

CULVERT AND ROAD REPAIRS

600 BRADLEY HILL ROAD, HAMLET OF BLAUVELT
ORANGETOWN, ROCKLAND COUNTY, NEW YORK

S.B.L. 65.18; 1; 4, 5, 21, 27

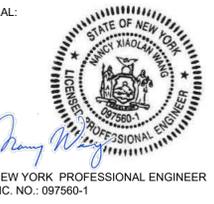
OWNER & DEVELOPER:



ARCHITECT & ENGINEER:



SEAL:



SCOPE OF WORK:

1. REMOVE CULVERT NO. 1. AND INSTALL NEW CMP CULVERT.
2. REMOVE CULVERT NO. 2. AND INSTALL NEW DOUBLE BARREL CMP CULVERT.
3. INSTALL HEADWALLS AT CULVERTS NO. 1 AND NO. 2.
4. PROVIDE PUMPING AND/OR OTHER MEANS TO DIVERT WATER FROM WORK AREA AS NEEDED.
5. RESTORE PAVEMENT OVER CULVERTS INCLUDING BACKFILL, COMPACTION, AND PAVING.
6. RESTORE AREAS DISTURBED IN CHANNEL TO EXISTING CONDITIONS.

DRAWING INDEX:

- T-001 COVER SHEET
- C-101 CULVERT NO. 1 REPLACEMENT PLAN & PROFILE
- C-102 CULVERT NO. 1 REPLACEMENT DETAILS
- C-201 CULVERT NO. 2 EXISTING CONDITIONS & REMOVAL PLAN
- C-202 CULVERT NO. 2 CMP CULVERT REPLACEMENT PLAN
- C-203 CULVERT NO. 2 CONSTRUCTION DETAILS
- C-301 EROSION CONTROL AND RESTORATION DETAILS

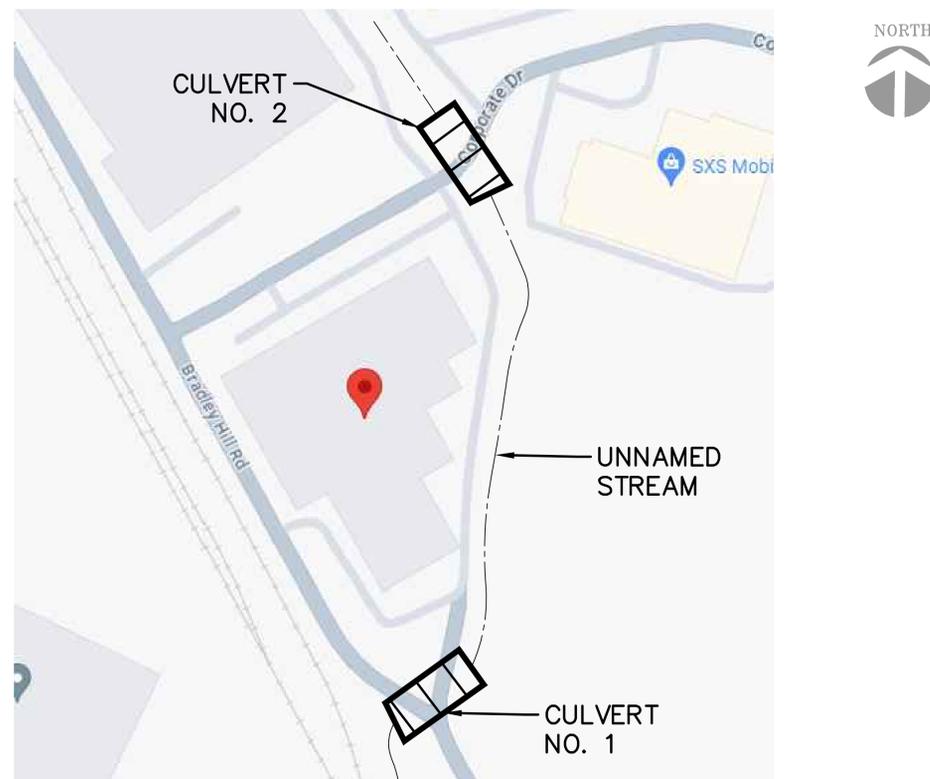
GENERAL NOTES:

1. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING 72 HOURS PRIOR TO ANY SITE DISTURBANCES:
 - A. 811 OR 1-800-272-4480
 - B. DESIGN ENGINEER
 - C. TOWN INSPECTORS AND DEPARTMENT OF BUILDING
 - D. ALL UTILITY COMPANIES HAVING INFRASTRUCTURE WITHIN THE SITE AND ADJACENT PROPERTY AREA.
2. WHERE NOT CONTAINED WITHIN THE PROJECT TECHNICAL SPECIFICATION OR WHERE CONSTRUCTION IS WITHIN THE RIGHT- OF-WAY OF GOVERNMENTAL ENTITIES, ALL CONSTRUCTION SHALL CONFORM TO MUNICIPAL / COUNTY STANDARD CONSTRUCTION DETAILS AND SPECIFICATIONS AND "N.Y. DEPT. OF TRANSPORTATION STANDARD SPECIFICATIONS" FOR ROAD AND BRIDGE CONSTRUCTION, AS AMENDED UNLESS SPECIFICALLY SHOWN OTHERWISE HEREIN. IN CASE OF CONFLICT, THE MORE RESTRICTIVE SHALL GOVERN.
3. EXISTING CONDITIONS SHOWN ARE TAKEN FROM MAP ENTITLED "TOPOGRAPHIC SURVEY, PATNERS GROUP HUDSON HOLDINGS, LLC, SECTION 65.18, BLOCK 1, LOT 21, 600 BRADLEY HILL ROAD - "BUILDING #2", HAMLET OF BLAUVELT, TOWN OF ORANGETOWN, ROCKLAND COUNTY, STATE OF NEW YORK" PREPARED BY JAMES D. SENS NYSPLS NO. 050846 OF CONTROL POINT ASSOCIATES, INC. DATED MAY 29, 2024. LAST REVISED SEP. 16, 2024.
4. VERTICAL DATUM FOR ALL TOPOGRAPHIC MAPPING SHOWN ON THIS SET OF PLANS IS NADV 1988.
5. THE FEDERAL EMERGENCY MANAGEMENT AGENCY HAS DETERMINED THAT THE SUBJECT SITE IS NOT LOCATED WITHIN FLOOD HAZARD AREA AS DEPICTED ON THE PRELIMINARY FLOOD INSURANCE RATE MAP (FIRM) ISSUED FOR THIS COMMUNITY: FIRM PANEL 179, MAP NO. 36087C0179G, EFFECTIVE ON MARCH 3, 2014.
6. CONTRACTOR SHALL REVIEW THE INFORMATION AND MAKE ANY ADDITIONAL INVESTIGATIONS HE/SHE DEEMS APPROPRIATE. TEST PITS MAY BE NECESSARY DURING CONSTRUCTION TO VERIFY THE LOCATION OF INFRASTRUCTURE PARTICULARLY IN AREAS WHERE NEW WORK IS NEAR EXISTING FACILITIES AND/OR UTILITY INFRASTRUCTURE.
7. THE CONTRACTOR SHALL HAVE THE RESPONSIBILITY TO VERIFY THE LOCATION, DEPTH, SIZE, ALIGNMENT, ETC., OF ALL EXISTING CULVERTS AND UTILITIES PRIOR TO ANY CONSTRUCTION.
8. THE CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IMMEDIATELY OF ANY DISCREPANCIES IN THE PLANS, REVISIONS AS MAY BE REQUIRED BY DESIGN IMPLEMENTATION, OR FIELD REVISIONS THERETO.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING WARNING SIGNS, BARRICADES, AND ANY AND ALL SAFETY MEASURES AS MAY BE REQUIRED BY LOCAL CODE, OSHA, STANDARD PRACTICE, AND / OR COMMON SENSE.
10. EXISTING SIGNS WITHIN AREAS AFFECTED BY THE CONSTRUCTION SHALL BE RE-SET AS DIRECTED BY THE OWNER.
11. SUBSTITUTIONS OF PROPRIETARY MATERIAL AND / OR PRODUCT SPECIFICATIONS WHERE CONTINGENT UPON THE NOTE "OR EQUAL" OR "OR EQUIVALENT" MUST BE APPROVED BY THE DESIGN ENGINEER PRIOR TO INSTALLATION. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DEMONSTRATE TO THE SATISFACTION OF THE DESIGN ENGINEER THAT THE SUBSTITUTION IS EQUIVALENT. APPROVAL OF SUBSTITUTIONS IS AT THE SOLE DISCRETION OF THE ENGINEER AND CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING THE LOCATION OF UNDERGROUND IMPROVEMENTS INSTALLED OR ENCOUNTERED DURING CONSTRUCTION. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL SUPPLY THE OWNER WITH A SET OF "RECORD" DRAWINGS. DRAWINGS SHALL BE NEATLY DRAWN AND CLEARLY DEPICT UTILITY SIZE AND LOCATION (BOTH HORIZONTAL AND VERTICAL). CONTRACTOR SHALL CERTIFY TO THE ACCURACY OF THIS DRAWING.
13. TRAFFIC STRIPING AND/OR MARKING, WHETHER CIRCULATION, DIRECTIONAL OR PARKING, SHALL BE PERFORMED IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES," AMENDED.
14. THE CONTRACTOR SHALL VERIFY THAT ALL PERMITS AS MAY BE REQUIRED BY LOCAL, COUNTY, STATE OR FEDERAL REGULATIONS ARE IN HAND AND VALID PRIOR TO COMMENCING WORK.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PLACEMENT AND MAINTENANCE OF PROPER AND SUFFICIENT CONSTRUCTION WARNING SIGNS AS INDICATED IN THE "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES," WHICH SHALL BE INSTALLED TO BOTH DIRECT CONSTRUCTION TRAFFIC AND TO PROTECT PEDESTRIANS AND MOTORISTS FROM CONSTRUCTION TRAFFIC.
16. ALL MATERIAL REMOVED FROM SITE SHALL BE DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL RULES AND REGULATIONS.
17. ROCKLAND COUNTY DRAINAGE AGENCY (RCDA) REVIEWED THE PROPOSED DESIGN AND ISSUED A LETTER OF JURISDICTIONAL DETERMINATION ON JULY 2, 2024 STATING THAT THE PROJECT LOCATION LIES OUTSIDE THE JURISDICTION OF THE RCDA, THEREFORE THE RCDA DOES NOT REQUIRE A STREAM CONTROL ACT PERMIT FOR THIS PROJECT.

WORK SCHEDULE

1. CONTRACTOR IS TO COORDINATE WITH THE FACILITY AND MAINTAIN FACILITY FUNCTIONAL AT ALL TIMES.
2. WORK TO BE SCHEDULED BASED ON FACILITIES OPERATION. WEEKEND WORK SCHEDULE MAY BE REQUIRED FOR UTILITY RELOCATION AND RESTORATION FOR THE CONSTRUCTION OF THE CULVERT REPLACEMENT.

LOCATION PLAN:



PROJECT INFORMATION

OWNER / APPLICANT:
ONYX MANAGEMENT GROUP, LLC
900 ROUTE 9 NORTH, SUITE 400,
WOODBRIIDGE, NJ 07095

PROJECT PARCELS (S.B.L.):
65.18; 1; 4
65.18; 1; 5
65.18; 1; 21
65.18; 1; 27

TOTAL DISTURBED AREA (LOD):
7,000 SF (0.16 AC.)

CULVERT AND ROAD REPAIR
600 BRADLEY HILL ROAD

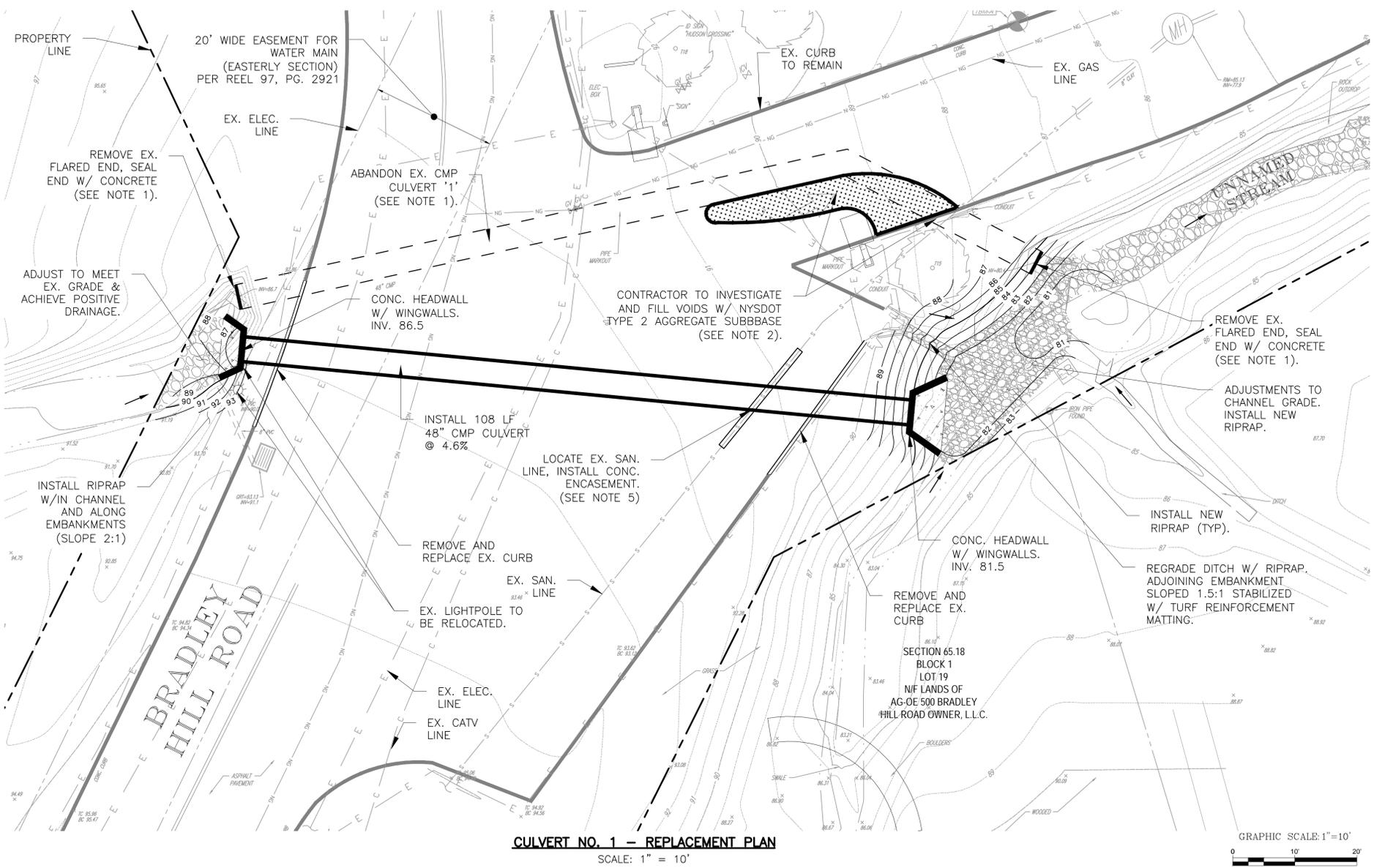
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ORANGETOWN, NY 10913

1	Per Contractor's Submittal	03/28/25
NO.	SUBMISSION	DATE

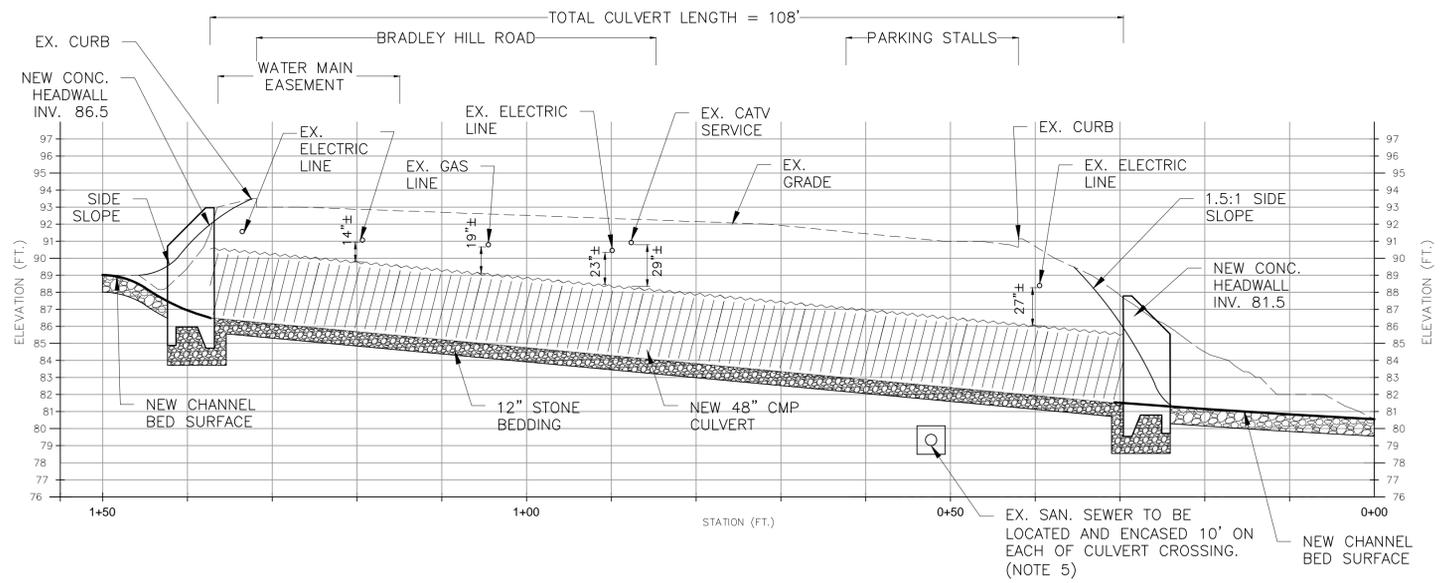
REVISIONS		
DESIGN:	TJW	
DRAWN:	TJW	
CHECKED:	NW	
SCALE:	AS NOTED	
DATE:	DECEMBER 13, 2024	
PROJECT NO.:	224015	

DRAWING TITLE:
COVER SHEET

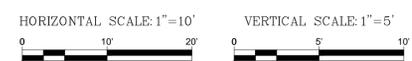
DRAWING NO.:
T-001 01 OF 07



CULVERT NO. 1 - REPLACEMENT PLAN
SCALE: 1" = 10'



CULVERT NO. 1 - PROFILE VIEW
SCALE: AS NOTED.



NOTES:

1. ABANDON AND PLUG EXISTING CULVERT. THE EXISTING CULVERTS SHALL BE SEALED AT THE ENDS WITH CONCRETE AND FILLED WITH A GROUT MIXTURE PUMPED INTO THE CULVERT FROM THE ENDS WITH THE SEALS SEQUENCED TO PROVIDE THE FLOW AND RELEASE OF AIR AS THE STRUCTURE IS FILLED. EQUIPMENT AND METHODS USED TO PERFORM THIS WORK SHALL MEET THE APPROVAL OF THE ENGINEER. REFER TO CONSTRUCTION DETAIL ON SHEET C-102.
2. CONTRACTOR TO EXPLORE AND EXCAVATE SINKHOLE AND TO REMOVE LOOSE MATERIAL AND FILL VOIDS WITH AGGREGATE MATERIAL AND COMPACTED RESTORED PAVEMENT.
3. EXISTING CULVERT TO BE UTILIZED DURING INSTALLATION OF NEW CULVERT AND ABANDONED IMMEDIATELY AFTER.
4. PRIOR TO ISNTALLATION OF NEW CULVERT, THE CONTRACTOR IS TO INVESTIGATE AND VERIFY ALL UNDERGROUND UTILITIES AT NEW CULVERT LOCATION. SLOPE OF CULVERT MAY BE ADJUSTED TO AVOID CONFLICTS.
5. THE SANITARY PIPE INVERT IS TO BE DETERMINED BY AND VERIFIED IN FIELD. PROVIDE PIPE ENCASEMENT IF THE VERTICAL SEPARATION IS LESS THAN 18".

OWNER & DEVELOPER:

ONYX EQUITIES, LLC

ARCHITECT & ENGINEER:

O&S ASSOCIATES
ENGINEERS & ARCHITECTS
145 Main Street
Hackensack, NJ 07601
201.488.7144
NEW JERSEY • NEW YORK • PENNSYLVANIA
OHIO • WASHINGTON DC • FLORIDA

SEAL:

NEW YORK PROFESSIONAL ENGINEER
LIC. NO.: 097560-1

**CULVERT AND ROAD REPAIR
600 BRADLEY HILL ROAD**

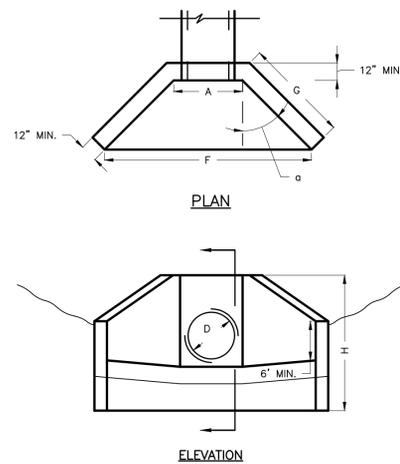
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NO.	REVISIONS	DATE
1	Per Contractor's Submittal	03/28/25

DESIGN: TJW
DRAWN: TJW
CHECKED: NW
SCALE: AS NOTED
DATE: DECEMBER 13, 2024
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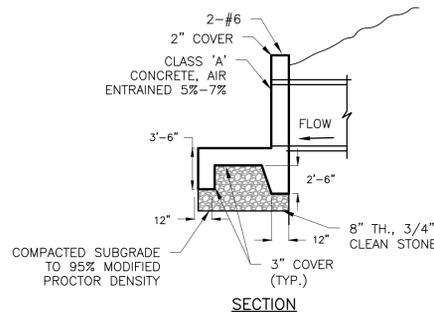
DRAWING TITLE:

**CULVERT NO. 1
REPLACEMENT
PLAN & PROFILE**



LOCATION	D	a	A	G	F	H
UPSTREAM	48"	60"	5'-8"	3'-6"	9'	9'
DOWNSTREAM	48"	60"	5'-8"	6'-3"	11'-4"	9'

NOTE:
* WINGWALL ANGLE AND LENGTH TO BE SELECTED TO MEET EXISTING ROCK WALLS.

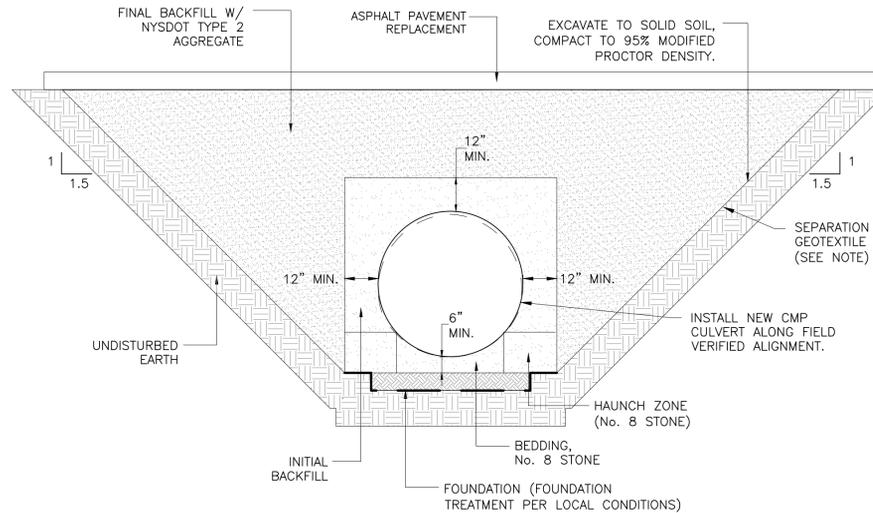


NOTES:

1. THE HEADWALLS ARE INTENDED TO BE REINFORCED CONCRETE, PRECAST OR CAST-IN-PLACE HEADWALLS. THE CONTRACTOR IS TO SUBMIT SHOP DRAWINGS PRIOR TO CONSTRUCTION.
2. ALL EXPOSED EDGES OF STRUCTURE TO RECEIVE 1/2" CHAMFER, INCLUDING FRONT AND BACK OF WALL.
3. ALL PRECAST CONCRETE STRUCTURES, CONCRETE BLOCK, OR FORM-IN-PLACE CONCRETE SHALL BE MADE OF DOT CLASS 'A' CONCRETE WITH 5% TO 7% AIR ENTRAINMENT.
4. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS SHALL BE COMPACTED TO 95% MODIFIED PROCTOR DENSITY.
5. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL STRUCTURES SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE.

SINGLE BARREL HEADWALL DETAIL

SCALE: N.T.S.



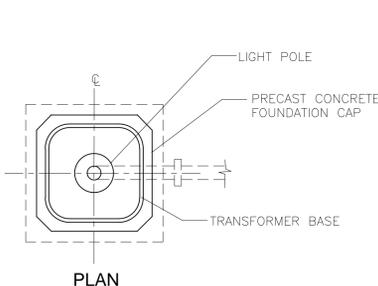
CULVERT NO. 1 - CIRCULAR CULVERT INSTALLATION DETAIL

SCALE: N.T.S.

EARTHWORK NOTES:

BACKFILL REQUIREMENTS FOLLOW THE GUIDELINES OF AASHTO LRFD BRIDGE DESIGN (SEC 12) AND CONSTRUCTION (SEC 26).

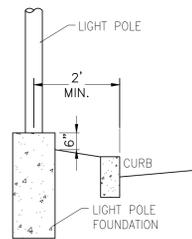
1. EXCAVATE COLLAPSED AREA AND REMOVE ALL DEBRIS AND UNSUITABLE SOIL MATERIAL.
2. MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE ARCH.
3. SEPARATION GEOTEXTILE TO MEET "NYSDOT STANDARD SPECIFICATIONS...", SECTION 737-01B - GEOTEXTILE SEPARATION.
4. **BEDDING MATERIAL.**
 - 4.1. BEDDING MATERIAL SHALL BE A RELATIVELY LOOSE MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE CULVERT, AND A MINIMUM OF TWICE THE CORRUGATION DEPTH (FOR CMP).
 - 4.2. BEDDING MATERIAL SHALL BE FREE OF ORGANICS, ROCK FRAGMENTS LARGER THAN 3", CHUNKS OF HIGHLY PLASTIC CLAY, FROZEN LUMPS, AND CORROSIVE OR OTHERWISE DELETERIOUS MATERIALS.
 - 4.3. MATERIAL SHALL BE ASTM-C33, SAND AND NO. 8 CLEAN STONE. CRUSHED ROCK MEETING AASHTO NOS. 57, 67, AND 8 MAY ALSO BE ACCEPTED PENDING THE ENGINEER'S APPROVAL.
5. **HAUNCH ZONE MATERIAL.**
 - 5.1. HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION.
 - 5.2. MATERIAL SHALL CONSIST OF: COARSE AGGREGATE MEETING ASTM-C33 NO. 8 CLEAN STONE AND FINE AGGREGATE MEETING ASTM-C33.
6. **INITIAL BACKFILL.**
 - 6.1. INITIAL BACKFILL FOR PIPE EMBEDMENT TO MEET AASHTO A-1, A-2, OR A-3 CLASSIFICATION OR APPROVED EQUAL, COMPACTED 90% STANDARD PROCTOR (T-99). MAXIMUM PARTICLE SIZE NOT TO EXCEED 3". ALL LIFTS SHALL BE PLACED IN A CONTROLLED MANNER. IT IS RECOMMENDED THAT LIFTS DO NOT EXCEED 8" UNCOMPACTED LIFT HEIGHT TO PREVENT UNEVEN LOADING, AND THE LESSER OF 1/3 THE SPAN OR 24" AS THE MAXIMUM DIFFERENTIAL SIDE TO SIDE).
 - 6.2. INITIAL BACKFILL ABOVE PIPE ARCH MAY INCLUDE CONTROLLED, LOW-STRENGTH MATERIAL MEETING "NYSDOT STANDARD SPECIFICATIONS...", SECTION 204 TO HAUNCH PIPE BEDDING PENDING THE ENGINEER'S APPROVAL.
7. **FINAL BACKFILL.**
 - 7.1. PLACE FINAL BACKFILL IN COMPACTED 8" LIFTS STARTING A MINIMUM OF 12" ABOVE THE INSTALLED CULVERT.



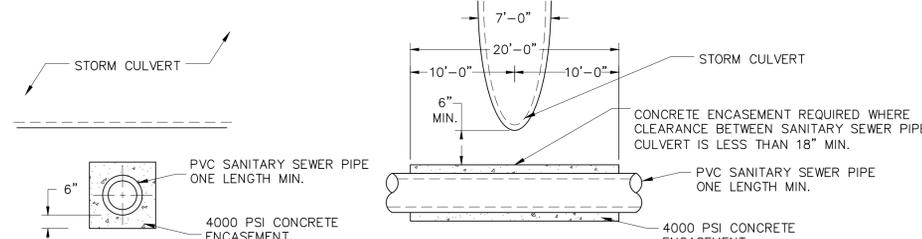
PLAN

NOTE:

1. THIS DETAIL INDICATED THE GENERAL REQUIREMENTS FOR LIGHT POLE FOUNDATION. IT MAY BE ADJUSTED BASED ON ACTUAL POLE TYPE AND ANCHOR REQUIREMENTS.
2. CONTRACTOR IS TO SUBMIT SHOP DRAWINGS FOR REVIEW.

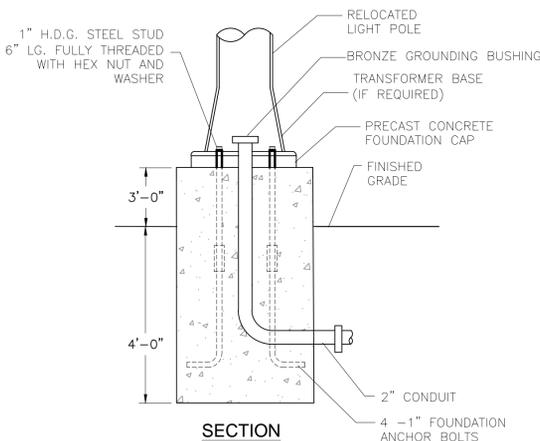


LIGHT POLE AT CURB



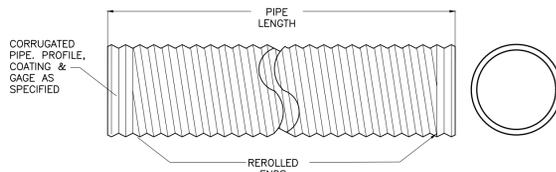
SANITARY SEWER CONCRETE ENCASEMENT DETAIL

SCALE: N.T.S.



LIGHT POLE FOUNDATION DETAIL

SCALE: N.T.S.

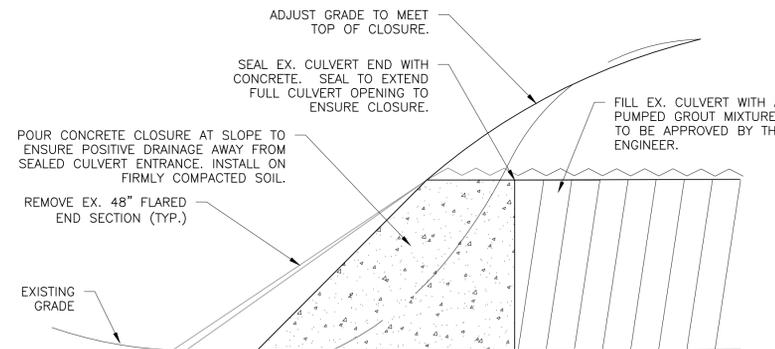


NOTES:

1. DETAIL IS APPLICABLE FOR ALL CMP CULVERTS.
2. MATERIAL PER SPECIFICATION AASHTO M197 OR ASTM B744 FOR ALUMINUM.
3. MATERIAL PER SPECIFICATION ASTM A929 FOR GALVANIZED OR ALUMINIZED STEEL & ASTM 742 FOR POLYMER COATED STEEL.
4. PIPE IS SUBJECT TO TOLERANCES AS NOTED IN SPECIFICATIONS AASHTO M36 AND ASTM A760.
5. THE AVERAGE OUTSIDE SPAN IS EQUAL TO THE AVERAGE INSIDE SPAN, PLUS TWO TIMES THE CORRUGATION DEPTH, PLUS TWO TIMES THE METAL THICKNESS. REFERENCE THE NCSPA CSP DESIGN MANUAL, PAGE 38, FOR RIVET SIZES AND LOCATIONS.
6. CONTRACTOR IS TO VERIFY THE EXISTING CORRUGATION PROFILE AND CONFIRM WHETHER CMP CULVERT IS HELICAL OR ANNULAR PRIOR TO CONSTRUCTION.
7. CORRECT JOINT MISALIGNMENT AND FAILURES WITH WELDING, MORTAR, OR TIES (AT END SECTIONS). FACILITATE JOINTS UTILIZING SAME TECHNIQUES HERE.

PIPE DATA:

GAGE: 12
MATERIAL: STEEL
COATING: ALT 2
FINISH: ALUMINIZED
CORRUGATION PROFILE: TBD
NOMINAL SPAN: 48"
NOMINAL RISE: 48"



SIDE ELEVATION VIEW

CULVERT ABANDONMENT DETAIL

SCALE: N.T.S.

CULVERT ABANDONMENT NOTES:

1. ANY TREE BRANCHES, LEAVES AND OTHER DEBRIS INSIDE THE EXISTING CULVERT NEED TO BE REMOVED PRIOR TO THE FILLING.
2. THE GROUT FILL MIXTURE PUMPED INTO THE CULVERT MAY BE CEMENTITIOUS GROUT OR FLOWABLE LOW STRENGTH CONCRETE.
 - 2.1. CEMENTITIOUS GROUT SHALL CONSIST OF A PREBLENDED OF LIGHTWEIGHT AGGREGATE, CEMENT, FLY ASH AND ADMIX TO PREVENT SEGREGATION AND PROMOTE EXPANSION UPON SETTING. LOOSE BULK DENSITY FOR THE DRY MIX MATERIALS SHALL BE 30 TO 35 POUNDS PER CUBIC FOOT. GROUT SHALL EQUAL OR EXCEED STRONG-SEAL GROUT 250 AND SHALL BE PACKAGED IN 2 CUBIC FOOT BAGS.
 - 2.1.1. GENERALLY, GROUT SHALL BE NONMETALLIC, NONSHRINK GROUT; PACKAGED, NONMETALLIC, NONCORROSIVE, NONSTAINING GROUT CONTAINING SELECTED SILICA SANDS, PORTLAND CEMENT, SHRINKAGE-COMPENSATING AGENTS, PLASTICIZING AND WATER-REDUCING AGENTS, COMPLYING WITH GRADES B AND C FOR FLOWABLE GROUT AND OF CONSISTENCY SUITABLE FOR APPLICATION WITHIN A 30-MINUTE WORKING TIME. WATER-SOLUBLE CHLORIDE ION CONTENT LESS THAN 0.06 PERCENT BY WEIGHT OF CEMENT WHEN TESTED ACCORDING TO ASTM C1218/C1218M.
 - 2.2. FLOWABLE FILL - LOW DENSITY CONTROLLED LOW STRENGTH MATERIAL OR CELLULAR CONCRETE TYPICALLY RANGES FROM 20LB/CUFT WET CAST DENSITY UP TO AROUND 70LB/CUFT. THESE DENSITIES PROVIDE STRENGTHS FROM AROUND 50PSI TO GREATER THAN 1,000 PSI.

OWNER & DEVELOPER:



ARCHITECT & ENGINEER:



NEW JERSEY • NEW YORK • PENNSYLVANIA
OHIO • WASHINGTON DC • FLORIDA

SEAL:



NEW YORK PROFESSIONAL ENGINEER
LIC. NO.: 097560-1

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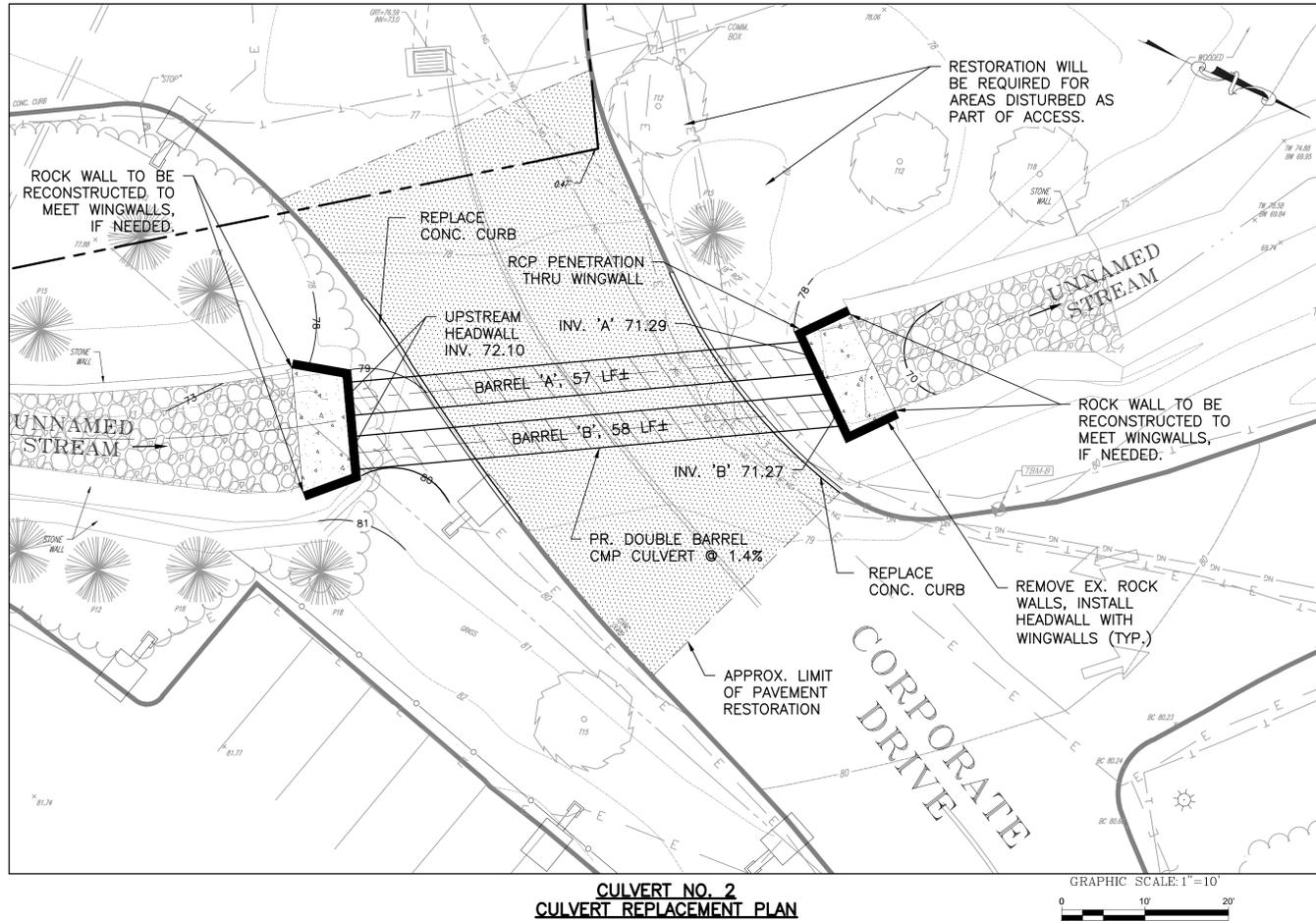
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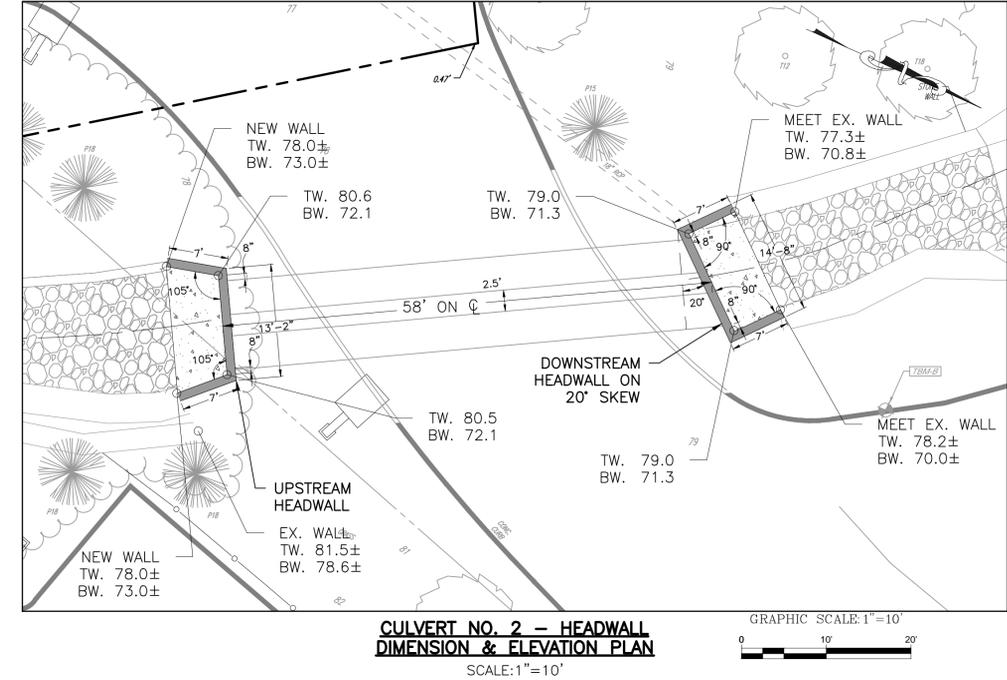
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DESIGN:	TJW
DRAWN:	TJW
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SCALE:	AS NOTED
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PROJECT NO.:	224015

**CULVERT NO. 1
REPLACEMENT
DETAILS**

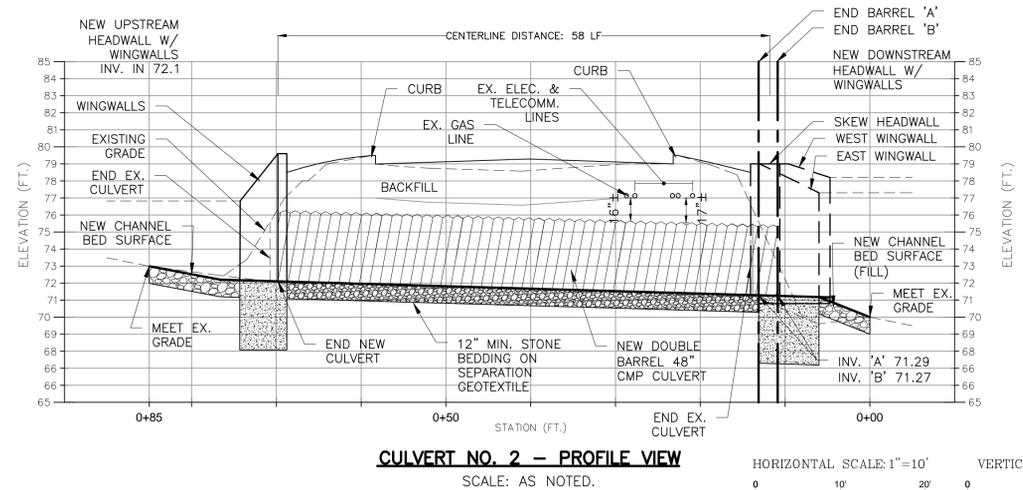
DRAWING NO.:
C-102



**CULVERT NO. 2
CULVERT REPLACEMENT PLAN**
SCALE: 1"=10'

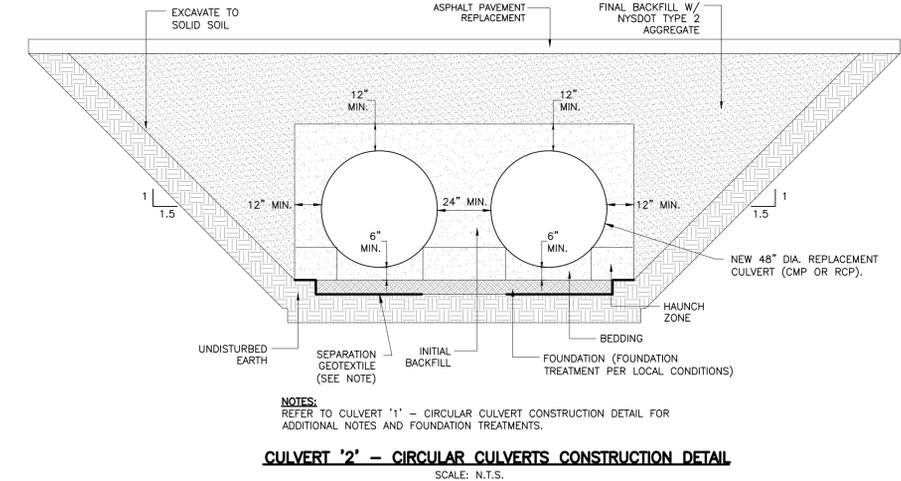


**CULVERT NO. 2 - HEADWALL
DIMENSION & ELEVATION PLAN**
SCALE: 1"=10'



CULVERT NO. 2 - PROFILE VIEW
SCALE: AS NOTED.

- PROFILE VIEW NOTES:**
- ELECTRIC AND TELEPHONE LINES WITHIN BRADLEY HILL DRIVE ARE APPROXIMATELY 24" BELOW THE FINISHED PAVEMENT GRADE; SIZE OF CONDUIT IS UNKNOWN.
 - NATURAL GAS LINE WITHIN BRADLEY HILL DRIVE IS APPROXIMATELY 24" BELOW THE FINISHED PAVEMENT GRADE; SIZE OF CONDUIT IS UNKNOWN.
 - MEET EXISTING GRADE AT EDGE OF CHANNEL RESTORATION AREA.



CULVERT '2' - CIRCULAR CULVERTS CONSTRUCTION DETAIL
SCALE: N.T.S.

OWNER & DEVELOPER:

ONYX
ONYX EQUITIES, LLC

ARCHITECT & ENGINEER:

O&S
ASSOCIATES
ENGINEERS & ARCHITECTS
145 Main Street
Hackensack, NJ 07601
201.488.7144
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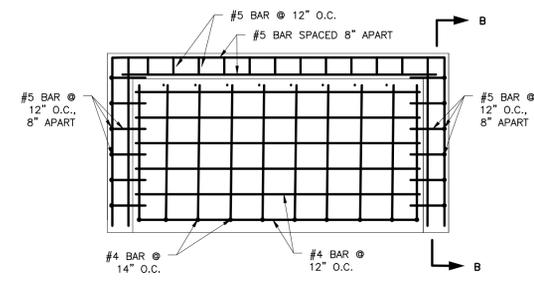
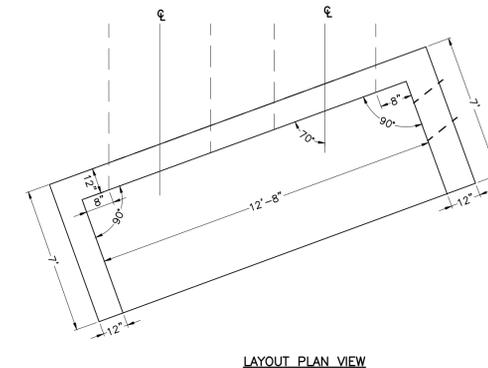
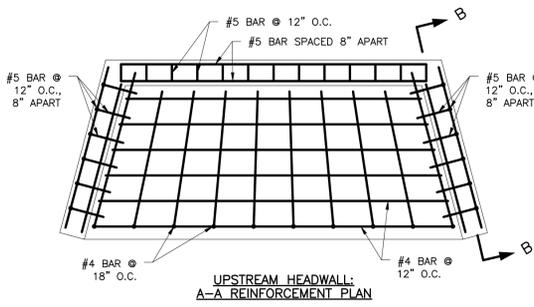
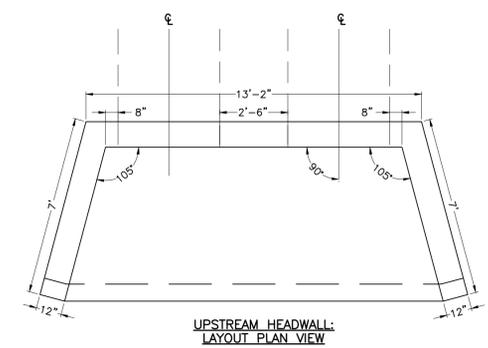
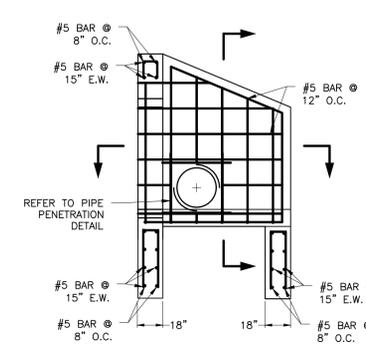
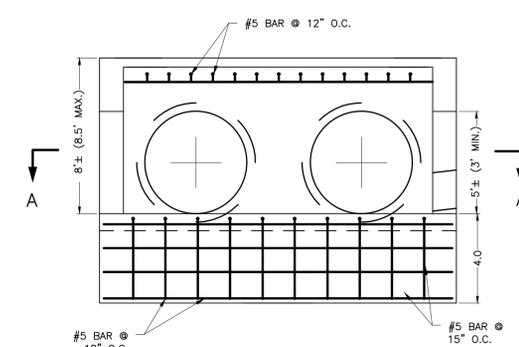
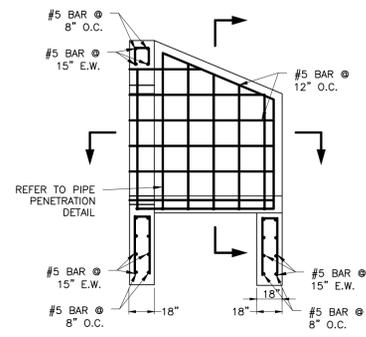
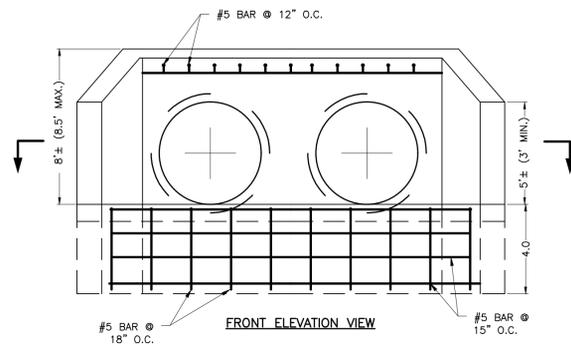
NEW YORK PROFESSIONAL ENGINEER
LIC. NO.: 097560-1

**CULVERT AND ROAD REPAIR
600 BRADLEY HILL ROAD**
S.B.L. 65.18; 1; 4; 5, 21, 27
600 BRADLEY HILL ROAD
ORANGETOWN, NY 10913

NO.	REVISIONS	DATE
1	Per Contractor's Submittal	03/28/25

DESIGN: TJW
DRAWN: TJW
CHECKED: NW
SCALE: AS NOTED
DATE: DECEMBER 13, 2024
PROJECT NO.: 224015

DRAWING TITLE:
**CULVERT NO. 2
CMP CULVERT
REPLACEMENT
PLAN**

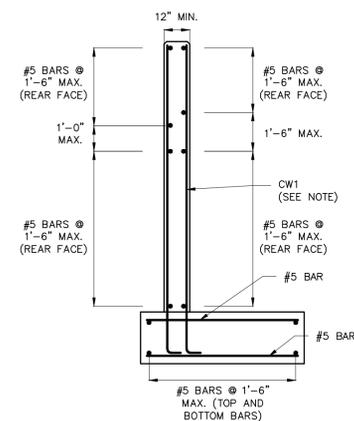


**DOUBLE BARREL CMP CULVERTS
UPSTREAM HEADWALL DETAILS**
SCALE: N.T.S.

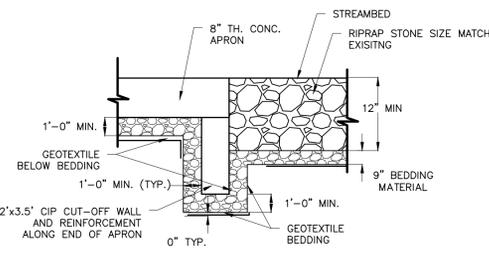
CMP CULVERT HEADWALL NOTES:

1. THIS DETAIL SHOWS THE GENERAL REINFORCEMENT REQUIREMENT. THE CONTRACTOR IS TO SUBMIT SHOP DRAWING WITH REINFORCEMENT DETAIL PRIOR TO INSTALLATION.
2. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" MIN. CLEAR DISTANCE.
3. REBAR SIZE IS #5 BAR FOR ALL REINFORCEMENT SHOWN.
4. HEADWALLS LOCATED AT EDGE OF SHOULDER SHALL BE PARALLEL TO CENTERLINE OF THE ROAD.
5. APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.
6. ACTUAL CULVERT WALL, TOP SLAB AND BOTTOM SLAB THICKNESSES, REINFORCEMENT SIZE AND SPACINGS TO BE DETERMINED BY CONTRACTOR AND APPROVED BY STRUCTURAL ENGINEER LICENSED IN THE STATE OF NEW YORK.
7. WHERE EPOXY COATED THREADED INSERTS ARE SHOWN, ANY NON-CORROSIVE MECHANICAL CONNECTOR MEETING NYS DOT SEC. 709-10 MAY BE USED AS AN ALTERNATE.
8. ALL REINFORCEMENT COVER ON C.I.P. CONCRETE SHALL BE 2" UNLESS NOTED OTHERWISE.
9. ALL REINFORCEMENT COVER ON PRECAST UNITS SHALL BE 1" MIN. UNLESS NOTED OTHERWISE.
10. DOWELS TO BE EMBEDDED INTO CULVERT WINGWALLS.
11. EXTEND APRON TO END OF WINGWALLS.
12. DOWEL INSERTION SHALL MEET ACI CODE REQUIREMENTS.

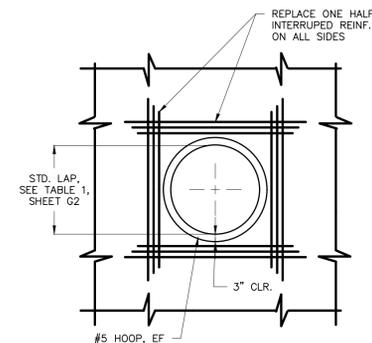
**DOUBLE BARREL CMP CULVERTS
DOWNSTREAM HEADWALL DETAILS**
SCALE: N.T.S.



**WINGWALL UNIT
REINFORCEMENT**



**PRECAST CONCRETE
APRON MEETS STREAMBED**
SCALE: N.T.S.



- NOTES:**
1. ONLY ADDITIONAL PENETRATION REINF. SHOWN. TYPICAL REINF. AND WATERPROOFING ARE NOT SHOWN FOR CLARITY.
 2. PREFABRICATED COMPOSITE STRUCTURAL DRAIN TO BE INSTALLED ALONG SOIL SIDE (AS REQUIRED).

REINFORCED PIPE PENETRATION
SCALE: N.T.S.

MISC. CONCRETE NOTES:

1. CONCRETE SHALL BE TYPE 1/II CEMENT WITH MIN. COMPRESSIVE STRENGTH OF 5,000 PSI AT 28-DAYS UNLESS OTHERWISE NOTED.
2. ALL PRECAST COMPONENTS SHALL BE PROVIDED FROM THE SAME MANUFACTURER (FOOTINGS, TOE WALLS, HEADWALLS, WINGWALLS, ETC.).
3. CONCRETE SEALANTS AND JOINT SEALERS TO BE MASTIC TYPE MANUFACTURED BY CONSEAL CONCRETE SEALANTS OR APPROVED EQUAL.

OWNER & DEVELOPER:



ARCHITECT & ENGINEER:



SEAL:



**CULVERT AND ROAD REPAIR
600 BRADLEY HILL ROAD**
S.B.L. 65.18; 1; 4, 5, 21, 27
600 BRADLEY HILL ROAD
ORANGETOWN, NY 10913

1	Per Contractor's Submittal	03/28/25
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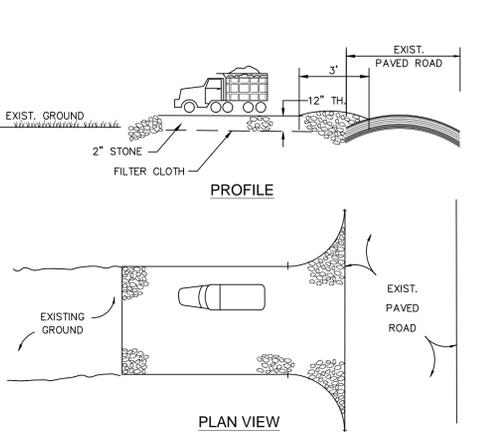
NO.	SUBMISSION	DATE
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DESIGN:	TJW
DRAWN:	TJW
CHECKED:	NW
SCALE:	AS NOTED
DATE:	DECEMBER 13, 2024
PROJECT NO.:	224015

**CULVERT NO. 2
CONSTRUCTION
DETAILS**

DRAWING NO.:
C-203
06 OF 07

CONSTRUCTION SEQUENCE	
CONSTRUCTION SEQUENCE ITEMS	DURATION
1. Provide written notification to the Town and Soil Conservation District at least three (3) business days prior to commencing work. A pre-construction meeting is to be held with the Town officials (if required per the Building Permit or ordinance) and Engineer prior to site disturbance.	---
2. Stake limit of disturbance. Identify all vegetation within limits of disturbance to be removed.	1 Day
3. Install construction access (stone access, plating, or matting if needed), silt fence/fock, tree protection, and inlet protection filters as shown prior to commencing any earthwork.	2 Days
4. Demolition. Remove rock walls, curbing, pavement, trees, and light pole(s) as needed to begin excavation for culvert. Mill and sawcut asphalt pavement as needed for work area.	1 Week
5. Construct cofferdams upstream and downstream to confine work area prior to excavation and deliver bypass pump(s).	1 Week
6. Earthwork. Begin excavation for new culverts. Install bypass pumps and provide dewatering as required. Take precautions per stream bypass and cofferdam construction detail notes.	2 Weeks
7. Construct Culvert. Prepare culvert foundation and compact excavation area. Coordinate delivery with manufacturer. Install culvert in sections. Take special care to follow best practices for delivery, storage, and installation to prevent damage. Install culvert in sections. Form haunch and backfill around culvert. Install final DGA backfill with Engineer's Approval. Make structural connections.	2-3 Weeks
8. Channel Restoration. Install new riprap within the stream channel as needed to maintain positive drainage.	1 Week
9. Culvert Abandonment / Removal. Abandon Culvert No. 1 per construction notes and details. Remove CMP Culvert(s) No. 2.	2 Weeks
10. Rough Grading. Rough grade lawn areas. Construct replacement curb. Prepare aggregate subbase of paved areas.	1 Week
11. Finish Grading. Install asphalt top course within street. Grade disturbed lawn areas to smooth transition around installed structures.	2 Days
12. Stabilization. All exposed areas within streets are to be stabilized by installing pavement. All exposed lawn areas are to be stabilized by seeding and mulching with stabilization matting installed along slopes.	---
13. After the construction work and areas are determined to be stabilized, all temporary erosion and sediment control devices are to be removed.	1 Day



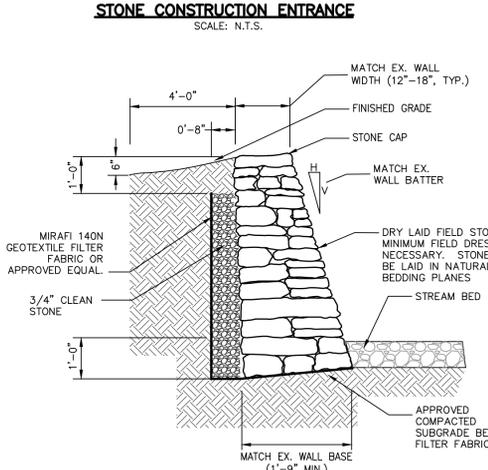
- NOTES:**
- STONE SIZE: USE 2" STONE.
 - LENGTH: AS SHOWN ON PLAN, 30 FT. MIN.
 - THICKNESS: NOT LESS THAN TWELVE (12) INCHES.
 - WIDTH: TEN (10) FEET MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINT WHERE INGRESS OR EGRESS OCCURS.
 - FILTER CLOTH: WILL BE PLACED OVER ENTIRE AREA PRIOR TO PLACING OF STONES.
 - 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.
 - MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONES AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY.
 - VEHICLE WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY, WHEN WASHING IS REQUIRED IT SHALL BE DONE ON AN APPROVED SEDIMENT TRAPPING DEVICE. INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

- MAINTENANCE PLAN**
- All erosion and sediment control practices shall be checked for stability and operation following every runoff-producing rainfall but in no case less than once every week. Any needed repairs shall be made immediately to maintain all practices as designed and installed for their appropriate phase of the project.
 - Silt shall be removed from behind the sediment fence when it becomes about 0.5 ft deep at the fence. The sediment fence will be repaired as necessary to maintain a barrier.
 - Silt shall be removed from inlet protection device when storage capacity has been approximately 50% filled.
 - Temporary seed the soil stockpile if it is to be exposed more than 30 days.

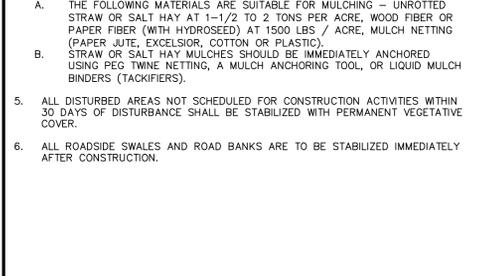
- VEGETATION STABILIZATION NOTES.**
- TEMPORARY VEGETATIVE COVER TO BE ESTABLISHED ON SOILS EXPOSED FROM 1 TO 12 MONTHS.
 - ADD LIMESTONE AT A RATE OF 4000 LBS/ACRE AND 10-10-10 FERTILIZER AT A RATE OF 600 LB/ACRE. PLANT AS FOLLOWS:

BEFORE MAY 20 ANNUAL RYE GRASS	40 LBS / ACRE
MAY 20 - JUNE 20 SUDAN GRASS	60 LBS / ACRE
JUNE 20 - AUG. 1 WEEPING LOVE GRASS	30 LBS / ACRE
AUG. 15 - OCT. 15 ANNUAL RYE GRASS	40 LBS / ACRE
OR APRIL - OCT. KOREAN LESPEDEZA	25 LBS / ACRE*

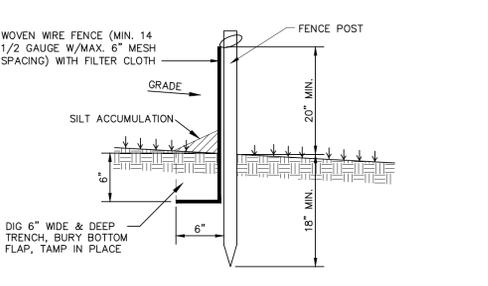
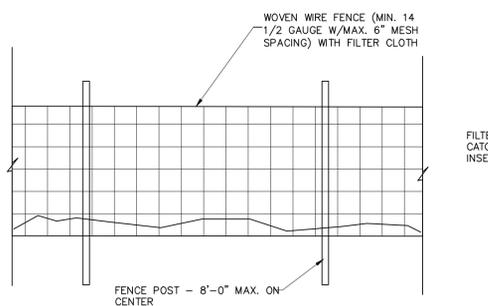
 *IF ADEQUATE SOIL MOISTURE IS MAINTAINED
 - PERMANENT VEGETATIVE COVER - GENERAL AREAS UNDER 5% SLOPE.
 - ADD LIMESTONE AT A RATE OF 4000 LBS/ACRE OR ACCORDING TO RESULTS OF SOIL TESTS. ADD 10-10-10 FERTILIZER AT A RATE OF 600 LB/ACRE OR ACCORDING TO RESULTS OF SOIL TESTS.
 - SEED WITH 54% KENTUCKY 31 FESCUE, 5% RED TOP AND 3% INERT (SOMETIMES DESIGNATED AS ATHLETIC FIELD MIXTURE) AT 100 LBS / ACRE.
 - PERMANENT VEGETATIVE COVER - GENERAL AREAS OVER 5% SLOPE.
 - ADD LIMESTONE AT A RATE OF 4000 LBS/ACRE OR ACCORDING TO RESULTS OF SOIL TESTS. ADD 10-10-10 FERTILIZER AT A RATE OF 600 LB/ACRE OR ACCORDING TO RESULTS OF SOIL TESTS.
 - SEED WITH KENTUCKY RED FESCUE AT 50 LBS / ACRE AND WITH CROWN VETCH AT 10 LBS / ACRE.
 - MULCHING IS REQUIRED ON ALL SEEDING. MULCH WILL INSURE AGAINST EROSION BEFORE GRASS IS ESTABLISHED AND WILL PROMOTE FASTER AND EARLIER ESTABLISHMENT.
 - THE FOLLOWING MATERIALS ARE SUITABLE FOR MULCHING - UNROTTED STRAW OR SALT HAY AT 1-1/2 TO 2 TONS PER ACRE, WOOD FIBER OR PAPER FIBER (WITH HYDROSEED) AT 1500 LBS / ACRE, MULCH NETTING (PAPER JUTE, EXCELSIOR, COTTON OR PLASTIC).
 - STRAW OR SALT HAY MULCHES SHOULD BE IMMEDIATELY ANCHORED USING PEG TWINE NETTING, A MULCH ANCHORING TOOL, OR LIQUID MULCH BINDERS (TACKIFIERS).
 - ALL DISTURBED AREAS NOT SCHEDULED FOR CONSTRUCTION ACTIVITIES WITHIN 30 DAYS OF DISTURBANCE SHALL BE STABILIZED WITH PERMANENT VEGETATIVE COVER.
 - ALL ROADSIDE SWALES AND ROAD BANKS ARE TO BE STABILIZED IMMEDIATELY AFTER CONSTRUCTION.



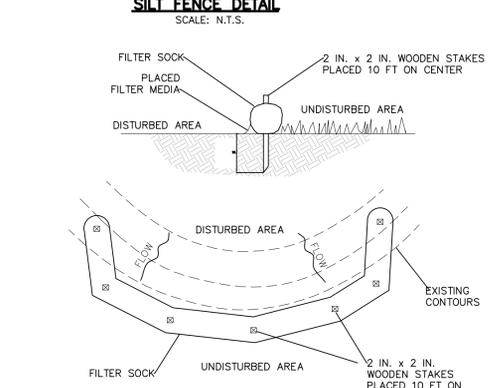
- NOTES:**
- ROCK TYPE SHALL GENERALLY MATCH EXISTING ROCK WALL ONSITE. THE WALL MAY BE COMPOSED OF NATIVE ROCK ONSITE, OR REMOVE SECTIONS OF WALL WHERE RECONSTRUCTED.
 - FLAT ROCKS ARE PREFERRED. AT LEAST 25% OF STONES MUST BE HEADER-TYPE (LENGTH 2-1/2 TIMES THICKNESS).
 - MEET EXISTING GRADE AT TOP AND BOTTOM OF RETAINING WALL.
 - ROCK JOINTS SHALL SLOPE INTO THE HILL (INWARD).
 - CAP STONE TO BE FULL WIDTH OF WALL AND AT LEAST 4" THICK.
 - CONTRACTOR TO VERIFY WHETHER THERE ARE ANY WEEPHOLES WITHIN THE EXISTING RETAINING WALL, AND SHALL INSTALL NEW WEEPHOLES IN A SIMILAR SPACING AND OF SIMILAR MATERIAL. PLACE 1/4" MESH COPPER SCREEN ON BACKSIDE OF CONDUIT WHERE WEEPHOLES ARE INSTALLED (NOT SHOWN).
 - FINISHED GRADE SHALL GENERALLY SLOPE AWAY FROM THE TOP OF THE WALL TO A NATURAL DRAINAGE PATH AND/OR MATCH EXISTING DRAINAGE PATTERNS.



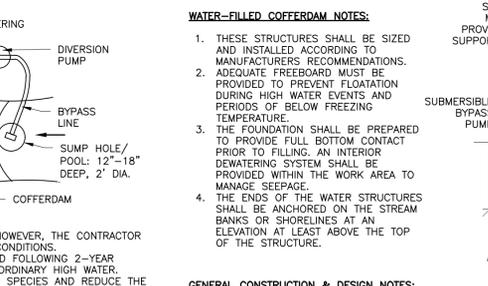
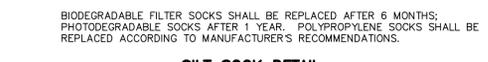
- NOTES:**
- WORK SHALL NOT BE CONDUCTED DURING STORM EVENTS OR HIGH FLOWS, HOWEVER, THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING EXCAVATION AREA AND ENSURING STABLE CONDITIONS.
 - MIN. BYPASS PUMP RATE SHALL BE EQUAL TO STREAM FLOW RATE GENERATED FOLLOWING 2-YEAR STORM EVENT. PUMPS SHOULD BE SIZED FOR THE FLOW EXPECTED DURING ORDINARY HIGH WATER. PUMPS SHOULD HAVE SCREENS TO REDUCE MORTALITY OF FISH AND AQUATIC SPECIES AND REDUCE THE AMOUNT OF FLOATING DEBRIS FROM GETTING CAUGHT IN THE PUMP. PUMP RATE SHOULD BE ADJUSTABLE TO ACCOUNT FOR MORE EXTREME WEATHER. PUMPING INTAKE AND OUTPUT SHALL RESULT IN NON-EROSIVE CONDITIONS AT UPSTREAM AND DOWNSTREAM AREAS.
 - WATER FROM THE WORK AREA SHALL BE PUMPED TO A SEDIMENT FILTERING MEASURES SUCH AS A DEWATERING SYSTEM COMPLIANT WITH WATER QUALITY STANDARDS, WHICH IS LOCATED IN A WELL VEGETATED UPLAND AREA. ALL FISH TRAPPED WITHIN THE STRUCTURE DURING THE DEWATERING PROCESS SHALL BE RETURNED, ALIVE AND UNHARMED, TO THE WATER IMMEDIATELY OUTSIDE THE CONFINES OF THE STRUCTURE.
 - STREAM FLOW SHALL BE DIVERTED AROUND THE WORK AREA AND THE PUMP SHOULD DISCHARGE ONTO A STABLE ENERGY DISSIPATOR COMPRISED OF ROCK OR SANDBAGS LOCATED WITHIN THE STREAM BED DOWNSTREAM OF THE SEDIMENT DIKE.
 - IMMEDIATELY FOLLOWING COMPLETION OF IN-STREAM WORK, ALL COFFERDAMS AND PUMP EQUIPMENT SHALL BE REMOVED AND DISTURBED AREAS SHALL BE GRADED AND STABILIZED IN ACCORDANCE WITH THE APPROVED PLANS.



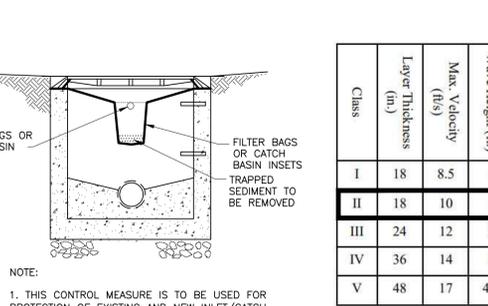
- NOTES:**
- WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
 - FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
 - SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/3 THE ABOVE GROUND HEIGHT OF THE FENCE, OR WHEN "BULGES" DEVELOP IN THE SILT FENCE.



- NOTES:**
- EROSION CONTROL MATTING TO BE EXCELSIOR "CURLX" OR EQUIVALENT.
 - 6" #8 GAL. U-SHAPED WIRE STAPLES OR METAL GEOTEXTILE PINS MAY BE USED TO ANCHOR ROLLED EROSION CONTROL PRODUCT TO THE GROUND.

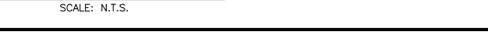
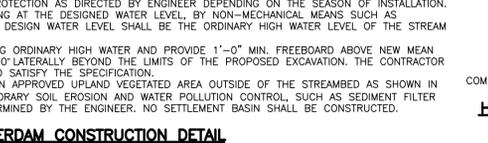
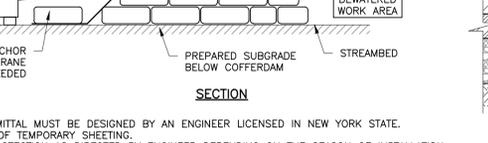
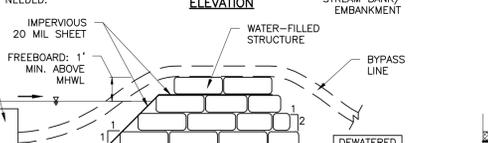
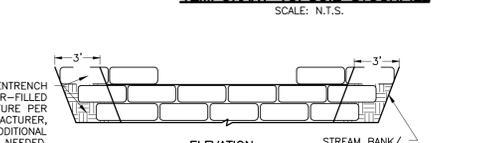
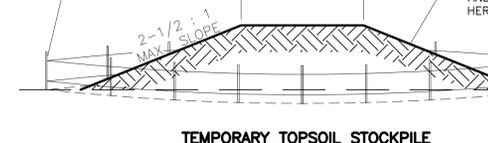
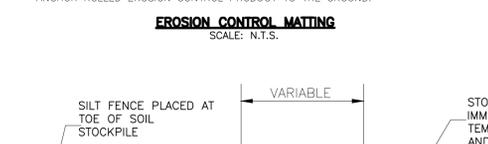
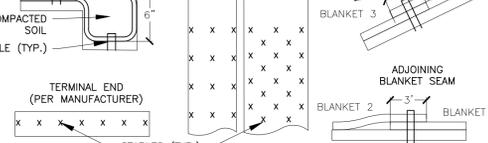
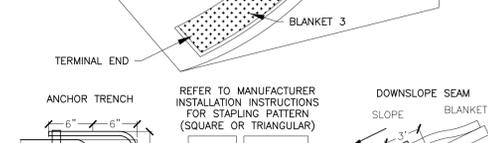
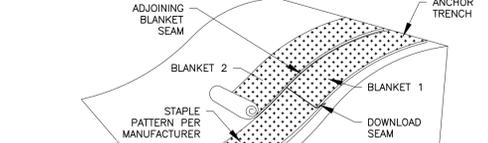
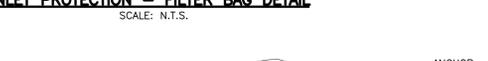


- GENERAL CONSTRUCTION & DESIGN NOTES:**
- THE COFFERDAM AND COFFERDAM REMOVAL DESIGN SUBMITTAL MUST BE DESIGNED BY AN ENGINEER LICENSED IN NEW YORK STATE.
 - COFFERDAM CONSTRUCTION MAY INCORPORATE THE USE OF TEMPORARY SHEETING.
 - CONTRACTOR SHALL PROVIDE ADDITIONAL STREAMBANK PROTECTION AS DIRECTED BY ENGINEER DEPENDING ON THE SEASON OF INSTALLATION.
 - COFFERDAMS SHALL BE CONSTRUCTED TO ALLOW FLOODING AT THE DESIGNED WATER LEVEL, BY NON-MECHANICAL MEANS SUCH AS OVERTOPPING OR FLOODING PORTS. THE RECOMMENDED DESIGN WATER LEVEL SHALL BE THE ORDINARY HIGH WATER LEVEL OF THE STREAM UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
 - THE COFFERDAM SHALL EXTEND 2'-0" ABOVE THE EXISTING ORDINARY HIGH WATER AND PROVIDE 1'-0" MIN. FREEBOARD ABOVE NEW HIGH WATER LEVEL. THE COFFERDAM SHALL EXTEND 3'-0" LATERALLY BEYOND THE LIMITS OF THE PROPOSED EXCAVATION. THE CONTRACTOR SHALL DETERMINE THE ACTUAL FIELD LIMITS REQUIRED TO SATISFY THE SPECIFICATION.
 - AFTER THE COFFERDAM BY PUMPING THE WATER TO AN APPROVED UPLAND VEGETATED AREA OUTSIDE OF THE STREAMBED AS SHOWN IN THE PLANS AND/OR APPROVED BY THE ENGINEER. TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL, SUCH AS SEDIMENT FILTER LOGS OR APPROVED EQUAL, MAY BE REQUIRED AS DETERMINED BY THE ENGINEER. NO SETTLEMENT BASIN SHALL BE CONSTRUCTED.



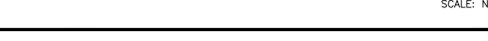
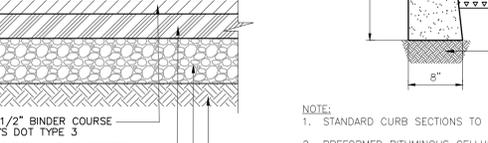
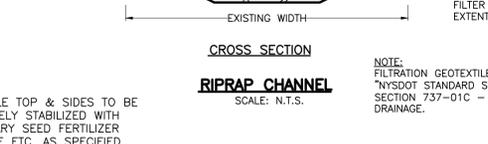
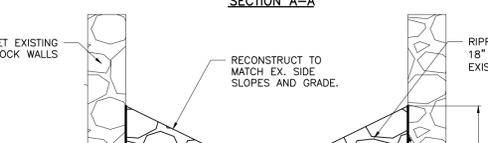
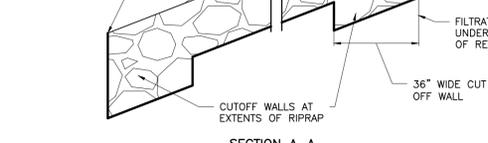
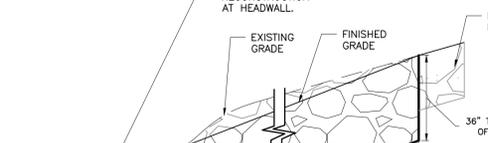
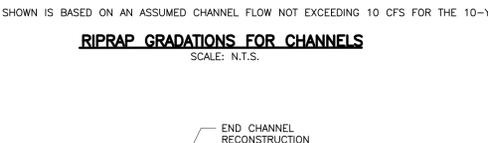
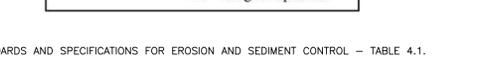
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				D 10			D 50			D 85			D 100		
				Wt. (lbs.)	d ₅₀ (in.)	d ₁₀ (in.)	Wt. (lbs.)	d ₅₀ (in.)	d ₁₀ (in.)	Wt. (lbs.)	d ₅₀ (in.)	d ₁₀ (in.)	Wt. (lbs.)	d ₅₀ (in.)	d ₁₀ (in.)
I	18	8.5	-	5	5	4	50	10	8	100	13	10	150	15	12
II	18	10	-	17	7	6	170	15	12	340	19	15	500	22	18
III	24	12	2	46	10	8	460	21	17	920	26	21	1400	30	24
IV	36	14	3	150	15	12	1500	30	25	3000	39	32	4500	47	36
V	48	17	4.8	370	20	16	3700	42	34	7400	53	43	11,000	60	49

- NOTES:**
- THIS CONTROL MEASURE IS TO BE USED FOR PROTECTION OF EXISTING AND NEW INLET/CATCH BASIN.
 - FILTER BAG/INLET SHALL BE LAYERED FILTER FABRIC WITH OVERFLOW CAPACITY OF UP TO 500 GPM. THE FILTER BAG/INSERT SHALL BE SECURELY INSERTED TO STORM STRUCTURES.
 - FILTER BAG/INSERT SHOULD BE "STORM SENTINEL" ADJUSTABLE CATCH BASIN INSERT WITH OVERFLOW, MANUFACTURED BY ENRAC, OR APPROVED EQUIVALENT.
 - INSPECTION AND REMOVAL OF SEDIMENT ARE REQUIRED AFTER EACH RUNOFF PRODUCING RAINFALL. REPAIR AND REPLACEMENT AS NEEDED.



Class	Layer Thickness (in.)	Max. Velocity (ft/s)	Wave Height (ft)	PERCENT FINER BY WEIGHT											
				D 10			D 50			D 85			D 100		
				Wt. (lbs.)	d ₅₀ (in.)	d ₁₀ (in.)	Wt. (lbs.)	d ₅₀ (in.)	d ₁₀ (in.)	Wt. (lbs.)	d ₅₀ (in.)	d ₁₀ (in.)	Wt. (lbs.)	d ₅₀ (in.)	d ₁₀ (in.)
I	18	8.5	-	5	5	4	50	10	8	100	13	10	150	15	12
II	18	10	-	17	7	6	170	15	12	340	19	15	500	22	18
III	24	12	2	46	10	8	460	21	17	920	26	21	1400	30	24
IV	36	14	3	150	15	12	1500	30	25	3000	39	32	4500	47	36
V	48	17	4.8	370	20	16	3700	42	34	7400	53	43	11,000	60	49

- NOTES:**
- NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL - TABLE 4.1.
 - THE RIPRAP GRADATION SHOWN IS BASED ON AN ASSUMED CHANNEL FLOW NOT EXCEEDING 10 CFS FOR THE 10-YEAR STORM EVENT.



OWNER & DEVELOPER:

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ARCHITECT & ENGINEER:

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NO.	REVISIONS	DATE
1	Per Contractor's Submittal	03/28/25

DESIGN:	TJW
DRAWN:	TJW
CHECKED:	NW
SCALE:	AS NOTED
DATE:	DECEMBER 13, 2024
PROJECT NO.:	224015

DRAWING TITLE:

EROSION CONTROL AND RESTORATION DETAILS

DRAWING NO.:

C-301

SCALE: N.T.S.

07 OF 07