CITY OF SALEM, MASSACHUSETTS

Commercial Marina

SALEM PORT EXPANSION PROJECT

BLANEY STREET, SALEM, MA

BID #R-44

ADDENDUM NO. 2

January 27, 2016

The attention of bidders submitting proposals for the subject project ***Commercial Marina – Salem Port Expansion Project*** are called to the following addendum. The items set forth herein, whether of omission, addition, substitution or clarification are all to be included in and form a part of the proposal submitted.

A. MEETING NOTES

a. Introductions of BCE Staff and parties present
b. Project key Dates

i.	Bid Docs are available	12/30/15
ii.	Pre Bid Meeting	1/19/16
iii.	Questions to be submitted	1/22/16
iv.	Bids Due	1/27/16 (Addendum #1 Changed to 2/1/16)
v.	Project Completion	5/27/16 (Addendum #2 Changed to 6/24/16)

c. Project Summary
   i. Prevailing wages
   ii. Project scope

B. RESPONSES TO REQUESTS FOR INFORMATION (RFIs)

Meeting Questions

a. Min length of float required?
   Meeting response – To be determined.
   Final Response - The maximum float length for the marina floats shall be 40'.
b. Are splices allowed to be used in the floats or do all members need to be continuous?
   Meeting response – Splices are shown on the Contract Drawings, however the owner would like floats without splices.
   Final Response - Floats may have splices, however splices shall be staggered as to no more than 50% shall occur at the same location.
c. What are the anticipated vessel sizes?
   Meeting response – We are not aware of any specific vessels at this time.
   Final Response - There are no specific vessels which are allocated for the site. Vessels are anticipated to range from 30 feet to 100 feet.

d. Does the whole float system need to be non-articulating?

Meeting response – Floats are shown with hinges, will have to review specification requirements and provide an answer.

Final Response - Each individual float segment shall be non-articulating, as shown in the Contract Plans the floats are to have clevis connection between each float.

e. The dimension across the inshore length does not match spacing with float widths? Should the end float be wider to match the total length?

Meeting response – We will review the float layout and provide an answer

Final Response - All the float sizes should match the widths and lengths shown on Sheet 9 of the Contract Drawings. Total width across the inshore end should be 128'-0". See the attached Sheet 9 Addendum No . 2

f. Are skids required on the floats, it appears there are skids shown on the details on sheet 10?

The floats are not required to have skids.

g. What is the typical timeline to receive the finalized Contract?

Meeting response – Typically the Contract takes several weeks would anticipate end of February.

Final Response - The contractors should anticipate a finalized Contract by the end of February/ Beginning of March.

h. It appears there could be limited time to complete the installation if the floats are used a template for driving the piles, would a Contract extension be considered?

Meeting response – We will discuss with the City on the possibility of a Contract Extension

Final Response - The Contract Completion date is modified as shown below in revisions to Contract Documents

i. What is the protocol for obstructions encountered during pile driving?

Meeting response – Typically it is within 5' of the surface, will confirm in the addendum.

Final Response - Any obstructions encountered within five feet of the surface shall be the responsibility of the Contractor. Obstruction beyond 5' of mudline, Owner reserves the right to relocate pile and pile guide.

j. Given the plumbing required, is a licensed plumber required?

Meeting response – We will have to review with the City and provide clarification

Final Response - The Contractor is required to use a licensed plumber to meet the City Permits.

k. What is the current list of plan holders?

Meeting response – Currently do not have a copy but will provide in the addendum.

Final Response - The current Plan Holders List is attached for reference.

<u>Submitted Questions</u>

l. Section 2400.2.2.B – Calls for 2" Sched pipe pile hoop. We recommend using a 4 roller pile hoop as detailed in attached reference drawings because the piles are 14" Steel Pipe.

Yes, a 4 sided pile hoop would be allowed, however UHMW shall be used in lieu of rollers. Use of rollers will not be approved.

m. Section 2400.2.2.F – Calls for 3¾" high fender. We recommend using a 3 1/8" fender, it has been accepted on many MA DEP jobs, it is much less expensive and performs essentially the same function.

An alternative fender may be used, provided it is an approved equal. Fenders shall be D- fenders as shown on detail L/10

n. Section 2400.2.3.A – Calls for "non-articulated design" Based on the site and exposure conditions we would recommend an articulating or hinged system for this site with hinges at approximately 40' intervals. See attached reference drawings. (continued page3 of 5)

i. If a hinged system is acceptable would a transition plate between dock sections be required if the spacing between deck boards at the hinge areas does not exceed 1.25"?

Each float segment shall be non-articulating, as shown in the Contract Plans the floats are to have connection between each float. A transition plate will be required. Gaps between floats shall be as shown on drawings to allow for access to connection from the deck.

o. Section 2400.2.5.A.1.b – Calls for "85 psf" live load for structural design of dock. The drawings in the package indicate 2X IPE decking material. Would a 1X or 5/4 material be acceptable as long as we can meet the 85 PSF structural design criteria? We can build the dock with 2X IPE however it is much more expensive and we have found 5/4 and 1X to be more than sufficient.

IPE decking has been removed from the contract. All float decking shall be Southern Yellow Pine treated in accordance with Specification 06310.

p. Drawing 34005-02-11 – Sheet 11 of 13 Shows details on the gangway, does this gangway need to be ADA compliant?

Yes, Per Specification 05200 the gangway needs to be ADA Compliant and include vertical pickets at 4" on center.

q. Drawing 34005-02-11 – Sheet 9 of 13 The spacing on the 4x40 finger floats and the 6x80 finger floats totals 118' where the mainwalks are shown as (3) 6x40 which total 120'. What is the correct dimension in this area?

The correct dimension is 118'-0" as shown on sheet 9 – see attached revised sheet 9 addendum No.1

r. Drawing 34005-02-11 – Sheet 9 of 13 shows gusseted corners, because you will be installing power pedestals on the corners we would recommend they be at least 2'x2' gussets. Please confirm size of gusseted corners.

The gusseted corners shall be 3'x3'.

s. The written specification in section 02400, 2.3 performance states the float shall be of non-articulated design. However the float drawings show hinged connections and call outs for hinge connections. I believe the articulating hinge connections are a necessary feature in this location. Will articulating hinge connections between float sections be acceptable?

See question "n" above for referenced answer.

t. Float drawings call for 2x tropical hardwood decking, because the load capabilities are much higher for IPE would thinner decking such as 5/4x6 or 1x6 be acceptable? If so what will the minimum acceptable thickness be, as the price difference is significant?

See question "o" above for referenced answer

u. Will it be acceptable if the all float framing lumber is .60 ACQ pressure treated due to the fact that all lumber is in the marine splash zone?

Float framing which is not exposed to the public shall be CCA all timber which is exposed to the public shall be ACQ per specification 06310

v. Do we need to apply MASS state wages for the float and gangway construction if its fabricated out of State?

No, Mass state wages do not apply to Items fabricated within an out of state facility.

w. Can Stainless steel (316) be substituted for the bronze bushing specified in Section F-11 on Drawing # 34005-02-11?

No, the bronze bushing is required for isolation of differing metals.

x. Will the client accept a stock full compliance truss style ramp that meets or exceeds the performance requirements outlined in the specifications and drawings that uses different extrusions and/or design details that are called out on the plans?

The gangway shall be constructed in accordance with the Structural Aluminum Specification 05200. Alternative extrusions and design details may be utilized, however all design requirements shall be met including MA PE Stamped Calculations

y. Section 09800 Coatings, Part 1.1, Paragraph B references Steel Sheeting under Section 02315. Specs do not include a section 02315. Please clarify.

Reference to Section 02315 is removed; see changes to Specification 09800 below.

z. Section 16000 Electrical, Section 2.04 Marina Power Pedestals, Paragraph A, Section 11 references 50A-120 V, 1 Phase….This seems to be an outdated service. Please Clarify.

Marina Power Pedestals have been modified to provide 50A and 30A connections. See revisions to sheet 13 below.

C. **LEGAL NOTICE -**

Paragraph 1:

REMOVE – Project shall be completed by May 27, 2016
INSERT – Project shall be completed by June 24, 2016

D. REVISONS TO CONTRACT DOCUMENTS AND SPECIFICATION

INSTRUCTIONS TO BIDDERS, PAGE 5

Paragraph 2:

REMOVE – Project shall be completed by May 27, 2016
INSERT – Project shall be completed by June 24, 2016

Paragraph 3:

REMOVE –May 27, 2016
INSERT –June 24, 2016

FORM FOR BID, PAGE B-4

INSERT after BID SCHEDULE – See attached revised General Bid Form

ADD ALTERNATIVE - 1

Alt-1 02400-2 TIMBER FLOAT REMOVAL AND REINSTALLATION

SECTION 02400, Page 02800-6

SECTION 4.1.A INSERT

B. Measurement for TIMBER FLOAT REMOVAL AND REINSTALLATION shall be for the Unit Price Lump Sum. This price and payment shall constitute full compensation for all supervision, labor, materials, and equipment for the satisfactory removal and reinstallation of the marina floats and utilities.

SECTION 4.2.A INSERT

B. Payment for TIMBER FLOAT REMOVAL AND REINSTALLATION shall be made by Contact Unit Price Lump Sum complete in-place float system. Items measured under this section shall include all work associated with the Timber Float Removal and Reinstallation including but not necessarily limited to float removal, utility disconnection and capping, storage onsite, and re-installation of floats and utilities, mooring guides, attachments and all other associated items to complete the work within the Contract Documents. The Contractor shall assume all pilings will remain in place.

UNDER SECTION 4.3 PAYMENTS ITEMS

INSERT:

ITEM	DESCRIPTION	UNIT
Alt-1 02400-2	TIMBER FLOAT REMOVAL AND REINSTALLATION	LUMP SUM

SECTION 09800, Page 09800-1

DELETE Reference - 1.1.B.1 Steel sheeting under STEEL H-SECTION PILES, SECTION 02315

SECTION 16000, Pages 16000-1 through 16000-23

DELETE SPEC SECTION 16000 in its entirety
REPLACE WITH: SPEC SECTION 16000 Addendum No. 2 - see attached

E. DRAWING CHANGES

SHEET 9 of 13

DELETE SHEET 9
REPLACE WITH SHEET 9ADDENDUM NO. 2 – Modifications to float dimensions.

SHEET 10 of 13

DELETE Detail H/10
INSERT Detail H/10 Exhibit 1 - ADDENDUM NO. 2

SHEET 11 of 13

INSERT the following note:
3. Pickets are not shown on Detail B/11 for clarity.

INSERT Detail H/11 Exhibit 1 - ADDENDUM NO. 2

SHEET 13 of 13

DELETE SHEET 13
REPLACE WITH SHEET 13 ADDENDUM NO. 2

- - - END OF ADDENDUM #2 - - -

ADDENDUM NO.2 IS COMPRISED OF 5 PAGES: Plus the following attachments.

PLAN HOLDERS LIST
GENERAL BID FORM
- Revised form for bid pages B-3 through B-7

SPECIFICATIONS
- 16000 Electrical

DRAWINGS
- EXHIBIT 1 – DETAIL H/10 & DETAIL H/11
- SHEET 9 – MARINA LAYOUT PLAN
- SHEET 13 – ELECTRICAL SITE PLAN

R-44
Planholders List

Name:	Ken Taliadoros
Org./Co.:	Great Eastern Marine Service In,c
Address:	
Email:	ken@greateastermarine.com
Phone:	978-283-2123
Fax:	978-283-9438
Set #:	

Name:	Peter Ruggs
Org./Co.:	Systems Electrical Services
Address:	
Email:	peter@systemselectricalservices.com
Phone:	617-466-0920
Fax:	617-466-0923
Set #:	

Name:	Jonah Mikutowiccz
Org./Co.:	AGM Marine Contractors, Inc.
Address:	
Email:	jonah.mikutowicsz@agmmarine.com
Phone:	508-477-8801
Fax:	508-477-8804
Set #:	

Name:	Kevin Pelletier
Org./Co.:	North Shore Marine Inc.
Address:	
Email:	kpelletier@barge90.com
Phone:	978-745-8062
Fax:	978-744-5809
Set #:	

Name:	Matthew Plauche
Org./Co.:	Smith Marine Inc.
Address:	
Email:	matt@smithmarineinc.com
Phone:	781-631-4800
Fax:	781-631-4801
Set #:	

Name:	Gina Marie Dicenso
Org./Co.:	G.V.W, Incorporated
Address:	
Email:	gdicenso@gvwinc.com
Phone:	617-567-6000
Fax:	617-567-3344
Set #:	

GENERAL BID FORM

To The Awarding Authority:

1. The Undersigned proposes to furnish all labor and materials required for the **Salem Port Expansion Project – Commercial Marina, Blaney Street, Salem, MA** in accordance with the Contract Documents prepared by the Salem Purchasing Department for the Contract Price specified below, subject to additions and deductions according to the terms of the contract.

The undersigned hereby declares to have carefully examined the annexed form of Contract, Specifications, and Drawings therein referred to and also the sites upon which the projected work is to be performed. Also, included in the Bid Form is a table requiring information on the Bidder's qualifications.

2. The undersigned acknowledges receipt of addenda numbered _____. (If none, write "NONE")

3. **The Proposed Contract Price is:** $_____

_____dollars

(insert words and numbers. In cases of conflict between words and numbers, words shall control)

THE OWNER SOLICITS THE FOLLOWING BIDS:

A. BASE BID

The Bidder agrees to perform all the Work described in the Contract Documents for the following prices:

B. BASE BID SCHEDULE

Brief Description of Item	**Est. Quant.**	**Unit**	**Rate**	**Total Amount in words**	**Total Amount in figures**
1. Mobilization (Item 02000-1)	1	LS		_____dollars and_____cents	$
2. Site Preparation (Item 02000-2)	1	LS		_____dollars and_____cents	$
3. Steel Pipe Piles (Item 02316-1)	29	EA		_____dollars and_____cents	$
4. Timber Floats (Item 02400-1)	1	LS		_____dollars and_____cents	$
5. Water Service (Item 02600-1)	1	LS		_____dollars and_____cents	$

6. Structural Aluminum (Item 05200-1)	1	LS		_____dollars and_____cents	$
7. Utilities (Item 16000-1)	1	LS		_____dollars and_____cents	$
TOTAL BID PRICE:					**$**

TOTAL BASE BID PRICE WRITTEN IN WORDS:

_____ DOLLARS

_____CENTS

ADDITIVE ALTERNATE ITEMS

1. ALTERNATIVE ITEM(S) BID

The Bidder agrees to perform the Work described in the Contract Documents for the following prices should the Owner choose to include this work within the Contract:

2. ALTERNATIVE ITEM BID SCHEDULE

Brief Description of Item	**Est. Quant.**	**Unit**	**Rate**	**Total Amount in words**	**Total Amount in figures**
A-1 02400-2 TIMBER FLOAT REMOVAL AND REINSTALLATION	1	LS		_____dollars and_____cents	$
TOTAL ALTERNATIVE ITEM BID PRICE:					**$**

TOTAL ALTERNATIVE ITEM BID PRICE WRITTEN IN WORDS:

_____ DOLLARS

_____CENTS

BID PROPOSAL INCLUDES ADDENDA NUMBER(S) _____

BASIS OF CONTRACT AWARD: The City's Basis of Award will be determined by the available funding for the project. Additive Alternatives, if included, will be selected in order and cannot be taken out of sequence.

All Bidders will be first evaluated for award on the Base Bid to confirm the project is within the available funding. If the available project funding exceeds the lowest responsive Base Bid, the City will review all Bids with the inclusion of Alternative 1 and determine if any bids are within the available project funding. If so, the City will proceed to the review of all Bids with the inclusion of Additive Alternative 1 and 2 and determine if any bids are within the available project funding. This process will continue with inclusion of subsequent Additive Alternatives until the lowest responsive bid total is greater that available project funding. At that point, the City will select the lowest responsive Bidder, with the inclusion of accepted Additive Alternatives, that is within the available funding for the project.

The City reserves the right to add additional funding to the project should it be in its best interest for maximizing the construction for the available funding.

DESCRIPTION OF PAY ITEMS

The description of payment items will be as defined within the Technical Specifications and as indicated below. Where differences in scope are present, the more encompassing shall govern. When conflicts in scope of work exists, the scope as defined in the Technical Specifications shall govern

BASE BID ITEMS

1. Mobilization

Payment for Mobilization/demobilization of all equipment, movement and/or relocation of equipment, all office and field engineering and survey support, and all other costs not specifically identified but is required to complete the work specified. Mobilization will be paid fifty percent (50%) of the lump sum price upon completion of mobilization at the work site. An additional twenty-five percent (25%) will be paid the Contractor upon the acceptance of his dredge verification survey. The final twenty-five percent (25%) will be paid only after the Contractor has received the written notice from the Owner to proceed with the demobilization and has successfully demobilized to the satisfaction of the Owner.

2. Site Preparation

Payment for Site Preparation shall be by the Unit Price Lump Sum. This price and payment shall constitute full compensation for all labor, equipment, materials, testing, transportation and supervision for the satisfactory supply and installation of all items under this section and shall include all work materials; preparation of the site including all erosion control activities including materials for barriers and siltation curtains; as specified or within Order of Conditions and/or other approvals; all activities required not otherwise identified for payment; and all safety barriers, signage, security requirements for the project site as described within, but not limited to, the Contract Documents and any other incidentals necessary to complete the work specified herein and as shown on the Contract Documents.

3. Steel Pipe Piles

Payment for Steel Pipe Piles shall be Each and shall include all work and materials for the installation of the Steel Pipe Piles. This price and payment shall constitute full compensation for all supervision, labor, materials, and equipment for the satisfactory supply and installation of all items specified herein and as shown on the Contract Documents.

4. Timber Floats

Payment for Timber Floats shall be made by the Contract Unit Price Lump Sum, complete in-place. Items measured under this section shall include all work associated with the Timber Floats including but not necessarily limited to supply, fabrication and installation of floats, mooring guides, attachments and all other associated items to complete the work within the Contract Documents

5. Timber Float Removal and Reinstallation

Payment for TIMBER FLOAT REMOVAL AND REINSTALLATION shall be made by Contact Unit Price Lump Sum complete in-place float system. Items measured under this section shall include all work associated with the Timber Float Removal and Reinstallation including but not necessarily limited to float removal, utility disconnection and capping, storage onsite, and re-installation of floats and utilities, mooring guides, attachments and all other associated items to complete the work within the Contract Documents. The Contractor shall assume all pilings will remain in place.

6. Water Service

Payment of Water Service shall be at the Contract Unit Price Lump Sum for the supplying and installation of, all piping and conduits, all piping on the pier including all connects and associated hardware for its complete installation with tapping copper line, curb stop, the associated piping through wall, under pier, along gangway and along floats to power pedestal locations, flexible transition at gangway, support brackets on gangway, all other associated brackets, connections, valves, labor, materials, equipment and supervision for material handling, installation, cutting to final elevation and connection to existing work. Work includes Vacuum Sewer Station.

7. Structural Aluminum

Payment for Structural Aluminum shall be by the Unit Price Lump Sum and shall include all materials, labor, supervision, and fabrication for the proper installation of gangways, ramps, platforms and miscellaneous aluminum items and all activities required to meet the Contract Documents.

8. Utilities

Payment for Utilities shall be by the Unit Price Lump Sum and shall include all materials, labor, supervision, and fabrication for the proper supply and installation of all utilities including electrical, water, sewer pump out, miscellaneous items and all activities required to meet the Contract Documents.

Bidder hereby agrees that he/she will not withdraw this bid within thirty (30) business days after the date fixed for receipt of bids and that, if the Owner accepts this bid, the bidder will execute the agreement within ten days after notification that the agreement and other Contract Documents are ready for signature.

Company Name**:**_____

Company Address**:**_____

_____

Telephone Number**:**_____ Fax Number:_____

Signature: _____

Print Name: _____

Date: _____

SECTION 16000

ELECTRICAL

1. GENERAL

1.00 GENERAL PROVISIONS

A. The GENERAL REQUIREMENTS, DIVISION 1, and BIDDING AND CONTRACT REQUIREMENTS, DIVISION 0, are hereby made a part of this Specification Section.

B. Examine all Drawings and all Sections of the Specifications and requirements and provisions affecting the work of this Section.

1.01 SCOPE OF WORK

A. The project entails the installation of Marina Power Pedestals and associated power at a new commercial marina, located in Salem, MA.

B. The work under this Section shall include the furnishing of all materials, labor, equipment and supplies and the performance of all operations to provide complete working systems, in general, to include the following items:

1. Identification
2. Raceways and Conduit
3. Wire and Cable
4. Junction Boxes, Pull Boxes and Wireways
5. Marina Power Pedestal (MPP)
6. Supervision and Approval
7. Relocation of existing electrical components that interfere with new construction and removal and disposal of obsolete components.
8. Testing
9. Shop drawings
10. Record (as-built) drawings

C. Work of this Section is generally shown on the Electrical Drawings.

1.02 RELATED WORK

A. Principal classes of Work related to the Work of this Section are listed in the Specification Table of Contents, and are specified to be performed under the indicated Sections of the Specifications. Refer to the indicated Sections for description of the extent and nature of the indicated Work, and for coordination with related trades. This listing may not include all related Work items. It is the responsibility of the Contractor to coordinate and schedule the Work of this Section with that of all other trades.

B. The following work is not included in this section and will be provided under other sections:

1. Temporary light, power, water, heat, gas and sanitary facilities for use during construction and testing. Refer to Division 1, General Conditions.

2. Excavation and backfill.

1.03 DEFINITIONS

A. As used in this Section, the following items are understood to have the following meaning:

1. "**Contractor or Subcontractor**", unless otherwise qualified, shall mean the installer of the work specified under this Section.

2. **"Furnish"** shall mean purchase and deliver to the project site, complete with every necessary appurtenance.

3. **"Install"** shall mean unload at the delivery point at the site and perform all work necessary to establish secure mounting and proper operation at the proper location in the project.

4. **"Provide"** shall mean "Furnish" and "Install".

5. **"Work"** shall mean all labor, materials, equipment, apparatus, controls, accessories and all other items required for a proper and complete installation.

6. **"Concealed"** shall mean hidden from sight in chases, furred-in spaces, shafts, hung ceilings, embedded in construction or in a crawl space. Areas to be concealed as part of tenant alterations to the building shall also be considered in this definition.

7. **"Exposed"** shall mean not installed underground or concealed as defined above.

8. **"Furnished by Others"** shall mean materials or equipment purchased and set in place under other sections of the general contract and connected to the systems covered by this section of the specifications by this trade contractor.

9. **"Owners Representative"** shall be the party responsible to make decisions regarding all contractual obligations in reference to the Scope of Work for the Owner.

10. **"Date of Substantial Completion"** shall indicate the date where the work has been formally accepted as evidenced by completed final punch list or where the work has reached the stage that the owner obtains beneficial use and commences utilization of the installed systems for business or occupancy purposes. The GENERAL REQUIREMENTS, DIVISION 1, shall supersede this definition where specifically defined.

1.04 CODES, REFERENCES AND PERMITS

A. Materials, installation of systems and equipment provided under this section shall be done in strict accordance with Massachusetts Department of Public Safety Codes, Massachusetts Department of Environmental Protection, Massachusetts State Building Code 780 CMR and any other Codes and Regulations having jurisdiction including but not limited to:

1. All Applicable NFPA Standards

2. Massachusetts Electrical Code (MEC)

3. Occupational Safety and Health Administration (OSHA)

4. State and Local Building Codes

5. Underwriters' Laboratories, Inc (UL)

6. Massachusetts Department of Conservation and Recreation Division of Planning and Engineering

B. Unless otherwise specified or indicated, materials, workmanship and equipment performance shall conform with the latest governing edition of the following standards, codes, specifications, requirements, and regulations, except when more rigid requirements are specified or are required by applicable codes but not limited to:

1. American National Standards Institute (ANSI)
2. American Society of Mechanical Engineers (ASME).
3. American Society of Testing and Materials (ASTM)
4. Certified Ballast Manufacturers (CME)
5. Illuminating Engineering Society (IES)
6. Institute of Electrical and Electronics Engineers (IEEE)
7. Insulated Cable Engineers Association (ICEA)
8. National Electrical Contractors Association (NECA)
9. National Electric Manufacturers Association (NEMA)
10. Thermal Insulation Manufacturers Association (TIMA)

C. Codes, laws and standards provide a basis for the minimum installation criteria acceptable. The drawings and specifications illustrate the scope required for this project, which may exceed minimum codes, laws and standards.

D. Give all notices, file all plans, obtain all permits and licenses, and obtain all necessary approvals from authorities having jurisdiction. Deliver all certificates of inspection to the authorities having jurisdiction. No work shall be covered before examination and approval by the Owner's Representative, inspectors, and authorities having jurisdiction. Replace imperfect or condemned work to conform to requirements, satisfactory to Owner's Representative, and without extra cost to the Owner. If work is covered before inspection and approval, this Contractor shall pay costs of uncovering and reinstalling the covering, whether it meets contract requirements or not.

1.05 GENERAL REQUIREMENTS

A. Nameplates

1. Each major component of equipment shall have the manufacturer's name, address, type or style, model or serial number, and catalog number on a plate secured to the equipment.

B. Equipment Guards

1. Belts, pulleys, chains, gears, couplings, projecting setscrews, keys, and other rotating parts so located that any person may come in close proximity thereto shall be completely enclosed or guarded. High-temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be guarded or covered with insulation of type specified for service.

1.06 MATERIAL AND EQUIPMENT STANDARDS

A. Where equipment or materials are specified with the name of a manufacturer, such specification shall be deemed to be used for the purpose of establishing a standard for that particular item. No equipment or material shall be used unless previously approved by the Owner's Representative.

B. Substitutions may be offered for review provided the material, equipment or process offered for consideration is equal in every respect to that indicated or specified. The request for each

substitution must be accompanied by complete specifications together with drawings or samples to properly appraise the materials, equipment or process. The contractor shall highlight and list all applicable specification requirements which the substituted material deviates from.

C. If a substitution of materials or equipment in whole or in part is made, this Contractor shall bear the cost of any changes necessitated by any other trade as a result of said substitution.

D. All materials, equipment and accessories provided under this section shall be new and unused products of recognized manufacturers as approved.

1.07 SUBMITTALS

A. Conform to the requirements of Division 1, General Conditions, for schedule and form of all submittals unless specifically noted otherwise in this section. Coordinate this submittal with submittals for all other finishes. Shop drawings and design layouts shall be prepared by licensed installing contractors and shall note the name(s), license number(s) and license expiration date(s) of the contractor(s) installing electrical systems.

B. Definitions:

1. Shop Drawings are information prepared by the Contractor to illustrate portions of the work in more detail than indicated in the Contract Documents.

2. Acceptable Manufacturers: The mechanical design for each product is based on the single manufacturer listed in the schedule or shown on the drawings. In Part 2 of the specifications, certain Alternate Manufacturers are listed as being acceptable. In addition, the MATERIAL AND EQUIPMENT STANDARDS paragraph potentially allows for substitutions as being acceptable. These are acceptable only if, as a minimum, they:

a. Meet all performance criteria listed in the schedules and outlined in the specifications. For example, to be acceptable, an emergency generator must deliver equal kW / kVA at equal or greater efficiency using equal or less fuel as the emergency generator listed in the schedules.

b. Fit within the available space it was designed for, including space for maintenance and component removal, with no modification to either the space or the product. Clearances to walls, ceilings, and other equipment will be at least equal to those shown on the design drawings. The fact that a manufacturer’s name appears as acceptable shall not be taken to mean the Engineer has determined that the manufacturer’s products will fit within the available space – this determination is solely the responsibility of the contractor.

c. Products must adhere to all architectural considerations including, but not limited to; being of the same color as the product scheduled or specified, fitting within the architectural enclosures and details, and for lighting – being the same size and of the same physical appearance as scheduled or specified products.

C. Submittal Procedures, Format and Requirements

1. Review submittal packages for compliance with Contract Documents and then submit to Owner’s Representative for review. Submit enough sets of shop drawings such that, after review, two sets will be kept by the reviewer, with only the remaining sets returned with reviewer’s marks and comments.

2. Each Shop Drawing shall indicate in title block, and each Product Data package shall indicate on cover sheet, the following information:

a. Title

b. Equipment number

c. Name and location of project

d. Names of Owner, Engineer and Seller

e. Names of manufacturers, suppliers, vendors, etc.

f. Date of submittal

g. Whether original submittal or resubmitted

3. Shop Drawings showing manufacturer's product data shall contain detailed dimensional drawings (minimum ¼" – 1' scale) including plans and sections (where physical clearance could be an issue). Provide larger scale details as necessary.

4. Submit accurate and complete description of materials of construction, manufacturer's published performance characteristics, sizes, weights, capacity ratings (performance data, alone, is not acceptable), electrical requirements, starting characteristics, wiring diagrams, and acoustical performance for complete assemblies. Drawings shall clearly indicate location (terminal block or wire number), voltage and function for all field terminations, and other information necessary to demonstrate compliance with all requirements of Contract Documents.

5. Provide Shop Drawings showing details of piping connections to all equipment. If connection details are not submitted and connections are found to be installed incorrectly, this contractor shall reinstall them within the original contract price.

6. Provide complete data for all auxiliary services and utilities required by submitted equipment. This shall include fuel, cooling and exhaust requirements and points of connections.

7. Provide a complete description of all controls and instrumentation required including electrical power connection drawing for all components and interconnection wiring to starters, detailed information on starters, control diagrams, termination diagrams, and all control interfaces with a central control system.

8. Provide installation and erection information including; lifting requirements, and any special rigging or installation requirements for all equipment.

9. The Owner's Representative shall approve all materials before commitment for materials is made.

D. Product Data: Submit complete manufacturer's product description and technical information including:

1. Raceways and Conduit

2. Wire and Cable

3. Junction Boxes, Pull Boxes and Wireways

4. Marina Power Pedestal (MPP)

5. Identification, labels and tags, including database for all equipment, and devices.

E. Submit shop drawings and product data grouped to include complete submittals of related systems, products and accessories in a single submittal.

1. Do not submit multiple product information in a single bound manual.

2. Three-ring binders shall not be accepted.

F. Deviations:

1. Concerning deviations other than substitutions, proposed deviations from Contract Documents shall be requested individually in writing whether deviations result from field conditions, standard shop practice, or other cause. Submit letter with transmittal of Shop Drawings which flags the deviation to the attention of the Owner's Representative.

2. Without letters flagging the deviation to the Owner's Representative, it is possible that the Engineer may not notice such deviation or may not realize its ramifications. Therefore, if such letters are not submitted to the Owner's Representative, the Seller shall hold the Engineers, his consultants and the Owner harmless for any and all adverse consequences resulting from the deviations being implemented. This shall apply regardless of whether the Engineer has reviewed or approved shop drawings containing the deviation, and will be strictly enforced.

3. Approval of proposed deviations, if any, will be made at discretion of Engineer.

G. Schedule: Incorporate shop drawing review period into construction schedule so that Work is not delayed. This subcontractor shall assume full responsibility for delays caused by not incorporating the following shop drawing review time requirements into his project schedule. Allow at least 10 working days, exclusive of transmittal time, for review each time shop drawing is submitted or resubmitted with the exception that 20 working days, exclusive of transmittal time are required for the following:

1. If more than five shop drawings of a single trade are received in one calendar week.

H. Responsibility

1. Intent of Submittal review is to check for capacity, rating, and certain construction features. The contractor shall ensure that work meets requirements of Contract Documents regarding information that pertains to fabrication processes or means, methods, techniques, sequences and procedures of construction; and for coordination of work of this and other Sections. Work shall comply with approved submittals to extent that they agree with Contract Documents. Submittal review shall not diminish responsibility under this Contract for dimensional coordination, quantities, installation, wiring, supports and access for service, nor the shop drawing errors or deviations from requirements of Contract Documents. The Engineer's noting of some errors while overlooking others will not excuse the contractor from proceeding in error. Contract Documents requirements are not limited, waived nor superseded in any way by review.

2. Inform subcontractors, manufacturers, suppliers, etc. of scope and limited nature of review process and enforce compliance with contract documents.

I. In the event that the contractor fails to provide Shop Drawings for any of the products specified herein:

1. The contractor shall furnish and install all materials and equipment herein specified in complete accordance with these Specifications.

2. If the contractor furnishes and installs material and/or equipment that is not in complete accordance with these Specifications, he shall be responsible for the removal of this material and/or equipment. He shall also be responsible for the replacement of this material and/or equipment with material and/or equipment that is in complete accordance with these Specifications, at the direction of the Owner's Representative.

3. Removal and replacement of materials and/or equipment that is not in complete compliance with these Specifications shall be done at no extra cost to the Owner.

4. Removal and replacement of materials and/or equipment that is not in complete compliance with these Specifications shall not be allowed as a basis for a claim of delay of completion of the Work.

J. Mark dimensions and values in units to match those specified.

K. Submit Material Safety Data Sheets (MSD) on each applicable product with submittal.

1.08 RECORD DRAWINGS

A. Refer to DIVISION 1, General Conditions, for record drawings and procedures to be provided under this section, unless specifically noted otherwise in this section.

B. Record Drawings (red-line drawings) will be updated by this Contractor daily for review with the monthly requisition. The record drawing shall be an accurate depiction of the systems as completed, including dimensions (vertical/horizontal) of concealed components off fixed building elements.

C. The Electrical Foreman shall maintain complete and separate set of prints of Contract Drawings at job site at all times and shall record work completed and all changes from original Contract Drawings clearly and accurately including work installed as a modification or addition to the original design.

D. At completion of work the Electrical Contractor shall prepare a complete set of record drawings on AutoCAD showing all systems as actually installed. The Architectural background AutoCAD files will be made available for the contractor's copying, at his expense, to serve as backgrounds for the drawings. The Electrical Contractor shall transfer changes from field drawings onto AutoCAD drawings and submit copy of files and three sets of prints to Owner's Representative for comments as to compliance with this section. CADD layering as established by the A&E design team shall be maintained with any and all changes done by the contractor.

E. The Waterfront Engineer and Electrical Engineer are not granting to the Contractor any ownership or property interest in the CADD Drawings by the delivery of the CADD Disks to the Contractor. The Contractor's rights to use the CADD disks and the CADD Drawings are limited to use for the sole purpose of assisting in the Contractor's performance of its contractual obligations under its contract with respect to the Project. The Waterfront Engineer and Electrical Engineer are granting no further rights. Any reuse or other use by the Contractor will be at the Contractor's sole risk and without liability to the Waterfront Engineer and Electrical Engineer. The Contractor hereby waives and releases any losses, claims, damages, liabilities of any nature whatsoever, and costs (including attorney fees) arising out of, resulting from, or otherwise related to the use of the CADD Disks and CADD Drawings by the Contractor. The Contractor, to the maximum extent permitted by law, hereby agrees to indemnify, defend and hold the Architect and Engineer harmless from all loses, claims, damages, liabilities, and costs (including attorney fees) arising out of, resulting from, or otherwise related to the use of the CADD Disks and CADD Drawings by the Contractor.

F. Record Drawings, shall show "as-built" condition of details, sections, riser diagrams, control changes and corrections to schedules. Schedules shall show actual manufacturer and model numbers of final equipment installation.

G. The Electrical Contractor shall submit the record set for approval by the engineer a minimum of four weeks prior to seeking final construction completion affidavits.

1.09 WARRANTIES

A. Submit manufacturer's standard replacement warranties for material and equipment furnished under this Section. Such warranties shall be in addition to and not in lieu of all liabilities which

the manufacturer and the Electrical contractor may have by law or by provisions of the Contract Documents.

B. All materials, equipment and work furnished under this Section shall be guaranteed against all defects in materials and workmanship for a minimum period of one-year (1) commencing with the Date of Substantial Completion. Where individual equipment sections specify longer warranties, provide the longer warranty. Any failure due to defective material, equipment or workmanship which may develop, shall be corrected at no expense to the Owner including all damage to areas, materials and other systems resulting from such failures.

C. Guarantee that all elements of each system meet the specified performance requirements as set forth herein or as indicated on the Drawings.

D. Upon receipt of notice from the Owner of the failure of any part of the systems during the warranty period, the affected parts shall be replaced. Any equipment requiring excessive service shall be considered defective and shall be replaced.

1.10 COORDINATION

A. Refer to Division 1, General Conditions, for coordination requirements applicable to this section, unless specifically noted otherwise in this section.

B. Materials and apparatus shall be installed as fast as conditions of the site will permit and must be installed promptly when and as required.

C. Confer with all other trades relative to location of all apparatus and equipment to be installed and select locations so as not to conflict with work of other Sections. Any conflicts shall be referred immediately to the Owner’s Representative for decision to prevent delay in installation of work. All work and materials placed in violation of this clause shall be readjusted to the Owner’s Representative's satisfaction at no expense to the Owner.

D. Where work of this section will be installed in close proximity to work of other sections or where there is evidence that the work of this section may interfere with work of other sections, assist in working out space conditions to make satisfactory adjustment. Prepare and submit for approval 3/8" scale or larger working drawings and sections, clearly showing how the work is to be installed in relation to the work of other sections. If the work of this section is installed before coordinating with other trades or so as to cause interference with work of other trades, make changes necessary to protect conditions without extra charge.

E. Keep fully informed as to the shape, size and position of all openings required for all apparatus, conduit, cable, sleeves, etc., and give information in advance to allow construction of required openings. Furnish all sleeves, pockets, supports and incidentals, and coordinate with the General Contractor for the proper setting of same.

F. All distribution systems which require pitch or slope such as condensate drains and water piping shall have the right of way over those which do not. Confer with other trades as to the location of pipes, ducts, lights and apparatus and install work to avoid interferences.

G. Make reasonable modifications in the work as required by structural interferences, or by interference with work of other trades, or for proper execution of the work without extra charge.

1.11 INTERPRETATION OF DRAWINGS AND SPECIFICATIONS

A. It is the intention of the Specifications and Drawings to call for complete, finished work, tested and ready for continuous operation. Any apparatus, appliance, material or work not shown on the Drawings, but mentioned in the Specifications or vice-versa, or any incidental accessories necessary to make the work complete in all respects and ready for operation, even if not

particularly specified, shall be provided by this Contractor without additional expense to the Owner.

B. The Drawings are generally diagrammatic. The locations of all items that are not definitely fixed by dimensions are approximate only. The exact locations must be determined at the project and shall have the approval of the Owner's Representative before being installed. This Contractor shall follow Drawings, including his shop drawings, in laying out work and shall check the Drawings of other trades to verify spaces in which work will be installed. Maintain maximum headroom and space conditions. Where space conditions appear inadequate, notify the Owner's Representative before proceeding with the installation. This Contractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work.

C. Size of conduits, cable trays, raceways and methods of running them are shown, but it is not intended to show every offset and fitting, nor every structural difficulty that may be encountered. To carry out the true intent and purpose of the Drawings, all necessary parts to make complete approved working systems ready for use, shall be furnished without extra charge. All work shall be installed in an approved workmanlike manner.

1.12 INSPECTION OF SITE CONDITIONS

A. Prior to submission of bid, visit the site and review the related construction documents to determine the conditions under which the Work has to be performed and send a report, in writing, to the Owner's Representative, noting any conditions which might adversely affect the Work of this Section of the Specifications.

1.13 SURVEY AND MEASUREMENTS

A. Base all required measurements, horizontal and vertical, from referenced points established with the Owner's Representative. The Electrical Contractor shall be responsible for correctly laying out the Work required under this Section of the Specifications.

B. In the event of discrepancy between actual measurements and those indicated, notify the Owner's Representative in writing and do not proceed with the related work until instructions have been issued.

1.14 DELIVERY, STORAGE AND HANDLING

A. No materials shall be delivered or stored on site until corresponding Shop Drawings have been approved.

B. All manufactured materials shall be delivered to the site in original packages or containers bearing the manufacturer's labels and product identification.

C. Protect materials against dampness. Store off floors, under cover and adequately protected from damage.

D. Inspect all equipment and materials, upon receipt at the job site, for damage and conformance to approved shop drawings.

1.15 PROTECTION OF WORK AND PROPERTY

A. This Contractor shall be responsible for the care and protection of all work included under this Section until the completion and final acceptance of this Contract.

B. Protect all equipment and materials from damage from all causes including, but not limited to, fire, vandalism and theft. All materials and equipment damaged or stolen shall be repaired or replaced with equal material or equipment at no additional cost to the Owner.

C. Protect all equipment, outlets and openings with temporary plugs, caps and covers. Protect work and materials of other trades from damage that might be caused by work or workmen under this Section and make good damage thus caused.

D. Damaged materials are to be removed from the site; no site storage of damaged materials will be allowed.

1.16 SUPERVISION

A. Supply the service of a competent Supervisor with a minimum of 5 years experience in Electrical construction supervision who shall be in charge of the Electrical work at the site.

1.17 SAFETY PRECAUTIONS

A. Life safety and accident prevention shall be a primary consideration. Comply with all of the safety requirements of the owner and OSHA throughout the entire construction period of the project.

B. Furnish, place and maintain proper guards and any other necessary construction required to secure safety of life and/or property.

1.18 SCHEDULE

A. Construct work in sequence under provisions of Division 1 and as coordinated with the Owner's Representative.

1.19 HOISTING, SCAFFOLDING AND PLANKING

A. The work to be done under this Section of the Specifications shall include the furnishing, set-up and maintenance of all derricks, hoisting machinery, cranes, helicopters, scaffolds, staging and planking as required for the work.

1.20 CUTTING AND PATCHING

A. Provide all cutting and patching necessary for the proper installation of work to be performed under this Section.

B. All work shall be fully coordinated with all phases of construction, in order to minimize the requirements for cutting and patching.

C. Form all chases or openings for the installation of the work of this Section of the specifications, or cut the same in existing work and see that all sleeves or forms are in the work and properly set in ample time to prevent delays. Be responsible that all such chases, openings, and sleeves are located accurately and are of the proper size and shape and consult with the Owner's Representative and all other trades concerned in reference to this work. Confine the cutting to the smallest extent possible consistent with the work to be done. In no case shall piers or structural members be cut without the approval of the Owner's Representative.

D. Fit around, close up, repair, patch, and point around the work specified herein to match the existing adjacent surfaces and to the satisfaction of the Owner's Representative.

E. Fill and patch all openings or holes left in the existing structures by the removal of existing equipment which is part of this Section of the Specifications.

F. All of this work shall be carefully done by workmen qualified to do such work and with the proper and smallest tools applicable.

G. Any cost caused by defective or ill-timed work required by this Section of the specifications shall be borne by this Contractor.

H. When, in order to accommodate the work required under this Section of the specifications, finished materials of other trades must be cut or fitted, furnish the necessary drawings and information to the trades whose materials must be cut or fitted.

1.21 SLEEVES, INSERTS AND ANCHOR BOLTS

A. Coordinate with other trades the location of and maintaining in proper positions, sleeves, inserts and anchor bolts to be supplied and/or set in place under this section of the specifications. In the event of incorrectly located preset sleeves, inserts and anchor bolts, etc., all required cutting and patching of finished work shall be done under this section of the specifications.

B. All pipes passing through floors, walls, ceilings or partitions shall be provided with fire stopping to maintain the fire rating of the structure. All penetrations and associated fire stopping shall be installed in accordance with the fire stopping manufacturer's listed installation details. Provide sleeves for all penetrations where required by the listed detail, for the penetration of all mechanical room floors and where specifically required on the drawings.

C. Field drilling (core drilling), when required, shall be performed under this section of the specifications, after receipt of approval by the Owner's Representative.

1.22 SUPPLEMENTARY STEEL, CHANNELS AND SUPPORTS

A. Provide all supplementary steel, factory fabricated channels and supports required for the proper installation, mounting and support of all Electrical equipment, piping, etc., required by the Specifications.

B. Supplementary steel and factory fabricated channels shall be firmly connected to building construction in a manner approved by the Owner's Representative as shown on the drawings or herein specified.

C. The type and size of the supporting channels and supplementary steel shall be determined by the Contractor and shall be of sufficient strength and size to allow only a minimum deflection in conformance with the manufacturer's requirements for loading.

D. All supplementary steel and factory fabricated channels shall be installed in a neat and workmanlike manner parallel to the walls, floors and ceiling construction. All turns shall be made with 90 degree and 45 degree fittings, as required to suit the construction and installation conditions.

E. All supplementary steel including factory fabricated channels, supports and fittings shall be stainless steel where exposed or subject to rust producing atmosphere. Factory fabricated channels shall be manufactured by Unistrut, H-strut, Powerstrut or approved equal.

1.23 HAZARDOUS MATERIALS

A. Removed batteries shall be recycled by a facility approved by the owner's representative. A uniform hazardous waste manifest shall be prepared for all disposals and returned with all applicable signoffs prior to application for final payment.

B. Removed fluorescent and HID lamps shall be recycled by a facility approved by the owner's representative. A uniform hazardous waste manifest shall be prepared for all disposals and returned with all applicable signoffs prior to application for final payment.

C. All ballasts in lighting fixtures to be disposed shall be verified to be PCB free. All ballasts manufactured prior to 1979 and not labeled as PCB free shall be considered to contain PCB's. Provide written verification to the owner's representative that confirms PCB free waste. Where PCB free waste cannot be verified, ballasts shall be recycled by a facility approved by the owner's representative, with PCB components eliminated by a high temperature incineration. A uniform

hazardous waste manifest shall be prepared for all disposals and returned with all applicable signoffs prior to application for final payment. All handling shall conform to EPA requirements. Provide breakout cost for this scope.

D. Where it has been identified that asbestos-containing material exists within the scope limits, refer to the Asbestos Abatement specification section for requirements.

1.24 ACCESSIBILITY

A. All work provided under this Section of the Specification shall be installed so that parts requiring periodic inspection, maintenance and repair are accessible. Work of this trade shall not infringe upon clearances required by equipment of other trades, especially code required clearances to electrical gear. Minor deviations from the drawings may be made to accomplish this, but changes of substantial magnitude shall not be made prior to written approval from the Owner's Representative.

1.25 SEISMIC RESTRAINT REQUIREMENTS

A. Submit working plans and calculations reviewed, signed and stamped by a professional engineer who is registered in the State where the project is located and has specific experience in seismic calculations, certifying that the plans meet all seismic requirements established by authorities having jurisdiction over the project.

B. For each seismic restraint, provide certified calculations to verify adequacy to meet the following design requirements:

1. Ability to accommodate relative seismic displacements of supported item between points of support.

2. Ability to accommodate the required seismic forces.

C. For each respective set of anchor bolts provide calculations to verify adequacy to meet combined seismic-induced sheer and tension forces.

D. For each weldment between structure and item subject to seismic force, provide calculations to verify adequacy.

E. Restraints shall maintain the restrained item in a captive position without short circuiting the vibration isolation.

1.26 PROJECT CLOSEOUT

A. Construction Observations By The Engineer

1. The engineer is contracted to make two (2) progress site visits during construction, **one** substantial completion (punch list) site visit for determining substantial completion and **one** Final inspection visit to determine if all work is complete.

2. The Sub Contractor and the General Contractor are required to inspect their own work and make any corrections to the work to comply with the specifications and the contract documents. It is not the responsibility of the engineer to develop lists of incomplete work items.

3. Progress Site Visits

a. The purpose of the progress site visit by the engineer is to observe if the work is proceeding in accordance with the contract documents.

b. The engineer will prepare a field report which will note in general the work completed since the last observation visit, work found not to be in accordance with the contract documents and work not corrected since the previous observation visit.

B. Substantial Completion

1. When the Subcontractor considers the Work under this Section is substantially complete, the subcontractor shall submit written notice, through the General Contractor, with a detailed list of items remaining to be completed or corrected and a schedule of when each remaining work item will be completed. Should the engineer determine the list of remaining work does not constitute substantial completion the engineer will notify the Architect and/or Owner and he will not make a substantial completion site visit.

2. The following items shall be submitted and approved by the Engineer prior to the written request for substantial completion inspection:

   a. Certification of successful operation of all systems.

   b. Training of the owner's personnel in the operation of the systems.

   c. Record Drawings in accordance with the contract specifications.

   d. Emergency contact list for reporting of malfunctioning equipment during the warranty period.

   e. Contractors Project Completion certificate.

3. Should the Engineer, during the substantial completion visit, observe that the Work is substantially complete, s/he will provide a written listing of the observed deficiencies referred herein as the Punch List. The Punch List will provide for a place for the subcontractor and general contractor to sign off and date each item individually indicating that the observed deficiency item has been corrected.

4. Should the Engineer, during the substantial completion site visit, observe that the Work is not substantially complete, s/he will provide, a written list of the major deficiencies and a reason for the work not being considered substantially complete.

5. The Subcontractor shall remedy all deficiencies listed in the punch list within the time frame required by the contract.

C. Engineers Construction Completion Certification

1. Where required by the applicable code, the Engineers Construction Completion Certification will be issued by RDK Engineers when all life safety and health related issues are complete, all required functional tests are complete and all reports are complete.

2. There shall be NO outstanding items identified on the punch list for scope within any of these categories.

D. Final Completion

1. The following items shall be submitted prior to the written request for Final completion:

   a. Revised Substantial Completion items to be resubmitted in accordance with the review process comments.

   b. Warranties commencing the date of Substantial completion

c. Individual Signed and dated Punch List acknowledging completion of all punch list items

2. When the Subcontractor considers all of the punch list work items complete, the subcontractor shall submit written notice through the General Contractor that all Punch List items are complete and resolved and the work is ready for final inspection. The signature lines for completion of each punch list item shall be signed by the Subcontractor indicating the work is complete and signed by the General contractor indicating s/he has inspected the work and found it to be complete. Should the Engineer find the work to be finally complete and all Punch List items are complete the Engineer will make a recommendation to the Architect or Owner. If the Engineer has found the punch list work to be incomplete during final inspection a written listing of the observed deficiencies will be prepared by the Engineer.

E. Subcontractor's Project Completion Certificate

1. Upon completion of work and prior to request for Certificate of Occupancy, the Subcontractor shall issue a certificate stating that work has been installed generally consistent with construction documents and all applicable codes. RDK Engineers can furnish a blank contractor's certificate form upon request. The certificate shall certify:

a. Execution of all work has been in accordance with the approved construction documents.

b. Execution and control of all methods of construction was in a safe and satisfactory manner in accordance with all applicable local, state and federal statutes and regulations.

2. The certificate shall include the following information:

a. Project.

b. Permit Number.

c. Location.

d. Construction Documents.

e. Date on Plans and Specifications submitted for approval and issuance of the Building Permit.

f. Addendum(a) and Revision Dates.

3. The certificate shall be signed by the Subcontractor and include the following:

a. Signature.

b. Date.

c. Company.

d. License Number.

e. License Expiration Date.

2. PRODUCTS

2.00 IDENTIFICATION

A. Nameplates

1. Nameplates shall be laminated black Bakelite with minimum 1/4" high white recessed letters.

2. Nameplates shall be securely attached to the equipment. Utilize mechanical fasteners such as galvanized steel or brass screws for exterior applications. High strength adhesives or cements may be used for interior applications.

2.01 RACEWAYS AND CONDUIT

A. Rigid Galvanized Steel (RGS) Conduit

1. RGS shall be zinc-coated steel that conforms to ANSI C80.1, UL Specification No. 6 and Federal Specification WW-C-581e by Allied Tube and Conduit, Republic Steel, Wheatland Tube or approved equal.

2. RGS fittings shall be threaded. Split couplings or non-threaded fittings shall not be used.

3. Nipples and Close Nipples shall be RGS, length as noted or as required to conform to field conditions.

4. Provide PVC coated RGS conduit at outdoor locations, where RGS is required.

B. Polyvinyl Chloride (PVC) Non-metallic Conduit

1. PVC conduit and fittings shall be Schedule 80, 90°C. UL Listed equal to Carlon Plus 80. PVC shall meet NEMA Specification TC-2, TC-3 and UL-651.

2. PVC, fittings and solvent cement shall be by single approved manufacturer.

3. PVC shall be sunlight resistant and listed for exposed or outdoor usage.

C. Miscellaneous Conduit Fittings

1. Elbows shall be standard radius unless noted otherwise. Where Large Radius elbows are specified, provide 48" radius unless noted otherwise.

2. Bushings shall be threaded pressed steel hot dipped galvanized with conduit end stop and integrally molded noncombustible phenolic insulated surface rated for 150^{o}C.

3. Bonding bushings shall be threaded pressed steel hot dipped galvanized with conduit end stop and integrally molded noncombustible phenolic insulated surface rated for 150^{o}C with a lay-in tin plated copper grounding lug.

4. Exposed conduit expansion fittings shall be hot-dipped galvanized malleable iron with external bonding jumper equal to O.Z./Gedney Type EX for RGS or Type TX for EMT (4" maximum expansion).

D. Wireways shall be minimum 16-gauge steel with all straight runs having hinged spring-latched covers. Finish shall be painted over a corrosion resistant phosphate pretreatment to protect against corrosion. Interior parts shall be smooth and free of sharp edges and burrs. Provide wireway as identified on the drawings for NEMA 1, 3R or 12 service. Wireways shall be equal to Square D and UL Listed.

2.02 WIRE AND CABLE

A. Provide single-conductor, annealed copper wire and cable with insulation rated for 600 V, of sizes specified and scheduled on Drawings, by General Electric, Southwire, Okonite or approved equal, for secondary service, feeders, branch and system wiring. Wire sizes shown and specified are American Wire Gauge for copper conductors.

B. The use of aluminum conductors is not allowed.

C. All wiring shall be stranded. Wire and cable shall have Type THWN-2 insulation for all conductors in conduit.

D. Multi Conductor Cable

1. Rated 600V minimum, 75°C for wet locations

2. Flexible, resistant to oils, solvents, ozone, aging, abrasion, and listed for use in marina (wet) locations.

3. Cable shall contain four (4) conductors and one (1) ground (minimum) per cable.

4. Conductors shall be color coded according to this specification.

E. Conductor Color-coding

1. Service entrance, branch circuit and feeder conductors shall be color-coded. Conductors #12 and #10 shall be colored with a factory applied solid or striped compound coating (black, red or blue). Neutrals and equipment grounds shall have solid compound or solid color coating (white and green), except that neutrals with colored stripe shall be used where required by code. Phase conductors #8 and larger with stripes, bands or hash marks shall have background color other than white, green and gray.

2. Alternative field-applied color coding methods may be used for wire #8 or larger, with color code as specified in other sections of this specification. Coloring shall be applied by the use of flame-retardant vinyl tape, equal to 3M Scotch 35.

F. Splices and Terminations

1. Ampacity and temperature rating of splices and connectors shall be equal to or greater than those of associated wires and cables.

2. Make splices in branch circuit or feeder wiring from #12 to #10 with UL-listed, solderless screw on connectors rated 600 V.

3. Make splices in branch circuit or feeder wiring above #10 with UL-listed 90°C, 600V, compression butt splice barrel equal to Burndy YS-L HYLINK.

4. Conductor terminations shall be standard bolt-on lugs with hex screws listed for attachment of copper wire and cable to panelboards, switchboards, disconnect switches and other electrical equipment.

5. Make terminations for stranded conductors on screw terminals with UL Listed 105°C, 600V PVC insulated barrel compression locking fork tongue terminal equal to Burndy TP-LF VINYLUG.

6. Make terminations and splices for conductors #6 and larger with UL-listed 90°C, 600V, compression standard barrel length lugs equal to Burndy YA-L for conductor sizes to #4/0. Connectors for cable 250 KCMil and larger shall be with UL-listed 90°C, 600V, compression long barrel length two hole lugs equal to Burndy YA-2N. Lugs shall be high conductivity seamless copper electro-tin plated for corrosion protection.

G. Wire management shall be provided by self-extinguishing self-locking nylon ties with -65 to 350°F. range for bundling conductors.

H. Cable pulling compounds shall be UL Listed and be suitable for use with the specified cable insulation system. The compound shall reduce the coefficient of friction, while not adding any

long term issues to the installation such as premature aging of the insulation system, added flammability or drying in such a manner as to stick the cable in place in the raceway.

2.03 JUNCTION AND PULL BOXES

A. Provide NEMA-4X stainless steel junction and pull boxes where indicated and as necessary to facilitate installation. Junction and pull boxes shall be of code required dimensions. Cover shall be of the same type and thickness material as the box construction.

B. Covers shall be secured with stainless steel screws with keyhole slots to accommodate easy removal.

C. Junction and pull boxes shall be NEMA 4X, IEC 60529, IP66 enclosures with hinged gasketed covers. Hinge shall be stainless steel with stainless steel pin.

2.04 MARINA POWER PEDESTAL

A. The Marina Power Pedestal shall be as follows:

1. 360° photocell controlled LED light.
2. Fiberglass construction with weather proof doors that protect receptacles and circuit breakers.
3. Lockable doors
4. Hose and cable brackets.
5. Large removable access panel for easy maintenance and installation.
6. Copper bus bars with 150A minimum rating.
7. One (1) ¾’ hose bib with stainless steel handles (coordinate with Bourne Consulting).
8. Optional base extension as required to accommodate power conduits.
9. Back lit device faceplate.
10. Thermoplastic engraved nameplates indicating the marina power pedestal number and side (1 or 2), as well as the electric service configuration at each receptacle. “50 Amps, 120/208 Volts” for 50A receptacles and “30 Amps, 120 Volts” for 30A receptacles. Refer to Identification section of this specification for more information.
11. Bussing
    a. Provide 3-phase 250 kcmil (minimum) mechanical lug bus with neutral and ground.
12. Devices
    a. For ship to shore power on floats:
        1) Side #1:
            a) Provide 50A, 120/250V, 1 phase receptacle, NEMA type SS-2, protected by dedicated 50A-2P branch circuit breaker.
            b) Provide 30A, 120V, 1 phase receptacle, NEMA type L5-30R, protected by dedicated 30A-1P branch circuit breaker.

2) Side #2:

a) Provide 50A, 120/250V, 1 phase receptacle, NEMA type SS-2, protected by dedicated 50A-2P branch circuit breaker.

b) Provide 30A, 120V, 1 phase receptacle, NEMA type L5-30R, protected by dedicated 30A-1P branch circuit breaker.

13. Electric Meters

a. Provide wireless digital electronic meters to independently meter both Side #1 and Side #2.

b. Provide wireless remote metering for all digital electronic meters. Provide Gateway, Software, all data wiring, etc. for a complete and operational system which meters the shore power electrical usage from within the mobile trailer. Provide start-up and testing services. Coordinate with City of Salem as required.

c. Marina power pedestal shall be: Lighthouse Series manufactured by Eaton Corporation; Ensign Pedestal by TDI Products, or approved equal.

3. EXECUTION

3.00 IDENTIFICATION

A. Nameplates

1. Provide nameplates on all equipment listed in other sections of this specification including but not limited to switchboards, substations, panelboards, transformers, junction and pull boxes, disconnect switches, motor starters and motor control centers, contactors, time clocks, remote control stations, fire alarm panels, smoke detector remote test/alarm stations and fire alarm annunciators.

2. Nameplates shall designate equipment tag number as defined on the drawings, system voltage where applicable, circuit number, device controlled and system function. Refer to typical nameplate detail on the drawings for additional requirements.

3. Submit a complete list of proposed nameplates prior to order to ensure conformance to design criteria. Submittal shall include nomenclature, size and layout of each tag.

4. Code 39 shall be the bar code format unless designated differently by the Owner's facility group. The contractor shall create the required bar codes and assign numbers based upon input from the owner's facility group. The contractors shall create a database of all equipment, panels and valves for owner's review and approval.

5. Equipment panel and valve labels shall be 4" by 2½" and designed to withstand temperatures of -22°F to +392°F. Labels are designed to be resistant to water, acid/solvent, dirt and oil repellant. Labels shall be high tensile Graphiplast® tearing strength as well as scratch resistant and affixed to equipment by cable ties or adhesive clear pouch. Location of label shall be at unit control panel, next to factory nameplate, lower right-hand corner of panel, and/or tie wrapped to localize disconnect at unit. Installation instructions shall be provided with the labels to assure durability (i.e., clean surface prior to adhering adhesive label, leave cable ties loose on outside of equipment to allow freedom of movement due to the elements, etc.) and with adhesive tags not secured when temperatures are below 45°F ambient temperature.

6. Samples of stickers together with color schedules shall be submitted during the submittal phase of this project.

B. Equipment Identification

1. Equipment identification designations shall be taken from equipment schedules and coordinated with the Owner's facility group to assure designations match up with Owner's maintenance management system identification database.

3.01 RACEWAYS AND CONDUIT

A. General

1. Unless specified or shown on Drawings otherwise, install raceways and conduits concealed. Raceways and conduits may be run exposed on unfinished walls and basement ceilings with exposed structure, in mechanical rooms, electric rooms, attics and roof spaces.

2. Run concealed raceways and conduits in as direct lines as possible with minimum number of bends of longest possible radius. Install exposed raceways and conduits parallel to or at right angles to building lines.

3. Raceway and conduit runs shall be mechanically and electrically continuous from supply to outlet. Conduit shall enter and be secured to metallic enclosures with lock nut and bushing inside. Provide additional exterior lock nut for RGS connections. Bushings shall be the bonding type for conduit connections to metallic enclosures with concentric or eccentric knockouts. Lock nuts and bushings will not be required where conduits are screwed into threaded hubs.

4. Size raceways and conduits as required by MEC unless oversized raceways and conduits are shown on the Drawings. Raceways and conduits shall be ¾" minimum.

5. Install conduit systems complete before installation of conductors. Blow through and swab after plaster is finished and dry, and before conductors are installed.

6. Raceways and conduits supports shall be rigidly attached to the building structure utilizing corrosion resistant components suitable for use with the selected raceway or conduit. Refer to the seismic restraint sections of this specification for any additional requirements.

7. Field bending, cutting and threading shall be executed with the proper tools, resulting in bends and shortened conduits and raceways that are equivalent to factory fabricated and purchased components.

8. Provide standoff clips for conduits on exterior and wet location walls.

9. Protect all vertical conduit runs from the entrance of foreign material before installation of conductors and the final closure of the raceway system. All spare conduits (vertical and horizontal runs) shall be sealed with a bushing and appropriate insert to prohibit entrance of debris or vermin. Affix a label that indicates "Spare Conduit to _____" at each seal. Label shall be in accordance with the labeling section of this specification.

B. Rigid Galvanized Steel (RGS) Conduit

1. RGS may be used for all raceway applications outlined for EMT and PVC. RGS shall be used in locations where subject to accidental damage or abuse and for all above grade exterior applications unless other wiring methods are specified on the drawings. All circuit conductors in excess of 600 V shall be installed in RGS.

2. Provide PVC coated RGS conduit at all outdoor locations, where RGS conduit is required.

3. PVC coated RGS shall be used in corrosive environments.

4. All RGS fittings shall be threaded. Utilize Erickson couplings where joining two threaded conduits that can not be rotated.

C. Polyvinyl Chloride (PVC) Non-metallic Conduit

1. PVC may be used for installation in concrete or direct burial applications where not subject to damage.

2. PVC shall not be used for penetrations from concrete slabs. Transition to RGS shall be made a minimum of 2" below the slab finished surface, prior to penetration.

3. All connections shall utilize solvent and glue in accordance with the recommendations of the conduit manufacturer.

D. Miscellaneous Conduit Fittings

1. Expansion/Deflection Fittings: Raceways and conduit buried or secured rigidly on opposite sides of building expansion joints and long runs of exposed conduit subject to expansion and contraction due to variations in temperature shall have expansion fittings. Raceways and conduit shall cross building expansion joints at right angles. Provide separate external copper bonding jumper secured with grounding straps on each end of fitting. Fittings shall safely deflect and/or expand/contract to twice the distance of potential movement.

2. Refer to other specification sections for requirements pertaining to sealing for hazardous atmospheres.

3.02 WIRE AND CABLE

A. Homerun designations on the drawings are diagrammatic only. Install branch circuits and feeders from the power source to the attachment point as required for a complete system.

B. Install wires and cable in raceways as specified. All conductor sizing is based upon no greater than three current carrying conductors in a conduit.

C. Conductors shall be identified at all accessible locations in the following manner:

1. Color code secondary service, feeders and branch circuit conductors as follows:

208/120 Volts	**Phase**
Black	A
Red	B
Blue	C
White	Neutral
Green	Ground

2. Provide nonferrous wire markers, embossed or printed to correspond with the Drawings. Labels shall be permanently marked so that the source of the branch circuit or feeder may be readily identified. Hand written labels are not acceptable. Embossed tag equal to 3M Scotch Code STL-TAG or SCS-TM shall be applied with two miniature cable ties or slipped through both end holes. Heat bonded tag equal to 3M Scotch Code SCS-HB shall be permanently affixed with a heat gun.

D. Splices and Terminations

1. No more than twelve splices of current carrying conductors or six circuits, whichever is greater, shall be allowed in a single enclosure or junction box.

2. Splices and terminations shall be sized to the specified conductor. The insulation shall be cut back with the appropriate tools such that the conductors are not nicked or damaged.

3. The compression tool shall be appropriate for the installation of the provided lug or butt splice to ensure pressure necessary for a proper connection is applied.

4. Terminations shall not be stacked or bent unless specifically listed for the application.

E. Arc-proofing shall be applied to all feeders greater than 100 Amperes where multiple circuits are installed in common enclosures such as handholes, manholes and junction boxes. Apply tape in single, half-lapped layer as required by manufacturer's recommendations. Secure with strips of red plastic film tape on 208Y/120V conductors.

F. Cable Pulling

1. Pull cables that share conduit at same time into completely installed raceway. Conductors shall not be pulled in raceways with existing wiring.

2. Submit cable pulling calculations for engineer’s approval prior to all mechanically assisted pulls. Attach pull ropes to conductors with basket-weave grips on pulling eyes. Provide means to measure tension during entire pull. Utilize pulling compounds to lessen friction in accordance with the manufacturer’s recommendations.

3. Mechanically assisted pulls shall utilize equipment specifically designed for the purpose such as ropes, electric wench, pulleys, etc. The use of a motorized vehicle to assist in a cable pull is prohibited.

3.03 JUNCTION AND PULL BOXES

A. Pull boxes connected to concealed conduits shall be mounted with covers flush with finished wall or ceiling.

B. Pull boxes exposed to rain or in damp/wet locations shall be weatherproof NEMA 3R unless noted otherwise on the drawings.

C. Each junction and pull box shall have a suitable laminated plastic nameplate with white cut letters identifying power source, voltage and driven load of the associated branch circuits or feeders.

D. Submit box sizing calculations to confirm all box dimensions are in accordance with code requirements with product data prior to installation.

3.04 MARINA POWER PEDESTAL

A. All Marine Power Pedestals shall be supported to the deck in an approved manner utilizing stainless steel hardware in accordance with the manufacturer’s recommendations. Electrical Contractor shall coordinate with the general contractor as required.

B. Circuit Marina Power Pedestals to mitigate load imbalances. Distribute receptacle connections evenly across all three phases to the extent possible.

3.05 ACCEPTANCE TESTS

A. General Scope

1. This section covers the required field tests and inspections to assess the suitability for initial energization of electrical power distribution equipment and systems.

2. The purpose of this specification is to assure that all tested electrical equipment and systems are operational and within applicable standards and manufacturer's tolerances and that the equipment and systems are installed in accordance with design specifications.

3. All testing shall be performed by an independent testing organization operating as an unbiased testing authority, professionally independent of the manufacturers, suppliers, and installers of equipment or systems evaluated by the testing organization. The electrical contractor responsible for the installation of the systems as described in other sections of this specification, shall engage the testing organization.

B. Applicable References

1. All inspections and field tests shall be in accordance with the latest edition of NETA ATS Acceptance Testing Specifications for Electrical Power Distribution Equipment Systems.

   Each on-site crew leader shall hold a current registered certification in electrical testing applicable to each type of apparatus to be inspected or tested. The certification in electrical testing shall be issued by an independent, nationally recognized, technician certification agency, such as NETA (InterNational Electrical Testing Association) or NICET (National Institute of Certification in Engineering).

C. Division of Responsibility

1. Coordinate all testing activity with the testing organization and the owner.

2. Provide the testing organization with all information necessary for the completion of the identified testing including but not limited to electrical plans and specifications, short circuit and coordination study results and schedules coordination with the owner for required shutdowns.

3. Provide all required field technical services, tooling, equipment, instrumentation, and supervision to perform specified tests and inspections.

4. Submit a test plan with requested dates and times that each test will be conducted for possible observation by the engineer or owners representative.

5. A written record of all tests and a final report summarizing the findings shall be submitted for approval prior to energizing any electrical power distribution equipment and systems.

D. Inspection And Test Procedures

The following tests shall be conducted in accordance with the referenced NETA testing standards and as further outlined in this section on all applicable equipment/components installed, unless specifically noted otherwise:

1. NETA ATS-7.3 Cables

   a. Low Voltage, 600 V Max.

      All feeders illustrated on the one line diagram shall be tested in accordance with the referenced standard.

2. NETA ATS-7.13 Grounding Systems

E. Qualifications of Testing Firm

1. The testing firm shall be a independent testing organization which can function as an unbiased testing authority, professionally independent of the manufacturers, suppliers, and installers of equipment or systems evaluated by the testing firm.

2. The testing firm shall be regularly engaged in the testing of electrical equipment devices, installations, and systems.

3. The lead, on site, technical person shall be currently certified by the InterNational Electrical Testing Association (NETA) or the National Institute for Certification in Engineering Technologies (NICET) (or equivalent), in electrical power distribution system testing.

4. The testing firm shall utilize technicians who are regularly employed by the firm for testing services.

The testing firm shall submit proof of the above qualifications with bid documents when requested.

4. MEASUREMENT AND PAYMENT

4.00 METHOD OF MEASUREMENT

A. Method of measurement is not applicable. The electrical contractor shall receive contract price payment at full completion of project.

4.01 METHOD OF PAYMENT

A. Payment for the following bid items shall be under one (1) lump sum.

Item Number	Description	Unit
16000-1	Site Lighting, Electrical	Lump Sum

B. Work under the Item 16000-1 listed above will be paid at the Contract price, complete in place, which price shall be full compensation for all materials, labor, equipment and transportation, legal disposal of all materials and all incidentals required to complete the installations and removals to the satisfaction of the Engineer.

END OF SECTION

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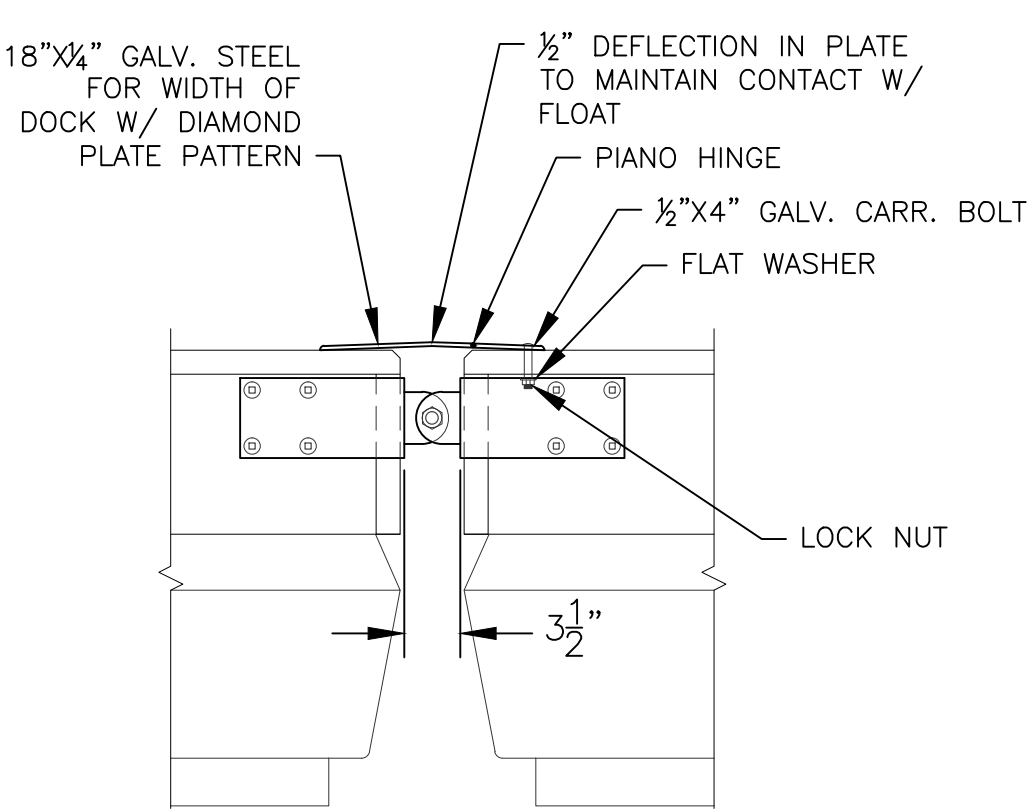

H / 10

TRANSITION DETAIL

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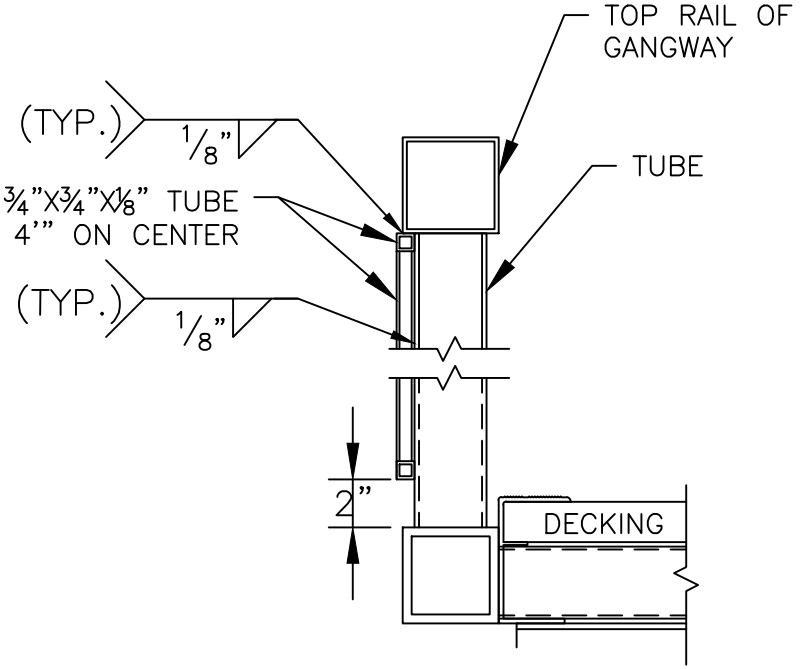

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PICKET WELDMENT

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

DETAIL REVISIONS

COMMERCIAL MARINA
SALEM PORT EXPANSION PROJECT
JANUARY 27, 2016

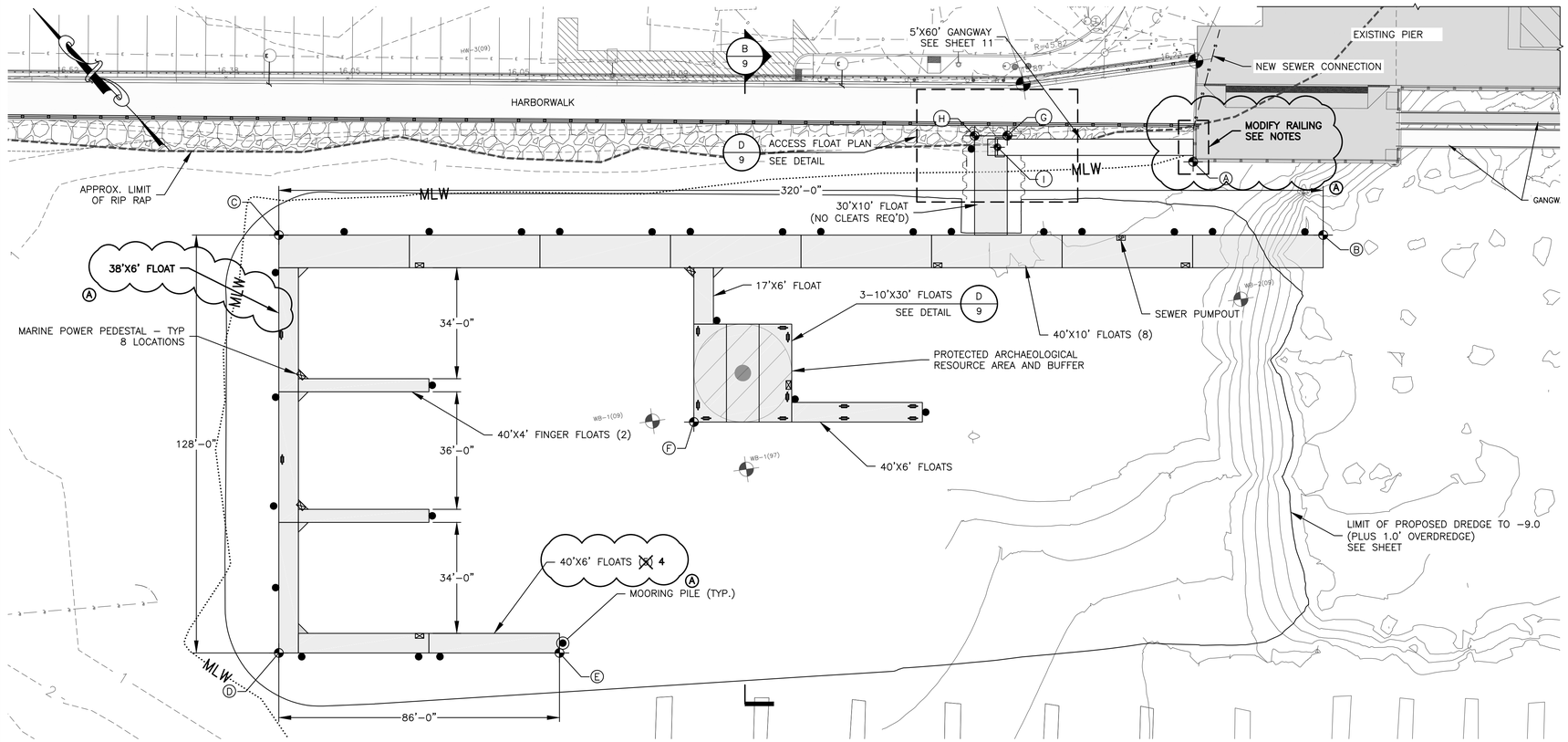
ADDENDUM #2

0 1

SCALE: 1"=1'-0"

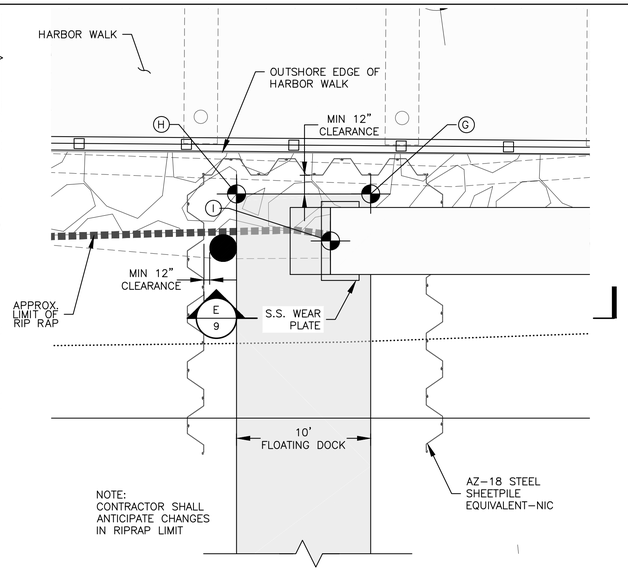
BCE Bourne Consulting Engineering, PC
3 Bent Street
Franklin, MA 02038
TEL. (508) 533-0606 FAX. (508) 533-0600

EXHIBIT 1



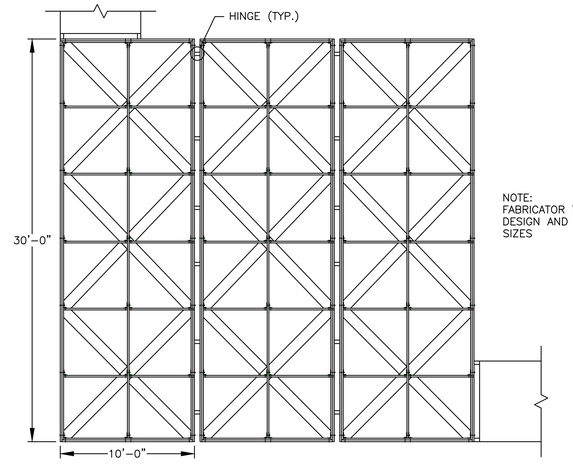
MARINA LAYOUT-PLAN

A 9 SCALE: 1"=20'-0"



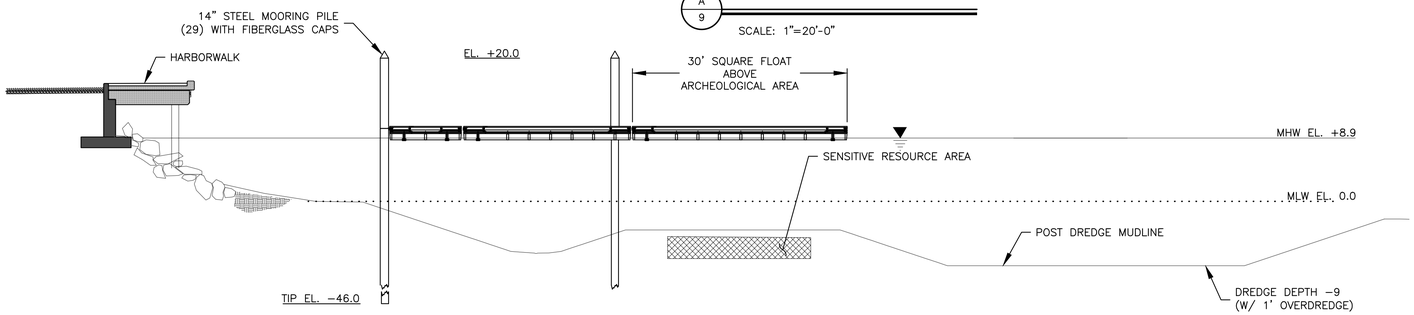
ACCESS FLOAT

C 9 SCALE: 3/16"=1'-0"



30' X 30' FLOAT

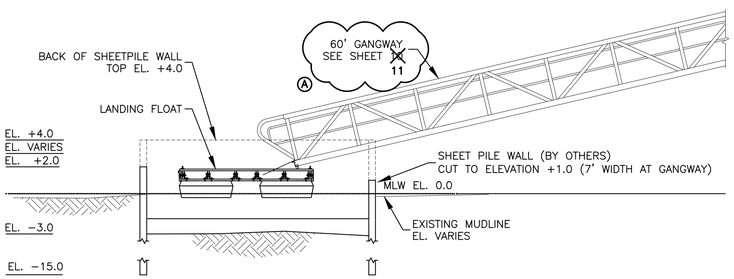
D 9 SCALE: 3/16"=1'-0"



PROPOSED CONDITIONS-PLAN

B 9 SCALE: 1"=10'-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



GANGWAY LANDING-SECTION

E 9 SCALE: 3/16"=1'-0"

NOTES:
1. CONTRACTOR TO MODIFY EXISTING RAILING SEGMENT TO ACCOMMODATE GANGWAY INSTALLATION.
2. RAILING SEGMENT SHALL BE SHIFTED TO REDUCE GAP @ INTERSECTION WITH HARBOR WALK.
3. TOP RAIL SHALL BE CUT TO CENTER POST, CAP TUBE, & RAILING RE-ANNODIZED TO MATCH EXISTING.
4. ALL TIMBER FLOATS SHALL BE HEAVY DUTY.

A

0 30 60
SCALE: 1"=30'-0"

REVISIONS	
01/21/16	A ADD #2

ADDENDUM #2

MARINA LAYOUT PLAN

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

BCE Bourne Consulting Engineering, PC
3 Bent Street
Franklin, MA 02038
TEL. (508) 533-6666 FAX. (508) 533-0600

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

DRAWING NO. 34005-02-09

SHEET 9 OF 13

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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
℄	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

XXAF / XXAT — CIRCUIT BREAKER, FIXED "XXAF" INDICATES FRAME SIZE "XXAT" INDICATES TRIP

FUSE

PC — PHOTOCELL

LIGHT

SITE LEGEND

EM — ELECTRIC MANHOLE

EH — ELECTRIC HAND HOLE

PB — 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#12G IN 3/4"C 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

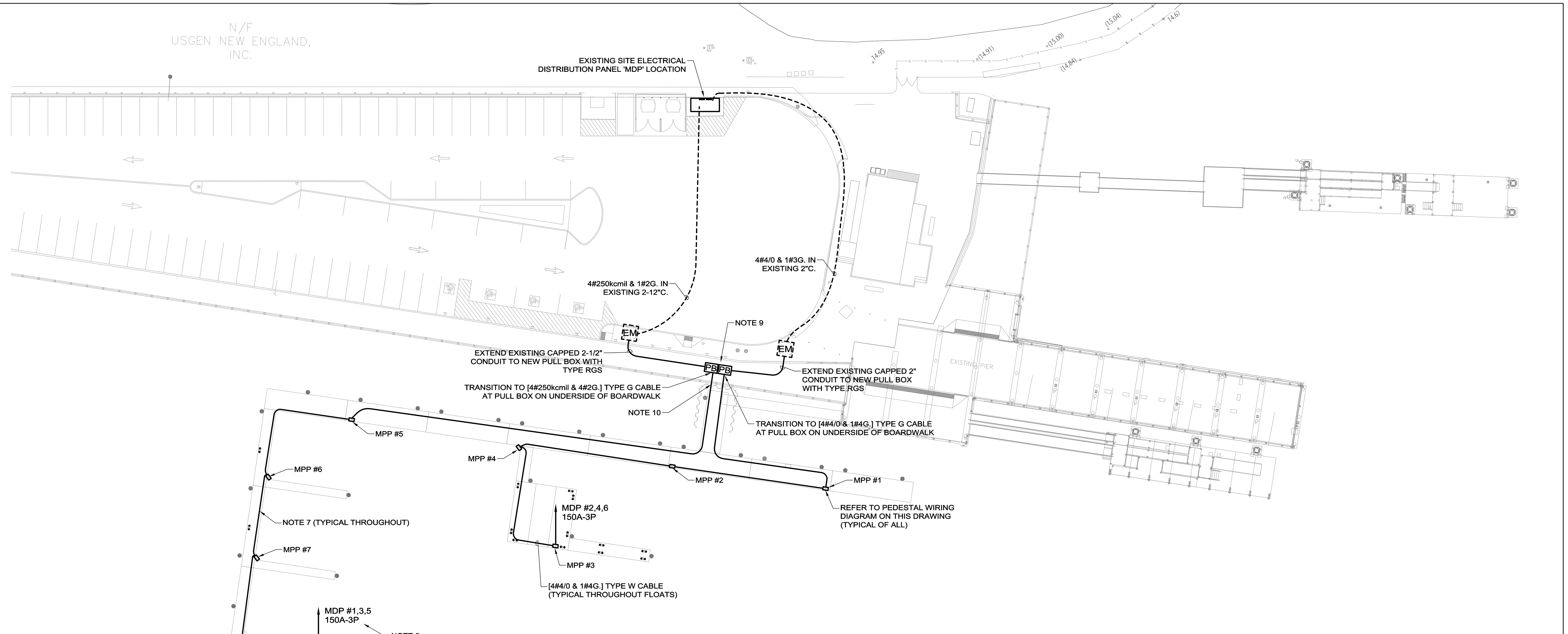
EXISTING EQUIPMENT LEGEND

XM — EXISTING EQUIPMENT TO REMAIN

XW — 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
SITE POWER PLAN

POWER NOTES:

1. REFER TO SITE/CIVIL DRAWINGS FOR ASSOCIATED NOTES, MOUNTING DETAILS, HEIGHTS AND EXACT LOCATIONS OF ALL DEVICES, INCLUDING EXACT LOCATIONS OF SITE LIGHTS.

3. 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.

4. 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.

5. MAINTAIN CONTINUITY OF BRANCH CIRCUITRY ASSOCIATED WITH ALL EXISTING POWER DEVICES TO REMAIN.

6. 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.

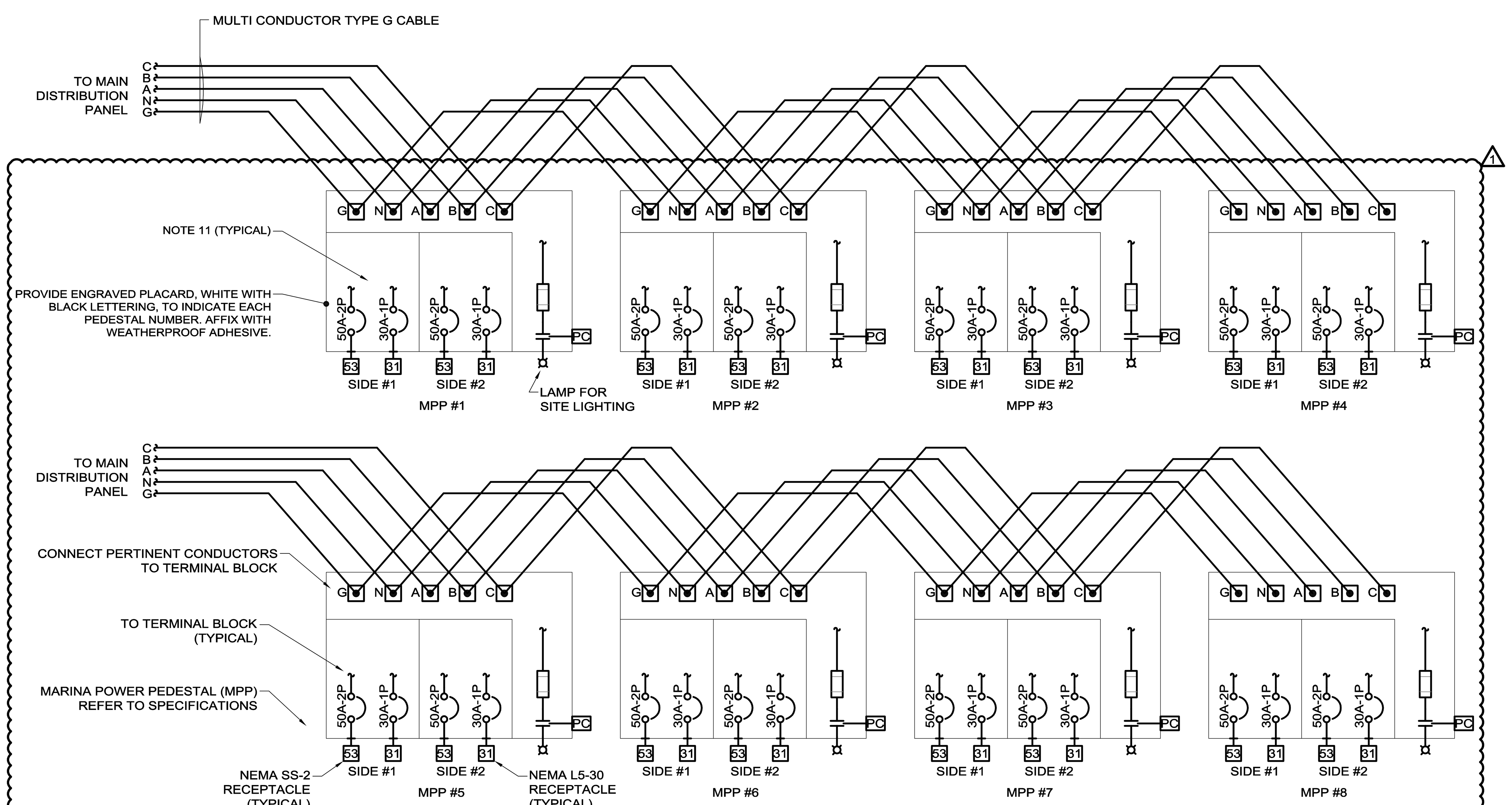
7. ALL CABLE SHALL BE SUPPORTED WITH HARDWARE LISTED FOR THE INTENDED USE. SUPPORT ALL CABLE AT INTERVALS PER THE NEC USING NONMETALLIC CLIPS. REFER TO NEC ARTICLE 555 FOR MORE REQUIREMENTS.

8. FOR EACH NEW FEEDER, PROVIDE NEW CIRCUIT BREAKERS IN EXISTING DISTRIBUTION PANEL 'MDP' TO MATCH EXISTING EQUIPMENT.

9. 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.

10. 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.

1 — 11. CIRCUIT MARINA POWER PEDESTAL SHORE POWER CONNECTIONS TO AVOID PHASE IMBALANCES. PROVIDE EACH SIDE OF EACH PEDESTAL WITH A LABEL INDICATING THE ELECTRIC SERVICE CONFIGURATION, SUCH AS: "50 AMPS, 120/208 VOLTS" AND "30 AMPS, 120 VOLTS". LABELS SHALL BE WHITE THERMOPLASTIC WITH BLACK CENTER LAMINATION AND BLACK ENGRAVED LETTERS. LABELS SHALL BE AFFIXED WITH PERMANENT WEATHERPROOF ADHESIVE.



MARINA POWER PEDESTAL
CONNECTION DIAGRAM

ELECTRICAL SITE PLAN

COMMERCIAL MARINA
SALEM PORT EXPANSION PROJECT
CITY OF SALEM
SALEM, MA
DECEMBER 2015
ADDENDUM NO. 2

RDK ENGINEERS
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BCE Bourne Consulting Engineering, PC
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RDK PROJECT NO. 20090112.05

1	01/18/16	
REVISIONS		

DRAWN: AT
CHECKED: DC
APPROVED: DC
DATE: 12/21/15

DRAWING NO. 34005-02-E100

SHEET 13 OF 13