

# SALEM PORT EXPANSION PROJECT

## SALEM, MA

# COMMERCIAL MARINA

DECEMBER 2015

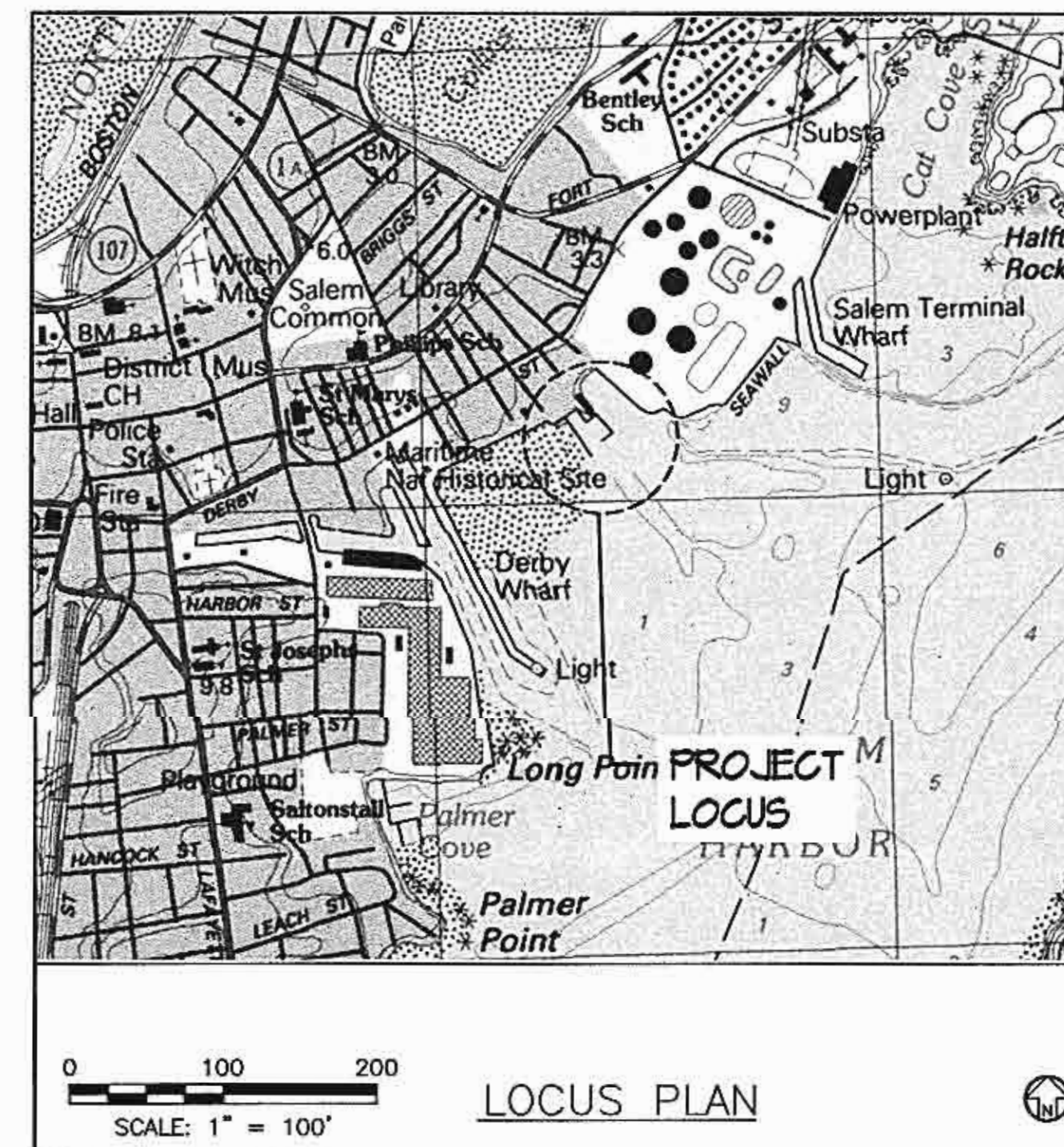
**Project Owner:**

**CITY OF SALEM**  
CITY HALL ANNEX  
120 WASHINGTON STREET  
SALEM, MA 01970

**Design Team:**

**Bourne Consulting Engineering - Waterfront Engineers**  
Franklin, MA

**RDK Engineers - Electrical Engineering**  
Andover, MA





**SITE ENVIRONMENTAL CONTROLS:**

- NO EXCAVATION OF UPLAND AREAS IS ANTICIPATED WITHIN PROJECT SCOPE.
- THE SITE HAS AN "ACTIVITY USE LIMITATION" (AUL). NO EXCAVATION OF UPLAND AREAS SHALL OCCUR WITHOUT THE APPROVAL BY THE CITY.
- WHERE EXCAVATION IS AUTHORIZED THE CONTRACTOR SHALL BE AWARE AND COMPLY WITH "THE HEALTH AND SAFETY PLAN" (HASP) AND "SOIL MANAGEMENT PLAN" (SMP) AND HAVE A COPY ON SITE AT ALL TIMES.
- ALL EXCAVATED MATERIAL HANDLING SHALL BE IN CONFORMANCE WITH THE SITE HASP AND SMP.

**OSHA REQUIREMENTS:**

- PURSUANT TO M.G.L. c.30, §39S, ANY PERSON SIGNING A CONTRACT TO WORK ON A PUBLIC BUILDING OR PUBLIC WORKS PROJECT ESTIMATED TO COST MORE THAN \$10,000, MUST CERTIFY UNDER THE PAINS AND PENALTIES OF PERJURY THAT ALL EMPLOYEES EMPLOYED ON THE WORKSITE, OR IN WORK SUBJECT TO THE BID, HAVE SUCCESSFULLY COMPLETED AT LEAST TEN HOURS OF OSHA APPROVED TRAINING. PROOF OF OSHA CERTIFICATION OF ALL WORKERS ONSITE WILL BE REQUIRED BY THE CITY PRIOR TO THE START OF WORK.

**CODES:**

- AMERICAN CONCRETE INSTITUTE (ACI-318-14).
- CONCRETE REINFORCING STEEL INSTITUTE (CRSI 2009).
- MASSACHUSETTS STATE BUILDING CODE 8TH EDITION.
- THE COMMONWEALTH OF MASSACHUSETTS, DEPARTMENT OF PUBLIC WORKS "STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES" (1988 EDITION AND THE 25 FEBRUARY 2010 SUPPLEMENTAL SPECIFICATIONS) (MHD).

**SURVEY CONTROL AND BASELINES:**

- TOPOGRAPHIC DATA AND SITE FEATURES SHOWN HEREON WERE COLLECTED ON MARCH 17, 2009, MARCH 19, 2009 AND MAY 28, 2009 BY NITSCH ENGINEERING AND HYDROGRAPHIC DATA SHOWN TAKEN FROM BOURNE CONSULTING ENGINEERING, P.C. PLAN ENTITLED "POST DREDGE SURVEY" FOR DREDGE PHASE I DATED 01/21/13 AND CAN ONLY REFLECT CONDITIONS AS THEY EXISTED DURING THE TIME OF THE SURVEY.
- COORDINATES ARE BASED ON MASSACHUSETTS (MAINLAND) STATE PLANE COORDINATE SYSTEM (NAD 83) AND ARE EXPRESSED IN FEET.
- ELEVATIONS ARE SHOWN IN FEET AND TENTHS BASED ON MEAN LOW WATER (MLW) DATUM. SEE TIDAL DATUM GRAPHIC FOR DATUM CONVERSION.
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN AS APPROXIMATE ONLY, AND ARE BASED ON UTILITY COMPANY RECORDS AND LOCATION OF OBSERVABLE FEATURES. OWNER MAKES NO WARRANTY OR GUARANTEE TO THE ACCURACY OF THE LOCATION OF UNDERGROUND UTILITIES.
- BORING LOCATIONS ARE SHOWN ON SHEET 3 AND BORING LOGS ON SHEETS 4 THROUGH 6.
- EXISTING SURVEY CONTROL POINTS ARE PROVIDED AND SHOWN ON SHEET 3. THE CONTRACTOR SHALL INSTALL ADDITIONAL SURVEY CONTROL AS NECESSARY TO PERFORM THE WORK. PERMANENT SURVEY CONTROL (AT LEAST 2 POINTS) SHALL BE ESTABLISHED FOR THE PROJECT AND PROTECTED FROM DAMAGE DURING CONSTRUCTION AND PROVIDED ON AS-BUILT DRAWINGS.
- THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN PROJECT BASELINES AND CONTROL AS REQUIRED TO ENSURE ACCURATE LOCATION OF ALL ELEMENTS OF THE PROJECT.

**SITE ACCESS AND STAGING AREAS:**

- CONTRACTOR STAGING AREA SHALL BE LOCATED WITHIN THE PROJECT LIMITS AS SHOWN ON SHEET 7.
- CONTRACTOR TO MAINTAIN A MINIMUM 2-WAY TRAVEL LANE ALONG BLANEY STREET. AREA SHALL BE KEPT CLEAR AT ALL TIMES UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE ENGINEER.
- NO MATERIALS OR EQUIPMENT SHALL BE STORED WITHIN THE LIMITS OF BLANEY STREET UNLESS APPROVED BY ENGINEER.
- THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR WORK SITE SECURITY. CONTRACTOR SHALL PROVIDE CHAIN LINK FENCING AROUND PERIMETER OF WORK AREA AND STAGING AREA TO PREVENT PUBLIC ACCESS AND PROVIDE PUBLIC SAFETY. THE FENCE SHALL BE A MINIMUM OF 6' HIGH AND CONSTRUCTED OF GALVANIZED STEEL CHAIN LINK WITH POSTS AT 8' ON CENTER. FENCE SHALL BE SUPPORTED BY CONCRETE BLOCKS TO RECEIVE POSTS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SAFETY. ALL CONSTRUCTION ACTIVITY SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL AND STATE REGULATIONS.

**SITE PREPARATION:**

- CONTRACTOR SHALL INSTALL ALL SIGNAGE PRIOR TO INITIATION OF CONSTRUCTION ACTIVITIES INCLUDE OWNER PROJECT SIGNAGE, DEP FILE NUMBER AND FEDERAL AND STATE MANDATED WORK PLACE SIGNAGE.
- CONTRACTOR SHALL HAVE IN-PLACE TRASH AND SANITARY FACILITIES FOR THE WORK PLACE.
- EXISTING STRUCTURES AND AMENITIES WITHIN THE PROXIMITY OF THE WORK SHALL BE PROTECTED TO PREVENT ACCIDENTAL DAMAGE BY CONSTRUCTION ACTIVITIES.
- DISCOVERY OF INCONSISTENT SITE INFORMATION OR CONDITIONS ARE TO BE IMMEDIATELY CONVEYED TO THE OWNER AND ENGINEER PRIOR TO COMMENCING OR CONTINUING CONSTRUCTION.
- THE CONTRACTOR SHALL NOTIFY DIG-SAFE PRIOR TO COMMENCING ANY WORK.
- LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY EXACT LOCATIONS OF UTILITIES AS MAY BE REQUIRED. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES OCCURRING AS A RESULT OF THE CONTRACTOR'S FAILURE TO LOCATE AND PROTECT UNDERGROUND UTILITIES. ALL REPAIRS SHALL BE MADE AT THE CONTRACTOR'S EXPENSE.
- CONTRACTOR SHALL MAINTAIN AND PROTECT ALL EXISTING UTILITIES AND DRAINAGE AT ALL TIMES. THE CONTRACTOR SHALL REPAIR ANY DAMAGE AND RESTORE TO THE PRE-EXISTING CONDITION AT NO COST TO THE OWNER.
- CONTRACTOR SHALL SUPPLY AND INSTALL APPROVED FILTER FABRIC IN CATCH BASINS AND COVER AS REQUIRED TO PREVENT CONSTRUCTION RELATED FILL OR OTHER MATERIAL FALLING INTO CATCH BASIN WITHIN STAGING AND WORK AREAS.
- CONTRACTOR SHALL CLEAN OUT ALL CATCH BASINS AND OTHER DRAINAGE STRUCTURES ON COMPLETION OF WORK.
- CONTRACTOR SHALL SUPPLY ALL NECESSARY TEMPORARY UTILITIES FOR CONSTRUCTION INCLUDING WATER, POWER, LIGHTING, DATA AND TELEPHONE.
- CONTRACTOR SHALL READ AND UNDERSTAND ALL REGULATORY CONDITIONS ASSOCIATED WITH THE PROJECT AND SHALL COMPLY WITH ALL ENVIRONMENTAL REQUIREMENTS AND PERMIT CONDITIONS.
- CONTRACTOR SHALL CONFINE ALL OTHER TEMPORARY STOCKPILES OF EXCAVATED MATERIAL OR IMPORTED FILL USING HAY BALES AND FILTER FABRIC.
- CONTRACTOR SHALL PROVIDE A CONFINED CONCRETE TRUCK WASHDOWN AREA AT A LOCATION TO BE APPROVED BY THE ENGINEER. WASHDOWN AREA SHALL INCLUDE PROTECTION TO PAVEMENT, A PERIMETER WALL AND A FILTER FABRIC LINER. NO RUNOFF CONTAINING CEMENT OR OTHER SUSPENDED SOLIDS WILL BE PERMITTED. ALL MATERIALS SHALL BE COMPLETELY REMOVED ON COMPLETION OF CONSTRUCTION AND DISPOSED OF AT AN APPROVED DISPOSAL LOCATION.

**EARTHWORK (IF REQUIRED):**

- EARTHWORK MATERIALS TO MEET THE FOLLOWING STANDARDS:
  - GRANULAR BORROW/FILL MHD M1.01.0
  - GRAVEL BORROW TYPE C MHD M1.03.0
  - DENSE GRADED CRUSHED STONE FOR SUBBASE MHD M2.01.7
  - CRUSHED STONE MHD M2.01.0
  - UNDERLAYER STONE MHD M2.02.4
- ORDINARY FILL BORROW:
  - COVER MATERIAL SHALL BE EXISTING SUITABLE GRANULAR MATERIAL FOR REUSE WITH MAXIMUM 4" STONE.

**MARINA TIMBER FLOATS:**

- UNLESS OTHERWISE SPECIFIED, ALL TIMBER TO BE USED SHALL BE NO. 1 AND BETTER SOUTHERN PINE AS GRADED BY SPIB AND WITH DESIGN VALUES PER NFPA NATIONAL DESIGN SPECIFICATION OR THE EQUIVALENT FOR DOUGLAS FIR AS GRADED BY WCLIB AND WWPA.
- ALL TIMBER SHALL BE NEW AND SUPPLIED WITH NOMINAL DIMENSIONS UNLESS OTHERWISE NOTED.
- ALL NEW SOUTHERN YELLOW PINE AND DOUGLAS FIR TIMBER MEMBERS TO WHICH THE PUBLIC MAY BE EXPOSED SHALL BE TREATED WITH ALKALINE COPPER QUATERNARY (ACQ) IN ACCORDANCE WITH AWPA & AWPB W/ MINIMUM RETENTION OF 0.40 LBS. PER CUBIC FOOT. ALL OTHER SOUTHERN YELLOW PINE MEMBERS SHALL BE CCA TREATED TO 2.5 PCF RETENTION.
- ALL DECKING SHALL BE TROPICAL HARDWOOD SUCH AS IPE.
- MISC. HARDWARE: GALVANIZED STEEL PLATES AND ALL BOLTS AND RELATED HARDWARE SHALL BE FASHIONED FROM STEEL AND GALVANIZED AFTER FABRICATION AND IN ACCORDANCE WITH REQUIREMENTS OF ASTM A123, AND/OR A153. BOLTS AND NUTS SHALL CONFORM TO ASTM A307.
- CONNECTION HARDWARE SHALL BE FABRICATED FROM ASTM-A36 GRADE STEEL WITH MINIMUM THICKNESS 1/4"

**STEEL:**

- STEEL PIPE PILES SHALL CONFORM TO ASTM A252, GRADE 3 AND THE FOLLOWING:
  - MOORING PILES:
    - 14" W/ 0.500" WALL
    - TIP ELEVATION: -46.0 MLW
    - COATING OF MOORING PILE SHALL BE FUSION BONDED EPOXY.

**LIVE LOADS:**

- PEDESTRIAN ACCESS: 100 PSF
- GANGWAY: 100 PSF
- FLOATS
  - 40 PSF WITH ZERO FREEBOARD
  - 20 PSF WITH 8 INCH FREEBOARD

**WAVE/WAKE DESIGN**

EXTREME WAVE HEIGHT: Hs=4', Hm=5.1', PERIOD=3.7 SEC.  
 25YR RETURN WAVE: Hs=2', Hm=2.5', PERIOD=3.7 SEC.  
 WAKE: 2'

**LEGEND**

- ⊗ CATCH BASIN
- ⊗ DRAIN MANHOLE
- ⊗ ELECTRIC MANHOLE
- ⊗ SEWER MANHOLE
- ⊗ TELEPHONE MANHOLE
- ⊗ HYDRANT
- ⊗ LIGHT POLE
- ⊗ UTILITY POLE
- ⊗ UTILITY POLE WITH LIGHT
- ⊗ WATER GATE
- ⊗ WATER SHUT OFF VALVE
- ⊗ SALEM WATER WORKS HAND HOLE
- ⊗ FIRE DEPARTMENT CONNECTION TO SPRINKLER
- ⊗ FIRE ALARM CALL BOX
- ⊗ GATE POST
- ⊗ METAL POST
- ⊗ SIGN POST
- ⊗ GAS GATE
- ⊗ GAS SHUT OFF VALVE
- ⊗ DECIDUOUS TREE WITH TRUNK DIAMETER
- ⊗ CONIFEROUS TREE WITH TRUNK DIAMETER
- R= RM ELEVATION EQUALS
- I= INVERT ELEVATION EQUALS
- N.P.V. NO PIPES VISIBLE
- T.O.D.= TOP OF DIRT ELEVATION EQUALS
- T.O.W.= TOP OF WATER ELEVATION EQUALS
- B.C.= BOTTOM OF CHANNEL ELEVATION EQUALS
- W.F. WOOD FENCE
- L.S. LANDSCAPED AREA
- BT BITUMINOUS
- CONC. CONCRETE
- C.L.F. CHAIN LINK FENCE
- V.G.C. VERTICAL GRANITE CURB
- O.H.W. OVERHEAD WIRES
- T.W. TOP OF WALL
- LOW LIMIT OF WORK
- HB HAY BALES
- IB IRIS BARRIER/SILT CURTAIN
- WBH WATERBRIGHT BULKHEAD
- FR FREEBOARD
- N.I.C. NOT IN CONTRACT
- IN IN PLACE
- O.C. ON CENTER
- REB REBUILT
- THD THREADED
- REQD REQUIRED
- HD HEAVY DUTY
- SHR SOIL MANAGEMENT PLAN
- PL PLATE
- PLT PLATE
- C.L. CENTERLINE
- M.H.W. MEAN HIGH WATER
- H.T.L. HIGH TIDE LINE
- M.H.H.W. MEAN HIGHER HIGH WATER
- M.L.W. MEAN LOWER LOW WATER
- DEL DOUBLE
- SAW SURFACED ARC WELDING
- SS STAINLESS STEEL
- PROP PROPERTY LINE
- DIAM DIAMETER
- ⊕ BENCH MARK
- 14.53TW TOP OF WALL ELEVATION
- 1460 SPOT GRADE ELEVATION
- MLW MEAN LOW WATER
- D UNDERGROUND DRAIN LINE
- E UNDERGROUND ELECTRIC LINE
- G UNDERGROUND GAS LINE
- S UNDERGROUND SEWER LINE
- T UNDERGROUND TELEPHONE LINE
- W UNDERGROUND WATER LINE
- OHV OVERHEAD WIRES

- WB-1(97) ⊕ WATER BORINGS (CONTECH)
- LB-1(97) ⊗ LAND BORINGS CONTECH)
- WB98-1 ⊕ WATER BORINGS (NEW HAMPSHIRE BORING)
- TP-101(01) ⊗ TEST PIT (TRC)
- MW-102(01) ⊕ MONITORING WELL (TRC)
- N/A ⊕ SURFACE SOIL SAMPLE (MARCH 2001)(TRC)
- MW-107(04) ⊕ MONITORING WELL (TRC)
- B-108(04) ⊗ LAND BORING (TRC)
- BORING 1(07) ⊗ LAND BORINGS (HAWTHORNE COVE MARINA)
- WB-1(09) ⊕ WATER BORINGS (GSI)
- CP-1(09) ⊕ WATER BORINGS (GSI)
- HW-1(09) ⊗ LAND BORINGS (GSI)
- TP-1(09) ⊗ TEST PITS (2009) (GSI)

**DATUM CONVERSION-SALEM WHARF**

	MLLW	MLW	NGVD29	NAVD
100 YR FLOOD (UPLAND)	16.5	16.2	11.8	11.0
HTL	11.3	11.0	6.6	5.8
MHHW	9.7	9.4	5.0	4.2
MHW	9.2	8.9	4.5	3.7
NAVD	5.5	5.2	0.8	0.0
NGVD29	4.7	4.4	0.0	-0.8
MLW	0.3	0.0	-4.4	-5.2
MLLW	0.0	-0.3	-4.7	-5.5

DATUM: Mean Low Water MLW  
 100 YR FLOOD +16.2  
 HTL +11.0  
 MHHW +8.9  
 NGVD +4.4  
 MLW 0.0

**LIST OF DRAWINGS @**

- Title Sheet
- Drawing List, Legend, Abbreviation & General Notes
- Existing Conditions
- Boring Logs-1
- Boring Logs-2
- Boring Logs-3
- Contractor Staging Area
- Proposed Conditions
- Marina Layout Plan
- Floot Details
- Gangway Landing Plan & Details
- Marina Utility Plan
- Electrical Site Plan



**DRAWING LIST, LEGEND, ABBREVIATIONS & GENERAL NOTES**

**COMMERCIAL MARINA SALEM PORT EXPANSION PROJECT**  
 CITY OF SALEM  
 SALEM, MA  
 DECEMBER 2015



DRAWN: JSF  
 CHECKED: KDB  
 APPROVED: RRB  
 DATE: 12/14/15

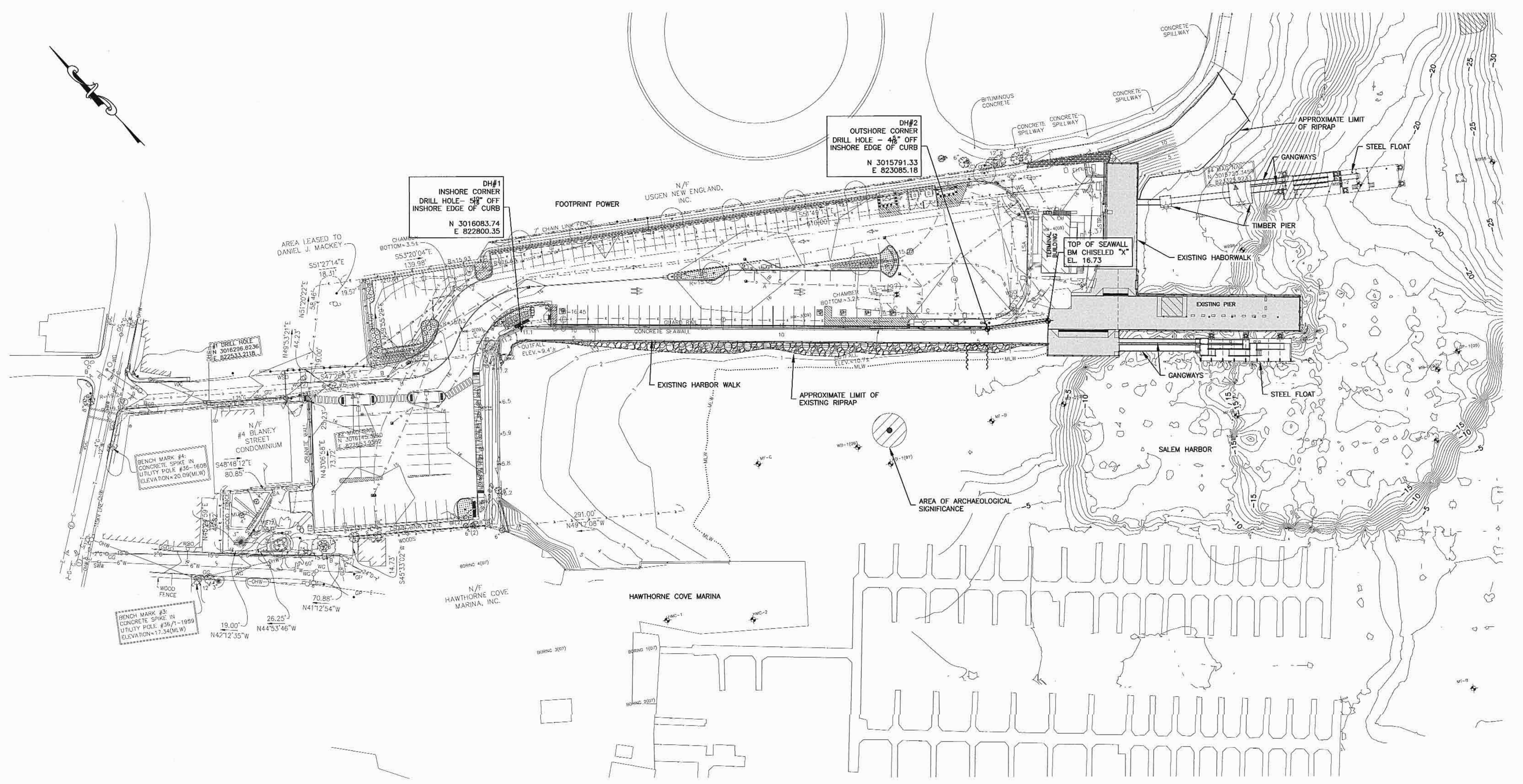
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SHEET 2 OF 13

REVISIONS



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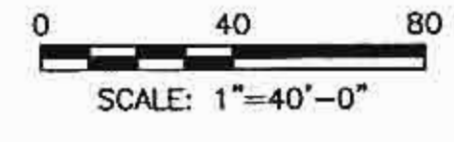


### EXISTING CONDITIONS

COMMERCIAL MARINA  
SALEM PORT EXPANSION PROJECT  
CITY OF SALEM  
SALEM, MA  
DECEMBER 2015



*Handwritten signature and date: 12/15/15*



	<b>Bourne Consulting Engineering, PC</b> <small>3 Bent Street Franklin, MA 02038 TEL (508) 533-6666 FAX (508) 533-6660</small>	
	DRAWN: JSF CHECKED: KDB APPROVED: RRB DATE: 12/14/15	DRAWING NO. 34005-02-03 SHEET 3 OF 13
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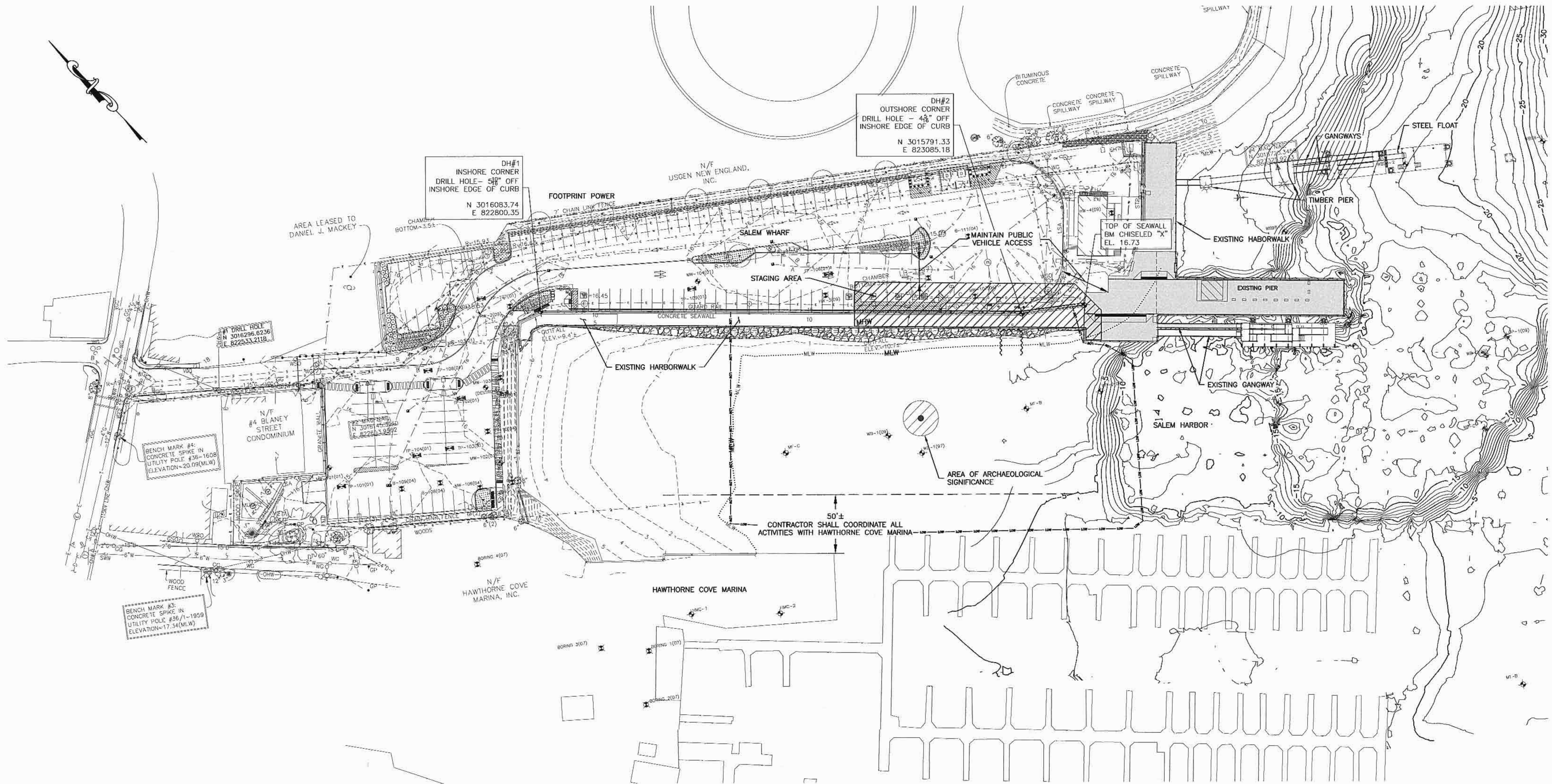






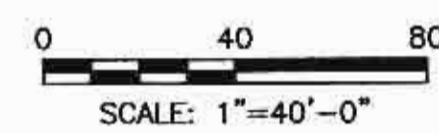


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# CONTRACTOR STAGING AREA

COMMERCIAL MARINA  
SALEM PORT EXPANSION PROJECT  
CITY OF SALEM  
SALEM, MA  
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NO.	DATE	REVISIONS

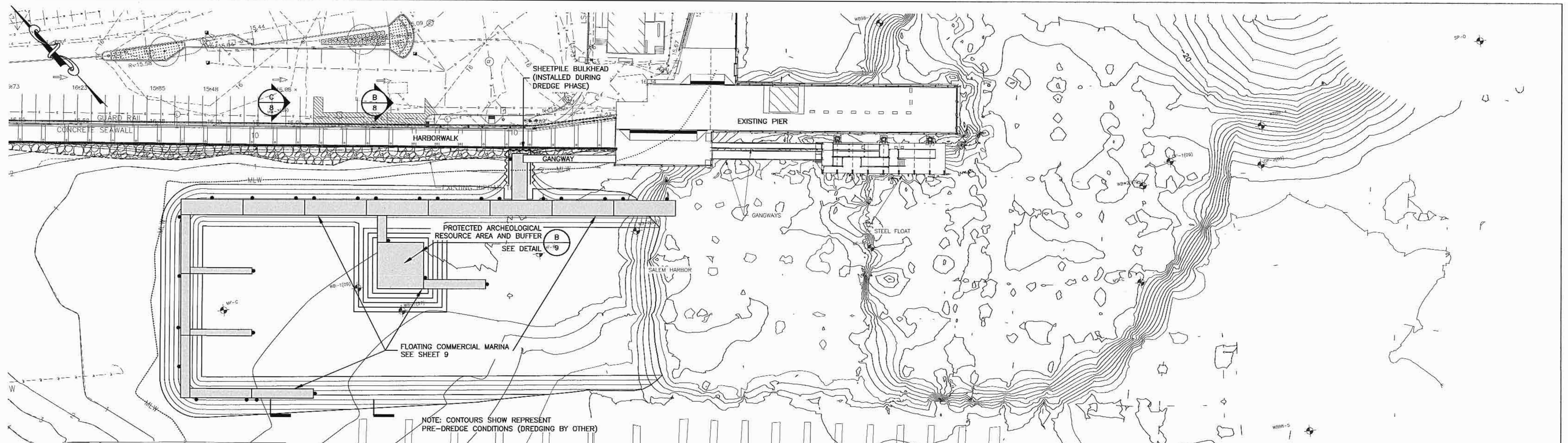
**BCE** Bourne Consulting Engineering, PC  
3 Bent Street, Franklin, MA 02038  
TEL (508) 533-6666 FAX (508) 533-6600

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APPROVED: RRB  
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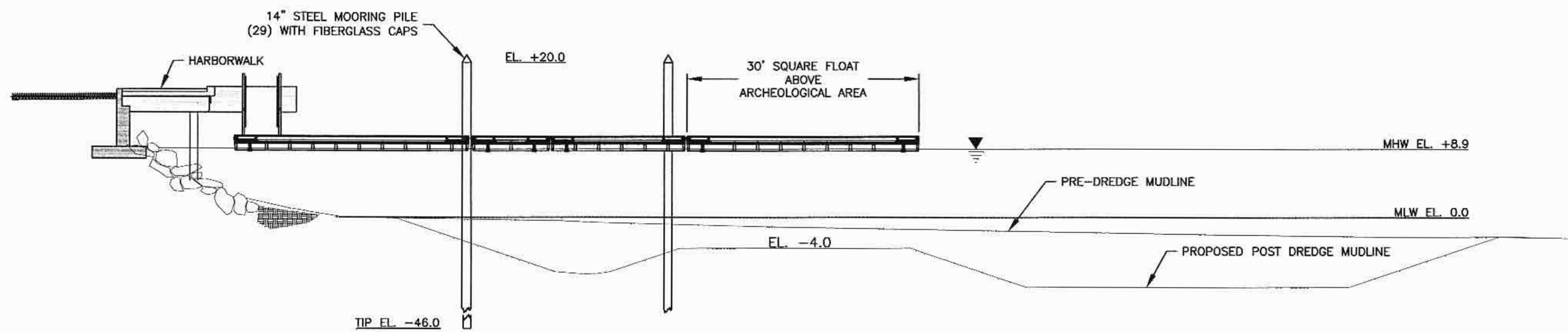
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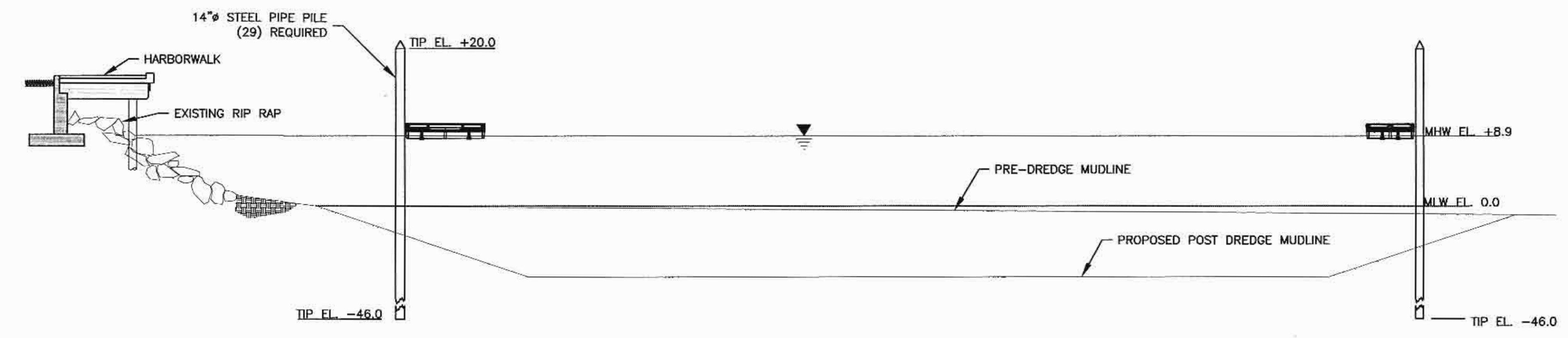
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**PROPOSED CONDITIONS-PLAN**  
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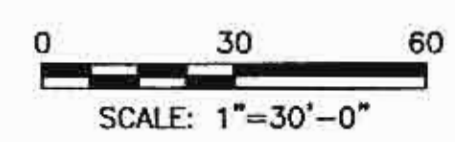
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**PROPOSED CONDITIONS-SECTION**  
 SCALE: 1"=10'-0"

**PROPOSED CONDITIONS**

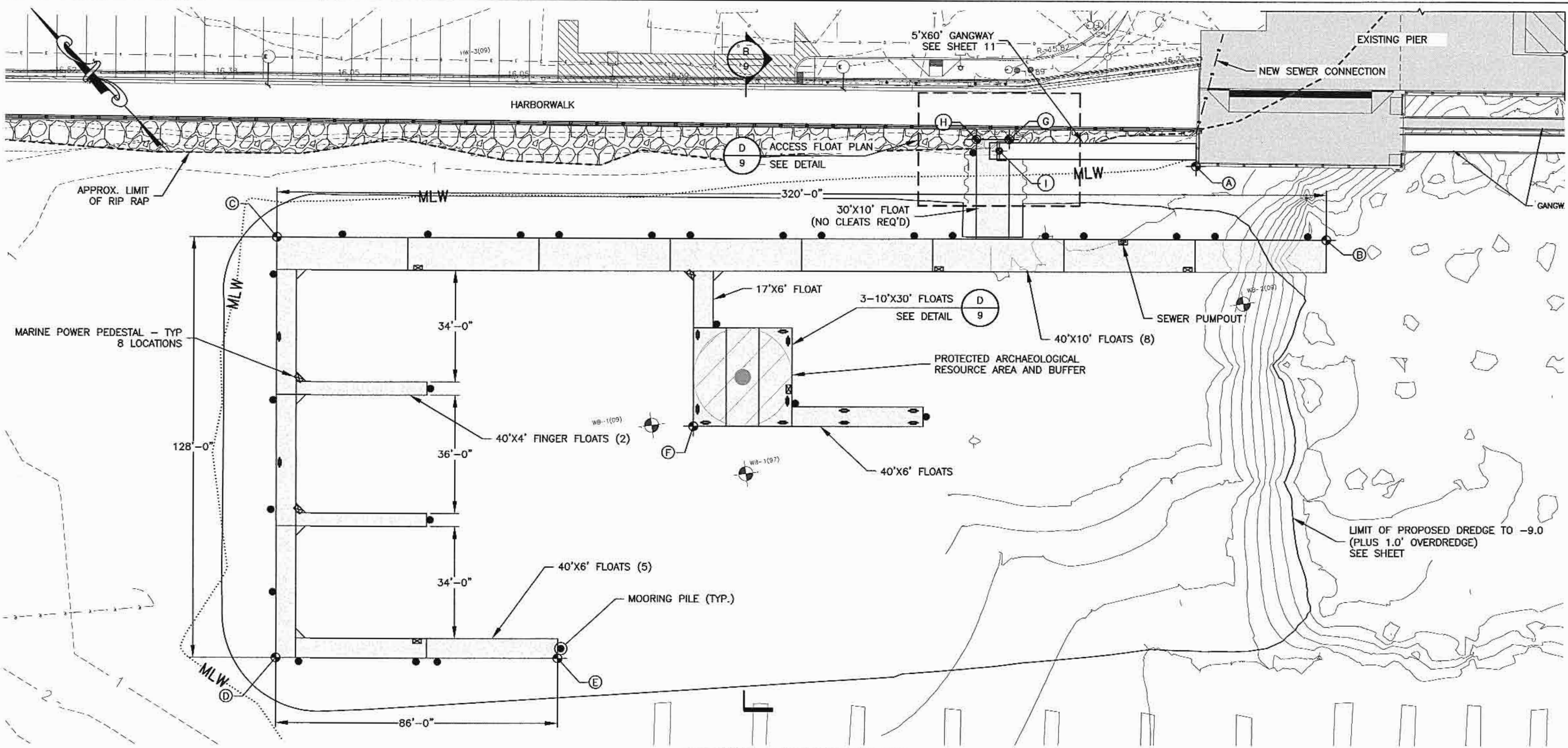
**COMMERCIAL MARINA  
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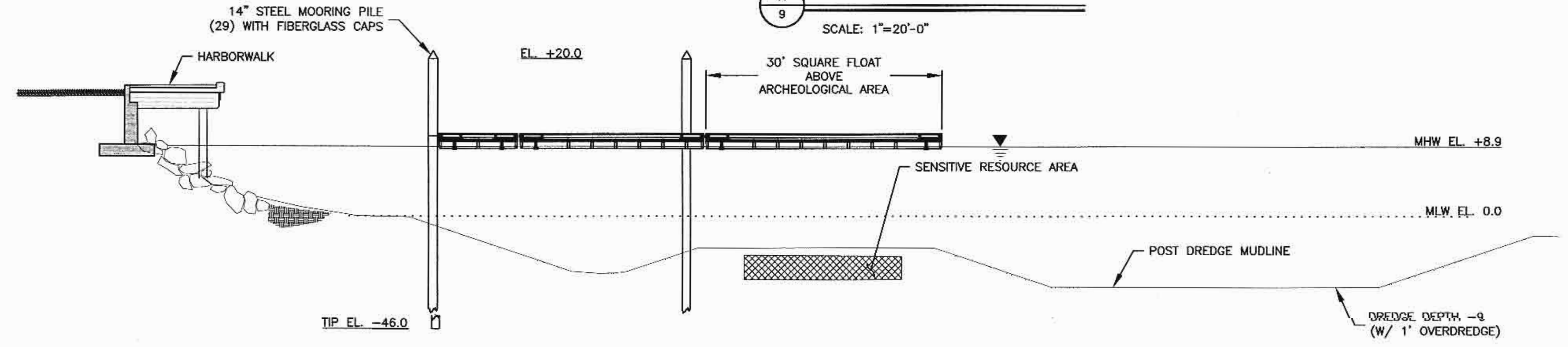
REVISIONS	<b>BCE</b>	<b>Bourne Consulting Engineering, PC</b>	<small>3 Bent Street Franklin, MA 01890 TEL. (508) 533-6600 FAX. (508) 533-6000</small>
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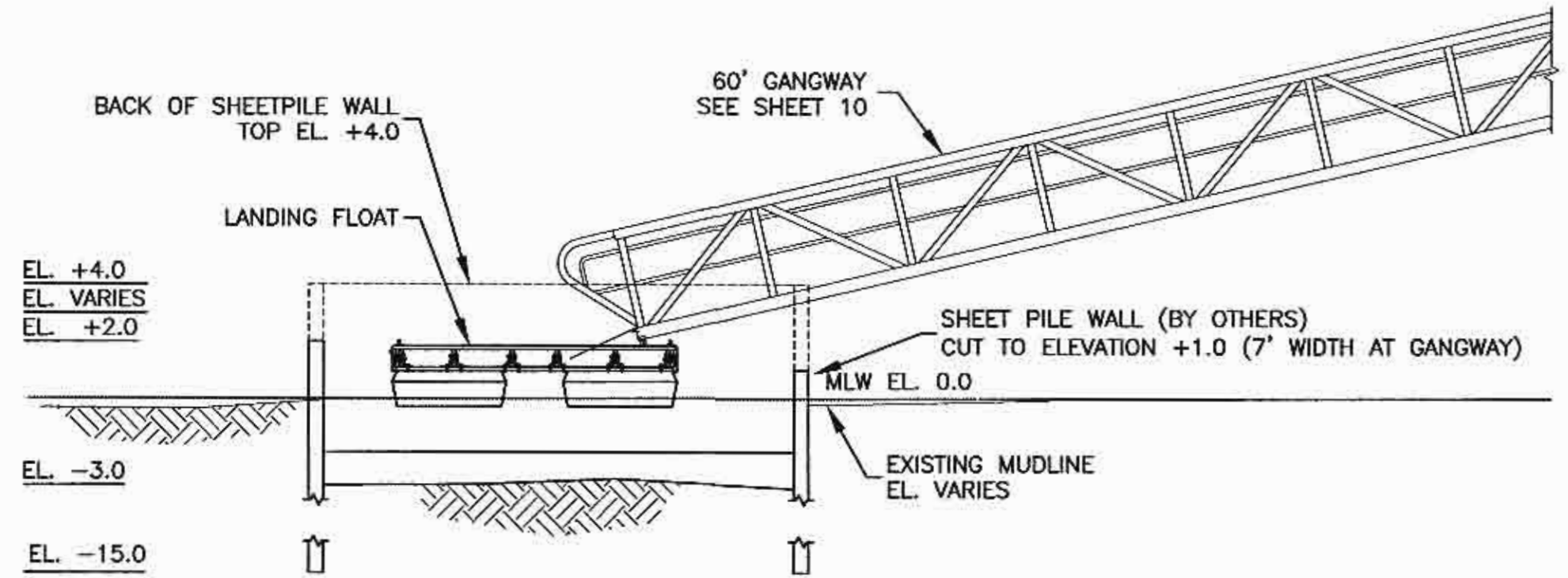
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**MARINA LAYOUT-PLAN**  
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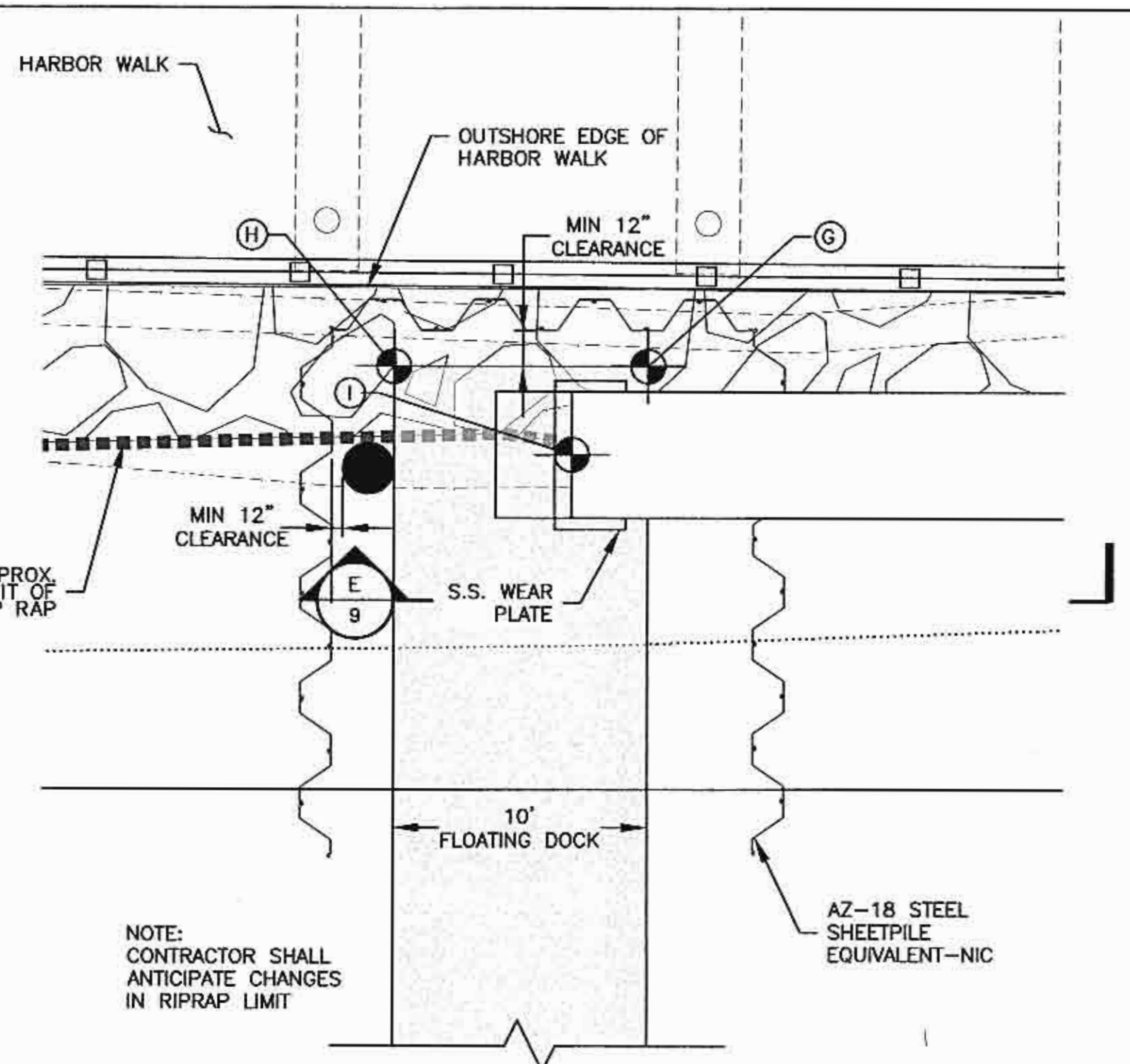
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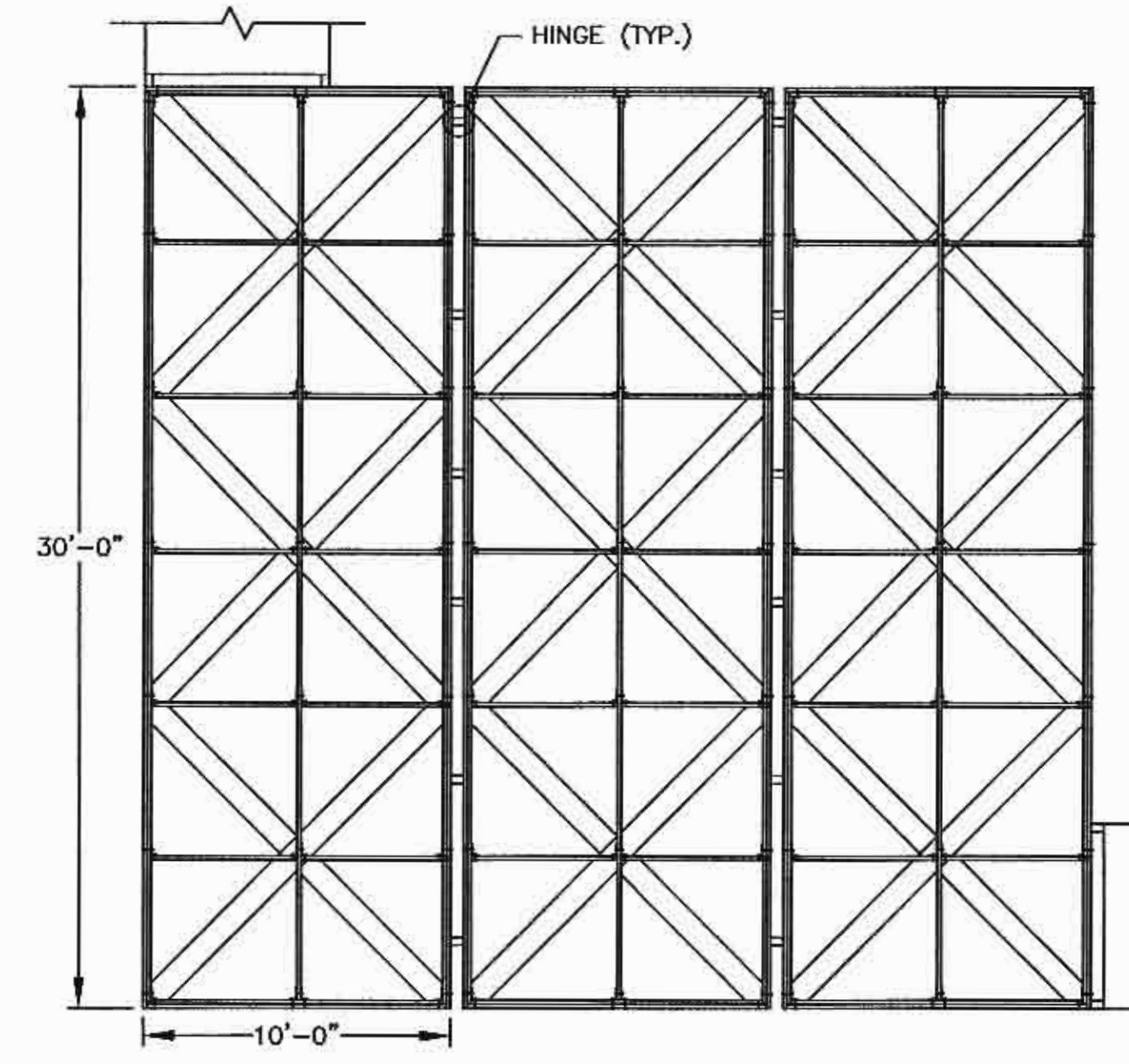
**GANGWAY LANDING-SECTION**  
SCALE: 3/16"=1'-0"

CONTROL POINTS

	NORTHING	EASTING
A	3015737.53	823104.77
B	3015693.42	823116.81
C	3015921.19	822892.03
D	3015831.28	822800.93
E	3015770.07	822861.33
F	3015790.44	822940.60
G	3015783.67	823070.46
H	3015790.79	823063.43
I	3015783.35	823065.86



**ACCESS FLOAT**  
SCALE: 3/16"=1'-0"



**30' X 30' FLOAT**  
SCALE: 3/16"=1'-0"

NOTE: FABRICATED TO SUBMIT DESIGN AND MEMBER SIZES

**MARINA LAYOUT PLAN**  
COMMERCIAL MARINA  
SALEM PORT EXPANSION PROJECT  
CITY OF SALEM  
SALEM, MA  
DECEMBER 2015

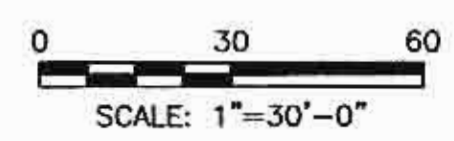


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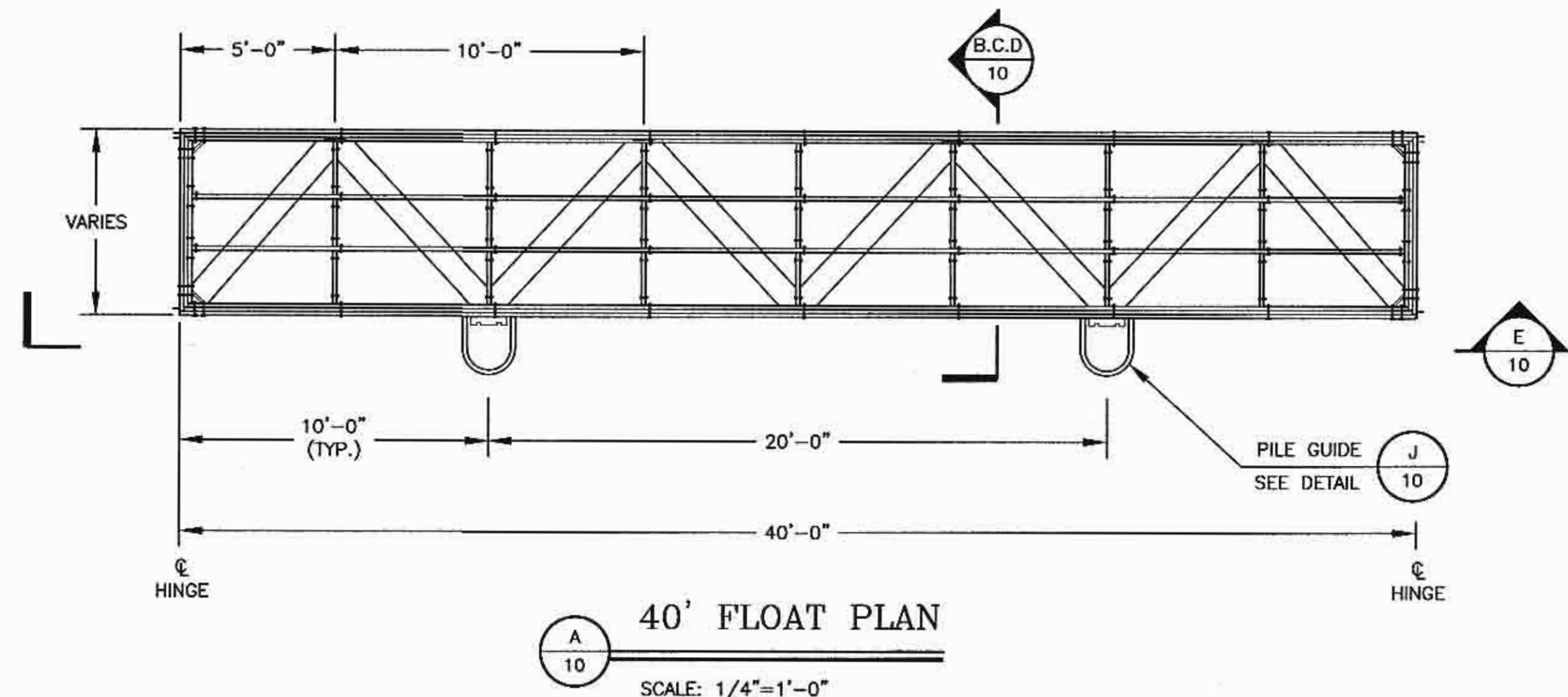
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REVISIONS

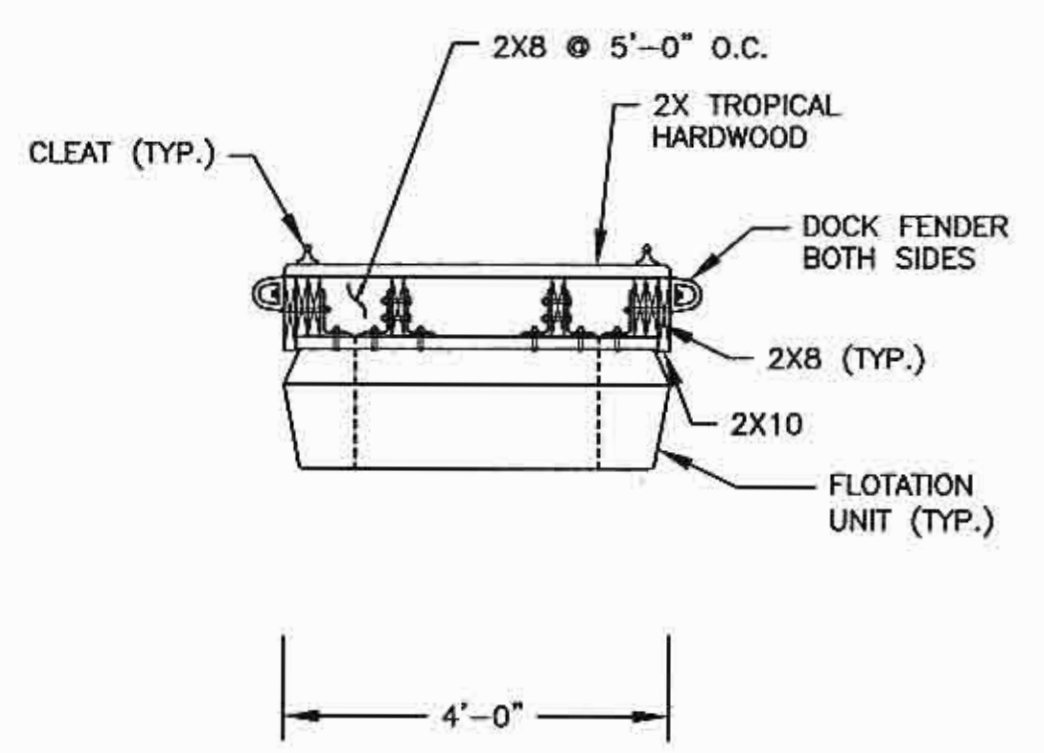
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SHEET 9 OF 13



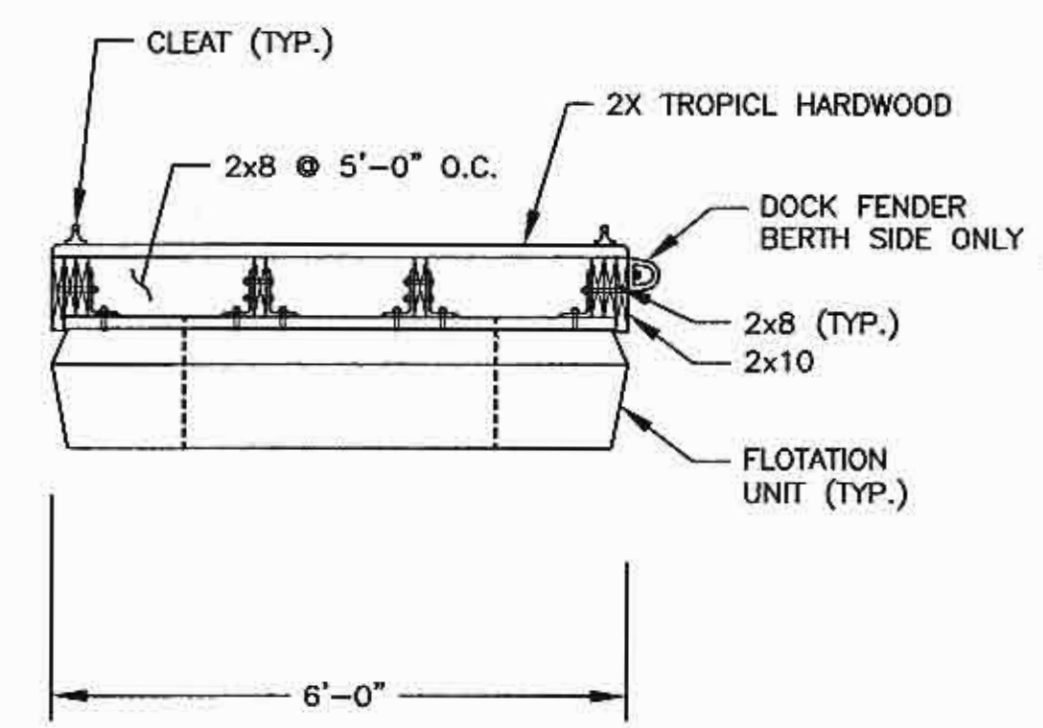




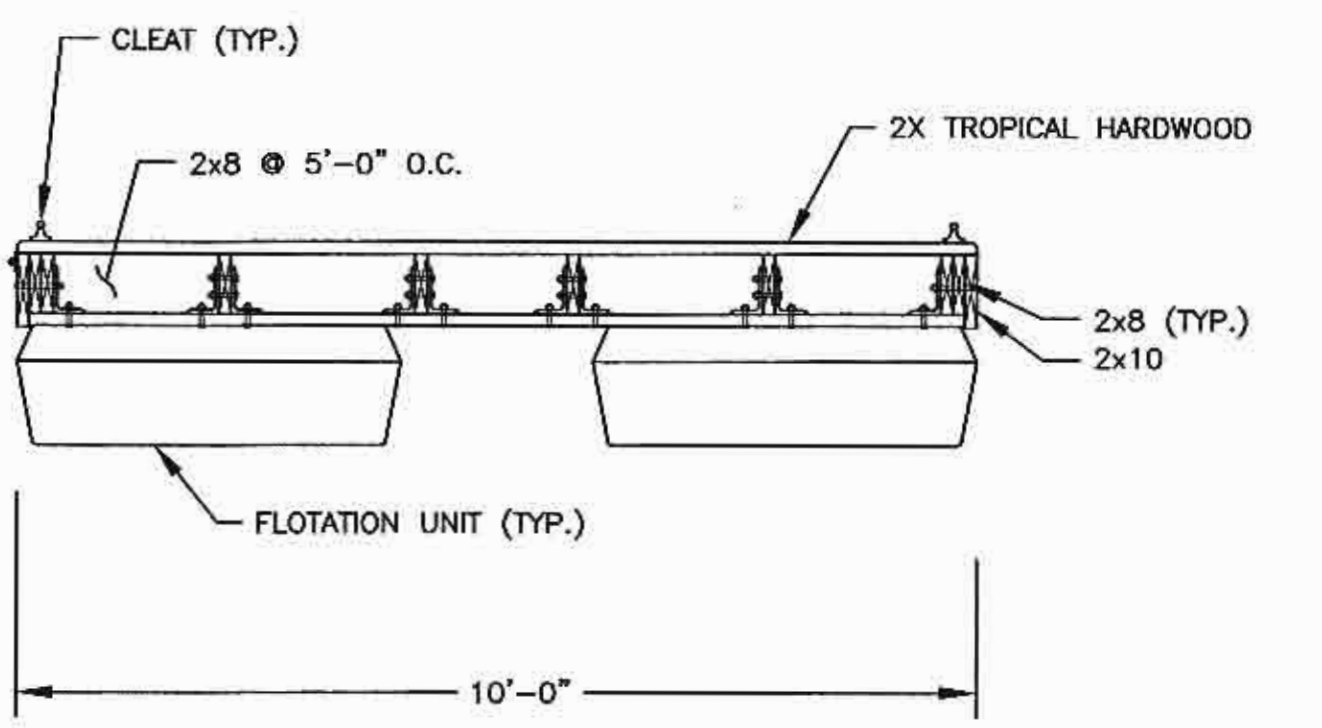
**40' FLOAT PLAN**  
SCALE: 1/4"=1'-0"



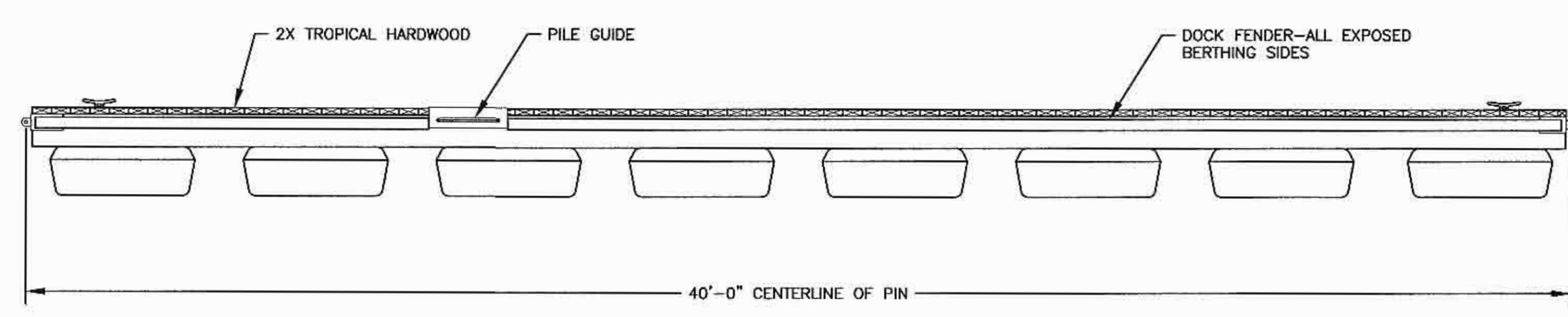
**4' FINGER FLOAT SECTION**  
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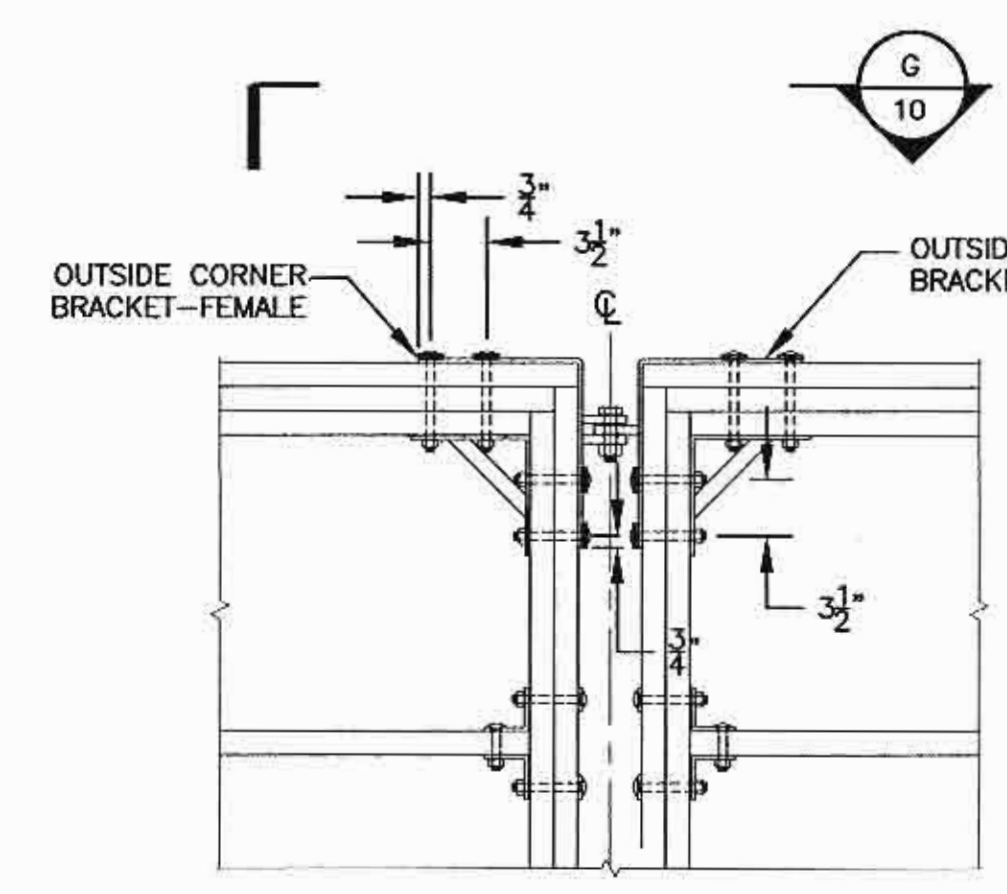
**6' FLOAT SECTION**  
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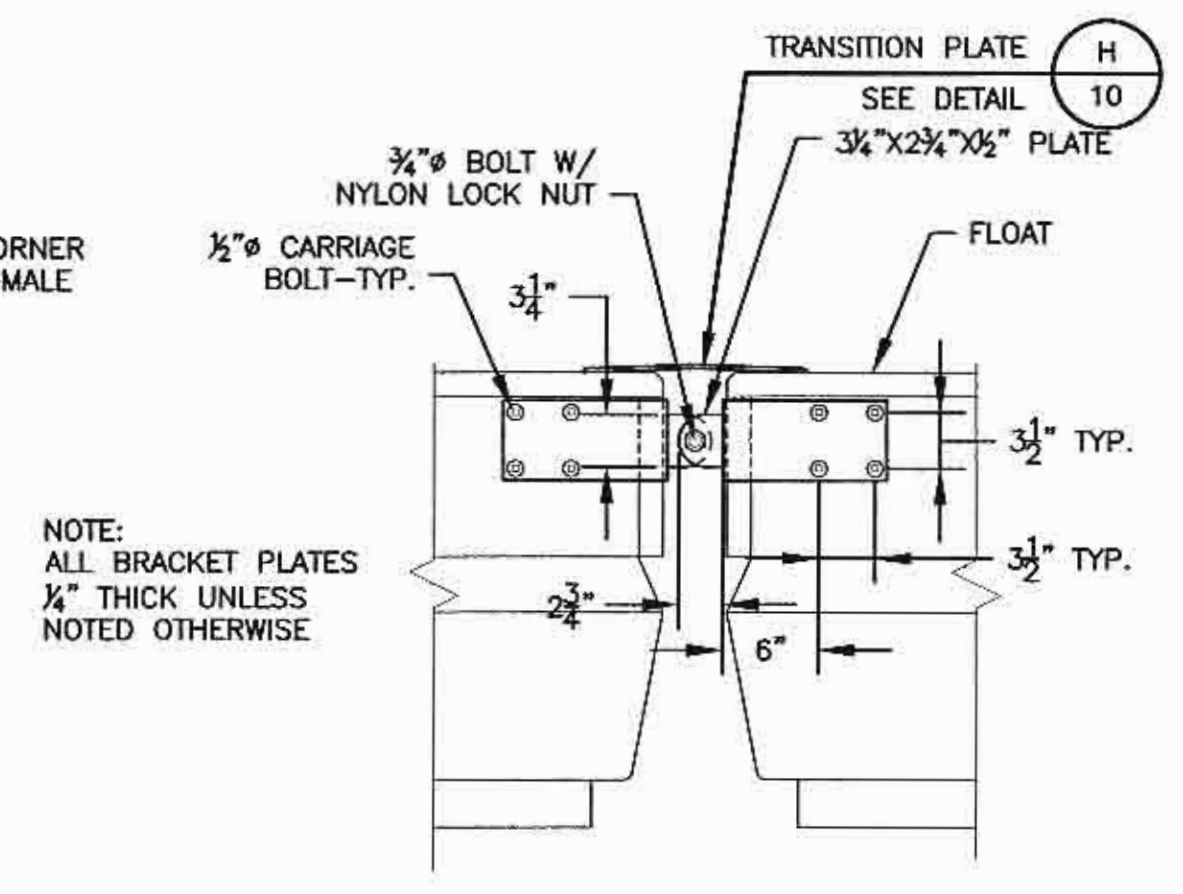
**10' FLOAT SECTION**  
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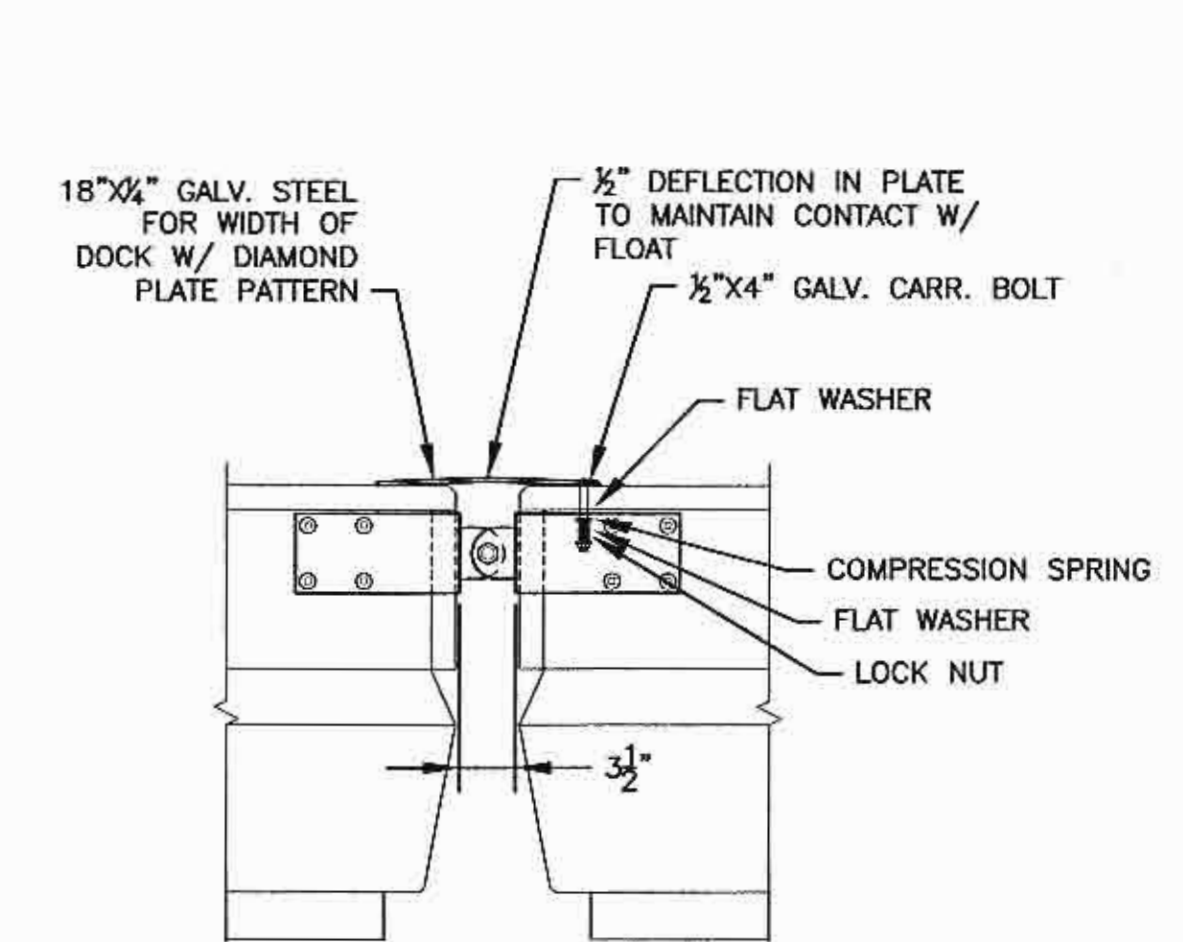
**FLOAT ELEVATION**  
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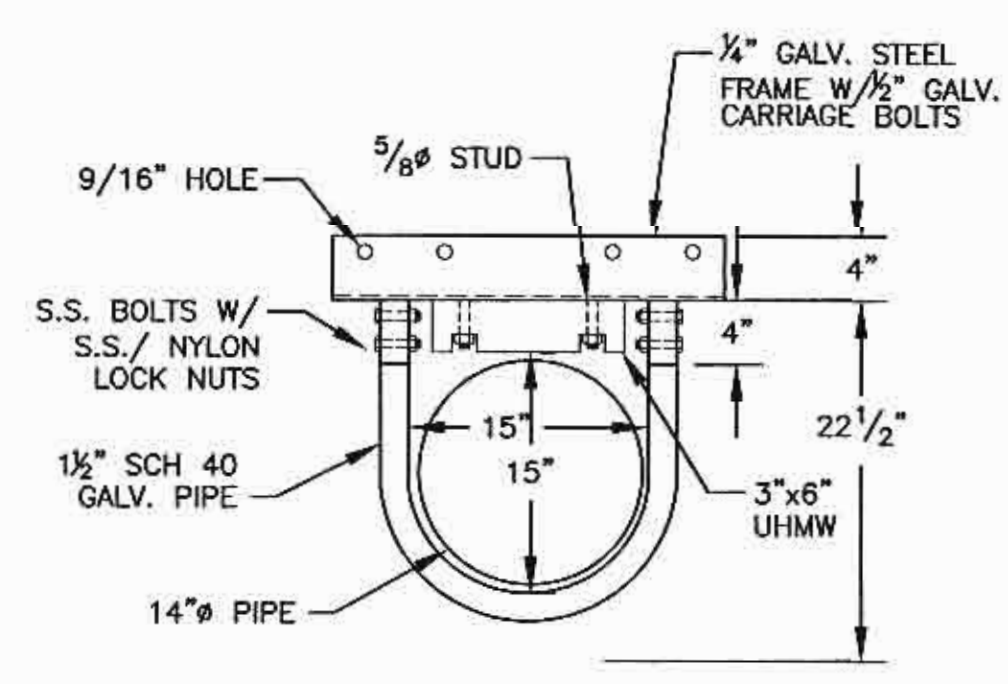
**FLOAT CONNECTION DETAIL**  
SCALE: 1"=1'-0"



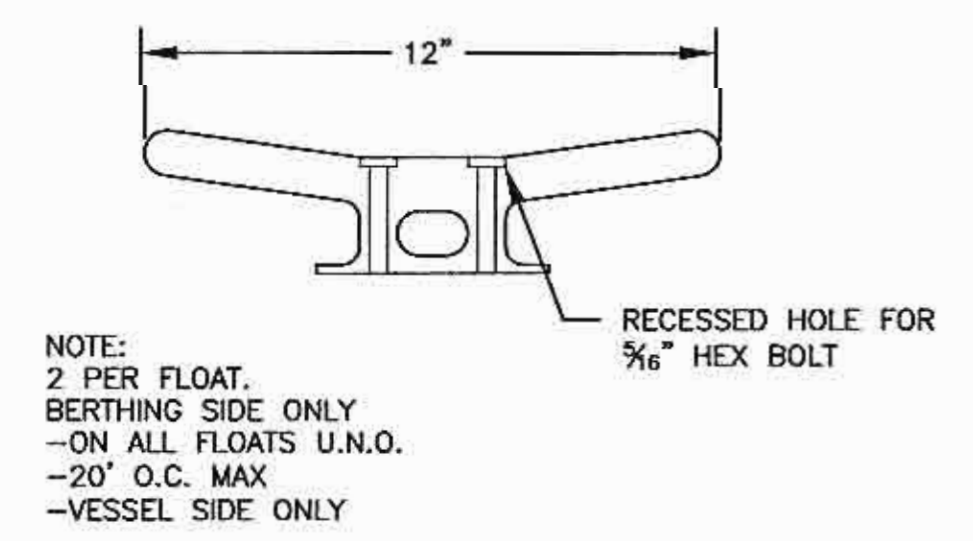
**FLOAT CONNECTION-SECTION**  
SCALE: 1"=1'-0"



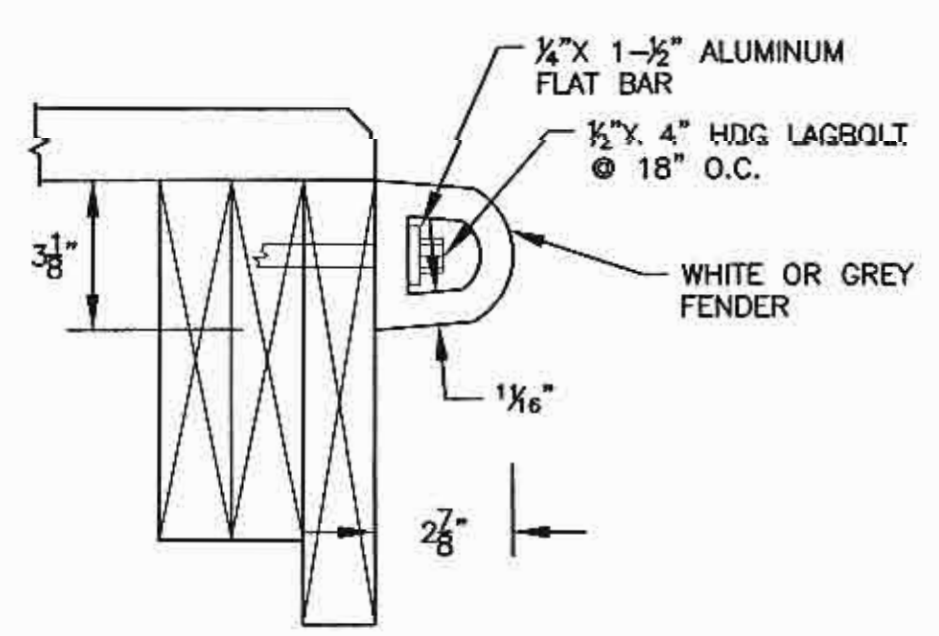
**TRANSITION DETAIL**  
SCALE: 1"=1'-0"



**PILE GUIDE DETAIL**  
SCALE: 1"=1'-0"



**12" CLEAT**  
SCALE: 3"=1'-0"



**DOCK FENDER**  
SCALE: 3"=1'-0"

**FLOAT DETAILS**

**COMMERCIAL MARINA  
SALEM PORT EXPANSION PROJECT**  
CITY OF SALEM  
SALEM, MA  
DECEMBER 2015

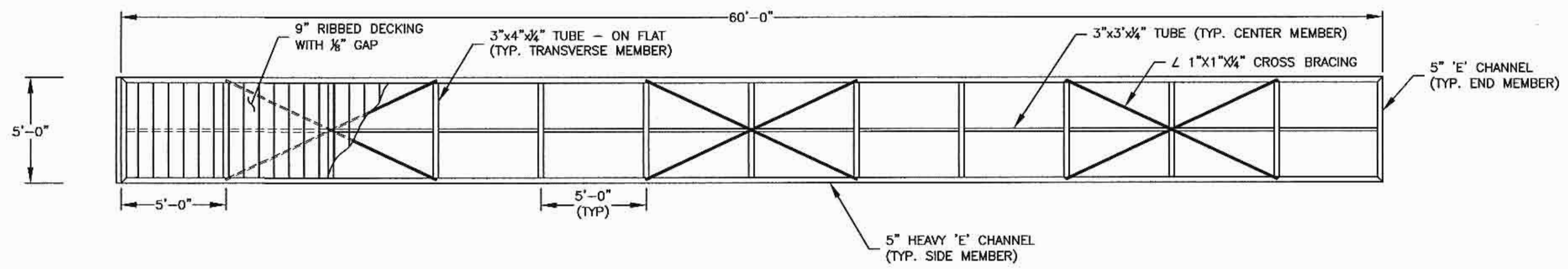


NOTE:  
1. ALL MEMBER SIZES SHOWN ARE MINIMUM.  
2. CONTRACTOR/FABRICATOR TO DETERMINE ACTUAL SIZE PER LOADING REQUIREMENTS.

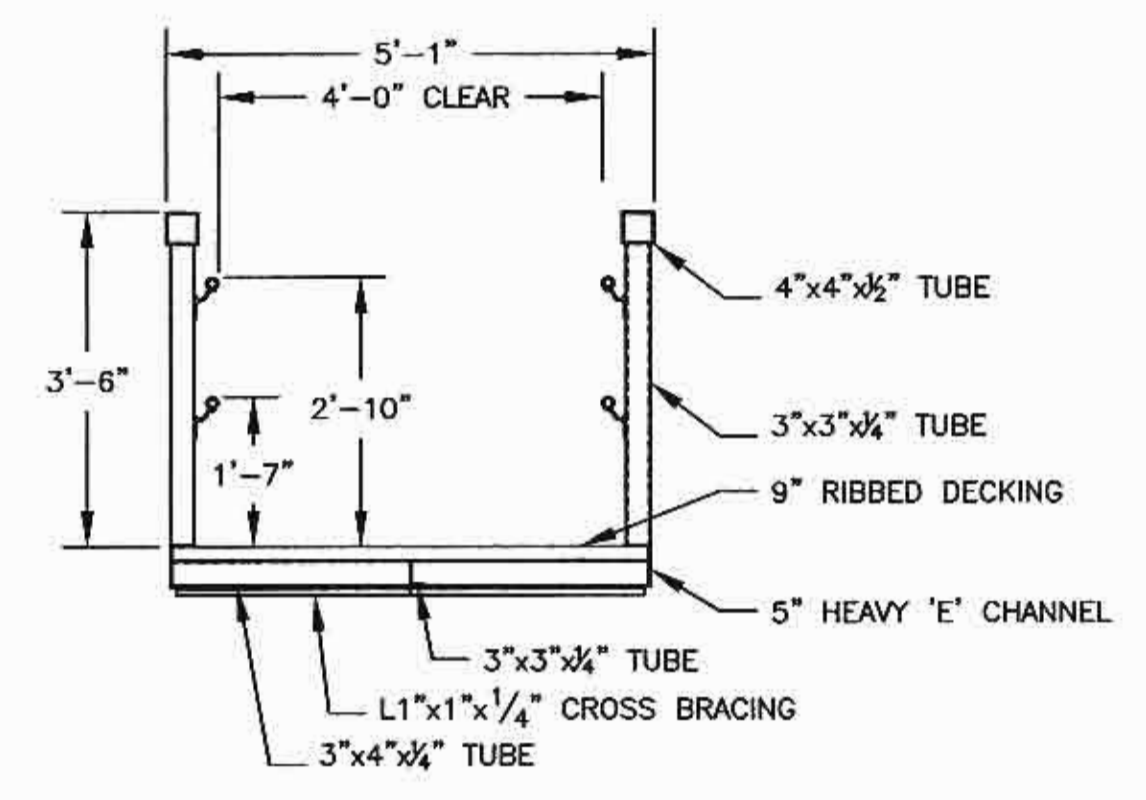
REVISIONS	<b>BCE</b> Bourne Consulting Engineering, PC	
	3 West Street Franklin, MA 01903 TEL. (508) 533-8868 FAX. (508) 533-0600	
	DRAWN: JSF	DRAWING NO. 34005-02-10
	CHECKED: KDB	SHEET 10 OF 13
	APPROVED: RRB	
	DATE: 12/14/15	



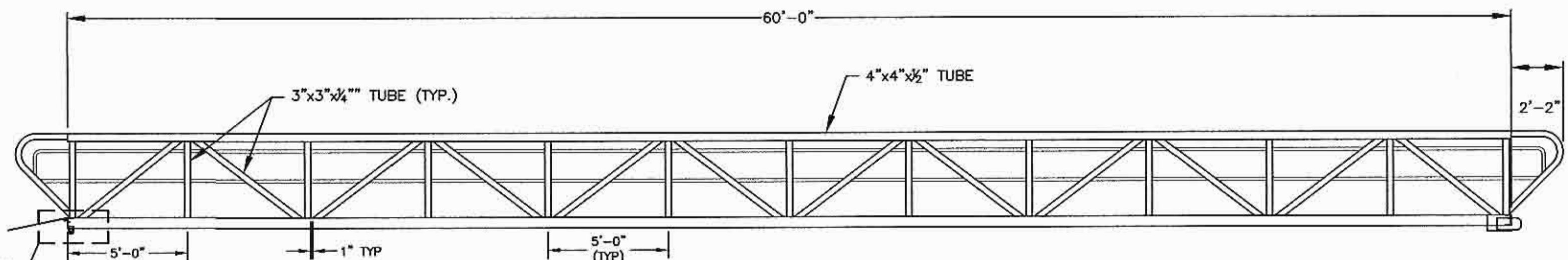
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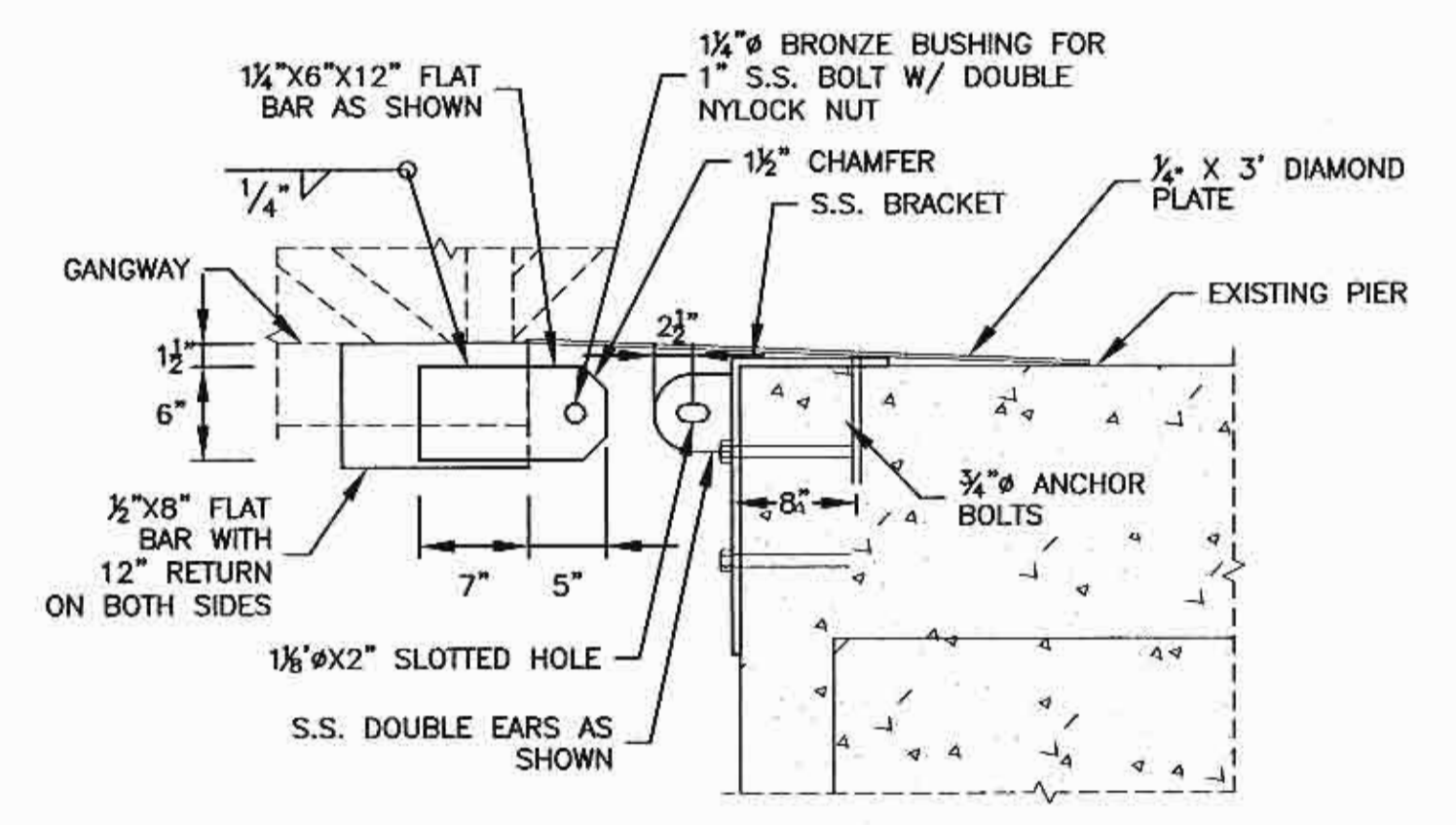
**60' GANGWAY-PLAN**  
A  
11  
SCALE: 1/4"=1'-0"



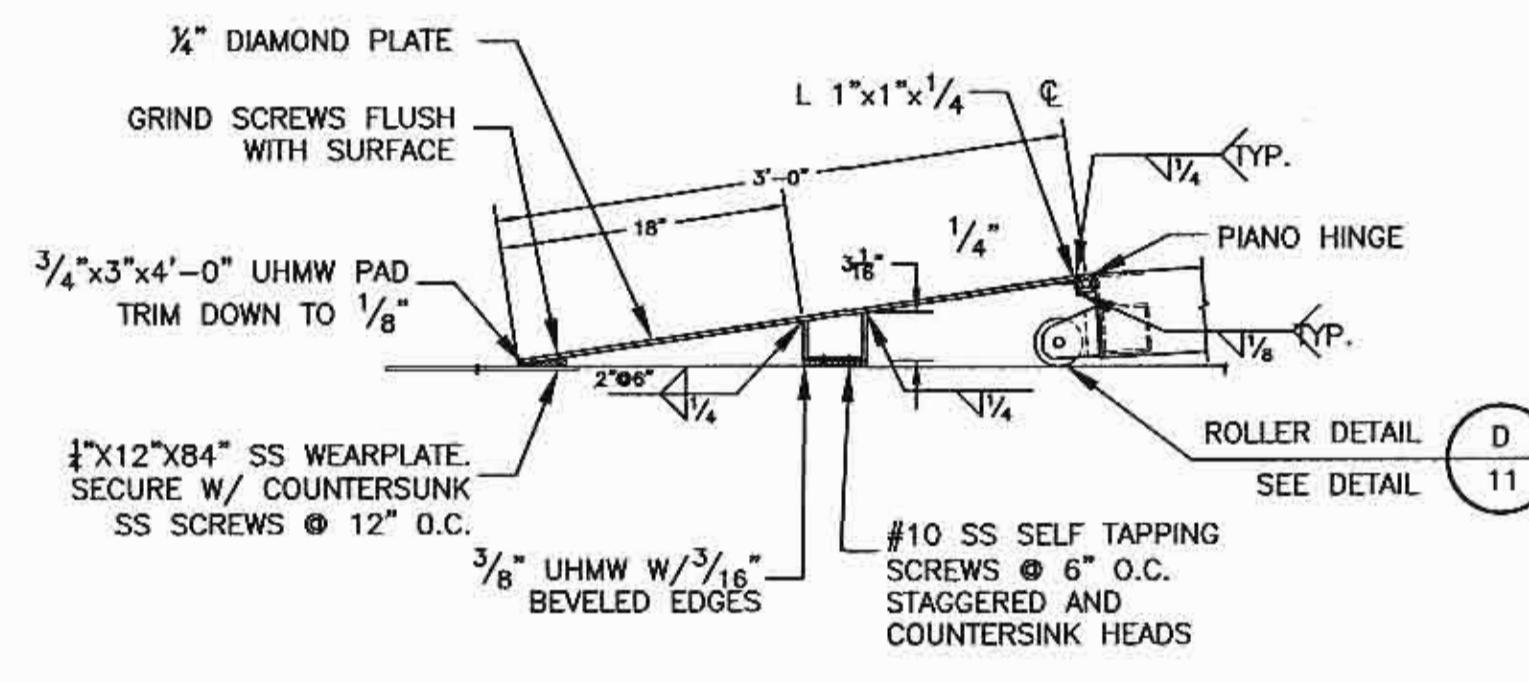
**60' GANGWAY-SECTION**  
E  
11  
SCALE: 1/2"=1'-0"



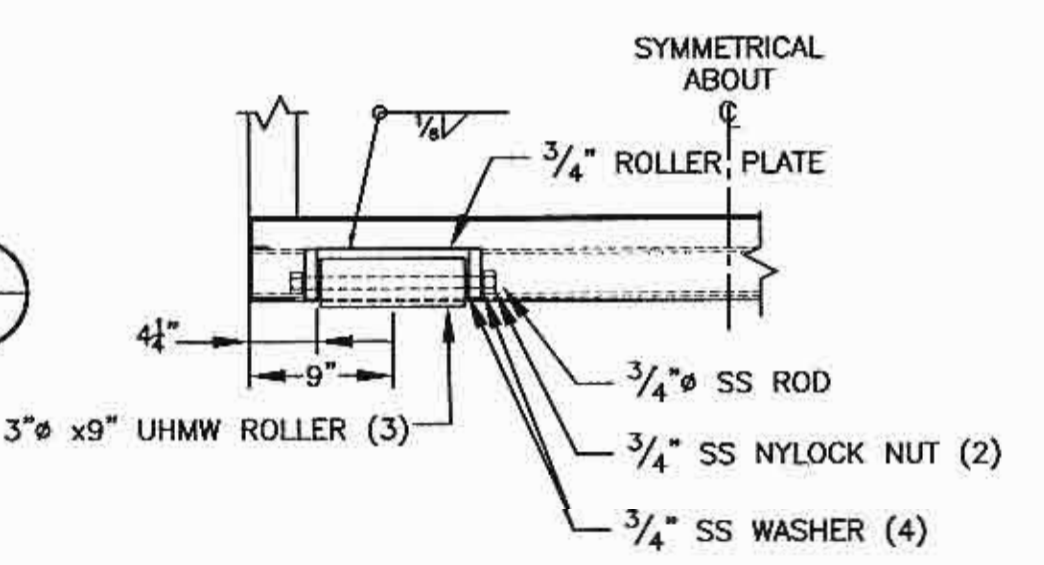
**60' GANGWAY-PLAN**  
B  
11  
SCALE: 1/4"=1'-0"



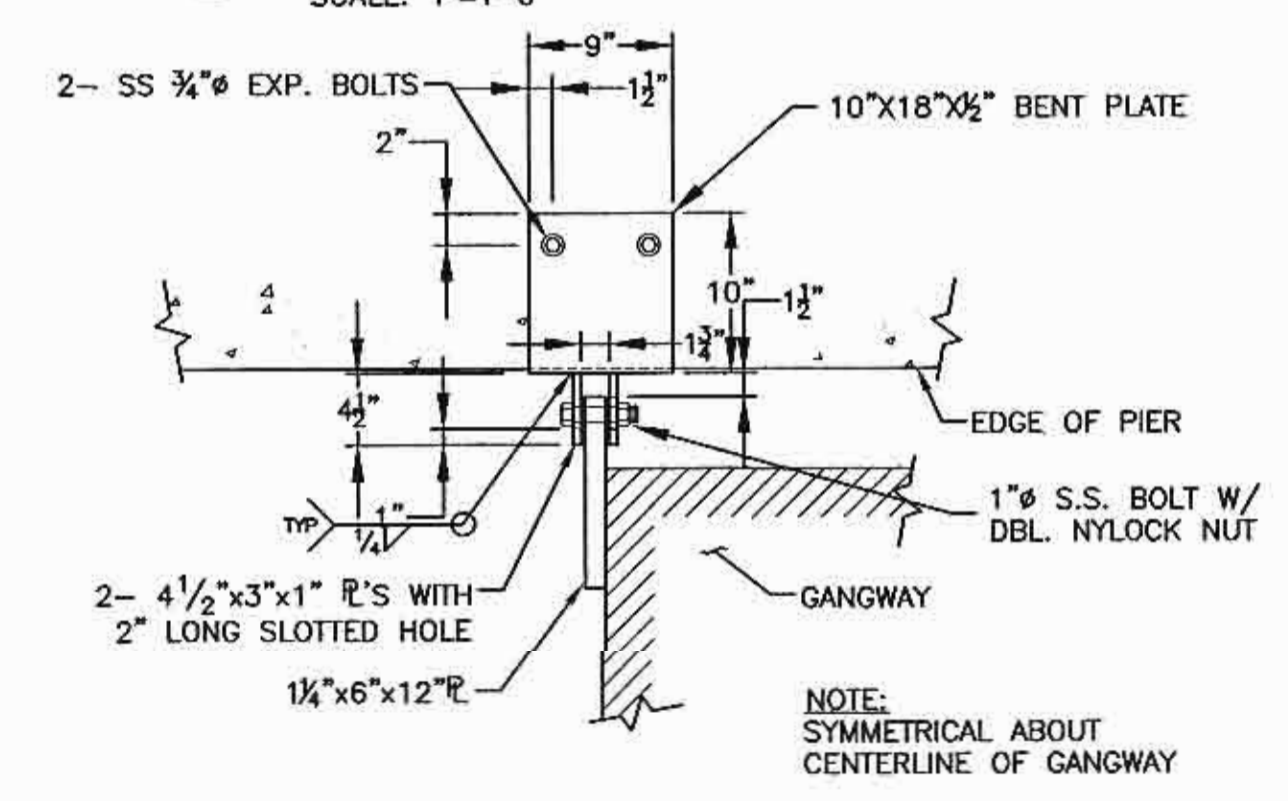
**GANGWAY CONNECTION-SECTION**  
F  
11  
SCALE: 1"=1'-0"



**ROLLER DETAIL**  
C  
11  
SCALE: 1"=1'-0"



**GANGWAY ROLLER DETAIL**  
D  
11  
SCALE: 1"=1'-0"



**GANGWAY ROLLER DETAIL**  
G  
11  
SCALE: 1"=1'-0"

**GANGWAY DETAILS**  
COMMERCIAL MARINA  
SALEM PORT EXPANSION PROJECT  
CITY OF SALEM  
SALEM, MA  
DECEMBER 2015

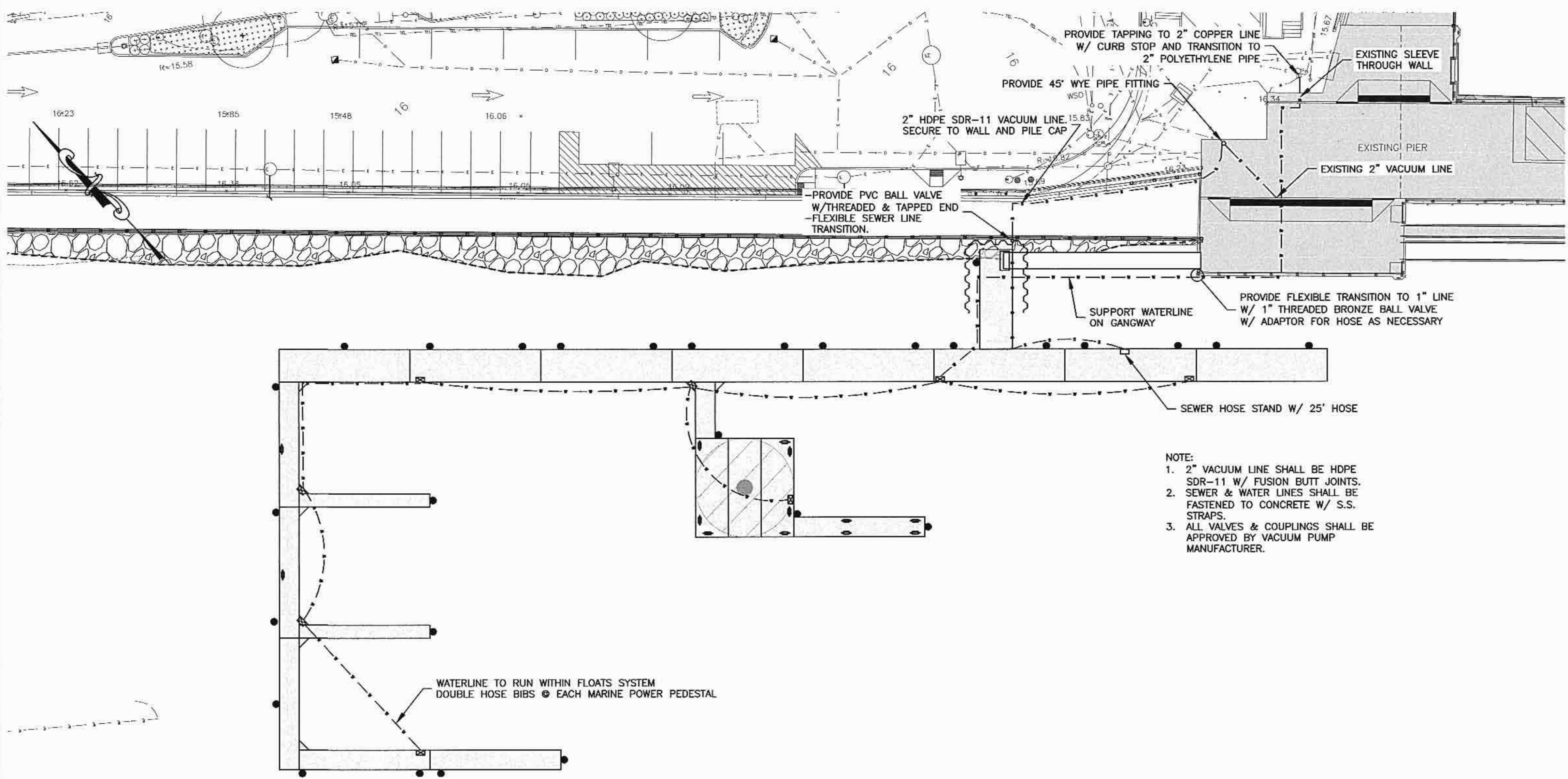


NOTES:  
1. ALL MEMBER SIZES SHOWN ARE MINIMUMS.  
2. FABRICATOR TO DETERMINE ACTUAL SIZES PER LOADING REQUIREMENTS

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File: X:\34946\34005 SALEM WHARF PHASE IV\COMMERCIAL MARINA-PHASE IIIB\FINAL DESIGN\SHIT-12 UTILITY PLAN & DETAILS.DWG - 11/12/2012 1:02 PM



- NOTE:
1. 2" VACUUM LINE SHALL BE HDPE SDR-11 W/ FUSION BUTT JOINTS.
  2. SEWER & WATER LINES SHALL BE FASTENED TO CONCRETE W/ S.S. STRAPS.
  3. ALL VALVES & COUPLINGS SHALL BE APPROVED BY VACUUM PUMP MANUFACTURER.

WATERLINE TO RUN WITHIN FLOATS SYSTEM  
DOUBLE HOSE BIBS @ EACH MARINE POWER PEDESTAL

MARINA UTILITY-PLAN  
A  
12  
 SCALE: 1"=20'-0"



**MARINA UTILITY  
 PLAN & DETAILS**  
 COMMERCIAL MARINA  
 SALEM PORT EXPANSION PROJECT  
 CITY OF SALEM  
 SALEM, MA  
 DECEMBER 2015

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**BCE** Bourne Consulting Engineering, PC  
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### ABBREVIATIONS

A/AMP	AMPERE	KWH	KILOWATT HOURS
AC	ALTERNATING CURRENT	LTG	LIGHTING
ADA	AMERICAN WITH DISABILITIES ACT	MCB	MAIN CIRCUIT BREAKER
AF	AMPERE FRAME	MEC	MASSACHUSETTS ELECTRICAL CODE
AFF	ABOVE FINISHED FLOOR	M/G	MOTOR/GENERATOR SET
AFG	ABOVE FINISHED GRADE	MH	MANHOLE
AIC	AMPERE INTERRUPTING CAPACITY	MLO	MAIN LUGS ONLY
AL	ALUMINUM	MTD	MOUNTED
AT	AMPERE TRIP	MTG	MOUNTING
ATS	AUTOMATIC TRANSFER SWITCH	NC	NORMALLY CLOSED CONTACT
AWG	AMERICAN WIRE GAUGE	NEC	NATIONAL ELECTRICAL CODE
B	BURIED	NO	NORMALLY OPEN CONTACT
C	CONDUIT	NTS	NOT TO SCALE
CA	CABLE	#	NUMBER
CATV	CABLE TELEVISION	OPD	OVER CURRENT PROTECTION DEVICE
CCTV	CLOSED CIRCUIT TELEVISION SYSTEM	POS	PROVIDED UNDER OTHER SECTIONS
CB	CIRCUIT BREAKER	PVC	POLYVINYL CHLORIDE
CKT	CIRCUITS	PWR	POWER
CPU	CENTRAL PROCESSING UNIT	RGS	RIGID GALVANIZED STEEL
ℓ	CENTERLINE	RMS	ROOT MEAN SQUARE VALUE
dB	DECIBEL	RPM	REVOLUTIONS PER MINUTE
DC	DIRECT CURRENT	SN	SOLID NEUTRAL
DWG	DRAWING	SWBD	SWITCHBOARD
EC	ELECTRICAL CONTRACTOR	TB	TERMINAL BLOCK
EMT	ELECTRIC METALLIC TUBING	TEL	TELEPHONE
FDR	FEEDER	TERMN	TERMINAL
FLMT	FLEXIBLE LIQUID TIGHT METALLIC TUBING	TSP	TWISTED SHIELDED-PAIR
FREQ	FREQUENCY	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSER
GEC	GROUNDING ELECTRODE CONDUCTOR	TYP	TYPICAL
GFI	GROUND FAULT INTERRUPTING	UG	UNDERGROUND
GND	GROUND	UNO	UNLESS NOTED OTHERWISE
HH	HANDHOLE	UPS	UNINTERRUPTIBLE POWER SUPPLY
HP	HORSEPOWER	UTP	UNSHIELDED TWISTED-PAIR
HVAC	HEATING, VENTILATING AND AIR CONDITIONING	V	VOLTS
HZ	HERTZ	VA	VOLT-AMPERE
IG	ISOLATED GROUND	VSD	VARIABLE SPEED DRIVE
JB	JUNCTION BOX	W	WATTS
KVA	KILOVOLT-AMPERE	WP	WEATHERPROOF
KW	KILOWATT		

### ONE LINE SYMBOLS LEGEND

	CIRCUIT BREAKER, FIXED "XXAF" INDICATES FRAME SIZE "XXAT" INDICATES TRIP
	FUSE
	PHOTOCELL
	LIGHT

### SITE LEGEND

	ELECTRIC MANHOLE
	ELECTRIC HAND HOLE
	PULL BOX WITH TERMINAL BLOCK, NEMA-4X, SIZED AS REQUIRED.

### BRANCH CIRCUIT & FEEDER LEGEND

	BRANCH CIRCUIT OR FEEDER
	BRANCH CIRCUIT OR FEEDER, UNDERGROUND
	BRANCH CIRCUIT OR FEEDER TURNING UP TOWARDS OBSERVER
	BRANCH CIRCUIT OR FEEDER TURNING DOWN AWAY FROM OBSERVER
	CONDUIT STUBBED

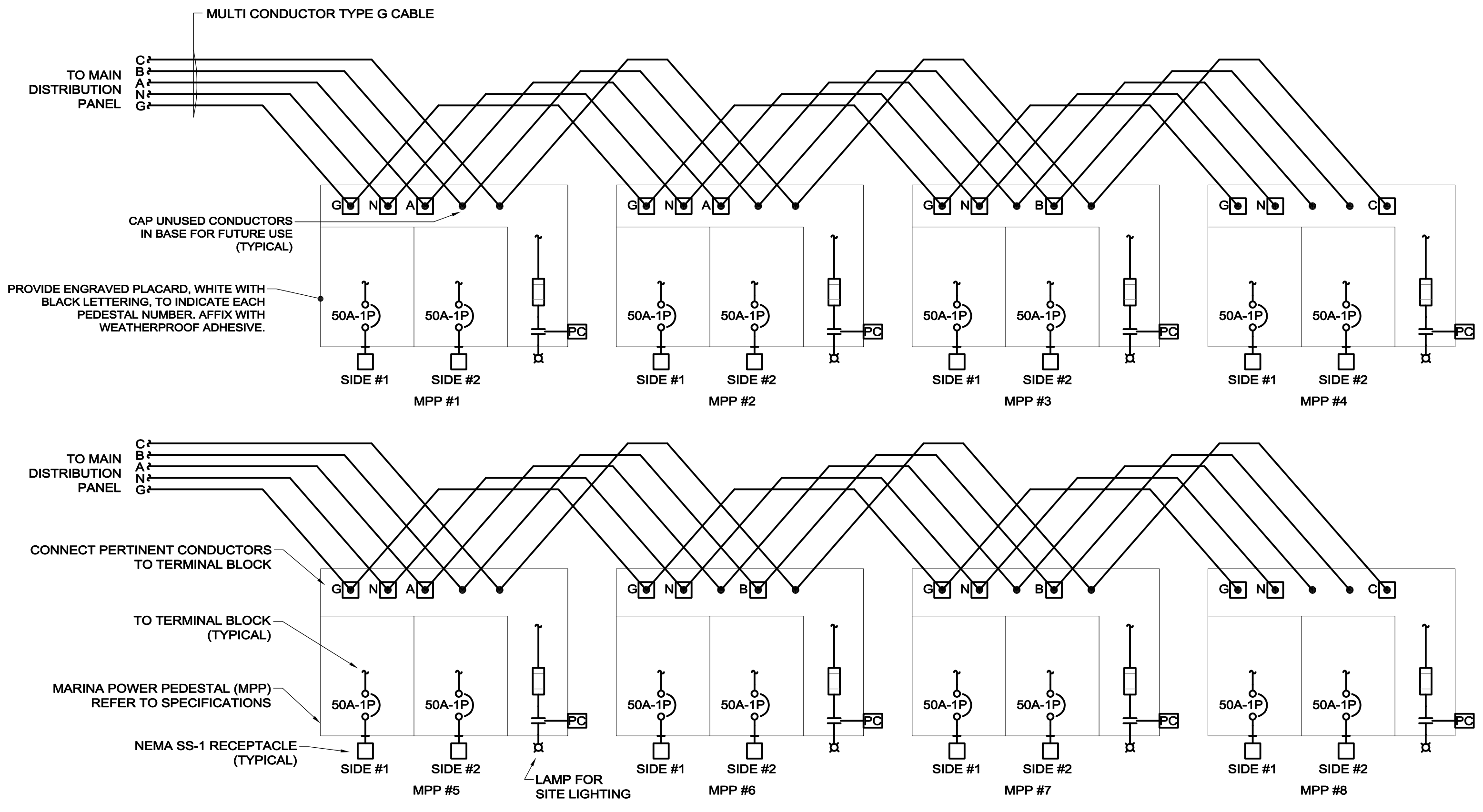
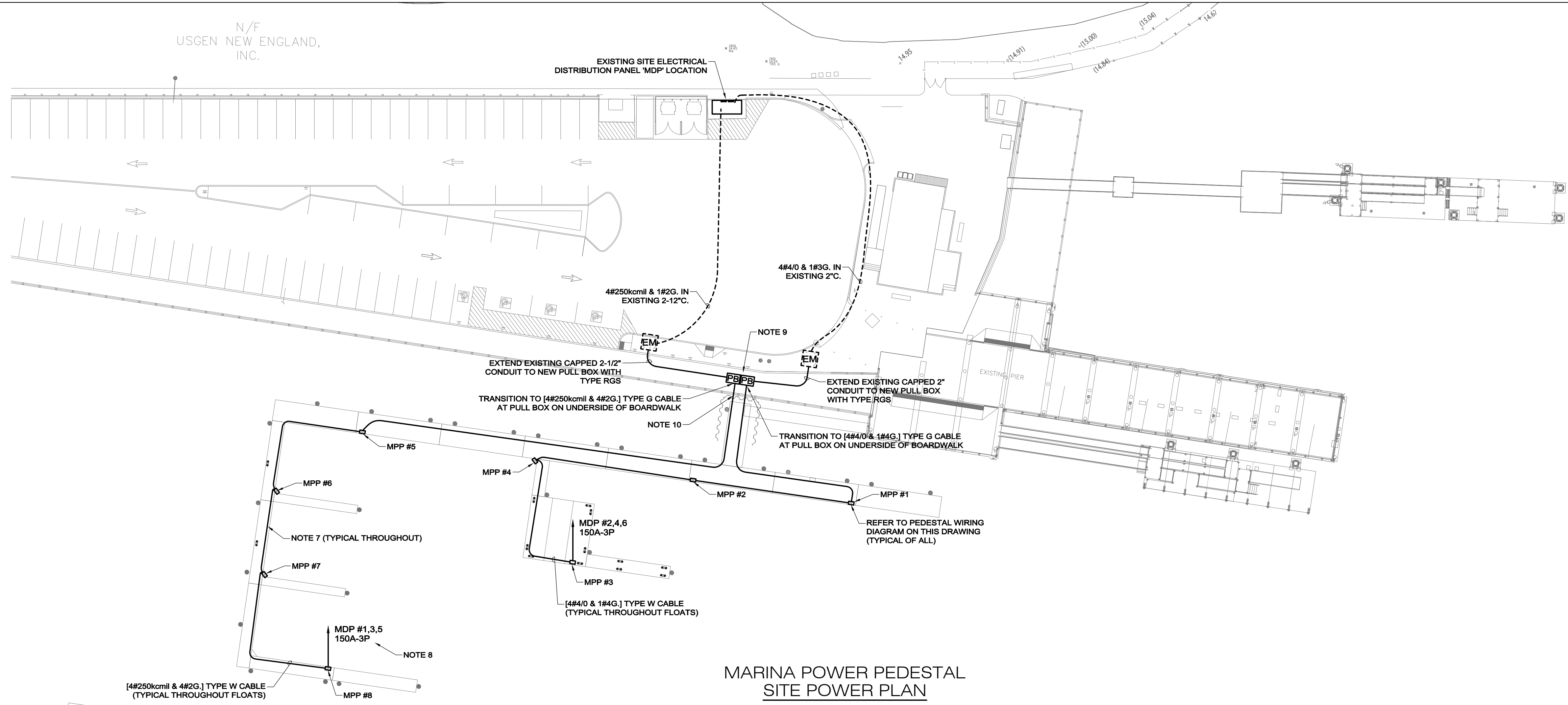
BRANCH CIRCUIT HOME RUN TICKS INDICATE QUANTITY OF CONDUCTORS. GROUND CONDUCTORS ARE NOT INDICATED. NO TICKS INDICATES 2#12 & 1#12S IN 3/4" MINIMUM R22A-1,3,5 INDICATES PANEL AND CIRCUIT DESIGNATION FROM WHICH HOMERUN SHALL ORIGINATE. EACH CIRCUIT SHALL BE 20A-1P (20AMP SINGLE POLE) UNLESS NOTED OTHERWISE.

### POWER DISTRIBUTION

	208Y/120 VOLT PANELBOARD, SURFACE MOUNTED REFER TO SCHEDULE OF PANELBOARDS
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### EXISTING EQUIPMENT LEGEND

	EXISTING EQUIPMENT TO REMAIN
	EXISTING EQUIPMENT TO BE REWORKED
	EXISTING EQUIPMENT FOR INFORMATION ONLY- INDICATED BY SYMBOL WITH LIGHT AND OUT OF FUNCTION LINE TYPE
	EXISTING EQUIPMENT TO BE REWORKED- INDICATED BY SYMBOL WITH DASHED AND IN FUNCTION LINE TYPE

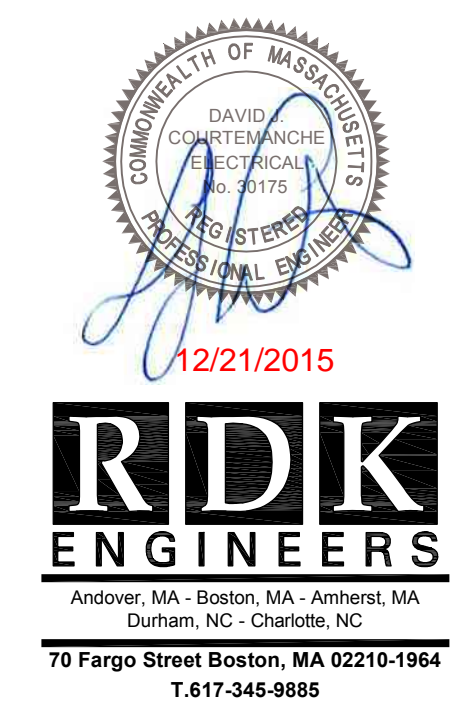


**MARINA POWER PEDESTAL CONNECTION DIAGRAM**

- #### POWER NOTES:
- REFER TO SITE/CIVIL DRAWINGS FOR ASSOCIATED NOTES, MOUNTING DETAILS, HEIGHTS AND EXACT LOCATIONS OF ALL DEVICES, INCLUDING EXACT LOCATIONS OF SITE LIGHTS.
  - CIRCUIT NUMBERS ARE DIAGRAMMATIC. EXACT NUMBERS SHALL BE DETERMINED IN THE FIELD AND REFLECTED ON AS-BUILT DOCUMENTATION BY THE ELECTRICAL CONTRACTOR. THE ASSOCIATED CIRCUIT NUMBERS THAT ARE APPLIED TO EACH DEVICE AND PIECE OF EQUIPMENT INFERS INTERCONNECTING BRANCH CIRCUITRY. INTERCONNECTING BRANCH WIRING SHALL BE SIZED EQUAL TO THE HOMERUN UNLESS NOTED OTHERWISE.
  - VOLTAGE DROP HAS BEEN CONSIDERED IN THE DESIGN OF ALL BRANCH CIRCUITRY AND FEEDER SIZES BASED UPON THE ILLUSTRATED EQUIPMENT LAYOUTS AND SHORTEST CONDUCTOR/RACEWAY ROUTING. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR DEVIATIONS TAKEN THAT WILL INCREASE CONDUCTOR/RACEWAY ROUTING LENGTHS.
  - MAINTAIN CONTINUITY OF BRANCH CIRCUITRY ASSOCIATED WITH ALL EXISTING POWER DEVICES TO REMAIN.
  - ELECTRICAL CONTRACTOR SHALL PROVIDE NEW WIRING IN EXISTING RACEWAYS WHERE INDICATED THROUGHOUT THE CONSTRUCTION DOCUMENTS. ELECTRICAL CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD PRIOR TO WORK.
  - ALL CABLE SHALL BE SUPPORTED WITH HARDWARE LISTED FOR THE INTENDED USE. SUPPORT ALL CABLE AT INTERVALS PER THE NEC USING NONMETALLIC CLIPS. REFER TO NEC ARTICLE 555 FOR MORE REQUIREMENTS.
  - FOR EACH NEW FEEDER, PROVIDE NEW CIRCUIT BREAKERS IN EXISTING DISTRIBUTION PANEL 'MDP' TO MATCH EXISTING EQUIPMENT.
  - PROVIDE STAINLESS STEEL PULL BOXES, TYPE NEMA-4X, SIZED ACCORDING TO THE NEC. IN EACH PULL BOX, PROVIDE TERMINAL BLOCK TO ACCOMMODATE TRANSITION FROM THWN-2 TO TYPE W CABLE. PROVIDE WATERTIGHT FITTINGS FOR CONDUIT AND CABLE. MOUNT TO UNDERSIDE OF PIER.
  - PROVIDE STAINLESS STEEL STRAIN RELIEF TO SUPPORT CABLE FROM UNDERSIDE OF PIER. DRAPE CABLE INTO WATER ADJACENT TO FLOATS WHILE PROVIDING ENOUGH SLACK FOR TIDAL FLUCTUATIONS. ATTACH CABLE TO FLOAT WITH STAINLESS STEEL STRAIN RELIEF WHEN ENTERING FLOAT FROM WATER. ROUTE CABLE THROUGH FLOATS. COORDINATE WITH FLOAT VENDOR.

## ELECTRICAL SITE PLAN

COMMERCIAL MARINA  
SALEM PORT EXPANSION PROJECT  
CITY OF SALEM  
SALEM, MA  
DECEMBER 2015



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