STRUCTURAL NOTES

GENERAL

1. THE STRUCTURAL DRAWINGS/SKETCHES SHALL BE USED IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTS AND SPECIFICATIONS. REFER TO CIVIL, ARCHITECTURAL, EQUIPMENT, MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION DRAWINGS AND SPECIFICATIONS FOR LOCATIONS, DIMENSIONS, AND DETAILS OF OPENINGS, SLEEVES, EMBEDMENTS, INSERTS, PADS, CURBS, DEPRESSIONS, ANCHOR BOLTS, AND OTHER PROJECT REQUIREMENTS NOT SHOWN ON STRUCTURAL DRAWINGS.
2. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IN THE FIELD THE PRESENCE AND LOCATION OF OVERHEAD, UNDER-GROUND, AND/OR EMBEDDED UTILITIES.
3. INVESTIGATION OF THE SITE FOR THE PRESENCE OF HAZARDOUS MATERIALS AND THE DEVELOPMENT OF MITIGATION METHODS IS NOT BY RIVERMOOR ENGINEERING.
4. CODES AND STANDARDS:
   a. THE MASSACHUSETTS AMENDMENTS TO THE INTERNATIONAL BUILDING CODE 2009 (BASIC/COMMERCIAL) EIGHTH EDITION
   b. THE INTERNATIONAL BUILDING CODE (IBC) 2009
   c. MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASCE 7-05
   d. BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 318-08, ASCE/SEI 5-08
   e. SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, AISC 360-05
   f. SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS, AISC 341-05, INCLUDING SUPPLEMENT NO. 1 DATED 2005
   g. STRUCTURAL WELDING CODE-STEEL, AWS D1.1-04
   h. STRUCTURAL WELDING CODE-SHEET STEEL, AWS D1.3-98
   i. SDI STANDARD FOR STEEL ROOF DECK, ANSI/RDI-2-09
5. DETAILS AND NOTES ON STRUCTURAL DRAWINGS SHALL BE APPLICABLE TO ALL PARTS OF THE STRUCTURAL WORK. DETAILS NOT SPECIFICALLY SHOWN SHALL BE SIMILAR TO THOSE SHOWN FOR THE MOST SIMILAR CONDITION AS DETERMINED BY THE ENGINEER.
6. THE STRUCTURAL WORK IS SUBJECT TO INDEPENDENT TESTING AND SPECIAL INSPECTION. REFER TO THE PROGRAM FOR STRUCTURAL TESTS AND SPECIAL INSPECTIONS FOR SPECIFIC PROJECT REQUIREMENTS. ALL COSTS FOR COORDINATING AND EXECUTING THE PROGRAM SHALL BE BORNE BY THE CONTRACTOR.
7. THE STRUCTURE IS DESIGNED TO ACT AS A STRUCTURAL UNIT UPON COMPLETION OF ALL STRUCTURAL WORK. THE CONTRACTOR SHALL DESIGN AND PROVIDE ALL REQUIRED SHORING AND BRACING TO RESIST FORCES ON THE STRUCTURE THROUGHOUT THE CONSTRUCTION PERIOD.

SUBMITTALS

1. SUBMITTALS SHALL COMPLY WITH GENERAL PROVISIONS AND DIVISION 1 SPECIFICATIONS, IF APPLICABLE.
2. ALL SUBMITTALS FROM SUBCONTRACTORS AND SUPPLIERS SHALL BE MADE BY THE CONTRACTOR.
3. THE CONTRACTOR SHALL REVIEW ALL SUBCONTRACTOR AND SUPPLIER SUBMITTALS FOR CORRECTNESS, COORDINATION WITH OTHER WORK, AND COORDINATION WITH CONSTRUCTION SEQUENCE PRIOR TO FORWARDING THE SUBMITTALS TO THE ENGINEER. SUBMITTALS SHALL BE NOTED WITH THE CONTRACTOR'S REVIEW STAMP.
4. THE CONTRACTOR SHALL COORDINATE THE FINAL LAYOUT AND DIMENSIONS OF FRAMED OPENINGS WITH SUBCONTRACTORS AND/OR EQUIPMENT SUPPLIERS AND VERIFY THAT ANY PROPOSED STRUCTURAL CHANGES ARE INDICATED ON THE APPLICABLE SHOP DRAWINGS.
5. THE ENGINEER WILL REVIEW SUBMITTALS FOR GENERAL CONFORMANCE WITH THE DESIGN DOCUMENTS.
6. SUBMITTALS ARE REQUIRED AS FOLLOWS:
   a. CONCRETE: MIX DESIGN(S); MATERIAL CERTIFICATIONS
   b. CONCRETE REINFORCING: SHOP DRAWING(S); MATERIAL CERTIFICATIONS
   c. STRUCTURAL STEEL: SHOP ERECTION AND DETAIL DRAWINGS; MATERIAL CERTIFICATIONS; EVIDENCE OF AISC CERTIFICATION OR ACCEPTABLE QUALITY CONTROL PLAN
   d. STEEL GRATING: SHOP LAYOUT AND DETAIL DRAWINGS; GRATING SPECIFICATIONS; FASTENING AND SPACINGS; MATERIAL CERTIFICATIONS
7. SUBMITTALS FOR WORK DESIGNED BY OTHERS UNDER PERFORMANCE CRITERIA SHALL BE CERTIFIED AND SEALED BY A STRUCTURAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS, AS INDICATED ABOVE.

DESIGN LOADS

1. CONDENSER UNIT OPERATING LOAD: 23,000 LB, SUPPORTED ON STRUCTURAL STEEL FRAMING AS SHOWN ON PLAN.
2. PLATFORM UNIFORM LIVE LOAD: 100PSF
3. SNOW LOAD
   a. GROUND SNOW LOAD, P_g: 30 PSF
   b. FLAT ROOF SNOW LOAD, P_f: 30 PSF
   c. SNOW EXPOSURE FACTOR, C_e: 1.0
   d. SNOW LOAD IMPORTANCE FACTOR: I: 1.0
4. WIND DESIGN DATA
   a. BASIC WIND SPEED (3-SECOND GUST): 110 MPH
   b. WIND IMPORTANCE FACTOR, I: 1.0
   c. OCCUPANCY CATEGORY: II
   d. WIND EXPOSURE: C
5. EARTHQUAKE DESIGN DATA
   a. SEISMIC IMPORTANCE FACTOR, I: 1.0
   b. OCCUPANCY CATEGORY: II
   c. SITE CLASS: D
   d. S_{ds}: 0.23
   e. S_{f1}: 0.068
   f. SEISMIC DESIGN CATEGORY: B
   g. BASIC SEISMIC FORCE RESISTING SYSTEM: ORDINARY MOMENT RESISTING FRAMES IN TWO ORTHAGONAL DIRECTIONS
   h. RESPONSE MODIFICATION FACTOR, R: 3.5

FOUNDATIONS

1. PRIMARY FOUNDATIONS FOR THIS PROJECT CONSIST OF PILES WITH PILE CAPS.
2. NOTIFY DIG-SAFE PRIOR TO ANY BUILDING OR SITE EXCAVATION.
3. FOUNDATION WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE RECOMMENDATIONS, MATERIAL SPECIFICATIONS, TESTS, AND INSPECTIONS INCLUDED IN THE PROJECT GEOTECHNICAL REPORT. THE SUBSURFACE CONDITIONS DESCRIBED IN THE SKETCHES/DRAWINGS, SPECIFICATIONS, TEST BORINGS, AND GEOTECHNICAL DATE PROVIDED BY KEVIN MARTIN, P.E., ARE TO BE INCLUDED ONLY TO ASSIST THE CONTRACTOR DURING BIDDING AND SUBSEQUENT CONSTRUCTION, AND REPRESENT CONDITIONS ONLY AT SPECIFIC LOCATIONS AND DEPTHS AT THE TIME OF THE SUBSURFACE INVESTIGATION.
4. THE CONTRACTOR SHALL DESIGN AND PROVIDE ANY TEMPORARY EARTH SUPPORT, SHEETING, SHORING, UNDERPINNING, AND BRACING AS NEEDED TO PROTECT ALL NEW WORK, EXISTING STRUCTURES, AND EXISTING UTILITIES FROM EXCESSIVE MOVEMENTS, INSTABILITY AND OVERLOAD DURING CONSTRUCTION.
5. THE CONTRACTOR SHALL CARRY OUT CONTINUOUS CONTROL OF SURFACE AND SUBSURFACE WATER DURING CONSTRUCTION SUCH THAT FOUNDATION WORK IS DONE IN THE DRY ON UNDISTURBED SUBGRADE MATERIAL OF THE SPECIFIED MOISTURE CONTENT. NO FOUNDATION CONCRETE SHALL BE PLACED IN THE WET OR ON FROZEN GROUND.
6. PLACE FOUNDATION BACKFILL UNIFORMLY AROUND FOUNDATION ELEMENTS. UNBALANCED FILL SHALL BE LIMITED TO 2 FT OR LESS UNLESS NOTED OTHERWISE.
7. FOUNDATION ELEMENTS SHALL BE CENTERED UNDER COLUMN GRID LINES AND STRUCTURAL ELEMENTS UNLESS NOTED OTHERWISE.

CAST-IN-PLACE CONCRETE

1. ALL CONCRETE WORK SHALL CONFORM TO THE BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI318-08.
2. UNLESS NOTED OTHERWISE, CONCRETE SHALL BE NORMAL WEIGHT AND HAVE A MINIMUM 28-DAY STRENGTH AS FOLLOWS (SEE ACI 318-08 TABLES 4.2.1, 4.3.1)
   a. PILE CAPS: 4,000 PSI
3. THE MAXIMUM AGGREGATE SIZE SHALL BE 1" UNLESS OTHERWISE AUTHORIZED.
4. THE TOTAL AIR CONTENT SHALL BE AS FOLLOWS (SEE ACI 318-08 TABLE 4.4.1):
5. THE MAXIMUM WATER-CEMENT RATIO SHALL BE AS FOLLOWS (SEE ACI 318-08TABLE 4.3.1):
6. CONCRETE WORK SHALL BE COORDINATED WITH ALL OTHER STRUCTURAL WORK, WITH ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION WORK, AND WITH ALL EQUIPMENT. THE CONTRACTOR SHALL VERIFY LOCATIONS AND INSTALLATION OF ALL EMBEDDED ITEMS INCLUDING BUT NOT LIMITED TO INSERTS, ANCHOR BOLTS, DOWELS, BLOCKOUTS, SLEEVES, PIPING, AND CONDUIT PRIOR TO CONCRETE PLACEMENT.
7. MATERIAL SPECIFICATIONS:
   a. CEMENT: ASTM C150
   b. AGGREGATE: ASTM C33
   c. AIR ENTRAINMENT ADMIXTURE: ASTM C260
   d. OTHER ADMIXTURES: ASTM C494
8. PROVIDE ¾ IN X ¾ IN CHAMFER ON ALL EXPOSED OUTSIDE CORNERS.
9. CONCRETE SHALL BE PLACED ON PROPERLY PREPARED SUBGRADE. DO NOT PLACE CONCRETE IN THE WET OR ON FROZEN GROUND.

CONCRETE REINFORCEMENT

1. REINFORCING STEEL DETAILING, FABRICATION, AND ERECTION SHALL COMPLY WITH THE ACI DETAILING MANUAL.
2. MATERIAL SPECIFICATIONS:
   a. #4 BARS AND LARGER: ASTM A615 GRADE 60
   b. #3 BARS: ASTM A615 GRADE 40
3. REINFORCING BARS SHALL BE DEFORMED AND UNCOATED UNLESS OTHERWISE NOTED.
4. MINIMUM PROTECTIVE COVER:
   a. CONCRETE CAST AGAINST EARTH: 3 IN
   b. BACKFILLED SURFACES: 2 IN
   c. OTHER SURFACES: 1-1/2 IN
5. PLACEMENT OF COLUMN BASE ANCHOR BOLTS SHALL COMPLY WITH THE TOLERANCE LIMITATIONS CONTAINED IN THE AISC CODE OF STANDARD PRACTICE.

STRUCTURAL STEEL

1. STRUCTURAL STEEL DESIGN, FABRICATION, AND ERECTION SHALL COMPLY WITH THE SPECIFICATION FOR STEEL BUILDINGS, AISC 360-05, THE SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS, AISC 341-05, AND THE OSHA ERECTION STANDARD.
2. STRUCTURAL STEEL FABRICATION AND ERECTION TOLERANCES SHALL COMPLY WITH THE AISC CODE OF STANDARD PRACTICE UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS.
3. MATERIAL SPECIFICATIONS
   a. WIDE FLANGE SHAPES: ASTM A572 GRADE 50
   b. SQUARE AND RECTANGULAR HOLLOW STRUCTURAL SECTIONS: ASTM A500 GRADE B (Fy=46 KSI)
   c. OTHER SHAPES, PLATES, AND BARS: ASTM A36
   d. HIGH STRENGTH BOLTS: ASTM A325, DIAMETER AND TYPE TO SUIT EACH CONDITION
   e. ANCHOR BOLTS: ASTM A1554 GRADE 36
   f. WELDING ELECTRODES: E7000
4. ALL STRUCTURAL STEEL SHALL BE HOT DIPPED GALVANIZED. BARE STEEL WHERE FIELD WELDS ARE TO BE MADE, AFTER FIELD WELDS ARE INSTALLED, TOUCH UP WITH ZINC RICH PAINT.
5. WELDED CONNECTIONS SHALL BE DESIGNED AND DETAILED UTILIZING PREQUALIFIED JOINTS. ALL WELDING SHALL BE BY CERTIFIED WELDERS.
6. STRUCTURAL STEEL SHALL BE WITHIN TOLERANCE BEFORE CONNECTIONS ARE FULLY BOLTED OR WELDED.
7. FOR THE PURPOSES OF ERECTION STABILITY, THE CONTRACTOR SHALL DESIGN AND PROVIDE ALL REQUIRED SHORING AND BRACING TO RESIST FORCES ON THE STRUCTURE THROUGHOUT THE CONSTRUCTION PERIOD.
8. WELDED STEEL BAR GRATING SHALL HAVE CAPACITY FOR 100 PSF LIVE LOAD, AND SHALL BE HOT DIP GALVANIZED. GRATING SHALL BE WELDED TO STRUCTURAL STEEL FRAMING. TOUCH-UP WITH ZINC RICH PAINT AFTER INSTALLATION.

ID	DESCRIPTION	DATE	ACTION
1	PERMIT	12/8/2015	

SIGNATURE BY PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

Project Title:
Independent Mechanical Maritime Bridge Terminal
New Bedford, MA

GENERAL NOTES

RIVERMOOR ENGINEERING, LLC
146 FRONT STREET, SUITE 211
SCITUATE, MASSACHUSETTS 02066
TEL: (781) 545-2848
FAX: (781) 544-7729

DATE: 12-4-15
DESIGNED BY: AG
DRAWN BY: BSH
CHECKED BY: AG

DRAWING NO.
S-1

15-290

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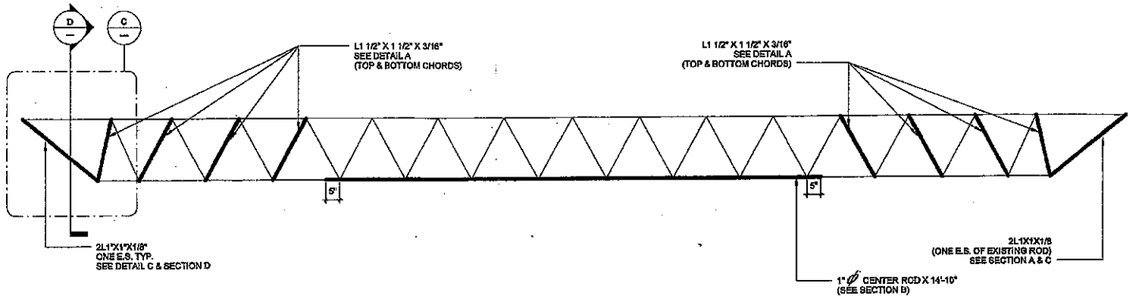
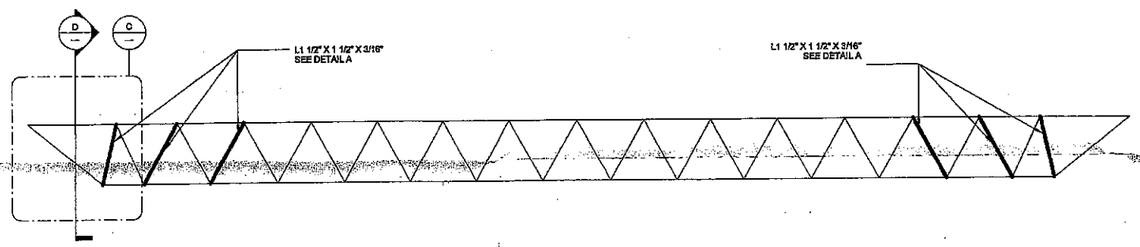
GENERAL NOTES:
1. ROOF LOADS: DL 25 PSF
   SNOW: 30 PSF
2. ALL NEW ANGLES AND ROUND BARS TO BE 50 KSI YEILD WELDABLE STEEL IN ACCORDANCE WITH STEEL JOIST INSTITUTE SPECIFICATIONS, SECTIONS 3.1, 102.1, AND 1002.1
3. ALL PAINTING?
4. ALL CUT LENGTHS ARE APPROXIMATE, AND SHOULD BE CONFIRMED BY CONTRACTOR PRIOR TO FABRICATION
5. SEE S-2 FOR LAYOUT



NOTE: TYPICAL JOIST STRUTS NOT SHOWN FOR CLARITY, OCCUR AT AU HANGERS (2 PER JOIST), SEE TYPICAL STRUT DETAIL

REINFORCE 7 JOISTS J1

SCALE: 1/2" = 1'-0"

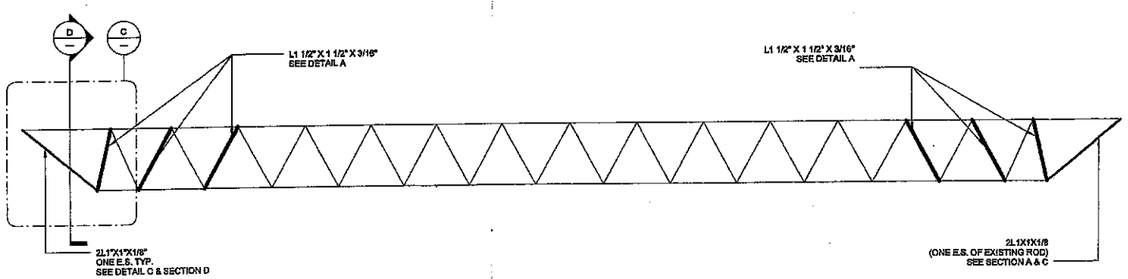


NOTE: TYPICAL JOIST STRUTS NOT SHOWN FOR CLARITY, OCCUR AT PIPING HANGERS, SEE TYPICAL STRUT DETAIL

FOR PIPING LOADS

REINFORCE 7 JOISTS J2

SCALE: 1/2" = 1'-0"

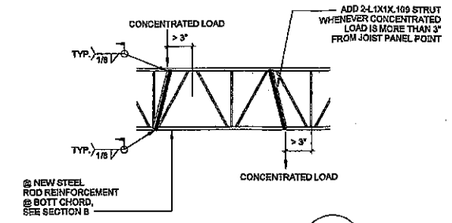


NOTE: TYPICAL JOIST STRUTS NOT SHOWN FOR CLARITY, OCCUR AT PIPING HANGERS, SEE TYPICAL STRUT DETAIL

FOR PIPING LOADS

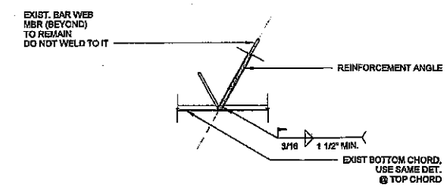
REINFORCE 5 JOISTS J3

SCALE: 1/2" = 1'-0"



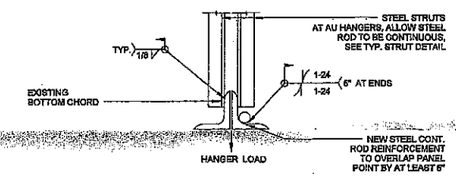
TYPICAL STRUT DETAIL

SCALE: 1/2" = 1'-0"



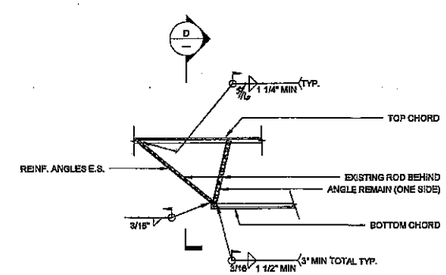
DETAIL A

SCALE: 1/2" = 1'-0"



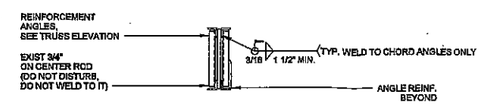
SECTION B

SCALE: 1/2" = 1'-0"



DETAIL C

SCALE: 1/2" = 1'-0"



SECTION D

SCALE: 1/2" = 1'-0"

Project Title:
Independent Mechanical
Maritime Bridge Terminal
New Bedford, MA

JOIST DETAILS

RIVERMOOR ENGINEERING, LLC
146 FRONT STREET, SUITE 211
SCITUATE, MASSACHUSETTS 02066
TEL: (781) 545-2948
FAX: (781) 544-7723

DATE: 11.10.2015
DESIGNED BY: AG
DRAWN BY: DSH
CHECKED BY: AG

DRAWING NO.
S-4

#15-290

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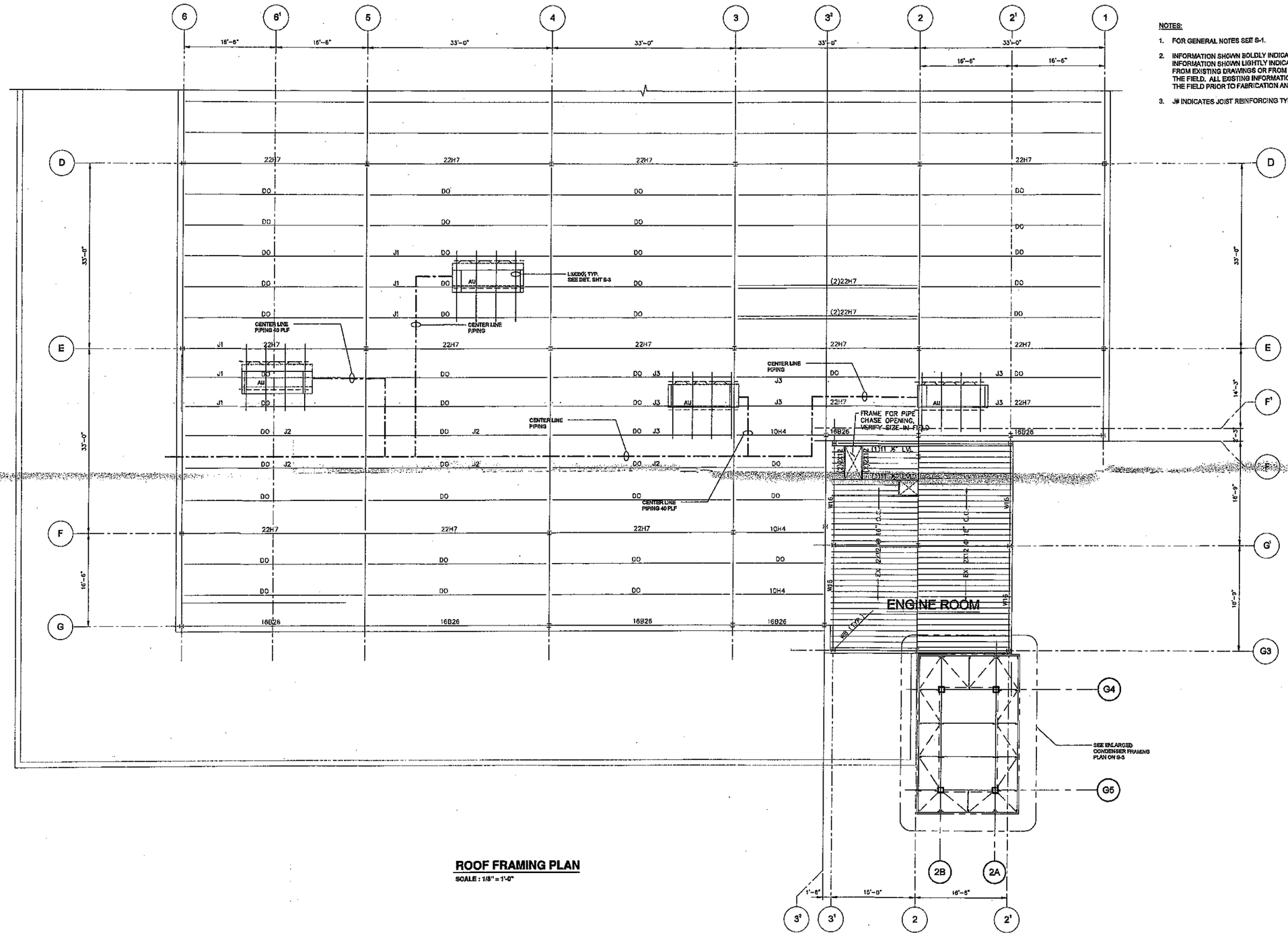

ROOF FRAMING PLAN

SCALE : 1/8" = 1'-0"

NOTES:

1. FOR GENERAL NOTES SEE S-1.
2. INFORMATION SHOWN BOLDLY INDICATES NEW WORK. INFORMATION SHOWN LIGHTLY INDICATES INFORMATION TAKEN FROM EXISTING DRAWINGS OR FROM INFORMATION OBTAINED IN THE FIELD. ALL EXISTING INFORMATION SHALL BE VERIFIED IN THE FIELD PRIOR TO FABRICATION AND CONSTRUCTION.
3. J# INDICATES JOIST REINFORCING TYPE. SEE DETAILS ON S-4.

ID	DESCRIPTION	DATE	ACTION
1	PERMIT	12/8/2015	

Project Title:
Independent Mechanical Maritime Bridge Terminal New Bedford, MA

FRAMING PLAN

RIVERMOOR ENGINEERING, LLC
146 FRONT STREET, SUITE 211
SCITUATE, MASSACHUSETTS 02066
TEL: (781) 545-2848
FAX: (781) 544-7729

DATE: 12-4-15
DESIGNED BY: AG
DRAWN BY: BSH
CHECKED BY: AG

DRAWING NO.
S-2

15-290

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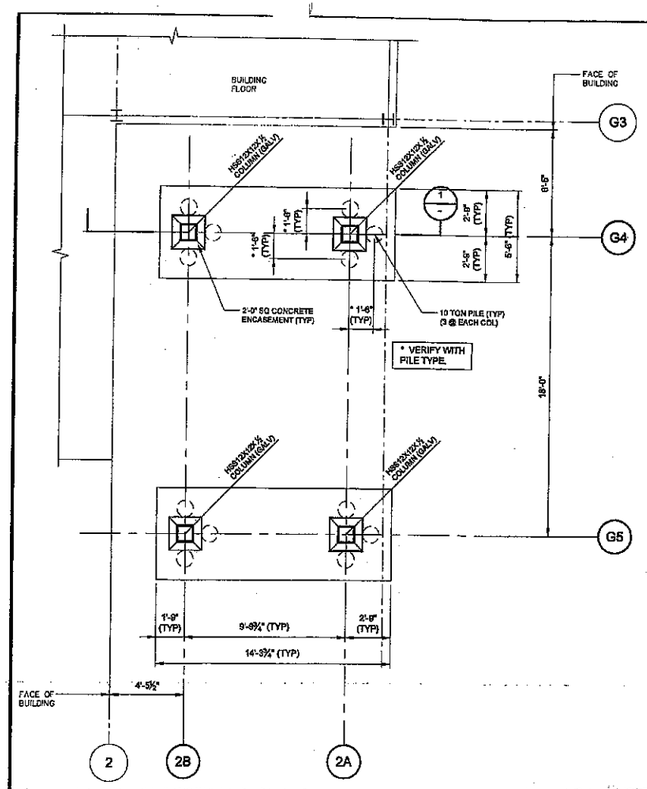
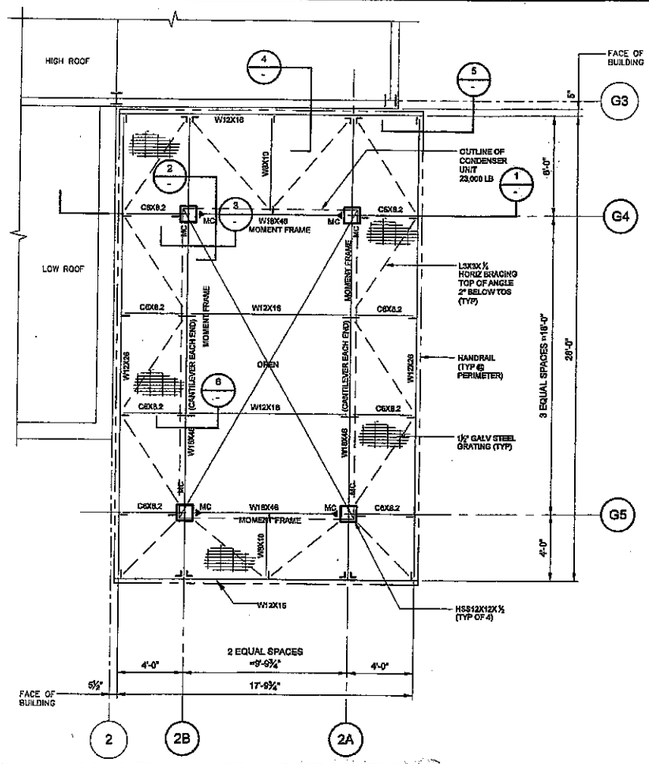


FOUNDATION PLAN

SCALE : 1/4" = 1'-0"

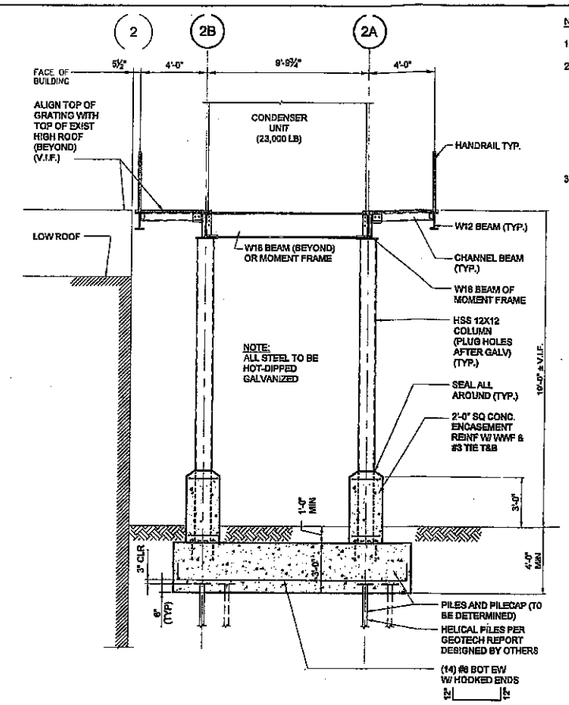


CONDENSER FRAMING PLAN

SCALE : 1/4" = 1'-0"

NOTES:

1. ALL FRAME STEEL SHALL BE GALVANIZED.
2. GRATING DESIGN LIVE LOAD = 100 PSF.
3. TOP OF STEEL GRATING SHALL MATCH TOP OF EXISTING ROOF.
4. VERIFY IN FIELD ALL DIMENSIONS PRIOR TO START OF WORK

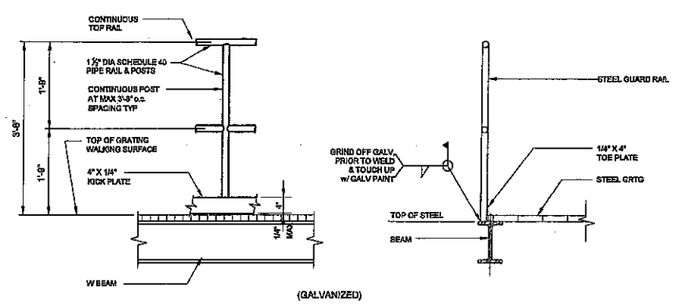


SECTION 1

SCALE : 3/4" = 1'-0"

NOTES:

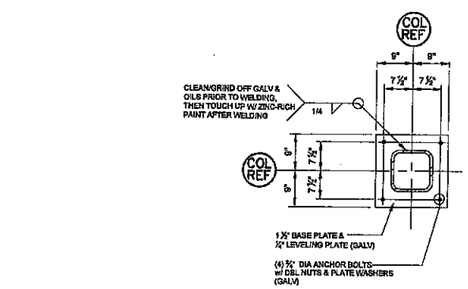
1. FOR GENERAL NOTES SEE S-1.
2. INFORMATION SHOWN BOLDLY INDICATES NEW WORK. INFORMATION SHOWN LIGHTLY INDICATES INFORMATION TAKEN FROM EXISTING DRAWINGS OR FROM INFORMATION OBTAINED IN THE FIELD. ALL EXISTING INFORMATION SHALL BE VERIFIED IN THE FIELD PRIOR TO FABRICATION AND CONSTRUCTION.
3. ► MC INDICATES MOMENT CONNECTION OF MOMENT FRAME.

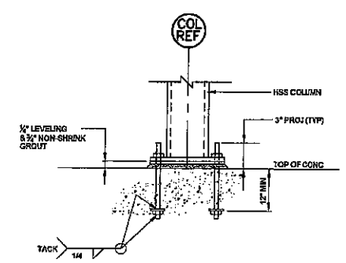


(GALVANIZED)

STANDARD RAILING DETAILS

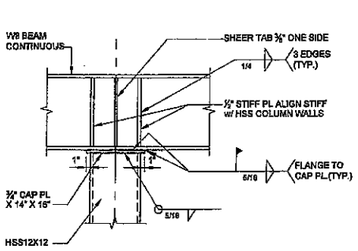
NTS





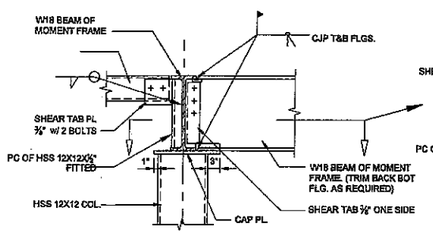
BASE PLATE DETAILS

NTS



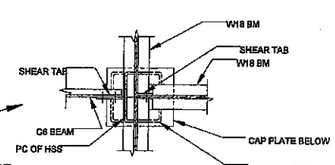
SECTION 2

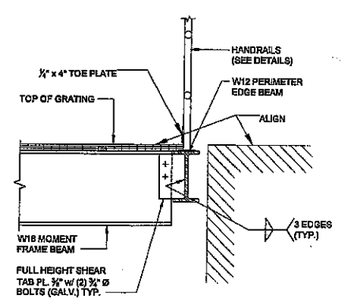
SCALE : 3/4" = 1'-0"



SECTION 3

SCALE : 3/4" = 1'-0"

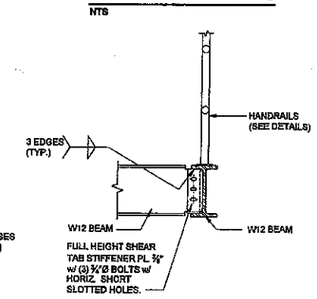




PERIMETER BEAMS (TYPICAL)

SECTION 4

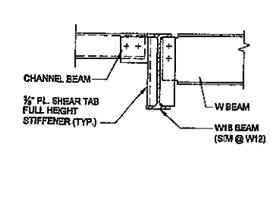
SCALE : 3/4" = 1'-0"



PERIMETER BEAMS @ CORNERS (TYPICAL)

SECTION 5

SCALE : 3/4" = 1'-0"



TYPICAL GRAVITY CONNECTION

SECTION 6

SCALE : 3/4" = 1'-0"

ID	DESCRIPTION	DATE	ACTION
1	PERMIT	12/8/2015	

Project Title:
Independent Mechanical Maritime Bridge Terminal
New Bedford, MA

ENLARGED PLANS, SECTIONS AND DETAILS

RIVERMOOR ENGINEERING, LLC
146 FRONT STREET, SUITE 211
SCITUATE, MASSACHUSETTS 02066
TEL: (781) 545-2848
FAX: (781) 544-7729

DATE : 12-4-15
DESIGNED BY: AG
DRAWN BY: BSH
CHECKED BY: AG

DRAWING NO.
S-3

15-290

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