE ROAD  
CHERRY HILL, NJ 08003  
(856) 795-9595, FAX (856) 795-1  
WEB SITE ADDRESS : WWW.RVE  
Certification of Authorization: 24 GA 28003  
—ENGINEERING EXCELLENCE—

STEPHANIE CUTHBERT  
*Stephanie Cuthbert*  
DATE: 5-2-2025

NJ LICENSED PROFESSIONAL ENGINEER  
NO. 42136

DRAWN BY SYDNEY IATAROLA  
PROJECT ENG'R SYDNEY IATAROLA

DATE 2,2023

PROJECT 3595X070

PROPOSED WATER MAIN IMPROVEMENTS PROFILE B & ENLARGED PLAN  
BURLINGTON WATER MAIN CROSSING  
RANCOCAS CREEK HORIZONTAL DIRECTIONAL DRILL  
TOWNSHIPS OF RIVERSIDE AND DELANCO, NEW JERSEY

NEW JERSEY AMERICAN WATER

95% COMPLETE DRAWINGS, NOT FOR CONSTRUCTION PURPOSES

USE DIMENSIONS ONLY  
SCALE AS SHOWN

G6



## SOIL EROSION AND SEDIMENT CONTROL NOTES

1. ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES TO BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCES, OR IN THEIR PROPER SEQUENCE, AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED. ALL WORK TO BE DONE IN ACCORDANCE WITH THE STATE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY.

2. ANY DISTURBED AREAS THAT WILL BE EXPOSED MORE THAN 10 DAYS AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, WILL IMMEDIATELY RECEIVE TEMPORARY SEEDING. IF THE SEASON PREVENTS THE ESTABLISHMENT OF A TEMPORARY COVER, THE DISTURBED AREAS WILL BE MULCHED WITH STRAW, OR EQUIVALENT MATERIAL, AT A RATE OF 2 TONS.

3. PERMANENT VEGETATION TO BE SEEDING OR SOODED ON ALL EXPOSED AREAS WITHIN TEN (10) DAYS AFTER FINAL GRADING. MULCH WILL BE USED FOR PROTECTING UNTIL SEEDING IS ESTABLISHED.

4. A SUB-BASE COVER WILL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING AND INSTALLATION OF IMPROVEMENTS IN ORDER TO STABILIZE STREAMS, DROUGHTS, GRADINGS, AND PARKING AREAS IN AREAS WHERE NO UTILITIES ARE PRESENT. THE SUB-BASE SHALL BE INSTALLED WITHIN FIFTEEN (15) DAYS OF PRELIMINARY GRADING.

5. IMMEDIATELY FOLLOWING INITIAL DISTURBANCE OR ROUGH GRADING, ALL CRITICAL AREAS SUBJECT TO EROSION (I.E.: STEEP SLOPES, ROADWAY EMBANKMENTS) WILL RECEIVE A TEMPORARY SEEDING IN COMBINATION WITH MULCH OR A SUITABLE EQUIVALENT, AT A RATE OF TWO (2) TONS PER ACRE.

6. ANY STEEP SLOPE RECEIVING PIPELINE INSTALLATION WILL BE BACKFILLED AND STABILIZED DAILY AS THE INSTALLATION PROCEEDS (I.E.: SLOPES GREATER THAN 3:1).

7. TEMPORARY CONTROLS, STANDARDS REQUIRE THE INSTALLATION OF A 5'0" x 3'0" x 1'-1/2" TO 2'30" STONE AT ALL CONSTRUCTION DRIVEWAYS IMMEDIATELY AFTER INITIAL SITE DISTURBANCE. A CRUSHED STONE CLEANING PAD WILL BE INSTALLED WHEREVER A CONSTRUCTION ENTRANCE EXISTS. THE 40#-60# PAD MUST BE 50' IN LENGTH. THE STONE MUST BE 1.5"-4" IN SIZE, PLACED 12" THICK AND THE FULL WIDTH OF THE ENTRANCE. IT SHOULD BE UNDERLAIN WITH A SYNTHETIC FILTER FABRIC AND MAINTAINED.

8. IN ACCORDANCE WITH STANDARDS FOR PERMANENT VEGETATIVE COVER FOR SOIL STABILIZATION, ANY SOIL HAVING A PH OF 4 OR LESS OR CONTAINING HIGH SULFATES SHALL BE COVERED WITH A MINIMUM OF 12 INCHES OF MULCH HAVING A PH OF 5 OR MORE PRIOR TO SEEDING PREPARATION.

9. THE BURLINGTON COUNTY SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED 72 HOURS IN ADVANCE OF ANY SOIL DISTURBING ACTIVITY.

10. AT THE TIME WHEN THE SITE PREPARATION FOR PERMANENT VEGETATIVE STABILIZATION IS GOING TO BE COMPLETED, ANY SOIL THAT WILL NOT PROVIDE A SUITABLE ENVIRONMENT TO SUPPORT ADEQUATE VEGETATIVE GROWTH COVER, SHALL BE COVERED WITH A CRUSHED STONE CLEANING PAD. PERMANENTLY PLANTED TREES AND SHRUBS SHALL BE SUITABLE FOR VEGETATIVE GROWTH. IF THE REMOVAL, OR TREATMENT OF THE SOIL WILL NOT PROVIDE SUITABLE COVER, NON-VEGETATIVE COVER SHALL BE INSTALLED. THE DISTRICT SHALL BE NOTIFIED OF THE ASSURANCE OF A CERTIFICATE OF OCCUPANCY BY THE MUNICIPALITY.

## TEMPORARY VEGETATIVE COVER FOR SOIL STABILIZATION

1. SITE PREPARATION  
A. GRADE AS NEEDED AND FEASIBLE TO PERMIT THE USE OF CONVENTIONAL EQUIPMENT FOR SEEDING  
B. INSTALL NEEDED PROTECTION CONTROL PRACTICES OR FACILITIES SUCH AS EROSION, GRADE STABILIZATION STRUCTURES, CHANNEL STABILIZATION MEASURES, SEDIMENT BASINS, AND WATERWAYS.

2. SEEDING PREPARATION  
A. APPLY LIMESTONE AND FERTILIZER. FERTILIZER SHALL BE APPLIED AT THE RATE OF 500 POUNDS PER ACRE (EQUIVALENT TO 100 POUNDS PER 1,000 SQUARE FEET OF 10-20-10 OR EQUIVALENT). APPLY LIMESTONE (EQUIVALENT TO 500 CALCIUM PPM MAGNESIUM OXIDES) AS FOLLOWS:

SOIL TEXTURE	TONS/ACRE	LB'S/1,000 SQ. FT.
CLAY, CLAY LOAM, AND HIGH ORGANIC SOIL	3	135
SANDY LOAM, LOAM, SILT LOAM	2	90
LOAMY SAND, SAND	1	45

PULVERIZED DOLOMITIC LIMESTONE IS PREFERRED FOR MOST SOILS SOUTH OF THE NEW BRUNSWICK-TRENTON LINE.

3. WORK LINE AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL, TO A DEPTH OF 4 INCHES WITH A DISC, SPRINGTOOTH HARROW, OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OR DISCHING OPERATION SHOULD BE ON THE GROUNDING, CONTOUR, TILLAGE UNTIL A REASONABLY UNIFORM SEEDING IS PREPARED.

4. SEEDING PREPARED TO BE SEEDING. IF TRAFFIC HAS LEFT THE CONTACT, THE AREA MUST BE RESEED. IF TRAFFIC HAS LEFT THE CONTACT, THE AREA MUST BE RESEED.

5. SLOPES HIGHER THAN 4:1 OR MORE THAN 10:1 SHOULD BE MULCHED WITH STRAW, OR EQUIVALENT MATERIAL, AT A RATE OF 2 TONS PER ACRE. MULCHING IS REQUIRED ON ALL SLOPES.

6. MULCHING IS REQUIRED ON ALL SLOPES. MULCH MATERIALS SHOULD BE UNLIMITED SMALL GRASS STRAW, FREE OF SEEDS, TO BE APPLIED AT A RATE OF 1 1/2 TO 2 TONS PER ACRE (70 TO 100 POUNDS PER 1,000 SQUARE FEET). EXCEPT THAT WHERE A CRUMPER IS USED INSTEAD OF A LIQUID MULCH BINDER, MULCH SHOULD BE APPLIED AT A RATE OF 1 1/2 TO 2 TONS PER ACRE (70 TO 100 POUNDS PER 1,000 SQUARE FEET). EXCEPT THAT WHERE A CRUMPER IS USED INSTEAD OF A LIQUID MULCH BINDER, MULCH SHOULD BE APPLIED AT A RATE OF 1 1/2 TO 2 TONS PER ACRE (70 TO 100 POUNDS PER 1,000 SQUARE FEET).

7. SPREAD UNIFORMITY BY HAND OR MECHANICALLY TO THAT APPROXIMATELY 75% TO 90% OF THE SOIL SURFACE WILL BE COVERED. FOR UNIFORM DISTRIBUTION OF HAND-SPREAD MULCH, DIVIDE AREA INTO APPROXIMATELY 1,000 SQUARE FEET SECTIONS AND DISSEMINATE 75 TO 90% OF THE AREA.

8. MULCH ANCHORING SHOULD BE ACCOMPLISHED IMMEDIATELY AFTER PLACEMENT TO MANAGE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS, DEPENDING UPON THE SIZE OF THE AREA, STRENGTH OF SLOPES, AND COSTS.

9. 1. EGG AND TWINE - DRIVE 8 TO 10 TO 100 WOODEN PILES TO WITHIN 2 TO 3 INCHES OF THE SOIL SURFACE EVERY 4 FEET IN ALL DIRECTIONS. STAKES MAY BE DRIVEN BEFORE OR AFTER APPLYING MULCH. SECURE MULCH TO SOIL SURFACE BY STRETCHING TWINE BETWEEN AN EGG AND A SQUARE PATTERN. SECURE TWINE AROUND EACH PILE WITH TWO OR MORE ROUND TURNS.

10. 2. MULCH NETTING - STRIKE PAPER, LITE, COTTON, OR PLASTIC NETTING TO THE SOIL SURFACE. USE A DEGRADABLE NETTING IN AREAS TO BE MOVED.

11. 3. CRUMPER (MULCH ANCHORING TOOL) - A TRACTOR-DRAWN IMPLEMENT, SOMEWHAT LIKE A DISC HARROW, ESPECIALLY DESIGNED TO PUSH OR CUT SOME OF THE BRISTLY LONG PILES STRIPS 3 TO 4 INCHES INTO THE SOIL, SO AS TO ANCHOR IT AND LEAVE PART STANDING UPRIGHT. THIS TECHNIQUE IS LIMITED TO AREAS TRAVELABLE BY A TRACTOR. MULCH MUST OPERATE ON THE CONTOUR OF SLOPES. STRAW MULCH RATE MUST BE 3 TONS PER ACRE. NO TACKLING OR ADHESIVE AGENT IS REQUIRED.

12. 4. WOOD-FIBER OR PAPER-FIBER MULCH AT THE RATE OF 1,000 POUNDS PER ACRE MAY BE APPLIED BY A HORIZOGRADER. USE IS LIMITED TO FLATTER SLOPES AND DURING OPTIMUM SEEDING PERIODS IN SPRING AND FALL.

## PERMANENT SEEDING MIXTURE

THIS SEEDING MIXTURE IS COMPOSED OF A SINGLE SPECIES WHICH GERMINATES QUICKLY IN ORDER TO REDUCE SOIL EROSION UNTIL A PERMANENT VEGETATIVE COVER CAN BE ESTABLISHED. A MATURE OF EQUAL QUALITY MAY BE SUBSTITUTED IF APPROVED BY OUR OFFICE.

COMMON NAME	SEEDING RATE
CLAY, CLAY LOAM, AND HIGH ORGANIC SOIL	15
SANDY LOAM, LOAM, SILT LOAM	10
LOAMY SAND, SAND	5

THE MINIMUM APPLICATION RATE FOR THIS SEEDING MIXTURE SHALL BE ONE (1) POUND/1,000 SQUARE FEET OR 100 POUNDS/ACRE.

RECOMMENDED SEEDING PERIODS ARE MARCH 1 - MAY 15 AND AUGUST 15 - OCTOBER 1. SUMMER SEEDING SHALL BE PERFORMED ONLY IF ADEQUATE IRRIGATION IS PROVIDED TO ENSURE SUCCESSFUL GERMINATION.

PERMANENT VEGETATIVE COVER FOR SOIL STABILIZATION  
1. SITE PREPARATION  
A. GRADE AS NEEDED AND FEASIBLE TO PERMIT THE USE OF CONVENTIONAL EQUIPMENT FOR SEEDING  
B. INSTALL NEEDED PROTECTION CONTROL PRACTICES OR FACILITIES SUCH AS EROSION, GRADE STABILIZATION STRUCTURES, CHANNEL STABILIZATION MEASURES, SEDIMENT BASINS, AND WATERWAYS.

2. SEEDING PREPARATION  
A. APPLY LIMESTONE AND FERTILIZER. FERTILIZER SHALL BE APPLIED AT THE RATE OF 500 POUNDS PER ACRE (EQUIVALENT TO 100 POUNDS PER 1,000 SQUARE FEET OF 10-20-10 OR EQUIVALENT). APPLY LIMESTONE (EQUIVALENT TO 500 CALCIUM PPM MAGNESIUM OXIDES) AS FOLLOWS:

SOIL TEXTURE	TONS/ACRE	LB'S/1,000 SQ. FT.
CLAY, CLAY LOAM, AND HIGH ORGANIC SOIL	3	135
SANDY LOAM, LOAM, SILT LOAM	2	90
LOAMY SAND, SAND	1	45

PULVERIZED DOLOMITIC LIMESTONE IS PREFERRED FOR MOST SOILS SOUTH OF THE NEW BRUNSWICK-TRENTON LINE.

3. WORK LINE AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL, TO A DEPTH OF 4 INCHES WITH A DISC, SPRINGTOOTH HARROW, OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OR DISCHING OPERATION SHOULD BE ON THE GROUNDING, CONTOUR, TILLAGE UNTIL A REASONABLY UNIFORM SEEDING IS PREPARED. THE SEEDING MIXTURE SHALL BE APPLIED AT THE RATE OF 1 1/2 TO 2 TONS PER ACRE (70 TO 100 POUNDS PER 1,000 SQUARE FEET). EXCEPT THAT WHERE A CRUMPER IS USED INSTEAD OF A LIQUID MULCH BINDER, MULCH SHOULD BE APPLIED AT A RATE OF 1 1/2 TO 2 TONS PER ACRE (70 TO 100 POUNDS PER 1,000 SQUARE FEET).

4. SEEDING PREPARED TO BE SEEDING. IF TRAFFIC HAS LEFT THE CONTACT, THE AREA MUST BE RESEED. IF TRAFFIC HAS LEFT THE CONTACT, THE AREA MUST BE RESEED.

5. SLOPES HIGHER THAN 4:1 OR MORE THAN 10:1 SHOULD BE MULCHED WITH STRAW, OR EQUIVALENT MATERIAL, AT A RATE OF 2 TONS PER ACRE. MULCHING IS REQUIRED ON ALL SLOPES.

6. MULCHING IS REQUIRED ON ALL SLOPES. MULCH MATERIALS SHOULD BE UNLIMITED SMALL GRASS STRAW, FREE OF SEEDS, TO BE APPLIED AT A RATE OF 1 1/2 TO 2 TONS PER ACRE (70 TO 100 POUNDS PER 1,000 SQUARE FEET). EXCEPT THAT WHERE A CRUMPER IS USED INSTEAD OF A LIQUID MULCH BINDER, MULCH SHOULD BE APPLIED AT A RATE OF 1 1/2 TO 2 TONS PER ACRE (70 TO 100 POUNDS PER 1,000 SQUARE FEET).

7. SPREAD UNIFORMITY BY HAND OR MECHANICALLY TO THAT APPROXIMATELY 75% TO 90% OF THE SOIL SURFACE WILL BE COVERED. FOR UNIFORM DISTRIBUTION OF HAND-SPREAD MULCH, DIVIDE AREA INTO APPROXIMATELY 1,000 SQUARE FEET SECTIONS AND DISSEMINATE 75 TO 90% OF THE AREA.

8. MULCH ANCHORING SHOULD BE ACCOMPLISHED IMMEDIATELY AFTER PLACEMENT TO MANAGE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS, DEPENDING UPON THE SIZE OF THE AREA, STRENGTH OF SLOPES, AND COSTS.

9. 1. EGG AND TWINE - DRIVE 8 TO 10 TO 100 WOODEN PILES TO WITHIN 2 TO 3 INCHES OF THE SOIL SURFACE EVERY 4 FEET IN ALL DIRECTIONS. STAKES MAY BE DRIVEN BEFORE OR AFTER APPLYING MULCH. SECURE MULCH TO SOIL SURFACE BY STRETCHING TWINE BETWEEN AN EGG AND A SQUARE PATTERN. SECURE TWINE AROUND EACH PILE WITH TWO OR MORE ROUND TURNS.

10. 2. MULCH NETTING - STRIKE PAPER, LITE, COTTON, OR PLASTIC NETTING TO THE SOIL SURFACE. USE A DEGRADABLE NETTING IN AREAS TO BE MOVED.

11. 3. CRUMPER (MULCH ANCHORING TOOL) - A TRACTOR-DRAWN IMPLEMENT, SOMEWHAT LIKE A DISC HARROW, ESPECIALLY DESIGNED TO PUSH OR CUT SOME OF THE BRISTLY LONG PILES STRIPS 3 TO 4 INCHES INTO THE SOIL, SO AS TO ANCHOR IT AND LEAVE PART STANDING UPRIGHT. THIS TECHNIQUE IS LIMITED TO AREAS TRAVELABLE BY A TRACTOR. MULCH MUST OPERATE ON THE CONTOUR OF SLOPES. STRAW MULCH RATE MUST BE 3 TONS PER ACRE. NO TACKLING OR ADHESIVE AGENT IS REQUIRED.

12. 4. WOOD-FIBER OR PAPER-FIBER MULCH AT THE RATE OF 1,000 POUNDS PER ACRE MAY BE APPLIED BY A HORIZOGRADER. USE IS LIMITED TO FLATTER SLOPES AND DURING OPTIMUM SEEDING PERIODS IN SPRING AND FALL.

13. 5. SEEDING PREPARED TO BE SEEDING. IF TRAFFIC HAS LEFT THE CONTACT, THE AREA MUST BE RESEED. IF TRAFFIC HAS LEFT THE CONTACT, THE AREA MUST BE RESEED.

14. 6. SLOPES HIGHER THAN 4:1 OR MORE THAN 10:1 SHOULD BE MULCHED WITH STRAW, OR EQUIVALENT MATERIAL, AT A RATE OF 2 TONS PER ACRE. MULCHING IS REQUIRED ON ALL SLOPES.

15. 7. MULCHING IS REQUIRED ON ALL SLOPES. MULCH MATERIALS SHOULD BE UNLIMITED SMALL GRASS STRAW, FREE OF SEEDS, TO BE APPLIED AT A RATE OF 1 1/2 TO 2 TONS PER ACRE (70 TO 100 POUNDS PER 1,000 SQUARE FEET). EXCEPT THAT WHERE A CRUMPER IS USED INSTEAD OF A LIQUID MULCH BINDER, MULCH SHOULD BE APPLIED AT A RATE OF 1 1/2 TO 2 TONS PER ACRE (70 TO 100 POUNDS PER 1,000 SQUARE FEET).

16. 8. SPREAD UNIFORMITY BY HAND OR MECHANICALLY TO THAT APPROXIMATELY 75% TO 90% OF THE SOIL SURFACE WILL BE COVERED. FOR UNIFORM DISTRIBUTION OF HAND-SPREAD MULCH, DIVIDE AREA INTO APPROXIMATELY 1,000 SQUARE FEET SECTIONS AND DISSEMINATE 75 TO 90% OF THE AREA.

17. 9. MULCH ANCHORING SHOULD BE ACCOMPLISHED IMMEDIATELY AFTER PLACEMENT TO MANAGE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS, DEPENDING UPON THE SIZE OF THE AREA, STRENGTH OF SLOPES, AND COSTS.

18. 10. 1. EGG AND TWINE - DRIVE 8 TO 10 TO 100 WOODEN PILES TO WITHIN 2 TO 3 INCHES OF THE SOIL SURFACE EVERY 4 FEET IN ALL DIRECTIONS. STAKES MAY BE DRIVEN BEFORE OR AFTER APPLYING MULCH. SECURE MULCH TO SOIL SURFACE BY STRETCHING TWINE BETWEEN AN EGG AND A SQUARE PATTERN. SECURE TWINE AROUND EACH PILE WITH TWO OR MORE ROUND TURNS.

19. 11. 2. MULCH NETTING - STRIKE PAPER, LITE, COTTON, OR PLASTIC NETTING TO THE SOIL SURFACE. USE A DEGRADABLE NETTING IN AREAS TO BE MOVED.

20. 12. 3. CRUMPER (MULCH ANCHORING TOOL) - A TRACTOR-DRAWN IMPLEMENT, SOMEWHAT LIKE A DISC HARROW, ESPECIALLY DESIGNED TO PUSH OR CUT SOME OF THE BRISTLY LONG PILES STRIPS 3 TO 4 INCHES INTO THE SOIL, SO AS TO ANCHOR IT AND LEAVE PART STANDING UPRIGHT. THIS TECHNIQUE IS LIMITED TO AREAS TRAVELABLE BY A TRACTOR. MULCH MUST OPERATE ON THE CONTOUR OF SLOPES. STRAW MULCH RATE MUST BE 3 TONS PER ACRE. NO TACKLING OR ADHESIVE AGENT IS REQUIRED.

21. 13. 4. WOOD-FIBER OR PAPER-FIBER MULCH AT THE RATE OF 1,000 POUNDS PER ACRE MAY BE APPLIED BY A HORIZOGRADER. USE IS LIMITED TO FLATTER SLOPES AND DURING OPTIMUM SEEDING PERIODS IN SPRING AND FALL.

22. 14. 5. SEEDING PREPARED TO BE SEEDING. IF TRAFFIC HAS LEFT THE CONTACT, THE AREA MUST BE RESEED. IF TRAFFIC HAS LEFT THE CONTACT, THE AREA MUST BE RESEED.

23. 15. 6. SLOPES HIGHER THAN 4:1 OR MORE THAN 10:1 SHOULD BE MULCHED WITH STRAW, OR EQUIVALENT MATERIAL, AT A RATE OF 2 TONS PER ACRE. MULCHING IS REQUIRED ON ALL SLOPES.

24. 16. 7. MULCHING IS REQUIRED ON ALL SLOPES. MULCH MATERIALS SHOULD BE UNLIMITED SMALL GRASS STRAW, FREE OF SEEDS, TO BE APPLIED AT A RATE OF 1 1/2 TO 2 TONS PER ACRE (70 TO 100 POUNDS PER 1,000 SQUARE FEET). EXCEPT THAT WHERE A CRUMPER IS USED INSTEAD OF A LIQUID MULCH BINDER, MULCH SHOULD BE APPLIED AT A RATE OF 1 1/2 TO 2 TONS PER ACRE (70 TO 100 POUNDS PER 1,000 SQUARE FEET).

25. 17. 8. SPREAD UNIFORMITY BY HAND OR MECHANICALLY TO THAT APPROXIMATELY 75% TO 90% OF THE SOIL SURFACE WILL BE COVERED. FOR UNIFORM DISTRIBUTION OF HAND-SPREAD MULCH, DIVIDE AREA INTO APPROXIMATELY 1,000 SQUARE FEET SECTIONS AND DISSEMINATE 75 TO 90% OF THE AREA.

26. 18. 9. MULCH ANCHORING SHOULD BE ACCOMPLISHED IMMEDIATELY AFTER PLACEMENT TO MANAGE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS, DEPENDING UPON THE SIZE OF THE AREA, STRENGTH OF SLOPES, AND COSTS.

27. 19. 10. 1. EGG AND TWINE - DRIVE 8 TO 10 TO 100 WOODEN PILES TO WITHIN 2 TO 3 INCHES OF THE SOIL SURFACE EVERY 4 FEET IN ALL DIRECTIONS. STAKES MAY BE DRIVEN BEFORE OR AFTER APPLYING MULCH. SECURE MULCH TO SOIL SURFACE BY STRETCHING TWINE BETWEEN AN EGG AND A SQUARE PATTERN. SECURE TWINE AROUND EACH PILE WITH TWO OR MORE ROUND TURNS.

28. 20. 11. 2. MULCH NETTING - STRIKE PAPER, LITE, COTTON, OR PLASTIC NETTING TO THE SOIL SURFACE. USE A DEGRADABLE NETTING IN AREAS TO BE MOVED.

29. 21. 12. 3. CRUMPER (MULCH ANCHORING TOOL) - A TRACTOR-DRAWN IMPLEMENT, SOMEWHAT LIKE A DISC HARROW, ESPECIALLY DESIGNED TO PUSH OR CUT SOME OF THE BRISTLY LONG PILES STRIPS 3 TO 4 INCHES INTO THE SOIL, SO AS TO ANCHOR IT AND LEAVE PART STANDING UPRIGHT. THIS TECHNIQUE IS LIMITED TO AREAS TRAVELABLE BY A TRACTOR. MULCH MUST OPERATE ON THE CONTOUR OF SLOPES. STRAW MULCH RATE MUST BE 3 TONS PER ACRE. NO TACKLING OR ADHESIVE AGENT IS REQUIRED.

30. 22. 13. 4. WOOD-FIBER OR PAPER-FIBER MULCH AT THE RATE OF 1,000 POUNDS PER ACRE MAY BE APPLIED BY A HORIZOGRADER. USE IS LIMITED TO FLATTER SLOPES AND DURING OPTIMUM SEEDING PERIODS IN SPRING AND FALL.

## PERMANENT SEEDING MIXTURE

THIS SEEDING MIXTURE IS COMPOSED OF MOISTURE-TOLERANT SPECIES WHICH CAN THRIVE WITH LOW MAINTENANCE. THE PROPRIETARY NAME OF THE MIXTURE IS REGIUM CONSERVATION. REGIUM CONSERVATION IS MANUFACTURED BY RUTS, INC. (800) 800-1000. (800) 800-1000. A MATURE OF EQUAL QUALITY MAY BE SUBSTITUTED IF APPROVED BY OUR OFFICE.

COMMON NAME	SEEDING RATE
CLAY, CLAY LOAM, AND HIGH ORGANIC SOIL	15
SANDY LOAM, LOAM, SILT LOAM	10
LOAMY SAND, SAND	5

THE MINIMUM APPLICATION RATE FOR THIS SEEDING MIXTURE SHALL BE ONE (1) POUND/1,000 SQUARE FEET OR 100 POUNDS/ACRE.

RECOMMENDED SEEDING PERIODS ARE APRIL 1 - MAY 31 AND AUGUST 15 - OCTOBER 15. SUMMER SEEDING SHALL BE PERFORMED ONLY IF ADEQUATE IRRIGATION IS PROVIDED TO ENSURE SUCCESSFUL GERMINATION.

PERMANENT SEEDING MIXTURE DETAIL  
THIS SEEDING MIXTURE IS COMPOSED OF DROUGHT-TOLERANT SPECIES WHICH CAN THRIVE IN THE ARID SOIL CONDITIONS COMMONLY FOUND IN THE PINELANDS. A MATURE OF EQUAL QUALITY MAY BE SUBSTITUTED IF APPROVED BY OUR OFFICE.

COMMON NAME	SEEDING RATE
CLAY, CLAY LOAM, AND HIGH ORGANIC SOIL	15
SANDY LOAM, LOAM, SILT LOAM	10
LOAMY SAND, SAND	5

PULVERIZED DOLOMITIC LIMESTONE IS PREFERRED FOR MOST SOILS SOUTH OF THE NEW BRUNSWICK-TRENTON LINE.

3. WORK LINE AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL, TO A DEPTH OF 4 INCHES WITH A DISC, SPRINGTOOTH HARROW, OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OR DISCHING OPERATION SHOULD BE ON THE GROUNDING, CONTOUR, TILLAGE UNTIL A REASONABLY UNIFORM SEEDING IS PREPARED. THE SEEDING MIXTURE SHALL BE APPLIED AT THE RATE OF 1 1/2 TO 2 TONS PER ACRE (70 TO 100 POUNDS PER 1,000 SQUARE FEET). EXCEPT THAT WHERE A CRUMPER IS USED INSTEAD OF A LIQUID MULCH BINDER, MULCH SHOULD BE APPLIED AT A RATE OF 1 1/2 TO 2 TONS PER ACRE (70 TO 100 POUNDS PER 1,000 SQUARE FEET).

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7. SPREAD UNIFORMITY BY HAND OR MECHANICALLY TO THAT APPROXIMATELY 75% TO 90% OF THE SOIL SURFACE WILL BE COVERED. FOR UNIFORM DISTRIBUTION OF HAND-SPREAD MULCH, DIVIDE AREA INTO APPROXIMATELY 1,000 SQUARE FEET SECTIONS AND DISSEMINATE 75 TO 90% OF THE AREA.

8. MULCH ANCHORING SHOULD BE ACCOMPLISHED IMMEDIATELY AFTER PLACEMENT TO MANAGE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS, DEPENDING UPON THE SIZE OF THE AREA, STRENGTH OF SLOPES, AND COSTS.

9. 1. EGG AND TWINE - DRIVE 8 TO 10 TO 100 WOODEN PILES TO WITHIN 2 TO 3 INCHES OF THE SOIL SURFACE EVERY 4 FEET IN ALL DIRECTIONS. STAKES MAY BE DRIVEN BEFORE OR AFTER APPLYING MULCH. SECURE MULCH TO SOIL SURFACE BY STRETCHING TWINE BETWEEN AN EGG AND A SQUARE PATTERN. SECURE TWINE AROUND EACH PILE WITH TWO OR MORE ROUND TURNS.

10. 2. MULCH NETTING - STRIKE PAPER, LITE, COTTON, OR PLASTIC NETTING TO THE SOIL SURFACE. USE A DEGRADABLE NETTING IN AREAS TO BE MOVED.

11. 3. CRUMPER (MULCH ANCHORING TOOL) - A TRACTOR-DRAWN IMPLEMENT, SOMEWHAT LIKE A DISC HARROW, ESPECIALLY DESIGNED TO PUSH OR CUT SOME OF THE BRISTLY LONG PILES STRIPS 3 TO 4 INCHES INTO THE SOIL, SO AS TO ANCHOR IT AND LEAVE PART STANDING UPRIGHT. THIS TECHNIQUE IS LIMITED TO AREAS TRAVELABLE BY A TRACTOR. MULCH MUST OPERATE ON THE CONTOUR OF SLOPES. STRAW MULCH RATE MUST BE 3 TONS PER ACRE. NO TACKLING OR ADHESIVE AGENT IS REQUIRED.

12. 4. WOOD-FIBER OR PAPER-FIBER MULCH AT THE RATE OF 1,000 POUNDS PER ACRE MAY BE APPLIED BY A HORIZOGRADER. USE IS LIMITED TO FLATTER SLOPES AND DURING OPTIMUM SEEDING PERIODS IN SPRING AND FALL.

13. 5. SEEDING PREPARED TO BE SEEDING. IF TRAFFIC HAS LEFT THE CONTACT, THE AREA MUST BE RESEED. IF TRAFFIC HAS LEFT THE CONTACT, THE AREA MUST BE RESEED.

14. 6. SLOPES HIGHER THAN 4:1 OR MORE THAN 10:1 SHOULD BE MULCHED WITH STRAW, OR EQUIVALENT MATERIAL, AT A RATE OF 2 TONS PER ACRE. MULCHING IS REQUIRED ON ALL SLOPES.

15. 7. MULCHING IS REQUIRED ON ALL SLOPES. MULCH MATERIALS SHOULD BE UNLIMITED SMALL GRASS STRAW, FREE OF SEEDS, TO BE APPLIED AT A RATE OF 1 1/2 TO 2 TONS PER ACRE (70 TO 100 POUNDS PER 1,000 SQUARE FEET). EXCEPT THAT WHERE A CRUMPER IS USED INSTEAD OF A LIQUID MULCH BINDER, MULCH SHOULD BE APPLIED AT A RATE OF 1 1/2 TO 2 TONS PER ACRE (70 TO 100 POUNDS PER 1,000 SQUARE FEET).

16. 8. SPREAD UNIFORMITY BY HAND OR MECHANICALLY TO THAT APPROXIMATELY 75% TO 90% OF THE SOIL SURFACE WILL BE COVERED. FOR UNIFORM DISTRIBUTION OF HAND-SPREAD MULCH, DIVIDE AREA INTO APPROXIMATELY 1,000 SQUARE FEET SECTIONS AND DISSEMINATE 75 TO 90% OF THE AREA.

17. 9. MULCH ANCHORING SHOULD BE ACCOMPLISHED IMMEDIATELY AFTER PLACEMENT TO MANAGE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS, DEPENDING UPON THE SIZE OF THE AREA, STRENGTH OF SLOPES, AND COSTS.

18. 10. 1. EGG AND TWINE - DRIVE 8 TO 10 TO 100 WOODEN PILES TO WITHIN 2 TO 3 INCHES OF THE SOIL SURFACE EVERY 4 FEET IN ALL DIRECTIONS. STAKES MAY BE DRIVEN BEFORE OR AFTER APPLYING MULCH. SECURE MULCH TO SOIL SURFACE BY STRETCHING TWINE BETWEEN AN EGG AND A SQUARE PATTERN. SECURE TWINE AROUND EACH PILE WITH TWO OR MORE ROUND TURNS.

19. 11. 2. MULCH NETTING - STRIKE PAPER, LITE, COTTON, OR PLASTIC NETTING TO THE SOIL SURFACE. USE A DEGRADABLE NETTING IN AREAS TO BE MOVED.

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