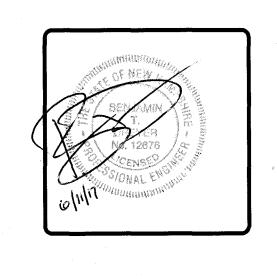
TOWN OF WOLFEBORO WOLFEBORO, NEW HAMPSHIRE

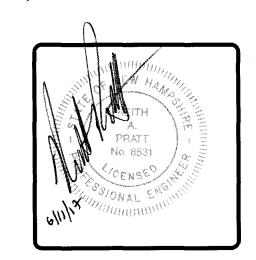
CONSTRUCTION DRAWINGS

DOCKSIDE BOAT LAUNCH IMPROVEMENTS

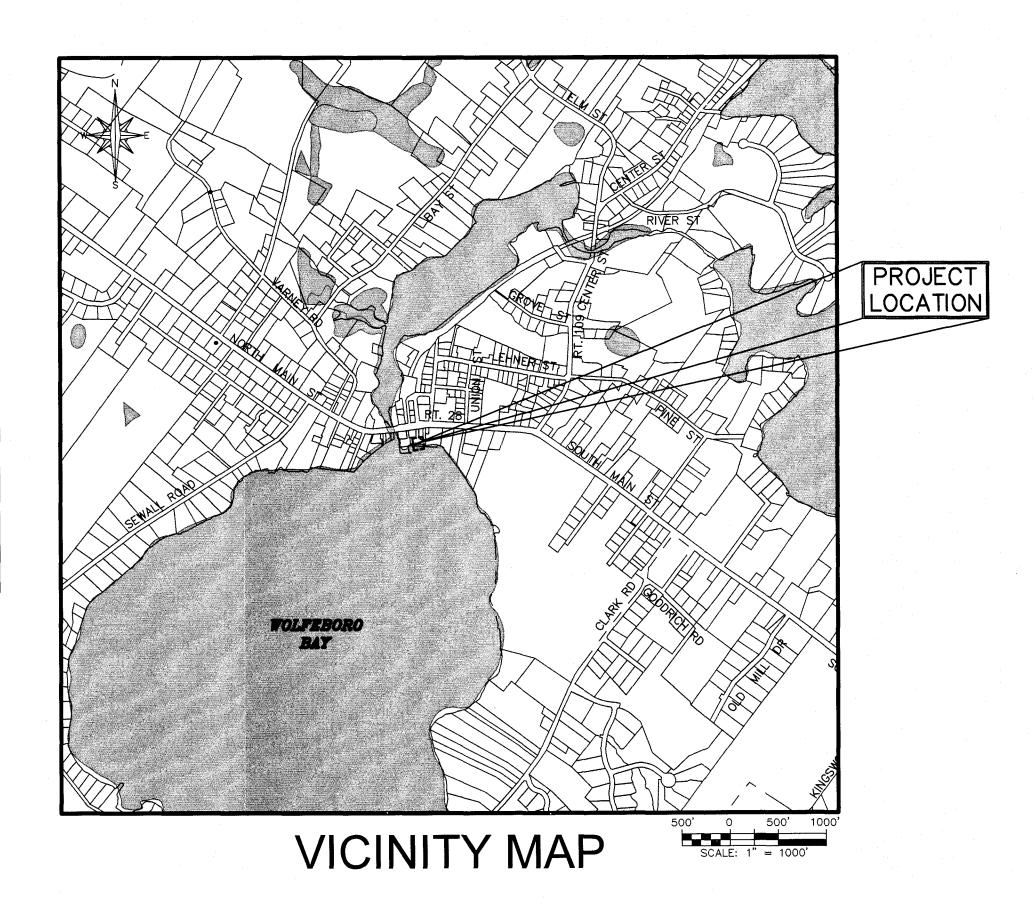
PREPARED BY
UNDERWOOD ENGINEERS
PORTSMOUTH, NEW HAMPSHIRE

JUNE 11, 2017





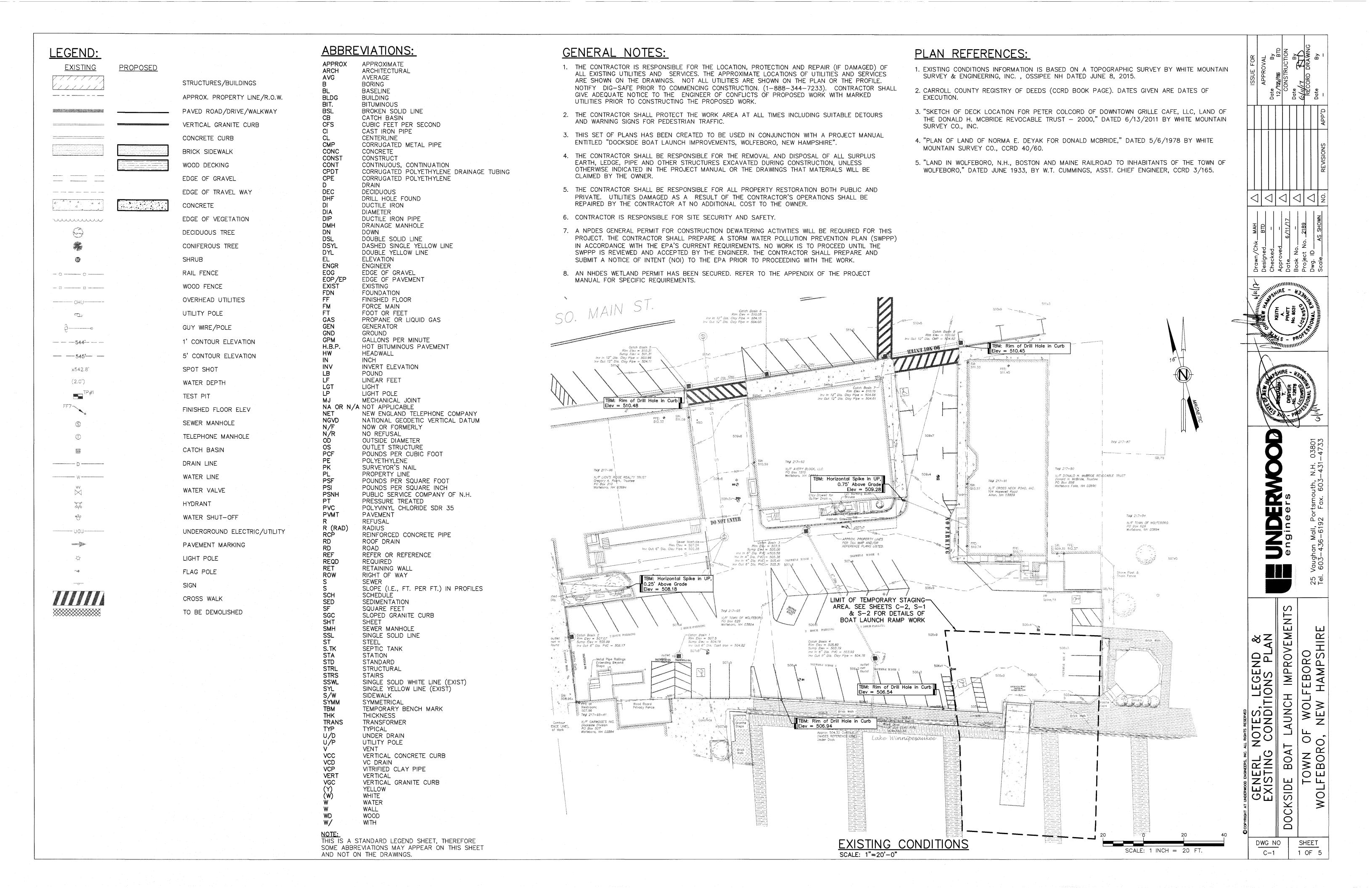
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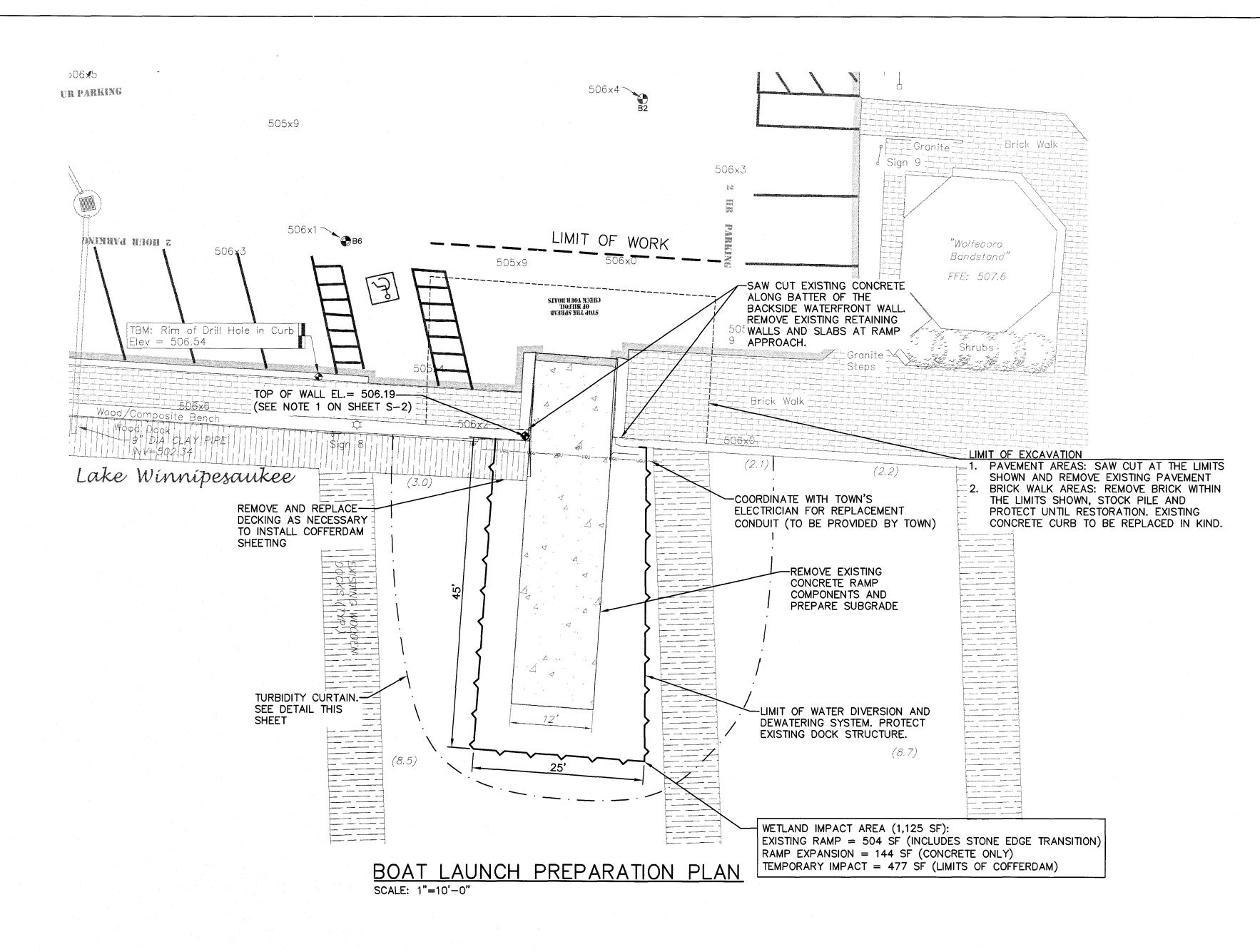




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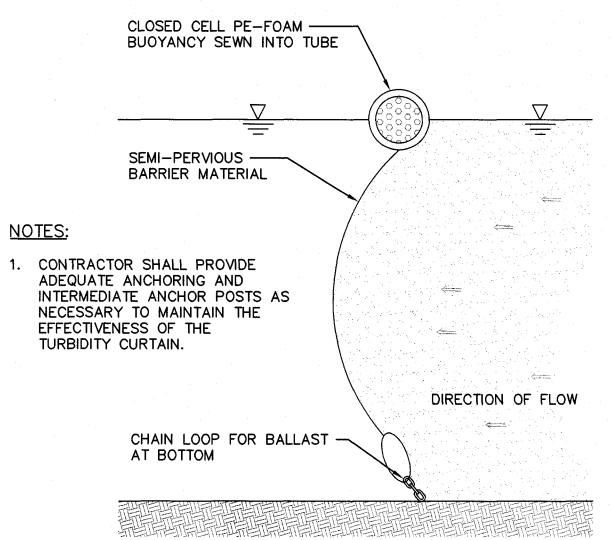
CONSTRUCTION SEQUENCE (GENERAL):

PERFORM WORK IN GENERAL IN THE FOLLOWING SEQUENCE:

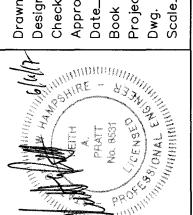
- 1. PRIOR TO START OF CONSTRUCTION, PROVIDE A WRITTEN NARRATIVE OF CONSTRUCTION METHODS TO BE USED AND A PRELIMINARY SCHEDULE OF KEY MILESTONES.
- 2. PREPARE SITE WHERE CONSTRUCTION IS PROPOSED INCLUDING ANY NECESSARY TEMPORARY FIELD OFFICE, STAGING AREAS AND RELATED FACILITIES.
- 3. INSTALL TURBIDITY CURTAIN AROUND PERIMETER OF THE WATERFRONT WORK AREA.
- 4. PREPARE DEWATERING PUMP DISCHARGE BASIN (OR EQUIVALENT BMP) IN A STABILIZED UPLAND AREA.
- 5. CONSTRUCT COFFER DAM SYSTEM TO THE LIMITS SHOWN.
- A SET OF WORKING DRAWINGS DETAILING THE COFFERDAM SYSTEM SHALL BE PREPARED BY A PROFESSIONAL ENGINEER LICENSED IN NEW HAMPSHIRE AND SUBMITTED BY THE CONTRACTOR FOR APPROVAL.
- THE WORKING DRAWINGS SHALL INCLUDE PROPOSED MATERIALS TO BE USED, CONSTRUCTION METHODS, DEWATERING AND PROVISIONS FOR FLOODING THE COFFERDAM AFTER WORK IS COMPLETED. PROPOSED MATERIALS MAY INCLUDE TRADITIONAL SHEET PILES, A PROPRIETARY DIVERSION SYSTEM OR OTHER APPROVED METHODS.
- 6. PREPARE SURROUNDING PAVEMENT SURFACES AS SHOWN AND REMOVE AS NECESSARY WITHIN THE LIMITS SPECIFIED.
- 7. DEWATER THE WORK AREA WITHIN THE COFFERDAM.
- 8. REMOVE THE EXISTING CONCRETE RAMP, RETAINING WALL AND SLAB.

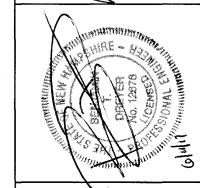
13. COMPLETE RESTORATION WORK FOR PARKING AND WALKWAY AREAS.

- 9. EXCAVATE TO SUBGRADE AND PREPARE BASE COARSE AGGREGATES.
- 10. CONSTRUCT CAST IN PLACE CONCRETE ELEMENTS (RETAINING WALLS AND RAMP SLAB).
- 11. INSTALL GUIDE RAILS AND PLACE PRE-CAST CONCRETE ELEMENTS (RAMP PLANK SEGMENTS).
- 12. ONCE ALL CONCRETE IS IN PLACE AND THE CAST IN PLACE ELEMENTS HAVE CURED SUFFICIENTLY, THE COFFERDAM CAN BE FLOODED AND REMOVED.
- 14. REMOVE TURBIDITY CURTAIN AND EROSION CONTROLS.



TURBIDITY CURTAIN
NOT TO SCALE





UNDERWOOD engineers

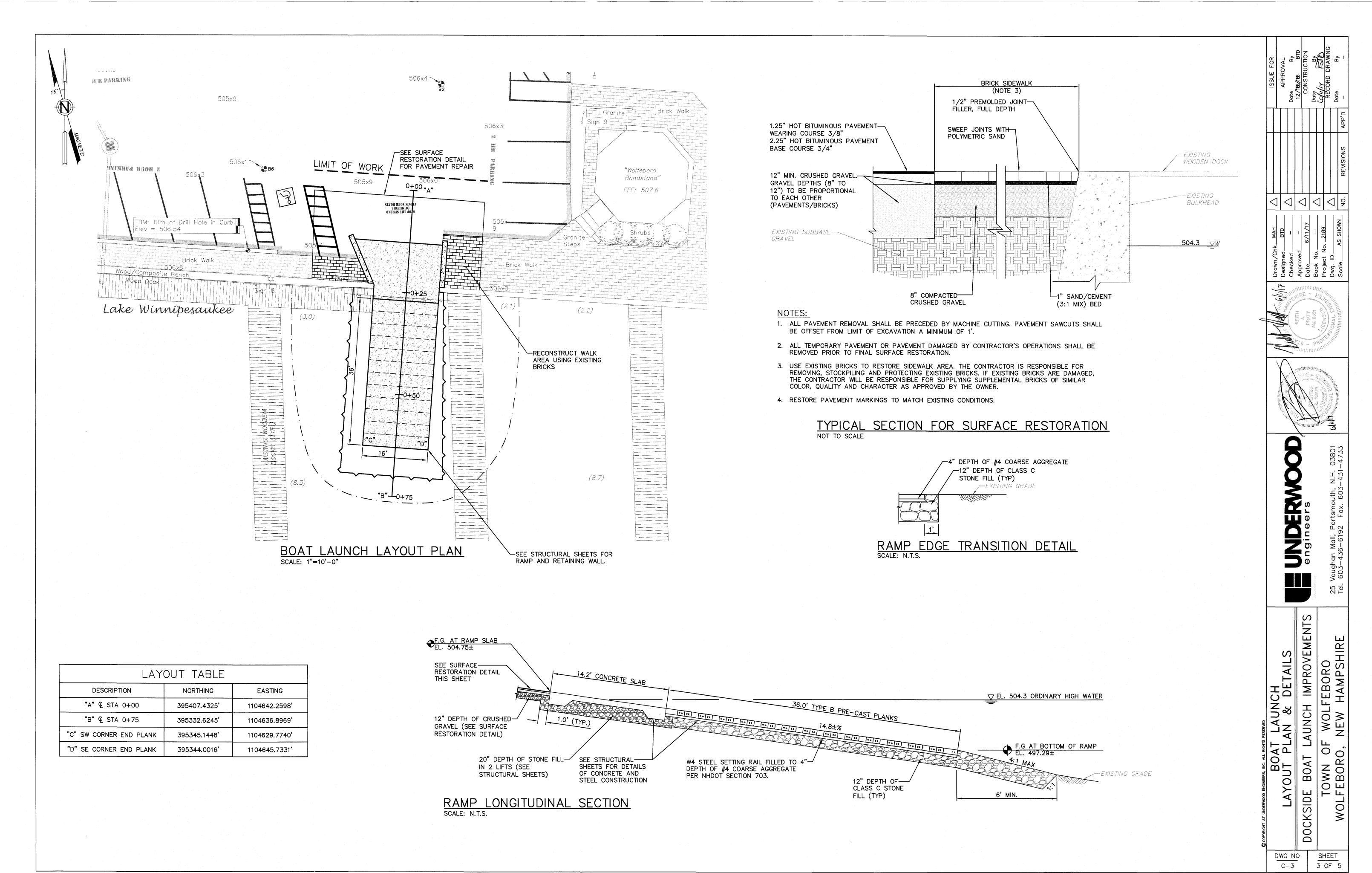
PLAN & DETAILS
AUNCH IMPROVEMENTS

PREPARATION PLAN & CKSIDE BOAT LAUNCH IMP TOWN OF WOLFEBC WOLFEBC

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DWG NO C-2

<u>SHEET</u> 2 OF 5



1 GENERAL

- 1.1 ALL MATERIALS, WORKMANSHIP, AND DETAILS SHALL CONFORM TO THE NEW HAMPSHIRE STATE BUILDING CODE, THE 2009 INTERNATIONAL BUILDING CODE AND THE REFERENCE STANDARDS INCLUDED THEREIN THAT ARE APPLICABLE TO THIS PROJECT.
- 1.2 THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE CONTRACT DRAWINGS. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE STRUCTURAL ENGINEER BEFORE PROCEEDING WITH THE AFFECTED WORK. ANY VARIATIONS OR SUBSTITUTIONS OF MATERIALS OR DETAILS FROM THOSE INDICATED ON THE DRAWINGS MAY ONLY BE MADE WITH PRIOR APPROVAL OF THE STRUCTURAL ENGINEER. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ANY AND ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, SHORING AND SAFETY PROGRAMS REQUIRED TO COMPLETE THE WORK OF THIS CONTRACT.
- 1.3 ALL STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE CIVIL AND SITE DRAWINGS AND SPECIFICATIONS. VERIFY LOCATION AND DIMENSIONS OF CHASES, INSERTS, OPENINGS, SLEEVES, WASHES, DRIPS, REVEALS, DEPRESSIONS, AND OTHER PROJECT REQUIREMENTS NOT SHOWN ON THE STRUCTURAL DRAWINGS. VERIFY AND COORDINATE ALL DIMENSIONS RELATED TO THIS PROJECT.
- 1.4 SHOP DRAWINGS ARE REQUIRED TO BE SUBMITTED FOR THE FOLLOWING STRUCTURAL COMPONENTS. SEE INDIVIDUAL MATERIAL SECTIONS FOR ADDITIONAL SUBMITTAL REQUIREMENTS.

STRUCTURAL FILL SIEVE ANALYSIS AND PROCTOR RESULTS REINFORCING STEEL (INCLUDING ALL ACCESSORIES) CONCRETE MIX DESIGNS INCLUDING ALL ADDITIVES PRECAST CONCRETE PLANK INCLUDING P.E. STAMPED CALCULATIONS

SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER AND A STAMPED APPROVAL RECEIVED BEFORE FABRICATION CAN PROCEED. THE CONTRACTOR SHALL REVIEW AND STAMP ALL SHOP DRAWINGS PRIOR TO SUBMITTAL FOR ENGINEERING REVIEW. SUBMITTED SHOP DRAWINGS WHICH HAVE NOT BEEN REVIEWED AND APPROVED BY THE CONTRACTOR SHALL BE RETURNED UNCHECKED TO THE CONTRACTOR FOR THEIR REVIEW AND APPROVAL. FAILURE TO SUBMIT SHOP DRAWINGS FOR THE REQUIRED MATERIALS SHALL RELIEVE THE ENGINEER OF RESPONSIBILITY AND LIABILITY FOR THOSE PARTS OF THE STRUCTURE AND ANY OTHER PART AFFECTED BY THE UNSUBMITTED PARTS. STRUCTURAL DESIGN DRAWINGS MAY NOT BE USED AS THE SHOP DRAWINGS AND WILL BE IMMEDIATELY REJECTED AND RETURNED IF SO SUBMITTED.

- 1.5 UNLESS OTHERWISE INDICATED, DETAILS SHOWN ON ANY DRAWING ARE TO BE CONSIDERED TYPICAL FOR ALL SIMILAR CONDITIONS.
- 1.6 NO MAIN FRAMING OR STRUCTURAL MEMBERS ARE TO BE MODIFIED, ALTERED, OR CUT WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER.
- 1.7 THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SHORING REQUIRED TO COMPLETE THE WORK OF THIS CONTRACT.
- 1.8 THESE DRAWINGS HAVE BEEN COMPILED FROM THE BEST AVAILABLE INFORMATION AND ARE NOT INTENDED TO LIMIT THE SCOPE OF THE WORK. THE CONTRACTOR MAY ENCOUNTER HIDDEN OR UNCOVERED CONDITIONS, NOT SHOWN ON THESE DRAWINGS, REQUIRING ADDITIONAL WORK FOR THE COMPLETION OF THIS CONTRACT. IT WILL BE ASSUMED THAT THE CONTRACTOR HAS INSPECTED THE SITE PRIOR TO BIDDING AND VERIFIED THE INFORMATION HEREIN SUPPLIED.

2 DESIGN LIVE LOADS

- 2.1 RETAINING WALLS: 35 PSF EQUIVALENT LATERAL FLUID ACTIVE PRESSURE 250 PSF SURCHARGE AT GRADE LEVEL ADJACENT TO RAMP
- DESIGN FOR TWO 3,000 LB WHEEL LOADS SPACED 6'-0" CENTER TO 2.2 PRECAST CONCRETE PLANK: CENTER, LOCATED ANYWHERE ALONG THE LENGTH OF THE PLANK.

3 FOUNDATIONS

- 3.1 FOUNDATION WALL FOOTINGS SHALL BEAR ON PROOF ROLLED NATURAL MATERIAL HAVING AN ALLOWABLE BEARING PRESSURE OF 3000 PSF.
- 3.2 CONTROLLED STRUCTURAL FILL SHALL CONSIST OF CLEAN GRANULAR MATERIAL FREE OF ORGANIC OR OTHER DELETERIOUS MATTER AND CONFORM TO A SIEVE ANALYSIS WHICH PRODUCES A GRAIN SIZE DISTRIBUTION CURVE FALLING ENTIRELY WITHIN THE FOLLOWING LIMITS, AS DETERMINED BY LABORATORY ANALYSIS: SCREEN OR SIEVE SIZE PERCENT PASSING BY WEIGHT

90-99% NO. 4 35-70% NO. 40 5-35% NO. 200 0-5%

FILL MATERIAL SHOULD BE PLACED IN LIFTS NOT EXCEEDING 12" IN LOOSE DEPTH FOR MATERIAL TO BE COMPACTED BY HEAVY COMPACTION EQUIPMENT, AND NOT MORE THAN 6" IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HAND OPERATED TAMPERS. PRIOR TO COMPACTION, EACH LAYER SHOULD BE MOISTENED OR AERATED AS NECESSARY TO PROVIDE OPTIMUM MOISTURE CONTENT. EACH LAYER SHALL BE COMPACTED TO 95% OF OPTIMUM DRY DENSITY AS DETERMINED BY A LABORATORY PERFORMED MODIFIED PROCTOR DENSITY TEST, ASTM D-1557. EACH LAYER OF COMPACTED STRUCTURAL FILL SHALL BE FIELD TESTED WITH A MINIMUM OF THREE (3) COMPACTION TESTS PER LAYER.

- 3.3 EXCAVATE TO LINES AND GRADES REQUIRED TO PROPERLY INSTALL THE FOUNDATION WALL FOOTINGS ON PROOF ROLLED NATURAL SOIL. REMOVE ALL TOPSOIL AND ORGANIC MATERIAL FROM UNDER SLABS ON GRADE. ALL EXCAVATIONS SHALL BE DRY BEFORE PLACING ANY CONCRETE. PROOF ROLL THE BOTTOM OF ALL EXCAVATIONS WITH A HAND OPERATED VIBRATORY ROLLER OR HEAVY PLATE COMPACTOR.
- 3.4 EXTERIOR WALL FOOTINGS ARE TO BE PLACED ON NATURAL SOIL AT A MINIMUM DEPTH OF 4'-6" BELOW THE LOWEST ADJACENT GROUND SURFACE EXPOSED TO FREEZING. ANY ADJUSTMENT OF ELEVATIONS OF FOOTINGS DUE TO FIELD CONDITIONS MUST HAVE THE EXPRESSED APPROVAL OF THE STRUCTURAL ENGINEER.
- 3.5 BACKFILLING AGAINST FOUNDATION WALLS SHALL BE DONE ONLY AFTER WALLS ARE BRACED TO PREVENT MOVEMENT OR SHALL BE DONE EQUALLY ON BOTH SIDES OF THE WALL. RETAINING WALLS SHALL BE BACKFILLED EQUALLY ON BOTH SIDES OF THE WALL UP TO THE LOWER SOIL ELEVATION AND THEN ON THE HIGHER SOIL SIDE. RETAINING WALL CONCRETE STRENGTH SHALL BE NOT LESS THAN THE DESIGN STRENGTH OF THE CONCRETE PRIOR TO BACKFILLING THE HIGH SIDE OF THE WALL.
- 3.6 BACKFILL THE FOUNDATION WALLS WITH APPROVED STRUCTURAL FILL PLACED IN 12-INCH OR 6 INCH LAYERS AND COMPACTED TO 95% DENSITY AT OPTIMUM MOISTURE CONTENT AS DEFINED BY ASTM D1557, METHOD D.
- 3.7 SLAB ON GRADE SHALL BE PLACED ON A 12" THICK LAYER OF COMPACTED STRUCTURAL FILL OVER AN 8" THICK LAYER OF 1 1/2" CRUSHED STONE, WITH THE TWO LAYERS SEPARATED BY FILTER FABRIC, MIRAFI 140N, OR APPROVED EQUAL.
- 3.8 WHERE NEW FOUNDATIONS ARE BUILT IN THE SAME LOCATION AS REMOVED EXISTING FOUNDATIONS, THEY SHALL BEAR ON UNDISTURBED SOIL AT OR BELOW THE ELEVATION OF THE EXISTING FOUNDATIONS UNLESS OTHERWISE INDICATED.
- 3.9 [XXX'-X"] INDICATES BOTTOM OF FOOTING ELEVATION.

4 CAST-IN-PLACE CONCRETE

- 4.1 CONCRETE WORK SHALL CONFORM TO THE LATEST EDITIONS OF: BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318), SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS (ACI 301), AND STANDARD SPECIFICATION FOR COLD WEATHER CONCRETING (ACI 306.1).
- 4.2 CONCRETE SHALL BE NORMAL WEIGHT, APPROVED, READY-MIXED CONCRETE HAVING AN ULTIMATE COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS FOR ALL CONCRETE UNLESS NOTED OTHERWISE. SLUMP SHALL BE 2-4 INCHES AND SHALL BE MEASURED AT THE POINT OF DISCHARGE FROM PUMP OR TRUCK CLOSEST TO THE PLACEMENT LOCATION.
- 4.3 ALL CONCRETE SHALL BE AIR ENTRAINED WITH 5-7% AIR BY VOLUME.
- 4.4 ABSOLUTELY NO CALCIUM CHLORIDE MAY BE USED IN ANY CONCRETE.
- 4.5 REINFORCING SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60.
- 4.6 FIBER REINFORCEMENT FOR CONCRETE CRACK CONTROL SHALL BE "GRACE FIBERS" CONFORMING TO ASTM C1116, TYPE 3. FIBERS SHALL BE ADDED AT A DOSAGE RATE OF 1.5 LBS PER CUBIC YARD
- 4.7 DETAILING, FABRICATION, AND ERECTION OF REINFORCEMENT, UNLESS OTHERWISE NOTED, SHALL CONFORM TO ACI DETAILING MANUAL (SP-66) IN ADDITION TO THE ABOVE CODES AND SPECIFICATIONS.
- 4.8 PLACE CONCRETE BY APPROVED METHODS OF ACI 304, RECOMMENDED PRACTICE FOR MEASURING, MIXING, TRANSPORTING AND PLACING CONCRETE. CONSOLIDATE CONCRETE BY MECHANICAL VIBRATION. DO NOT USE VIBRATORS FOR MOVING CONCRETE IN FORMS.
- 4.9 PLACE REINFORCING USING STANDARD BAR SUPPORTS TO PROVIDE PROPER CLEARANCE AND PREVENT DISPLACEMENT DURING CONCRETE OPERATIONS.
- MINIMUM CONCRETE COVER FOR REINFORCEMENT SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE:
 - * UNFORMED SURFACES IN CONTACT WITH GROUND OR EXPOSED TO WEATHER .. * FORMED SURFACES IN CONTACT WITH GROUND,
 - EXPOSED TO WEATHER OR WATER 2 INCHES * SLABS ON GRADE
- 4.11 PROPERLY BRACE AND SHORE FORMWORK TO MAINTAIN ALIGNMENT AND TOLERANCES IN ACCORDANCE WITH ACI 347.
- 4.12 LAP ALL REINFORCING BARS 48 BAR DIAMETERS UNLESS NOTED OTHERWISE.
- 4.13 INSTALLATION OF REINFORCEMENT SHALL BE COMPLETED AT LEAST 24 HOURS PRIOR TO SCHEDULED CONCRETE PLACEMENT. NOTIFY ENGINEER OF COMPLETION AT LEAST 24 HOURS PRIOR TO SCHEDULED REINFORCEMENT PLACEMENT COMPLETION.

5 PRECAST CONCRETE

- 5.1 ALL PRECAST CONCRETE SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE PCI DESIGN HANDBOOK - PRECAST AND PRESTRESSED CONCRETE, MNL-120, PCI MANUAL FOR THE DESIGN OF HOLLOW-CORE SLABS, MNL-126, AND PCI MANUAL FOR QUALITY CONTROL FOR PLANTS AND PRODUCTION OF PRECAST AND PRESTRESSED CONCRETE PRODUCTS, MNL-116. THE PRECAST CONCRETE MANUFACTURER SHALL BE A PCI CERTIFIED
- 5.2 ALL PRECAST CONCRETE SHALL HAVE AN ULTIMATE COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
- 5.3 ALL PRECAST PLANK SHALL BE DESIGNED USING MILD REINFORCING STEEL ONLY. CONCRETE COVER ON ALL REINFORCING STEEL SHALL BE 3" UNLESS OTHERWISE NOTED.
- 5.4 ALL MILD REINFORCING STEEL SHALL CONFORM TO ASTM A615. GRADE 60.
- 5.5 ALL PRECAST CONCRETE MEMBERS SHALL BE DESIGNED FOR LOADS INDICATED ON THE DRAWINGS IN ADDITION TO THE DEAD WEIGHT OF THE MEMBER.
- 5.6 SHOP DRAWINGS OF ALL PRECAST CONCRETE SHALL BE SUBMITTED FOR REVIEW AND APPROVAL. SHOP DRAWINGS SHALL INCLUDE ALL ERECTION PLANS AND DETAILS AS WELL AS DESIGN CALCULATIONS FOR EACH DIFFERENT PIECE OF PRECAST CONCRETE, STAMPED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE STRUCTURAL ENGINEERING IN THE STATE OF **NEW HAMPSHIRE.**

6 STRUCTURAL STEEL

- 6.1 ALL STRUCTURAL STEEL WORK SHALL CONFORM TO "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS"- AISC, "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"- AISC, AND "STRUCTURAL WELDING CODE-STEEL"- AWS D1.1.
- 6.2 STRUCTURAL STEEL W SHAPES SHALL CONFORM TO ASTM A992. STRUCTURAL STEEL ANGLES AND PLATES SHALL CONFORM TO ASTM A36.
- 6.3 ANCHOR RODS FOR EMBEDMENT IN CONCRETE SHALL CONFORM TO ASTM A36 AND SHALL BE HOT DIP GALVANIZED. STEEL TO STEEL CONNECTION BOLTS SHALL CONFORM TO ASTM A325N AND SHALL BE 3/4" DIAMETER UNLESS NOTED OTHERWISE OR REQUIRED BY THE FABRICATOR'S CONNECTION DESIGN. ALL BOLTS, NUTS, WASHERS AND RODS SHALL BE HOT DIP GALVANIZED.
- 6.4 THE FABRICATOR SHALL DESIGN ALL CONNECTIONS NOT SPECIFICALLY DETAILED. CONNECTIONS SHALL BE DESIGNED AS SHEAR BEARING JOINTS UNLESS NOTED OTHERWISE. THE FABRICATOR SHALL SUBMIT ALL OTHER PROPOSED CONNECTION DETAILS FOR GENERAL REVIEW PRIOR TO SUBMISSION OF THE STRUCTURAL STEEL SHOP DRAWINGS.
- 6.5 WELDING ELECTRODES SHALL BE E70XX SERIES.
- 6.6 ALL STEEL, INCLUDING CONNECTORS, SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 AND A153.
- 6.7 SHOP FABRICATE ALL MEMBERS AND CONNECTIONS TO MAXIMUM EXTENT POSSIBLE USING WELDING OR BOLTING. USE BOLTED FIELD CONNECTIONS UNLESS SPECIFICALLY NOTED OTHERWISE. FIELD WELDING OF ANY HOT DIP GALVANIZED MATERIAL IS NOT PERMITTED.
- 6.8 STRUCTURAL STEEL FRAMING SHALL BE TRUE AND PLUMB BEFORE CONNECTIONS ARE FINALLY

7 ABBREVIATIONS

CENTER TO CENTER CONC CONCRETE CONT. CONTINUOUS CTRD. CENTERED DWGS. DRAWINGS DWLS. DOWELS E.F. EACH FACE EACH ELEV **ELEVATION** EMBED. **EMBEDMENT** EX. OR EXIST. EXISTING FOUNDATION FTG FOOTING HOT DIP GALVANIZED HDG HORIZ HORIZONTAL JOINT MINIMUM NOT TO SCALE OUTSIDE FACE 0.H. OPPOSITE HAND ON CENTER PLATE POUNDS PER LINEAR FOOT POUNDS PER SQUARE FOOT **REINF** REINFORCING REQ'D REQUIRED S.O.G. SLAB ON GRADE SECT. SECTION SHEET SIM SIMILAR STD STANDARD STEEL T.O. TOP OF T.O.S. TOP OF SLAB

TOP OF WALL

VERIFY IN FIELD

UNLESS NOTED OTHERWISE

TYPICAL

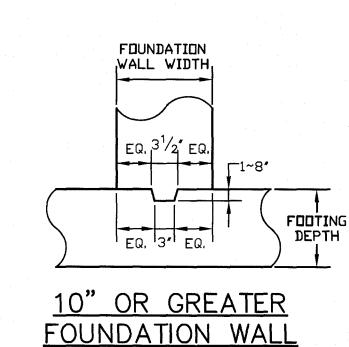
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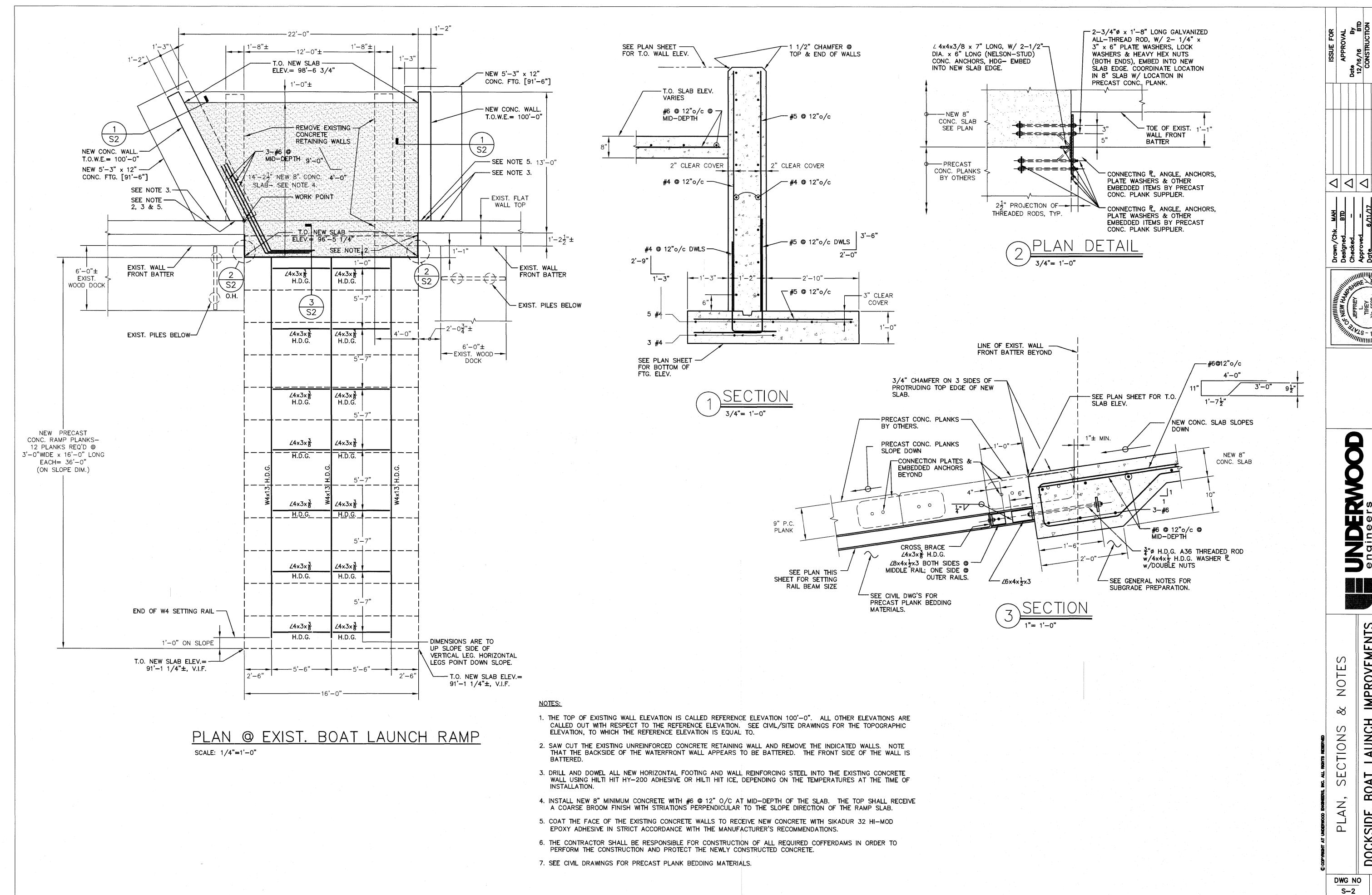
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IMPROVEMENTS LAUNCH

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