

ROCK GARDEN RESILIENCY IMPROVEMENTS

BLITHEWOLD MANSION, GARDENS, AND ARBORETUM

BRISTOL, RHODE ISLAND

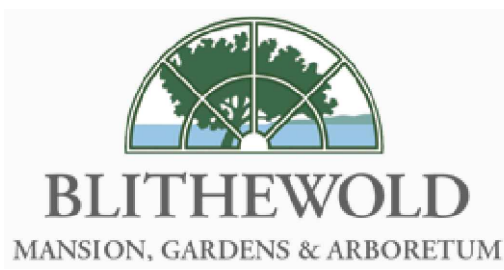
OCTOBER 24, 2024

REVISED FEB 25, 2025

CRMC PERMITTING SET

Received
3/14/2025
Coastal Resources
Management Council

PREPARED FOR:

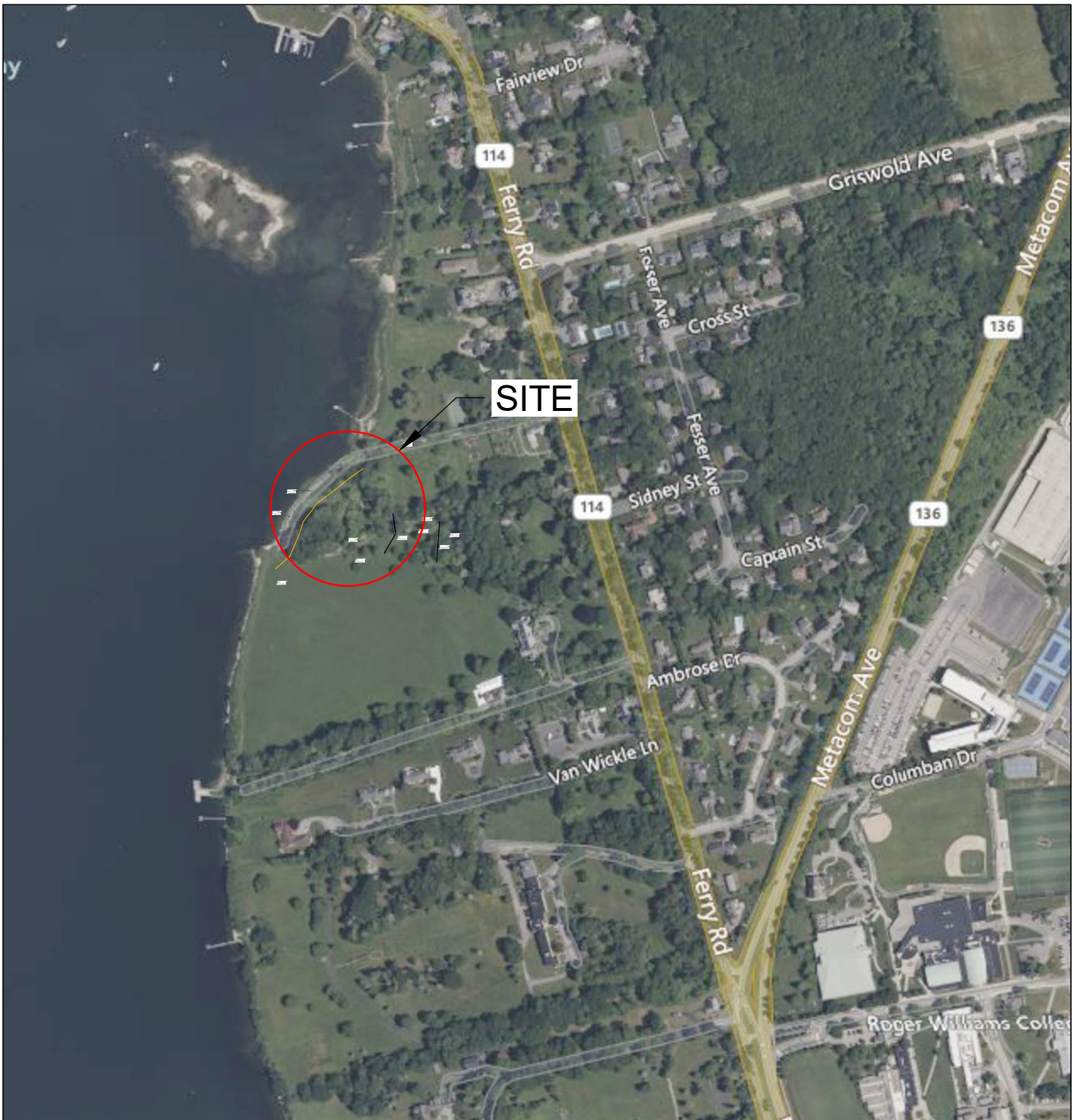


BLITHEWOLD MANSION, GARDENS,
AND ARBORETUM
101 FERRY ROAD
BRISTOL, RI 02809

DESIGNED BY:



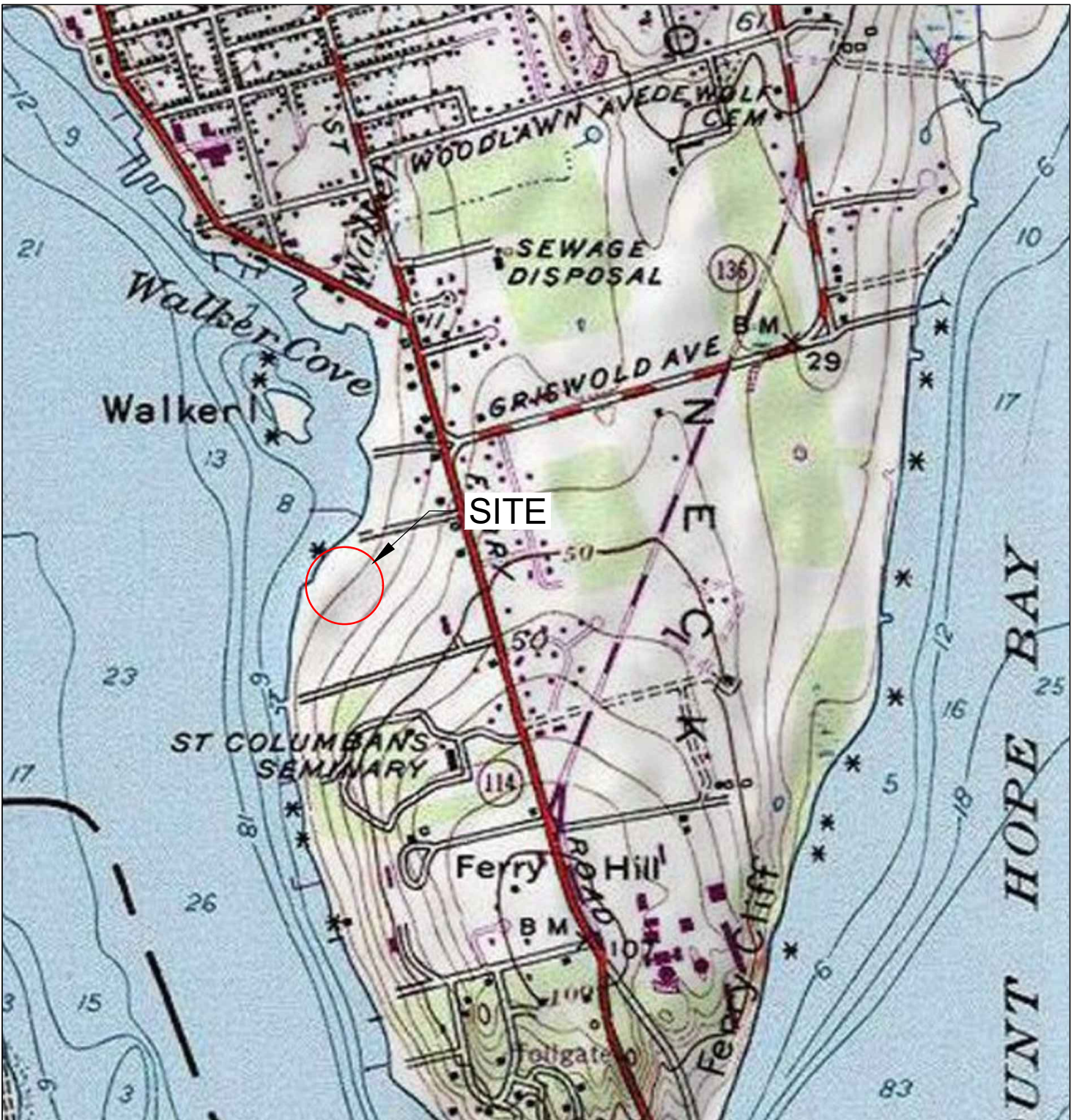
GZA GEOENVIRONMENTAL, INC.
188 VALLEY STREET, SUITE 300
PROVIDENCE, RI 02909



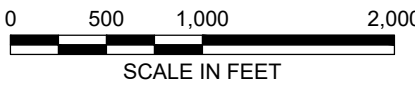
PROJECT VICINITY MAP



SOURCE: BASE MAP FROM BRISTOL RHODE ISLAND AXIS GIS.



PROJECT LOCUS MAP



SOURCE: BASE MAP FROM BRISTOL RHODE ISLAND AXIS GIS.
CONTOUR ELEVATIONS REFERENCE NAVD88 SHOWN IN 10
FOOT INTERVALS

SHEET LIST TABLE	
SHEET #	SHEET TITLE
1	COVER AND INDEX OF DRAWINGS
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1		REVISED PER CRMC COMMENTS	KMB	2/25/2025
NO.		ISSUE/DESCRIPTION	BY	DATE
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA. GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.				
ROCK GARDEN RESILIENCY IMPROVEMENTS BLITHEWOLD MANSION, GARDENS, AND ARBORETUM BRISTOL, RHODE ISLAND				
COVER				
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com			PREPARED FOR: BLITHEWOLD MANSION, GARDENS & ARBORETUM	
PROJ MGR: RAD	REVIEWED BY: RAD	CHECKED BY: RAD	DRAWING	
DESIGNED BY: HLP	DRAWN BY: HLP	SCALE: TJG	1	
DATE: 10/24/2024	PROJECT NO.: 35335.01	REVISION NO.: -	SHEET NO.	

PERMITTING ONLY
NOT FOR CONSTRUCTION

FIGURE NOTES:

1. THE SITE IS LOCATED IN THE TOWN OF BRISTOL, RI ON PLAT 165 LOTS 7 AND 8.
2. PER THE TOWN OF BRISTOL ASSESSORS DATABASE THE SITE AREA IS APPROXIMATELY 22.31± ACRES.
3. THE SITE PROJECT AREA ENCOMPASSES APPROXIMATELY 1.74± ACRES AND PROPOSES A DISTURBANCE AREA OF APPROXIMATELY 0.57± ACRES.
4. THE OWNER OF PLAT 165 LOT 7 AND 8 IS: BLITHEWOLD, INC OF RI, 101 FERRY ROAD, BRISTOL, RI 02809.
5. THE WORK AREA IS ENTIRELY WITHIN FEMA ZONE VE AREAS. REFERENCE FEMA FLOOD INSURANCE RATE MAP 44001C0018H EFFECTIVE JULY 7, 2014. ZONE VE ARE COASTAL AREAS WITH A 1% OR GREATER CHANCE OF FLOODING ON AN ANNUAL BASIS AND AN ADDITIONAL HAZARD ASSOCIATED WITH STORM WAVES.
6. BASE MAP DEVELOPED FROM LIMITED TOPOGRAPHIC AND BATHYMETRIC SURVEY DATA COLLECTED BY GZA PERSONNEL IN FEBRUARY AND MARCH 2024; TOPOGRAPHIC AND PROPERTY BOUNDARY SURVEY OF BLITHEWOLD MANSION, MUSEUM AND ARBORETUM PROVIDED TO GZA BY SCITUATE SURVEYS AND DATED JUNE 18, 2002; TIDAL DATUM REFERENCED TO THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) STATION ID 8451552, BRISTOL FERRY, RHODE ISLAND.
7. ALL ELEVATIONS SHOWN ON PLANS ARE IN U.S. FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
9. ALL EXISTING UTILITIES SHOWN HERE ARE FROM VISIBLE INFORMATION, DRAWINGS FROM OTHERS, OR INFORMATION PROVIDED TO GZA AND ARE SUBJECT TO CHANGE. THE LOCATIONS OF UNDERGROUND PIPES AND CONDUITS HAVE BEEN DETERMINED FROM THE AFOREMENTIONED REFERENCES AND ARE APPROXIMATE ONLY. PRIOR TO PERFORMING ANY GROUND DISTURBING ACTIVITIES, THE PROPER UTILITY ENGINEERING DEPARTMENTS SHOULD BE CONTACTED AND THE ACTUAL LOCATION OF SUBSURFACE STRUCTURES DETERMINED IN THE FIELD. CALL DIG SAFE® (811 OR 888-344-723) PRIOR TO EXCAVATION. ANY DAMAGE TO UTILITIES WHICH ARE SHOWN ON THESE PLANS OR DETAILED BY DIG SAFE SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
10. PRIOR TO CONSTRUCTION THE CONTRACTOR SHOULD VERIFY ALL EXISTING CONDITIONS, ELEVATIONS AND DIMENSIONS IN THE FIELD BEFORE ORDERING ANY MATERIAL, COMMENCING ANY FABRICATION OR PERFORMING ANY WORK. THE CONTRACTOR MUST NOTIFY THE OWNER, IN WRITING, OF ANY CONDITIONS, ELEVATIONS OR DIMENSIONS THAT VARY FROM THOSE SHOWN ON THE DRAWINGS PRIOR TO THE START OF CONSTRUCTION.
11. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SCALED TO THEIR ACTUAL DIMENSIONS OR LOCATIONS ON THE DRAWINGS. THE DETAIL SHEETS, MANUFACTURERS' LITERATURES, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED MATERIALS SHOULD BE REFERRED TO FOR LAYOUT OF PROJECT FEATURES.
12. ELECTRONIC VERSIONS OF THE PLANS, SPECIFICATIONS AND DATA FILES WHICH ARE OBTAINED FROM THE DESIGNER SHOULD NOT BE SOLELY RELIED UPON FOR CONSTRUCTION. STAMPED PAPER COPIES SUPPLIED AS PART OF CONTRACT DOCUMENTS SHOULD BE UTILIZED TO VERIFY LOCATION.
13. ANY PROPRIETARY PRODUCT(S) REFERENCED IN THIS PLAN SET ARE REPRESENTATIVE OF THE MINIMUM DESIGN REQUIREMENTS IT IS PURPOSED TO SERVE. ALTERNATIVES TO ANY PROPRIETARY PRODUCT(S) MAY BE SUBMITTED TO THE ENGINEER OF RECORD AND THE OWNER FOR CONSIDERATION. THESE MUST BE ACCOMPANIED BY APPROPRIATE SPECIFICATION SHEETS / ANY DESIGN CALCULATIONS THAT DEMONSTRATE THE ALTERNATIVE(S) MEET THE MINIMUM DESIGN PARAMETERS OF THE PRODUCT SHOWN ON THE PLANS. NO ALTERNATIVES MAY BE USED WITHOUT WRITTEN PERMISSION OF THE ENGINEER OF RECORD OR THE SITE OWNER.
14. THIS PLAN MAY REFERENCE AND / OR INCLUDE REPRODUCTIONS OF PROPRIETARY PRODUCTS / DETAILS BY OTHERS, AND / OR THEIR ASSOCIATED SPECIFICATIONS. ANY REFERENCED OR REPRODUCED PROPRIETARY PRODUCT OR DETAIL BY OTHERS THAT IS SHOWN ON THIS GZA DRAWING SET IS STRICTLY FOR INFORMATIONAL PURPOSES ONLY. GZA DOES NOT WARRANT ANY PROPRIETARY PRODUCTS, DETAILS BY OTHERS OR THEIR RESPECTIVE DESIGN. ANY GZA DRAWING WHICH MAY INCLUDE PROPRIETARY PRODUCT(S) OR DETAIL(S) BY OTHERS (EITHER IMPLIED OR EXPLICITLY) AND IS BEARING THE STAMP OF A GZA PROFESSIONAL ENGINEER, SAID STAMP DOES NOT EXTEND TO ANY PORTION OF THE PROPRIETARY PRODUCT(S) OR DETAIL(S) BY OTHERS OR ITS DESIGN.
15. THE WETLAND EDGE WAS DELINEATED BY GZA PERSONNEL ON JANUARY 15, 2024. WETLAND FLAGS WERE LOCATED WITH RTK GPS.

PERMITS

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ANY LOCAL PERMITS REQUIRED FOR THE PERFORMANCE OF THIS SCOPE OF WORK.
2. ALL STATE PERMITS REQUIRED BY THE RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT COUNCIL (RIDEM) AND COASTAL RESOURCE MANAGEMENT COUNCIL (CRMC) WILL BE OBTAINED BY THE OWNER.

GENERAL CONSTRUCTION NOTES

6. CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS, SUPERVISION, TRANSPORTATION, TESTING, AND EQUIPMENT TO PERFORM ALL EARTHWORK AS SPECIFIED HEREIN, AS SHOWN ON THE DRAWINGS, AND AS NECESSARY TO COMPLETE THE WORK.
7. CONTRACTOR SHALL BE PREPARED TO PERFORM EARTHWORK IN CONJUNCTION AND CONCURRENT WITH OTHER CONSTRUCTION ACTIVITIES AS REQUIRED TO COMPLETE THE WORK AS SPECIFIED HEREIN AND AS SHOWN ON THE DRAWINGS.
8. EARTHWORK SHALL CONFORM TO THE DIMENSIONS, LINES, GRADES, AND ELEVATIONS SPECIFIED HEREIN AND SHOWN ON THE DRAWINGS.
9. WORK SHALL BE SEQUENCED TO MAXIMIZE THE RE-USE OF SITE MATERIALS TO OBTAIN SUBGRADE ELEVATIONS.
10. OWNER RESERVES THE RIGHT TO MODIFY/CHANGE SUBGRADE ELEVATIONS DEPICTED ON THE DRAWINGS.
11. CONTRACTOR SHALL PERFORM EARTHWORK AND ALL RELATED ACTIVITIES IN STRICT ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS AND ALL APPLICABLE PERMITS AND APPROVALS.
12. CONTRACTOR SHALL PROVIDE TEMPORARY STORMWATER BYPASS PIPING AND BERMS AS NECESSARY TO PROTECT THE WORK AREA DURING CONSTRUCTION.

SCOPE OF WORK

1. CONTRACTOR IS RESPONSIBLE FOR BEING FAMILIAR WITH ALL SITE CONDITIONS AND EXISTING AND PROPOSED TOPOGRAPHY PRIOR TO THE START OF THE WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ALL APPROPRIATE SUBSURFACE UTILITIES MARK OUTS PRIOR TO PERFORMING ANY SUBSURFACE WORK AND SHALL PROVIDE SUFFICIENT NOTIFICATION TO THE LOCAL DIG SAFE® AGENCY AS REQUIRED BY RHODE ISLAND STATE LAW. CONTRACTOR SHALL PROVIDE DIG SAFE® NOTIFICATION NUMBER TO THE OWNER / ENGINEER ALONG WITH DOCUMENTATION OF CLEARANCE AT LEAST 5 DAYS PRIOR TO THE PERFORMANCE OF INTRUSIVE ACTIVITIES.
2. THE WORK SHALL BE CARRIED OUT IN SUCH MANNER AS TO PREVENT UNDERMINING OR DISTURBING ANY EXISTING UTILITIES, CATCH BASINS, MANHOLES, CULVERTS, BUILDINGS, FENCES, OR OTHER STRUCTURES AT OR ADJACENT TO THE SITE (UNLESS OTHERWISE SCHEDULED TO BE ALTERED, AND/OR REPLACED AS PART OF THE WORK). THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ANY DAMAGE TO EXISTING UTILITIES OR OTHER FEATURES AS A RESULT OF HIS/HER OPERATIONS AT NO ADDITIONAL COST TO THE OWNER.
3. THE CONTRACTOR SHALL PROVIDE SHORING AND BRACING (IF NECESSARY) TO COMPLETE AND PROTECT ALL EXCAVATED AREAS, AS REQUIRED FOR SAFETY AND COMPLIANCE WITH APPLICABLE OSHA REQUIREMENTS AND REGULATIONS. COSTS FOR SHORING AND BRACING SHALL BE INCLUDED AS A PART OF THE CONTRACT PRICE FOR COMPLETING THE WORK AND THE OWNER SHALL MAKE NO SEPARATE PAYMENT FOR THE WORK NECESSARY TO COMPLY WITH THESE REQUIREMENTS.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR THE HANDLING, MANAGEMENT, TEMPORARY STOCKPILING, LOADING, TRANSPORTATION, AND OFF-SITE DISPOSAL OF AN OWNER APPROVED FACILITY OF UNSUITABLE SITE MATERIALS AND EXCESS SUITABLE SITE MATERIALS, AND ALL OTHER EXCESS MATERIALS IN ACCORDANCE WITH THE DRAWINGS.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND OFF-SITE DISPOSAL ACCORDANCE WITH STATE AND FEDERAL REGULATIONS FACILITY OF ALL DEBRIS GENERATED BY HIS/HER OPERATIONS. THE CONTRACTOR SHALL LEAVE THE SITE IN A CLEAN AND SAFE CONDITION AT THE END OF EACH WORK SHIFT AND AT THE COMPLETION OF SITE ACTIVITIES.
6. UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL LABOR, MATERIALS, EQUIPMENT, SUPERVISION, AND INCIDENTALS TO PERFORM THE FOLLOWING CONSISTENT WITH THESE SPECIFICATIONS AND APPLICABLE PERMITS AND

APPROVALS, AND AS SHOWN ON THE DRAWINGS:

- A. ALL SYSTEM COMPONENTS AND CONSTRUCTION METHODS SUCH AS PIPE, FITTINGS, CASTINGS, ETC. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO PURCHASE AND INSTALLATION. THIS SUBMISSION SHALL INCLUDE MANUFACTURERS LITERATURE, SHOP DRAWINGS, PROPOSED CONSTRUCTION METHODS, ETC.
- B. CONTRACTOR SHALL IMPORT MATERIALS AS NEEDED TO PERFORM THE WORK (SEE BELOW IMPORT SECTION). NO OTHER MATERIALS WILL BE ALLOWED TO BE IMPORTED. ENGINEER RESERVES THE RIGHT TO REJECT ANY MATERIALS THAT DO NOT MEET THESE REQUIREMENTS.

SEQUENCE OF WORK:

1. CONTRACTOR CONSTRUCTION ACCESS, WORK ZONES AND STAGING AREAS SHALL BE APPROVED BY THE OWNER PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL INSTALL TEMPORARY BARRIERS APPROVED BY THE ENGINEER AND/OR OWNER TO CREATE A DEDICATED WORK AREA.
3. CONTRACTOR SHALL INSTALL SOIL EROSION AND SEDIMENT CONTROLS AS SHOWN ON THE DRAWINGS.
4. CONTRACTOR SHALL CLEAR AND GRUB WITHIN PROPOSED BERM LIMITS AND IN AREAS TO BE RE-GRADED AS SHOWN ON THE DRAWINGS.
5. CONTRACTOR SHALL DREDGE THE WATER GARDEN TO THE DEPTHS SHOWN ON THE DRAWINGS AND INSTALL THE CLAY LINER.
6. CONTRACTOR SHALL INSTALL DRAINAGE LINES AS SHOWN ON THE DRAWINGS.
7. REGRADE SITE TO THE ELEVATIONS SHOWN ON THE DRAWINGS.
8. CONSTRUCT THE BERM AND ROCK TOE AS SHOWN ON THE DRAWINGS
9. CONTRACTOR SHALL PERFORM SITE RESTORATION. PLANTING OF TREES AND SHRUBS WILL BE PERFORMED BY THE OWNER.

SOIL EROSION AND SEDIMENT CONTROL NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR ALL SOIL EROSION AND SEDIMENT CONTROL (SESC).
2. ALL EROSION, RUNOFF AND SEDIMENT CONTROL MEASURES TO BE INSTALLED PER THE RHODE ISLAND SOIL EROSION AND SEDIMENT CONTROL HANDBOOK (RISESC), LATEST EDITION AND WITH REGULATIONS / ORDINANCES OF LOCAL AUTHORITIES HAVING JURISDICTION.
3. NOTE THE SOIL EROSION AND SEDIMENT CONTROL SHOWN ON THESE PLANS ARE THE MINIMUM QUANTITY / TYPE OR JURISDICTION CONTROL DEVICES AND MATERIALS DEEMED REQUIRED BY GZA TO MEET THE OBJECTIVES OF THE RISESC HANDBOOK. ADDITIONAL MEASURES / ALTERNATIVE CONFIGURATIONS MAY BE REQUIRED IN ORDER TO MEET THE RISESC HANDBOOK BASED ON FACTORS INCLUDING (BUT NOT LIMITED TO) SITE PARAMETERS, WEATHER EVENTS, INSPECTIONS AND UNIQUE FEATURES. THE SESC WILL CONTINUE TO EVOLVE THROUGHOUT CONSTRUCTION.
4. ALL SOIL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED PRIOR TO THE START OF THE WORK, ARE TO BE MAINTAINED THROUGHOUT CONSTRUCTION AND UNTIL THE SITE IS FULLY STABILIZED.
5. IF DISPOSAL OF MATERIALS FROM AN EROSION EVENT DURING CONSTRUCTION IS NEEDED, ANY MATERIAL WHICH MAY NEED TO BE DISPOSED OF OFF SITE SHALL BE DISPOSED OF IN A MANNER CONSISTENT WITH FEDERAL, STATE, LOCAL REGULATIONS AND CONTRACT DOCUMENTS.
6. SWEEPING AT THE SITE CONSTRUCTION ENTRANCE TO OCCUR DAILY DURING CONSTRUCTION TO MINIMIZE SEDIMENT ON ADJACENT STREETS.
7. IN ADDITION TO THOSE AREAS SPECIFICALLY DESIGNATED ON THE PLANS, ALL DISTURBED AREAS INCLUDING THE CONTRACTOR'S STOCKPILE AND STAGING AREAS MUST BE RESTORED TO MATCH THE DESIGN PLANS OR THE PRE-CONSTRUCTION CONDITION.

QUALITY CONTROL

1. THE ENGINEER WILL PERFORM CERTAIN TESTING AND INSPECTIONS TO ENSURE COMPLIANCE OF THE WORK AND MATERIALS WITH THE SPECIFICATIONS. IN THE EVENT THESE TESTS OR INSPECTIONS INDICATE NON-COMPLIANCE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTING, REPAIRING, OR REPLACING THE DEFICIENCY AT NO ADDITIONAL COST TO THE OWNER.
2. CONTRACTOR SHALL INSPECT ALL MATERIALS PRIOR TO INSTALLATION. ANY MATERIALS THAT ARE FOUND TO BE DEFECTIVE, DETERIORATED, DAMAGED OR INCONSISTENT WITH THESE SPECIFICATIONS OR THE DRAWINGS SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
3. CONTRACTOR SHALL NOT PLACE ANY FILL OR PREPARE ANY SUBGRADES UNLESS THE ENGINEER OR OWNER IS PRESENT. THE CONTRACTOR SHALL KEEP THE ENGINEER INFORMED OF THE PROJECT SCHEDULE AND PLANNED ACTIVITIES TO AVOID POTENTIAL DELAYS IN THE WORK. ANY DELAYS CAUSED BY THE CONTRACTOR'S FAILURE TO COMMUNICATE WITH THE ENGINEER SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
4. CONTRACTOR SHALL PERFORM THE REQUIRED WORK IN COMPLIANCE WITH APPLICABLE REQUIREMENTS OF GOVERNING AUTHORITIES HAVING JURISDICTION

LINE AND GRADE CONTROL

1. CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND MAINTAINING LINE AND GRADE CONTROL FOR ALL ASPECTS OF THE WORK AND AS SPECIFIED ON THE DRAWINGS. ALL SURVEY WORK CONDUCTED ON THE PROJECT SHALL CORRESPOND TO THE SITE COORDINATE SYSTEM AND VERTICAL DATUM AS SHOWN ON THE DRAWINGS.
2. SURVEY TOLERANCES FOR THE SUBGRADE AND FINAL GRADE SHALL BE AS FOLLOWS:
 - A. HORIZONTAL TOLERANCE: 0.1 FEET
 - B. VERTICAL TOLERANCE: 0.1 FEET
3. ACCEPTABLE SURVEY EQUIPMENT SHALL INCLUDE LASER LEVEL, OPTICAL AUTOMATIC LEVEL, TOTAL STATION AND/OR RTK GPS.
4. THE ENGINEER MAY PERFORM SPOT GRADE CHECKS AND LAYOUT REVIEW FOR EACH PHASE OF THE CONSTRUCTION TO VERIFY THE DESIGN GRADES AND STRUCTURE ALIGNMENT HAVE BEEN ESTABLISHED. ANY SURVEY LAYOUT CONFLICTS SHALL BE ADDRESSED AND CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

PRODUCTS

FILTREXX SOXX

1. FILTREXX SOXX ARE TO BE 12-INCH DIAMETER AND MANUFACTURED BY FILTREXX OR ENGINEER ACCEPTED EQUAL.
2. MATERIAL FOR THE FILTREXX SOXX SHALL BE COMPOST WITH NO MANURE, BIOSOLIDS, KILN-DRIED WOOD OR CONSTRUCTION DEBRIS ALLOWED. PARTICLE SIZE ANALYSIS: 98% SHALL PASS THROUGH A 3 INCH (75MM) SIEVE; 30-50% SHALL PASS 3/8 INCHES (10MM) SIEVE.
3. FILTREXX SOXX SHALL BE KNITTED MESH WITH 1/8" - 3/8" (3-10 MM) OPENINGS, AND MADE OF BIODEGRADABLE (COTTON OR JUTE) MATERIALS.

LOW PERMEABILITY SOILS

1. LOW PERMEABILITY SOILS SHALL CONSIST OF HARD, DURABLE SAND, SILT AND GRAVEL AND SHALL BE FREE FROM ICE AND SNOW, ROOTS, SOD, RUBBISH AND OTHER DELETERIOUS OR ORGANIC MATTER. LOW PERMEABILITY SOILS SHALL BE CLASSIFIED AS A FINE TO COARSE SAND WITH A SILT CONTENT RANGING FROM 20% TO 40% AND A GRAVEL CONTENT RANGING FROM 10% TO 25% AND WILL HAVE A MAXIMUM HYDRAULIC CONDUCTIVITY OF 1 X10-4 CM/SEC AND SHALL CONFORM TO THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE SIZE	PERCENT FINER BY WEIGHT
3 INCH	100%
1 INCH	80-90%
1/2 INCH	80-90%
NO. 4	60-85%
NO. 40	30-60%
NO. 200	20-40%

2. LOW PERMEABILITY SOILS SHALL BE COMPACTED TO 95% OF THE MAXIMUM PROCTOR DENSITY WHEN PLACED WITHIN THE BERM.

TOPSOIL

1. TOPSOIL SHALL CONFORM TO SECTION M.18.01 OF THE RIDOT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION." LATEST EDITION AND MEET OF THE FOLLOWING REQUIREMENTS:
 - A. CONSIST OF SCREENED LOOSE, FRIABLE, FINE SANDY LOAM OR SANDY LOAM, AS DEFINED BY THE USDA'S SOIL CONSERVATION SERVICE IN THE SOIL SURVEY MANUAL, ISSUED IN 1993.
 - B. REASONABLY FREE OF SUBSOIL, REFUSE, STUMPS, ROOTS, ROCKS, COBBLES, STONES, BRUSH, NOXIOUS WEEDS, LITTER, AND OTHER MATERIALS WHICH ARE LARGER THAN ½-INCH IN ANY DIMENSION AND WHICH WILL PREVENT THE FORMATION OF A SUITABLE SEED BED.
 - C. CONTAINING MINIMUM OF 6 PERCENT AND MAXIMUM OF 15 PERCENT ORGANIC MATTER AS DETERMINED BY LOSS-ON-IGNITION OF OVEN DRIED SAMPLES.
 - D. HAVE A MAXIMUM HYDRAULIC CONDUCTIVITY OF 7.2X10-4 CM/SEC.

WATER GARDEN LINER INSTALLATION SEQUENCE

1. DEWATER THE POND THROUGH A DEWATERING BASIN.
2. DREDGE THE WATER GARDEN SUBGRADE TO THE LINES AND GRADES SHOWN ON THE DRAWINGS. EXCAVATED MATERIAL FROM THE POND BOTTOM SHALL BE DEWATERED ON SITE AND UTILIZED TO CONTRUIT THE PROPOSED BERM.
3. PREPARE AND COMPACT THE LINER SUBGRADE SOILS.
4. PLACE AND COMPACT 12-INCH THICK CLAY LINER.

CLAY LINER MATERIAL

1. CLAY LINER MATERIAL SHALL HAVE A MINIMUM PLASTICITY INDEX OF 12 (PI ≥12) AND A MINIMUM OF 50 PERCENT PASSING THE NO. 200 SIEVE.
2. THE CLAY LINER MATERIAL SHALL BE CAPABLE OF PROVIDING A LINER WITH A MAXIMUM HYDRAULIC CONDUCTIVITY (PERMEABILITY) OF 1 X 10-7 CENTIMETERS PER SECOND.
3. PROPOSED LINER MATERIAL PROPERTIES SHALL BE DETERMINED IN THE LAB PRIOR TO PLACEMENT FOR EACH DIFFERENT BORROW AREA AND MATERIAL. A STANDARD OR MODIFIED PROCTOR TEST DENSITY CURVE, AND OPTIMUM MOISTURE, SHALL BE DEVELOPED FROM THE BORROW MATERIALS. A HYDRAULIC CONDUCTIVITY (PERMEABILITY) SHALL BE DETERMINED ON A RE-COMPACTED SAMPLE. THE SAMPLE SHALL BE RE-COMPACTED TO THE MINIMUM DENSITY AND MOISTURE CONTENT SPECIFIED. ONE SET OF TEST SHALL BE PERFORMED FOR EACH 5,000 CUBIC YARDS OF LINER MATERIAL IMPORTED.

FOUNDATION PREPARATION

1. FOUNDATION SURFACES SHALL BE GRADED TO REMOVE SURFACE IRREGULARITIES AND SHALL BE SCARIFIED OR OTHERWISE ACCEPTABLY SCORED OR LOOSENEED TO A MINIMUM DEPTH OF 2 INCHES. THE MOISTURE CONTENT OF THE LOOSENEED MATERIAL SHALL BE CONTROLLED AS SPECIFIED FOR THE CLAY LINER. THE SURFACE MATERIALS OF THE FOUNDATION SHALL BE COMPACTED AND BONDED WITH THE FIRST LAYER OF THE CLAY LINER AS SPECIFIED FOR SUBSEQUENT LAYERS OF CLAY LINER.

PLACEMENT

1. THE CLAY LINER SHALL NOT BE PLACED UNTIL THE REQUIRED FOUNDATION PREPARATION HAS BEEN COMPLETED AND THE FOUNDATION HAS BEEN INSPECTED AND APPROVED BY THE ENGINEER. THE CLAY LINER SHALL NOT BE PLACED UPON A FROZEN SURFACE, NOR SHALL SNOW, ICE, OR FROZEN MATERIAL BE INCORPORATED IN THE CLAY LINER. CLAY MATERIALS SHALL CONTAIN NO SOD, BRUSH, ROOTS, FROZEN SOIL, OR OTHER PERISHABLE MATERIALS. ROCK PARTICLES LARGER THAN 3 INCHES SHALL BE REMOVED PRIOR TO COMPACTION OF THE CLAY.
2. THE CLAY LINER SHALL BE PLACED IN LIFTS. THE THICKNESS OF EACH LIFT BEFORE COMPACTION SHALL NOT EXCEED THE SMALLER OF 6 INCHES OR THE LENGTH OF THE TEETH OF THE FOOTED COMPACTOR USED.
3. THE DISTRIBUTION OF MATERIALS THROUGHOUT THE CLAY LINER SHALL BE ESSENTIALLY UNIFORM, AND THE CLAY LINER SHALL BE FREE FROM LENSES, POCKETS, STREAKS, OR LAYERS OF MATERIAL DIFFERING SUBSTANTIALLY IN TEXTURE, MOISTURE CONTENT, OR GRADATION FROM THE SURROUNDING MATERIAL. IF THE SURFACE OF ANY LAYER BECOMES TOO HARD AND SMOOTH FOR PROPER BOND WITH THE SUCCEEDING LAYER, IT SHALL BE SCARIFIED TO A DEPTH OF NOT LESS THAN 2 INCHES BEFORE THE NEXT LAYER IS PLACED.

CONTROL OF MOISTURE CONTENT

1. DURING PLACEMENT AND COMPACTION OF THE CLAY LINER, THE MOISTURE CONTENT OF THE CLAY BEING PLACED SHALL BE MAINTAINED ABOVE THE OPTIMUM MOISTURE AS DETERMINED BY THE STANDARD PROCTOR TEST OR MODIFIED PROCTOR TEST. THE APPLICATION OF WATER TO THE CLAY SHALL BE ACCOMPLISHED AT THE BORROW AREAS IN-SO-FAR AS PRACTICABLE. WATER MAY BE APPLIED BY SPRINKLING THE CLAY AFTER PLACEMENT AND BEFORE COMPACTION OF THE LINER, IF NECESSARY. UNIFORM MOISTURE DISTRIBUTION SHALL BE OBTAINED BY DISKING.

COMPACTION

1. THE CLAY LINER SHALL BE COMPACTED TO A MINIMUM OF 95% OF STANDARD PROCTOR DRY DENSITY OR TO A MINIMUM OF 90% OF MODIFIED PROCTOR DRY DENSITY. THE CLAY LINER SHALL BE COMPACTED WITH A FOOTED COMPACTOR WEIGHING AT LEAST 25,000 POUNDS, OPERATED CONTINUOUSLY OVER THE CLAY MATERIAL.

REWORKING OR REMOVAL AND REPLACEMENT OF DEFECTIVE LINER

1. CLAY LINER PLACED AT DENSITIES LOWER THAN THE SPECIFIED MINIMUM DENSITY OR AT MOISTURE CONTENTS LOWER THAN THE OPTIMUM MOISTURE CONTENT OR OTHERWISE NOT CONFORMING TO THE REQUIREMENTS OF THE SPECIFICATIONS SHALL BE REWORKED TO MEET THE SPECIFICATIONS OR REMOVED AND REPLACED. THE REPLACEMENT CLAY MATERIAL AND THE FILL SURFACES UPON WHICH IT IS PLACED SHALL CONFORM TO ALL REQUIREMENTS OF THIS SPECIFICATION FOR FOUNDATION PREPARATION, APPROVAL, PLACEMENT, MOISTURE CONTROL, AND COMPACTION.

4-INCH AND 10-INCH PVC PIPE

1. PROPOSED DRAINAGE LINES SHALL CONSIST OF SMOOTH INTERIOR, WATER-TIGHT SCHEDULE 40 PVC PIPE, MATCHING THE DIMENSIONS AND CONFIGURATIONS SHOWN ON THE DRAWINGS.
2. PIPING SHALL HAVE THE FOLLOWING MINIMUM MATERIAL PROPERTIES:
3. ALL THERMOPLASTIC GATE VALVES SHALL BE CONSTRUCTED FROM PVC TYPE I CELL CLASSIFICATION 12454. ALL O-RINGS SHALL BE BUNA-N, EPDM OR FK. ALL VALVES SHALL HAVE A RISING STEM AND POLYPROPYLENE HANDWHEEL. ALL VALVE GATE WEDGES SHALL HAVE POLYPROPYLENE WEDGE. ALL VALVE COMPONENTS SHALL BE REPLACEABLE. ALL 4" VALVES SHALL BE PRESSURE RATED AT 235 PSI FOR WATER AT 73°F.

WARNING TAPE

- 1) WARNING TAPE SHALL BE AT LEAST 2-INCH WIDE, NOMINAL 4.5 MIL (0.0045") OVERALL THICKNESS WITH A SOLID ALUMINUM FOIL CORE. THE IMPRINTED WARNING MESSAGE SHOULD BE "CAUTION - BURIED DRAINAGE LINE BELOW". THE TAPE SHALL BE IMPERVIOUS TO ACIDS, ALKALIS AND OTHER DESTRUCTIVE ELEMENTS FOUND IN SOIL.
- 2) WARNING TAPE SHALL BE MANUFACTURED BY SETON, INC. OR ENGINEER APPROVED EQUIVALENT

GRASS SEED MIX

1. SEED MIX SHALL BE SPECIFIED BY THE OWNER. THE MIX SHALL BE A NATIVE MIX SUITABLE FOR LAWNS IN RHODE ISLAND.

SUBMITTALS



1. WITHIN 21 DAYS OF NOTICE TO PROCEED, CONTACTOR SHALL SUBMIT TECHNICAL INFORMATION ON THE MATERIALS PROPOSED FOR USE TO MEET THE REQUIREMENTS OF THIS SECTION.

INSTALLATION OF SEEDED AREAS

- A. SOIL PREPARATION
- A. SOIL PREPARATION OF NEW GRASS AREAS OR AREAS DISTURBED BY CONTRACTOR'S OPERATIONS
- 1) LIMIT SOIL PREPARATION TO AREAS TO BE PLANTED WITHIN 7 DAYS
- 2) PROTECT EXISTING GRASS AREAS AND CREATE A SMOOTH TRANSITION BETWEEN THEM AND NEW WORK. REPAIR ANY DAMAGE DONE TO THE SATISFACTION OF THE ENGINEER.
- 3) FINE GRADE AS NECESSARY TO ACHIEVE A SMOOTH EVEN SURFACE TRUE TO LINE AND GRADE. MATCH GRADES SMOOTHLY WITH EXISTING GRASS AREAS TO REMAIN.
- 4) SECURE ACCEPTANCE OF FINE GRADING BY THE ENGINEER PRIOR TO THE COMMENCEMENT OF SEEDING OPERATIONS.
- B. SEEDING SEASON
- 1) THE CALENDAR DATES FOR SEEDING SHALL BE: SPRING - MARCH 15 TO MAY 15 FALL - AUGUST 15 TO OCTOBER 15
- 2) SEEDING OUTSIDE THESE WINDOWS SHALL BE PRE-APPROVED BY THE OWNER. APPROVAL BY THE OWNER TO SEED OUTSIDE THESE WINDOWS WILL NOT VOID THE WARRANTY OR GUARANTEE PERIOD.
- C. ALL DISTURBED AREAS SHALL BE TREATED DURING THE SEEDING SEASON AS FOLLOWS:
- 1) AREAS AT FINAL GRADE: PERMANENT SEEDING SHALL BE ACCOMPLISHED
- 2) AREAS NOT TO BE BROUGHT TO FINAL GRADE FOR AN EXTENDED PERIOD OF TIME: TEMPORARY SEEDING SHALL BE PERENNIAL RYEGRASS (LOLIUM PERENNE) AT A RATE OF 3 POUNDS PER 1000 SQUARE FEET
- 3) DURING "OUT OF SEASON" PERIODS UNSEEDED AREAS SHALL BE TREATED USING EROSION CONTROL NETTING IN ACCORDANCE WITH THIS SPECIFICATION. "OUT OF SEASON" TREATMENTS SHALL BE REMOVED PRIOR TO SEEDING UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- D. SEEDING CONSERVATION SEED MIX SEED AND LAWN SEED MIX AREAS
- 1) WHERE NEWLY SEEDED AREAS ABOUT OTHER NEWLY PLANTED OR EXISTING PLANTED AREAS ESTABLISH AND DELINEATE THE LIMITS OF NEW AREAS WITH LIME. SECURE APPROVAL BY ENGINEER OF LIMED EDGE PRIOR TO BEGINNING SEEDING OPERATIONS.
- E. MAINTAIN A MOIST SEED BED AT ALL TIMES. WATER THE SEED BED SO THAT THE TOPSOIL IS WET TO A DEPTH OF TWO INCHES.
- F. PROTECT THE SEED BED WITH BARRICADES, IF NECESSARY, TO KEEP ALL TRAFFIC OFF THE AREAS.
- G. AFTER GRASS HAS APPEARED, RE-SEED ALL AREAS WHICH HAVE FAILED TO SHOW A UNIFORM STAND OF GRASS. FOR ISOLATED POINTS OF EROSION THAT ARE NOT ABLE TO BE STABILIZED BY RE-SEEDING, USE SOD.

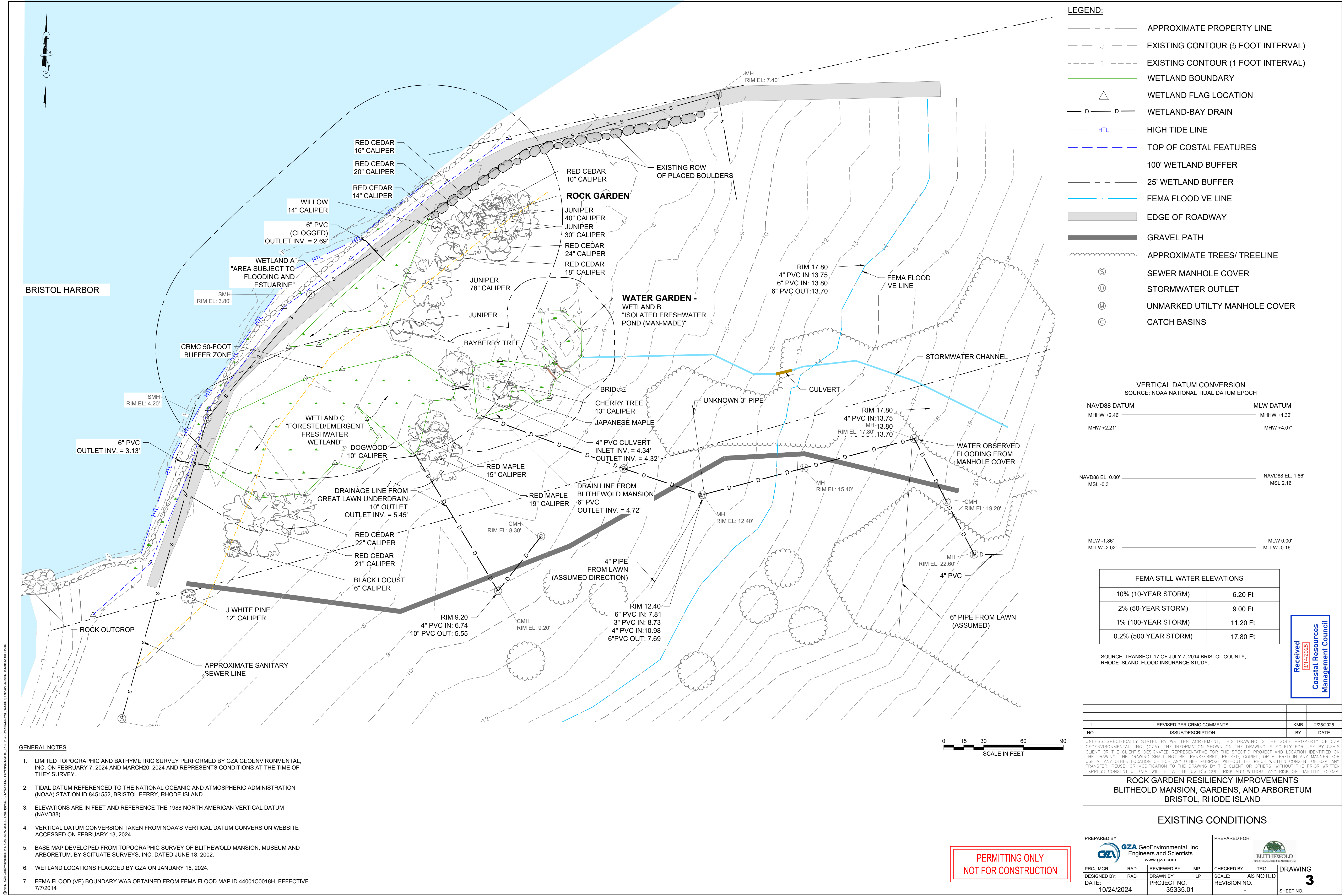
PROTECTION OF WORK

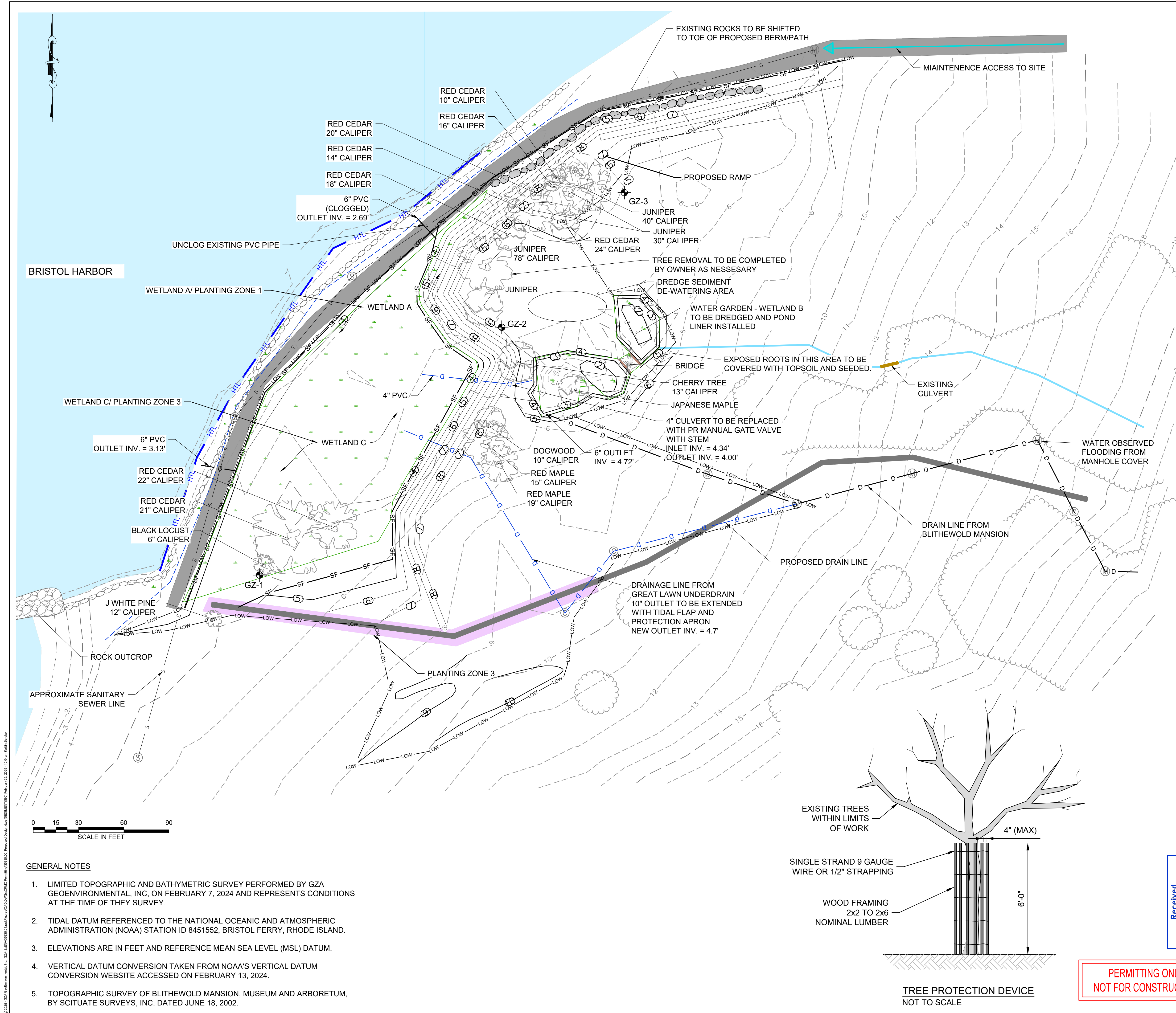
1. THE CONTRACTOR SHALL USE ALL MEANS NECESSARY TO PROTECT ALL PRIOR WORK, INCLUDING ALL MATERIALS AND COMPLETED WORK OF OTHER SECTIONS.
2. IN THE EVENT OF DAMAGE TO PRIOR AND COMPLETED WORK, THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REPAIRS AND REPLACEMENTS NECESSARY TO THE APPROVAL OF THE ENGINEER AND AT NO ADDITIONAL COST TO THE OWNER

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ROCK GARDEN RESILIENCY IMPROVEMENTS BLITHEWOLD MANSION, GARDENS, AND ARBORETUM BRISTOL, RHODE ISLAND				
NOTES				
PREPARED BY:  GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR:  BLITHEWOLD MANSION, GARDENS & ARBORETUM		
PROJ MGR: RAD	DESIGNED BY: RAD	REVIEWED BY: MP	CHECKED BY: TRG	DRAWING
		DRAWN BY: HLP	SCALE: AS NOTED	
DATE: 10/24/2024		PROJECT NO. 35335.01	REVISION NO. -	SHEET NO. 2

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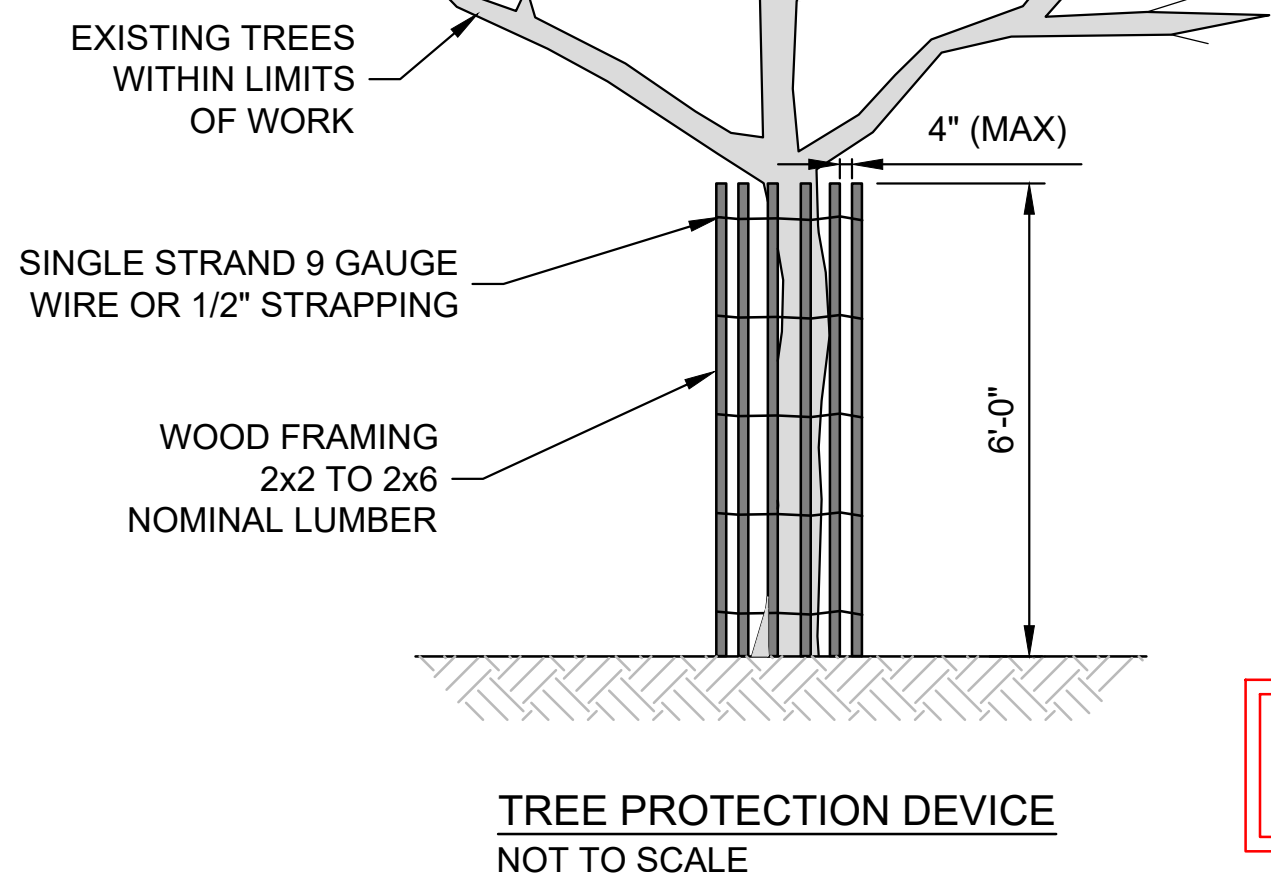
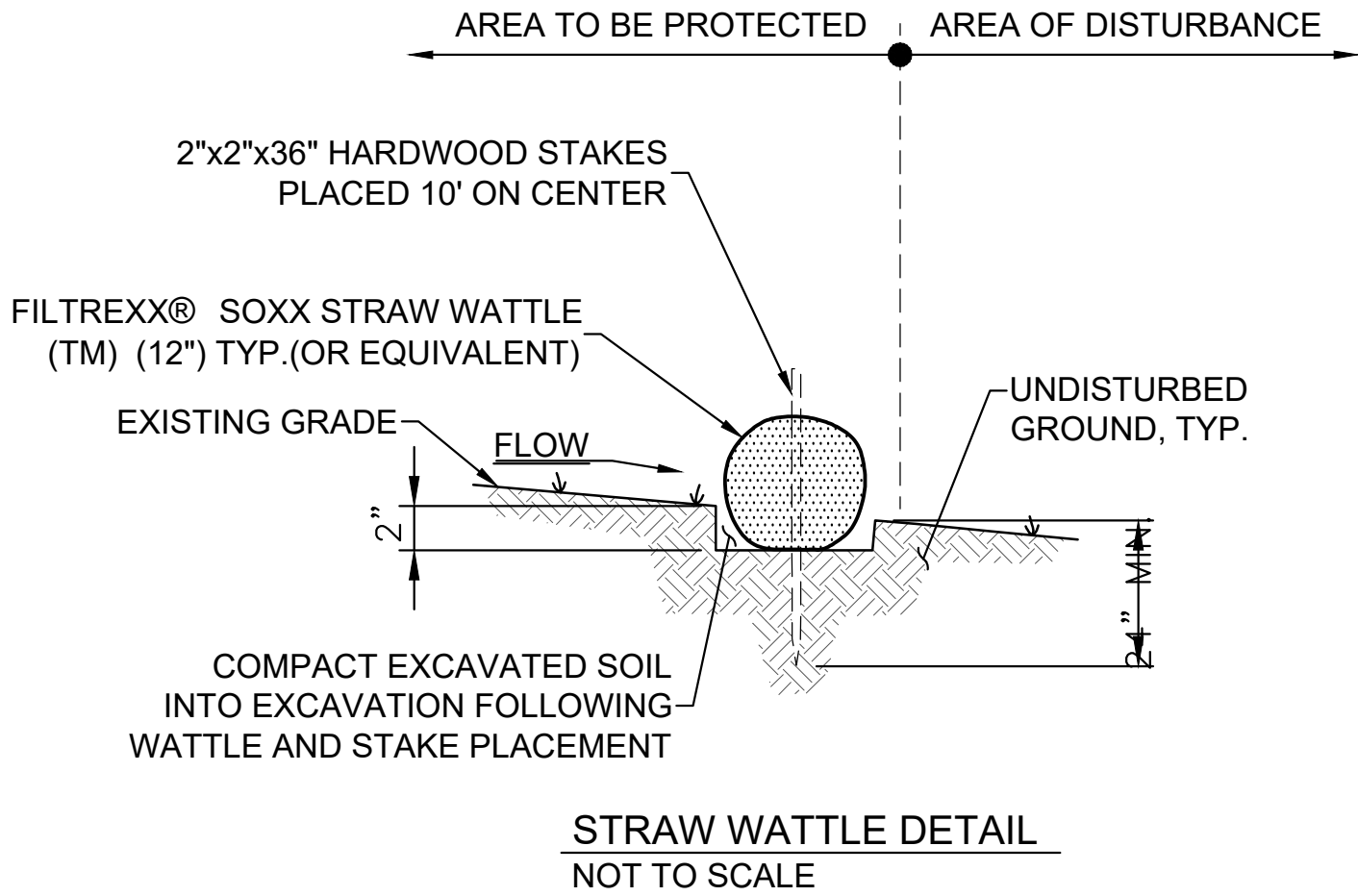




- LEGEND:**
- 5 EXISTING CONTOUR (5 FOOT INTERVAL)
 - 1 EXISTING CONTOUR (1 FOOT INTERVAL)
 - WETLAND BOUNDARY
 - 5 PROPOSED CONTOURS
 - STORMWATER CHANNEL
 - D D WETLAND-BAY DRAIN
 - HTL HIGH TIDE LINE
 - TOP OF COSTAL FEATURES
 - EDGE OF ROADWAY
 - GRAVEL PATH
 - APPROXIMATE TREES/ TREELINE
 - S SEWER MANHOLE COVER
 - D STORMWATER OUTLET
 - M UNMARKED UTILITY MANHOLE COVER
 - C CATCH BASINS
 - D D PROPOSED DRAINAGE PIPES
 - SF SF PROPOSED STRAW WATTLE
 - LOW LOW LIMIT OF WORK

- NOTES**
- TREES WITHIN THE LIMIT OF WORK MUST HAVE TREE DEVICE INSTALLED. SEE TREE PROTECTION DEVICE DETAIL.

PROJECT AREA OF DISTURBANCE	
TEMPORARY IMPACT	9,726 SQUARE FT
PERMANENT IMPACT	15,248 SQUARE FT
TOTAL IMPACT	24,974 SQUARE FT

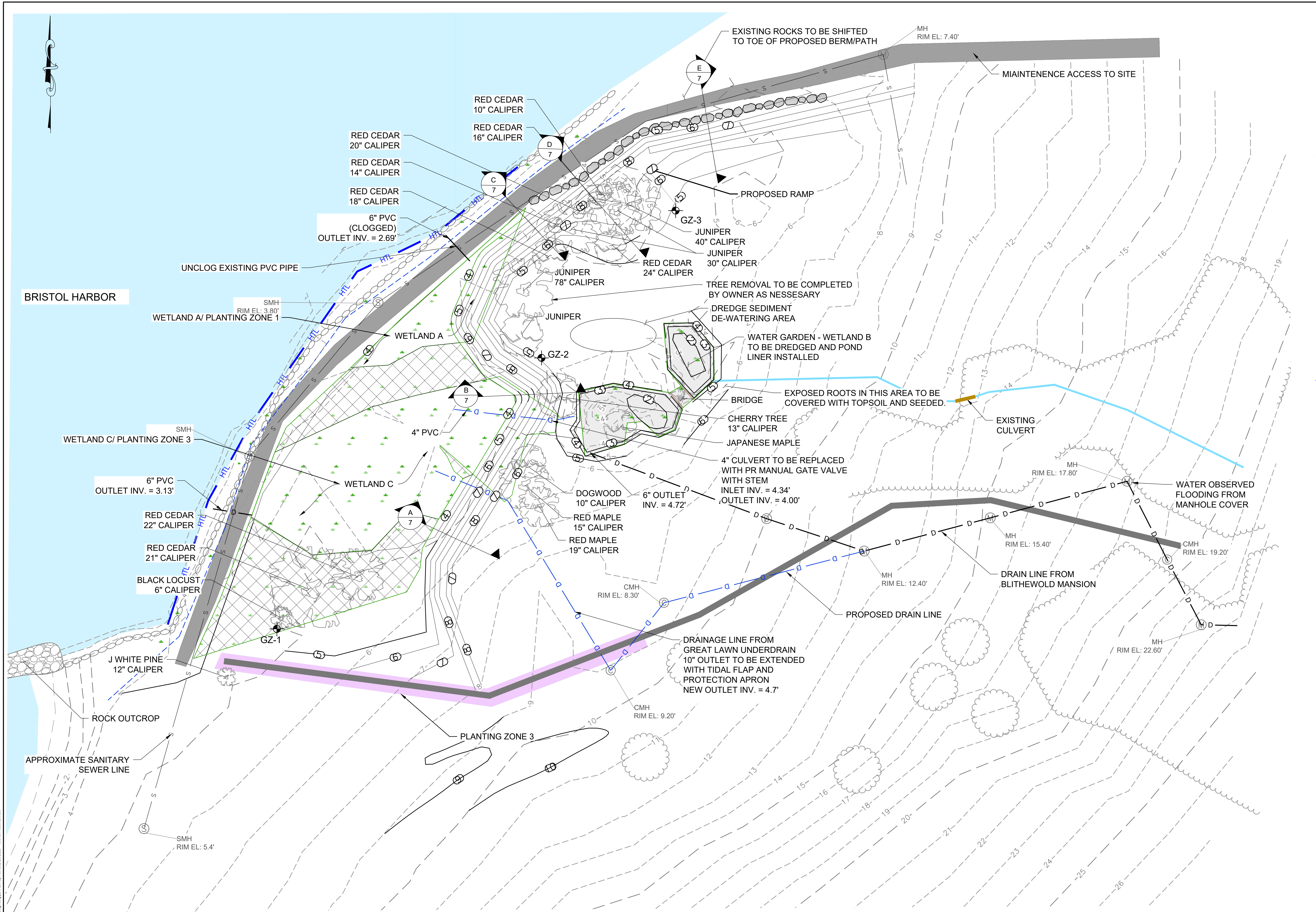


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- GENERAL NOTES**
- LIMITED TOPOGRAPHIC AND BATHYMETRIC SURVEY PERFORMED BY GZA GEOENVIRONMENTAL, INC. ON FEBRUARY 7, 2024 AND REPRESENTS CONDITIONS AT THE TIME OF THEY SURVEY.
 - TIDAL DATUM REFERENCED TO THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) STATION ID 8451552, BRISTOL FERRY, RHODE ISLAND.
 - ELEVATIONS ARE IN FEET AND REFERENCE MEAN SEA LEVEL (MSL) DATUM.
 - VERTICAL DATUM CONVERSION TAKEN FROM NOAA'S VERTICAL DATUM CONVERSION WEBSITE ACCESSED ON FEBRUARY 13, 2024.
 - TOPOGRAPHIC SURVEY OF BLITHEWOLD MANSION, MUSEUM AND ARBORETUM, BY SCITUATE SURVEYS, INC. DATED JUNE 18, 2002.

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ROCK GARDEN RESILIENCY IMPROVEMENTS BLITHEOLD MANSION, GARDENS, AND ARBORETUM BRISTOL, RHODE ISLAND				
SEDIMENT AND EROSION CONTROL PLAN				
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: BLITHEWOLD MUSEUM, GARDENS & ARBORETUM		
PROJ MGR: RAD	REVIEWED BY: MP	CHECKED BY: TRG	DRAWING	
DESIGNED BY: RAD	DRAWN BY: HLP	SCALE: AS NOTED	5	
DATE: 10/24/2024	PROJECT NO. 35335.01	REVISION NO. -	SHEET NO.	



LEGEND:

- 5 — EXISTING CONTOUR (5 FOOT INTERVAL)
- 1 — EXISTING CONTOUR (1 FOOT INTERVAL)
- WETLAND BOUNDARY
- 5 — PROPOSED CONTOURS
- STORMWATER CHANNEL
- WETLAND-BAY DRAIN
- HTL — HIGH TIDE LINE
- TOP OF COSTAL FEATURES
- EDGE OF ROADWAY
- GRAVEL PATH
- APPROXIMATE TREES/ TREELINE
- S — SEWER MANHOLE COVER
- D — STORMWATER OUTLET
- M — UNMARKED UTILITY MANHOLE COVER
- C — CATCH BASINS
- PROPOSED DRAINAGE PIPES

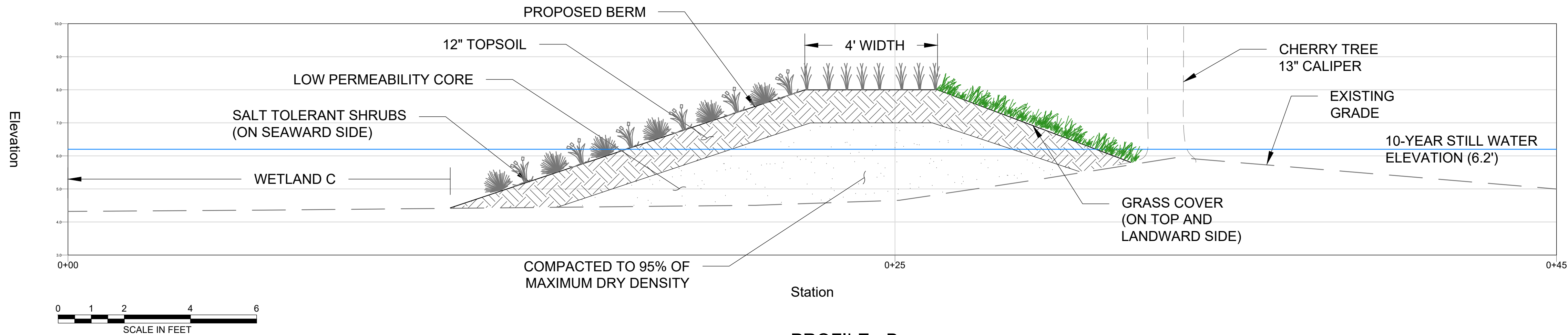
VOLUME CALCULATIONS	
CUT VOLUME	358 CUBIC YARD
FILL VOLUME	958 CUBIC YARD
VOLUME TOTAL	(FILL) 600 CUBIC YARD

- GENERAL NOTES**
- LIMITED TOPOGRAPHIC AND BATHYMETRIC SURVEY PERFORMED BY GZA GEOENVIRONMENTAL, INC. ON FEBRUARY 7, 2024 AND REPRESENTS CONDITIONS AT THE TIME OF THEY SURVEY.
 - TIDAL DATUM REFERENCED TO THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) STATION ID 8451552, BRISTOL FERRY, RHODE ISLAND.
 - ELEVATIONS ARE IN FEET AND REFERENCE MEAN SEA LEVEL (MSL) DATUM.
 - VERTICAL DATUM CONVERSION TAKEN FROM NOAA'S VERTICAL DATUM CONVERSION WEBSITE ACCESSED ON FEBRUARY 13, 2024.
 - TOPOGRAPHIC SURVEY OF BLITHEWOLD MANSION, MUSEUM AND ARBORETUM, BY SCITUATE SURVEYS, INC. DATED JUNE 18, 2002.
 - HIGH MARSH IS EXPECTED TO MIGRATE TO AREAS UP TO ELEVATION 5 (TOE OF BOTTOM) IN A 0-1 FOOT SEA LEVEL RISE SCENARIO.

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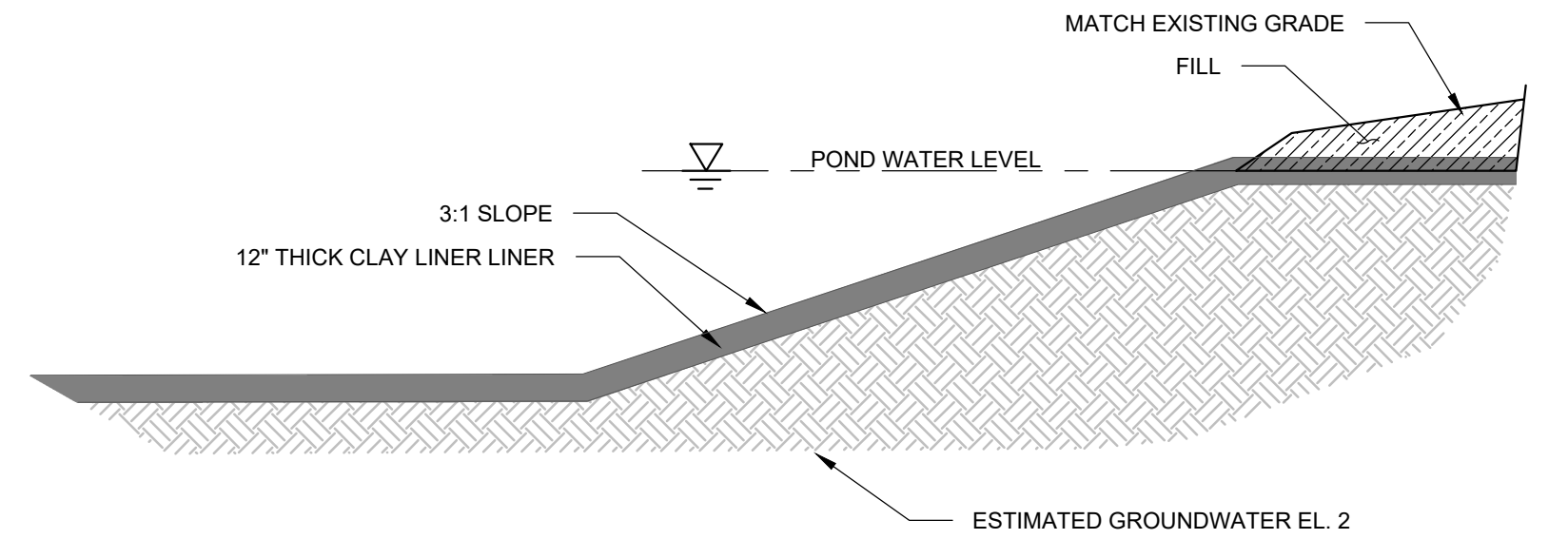
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GRADING PLAN					
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com			PREPARED FOR: BLITHEWOLD MUSEUM, GARDENS & ARBORETUM		
PROJ MGR: RAD	DESIGNED BY: RAD	REVIEWED BY: MP	DRAWN BY: HLP	CHECKED BY: TRG	DRAWING
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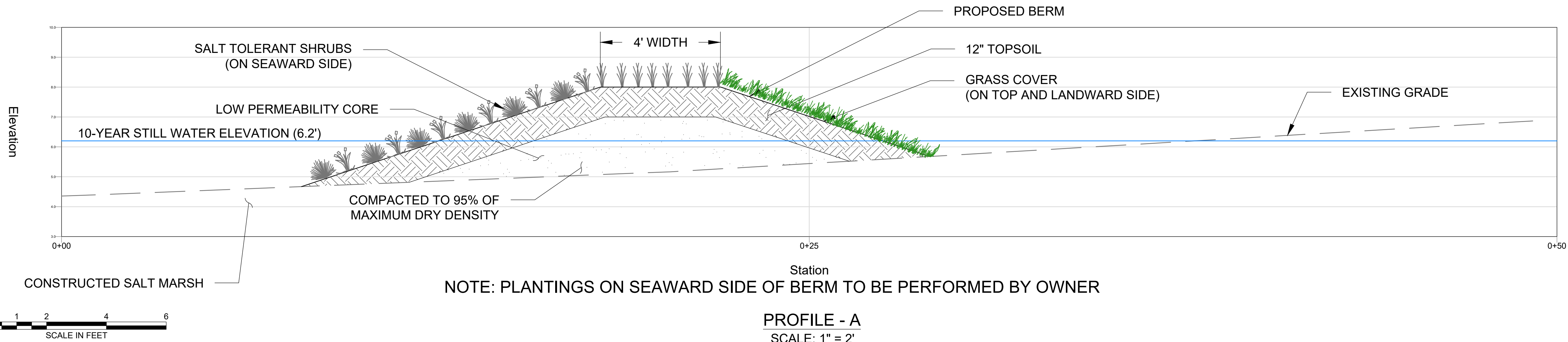


PROFILE - B
SCALE: 1" = 2'

NOTE: PLANTINGS ON SEAWARD SIDE OF BERM TO BE PERFORMED BY OWNER

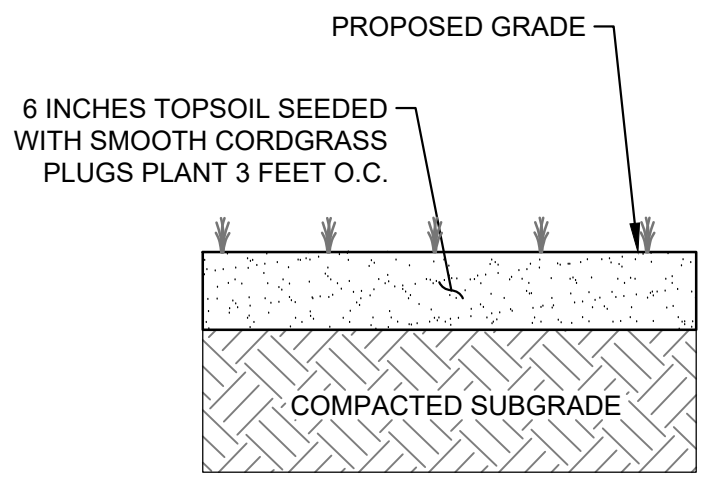


POND LINER DETAIL
NOT TO SCALE





PROFILE - A
SCALE: 1" = 2'

NOTE: PLANTINGS ON SEAWARD SIDE OF BERM TO BE PERFORMED BY OWNER

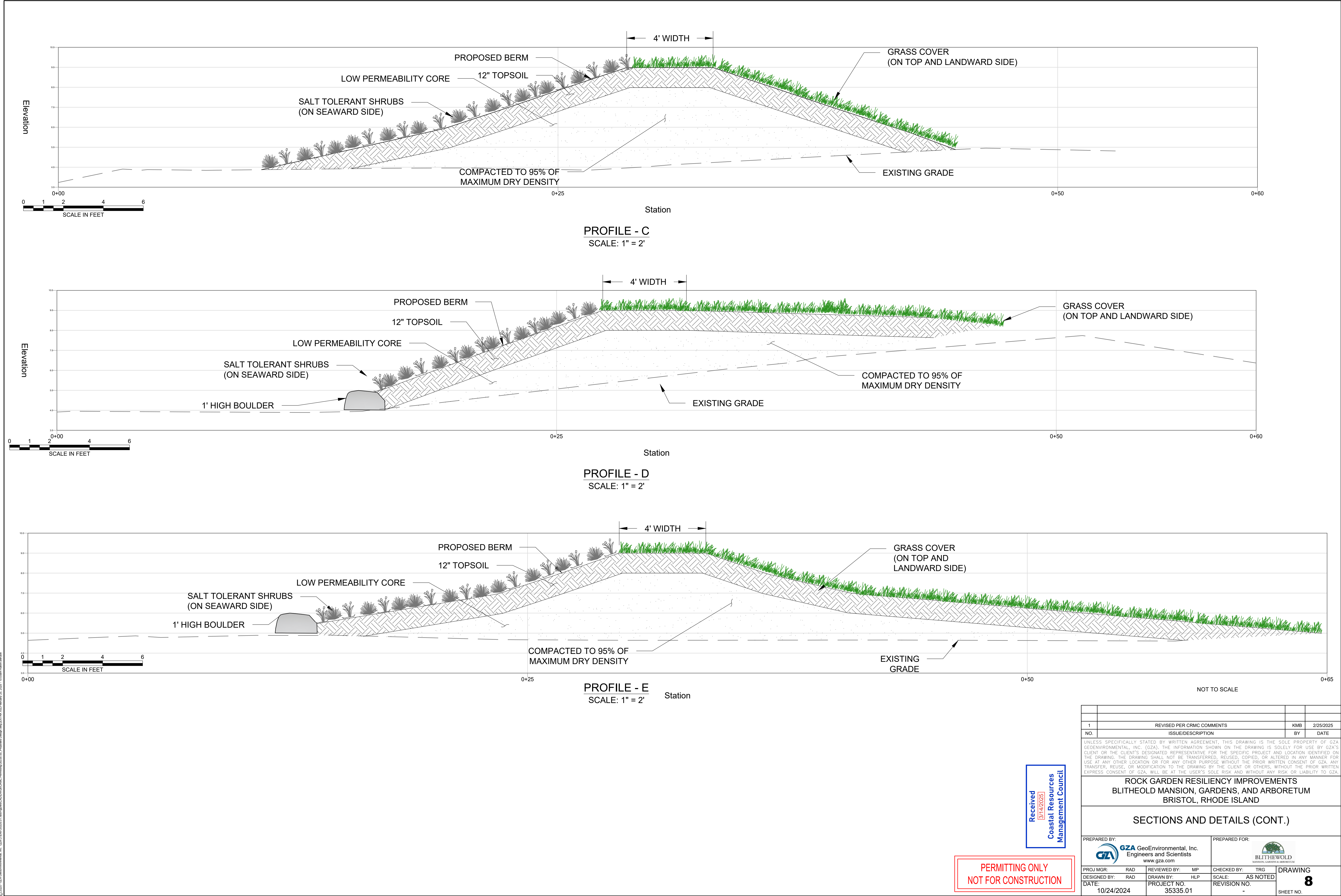




SALT MARSH RESTORATION DETAIL
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SECTIONS AND DETAILS					
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PROJ. MGR: RAD	DRAWN BY: HLP	REVIEWED BY: MP	CHECKED BY: TRG	DRAWING	
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SECTIONS AND DETAILS (CONT.)					
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