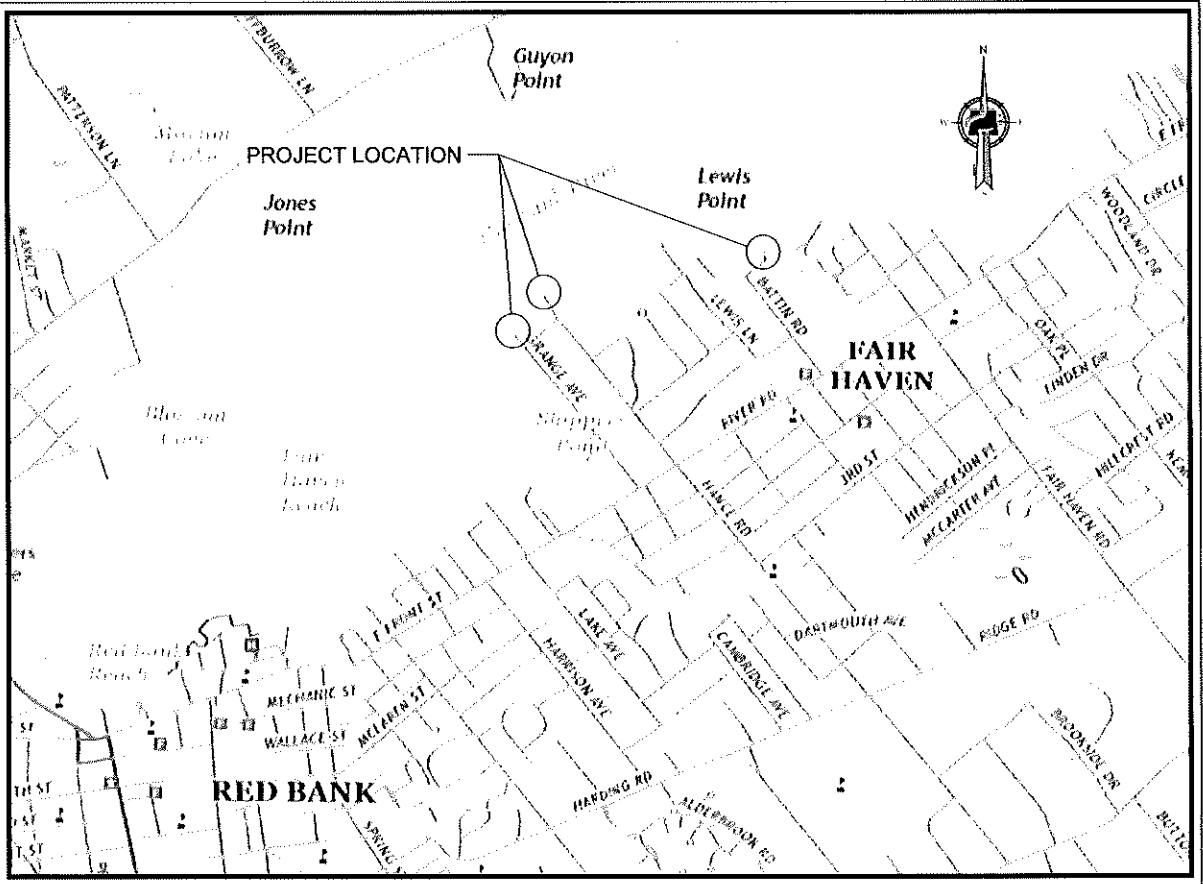


CONSTRUCTION PLANS
FOR
BULKHEAD REPLACEMENT
GRANGE AVENUE & HANCE ROAD
POCKET PARKS AND BATTIN ROAD
BOAT RAMP REPLACEMENT
BOROUGH OF FAIR HAVEN
MONMOUTH COUNTY, NEW JERSEY

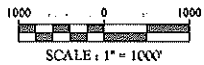
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T-2, T-3	STRUCTURAL NOTES	
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S-1.2	SITE & GRADING PLAN: GRANGE AVENUE	5/15/2020
S-1.3	BULKHEAD PLAN: GRANGE AVENUE	5/15/2020
S-2.1	EXISTING CONDITIONS & DEMOLITION PLAN: HANCE ROAD	5/15/2020
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SE-1, SE-2	SOIL EROSION AND SEDIMENT CONTROL PLAN	5/15/2020
SE-3, SE-4	SOIL EROSION & SEDIMENT CONTROL NOTES & DETAILS	5/15/2020
ST-1	BULKHEAD SECTION & DETAILS	5/15/2020
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ST-4	BOAT RAMP DETAILS	5/15/2020
ST-5	STRUCTURAL NOTES	5/15/2020



LOCATION MAP



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Richard C. Maloney
RICHARD C. MALONEY
NEW JERSEY PROFESSIONAL
ENGINEER - LICENSE NUMBER: GE39033

CONSTRUCTION PLANS
FOR
BULKHEAD
REPLACEMENT
GRANGE AVENUE &
HANCE ROAD
POCKET PARKS &
BATTIN ROAD BOAT
RAMP
BOROUGH OF FAIR HAVEN
MONMOUTH COUNTY
NEW JERSEY

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SCALE	DATE	DRAWN BY	CHECKED BY
AS SHOWN	4/29/19	TEK	KEH
PROJECT NUMBER	DRAWING NAME		
170649118	C-COVER		

SHEET TITLE
COVER SHEET

SHEET NUMBER
T-1

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE NEW JERSEY UNIFORM CONSTRUCTION CODE (NJUCC), BASED ON IBC 2015, WHICH IS THE ADOPTED BUILDING CODE FOR THE PROJECT SITE, AND ITS REFERENCE DOCUMENT, ASCE 7-10, "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES".

- EXCAVATION, FOUNDATION AND BACKFILLING

- ## STEEL SHEET PILES & ANCHORS

1. ALL SHEET PILES SHALL BE FABRICATED FROM ASTM A572 GRADE 50 STEEL ($F_y = 50$ KSI MINIMUM).
2. SECTIONS FOR STEEL SHEET PILING SHALL BE AS SHOWN ON THE DRAWINGS, AND SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:
- A. TYPICAL BULKHEAD SHEETS:
- | | |
|--|-----------------------------|
| (1) SHEET WIDTH = | 28.50 IN. |
| (2) SHEET HEIGHT (CORRUGATION DEPTH) = | 10.00 IN. |
| (3) SHEET THICKNESS = | 0.25 IN. |
| (4) CROSS-SECTIONAL AREA = | 4.18 IN. ² /FT. |
| (5) SECTION MODULUS = | 14.36 IN. ⁴ /FT. |
| (6) MOMENT OF INERTIA = | 71.82 IN. ⁴ /FT. |
| (7) SHEET PILE WEIGHT = | 33.81 LBS/FT. |
| (8) WALL WEIGHT = | 14.23 PSF |

3. ALL STEEL SHEET PILES SHALL BE SHOP COATED WITH THE FOLLOWING COATING SYSTEM:
- A. FIRST COAT SHALL BE A CYCLOALIPHATIC AMINE EPOXY MATERIAL.
 - (1) SURFACE PREPARATION: SSPC-SP-10
 - (2) MATERIAL SHALL BE SELF-PRIMING
 - (3) DRY FILM THICKNESS: 4.0 TO 6.0 mils PER COAT
 - (4) SOLIDS CONTENT: 75% $\pm$ 2% BY VOLUME
 - (5) FINISH: GLOSS
 - B. SECOND COAT SHALL BE AN ALIPHATIC ACRYLIC POLYURETHANE MATERIAL.
 - (1) DRY FILM THICKNESS: 2.0 TO 2.5 mils
 - (2) SOLIDS CONTENT: 70% $\pm$ 2% BY VOLUME
 - (3) FINISH: GLOSS
 - (4) ABRASION RESISTANCE: 2562 psi (ASTM D4541)
 - C. ALL ASPECTS OF SURFACE PREPARATION, COATING STORAGE, MIXING & HANDLING, COATING APPLICATION, AND CURING SHALL BE IN COMPLETE ACCORDANCE WITH THE COATING MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
 - D. COLOR OF FINAL COATING SHALL BE AS SELECTED BY OWNER FROM MANUFACTURER'S STANDARD COLOR SELECTION.
 - E. COAL-TAR EPOXY COATING MAY NOT BE SUBSTITUTED ON SHEET PILES.

4. CONTRACTOR SHALL USE A DRIVING TEMPLATE FOR DRIVING STEEL SHEET PILING.
5. DRIVING OF PILES IN PAIRS IS RECOMMENDED TO FACILITATE DRIVING AND HELP MAINTAIN VERTICALITY OF PILES.
6. PILING SHOULD BE DRIVEN WITH THE BALL EDGE LEADING WHERE POSSIBLE TO AVOID CLOGGING OF SOCKET END DURING DRIVING. WHEN CONDITIONS REQUIRE THAT SOCKET END LEAD, OR IF SELECTED SHEET PILES DO NOT INCLUDE A BALL END, A BOLT OR SIMILAR OBJECT SHOULD BE PLACED IN BOTTOM OF LEADING SOCKET TO MINIMIZE CLOGGING.
7. SHEET PILE ANCHORAGE SYSTEMS:
- A. SHEET PILE ANCHORAGE SYSTEM SHALL INCLUDE STEEL CHANNEL WALKER SECTIONS LOCATED BEHIND THE SHEET PILES (LANDWARD SIDE) TO REDUCE POSSIBILITY OF BOAT DAMAGE DUE TO WALKER IMPACTS. ANCHOR THE RODS AND HELICAL ANCHORS SHALL BE LOCATED TO OCCUR WITHIN THE CORRUGATIONS OF THE SELECTED SHEET PILE PROFILE. SPACING OF ANCHOR, THE RODS AND HELICAL ANCHORS SHALL BE 9'-6" O.C. MAXIMUM. SEE DESIGN DRAWINGS FOR ADDITIONAL INFORMATION AND CONNECTION DETAILS.
 - B. THE RODS FROM SHEET PILE WALKERS TO HELICALS:
 - (1) TYPICAL BULKHEAD THE RODS SHALL BE 1 1/2" THREADED RODS, ASTM A572, GRADE 50 STEEL ($F_y = 50$ KSI MIN).
 - (2) EACH ROD (TYPICAL RODS OR DIAGONALS) SHALL INCLUDE TURNBUCKLES FOR TENSIONING AND ADJUSTMENT. AFTER INSTALLATION, TURNBUCKLES AND INNER AND OUTER ROD SECTIONS, SHALL BE PROVIDED WITH OPPOSITE-HAND THREADS TO PERMIT TENSIONING AND ADJUSTMENT USING TURNBUCKLES.
 - (3) ALL ELEMENTS OF THE ROD SYSTEM, INCLUDING BUT NOT LIMITED TO RODS, TURNBUCKLES, WASHERS, HEX NUTS, SHIMS AND OTHER HARDWARE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 & A153 AS APPLICABLE, WITH 20 OUNCES OF ZINC PER SQUARE FOOT MINIMUM. AFTER GALVANIZING, ALL ELEMENTS AS NOTED ABOVE SHALL ALSO BE FULLY COATED WITH COAL-TAR EPOXY. THREADED ELEMENTS SHALL BE COATED WITH COAL-TAR EPOXY IN FIELD ONLY AFTER FINAL ADJUSTMENT AND TIGHTENING OF ALL ELEMENTS IS COMPLETED. SEE NOTES FOR SHEET PILE DETAILS OF COAL-TAR EPOXY COATING.

- C. DRILLED-IN HELICAL SOIL ANCHORS
- (1) DESIGN LENGTH OF HELICAL ANCHORS FROM FACE OF BULKHEAD SHEET PILES SHALL BE 45'-0" MINIMUM, AS SHOWN IN THE DESIGN DRAWINGS.
 - (2) HELICAL ANCHOR INSTALLATION ANGLE SHALL BE 20° FROM HORIZONTAL (APPROX. 4 1/4" PER 1'-0"). ANCHORS SHALL BE PERPENDICULAR TO THE LINE OF THE BULKHEAD IN PLAN.
 - (3) ENTIRE HELICAL ANCHOR SYSTEM SHALL BE SUPPLIED FROM THE SAME MANUFACTURER, INCLUDING SHAFTS, HELICES, AND ALL HARDWARE.
 - (4) ALL DETAILS OF HELICAL ANCHOR INSTALLATION SHALL BE IN COMPLETE ACCORDANCE WITH THE DESIGN DRAWINGS, AND WITH THE MANUFACTURER'S RECOMMENDATIONS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
 - a. ANCHOR LENGTH, LOCATION, INSTALLATION ANGLE AND SPACING ON BULKHEAD.
 - b. ANCHOR HELIX MATERIAL, DIAMETERS, THICKNESSES, AND SPACING ALONG SHAFT. NOMINAL SPACING BETWEEN HELIX PLATES SHALL BE THREE TIMES THE DIAMETER OF THE LARGER HELIX. HELIX MATERIAL SHALL BE IN ACCORDANCE WITH ASTM A936 HOT-ROLLED HIGH STRENGTH LOW ALLOY STEEL SHEET, ASTM A656 HOT-ROLLED STRUCTURAL STEEL PLATE OR STEEL PLATE MANUFACTURED TO STANDARD AS REQUIRED TO OBTAIN THE DESIGN LOAD CAPACITY. HELICES SHALL BE FORMED BY MATCHING METAL DIES.
 - c. ANCHOR SHAFT SIZE, CONNECTIONS, AND MATERIAL. SHAFT MATERIAL SHALL BE IN ACCORDANCE WITH ASTM A29, OR MANUFACTURER'S STANDARD AS REQUIRED TO OBTAIN THE DESIGN LOAD CAPACITY.
 - d. ANCHOR LOAD TESTS.
 - (5) ALL HELICAL ANCHORS, WELDES, DRIVE SHAFTS, ADAPTERS, RODS, NUTS, BOLTS, WASHERS, PLATE WASHERS, PIPE SPACERS, AND OTHER HARDWARE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 & A153 AS APPLICABLE, WITH 20 OUNCES OF ZINC PER SQUARE FOOT, MINIMUM. AFTER GALVANIZING, ALL EXPOSED ELEMENTS AT TURNBUCKLE CONNECTIONS SHALL ALSO BE FULLY COATED WITH COAL-TAR EPOXY SEAL. NOTES THIS SHEET FOR DETAILS OF COAL-TAR EPOXY COATING.

- (6) HELICAL ANCHORS SHALL HAVE THE FOLLOWING CAPACITIES:
 - a. ANCHOR DESIGN LOAD: 36.25 KIPS
 - b. ANCHOR ULTIMATE CAPACITY: 72.50 KIPS
 - c. INSTALLATION TORQUE: 7785 FT-LBS
- (7) INSTALLATION OF HELICAL ANCHORS SHALL BE PERFORMED BY A CONTRACTOR EXPERIENCED IN DRILLED HELICAL SOIL ANCHOR INSTALLATION, AND AS APPROVED BY THE ANCHOR MANUFACTURER.
- (8) HELICAL ANCHORS SHALL BE LOAD TESTED IN ACCORDANCE WITH THE ANCHOR MANUFACTURER'S RECOMMENDATIONS. ALL ASPECTS OF ANCHOR TESTING SHALL BE IN COMPLETE ACCORDANCE WITH THE MFR'S RECOMMENDATIONS, INCLUDING NUMBER/FREQUENCY OF ANCHOR TESTS, TEST PROCEDURES, MAGNITUDE OF TEST LOADS, METHOD OF TEST LOAD APPLICATION, AND DURATION OF TEST LOAD APPLICATION. CONTRACTOR SHALL WAIT MINIMUM OF TWO DAYS AFTER INSTALLATION TO CONDUCT LOAD TESTING ON ANY ANCHOR.
- (9) HELICAL ANCHOR DESIGN & SHOP DRAWINGS SHALL BE SUBMITTED FOR ENGINEER APPROVAL. DESIGN AND SHOP DRAWINGS SHALL BE NEW JERSEY SIGNED AND SEALED BY THE CONTRACTORS ENGINEER.

1. BULKHEAD IS DESIGNED FOR A SURCHARGE LOAD OF 200 PSF ON RETAINED SOIL.

ALL ELEVATIONS REFER TO NORTH AMERICAN
VERTICAL DATUM 1988 (NAVD 88). AS FOLLOWS:

MEAN HIGHER HIGH WATER (MHHW) =	2.09'
NAVD 88 REFERENCE =	0.00'
MEAN HIGH WATER (MHW) =	1.79'
MEAN TIDE LEVEL (MTL) =	0.09'
MEAN LOW WATER (MLW) =	-1.62'
MEAN LOWER LOW WATER (MLLW) =	-1.74'

1. ALL STRUCTURAL STEEL FABRICATION AND ERECTION SHALL CONFORM TO THE AISC "MANUAL OF STEEL CONSTRUCTION — ALLOWABLE STRESS DESIGN", LATEST EDITION.
2. ALL STRUCTURAL STEEL "W" SHAPES SHALL CONFORM TO ASTM A992 OR A572, GRADE 50. ALL STEEL PIPE SHALL CONFORM TO ASTM A53, TYPE "E" OR "S", GRADE B. HOLLOW STRUCTURAL SECTIONS (HSS) SHALL COMPLY WITH ASTM A500 GR. B. ALL OTHER SHAPES AND SECTIONS SHALL CONFORM TO ASTM A36 OR A572, GRADE 50, AS NOTED. ALL PIPE SIZES ARE NOMINAL DIAMETER.

1. ALL CONNECTIONS OF STRUCTURAL STEEL MEMBERS SHALL BE MADE USING WELDS OR STANDARD, UNFINISHED BOLTS. CONNECTION MATERIALS SHALL BE AS FOLLOWS:
 - A. UNFINISHED BOLTS SHALL CONFORM TO ASTM A325.
 - B. WELDS SHALL BE IN ACCORDANCE WITH THE LATEST AMERICAN WELDING SOCIETY (AWS) SPECIFICATIONS. ALL WELDING ELECTRODES SHALL BE E70 SERIES, UNLESS OTHERWISE NOTED.
4. SHOP AND FIELD WELDING SHALL BE PERFORMED BY WELDERS WHO ARE CERTIFIED (AWS "STANDARD CERTIFICATION PROCEDURE") TO PERFORM THE TYPE OF WORK REQUIRED. WELDS SHALL CONFORM TO AWS D1.1, "STRUCTURAL WELDING CODE - STEEL", LATEST EDITION. PROVIDE MINIMUM WELD SIZES PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 9TH EDITION, WHEN WELD SIZES ARE NOT SHOWN.
5. STEEL SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
6. THE DRAWINGS REPRESENT THE PERMANENT FRAMING AND FINAL DETAILS WHERE SHOWN. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING PROPER DESIGN AND CONSTRUCTION OF FALSEWORK, TEMPORARY BRACING, SHORING, AND RECOMMENDED ERECTION PROCEDURES.
7. PAINTING & FINISHING:
 - A. U.O.N. STEEL SHAPES, PLATES, AND FABRICATIONS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123. ALL STEEL SHALL ALSO BE COATED WITH COAL-TAR EPOXY AS DESCRIBED BELOW, AND AS APPROVED BY THE ENGINEER.
 - B. U.O.N. ALL HARDWARE (NUTS, BOLTS, WASHERS, ETC.) SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153. ALL HARDWARE SHALL ALSO BE COATED WITH COAL-TAR EPOXY AS DESCRIBED BELOW, AND AS APPROVED BY THE ENGINEER. FIELD-INSTALLED AFTER INSTALLATION, TIGHTENING, AND ADJUSTMENT OF HARDWARE.
 - C. ALL STEEL FRAMING, GRATING, STAIR COMPONENTS, HANDRAILS, GUARDRAILS, AND THEIR ASSOCIATED FASTENERS TO BE PAINTED PER THE FOLLOWING SYSTEM BY THEMEC OR APPROVED EQUAL:

SURFACE PREP: SSPC-SP2 HAND TOOL CLEAN
PRIME: V10-99 OR 4 VERSARE, 2-3 MILS DFT
INTERMEDIATE: 2H OR 23 ENDURATONE, 2-3 MILS DFT
FINISH: 2H OR 23 ENDURATONE, 2-3 MILS DFT
8. STAIR STRINGERS SHALL HAVE FULL PENETRATION WELDED CONNECTIONS ALL AROUND AT CRANKED SEGMENTS AND GROUND SMOOTH UNLESS OTHERWISE NOTED.

1. ALL STEEL PARTS OF BULKHEAD ANCHORAGE SYSTEM SHALL BE COATED WITH COAL-TAR EPOXY COATING. (SHEET PILES SHALL NOT RECEIVE COAL-TAR EPOXY COATING. SEE NOTES THIS SHEET FOR STEEL SHEET PILE COATING SYSTEM.)
2. THREADED PORTIONS OF THE RODS, TURNBUCKLES, AND SIMILAR ELEMENTS SHALL BE COATED WITH COAL-TAR EPOXY IN FIELD, AFTER FINAL TIGHTENING AND ADJUSTMENT OF ANCHORAGE SYSTEM. ALL OTHER PORTIONS OF BULKHEAD ANCHORAGE SYSTEM SHALL BE SHOP-COATED.
3. COAL-TAR EPOXY SHALL BE IN COMPLETE ACCORDANCE WITH THE REQUIREMENTS OF THE US ARMY CORPS OF ENGINEERS FORMULA C-200, AND STEEL STRUCTURES PAINTING COUNCIL (SSPC) STANDARD "PAINT 16".
4. MINIMUM (NOT AVERAGE) DRY FILM THICKNESS (DFT) OF 16 mils IS REQUIRED ON ALL COATED ELEMENTS.
5. COAL-TAR EPOXY COATING MATERIAL SHALL BE A HIGH-BUILD, BLACK, GLOSS-FINISH SELF-PRIMING PRODUCT, WITH SOLIDS CONTENT OF 74% $\pm 2\%$ BY VOLUME.
6. COAL-TAR EPOXY MATERIAL SHALL MEET OR EXCEED THE FOLLOWING PERFORMANCE REQUIREMENTS:

A. ASTM D4060 (ABRASION):	130mg MAX LOSS AFTER 1000 CYCLES
B. ASTM D4541 (ADHESION):	1443 psi MINIMUM
C. ASTM D2794 (IMPACT):	100 in-lbs
D. ASTM B117 (SALT FOG):	NO BLISTERING, RUSTING OR DELAMINATION AFTER 2000 HRS.
7. ALL ASPECTS OF COATING APPLICATION, INCLUDING PRODUCT STORAGE & HANDLING, SURFACE PREPARATION, MIXING, PRODUCT APPLICATION, CURING AND PROTECTION SHALL BE IN COMPLETE ACCORDANCE WITH THE COATING MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

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RICHARD C. MALONEY NEW JERSEY PROFESSIONAL ENGINEER - LICENSE NUMBER: GE31923	
CONSTRUCTION PLANS FOR BULKHEAD REPLACEMENT GRANGE AVENUE & HANCE ROAD POCKET PARKS & BATTIN ROAD BOAT RAMP BOROUGH OF FAIR HAVEN MONMOUTH COUNTY NEW JERSEY	
	
RED BANK OFFICE Corporate Headquarters 311 Newman Springs Road Suite 101 Red Bank, NJ 07701 Phone: 737.381.1550 Fax: 737.381.1184	
SCALE AS SHOWN PROJECT NUMBER 1705041001	DATE 4/23/18 DRAWN BY TDC CHECKED BY C-CYR
SHEET TITLE STRUCTURAL NOTES	
SHEET NUMBER T-2	

CONCRETE AND REINFORCING

- ALL CONCRETE WORK SHALL COMPLY WITH THE REQUIREMENTS OF ACI 318 AND "SPECIFICATIONS FOR CONCRETE BUILDINGS" ACI 301, LATEST EDITIONS.
- ALL CONCRETE SHALL HAVE MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,500 PSI, UNLESS OTHERWISE NOTED. CONCRETE SHALL BE AIR-ENTRAINED IN ACCORDANCE WITH ACI STANDARDS. MAXIMUM SLUMP SHALL BE 4 INCHES. ALL CONCRETE SHALL BE NORMAL WEIGHT, U.N.D.
- ALL REINFORCING STEEL FOR CONCRETE AND MASONRY CONSTRUCTION SHALL CONFORM WITH ASTM A615, GRADE 60. ALL REINFORCING STEEL SHALL BE EPOXY-COATED IN ACCORDANCE WITH ASTM A775.
- ALL REINFORCING BARS SHALL BE SPLICED A MINIMUM OF 40 BAR DIAMETERS. ALL REINFORCING BARS SHALL BE CONTINUOUS AROUND CORNERS.
- WELDED WIRE FABRIC (WWF) SHALL CONFORM WITH ASTM A185. WIRE FABRIC SHALL BE TIED WITH WIRE AND OVERLAPPED TWO SQUARES AT EDGES. ALL WWF SHALL BE EPOXY-COATED IN ACCORDANCE WITH ASTM A884.
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED OVER REINFORCEMENT, UNLESS OTHERWISE NOTED ON THE DRAWINGS:
 - CONCRETE CAST AGAINST EARTH: 3 INCHES
 - CONCRETE EXPOSED TO EARTH OR WEATHER: 2 INCHES
 - CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
 - SLABS AND WALLS: 1 INCH
 - BEAMS AND COLUMNS: 1/2 INCHES
- ALL REINFORCING SHALL BE DETAILED, FABRICATED, AND SUPPORTED IN FORMS AND SPACED WITH ACCESSORIES FOLLOWING THE REQUIREMENTS OF THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES", ACI 315. PLACING OF BARS SHALL CONFORM TO THE LATEST CRSI RECOMMENDED PRACTICES FOR PLACING REINFORCING BARS.
- NO ADMIXTURE SHALL BE ALLOWED WITHOUT PRIOR APPROVAL OF THE ENGINEER. THE USE OF CALCIUM CHLORIDE IS PROHIBITED.
- AFTER CONCRETING HAS STARTED, IT SHALL BE CARRIED ON AS A CONTINUOUS OPERATION UNTIL PLACING OF A PANEL OR SECTION, AS DEFINED BY ITS BOUNDARIES OR PREDETERMINED JOINTS, IS COMPLETED.
- ALL CONCRETE SHALL BE THOROUGHLY CONSOLIDATED BY SUITABLE MEANS SUCH AS MECHANICAL VIBRATION DURING PLACEMENT AND THOROUGHLY WORKED AROUND REINFORCEMENT.
- FINISH CONCRETE IN ACCORDANCE WITH "FINISHING OF FORMED SURFACES", OF ACI 301. FOUNDATION WALL SHALL BE SMOOTH-FORMED FINISH, UNLESS OTHERWISE NOTED.
- GROUT SHALL BE A NON-SHRINK, NON-METALLIC, CEMENTITIOUS GROUT, AS APPROVED BY THE ENGINEER.
- ALL BOLTS, SLEEVES, AND OTHER EMBEDDED ITEMS SHALL BE SET BEFORE CONCRETE IS PLACED. SEE MECHANICAL, ELECTRICAL, AND VENDORS' DRAWINGS FOR SIZES AND LOCATIONS.

FILTER FABRIC FOR BULKHEAD CONSTRUCTION

- FILTER FABRIC SHALL BE PROVIDED FOR CONSTRUCTION OF BULKHEAD AT AREAS AS SHOWN ON THE DESIGN DRAWINGS, INCLUDING BUT NOT LIMITED TO:
 - ISOLATION AND CONTROL OF GRANULAR FILL MATERIALS BEHIND NEW BULKHEAD SHEET PILES.
 - CLOSURE AT INTERFACES BETWEEN NEW SHEET PILE BULKHEAD CONSTRUCTION AND EXISTING BULKHEADS.
 - CLOSURE AT STORM DRAIN PENETRATIONS OF NEW SHEET PILE BULKHEAD.
- FILTER FABRIC SHALL BE A NON-WOVEN CML ENGINEERING FABRIC MATERIAL (GEOTEXTILE) WITH THE FOLLOWING MINIMUM MATERIAL PROPERTIES:
 - GRAB TENSILE STRENGTH (ASTM D4632): 80 LB.
 - GRAB TENSILE ELONGATION (ASTM D4632): 50%
 - MULLEN BURST (ASTM D3786): 150 PSI
 - PUNCTURE (ASTM D4833): 45 LB.
 - TRAPEZOID TEAR (ASTM D4533): 35 LB.
 - UV RESISTANCE @ 500 hr (ASTM D4355): 70%
 - APPARENT OPENING SIZE (US SIEVE) (ASTM D4751): 70
- COMPLETE MANUFACTURER'S DATA ON FILTER FABRIC (GEOTEXTILE) MATERIAL SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL PRIOR TO PROCUREMENT OR INSTALLATION OF MATERIAL.
- ALL ASPECTS OF MATERIAL STORAGE, HANDLING, AND INSTALLATION SHALL BE IN COMPLETE ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.

CONCRETE CURING

- PROPER CURING OF CONCRETE IS OF THE UTMOST IMPORTANCE. BEGINNING IMMEDIATELY AFTER PLACEMENT, CONCRETE SHALL BE PROTECTED FROM PREMATURE DRYING, EXCESSIVELY HOT OR COLD TEMPERATURES, AND MECHANICAL INJURY AND SHALL BE MAINTAINED WITH MINIMAL MOISTURE LOSS AT A RELATIVELY CONSTANT TEMPERATURE FOR AT LEAST 7 DAYS. THE MATERIALS AND METHODS OF CURING SHALL BE SUBJECT TO ACCEPTANCE BY THE ENGINEER. UNSATISFACTORY FINISHED CONCRETE THAT RESULTS FROM FAILURE TO FOLLOW THE SPECIFIED CURING PROCEDURES MAY BE REQUESTED BY THE OWNER OR ENGINEER TO BE REMOVED AND REPLACED. ALL COSTS ASSOCIATED WITH REMOVAL AND REPLACEMENT OF CONCRETE WORK SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- SLABS - IT IS MANDATORY THAT 7 DAYS OF WET CURING ON ALL MAT SLABS AND FORMED SLABS BE PERFORMED. USE SOAKER HOSE, WET BURLAP AND PLASTIC SHEETS OVER BURLAP ON ALL EXPOSED SURFACES FOR 7 DAYS MINIMUM.
- COLD WEATHER - WHEN THE MEAN DAILY OUTDOOR TEMPERATURE IS LESS THAN 40°F, THE TEMPERATURE OF THE CONCRETE SHALL BE MAINTAINED BETWEEN 50°F AND 70°F FOR THE REQUIRED CURING PERIOD. WHEN NECESSARY, ARRANGEMENTS FOR HEATING, COVERING, INSULATING, OR HOUSING THE CONCRETE WORK SHALL BE MADE IN ADVANCE OF PLACEMENT AND SHALL BE ADEQUATE TO MAINTAIN THE REQUIRED TEMPERATURE WITHOUT INJURY TO THE CONCRETE DUE TO CONCENTRATION OF HEAT.
- HOT WEATHER - WHEN NECESSARY, PROVISION FOR WINDBREAKS, SHADING, AND/OR COVERING WITH A LIGHT-COLORED MATERIAL SHALL BE MADE IN ADVANCE OF CONCRETE PLACEMENT. SUCH PROTECTIVE MEASURES SHALL BE TAKEN AS QUICKLY AS CONCRETE HARDENING AND FINISHING OPERATIONS WILL ALLOW. TEMPERATURE OF CONCRETE AT PLACEMENT SHALL NOT EXCEED 85°F.

EPOXY MATERIALS FOR CONCRETE CONSTRUCTION

- EPOXY MATERIAL FOR ANCHORAGE OF REINFORCING DOWELS INTO EXISTING CONCRETE, FILLING OF CONNECTION SLEEVES AT LIGHT POLE INSTALLATION, AND SIMILAR APPLICATIONS, SHALL BE A HIGH-MODULUS, HIGH STRENGTH EPOXY BONDING/GROUTING ADHESIVE.
- EPOXY MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-881 AND ASTM M-235 STANDARDS.
- EPOXY MATERIAL SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:
 - 7-DAY COMPRESSIVE MODULUS: 2.1x10¹⁰ PSI
 - TENSILE PROPERTIES PER ASTM D-638:
 - 7-DAY TENSILE STRENGTH: 6,900 PSI
 - 7-DAY ELONGATION AT BREAK: 1.9%
 - 14-DAY MODULUS OF ELASTICITY: 5.4x10¹⁰ PSI
 - FLEXURAL PROPERTIES PER ASTM D-790:
 - 14-DAY FLEXURAL STRENGTH: 7,000 PSI
 - 14-DAY TANGENT M.O.E. IN BENDING: 6.9x10¹⁰ PSI
 - SHEAR STRENGTH PER ASTM D-732:
 - 14-DAY SHEAR STRENGTH: 6,200 PSI
 - WATER ABSORPTION PER ASTM D-570:
 - 7-DAY (24 hr IMMERSION): 0.21%
 - COMPRESSIVE STRENGTH PER ASTM D-695 (73°F):
 - 8-hr: 140 PSI
 - 16-hr: 4,800 PSI
 - 1-DAY: 5,700 PSI
 - 3-DAY: 11,300 PSI
 - 7-DAY: 11,800 PSI
 - 14-DAY: 12,200 PSI
 - 28-DAY: 12,200 PSI
- WHERE INDICATED IN THE STRUCTURAL DETAILS, EPOXY GROUTING ADHESIVE SHALL HAVE CLEAN, OVEN-DRIED SAND ADDED IN ACCORDANCE WITH THE EPOXY MANUFACTURER'S RECOMMENDATIONS.
- ALL DETAILS OF EPOXY INSTALLATION, INCLUDING PREPARATION OF SURFACES, DRILLING FOR EMBEDDED REINFORCING BARS, AND HANDLING, MIXING, & APPLICATION OF EPOXY MATERIALS SHALL BE IN COMPLETE ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- CONTRACTOR SHALL SUBMIT DATA SHEETS FOR ENGINEER'S REVIEW FOR ALL EPOXY MATERIAL(S) TO BE USED.

TIMBER FRAMING:

- ALL ASPECTS OF TIMBER CONSTRUCTION SHALL BE IN COMPLETE ACCORDANCE WITH THE REQUIREMENTS OF THE "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION" (NDS), LATEST EDITION, AS PUBLISHED BY THE AMERICAN FOREST & PAPER ASSOCIATION AND THE AMERICAN WOOD COUNCIL.
- MATERIALS:
 - TIMBER - SOUTHERN YELLOW PINE, No.2 GRADE OR BETTER FOR ALL TIMBER FRAMING, INCLUDING PIERS, BOAT RAMP WALKWAYS, AND BULKHEAD CAP. ALL TIMBER FRAMING SHALL BE PRESERVATIVE TREATED IN ACCORDANCE WITH NOTE #3, BELOW.
 - HARDWARE - ALL STUDS, BOLTS, NUTS, AND WASHERS FOR TIMBER FRAMING SHALL BE ASTM A307, HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153, UNLESS OTHERWISE NOTED. PLATES, STRAPS, AND ANGLES SHALL BE ASTM A36 STEEL, HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123, UNLESS OTHERWISE NOTED.
- ALL TIMBER FRAMING SHALL BE PRESERVATIVE TREATED IN ACCORDANCE WITH "AMERICAN WOOD PRESERVERS ASS'N. (AWPA) STANDARDS 2005", STANDARD U1-05, AS FOLLOWS:
 - ALL TIMBER FRAMING AT BULKHEAD PIERS, PIERS, AND WALKWAYS EXCEPT AS SPECIFICALLY NOTED IN "B", BELOW:
 - AWPA USE CATEGORY: UC-BB (SALT WATER EXPOSURE)
 - COMMODITY (U1-05, TABLE 3-1): LUMBER / TIMBERS
 - CCA PRESERVATIVE TREATMENT WITH A RETENTION OF 2.5 LBS./CUFT SHALL BE PROVIDED PER U1-05, TABLE 3.0
 - NO SUBSTITUTIONS OF OTHER TREATMENTS SHALL BE PERMITTED.
 - TIMBER CAP TOP PLANK SECTIONS AT BULKHEAD, ALL WALKING SURFACE PLANKS AT PIERS, AND CURB SECTIONS AT MAIN PIERS:
 - AWPA USE CATEGORY: UC-4B (SALT WATER SPRAY)
 - COMMODITY (U1-05, TABLE 3-1): LUMBER / TIMBERS
 - ACO PRESERVATIVE TREATMENT WITH A RETENTION OF 0.6 LBS./CUFT SHALL BE PROVIDED PER U1-05, TABLE 3.0
 - NO SUBSTITUTIONS OF OTHER TREATMENTS SHALL BE PERMITTED.
- ALL FIELD CUTS SHALL BE FIELD-TREATED WITH PRESERVATIVE TREATMENT IN ACCORDANCE WITH APPLICABLE AWPA STANDARDS AND PROCEDURES.
- ALL STEEL HARDWARE, NAILS AND BOLTS SHALL BE OF SUFFICIENT LENGTH FOR THEIR INTENDED USE. ALL BOLTS SHALL INCLUDE FLAT WASHERS AND HEAVY HEX NUTS.
- ALL STEEL FASTENERS, BOLTS, WASHERS, NUTS, LAG BOLTS, PLATES, ANGLES AND OTHER CONNECTION HARDWARE SHALL BE HOT-DIP GALVANIZED PER ASTM STANDARDS A123 OR A153, WITH 20 OZ. OF ZINC PER SQUARE FOOT, UNLESS OTHERWISE SPECIFIED TO BE STAINLESS STEEL.
- ALL LAG BOLTS SHALL BE INSTALLED USING PILOT AND CLEARANCE HOLES IN CONNECTED TIMBER ELEMENTS IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF NDS SECTION 11.1.3. (G = 0.55)
- ALL NAILS SHALL BE STAINLESS STEEL RINGSHANKED OR SPIRALLY-WOUND NAILS OF SIZES AS SHOWN, OR SUITABLE FOR THE CONNECTED ELEMENTS. DECK PLANKS SHALL BE ATTACHED TO JOISTS USING (3) NAILS AT EACH JOIST FOR 2x6 PLANKS OR (2) NAILS AT EACH JOIST FOR 2x4 PLANKS.
- PREFABRICATED TIMBER CONNECTORS:
 - CONTRACTOR SHALL SUBMIT COMPLETE DATA ON ALL PREFABRICATED TIMBER CONNECTORS FOR REVIEW BY THE ENGINEER. SUBMITTED DATA SHALL INCLUDE LOAD CAPACITIES FOR ALL CONNECTORS.
 - CONNECTOR SIZES AND TYPES SHALL BE AS SHOWN ON THE DESIGN DRAWINGS AND DETAILS.
 - CONNECTORS SHALL BE INSTALLED USING ALL FASTENERS AS RECOMMENDED BY THE MANUFACTURER FOR THE PUBLISHED LOAD CAPACITIES.
 - TWIST STRAPS FOR CONNECTION OF PIER JOISTS TO GIRDERS SHALL BE 14 ga. STAINLESS STEEL, TYPE 304. MANUFACTURER'S STANDARD ELECTRO-GALVANIZED OR HOT-DIP GALVANIZED CONNECTORS WILL NOT BE ACCEPTED.
 - AT CONTRACTOR'S OPTION, AND WITH SPECIFIC APPROVAL OF THE ENGINEER, 1/2" THICK x 1 1/2" WIDE HOT-DIP GALVANIZED STEEL TWIST STRAPS MAY BE SUBSTITUTED FOR PREFABRICATED STAINLESS STEEL STRAPS.
 - STRAPS SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM STANDARD A123.
 - HOT-DIP GALVANIZED TWIST STRAPS SHALL BE SECURED WITH A TOTAL OF (4) 3/8" x 2" LAG BOLTS, (2) INTO EACH WOOD MEMBER. LAG BOLTS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM STANDARD A153.
- BOLTS LOCATED TOWARDS THE WATER SHALL BE RECESSED OR OTHERWISE PROTECTED AND SHALL NOT BE EXPOSED OR EXTEND PAST THE FACES OF THE TIMBER FRAMING TO REDUCE THE POSSIBILITY OF DAMAGE TO BOATS. SEE STRUCTURAL DETAILS FOR RECESSES AND BOLT PROTECTION.

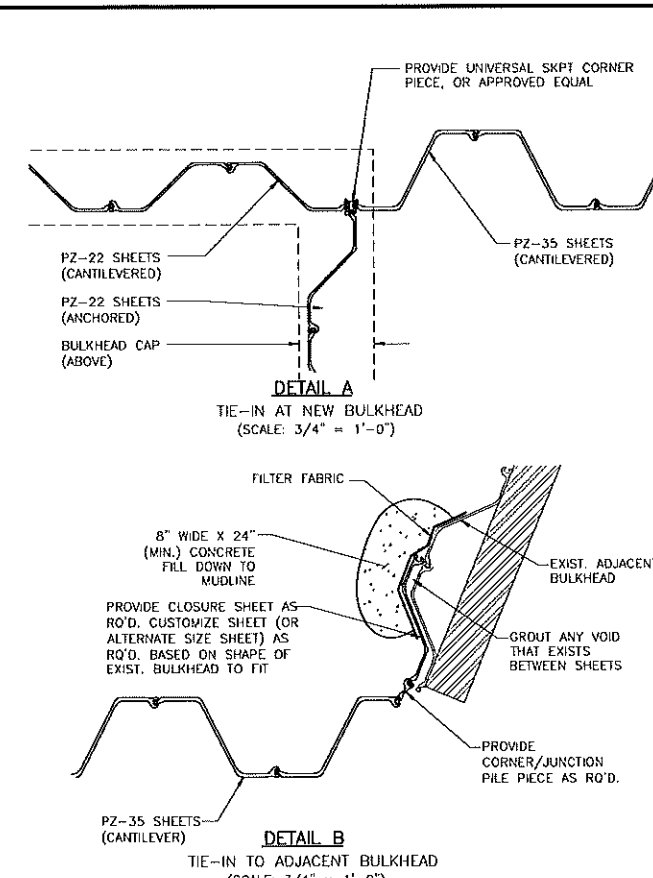
TIMBER PILES:

- TIMBER PILES SHALL BE SOUTHERN YELLOW PINE MATERIAL, IN ACCORDANCE WITH ASTM D25, CLASS B.
- TIMBER PILES SHALL BE AIR-SEASONED PRIOR TO KILN DRYING.
- TIMBER PILES SHALL BE PRESERVATIVE TREATED IN ACCORDANCE WITH AWPA STANDARD U1-05, AS FOLLOWS:
 - AWPA USE CATEGORY: UC5B (SALT WATER EXPOSURE)
 - COMMODITY (U1-05, TABLE 3-1): PILES, ROUND
 - TREATMENT CHEMICAL: CCA
 - MINIMUM RETENTION: 2.5 PCF (TABLE 3.0)
 - TREATMENT WITH CCA SHALL INCLUDE POST-TREATMENT FIXATION PROCESS.
- TIMBER PILES SHALL HAVE MINIMUM TIP DIAMETER OF 8" AND BUTT DIAMETER OF 12" IN ALL LOCATIONS UNLESS OTHERWISE NOTED.
- LENGTH OF PILES SHALL BE AS REQUIRED TO ATTAIN TOP ELEVATIONS AS SHOWN ON THE DRAWINGS. EXPECTED PILE LENGTH IS APPROXIMATELY 30'-0"±.
- TIMBER PILES SHALL HAVE THE FOLLOWING MINIMUM LOAD CAPACITIES:
 - VERTICAL: 2-TON (4000 LBS)
 - LATERAL: 1-TON (2000 LBS)
- TIMBER PILES SHALL BE DRIVEN TO THE DEPTHS REQUIRED TO ACHIEVE THE MINIMUM REQUIRED LOAD CAPACITIES AS NOTED ABOVE. EXPECTED EMBEDMENT BELOW THE MUD LINE IS APPROXIMATELY 14 FT.
IF A DRIVING RESISTANCE EQUAL TO OR GREATER THAN 2 TONS IS ENCOUNTERED AT A MINIMUM EMBEDMENT OF 14' BELOW MUD LINE, PILE DRIVING MAY BE STOPPED.
- FOR DRIVING RESISTANCE DETERMINATION, THE "ENGINEERING NEWS FORMULA" SHALL BE USED. DYNAMIC PILE ANALYSIS MAY BE USED IN LIEU OF PILE LOAD TEST.
- ALL PILES SHALL BE DRIVEN BY AN APPROVED GRAVITY, STEAM, OR DIESEL HAMMER. PILE DRIVING HAMMER SHALL HAVE RATED ENERGY OF 15,000 FOOT-POUNDS PER BLOW (MINIMUM). JETTING OF PILES IS NOT PERMITTED. IF EXTREMELY HARD DRIVING MATERIALS EXIST AND CONDITIONS PERSIST, CONTRACTOR SHALL CONTACT THE ENGINEER TO DETERMINE POSSIBLE LIMITED USE OF JETTING.
- APPROPRIATE PILE CUSHIONING SHALL BE PROVIDED DURING PILE DRIVING, IN ACCORDANCE WITH THE PILE SUPPLIER'S RECOMMENDATIONS, AND AS APPROVED BY THE ENGINEER.
- PILES SHALL BE DRIVEN VERTICALLY (PLUMB), CONTRACTOR SHALL USE PILING GUIDE AS NECESSARY TO ENSURE PILING IS INSTALLED PLUMB.
- TOLERANCE FOR PILE SETTING AND HORIZONTAL LOCATION SHALL BE ±2" IN ANY DIRECTION. TOLERANCE FOR PLUMBNESS OF PILES SHALL BE 1" PER 10' OF PILE LENGTH.

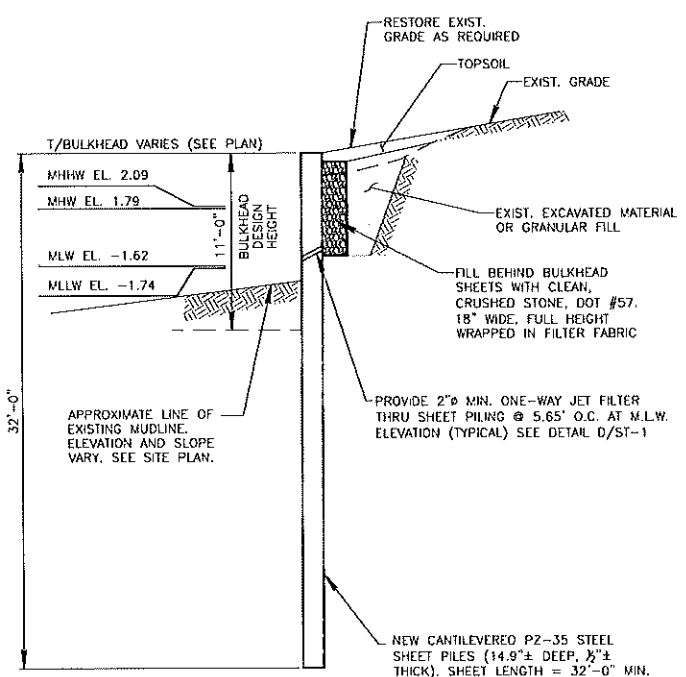
DESIGN LOADS --

- LIVE LOADS: (NUCC 1607.1, ITEM #40)
 - MAIN PIER RECONSTRUCTION & RAMP WALKWAYS, PEDESTRIAN LOAD = 60 PSF
 - SNOW LOAD
GROUND SNOW LOAD, PG: 20 PSF
EXPOSURE CATEGORY: C
EXPOSURE FACTOR, CE: 0.9
THERMAL FACTOR, CT: 1.2
IMPORTANCE FACTOR: 1.0
- DEAD LOADS:
 - PIERS & WALKWAYS:
 - NOMINAL THICKNESS COMPOSITE DECK = 7 PSF ± (ALLOWANCE FOR POSSIBLE FUTURE USE OF COMPOSITE DECK - ACTUAL 2X TIMBER DECK = 4 PSF ±)
 - PLUS ACTUAL FRAMING WEIGHT @ 35 PCF ±, TYPICAL
- LATERAL LOADS:
 - WIND LOAD (NUCC 1609/ASCE 7-10 CHAPTER 6)
 - BASIC WIND SPEED, V3 (FIG 1609) = 115 MPH
 - EXPOSURE = C
 - IMPORTANCE FACTOR, Iw = 1.00
 - GUST FACTOR, G = 0.85
 - SEISMIC LOAD (NUCC 1613/ASCE 7-10 CHAPTERS 11 & 12)
 - OCCUPANCY CATEGORY/USE GROUP = II
 - SITE CLASS = "D"
 - IMPORTANCE FACTOR, Ie = 1.00
 - Ss = 30%
 - S1 = 6%
 - SEISMIC DESIGN CATEGORY = "B"
 - ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE
 - BASIC SEISMIC FORCE RESISTING SYSTEM: ASCE 7-05, TABLE 12.2-1, ITEM #G.7, "TIMBER INVERTED PENDULUM STRUCTURES", R = 1.50
 - RESULTING LATERAL FORCE COEFFICIENT = 0.208 x W, WHERE "W" INCLUDES DEAD LOAD ONLY, PER 12.7.2
- DESIGN LOAD COMBINATIONS:
 - LOAD COMBINATIONS ARE IN ACCORDANCE WITH NUCC 1605.3 AND ASCE 7-10 2.4.1

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RICHARD C. MALONEY NEW JERSEY PROFESSIONAL ENGINEER - LICENSE NUMBER GE09013			
CONSTRUCTION PLANS FOR BULKHEAD REPLACEMENT GRANGE AVENUE & HANCE ROAD POCKET PARKS & BATTIN ROAD BOAT RAMP BOROUGH OF FAIR HAVEN MONMOUTH COUNTY NEW JERSEY			
RED BANK OFFICE Corporate Headquarters 331 Newnam Springs Road Suite 201 Red Bank, NJ 07701 Phone: 732.383.1950 Fax: 732.383.1984			
SCALE	DATE	DRAWN BY	CHECKED BY
AS SHOWN	4/22/19	TDK	RCM
PROJECT NUMBER	DRAWING NAME		
170549 EIR	C-CYR		
SHEET TITLE			
STRUCTURAL NOTES			
SHEET NUMBER			
T-3			



SCALE: 1" = 10'

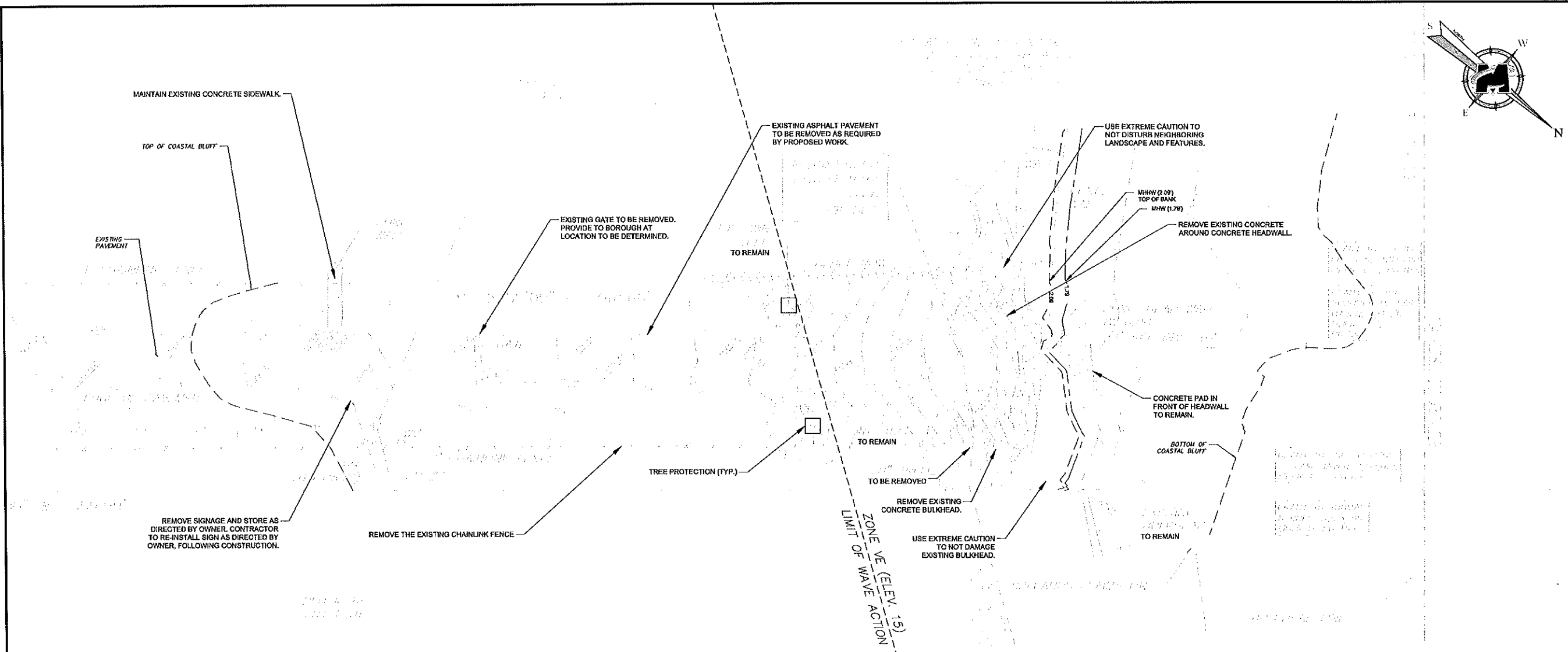


SECTION 2
TYPICAL CANTILEVERED BULKHEAD SECTION AT GRANGE AVENUE
(SCALE: 3/16" = 1'-0")

TIDAL RANGE		
	NAVD	MLW
MHHW	2.09'	3.71'
MHW	1.79'	3.41'
MTL	0.9'	1.71'
NAVD88	0.00'	1.62'
MLW	-1.62'	0.00'
MLLW	-1.74'	-0.12'

NOTES:
1. NO BULKHEAD CAP THIS SECTION.
2. RECOAT TOP 6" MINIMUM OF STEEL SHEET
AFTER DRIVING (REFERENCE STRUCTURAL NOTES).

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1	FINAL PLAN SUBMITTAL	07/23/19	1
2	REVISED PER AGENCY & NJOCC COMMENTS	01/07/20	2
3	ISSUED TO BID	05/07/20	3
			
RICHARD C. MALONEY NEW JERSEY PROFESSIONAL ENGINEER - LICENSE NUMBER: GE39031			
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		RED BANK OFFICE Corporate Headquarters 2311 Newmans Spring Road Suite 203 Red Bank, NJ 07701 Phone: 732.351.1510 Fax: 732.351.1904	
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PROJECT NUMBER	DRAWING NAME		
1700419215	B-BULK-G-ING		
SHEET TITLE BULKHEAD PLAN GRANGE AVENUE			
SHEET NUMBER S-1.3			



HANCE ROAD EXISTING CONDITIONS & DEMOLITION PLAN

SCALE: 1" = 10'

GENERAL NOTES

1. THE ENTIRE SITE IS WITHIN 300' RIPARIAN ZONE.
2. HORIZONTAL DATUM BASED UPON THE NEW JERSEY STATE PLANE COORDINATED SYSTEM, NAD 83 (NEAR SURFACE DERIVED COORDINATES UTILIZING KEYNET GPS).
3. EXISTING SITE TOPOGRAPHIC INFORMATION AS SHOWN HEREON IS BASED UPON NAVD 88 (NORTH AMERICAN VERTICAL DATUM OF 1988).
4. TIDAL INFORMATION OBTAINED FROM NOAA OCEANIC, NAVESINK RIVER, NJ, STATION ID 8531753.
5. AS, VE, AND WAVE ACTION ZONES ARE BASED ON PRELIMINARY FEMA FLOOD INSURANCE RATE MAP REVISED JANUARY 30, 2015, MAP NUMBER 16035C0181G.
6. ALL AREAS THAT ARE NOT DESIGNATED FOR REMOVAL SHALL BE MAINTAINED IN PRE-CONSTRUCTION CONDITION.
7. THE LOCATION OF ALL UNDERGROUND UTILITIES AS SHOWN HEREON ARE APPROXIMATE AND ARE BASED ON VISIBLE SURFACE STRUCTURES AND ANY UTILITY MAPS PROVIDED BY UTILITY COMPANIES REFERENCED HEREON. NO EXCAVATIONS WERE MADE DURING THE PROCESS OF THIS SURVEY TO LOCATE BURIED UTILITIES/STRUCTURES. ADDITIONAL BURIED UTILITIES/STRUCTURES MAY BE ENCOUNTERED. THE CONTRACTOR SHALL HAVE ALL UNDERGROUND UTILITIES FIELD-VERIFIED BY THE PROPER UTILITY COMPANIES BEFORE ANY CONSTRUCTION BEGINS.
8. MEAN LOW WATER LINE AND MEAN LOWER LOW WATER LINE ARE OUTSIDE THE LIMITS OF THIS PROJECT.

DEMOLITION NOTES

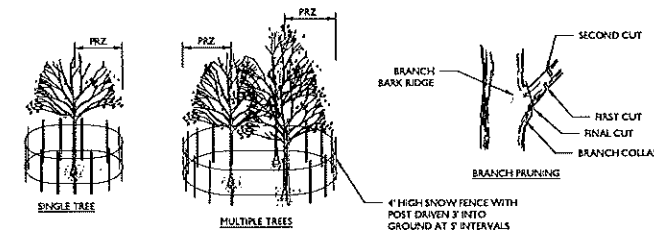
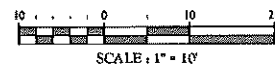
1. BULKHEAD REMOVAL SHALL INCLUDE ALL BULKHEAD MATERIALS. FULL DEPTH OF BULKHEAD SHALL BE REMOVED. IT IS CONTRACTOR'S RESPONSIBILITY TO STABILIZE UPWARD SLOPE DURING CONSTRUCTION.
2. STONE WALL AND BULKHEAD REMOVAL SHALL ALSO INCLUDE ALL FILL AND OTHER DEBRIS THAT HAS COLLAPSED AND WHICH NEEDS TO BE REMOVED TO ALLOW PROPER CONSTRUCTION OF NEW UNIFORM AND STRAIGHT BULKHEAD.
3. ALL AREAS THAT ARE NOT DESIGNATED FOR REMOVAL, OR ARE LISTED TO REMAIN, SHALL BE MAINTAINED IN PRE-CONSTRUCTION CONDITIONS. CONTRACTOR SHALL SUBMIT PHOTOS AND VIDEO OF ENTIRE PROJECT AREA AND SURROUNDING AREA. ANY DAMAGE SHALL BE REPAIRED AT NO COST TO OWNER.
4. ALL VEGETATION AND TREES NOT DESIGNATED FOR REMOVAL SHALL BE PROTECTED PER INCLUDED DETAILS.
5. ALL COSTS FOR DEMOLITION SHALL BE INCLUDED IN BO PAY ITEM "CLEARING SITE".

TIDAL RANGE

	NAVD	MLW
MHHW	2.09'	3.71'
MHW	1.79'	3.41'
MTL	0.9'	1.71'
NAVD88	0.00'	1.62'
MLW	-1.62'	0.00'
MLLW	-1.74'	-0.12'

LEGEND

MEAN HIGHER HIGH WATER LINE ————
 MEAN HIGH WATER LINE ————
 MEAN LOW WATER LINE ————
 MEAN LOWER LOW WATER LINE ————
 PROPERTY/GRANT BOUNDARY LINE ————



NOTES

1. PROTECTIVE FENCING IS TO BE ERECTED PRIOR TO CONSTRUCTION AND MAINTAINED DURING CONSTRUCTION AS DIRECTED BY THE LANDSCAPE ARCHITECT, SOIL CONSERVATION DISTRICT AND/OR MUNICIPAL ENGINEER.
2. NO CONSTRUCTION ACTIVITY IS PERMITTED WITHIN THE PROTECTIVE FENCING.
3. AS CONSTRUCTION NEARS COMPLETION THE FENCING WILL BE REMOVED AS DIRECTED.
4. AT THE COMPLETION OF CONSTRUCTION, ALL TREES WILL BE PRUNED AS NECESSARY TO CORRECT ANY DAMAGE RESULTING FROM CONSTRUCTION ACTIVITY.
5. GENERAL MECHANICAL DAMAGE - SEE CRITICAL ROOT ZONE CALCULATION (CRZ) FOR CORRECT PLACEMENT OF TREE PROTECTION.
6. BOX TREES WITHIN 25 FEET OF A BUILDING SITE TO PREVENT MECHANICAL INJURY, FENCING OR OTHER BARRIER SHOULD BE INSTALLED BEYOND THE CRITICAL ROOT ZONE.
7. BOARDS WILL NOT BE NAILED TO TREES DURING BUILDING OPERATIONS.
8. FEEDER ROOTS SHOULD NOT BE CUT IN AN AREA INSIDE THE PROTECTED ROOT ZONE (PRZ) OR CRITICAL ROOT ZONE (CRZ). TREE ROOT SYSTEM COMMONLY EXTENDS BEYOND THE DRY LINE.
9. DAMAGED TRUNKS OR EXPOSED ROOTS SHOULD HAVE DAMAGED BARK REMOVED IMMEDIATELY AND NO PAINT SHALL BE APPLIED. EXPOSED ROOTS SHOULD BE COVERED WITH TOPSOIL IMMEDIATELY AFTER EXCAVATION IS COMPLETE. ROOTS SHALL BE PRUNED TO GIVE A CLEAN, SHARP SURFACE AMENABLE TO HEALING. ROOTS EXPOSED DURING HOT WEATHER SHOULD BE RIGIDATED TO PREVENT PERMANENT TREE INJURY. CARE FOR SERIOUS INJURY SHOULD BE PRESCRIBED BY A PROFESSIONAL FORESTER OR CERTIFIED TREE EXPERT.
10. TREE LIMB REMOVAL WHERE NECESSARY, WILL BE DONE AS NATURAL TARGET PRUNING TO REMOVE THE DESIRED BRANCH COLLAR. THERE SHOULD BE NO FLUSH CUTS. FLUSH CUTS DESTROY A MAJOR DEFENSE SYSTEM OF THE TREE. NO TREE PAINT SHALL BE APPLIED. ALL CUTS SHALL BE MADE AT THE OUTSIDE EDGE OF THE BRANCH COLLAR. CUTS MADE TOO FAR BEYOND THE BRANCH COLLAR MAY LEAD TO EXCESS SPROUTING, CRACKS AND ROT. REMOVAL OF A "V" CROTCH SHOULD BE CONSIDERED FOR FREE STANDING SPECIMEN TREES TO AVOID FUTURE SPLITTING DAMAGE.
11. CRITICAL ROOT ZONE (CRZ) OR PROTECTED ROOT ZONE (PRZ) CALCULATION:
 MEASURE DBH OF TREE (DIAMETER OF TREE IN BREAST HEIGHT OR 4.5' ABOVE GROUND ON THE UPWIND SIDE) IN INCHES.
 CRZ OR PRZ = DBH TIMES 1.5 (FOR OLD/UNHEALTHY/SENSITIVE TREES) OR DBH X 1.0 (FOR YOUNG/HEALTHY/TOLERANT TREES). EXPRESS IN FEET.

TEMPORARY TREE PROTECTION DETAIL

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REV	DATE	DESCRIPTION	DRAWN BY	DATE	DESCRIPTION	DRAWN BY
1	01/17/20	ISSUED FOR PERMIT	TK	01/17/20	ISSUED FOR PERMIT	TK
2	01/17/20	ISSUED FOR PERMIT	TK	01/17/20	ISSUED FOR PERMIT	TK
3	01/17/20	ISSUED FOR PERMIT	TK	01/17/20	ISSUED FOR PERMIT	TK

Richard C. Maloney
RICHARD C. MALONEY
 NEW JERSEY PROFESSIONAL
 ENGINEER - LICENSE NUMBER: GE09023

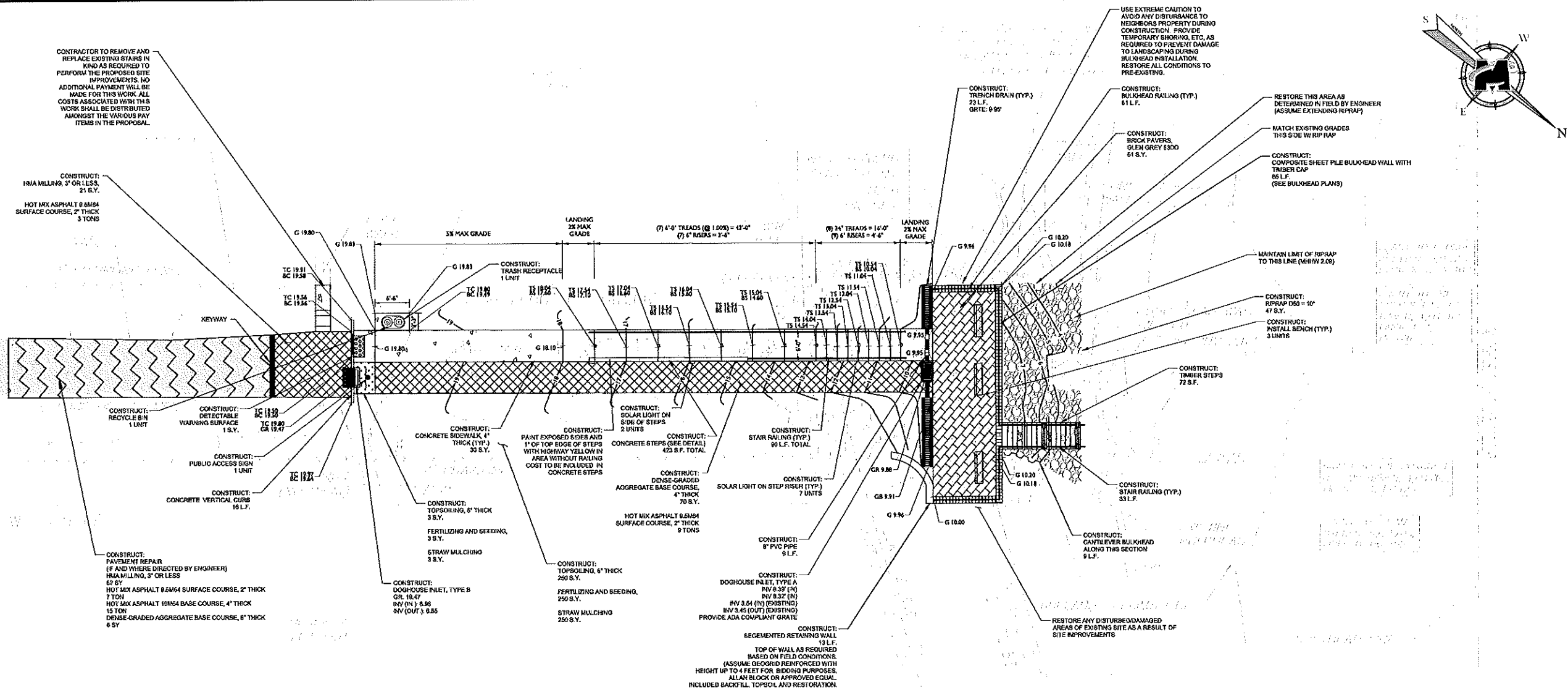
CONSTRUCTION PLANS
 FOR
**BULKHEAD
 REPLACEMENT
 GRANGE AVENUE &
 HANCE ROAD
 POCKET PARKS &
 BATTIN ROAD BOAT
 RAMP**
 BOROUGH OF FAIR HAVEN
 MONMOUTH COUNTY
 NEW JERSEY

RED BANK OFFICE
 Corporate Headquarters
 331 Newman Springs Road
 Suite 200
 Red Bank, NJ 07701
 Phone: 732.383.1950
 Fax: 732.383.1964

SCALE	DATE	DRAWN BY	CHECKED BY
AS SHOWN	02/18	TK	TK

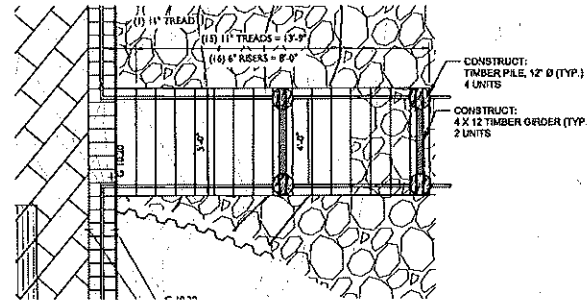
PROJECT NO.: 17001812
 DRAWING NAME: C-DEM
 SHEET TITLE: **HANCE ROAD
 EXISTING CONDITIONS &
 DEMOLITION PLAN**

MATCH LINE THIS SHEET



SITE & GRADING PLAN HANCE ROAD SCALE: 1" = 10'

- NOTES:**
1. THE ENTIRE SITE IS WITHIN 300' RAMPAN ZONE.
 2. HORIZONTAL DATUM BASED UPON THE NEW JERSEY STATE PLANE COORDINATE SYSTEM, NAD 83 (NEAR SURFACE DERIVED COORDINATES UTILIZING KEYNET GPS).
 3. EXISTING SITE TOPOGRAPHIC INFORMATION AS SHOWN HEREON IS BASED UPON NAVD 83 (NORTH AMERICAN VERTICAL DATUM OF 1983).
 4. TIDAL INFORMATION OBTAINED FROM NOAA OCEANIC, HAVEN/IN RIVER, NJ, STATION ID 8511233.
 5. AE, VE, AND WAVE ACTION ZONES ARE BASED ON PRELIMINARY FEMA FLOOD INSURANCE RATE MAP REVISED JANUARY 30, 2015, MAP NUMBER 34035C0181G.
 6. ALL AREAS THAT ARE NOT DESIGNATED FOR REMOVAL SHALL BE MAINTAINED IN PRE-CONSTRUCTION CONDITION.
 7. THE LOCATION OF ALL UNDERGROUND UTILITIES AS SHOWN HEREON ARE APPROXIMATE AND ARE BASED ON VISIBLE SURFACE STRUCTURES AND ANY UTILITY MAPS PROVIDED BY UTILITY COMPANIES REFERENCED HEREON. NO EXCAVATIONS WERE MADE DURING THE PROGRESS OF THIS SURVEY TO LOCATE BURIED UTILITIES/STRUCTURES. ADDITIONAL BURIED UTILITIES/STRUCTURES MAY BE ENCOUNTERED. THE CONTRACTOR SHALL HAVE ALL UNDERGROUND UTILITIES FIELD-VERIFIED BY THE PROPER UTILITY COMPANIES BEFORE ANY CONSTRUCTION BEGINS.
 8. MEAN LOW WATER LINE AND MEAN LOWER LOW WATER LINE ARE OUTSIDE THE LIMITS OF THIS PROJECT.



TIMBER STEP INSET SCALE: 1" = 4'

LEGEND

EXISTING

TRANSVERSE LINE, CENTER LINE
OR BASELINE (AS WELL AS SUCH)

PROPOSED

12+00 13+00

12+00 13+00

RIGHT OF WAY LINE

PROPERTY LINE

EDGE OF PAVEMENT

CURB

DEPRESSED CURB

SIDEWALK

FENCES

TREELINE

ROADWAY SIGNS

WETLAND LINE

MUNICIPAL BOUNDARY LINE

8" INLET

12" INLET

STORM MANHOLE

SANITARY MANHOLE

FLARED END SECTION

HEADWALL

HYDRANT

POLE MOUNTED LIGHT

CONTOURS

SPOT ELEVATION

DIRECTION OF OVERLAND FLOW

TOP OF CURB ELEVATION

BOTTOM OF CURB ELEVATION

TOP OF DEPRESSED CURB ELEVATION

MEAN HIGHER HIGH WATER LINE

MEAN HIGH WATER LINE

MEAN LOW WATER LINE

MEAN LOWER LOW WATER LINE

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DATE	DESCRIPTION
10/1/2023	FINAL PLAN SUBMITTAL
9/1/2023	REVISED PER BOROUGH & NJOCC COMMENTS
8/1/2023	REVISED TO BD

RICHARD C. MALONEY
NEW JERSEY PROFESSIONAL
ENGINEER - LICENSE NUMBER: GE0023

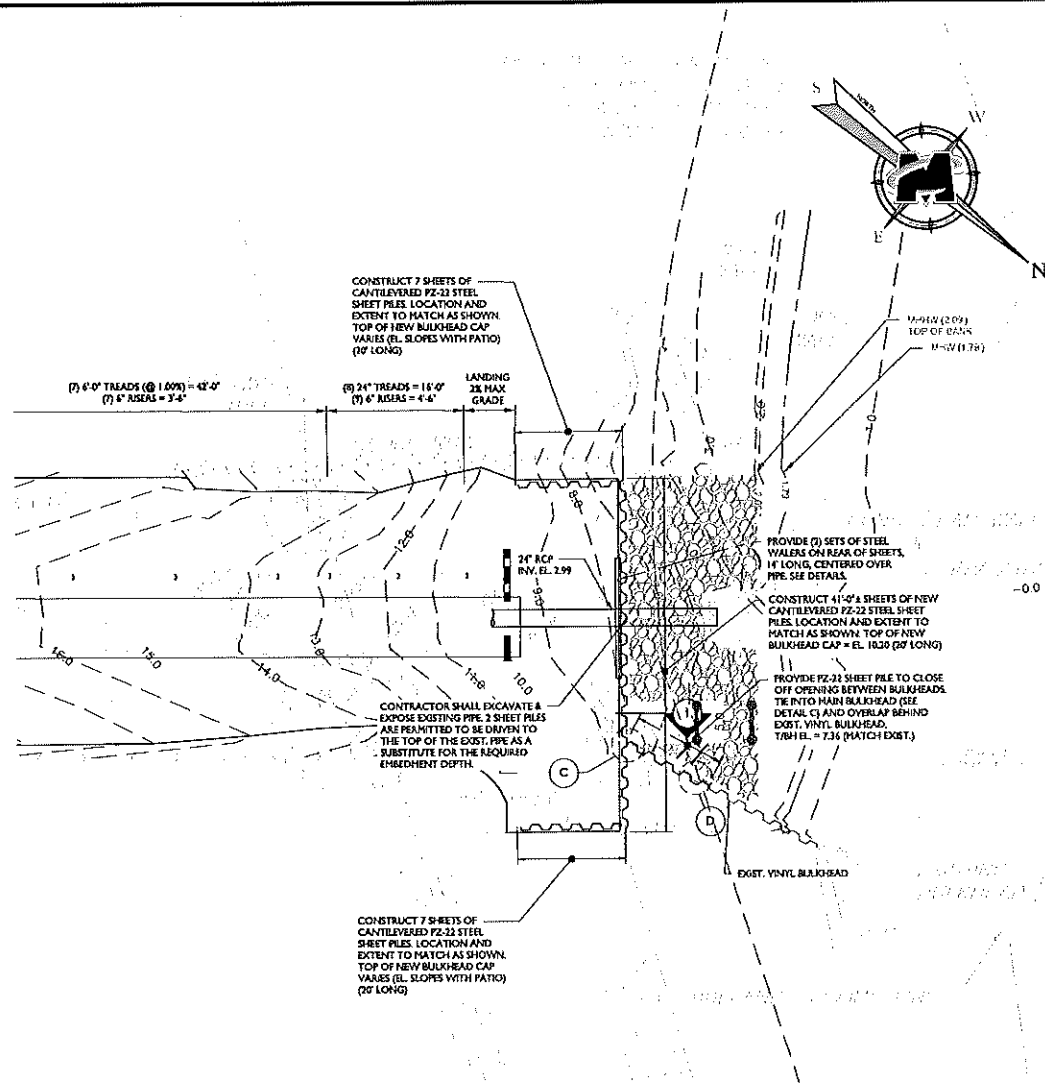
**CONSTRUCTION PLANS
FOR
BULKHEAD
REPLACEMENT
GRANGE AVENUE &
HANCE ROAD
POCKET PARKS &
BATTIN ROAD BOAT
RAMP
BOROUGH OF FAIR HAVEN
MONMOUTH COUNTY
NEW JERSEY**

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Red Bank, NJ 07701
Phone: 732.383.1950
Fax: 732.383.1984

DATE	10/1/2023	DRAWN BY	TK	CHECKED BY	ACH
AS SHOWN	6/20/23	DATE	10/1/2023	PROJECT NUMBER	1700619028
PROJECT NUMBER		DRAWING NAME		CL-INT-HANCE-CEP-3	

SHEET TITLE
**SITE & GRADING PLAN
HANCE ROAD**

SHEET NO.
S-2.2

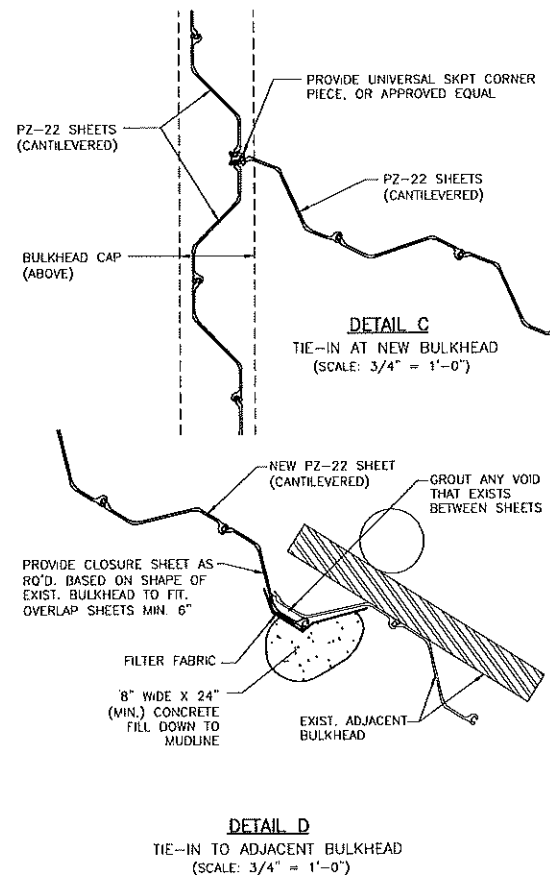


BULKHEAD PLAN **HANCE ROAD** **SCALE: 1" = 10'**

NOTES

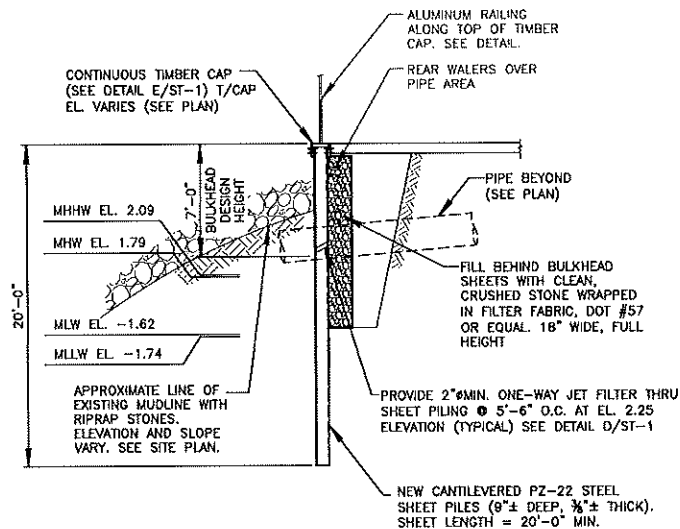
- STEEL SHEET PILING SHALL BE AS SHOWN ON PLANS. ALL STEEL SHEET PILING SHALL BE ASTM A572 GRADE 50 STEEL (MINIMUM).
A. CONTRACTOR SHALL USE A DRIVING TEMPLATE FOR DRIVING STEEL SHEET PILING.
B. DRIVING OF PILES IN PAIRS IS RECOMMENDED TO FACILITATE DRIVING AND HELP MAINTAIN VERTICALITY OF PILES.
C. PILING SHOULD BE DRIVEN WITH THE BALL END (IF ANY) LEADING WHEN POSSIBLE, TO AVOID CLOGGING OF SOCKET END DURING DRIVING. WHEN CONDITIONS REQUIRE THAT SOCKET END LEAD, OR IF SPECIFIED SECTION DOES NOT INCLUDE BALL END, A BOLT OR SIMILAR OBJECT SHOULD BE PLACED IN BOTTOM OF SOCKET TO MINIMIZE CLOGGING.
D. PROVIDE CORNER PILES IN BULKHEAD AS REQUIRED.
- ALL STEEL ELEMENTS OF THE BULKHEAD SYSTEM SHALL BE COATED FOR PROTECTION AS FOLLOWS:
A. STEEL SHEET PILES SHALL RECEIVE A THREE-COAT SYSTEM CONSISTING OF A TWO COAT FIRST COAT OF AMERCOAT 140 BY PPG (MIN. 10-12 mil PER COAT) AND A THIRD COAT OF AMERCOAT 439H BY PPG OR APPROVED EQUAL COLOR PER OWNER. ALL COATS SHALL BE THE SAME COLOR. COAL-TAR EPOXY MAY NOT BE SUBSTITUTED.
B. REMAINDER OF STEEL ELEMENTS, INCLUDING (BUT NOT LIMITED TO) HARDWARE, SHALL RECEIVE A COAL-TAR EPOXY COATING OF 16 MILS MINIMUM DFT.
C. SURFACE PREPARATION, APPLICATION OF COATINGS, AND CURING SHALL BE IN STRICT ACCORDANCE WITH THE COATING MANUFACTURER'S WRITTEN INSTRUCTIONS AND RECOMMENDATIONS.
D. THREADED PARTS SHALL BE HOT-DIP GALVANIZED IN SHOP AND FIELD-COATED WITH COAL-TAR EPOXY AFTER INSTALLATION AND FINAL ADJUSTMENT.
- ALL NEW FILL, BACKFILL, & DISTURBED SOIL SHALL BE COMPACTED IN 8\"/>

TIDAL RANGE		
	NAVD	MLW
MHHW	2.09'	3.71'
MHW	1.79'	3.41'
MTL	0.9'	1.71'
NAVD88	0.00'	1.62'
MLW	-1.62'	0.00'
MLLW	-1.74'	-0.12'



DETAIL D
TIE-IN TO ADJACENT BULKHEAD
(SCALE: 3/4" = 1'-0")

NOTE:
TIE IN/CLOSURE DETAIL IS SCHEMATIC BASED ON VISIBLE FIELD CONDITIONS. CONTRACTOR TO FIELD MEASURE AFTER DEMOLITION AND PROVIDE TO SCALE SHOP DRAWINGS OF ACTUAL DIMENSIONS OF EXISTING AND PROPOSED MATERIALS FOR APPROVAL BY THE ENGINEER. CONTRACTOR COSTS TO INCLUDE ALL REQUIRED ITEMS TO PROVIDE A TIGHT FIT.



SECTION 1
TYPICAL CANTILEVERED BULKHEAD SECTION AT HANCE ROAD
(SCALE: 3/16" = 1'-0")



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2	08/12/15	ISSUED TO BID	TEC					
3								
4								
5								
6								
7								
8								
9								
10								

Richard C. Maloney
RICHARD C. MALONEY
NEW JERSEY PROFESSIONAL
ENGINEER - LICENSE NUMBER: GE18023

CONSTRUCTION PLANS
FOR
**BULKHEAD
REPLACEMENT
GRANGE AVENUE &
HANCE ROAD
POCKET PARKS &
BATTIN ROAD BOAT
RAMP**
BOROUGH OF FAIR HAVEN
MONMOUTH COUNTY
NEW JERSEY

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SCALE	DATE	DRAWN BY	CHECKED BY
AS SHOWN	08/12/15	TEC	RCH

PROJECT NUMBER	DRAWING NAME
170041013	BULKHEAD

SHEET TITLE
BULKHEAD PLAN HANCE ROAD

SHEET NUMBER
S-2.3

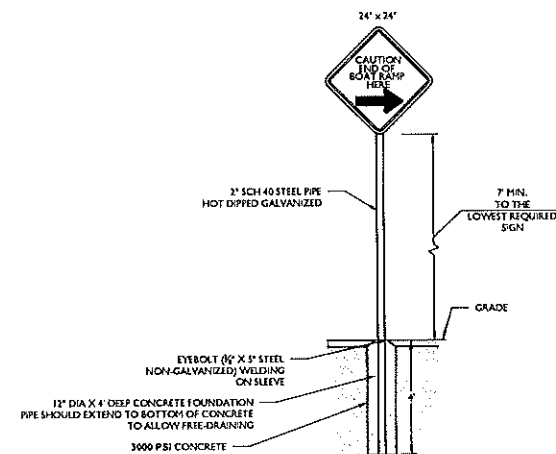
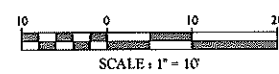
[illegible]
RICHARD C. MALONEY
 NEW JERSEY PROFESSIONAL
 ENGINEER - LICENSE NUMBER: GE39023

NOTES:

1. ALL UPLAND PROJECT ACTIVITIES WITHIN 300' RIPARIAN ZONE.
2. ALL EXISTING TOPOGRAPHIC INFORMATION SHOWN REFERS TO NAD 1983/1993 DATUMS.
3. TIDAL INFORMATION OBTAINED FROM NOAA CIRCULAR, NAVY/US NAVY RIVER, NJ, STATION ID 831751.
4. AE, VE, AND WAVE ACTION ZONES ARE BASED ON PRELIMINARY FEMA FLOOD INSURANCE RATE MAP REVISED SEPTEMBER 13, 2009, MAP NUMBER 34021C01B1F.
5. THE SITE IS LOCATED IN THE AE FLOOD ZONE EL. 9'.

BATTIN ROAD BOAT RAMP SITE AND GRADING PLAN

SCALE: 1" = 10"



CAUTION SIGN DETAIL
NOT TO SCALE

LEGEND

EXISTING		PROPOSED
8' 12.40' 0' 13.40'	TRAVERSE LINE, CENTER LINE OR BASELINE (LABEL AS SUCH)	12.00' 13.00'
	RIGHT OF WAY LINE	
	PROPERTY LINE	
	EDGE OF PAVEMENT	
FACE C/C	CURB	FACE BACK
	DEPRESSED CURB	
	SIDEWALK	
X X	FENCES	X X
	TREE LINE	
	ROADWAY SIGNS	
	WETLAND LINE	
	MUNICIPAL BOUNDARY LINE	
(D)	"INLET	(D)
(S)	STORM MAN-HOLE	(S)
(S)	SANITARY MAN-HOLE	(S)
	FLARED END SECTION	
HEADWALL	HEADWALL	
HYDRANT	HYDRANT	
FOLE MOUNT LIGHT	FOLE MOUNT LIGHT	
75	CONTOURS	75
X G 2.0	SPOT ELEVATION	X G 3.0
	DIRECTION OF OVERLAND FLOW	—>—
X TC 2.0	TOP OF CURB ELEVATION	X TC 2.0
X BC 2.0	BOTTOM OF CURB ELEVATION	X BC 2.0
	TOP OF DEPRESSED CURB ELEVATION	X TDC 2.0
	MEAN HIGHER HIGH WATER LINE	
	MEAN LOW WATER LINE	
	MEAN LOWER LOW WATER LINE	

**CONSTRUCTION PLANS
FOR
BULKHEAD
REPLACEMENT
GRANGE AVENUE &
HANCE ROAD
POCKET PARKS &
BATTIN ROAD BOAT
RAMP
BOROUGH OF FAIR HAVEN
MONMOUTH COUNTY
NEW JERSEY**



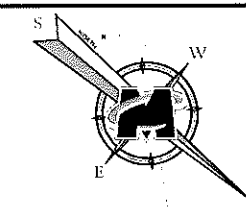
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Fax: 732.383.1984

SCALE AS SHOWN	DATE 4/22/15	DRAWN BY TEC	CHECKED BY RCH
PROJECT NUMBER 170041725		DRAWING NAME C-LAYT-BATT	

SHEET TITLE

**SITE & GRADING PLAN:
BATTIN ROAD**

S-3.2



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Myrtle Beach, SC	Sebring, FL
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3	01/20/11	REVISED TO BID

Richard C. Maloney
RICHARD C. MALONEY
NEW JERSEY PROFESSIONAL
ENGINEER - LICENSE NUMBER: 0E39013

CONSTRUCTION PLANS
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REPLACEMENT
GRANGE AVENUE &
HANCE ROAD
POCKET PARKS &
BATTIN ROAD BOAT
RAMP**
BOROUGH OF FAIR HAVEN
MONMOUTH COUNTY
NEW JERSEY

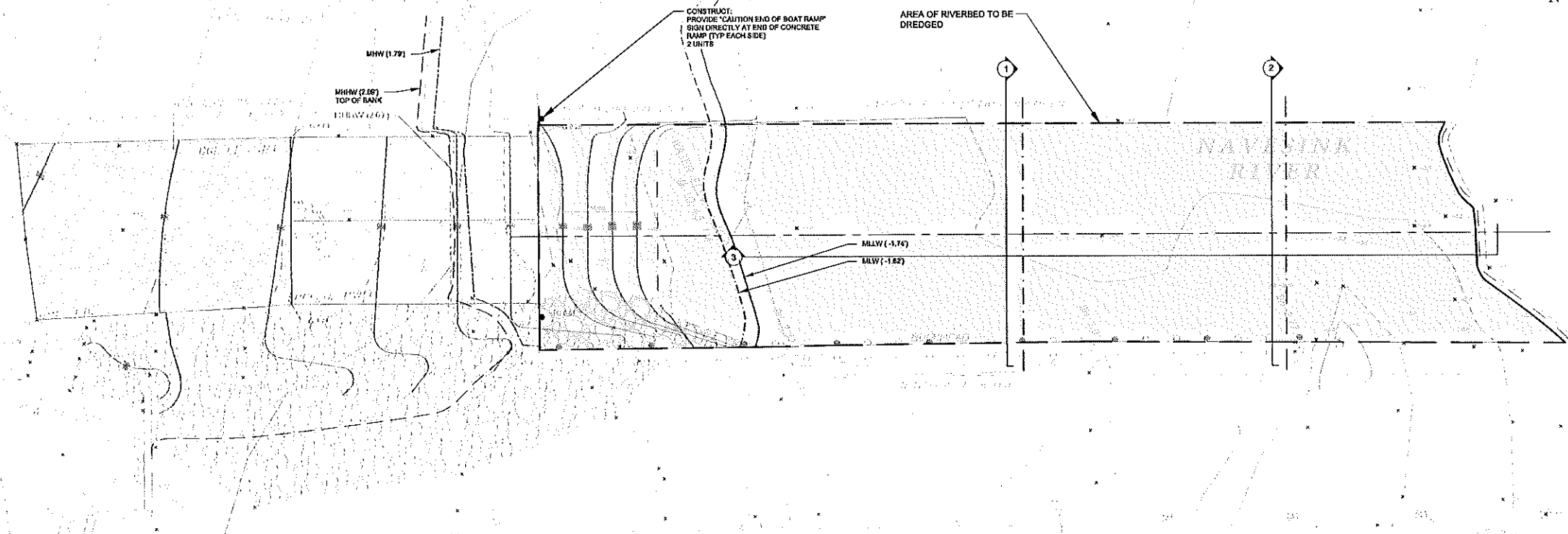
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SCALE	DATE	DRAWN BY	CHECKED BY
AS SHOWN	05/11	TEK	KCH

PROJECT NUMBER: 170041215
DRAWING NAME: DREDGE PLAN

**DREDGE PLAN:
BATTIN ROAD**

S-3.3



- NOTES**
1. ALL UPLAND PROJECT ACTIVITIES WITHIN 300' RIPARIAN ZONE.
 2. ALL EXISTING TOPOGRAPHIC/HYDROGRAPHIC INFORMATION SHOWN REFERS TO NAD 1983/NGVD1988 DATUMS.
 3. TIDAL INFORMATION OBTAINED FROM NOAA OCEANIC, NAVESINK RIVER, NJ, STATION ID 8331753.
 4. AE, VE, AND WAVE ACTION ZONES ARE BASED ON PRELIMINARY FEMA FLOOD INSURANCE RATE MAP REVISED SEPTEMBER 25, 2009, MAP NUMBER 3402SC0181F.
 5. THE SITE IS LOCATED IN THE AE FLOOD ZONE EL. 7'.

TIDAL RANGE		
	NAVD	MLW
MHHW	2.09'	3.71'
MHW	1.79'	3.41'
MTL	0.9'	1.71'
NAVD88	0.00'	1.62'
MLW	-1.62'	0.00'
MLLW	-1.74'	-0.12'

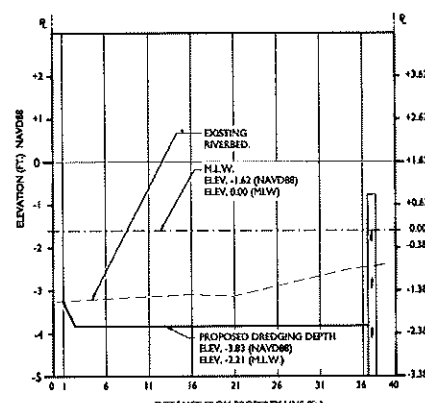
BATTIN ROAD BOAT RAMP DREDGING PLAN

SCALE: 1" = 10'

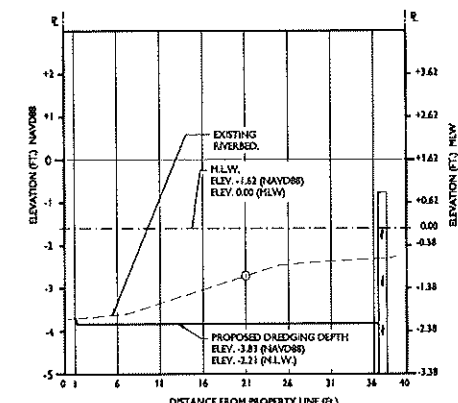
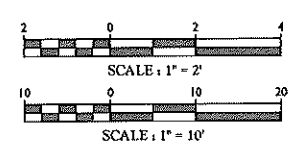


TOTAL DREDGING VOLUME = 300 CY*

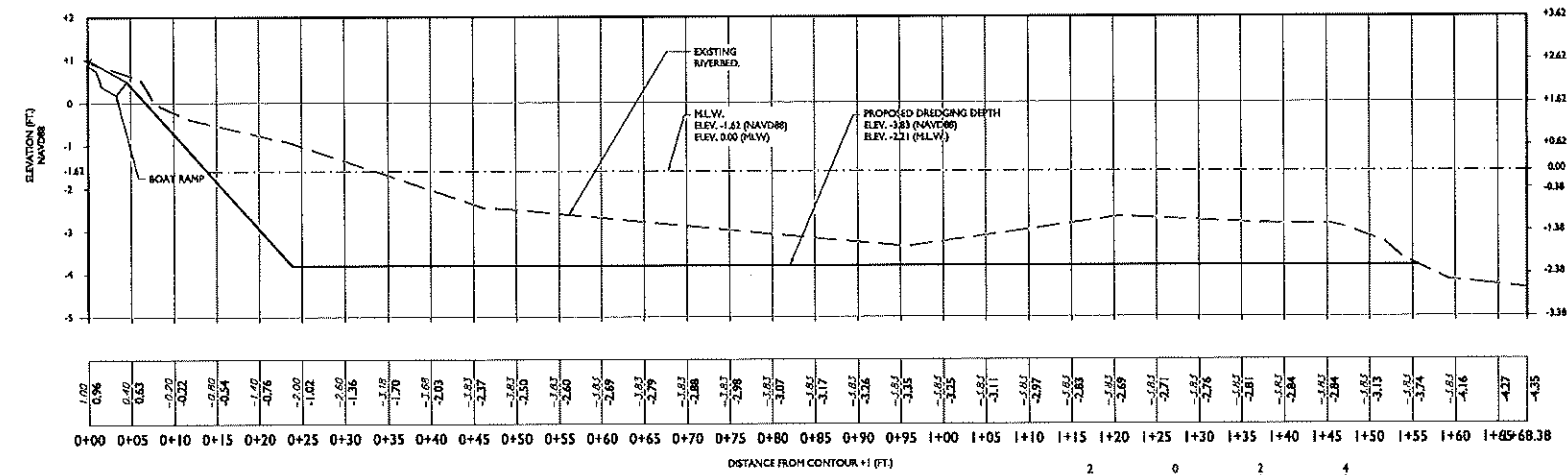
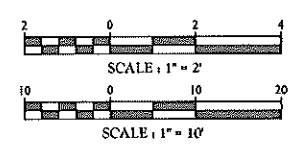
*DREDGE VOLUME BASED ON HYDRO SURVEY WITH CONSIDERATION FOR SEASONAL VARIATION. RIVERBED IN DREDGE AREAS VARIES SEASONALLY. CONTRACTOR SHALL INSPECT AREA PRIOR TO BID TO CONFIRM ACTUAL QUANTITIES AT TIME OF BID. PAYMENT FOR THIS ITEM WILL BE LUMP SUM FOR DREDGING DOWN TO ELEVATION -3.83 AS SHOWN ON PLAN.



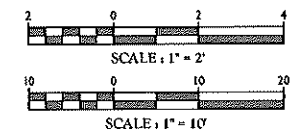
CROSS SECTION 1
HORIZONTAL: 1" = 10'
VERTICAL: 1" = 2'



CROSS SECTION 2
HORIZONTAL: 1" = 10'
VERTICAL: 1" = 2'



LONGITUDINAL SECTION 3
HORIZONTAL: 1" = 10'
VERTICAL: 1" = 2'



REV	DATE	DESCRIPTION
1	08/01/19	ISSUED FOR BIDDING
2	08/01/19	REVISED FOR BIDDING COMMENTS
3	08/01/19	ISSUED TO BID

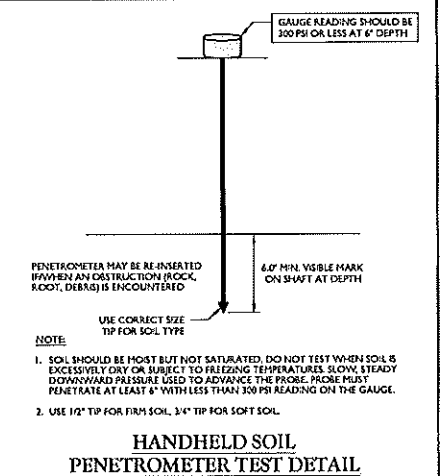
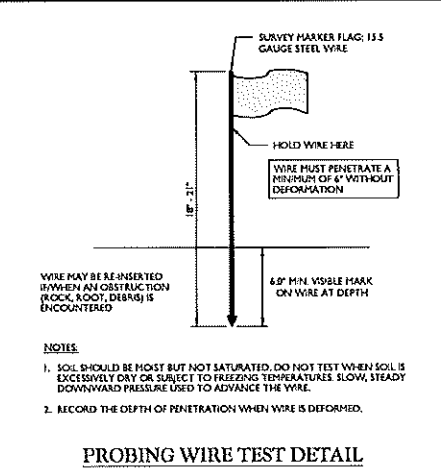
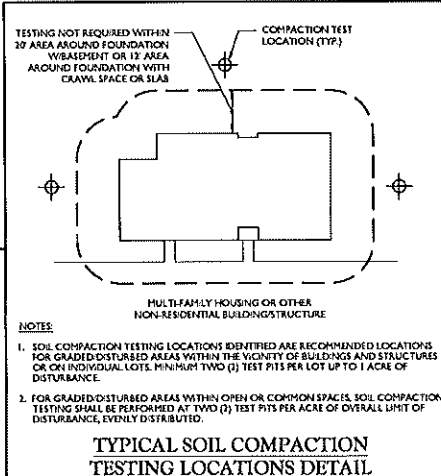
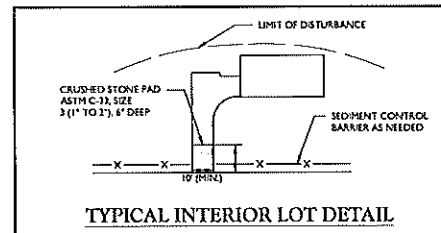
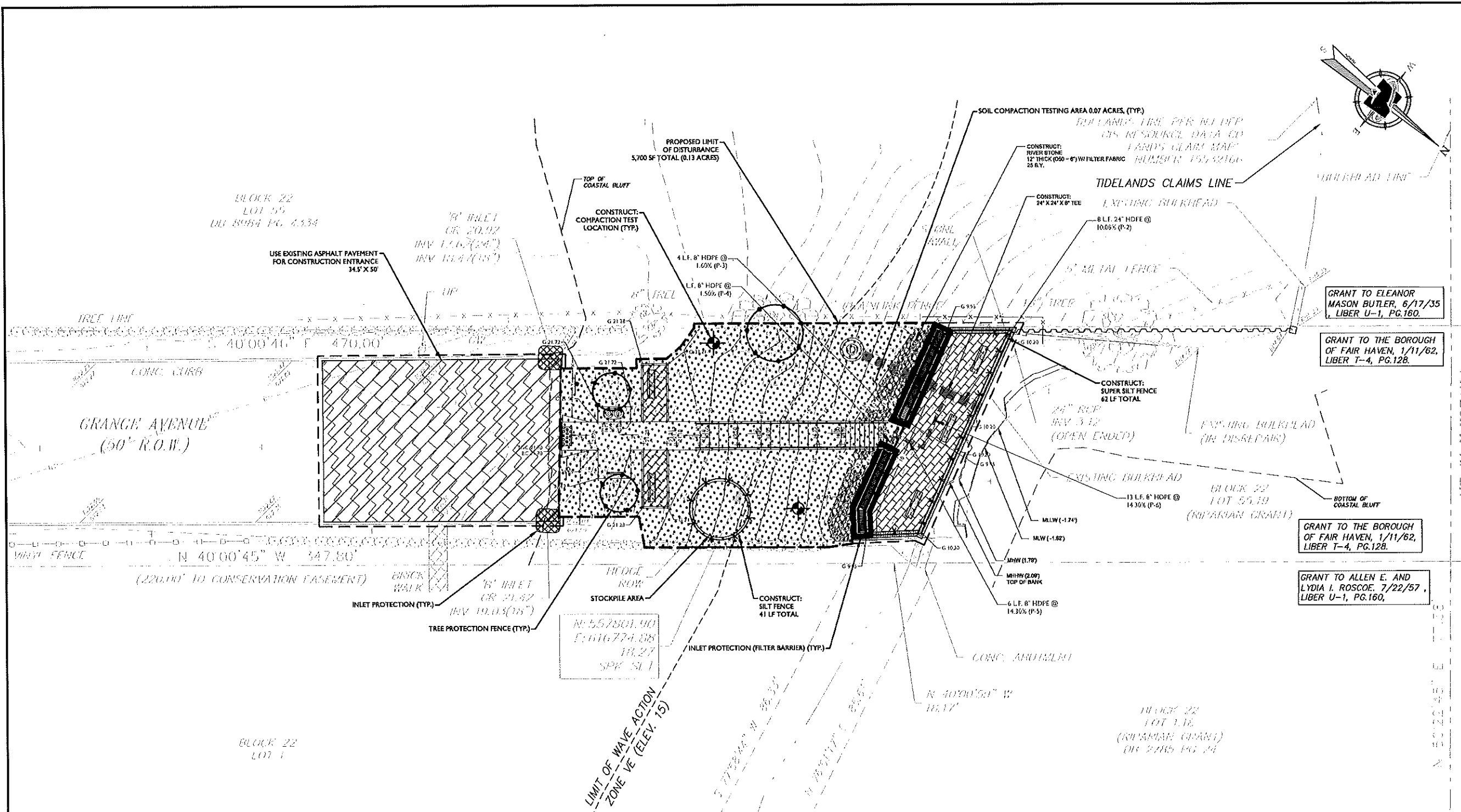
Richard C. Maloney
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ENGINEER - LICENSE NUMBER: CE37013

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FOR
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SCALE: AS SHOWN
DATE: 4/22/19
PROJECT NUMBER: 170041028
DRAWING NAME: C-455C

SHEET TITLE: **SOIL EROSION &
SEDIMENT CONTROL PLAN
GRANGE AVENUE**



REV	DATE	DESCRIPTION	BY	CHK	APP
1	08/21/23	ISSUED FOR BIDDING & PERMITS	TEK	TEK	SS
2	08/21/23	REVISED FOR BIDDING & PERMITS	TEK	TEK	SS
3	08/21/23	REVISED FOR BIDDING & PERMITS	TEK	TEK	SS
4	08/21/23	REVISED FOR BIDDING & PERMITS	TEK	TEK	SS
5	08/21/23	REVISED FOR BIDDING & PERMITS	TEK	TEK	SS
6	08/21/23	REVISED FOR BIDDING & PERMITS	TEK	TEK	SS
7	08/21/23	REVISED FOR BIDDING & PERMITS	TEK	TEK	SS
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9	08/21/23	REVISED FOR BIDDING & PERMITS	TEK	TEK	SS
10	08/21/23	REVISED FOR BIDDING & PERMITS	TEK	TEK	SS

Richard C. Maloney
RICHARD C. MALONEY
NEW JERSEY PROFESSIONAL
ENGINEER - LICENSE NUMBER: GE00013

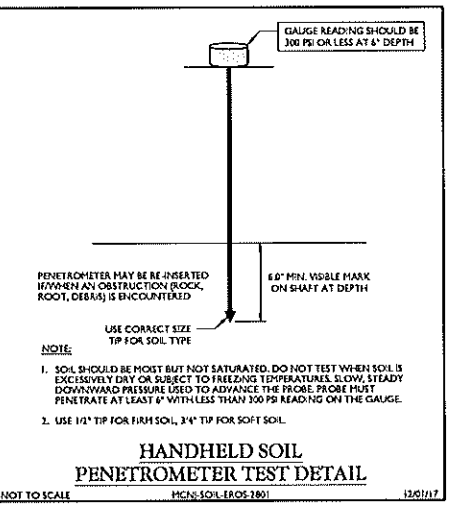
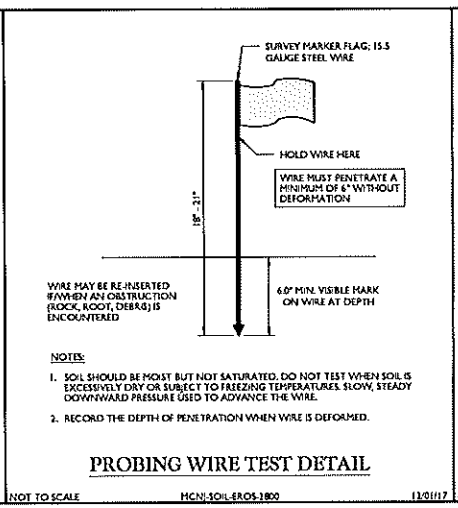
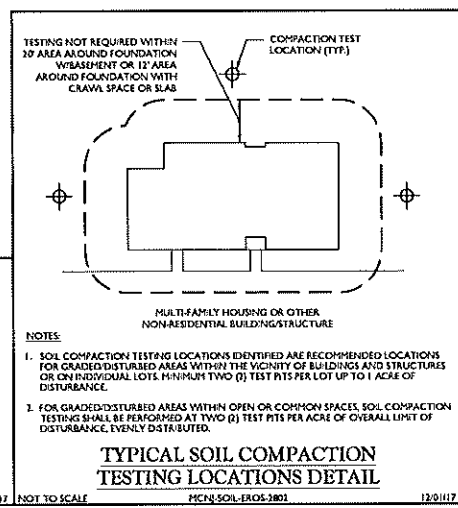
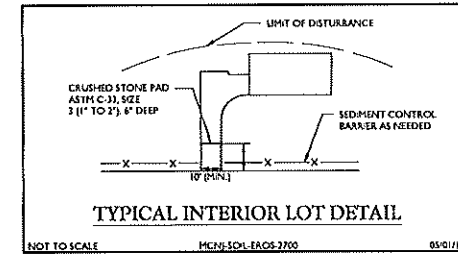
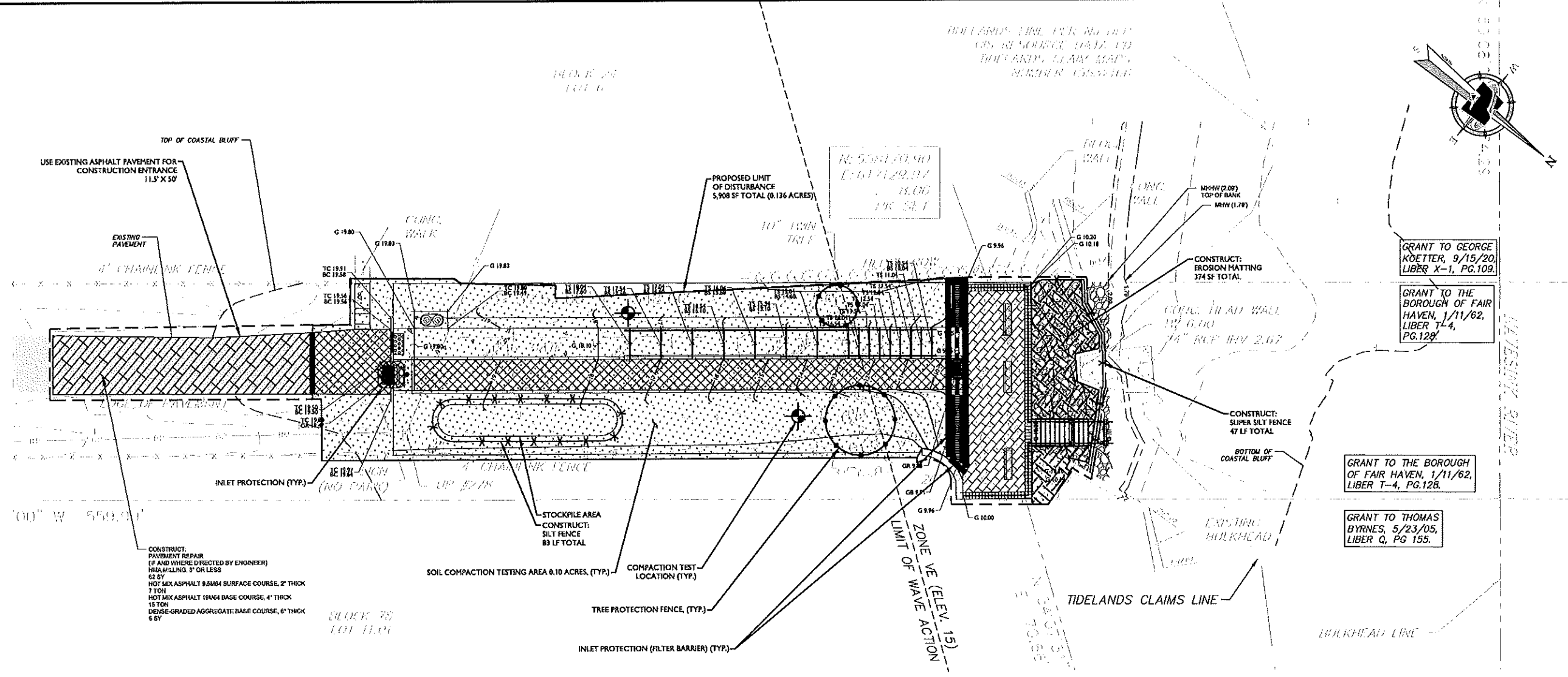
CONSTRUCTION PLANS
FOR
**BULKHEAD
REPLACEMENT
GRANGE AVENUE &
HANCE ROAD
POCKET PARKS &
BATTIN ROAD BOAT
RAMP**
BOROUGH OF FAIR HAVEN
MONMOUTH COUNTY
NEW JERSEY

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SCALE: AS SHOWN DATE: 08/21/23 DRAWN BY: TEK CHECKED BY: ACM
PROJECT NUMBER: 17004103 DRAWING NAME: C-SECC-HANCE

SHEET TITLE: **SOIL EROSION &
SEDIMENT CONTROL PLAN
HANCE ROAD**

SHEET NUMBER: **SE - 2**



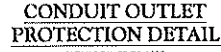


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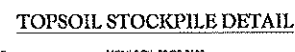


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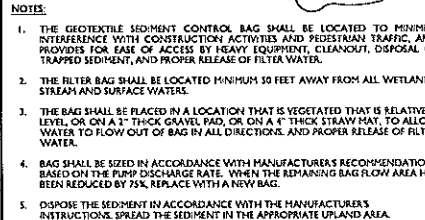
- | PERCENT SLOPE OF
ROADWAY | LENGTH OF STONE REQUIRED | |
|-----------------------------|--|--------------------|
| | COARSE GRAINED SOILS | FINE GRAINED SOILS |
| 0% TO 1% | 50 FT | 100 FT |
| 1% TO 5% | 100 FT | 200 FT |
| > 5% | ENTIRE SURFACE STABILIZED WITH HOT MIX ASPHALT
BASE COURSE, MIX 1-2 | |



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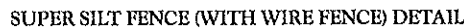


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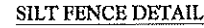


SEDIMENT CONTROL BAG FOR DEWATERING DETAIL

NOT USCALE MONSIEUR LAUS-TRON 09A



NOT TO SCALE



NOT TO SCALE



NOT TO SCALE

- NOTES:**
1. GEOTEXTILE TO BE WOVEN POLYPROPYLENE PRODUCT, OR APPROVED EQUAL.
 2. FILLER COVE MAY BE SAND, COMPOST, OR PEA GRAVEL COMPLETELY CONTAINED WITHIN GEOTEXTILE LEAKS, CLOSED BY SUITABLE MECHANICAL MEANS TO PREVENT SEepage OF FILLER.
 3. WHERE NO CURB IS PRESENT, BARRIER SHALL COMPLETELY ENCRUISE THE DRAIN INLET.
 4. INLET GRADE OPENINGS TO BE KEPT CLEAR OF OBSTRUCTIONS AT ALL TIMES.
 5. THE PROTECTION DEVICE WILL BE DESIGNED TO CAPTURE OR TRAP STORM DEBRIS FROM THE 1 YEAR 24 HOUR STORM EVENT AND SHALL SAFELY CONVEY HIGHER FLOWS DIRECTLY INTO THE STORM SEWER SYSTEM.
 6. OTHER METHODS THAT ACCOMPLISH THE PURPOSE OF STORM SEWER INLET PROTECTION MAY BE USED IF APPROVED BY THE SOIL CONSERVATION SERVICE.
 7. INSPECTIONS SHALL BE FREQUENT, MAINTENANCE, REPAIR, AND REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED. THE BARRIER SHALL BE REBUILT STRONGLY IN THE AREA DRAINING TO THE INLET AS NEARLY STRAIGHT AS POSSIBLE.



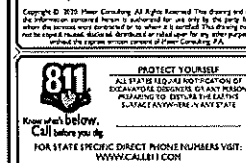
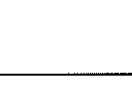
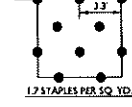
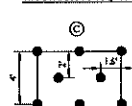
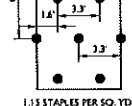
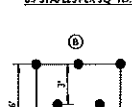
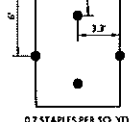
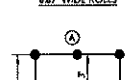
1. PROTECTIVE FENCING IS TO BE ERECTED PRIOR TO CONSTRUCTION AND MAINTAINED DURING CONSTRUCTION AS DIRECTED BY THE LANDSCAPE ARCHITECT, SOIL CONSERVATION DISTRICT AND/OR MUNICIPAL ENGINEER.
2. NO CONSTRUCTION ACTIVITY IS PERMITTED WITHIN THE PROTECTIVE FENCING.
3. AS CONSTRUCTION NEARS COMPLETION THE FENCING WILL BE REMOVED AS DIRECTED.
4. AT THE COMPLETION OF CONSTRUCTION, ALL TREES WILL BE PRUNED AS NECESSARY TO CORRECT ANY DAMAGE RESULTING FROM CONSTRUCTION ACTIVITY.
5. GENERAL MECHANICAL DAMAGE - SEE CRITICAL ROOT ZONE CALCULATION (CRZ) FOR CORRECT PLACEMENT OF TREE PROTECTION.
6. BOX TREES WITHIN 15 FEET OF A BUILDING SITE TO PREVENT MECHANICAL INJURY, FENCING OR OTHER BARRIER SHOULD BE INSTALLED BEFORE THE CRITICAL ROOT ZONE.
7. BOARDS WILL NOT BE NAIL TO TREES DURING BUILDING OPERATIONS.
8. FEEDER ROOTS SHOULD NOT BE CUT IN AN AREA INSIDE THE PROTECTED ROOT ZONE (PRZ) OR CRITICAL ROOT ZONE (CRZ). TREE ROOT SYSTEM COMMONLY EXTEND BEYOND THE DRAIN LINE.
9. DAMAGED TRUNKS OR EXPOSED ROOTS SHOULD HAVE DAMAGED BARK REMOVED IMMEDIATELY AND NO PAINT SHALL BE APPLIED. EXPOSED ROOTS SHOULD BE COVERED WITH TORSOL IMMEDIATELY AFTER EXCAVATION IS COMPLETE. ROOTS SHALL BE PRUNED TO GIVE A CLEAN, BRAN SURFACE ABLE TO HEALING. ROOTS EXPOSED DURING HOV SHALL BE PRUNED TO PREVENT PERMANENT TREE INJURY. CARE FOR SERIOUS INJURY SHOULD BE REQUESTED BY A PROFESSIONAL FORESTER OR CERTIFIED TREE EXPERT.
10. TREE LIMB REMOVAL, WHEN NECESSARY, WILL BE DONE AS NATURAL TRAIL PRUNING TO REMOVE THE DESIRED BRANCH COLLAR. THERE SHOULD BE NO FLUSH CUTS. FLUSH CUTS DESTROY A MAJOR DEFENSE SYSTEM OF THE TREE. NO TREE PAINT SHALL BE APPLIED. ALL CUTS SHALL BE MADE AT THE OUTSIDE EDGE OF THE BRANCH COLLAR. CUTS MADE TOO FAR BEYOND THE BRANCH COLLAR MAY LEAD TO EXCESS SPROUTING, CRACKS AND ROT. REMOVAL OF A "Y" CROTCH SHOULD BE CONSIDERED FOR FREE STANDING SPECIMEN TREES TO AVOID FUTURE SPLITTING DAMAGE.
11. CRITICAL ROOT ZONE (CRZ) OR PROTECTED ROOT ZONE (PRZ) CALCULATION
 HEADLINE CRZ OR PRZ = DIAMETER OF TREE IN INCHES x HEIGHT OR 1.5 (FOR ABOVE GROUND) OR THE UPHILL SIDE IN INCHES
 CRZ OR PRZ = DIAMETER TIMES 1.5 (FOR COLD/UNHEALTHY/THYRUS SIVITE) TREES OR DIAMETER X 2.0 (FOR YOUNG/HEALTHY/POPLETAR TREES). EXPRESS IN FEET.

TEMPORARY TREE PROTECTION DETAIL

NOT TO SCALE



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[illegible]


RICHARD C. MALONEY
NEW JERSEY PROFESSIONAL
ENGINEER - LICENSE NUMBER: GE39023

**CONSTRUCTION PLANS
FOR
BULKHEAD
REPLACEMENT
GRANGE AVENUE &
HANCE ROAD
POCKET PARKS &
BATTIN ROAD BOAT
RAMP
BOROUGH OF FAIR HAVEN
MONMOUTH COUNTY
NEW JERSEY**

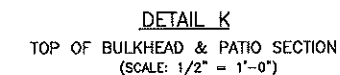
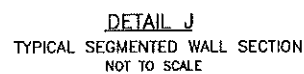
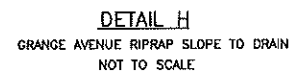


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PROJECT NUMBER		DRAWING NAME	
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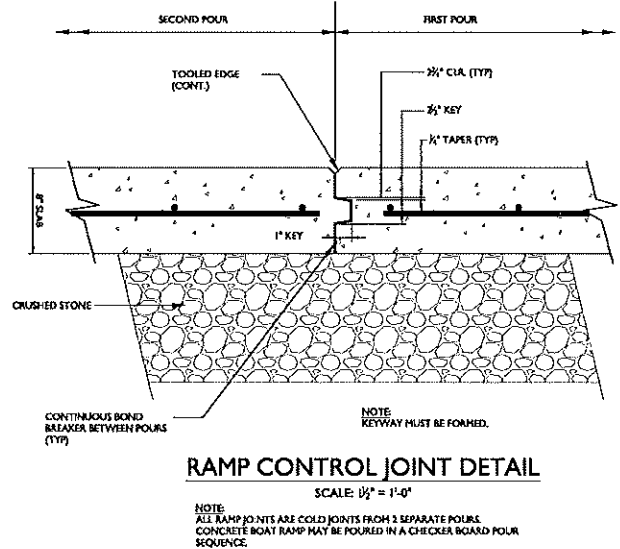
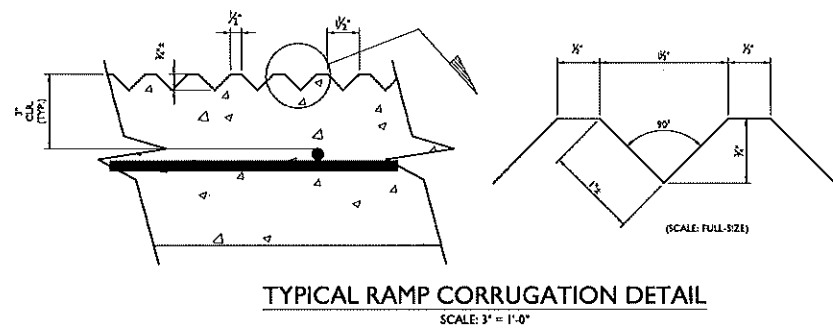
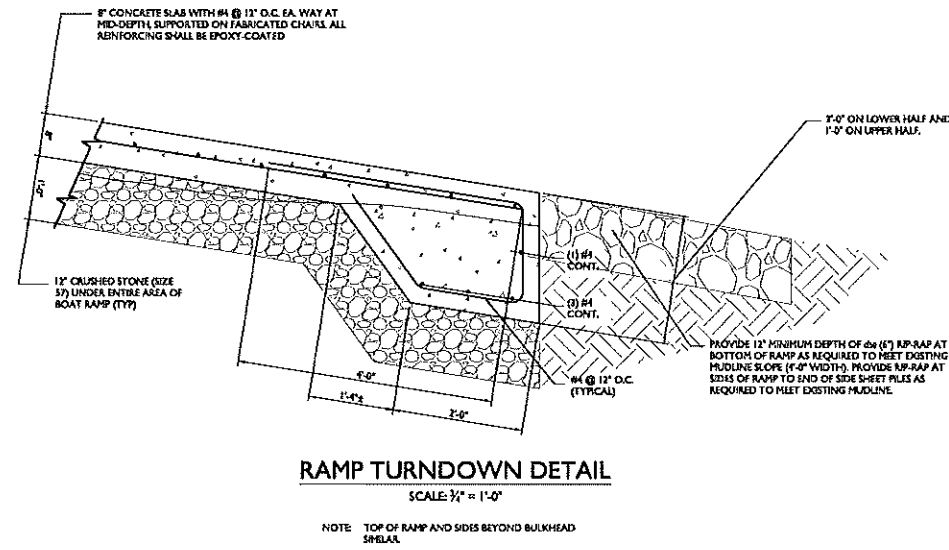
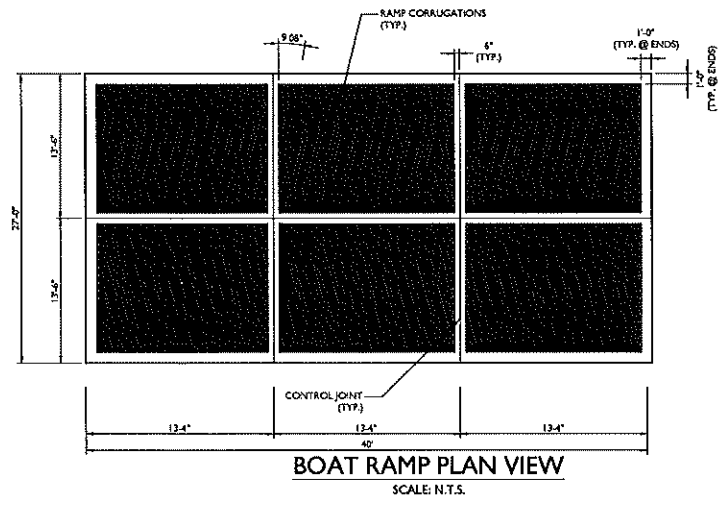
SOIL EROSION & SEDIMENT CONTROL DETAILS & NOTES

SE - 4



SHEET NUMBER

ST-2



NOTE:
PRIOR TO START OF RAMP CONSTRUCTION, CONTRACTOR SHALL SUBMIT TO ENGINEER FOR APPROVAL A SAMPLE OF THE SCALED PROPOSED FOR USE TO CREATE RAMP CORRUGATED SURFACE. CONTRACTOR SHALL PREPARE AT SITE A 1'-0"x4'-0" MIN. SAMPLE MOCK-UP OF CONCRETE SURFACE AS FORMED WITH SCALED FOR ENGINEER'S ACCEPTANCE AND APPROVAL PRIOR TO POURING RAMP.

NOTE:
ALL RAMP JOINTS ARE COLD JOINTS FROM 3 SEPARATE POURS. CONCRETE BOAT RAMP MAY BE POURED IN A CHECKER BOARD POUR SEQUENCE.

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1	07/20/18	FINAL PLAN SUBMITTAL	TC	SS
2	08/15/18	REVISED FOR BIDDING & ADD COMMENTS	SS	SS
3	08/15/18	REVISED TO BID	SS	SS

Richard C. Maloney
RICHARD C. MALONEY
NEW JERSEY PROFESSIONAL
ENGINEER - LICENSE NUMBER: GE39023

CONSTRUCTION PLANS
FOR
**BULKHEAD
REPLACEMENT
GRANGE AVENUE &
HANCE ROAD
POCKET PARKS &
BATTIN ROAD BOAT
RAMP**
BOROUGH OF FAIR HAVEN
MONMOUTH COUNTY
NEW JERSEY

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PROJECT NUMBER	DRAWING NAME	DATE	SCALE
17064128	C-0711		

SHEET TITLE
BOAT RAMP DETAILS
SHEET NUMBER
ST-4

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE NEW JERSEY UNIFORM CONSTRUCTION CODE (NUCC), BASED ON IBC 2018, WHICH IS THE ADOPTED BUILDING CODE FOR THE PROJECT SITE, AND ITS REFERENCE DOCUMENT, ASCE 7-16, "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES".
2. ALL ASPECTS OF THE WORK ALSO SHALL BE IN COMPLETE ACCORDANCE WITH THE REQUIREMENTS AND DIRECTIVES OF THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION, AND ALL GRANTED PERMITS (SEE SPECIFICATIONS).
3. CONTRACTOR SHALL PROVIDE TEMPORARY BRACING AS REQUIRED TO SUPPORT LOADS WHICH NEW AND EXISTING STRUCTURES MAY BE SUBJECTED TO DURING CONSTRUCTION.
4. CONTRACTOR SHALL FIELD MEASURE AND VERIFY ALL EXISTING CONDITIONS, ELEVATIONS, ANGLES, AND DIMENSIONS IN FIELD. ANY UNUSUAL CONDITIONS OR DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE PURCHASE, FABRICATION, OR ERECTION OF ANY MATERIALS.
5. CONTRACTOR SHALL SUBMIT FOR ENGINEER'S REVIEW, ERECTION DRAWINGS AND DETAILED SHOP DRAWINGS FOR ALL STRUCTURAL MATERIALS INCLUDING:
 - A. SHEET PILE SECTIONS
 - B. SECTIONS AND FABRICATIONS
 - C. DATA SHEETS ON ALL STRUCTURAL MATERIALS, COATINGS, TREATMENTS, AND ADHESIVES
 - D. ALL SITE IMPROVEMENT ITEMS

1. ALL FOUNDATIONS SHALL BE FOUNDED ON FIRM, UNDISTURBED SOIL. ALL SOFT SPOTS OR OVER-EXCAVATION OF FOOTINGS SHALL BE FILLED WITH ACCEPTABLE FILL MATERIAL AND COMPACTED TO 95% MODIFIED PROCTOR DENSITY. ALL FOOTING EXCAVATIONS SHALL BE FINISHED BY HAND.
2. BACKFILL SHALL BE PLACED IN 8-INCH MAXIMUM LIFTS AND COMPACTED TO A MINIMUM DENSITY OF 95% (UNDER SLABS ON-GRADE NEW PAVEMENT AND FOOTINGS) AND 90% ELSEWHERE OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D1557 MODIFIED PROCTOR, UNLESS NOTED OTHERWISE.
3. COMPLIANCE MUST BE SHOWN THROUGH TESTING PERFORMED BY A CERTIFIED COMPACTION TESTING PROVIDER. A MINIMUM OF 2 TESTS PER LIFT MUST BE PERFORMED. ALL TEST RESULTS MUST BE PROVIDED TO AND APPROVED OF BY THE ENGINEER PRIOR TO FURTHER INSTALLATION OF LIFTS.
4. THE COMPACTION AND TESTING OF THE BACKFILL DURING CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
5. BACKFILL SHALL CONSIST OF NON-EXPANSIVE, FREE-DRAINING, WELL GRADED SAND AND GRAVEL, FREE OF DEBRIS AND ORGANIC MATERIAL. EXCAVATED SITE MATERIALS MAY BE REUSED IF AT PROPER MOISTURE CONTENT AND FREE OF DEBRIS.
6. CONTRACTOR WILL BE RESPONSIBLE FOR, AND SHALL SAFEGUARD AND PROTECT, ALL EXCAVATIONS AND EXISTING STRUCTURES DURING CONSTRUCTION OF FOUNDATIONS BY PROPER SAFEGUARDS WHICH MAY INCLUDE BRACING.
7. ALL EXCAVATIONS SHALL CONFORM WITH CURRENT OSHA REQUIREMENTS AND STANDARDS.
8. THE DESIGN AND OPERATION OF THE GROUNDWATER CONTROLS DURING CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
9. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

1. FILTER FABRIC SHALL BE PROVIDED FOR CONSTRUCTION OF BULKHEAD AT AREAS AS SHOWN ON THE DESIGN DRAWINGS, INCLUDING BUT NOT LIMITED TO:
 - 1.1. ISOLATION AND CONTROL OF GRANULAR FILL MATERIALS BEHIND NEW BULKHEAD SHEET PILES.
 - 1.2. CLOSURE AT INTERFACES BETWEEN NEW SHEET PILE BULKHEAD CONSTRUCTION AND EXISTING BULKHEADS.
2. FILTER FABRIC SHALL BE A NON-WOVEN CIVIL ENGINEERING FABRIC MATERIAL (GEOTEXTILE) WITH THE FOLLOWING MINIMUM MATERIAL PROPERTIES:
 - 2.1. GRAB TENSILE STRENGTH (ASTM D4632): 80.8 LB
 - 2.2. GRAB TENSILE ELONGATION (ASTM D4632): 50%
 - 2.3. MULLEN BURST (ASTM D3785): 150 PSI
 - 2.4. PUNCTURE (ASTM D4893): 45 LB
 - 2.5. TRAPEZOID TEAR (ASTM D4533): 35 LB
 - 2.6. UV RESISTANCE @ 500hr (ASTM D4355): 70%
 - 2.7. APPARENT OPENING SIZE (US SIEVE) (ASTM D4751): 70
3. COMPLETE MANUFACTURER'S DATA ON FILTER FABRIC (GEOTEXTILE) MATERIAL SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL PRIOR TO PROCUREMENT OR INSTALLATION OF MATERIAL.
4. ALL ASPECTS OF MATERIAL STORAGE, HANDLING, AND INSTALLATION SHALL BE IN COMPLETE ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.

1. LIGHT FIXTURE ALONG STAIRS SHALL BE SOLAR-POWERED STAINLESS STEEL DECK LIGHTS.
2. FIXTURE SHALL BE "SOLAR POWER 5 1/2"W STAINLESS STEEL DECK LIGHTS" STYLE #6V956" BY LAPS PLUS. (www.lapsplus.com), OR EQUAL AS APPROVED BY THE ENGINEER.
3. LIGHTS SHALL BE AFFIXED TO THE STEPS USING STAINLESS STEEL MOUNTING SCREWS AS DIRECTED BY THE MANUFACTURER.

1. **TIMBER PILES SHALL BE SOUTHERN YELLOW PINE MATERIAL, IN ACCORDANCE WITH ASTM D25, CLASS B.**
2. **TIMBER PILES SHALL BE AIR-SEASONED PRIOR TO KILN DRYING.**
3. **TIMBER PILES SHALL BE PRESERVATIVE TREATED IN ACCORDANCE WITH AWPA STANDARD U1-05, AS FOLLOWS:**

A. AWPA USE CATEGORY:	UC5B (SALT WATER EXPOSURE)
B. COMMODITY (U1-05, TABLE 3-1):	PILES, ROUND
C. TREATMENT CHEMICAL:	CCA
D. MINIMUM RETENTION:	2.5 PCF (TABLE 3-2)
E. TREATMENT WITH CCA SHALL INCLUDE POST-TREATMENT FIXATION PROCESS.	
4. **TIMBER PILES SHALL HAVE MINIMUM TIP DIAMETER OF 8" AND BUTT DIAMETER OF 12" IN ALL LOCATIONS UNLESS OTHERWISE NOTED.**
5. **LENGTH OF PILES SHALL BE AS REQUIRED TO ATTAIN TOP ELEVATIONS AS SHOWN ON THE DRAWINGS.**
6. **TIMBER PILES SHALL HAVE THE FOLLOWING MINIMUM LOAD CAPACITIES:**

A. VERTICAL:	4-TON (8000 LBS)
---------------------	-------------------------
7. **TIMBER PILES SHALL BE DRIVEN TO THE DEPTHS NOTED ON THE PLANS.**
8. **ALL PILES SHALL BE DRIVEN BY AN APPROVED GRAVITY, STEAM, OR DIESEL HAMMER. PILE DRIVING HAMMER SHALL HAVE RATED ENERGY OF 15,000 FOOT-POUNDS PER BLOW (MINIMUM). SETTING OF PILES IS NOT PERMITTED, IF EXTREMELY HARD DRIVING MATERIALS EXIST AND CONDITIONS PERSIST, CONTRACTOR SHALL CONTACT THE ENGINEER TO DETERMINE POSSIBLE LIMITED USE OF SETTING.**

1. ALL ASPECTS OF TIMBER CONSTRUCTION SHALL BE IN COMPLETE ACCORDANCE WITH THE REQUIREMENTS OF THE "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION" (NDS), LATEST EDITION, AS PUBLISHED BY THE AMERICAN FOREST & PAPER ASSOCIATION AND THE AMERICAN WOOD COUNCIL.
2. MATERIALS:
 - A. TIMBER - SOUTHERN YELLOW PINE, No.2 GRADE OR BETTER FOR ALL TIMBER FRAMING, INCLUDING STAIRS, AND BULKHEAD CAP. ALL TIMBER FRAMING SHALL BE PRESERVATIVE TREATED IN ACCORDANCE WITH NOTE #3, BELOW.
 - B. HARDWARE - ALL STUDS, BOLTS, NUTS, AND WASHERS FOR TIMBER FRAMING SHALL BE ASTM A307, HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153, UNLESS OTHERWISE NOTED. PLATES, STRAPS, AND ANGLES SHALL BE ASTM A36 STEEL, HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123, UNLESS OTHERWISE NOTED.
3. ALL TIMBER FRAMING SHALL BE PRESERVATIVE TREATED IN ACCORDANCE WITH AMERICAN WOOD PRESERVERS ASSN. (AWPA) STANDARDS 2003; STANDARD U1-05, AS FOLLOWS:
 - A. ALL TIMBER FRAMING AT BULKHEAD CAPS, AND STAIRS EXCEPT AS SPECIFICALLY NOTED IN "B", BELOW:
 - (1) AWPA USE CATEGORY: UC-5B
(SALT WATER EXPOSURE)
 - (2) COMMODITY (U1-05, TABLE 3-1): LUMBER / TIMBERS
 - (3) CCA PRESERVATIVE TREATMENT WITH A RETENTION OF 2.5 LBS./CU.F. SHALL BE PROVIDED PER U1-05, TABLE 3.0
 - (4) NO SUBSTITUTIONS OF OTHER TREATMENTS SHALL BE PERMITTED.
 - B. TIMBER CAP TOP PLANK SECTIONS AT BULKHEAD:
 - (1) AWPA USE CATEGORY: UC-4B
(SALT WATER SPRAY)
 - (2) COMMODITY (U1-05, TABLE 3-1): LUMBER / TIMBERS
 - (3) ACQ PRESERVATIVE TREATMENT WITH A RETENTION OF 0.6 LBS./CU.F. SHALL BE PROVIDED PER U1-05, TABLE 3.0
 - (4) NO SUBSTITUTIONS OF OTHER TREATMENTS SHALL BE PERMITTED.
4. ALL FIELD CUTS SHALL BE FIELD-TREATED WITH PRESERVATIVE TREATMENT IN ACCORDANCE WITH APPLICABLE AWPA STANDARDS AND PROCEDURES.

NOTE:

REFER TO THE PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION ON ALL STRUCTURAL MATERIALS. IF ANY CONFLICTS EXIST BETWEEN PLANS AND SPECIFICATIONS, THE MORE STRINGENT SHALL GOVERN.

1. ALL CONCRETE WORK SHALL COMPLY WITH THE REQUIREMENTS OF ACI 318 AND "SPECIFICATIONS FOR CONCRETE BUILDINGS" ACI 301, LATEST EDITIONS.
2. ALL CONCRETE SHALL HAVE MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI, UNLESS OTHERWISE NOTED. CONCRETE BOAT RAMP TO BE 5,000 PSI. CONCRETE SHALL BE AIR-ENTRAINED IN ACCORDANCE WITH ACI STANDARDS. MAXIMUM SLUMP SHALL BE 4 INCHES. ALL CONCRETE SHALL BE NORMAL WEIGHT, U.N.O.
3. ALL REINFORCING STEEL FOR CONCRETE AND MASONRY CONSTRUCTION SHALL CONFORM WITH ASTM A615, GRADE 60. ALL REINFORCING STEEL SHALL BE HOT DIPPED GALVANIZED OR EPOXY-COATED IN ACCORDANCE WITH ASTM A775.
4. ALL REINFORCING BARS SHALL BE SPICED A MINIMUM OF 40 BAR DIAMETERS. ALL REINFORCING BARS SHALL BE CONTINUOUS AROUND CORNERS.
5. WELDED WIRE FABRIC (WYWF) SHALL CONFORM WITH ASTM A185. WIRE FABRIC SHALL BE TIED WITH WIRE AND OVERLAPPED TWO SQUARES AT EDGES. ALL WYWF SHALL BE HOT DIPPED GALVANIZED OR EPOXY-COATED IN ACCORDANCE WITH ASTM A884.
6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED OVER REINFORCEMENT, UNLESS OTHERWISE NOTED ON THE DRAWINGS:
A. CONCRETE CAST AGAINST EARTH: 3 INCHES
B. CONCRETE EXPOSED TO EARTH OR WEATHER: 2 INCHES
C. CONCRETE NOT EXPOSED TO EARTH OR WEATHER: 1 INCH
7. ALL REINFORCING SHALL BE DETAILED, FABRICATED, AND SUPPORTED IN FORMS AND SPACED WITH ACCESSORIES FOLLOWING THE REQUIREMENTS OF THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES", ACI 315. PLACING OF BARS SHALL CONFORM TO THE LATEST CSI RECOMMENDED PRACTICES FOR PLACING REINFORCING BARS.
8. NO ADMIXTURE SHALL BE ALLOWED WITHOUT PRIOR APPROVAL OF THE ENGINEER. THE USE OF CALCIUM CHLORIDE IS PROHIBITED.
9. AFTER CONCRETING HAS STARTED, IT SHALL BE CARRIED ON AS A CONTINUOUS OPERATION UNTIL PLACING OF A PANEL OR SECTION, AS DEFINED BY ITS BOUNDARIES OR PREDETERMINED JOINTS, IS COMPLETED.
10. ALL CONCRETE SHALL BE THOROUGHLY CONSOLIDATED BY SUITABLE MEANS SUCH AS MECHANICAL VIBRATION DURING PLACEMENT AND THOROUGHLY WORKED AROUND REINFORCEMENT.
11. FINISH CONCRETE IN ACCORDANCE WITH "FINISHING OF FORMED SURFACES", OF ACI 301. FOUNDATION WALL SHALL BE SMOOTH-FORMED FINISH, UNLESS OTHERWISE NOTED. SEE NOTE #14, BELOW.
12. GROUT SHALL BE A NON-SHRINK, NON-METALLIC, CEMENTITIOUS GROUT, AS APPROVED BY THE ENGINEER.
13. ALL BOLTS, SLEEVES, AND OTHER EMBEDDED ITEMS SHALL BE SET BEFORE CONCRETE IS PLACED. SEE MECHANICAL, ELECTRICAL, AND VENDORS' DRAWINGS FOR SIZES AND LOCATIONS.

1. PROPER CURING OF CONCRETE IS OF THE UTMOST IMPORTANCE. IMMEDIATELY AFTER PLACEMENT, CONCRETE SHALL BE PROTECTED FROM PREATURE DRYING, EXCESSIVELY HOT OR COLD TEMPERATURES, AND MECHANICAL INJURY AND SHALL BE MAINTAINED WITH MINIMAL MOISTURE LOSS AT A RELATIVELY CONSTANT TEMPERATURE FOR AT LEAST 7 DAYS. THE MATERIALS AND METHODS OF CURING SHALL BE SUBJECT TO ACCEPTANCE BY THE ENGINEER. UNSATISFACTORY FINISHED CONCRETE THAT RESULTS FROM FAILURE TO FOLLOW THE SPECIFIED CURING PROCEDURES MAY BE REQUESTED BY THE OWNER OR ENGINEER TO BE REMOVED AND REPLACED. ALL COSTS ASSOCIATED WITH REMOVAL AND REPLACEMENT OF CONCRETE WORK SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

2. SLABS -
IT IS MANDATORY THAT 7 DAYS OF WET CURING ON ALL MAT SLABS AND FORMED SLABS BE PERFORMED. USE SOAKER HOSE, WET BURLAP AND PLASTIC SHEETS OVER BURLAP ON ALL EXPOSED SURFACES FOR 7 DAYS MINIMUM.

3. COLD WEATHER -
WHEN THE MEAN DAILY OUTDOOR TEMPERATURE IS LESS THAN 40°F, THE TEMPERATURE OF THE CONCRETE SHALL BE MAINTAINED BETWEEN 50°F AND 70°F FOR THE REQUIRED CURING PERIOD. WHEN NECESSARY, ARRANGEMENTS FOR HEATING, COVERING, INSULATING, OR HOUSING THE CONCRETE WORK SHALL BE MADE IN ADVANCE OF PLACEMENT AND SHALL BE ADEQUATE TO MAINTAIN THE REQUIRED TEMPERATURE WITHOUT INJURY TO THE CONCRETE DUE TO CONCENTRATION OF HEAT.

4. HOT WEATHER -
WHEN NECESSARY, PROVISION FOR WINDBREAKS, SHADING, AND/OR CURING WITH A LIGHT-COLORED MATERIALS SHALL BE MADE IN ADVANCE OF CONCRETE PLACEMENT. SUCH PROTECTIVE MEASURES SHALL BE TAKEN AS QUICKLY AS CONCRETE HARDENING AND FINISHING OPERATIONS WILL ALLOW. TEMPERATURE OF CONCRETE AT PLACEMENT SHALL NOT EXCEED 85°F.

STEEL SHEET PILING FROM NUCOR COMPANY SKYLINE STEEL OR EQUAL SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

<u>PZ-22:</u>	
SHEET WIDTH (SINGLE) =	22.0 IN.
SHEET CORRUGATION HEIGHT =	9.0 IN.
SHEET THICKNESS =	0.375 IN.
<u>PZ-35:</u>	
SHEET WIDTH (SINGLE) =	22.6 IN.
SHEET CORRUGATION HEIGHT =	1.49 IN.
SHEET THICKNESS =	0.500 IN.

ALL STEEL SHEET PILES SHALL BE SHOP COATED WITH THE FOLLOWING COATING SYSTEM BY PPG OR EQUAL:

2.1. THE FIRST/SECOND COAT SHALL BE TWO COATS OF AMERCOAT 240 (MINIMUM 10-12mils PER COAT.

2.2. THE THIRD COAT SHALL BE ONE COAT OF AMERCOAT 450H (MINIMUM 2mils PER COAT).

AFTER BULKHEAD INSTALLATION, COAT TOP 4" OF ALL SHEETS (FRONT, TOP & REAR) WITH MINIMUM OF 16MIL BITUMINOUS COATING OVER EXISTING COATING. EXCEPT OF SECTION 2 BULKHEAD, WHERE TOP SHOULD BE REPAIRED PER NOTE BELOW.

REPAIR ALL OTHER AREAS OF COATING THAT WERE DAMAGED DURING DELIVERY AND INSTALLATION AT ALL PENETRATIONS AND BOLT HOLES IN SHEETING WITH ORIGINAL COATING SYSTEM (3 COATS).

ALL STEEL SHEET PILING SHALL BE ASTM A572 GRADE 50 STEEL ($F_y = 50 \text{ KSI}$ MINIMUM). ALL STEEL SHEET PILING SHALL BE HOT ROLLED.

CONTRACTOR SHALL USE A DRIVING TEMPLATE FOR DRIVING STEEL SHEET PILING.

DRIVING OF PILES IN PAIRS IS RECOMMENDED TO FACILITATE DRIVING AND HELP MAINTAIN VERTICALITY OF PILES.

PILING SHOULD BE DRIVEN WITH THE BALL EDGE LEADING WHERE POSSIBLE, TO AVOID CLOGGING OF SOCKET END DURING DRIVING. WHEN CONDITIONS REQUIRE THAT SOCKET END LEAD, A BOLT OR SIMILAR OBJECT SHOULD BE PLACED IN BOTTOM OF SOCKET TO MINIMIZE CLOGGING.

CUT OFF EXCESS MATERIAL ALONG TOP OF DRIVEN SHEET PILE AFTER INSTALLATION. HANDLING HOLES MUST BE IN THE TOP 8" OF SHEET IN AREAS WHERE A CAP IS SPECIFIED. IN AREAS WITHOUT A CAP, HOLES SHALL BE COVERED WITH A WELDED 1/2" THICK PLATE. COAT W/ 16mils BITUMINOUS COATING.

0. SHEET PILE ANCHORAGE SYSTEMS:

- B. THE RODS FROM SHEET PILE WALKERS TO HELICALS:
 - a. TYPICAL BULKHEAD TIE RODS SHALL BE 1"Ø THREAD BAR TIE-RODS, GRADE 150 STEEL.
 - b. EACH ROD (TYPICAL RODS OR DIAGONALS) SHALL INCLUDE A THREAD ADAPTER FOR TENSIONING AND ADJUSTMENT OF ROD AFTER INSTALLATION. ADAPTER AND INNER AND OUTER ROD SECTIONS, SHALL BE PROVIDED WITH OPPOSITE-HAND THREADS TO PERMIT TENSIONING AND ADJUSTMENT USING A TURNING BAR.
 - c. ALL ELEMENTS OF THE ROD SYSTEM, INCLUDING BUT NOT LIMITED TO RODS, ADAPTERS, WASHERS, HEX NUTS, SHIMS AND OTHER HARDWARE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 & A153 AS APPLICABLE, WITH 20 OUNCES OF ZINC PER SQUARE FOOT, MINIMUM. AFTER GALVANIZING, ALL ELEMENTS AS NOTED ABOVE SHALL ALSO BE FULLY COATED WITH COAL-TAR.
- C. THREADED ELEMENTS SHALL BE COATED WITH COAL-TAR EPOXY IN FIELD ONLY AFTER FINAL ADJUSTMENT AND TIGHTENING OF PARTS IS COMPLETED. SEE NOTES THIS SHEET FOR DETAILS OF COAL-TAR EPOXY COATING.

2. DRILLED IN HELICAL SOIL ANCHORS

- A. DESIGN LENGTH OF HELICAL ANCHORS FROM FACE OF BULKHEAD SHEET PILES SHALL BE 50'-0" MINIMUM, AS SHOWN IN THE DESIGN DRAWINGS.
- B. HELICAL ANCHOR INSTALLATION ANGLE SHALL BE 20° FROM HORIZONTAL. ANCHORS SHALL BE PERPENDICULAR TO THE LINE OF THE BULKHEAD IN PLAN.
- C. TIE RODS, ANCHOR SYSTEM SHALL BE SUPPLIED FROM THE SAME MANUFACTURER, INCLUDING ADAPTERS, WASHERS, NUTS, SHIMS, ETC.

MANUFACTURER'S RECOMMENDATIONS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

- a. ANCHOR LENGTH, LOCATION, INSTALLATION ANGLE AND SPACING ON BULKHEAD.
- b. ANCHOR HELIX MATERIAL, DIAMETERS, THICKNESSES, AND SPACING ALONG SHAFT. NOMINAL SPACING BETWEEN HELIX PLATES SHALL BE FIVE TIMES THE DIAMETER OF THE LARGER HELIX. HELIX MATERIAL SHALL BE IN ACCORDANCE WITH ASTM A936 HOT-ROLLED HIGH STRENGTH LOW ALLOY STEEL SHEET, ASTM A566 HOT-ROLLED STRUCTURAL STEEL PLATE, OR MANUFACTURER'S STANDARD AS REQUIRED TO OBTAIN THE DESIGN LOAD CAPACITY. HELICES SHALL BE FORMED BY MATCHING METAL DIES.
- c. ANCHOR SHAFT SIZE, CONNECTIONS, AND MATERIAL. SHAFT MATERIAL SHALL BE IN ACCORDANCE WITH ASTM A29, OR MANUFACTURER'S STANDARD AS REQUIRED TO OBTAIN THE DESIGN LOAD CAPACITY.

E. ALL HELICAL ANCHOR HELICES, DRIVE SHAFTS, ADAPTERS, RODS, NUTS, BOLTS, WASHERS, PLATE WASHERS, PLATE SPACERS, AND OTHER HARDWARE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 & A153 AS APPLICABLE, WITH 20 OUNCES OF ZINC PER SQUARE FOOT, MINIMUM. AFTER GALVANIZING, ALL EXPOSED ELEMENTS AT ADAPTER CONNECTION SHALL ALSO BE FULLY COATED WITH COAL-TAR EPOXY. SEE NOTES THIS SHEET FOR DETAILS OF COAL-TAR EPOXY COATING.

F. HELICAL ANCHORS SHALL HAVE THE FOLLOWING CAPACITIES:

- a. ANCHOR DESIGN LOAD: 32.5 KIPS
- b. ANCHOR ULTIMATE CAPACITY: 76.0 KIPS

G. INSTALLATION OF HELICAL ANCHORS SHALL BE PERFORMED BY A CONTRACTOR EXPERIENCED IN DRILLED HELICAL SOIL ANCHOR INSTALLATION, AND AS APPROVED BY THE ANCHOR MANUFACTURER.

H. HELICAL ANCHORS SHALL BE LOAD TESTED IN ACCORDANCE WITH THE ANCHOR MANUFACTURER'S RECOMMENDATIONS. ALL ASPECTS OF ANCHOR TESTING SHALL BE IN COMPLETE ACCORDANCE WITH THE MGR'S RECOMMENDATIONS, INCLUDING BUT NOT LIMITED TO: FREQUENCY OF ANCHOR TESTS, TEST PROCEDURES, SIGNIFICANCE OF TEST LOADS, METHOD OF TEST LOAD APPLICATION, AND DURATION OF TEST LOAD APPLICATION. CONTRACTOR SHALL WAIT MINIMUM OF TWO DAYS AFTER INSTALLATION TO CONDUCT LOAD TESTING ON ANY ANCHOR.

I. HELICAL ANCHOR DESIGN & SHOP DRAWINGS SHALL BE SUBMITTED FOR ENGINEER APPROVAL. DESIGN AND TEST DRAWINGS SHALL BE NEW JERSEY SIGNED AND SEALED BY THE CONTRACTOR'S ENGINEER.

J. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

3. ALL STRUCTURAL STEEL FABRICATION AND ERECTION SHALL CONFORM TO THE AISC "MANUAL OF STEEL CONSTRUCTION - ALLOWABLE STRESS DESIGN", LATEST EDITION.
2. ALL STRUCTURAL STEEL "W" SHAPES SHALL CONFORM TO ASTM A992 OR A572, TYPE 50, AS NOTED. ALL PIPE SHALL CONFORM TO ASTM A51, TYPE "C" OR "S", GRADE 60, AS NOTED. ALL OTHER SHAPES AND PLATES SHALL CONFORM TO ASTM A36 OR A572, GRADE 50, AS NOTED. ALL PIPE SIZES ARE NOMINAL DIAMETER.
3. ALL CONNECTIONS OF STRUCTURAL STEEL MEMBERS SHALL BE MADE USING VENEER OR STANDARD, UNFINISHED BOLTS. CONNECTION MATERIALS SHALL BE AS FOLLOWS:
 - A. BOLTS SHALL CONFORM TO ASTM A325 OR EQUIVALENT.
 - B. WELDS SHALL BE IN ACCORDANCE WITH THE LATEST AMERICAN WELDING SOCIETY (AWS) SPECIFICATIONS. ALL WELDING ELECTRODES SHALL BE E70 SERIES, UNLESS OTHERWISE NOTED.
4. SHOP AND FIELD WELDING SHALL BE PERFORMED BY WELDERS WHO ARE CERTIFIED (AWS) STANDARD CERTIFICATION PROCEDURE TO PERFORM THE TYPE OF WORK REQUIRED. WELDS SHALL CONFORM TO AWS D 1.1, "STRUCTURAL WELDING CODE - STEEL", LATEST EDITION. PROVIDE MINIMUM WELD SIZES PER TABLE D2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 9th EDITION, WHEN WELD SIZES ARE NOT SHOWN.
5. STEEL SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
6. THE DRAWINGS REPRESENT THE PERMANENT FRAMING AND FINAL DETAILS WHEN SHOWN. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING PROPER DESIGN AND CONSTRUCTION OF FALSEWORK, TEMPORARY BRACING, SHORING, AND RECOMMENDED ERECTION PROCEDURES.
7. PAINTING:
 - A. STEEL SHAPES, PLATES, AND FABRICATIONS SHALL BE COATED WITH COAL-TAR EPOXY IN ACCORDANCE WITH SSPC PAINT-16 AND THE U.S. ARMY CORPS OF ENGINEERS FORMULA C-200. ALL DETAILS OF SURFACE PREPARATION AND COATING APPLICATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
 - B. ALL HARDWARE (NUTS, BOLTS, WASHERS, ANCHOR PLATES, TIE RODS, TURNBUCKLES, ETC.) SHALL BE HOT-DIP GALVANIZED AND THEN COATED WITH COAL-TAR EPOXY AS NOTED ABOVE. FIELD-INSTALLED AFTER INSTALLATION, TIGHTENING, AND ADJUSTMENT OF HARDWARE. EXPOSED TIE ROD END, NUT & PLATE SHALL NOT BE COATED WITH COAL-TAR; THESE ITEMS SHALL BE COATED WITH A PRIME & 2 COAT MARINE PRIME PAINT COATING (PPG OR SIMILAR) DESIGNED TO BE APPLIED OVER GALVANIZED STEEL. COLOR TO MATCH BULKHEAD COATING.
8. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

1. ALL STEEL PARTS OF BULKHEAD ANCHORAGE SYSTEM SHALL BE COATED WITH COAL-TAR EPOXY COATING. (SHEET FILMS SHALL NOT RECEIVE COAL-TAR EPOXY COATING. SEE NOTES THIS SHEET FOR STEEL SHEET PILE COATING SYSTEM.)
2. THREADED PORTIONS OF THE RODS, TURNBUCKLES, AND SIMILAR ELEMENTS SHALL BE COATED WITH COAL-TAR EPOXY IN FIELD, AFTER FINAL TIGHTENING AND ADJUSTMENT OF ANCHORAGE SYSTEM. ALL OTHER PORTIONS OF BULKHEAD ANCHORAGE SYSTEM SHALL BE SHOP-COATED.
3. COAL-TAR EPOXY SHALL BE IN COMPLETE ACCORDANCE WITH THE REQUIREMENTS OF THE US ARMY CORPS OF ENGINEERS FORMULA C-200, AND STEEL STRUCTURES PAINTING COUNCIL (SSPC) STANDARD "PAINT 16".
4. MINIMUM (NOT AVERAGE) DRY FILM THICKNESS (DFT) OF 16 mils IS REQUIRED ON ALL COATED ELEMENTS.
5. COAL-TAR EPOXY COATING MATERIAL SHALL BE A HIGH-BUILD, BLACK, GLOSS-FINISH SELF-PRIMING PRODUCT, WITH SOLIDS CONTENT OF 74% $\pm$ 2% BY VOLUME.
6. PENALTIES FOR EPOXY MATERIAL SHALL MEET OR EXCEED THE FOLLOWING PERFORMANCE REQUIREMENTS:

A. ASTM D4060 (ABRASION):	130mg MAX LOSS AFTER 1000 CYCLES
B. ASTM D4541 (ADHESION):	1443 psi MINIMUM
C. ASTM D2794 (IMPACT):	100 in-lbs
D. ASTM B117 (SALT FOG):	NO RUSTING, RUSTING OR DELAMINATION AFTER 2000 HRS.
7. ALL ASPECTS OF COATING APPLICATION, INCLUDING PRODUCT STORAGE & HANDLING, SURFACE PREPARATION, MIXING, PRODUCT APPLICATION, CURING AND PROTECTION SHALL BE IN COMPLETE ACCORDANCE WITH THE COATING MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

1. ALL ALUMINUM MATERIALS AND FABRICATION SHALL COMPLY WITH THE REQUIREMENTS OF THE ALUMINUM DESIGN MANUAL 2003, AND WITH THE ALUMINUM ASSOCIATION, INC.
2. ALUMINUM MATERIALS SHALL BE TYPE 6063-T6, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ASTM B 221 AND B 308, AS APPLICABLE.
3. WELDING OF ALUMINUM SHALL COMPLY WITH THE REQUIREMENTS OF AMERICAN WELDING SOCIETY (AWS) STANDARD D1.2, "STRUCTURAL WELDING CODE - ALUMINUM". WELDING ELECTRODES FOR 6061 ALUMINUM SHALL BE ER6043, U.N.O.
4. ALL RAILING SHALL BE WELDED AND SHALL CONSIST OF ANODIZED ALUMINUM SCHEDULE 40 PIPE, 1/2" NOMINAL (1.99" O.D.) IN ACCORDANCE WITH ASTM B 241, TYPE 6063-T6. ALL PICKETS SHALL BE ANODIZED ALUMINUM SCHEDULE 40 PIPE, 1/2" NOMINAL (1.99" O.D.) IN ACCORDANCE WITH ASTM B 241, TYPE 6063-T6.
5. WELDING IS TO BE CONDUCTED PRIOR TO ANODIZING.
6. HANDRAILS SHALL BE DESIGNED TO WITHSTAND THE LOADS AS SPECIFIED IN NUCC SECTION 1607.7.1.
7. HANDRAILS SHALL BE FABRICATED IN THE LARGEST SECTIONS PRACTICAL FOR SHIPPING AND HANDLING IN FIELD FOR INSTALLATION.
8. HANDRAIL EXTENSIONS AT TOP, BOTTOM, TURNS AND SWITCHBACKS SHALL BE IN ACCORDANCE WITH THE HANDRAIL REQUIREMENTS OF ANSI A117.1.
9. POST TO BE MOUNTED TO 4 1/2"x4 1/2"x1/2" THICK ALUMINUM BASE PLATE. UTILIZE FOUR (4) 3/4" HOT-DIPPED GALVANIZED LAG SCREWS (6" LONG) AND DR-REILL ALL HOLES.
10. RAILING CONTRACTOR SHALL ADD TWO (2) 3x10 BLOCKING BETWEEN OUTER JOISTS AT ALL POST LOCATIONS. PROVIDE FOUR (4) 16d TOE NAILS EACH SIDE AT EACH END OF BLOCKING (16 TOTAL PER BLOCKING).

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