

CITY OF SALEM, MASSACHUSETTS



BID #R-44

**Salem Port Expansion Project
Commercial Marina
SALEM WHARF PROJECT
BLANEY STREET, SALEM, MA**

Bid Opening: January 27, 2016

at 3:00 PM

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**LEGAL NOTICE
CITY OF SALEM
BID # R-44**

Sealed Bids will be received at the Office of the City Purchasing Agent, 120 Washington Street, 3rd floor, Salem, MA 01970, on or before **3:00 P.M. January 27, 2016** at which time and place they will be publicly opened and read for the following:

**SALEM PORT EXPANSION PROJECT – COMMERCIAL MARINA,
BLANEY STREET, SALEM, MA**

There will be a refundable fee of \$100.00 for the Bid Documents when returned in a timely manner. A Non-Refundable fee of \$25.00 for mailing of Bid Documents.

The **Bid** award is made by the Purchasing Agent and is subject to **Mayoral** approval. The City of Salem reserves the right to reject any and all bids or to waive any informalities in the Bid process, if deemed in the City's best interest.

A **pre-bid** conference will be held on **Tuesday, January 19, 2016 at 12:00PM** at **Salem Wharf Terminal Building, 10 Blaney Street** with site visit to follow, weather permitting. Contact Kathleen Winn, Department of Planning and Community Development at (978) 619-5685 for questions.

Bid Documents containing Specifications, Requirements, and Conditions will be/are available to view after **2:00 PM, December 30, 2015**, at the Office of the City Purchasing Agent, 120 Washington Street 3rd Floor, Salem, MA and may be viewed and printed from www.salem.com within the Purchasing Department, under Bids and RFP's, **R-44**.

Office Hours:

Mon., Tues., Wed., 8:00AM – 4:00PM

Thurs. 8:00AM – 7:00PM

Fri. 8:00AM – 12:00PM (noon)

Whitney Haskell
Purchasing Agent

INVITATION FOR BID

The City of Salem invites sealed bids for the **Salem Port Expansion Project – Commercial Marina, Blaney Street, Salem, MA**

Bid documents will be available for pick up during normal business hours **after 2:00 PM on Wednesday, December 30, 2015** at the Purchasing Agents Office, Salem City Hall Annex, 120 Washington Street, 3rd Floor, Salem, MA 01970. City Hall hours are as follows:

| | |
|---------------------|--------------------|
| Monday - Wednesday: | 8:00 AM - 4:00 PM |
| Thursday: | 8:00 AM - 7:00 PM |
| Friday: | 8:00 AM - 12:00 PM |

A **pre-bid** conference will be held on **Tuesday, January 19, 2016 at 12:00PM** at **Salem Wharf Terminal Building, 10 Blaney Street** with site visit to follow, weather permitting. Contact Kathleen Winn, Department of Planning and Community Development at (978) 619-5685 for questions.

Bidders shall address inquiries regarding availability of documents, delivery time, and other similar matters to the Purchasing Agent, 120 Washington Street, 3rd Floor, Salem, MA 01970, Attn: Albert C. Hill, Jr.,. Copies of Addenda, if any, will be mailed faxed or e-mailed to bidders of record without charge.

Each bidder shall fully acquaint him/herself with the site conditions as they exist and shall also thoroughly examine the Contract and Bidding Documents. Failure of any bidder to acquaint him/herself with these documents shall in no way relieve bidder from any obligation with respect to his/her bid.

Sealed bids will be received **on or before 3:00 P.M., January 27, 2016** at the Purchasing Department, City Hall Annex, 120 Washington Street, 3rd Floor, Salem, MA 01970.

Bids will be valid only when accompanied by a bid deposit in the form of a certified check, issued by a responsible bank or trust company, or a bid bond duly executed by the bidder as principal and having as surety thereon a surety company approved by the City, all in the amount of 5% of the total bid, payable to the "City of Salem".

Prior to the contract execution, the successful bidder will be required to furnish:

1. Labor and Materials Payment Bond and a Performance Bond being 100% of the amount of the Contract Price, issued by a company Licensed by the Division of Insurance of the Commonwealth of Massachusetts and in accordance with the requirements of the contract documents.
2. Certificate of Insurance with Workers Compensation Coverage in the amounts required by the contract documents.

The Awarding Authority reserves the right to waive any informalities and to reject any or all bids if it is in the public interest to do so.

INSTRUCTIONS TO BIDDERS

All bidders must adhere to these instructions. Bids that do not meet all the requirements of these instructions will not be considered.

The City of Salem will receive sealed bids for the proposed **Salem Port Expansion Project – Commercial Marina, Blaney Street, Salem, MA** until **3:00 P.M. on January 27, 2016** at the Purchasing Department, City Hall Annex, 120 Washington Street, Salem, MA 01970, at which time all bids will be publicly opened and read aloud.

Bids should be addressed to the Purchasing Department, 120 Washington Street, Salem, MA 01970, and marked “**Salem Port Expansion Project – Commercial Marina, Blaney Street, Salem, MA**” on the lower left hand corner of the envelope.

No bid received after the time and or date established for the opening of the bids will be considered regardless of the cause for the delay of the receipt of any such bid.

Copies of the contract for the work and required bid forms can be obtained from the Office of the Purchasing Department. Bid Surety and other conditions of bidding shall be as described in the Notice to Bidders in the bid documents.

There will be a refundable fee of \$100.00 for the Bid Documents when returned in a timely manner. A Non-Refundable fee of \$25.00 for mailing of Bid Documents.

All bids are subject to Commonwealth of Massachusetts General Laws C30, S39M and prevailing wage rates under MA C149, Sections 26-27D and the Federal Davis Bacon and Related Acts, as amended.

All bids shall be made by attending to each item enumerated below:

- Insert total bid price for Base Bid work in words and figures and amount in designated space.
- Insert individual lump sum bid prices for all Add Alternates
- Indicate Addenda received on the General Bid Form and sign Bid.
- Fill in all appropriate blank spaces in the Bid documents.
- Submit this bid intact without changing any of the text, enclosed in a sealed envelope bearing the name and address of the bidder and marked “**Salem Port Expansion Project – Commercial Marina, Blaney Street, Salem, MA**”.
- Submit to the City a Bid Bond for 5% of bid as bid security. The Bid Bond shall be made payable to “City of Salem, Massachusetts” and shall not be enclosed in the sealed envelope containing the Bid, but shall be contained in a separate envelope that shall be attached to the bid.

This inquiry implies no obligation on the part of the buyer or the City of Salem. Bids will not be considered unless returned on the enclosed bid forms.

Any request from a prospective bidder for the interpretation of the meaning of the Contract Drawings,

Specifications, or other Contract Documents shall be made in writing to the City Purchasing Agent, and to be given consideration must be received at least five calendar days prior to the date fixed for the opening of proposals. Interpretations will be made by the City as requested and all interpretations will be made in form of written Addenda to the Contract Documents, which Addenda shall become a part of the Contract.

All Addenda issued will be mailed or faxed to all persons registered with the Salem Purchasing Department, not later than three calendar days prior to the date fixed for the opening of Bids. Failure of any bidder to receive any such Addenda shall not relieve any bidder from any obligation under his bid as submitted.

A bid may be withdrawn by written request prior to the schedule time for bid opening.

At the date fixed for opening of bids, it will be presumed that each bidder has made an examination of the locations and sites of the work to be done under the contract; has satisfied himself as to the actual conditions, locations of utilities, requirements and quantities of work; and has read and become thoroughly familiar with Contract Documents, including the Contract Drawings, and all Addenda to them, if any.

The failure or omission of any bidder to receive or examine and become familiar with any form, instrument, or document shall in no way relive the bidder of any obligation in respect to his bid.

Bids will be evaluated on price, quality, experience and references.

The work and contract requirements are stated in the Contract Documents. In case of error in the extension of prices quoted herein, the unit price will govern.

As the City is exempt from payment of Federal Excise and Massachusetts Sales Taxes, price quoted herein are not to include these taxes. The City of Salem exemption number will be provided.

The bidder agrees to furnish material and/or services at prices quoted herein from the date of the bid award to the completion and acceptance of the project by the City.

The bidder to whom the contract is awarded guarantees to the City of Salem all equipment, materials and/or workmanship until final inspection and acceptance. He/She shall replace promptly all defective equipment, materials and/or workmanship required without additional costs to the City.

Contract execution will be conditioned upon producing a Labor and Materials Payment Bond and Performance Bond issued by a surety company satisfactory to the City and licensed by the State Division of Insurance, in an amount equal to One Hundred Percent (100%) of the total amount bid.

All bonds, except those of the bidder to whom the contract is awarded, will be returned as early as practicable after the awarding of the contract.

Notice of the acceptance of any bid will be given to the successful bidder by the City via posting a registered letter to the bidder's address stated in the bid. If, within ten (10) days, Sundays and holidays excluded, after notice of acceptance by the City, the successful bidder shall fail to deliver his contract duly

signed and his bonds, property executed, the proposal and acceptance, at the option of the owner, may become null and void, and the bid security accompanying his bid shall become the property of the City which may proceed to accept another bid.

The contractor shall start the work under this contract within 10 calendar days after the issuance of the Notice to Proceed, provided he shall have been notified to do so by the City and shall continue work to completion with all practical dispatch and regularity so that **Project shall be completed by May 27, 2016** and within all regulatory requirements.

The performance period shall begin upon Notice to Proceed and shall end on **May 27, 2016**. The sum of One thousand (\$1000) dollars per day as liquidated damages shall be paid by the Contractor to the City if any work is uncompleted after on **May 27, 2016** unless an extension of the performance period is granted in writing by the Salem Purchasing Agent.

Workman's Compensation, Property Damage, and Public Liability Insurance requirements are set forth in detail in the Articles. The Contractor shall comply with all laws, ordinances and regulations of the Federal, State and Municipal Governments which may be in force during the life of the contract, in any manner affecting his employees or the conduct of the work or the material used or employed in the work.

It is understood and agreed that it shall be a material breach of contract resulting from this bid for the contractor to engage in any practice which shall violate any provisions of M.G.L. Ch. 151 and Ch. 30, S39M as amended, EEOC Regulations and M.G.L. Ch. 62C Section 49R.

As stipulated in the Contract, the Contractor shall indemnify and save harmless the City, its officers, employees and agents from all claims, suits or actions of every kind and character made upon or brought against said City, its officers, employees and agents, for or on account of any injuries, or damages received or sustained by any party or parties by or from the acts of the said Contractor or its servants, agents, and Sub-Contractors, in doing the work and rendering services herein contracted for, or by in consequence of any negligence in operations or any improper material or equipment used, or by or on account of any action of omission of said Contract or his or its servants, agents, and Sub-Contractors; or on account of or in consequence of the performance of the Contract, whether or not such injuries to persons or damage to the property are due or claimed to be due to any negligence of the Contractor, his employees, his agents or servants. This indemnity shall include attorney's fees and costs and all other expenses incurred in the defense of any suit.

The wages paid to labor on the work shall be not less than those prescribed by the Commissioner of Labor and Industries in accordance with Massachusetts General Laws, Chapter 149, Sections 26 through 27D amended and in the Federal Davis Bacon Act and related acts. The higher wage rate shall prevail. Certified payroll forms must be submitted weekly to the Salem Department of Planning and Community Development. If the certified payroll submittals are not up to date or are in conflict with the prevailing wage law, then requisitions for payment from the contractor will not be processed.

Contractors shall retain their records for at least six (6) years after final payment. These records may be subject to inspection by authorized representatives of the state or City of Salem during the entire six (6) year period.

The City of Salem has an established set of conditions for public construction contracts. A substantial amount of money that is expended on public contracts is derived through taxes paid by City residents. It is in the public interest, health, welfare, and safety to ensure that the employees on such projects are paid at the lawfully required wage rates, have been trained in a bona fide apprenticeship training program, have hospitalization and medical coverage, and are classified according to the law. In light of the economic loss to the city when bidders and subcontractors who perform work on public construction projects are not from the Salem area and/or do not hire workers from the Salem area, it is in the public interest to establish goals for the hiring of Salem residents on public construction projects, and it is found that these provisions will serve the public interest, health, welfare and safety as described hereinabove. The City Conditions are specified in The GENERAL CONDITIONS below.

Under Massachusetts Executive Order 237, it is the policy of the Commonwealth to promote to the fullest participation of all citizens in resources provided by municipal government. Therefore, the City of Salem invites the participation of minority and women owned businesses in any and all parts of the contract.

A contract for work under this proposal shall obligator the Contractors and Sub-Contractors not to discriminate in employment practices. Bidder must, if requested, submit compliance reports concerning their employment practices and policies in order to maintain their ability to receive an award of Contract. Bidders must, if requested, submit a list of all Sub-Contractors who will perform work on this Contract together with a "Certification of Bidder Regarding Equal Employment Opportunity" signed by the Contractor and/or his or her Sub-Contractors as requested.

THE CITY RESERVES THE RIGHT TO REJECT ANY OR ALL BIDS, for any reason the City deems advisable, and so award the contract to any one of the contractors bidding on the work regardless of the amount of the bid. It is the City's intention that the contract will be awarded to the lowest responsive and responsible bidder possessing the skill, ability and integrity necessary to the faithful performance of the work, provided the times stated by the Contractor in the Schedule of Prices for starting and completing the work are deemed advantageous to the City's interest.

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.

CHECKLIST
SUBMISSION REQUIREMENTS

This page is to be completed by the City of Salem and is also supplied to assist bidders in fulfilling the Bid Submission Requirements:

| | |
|--|--|
| <input type="checkbox"/> YES <input type="checkbox"/> NO | FORMAL BID COVER SHEET |
| <input type="checkbox"/> YES <input type="checkbox"/> NO | COMPLETE GENERAL BID FORM |
| <input type="checkbox"/> YES <input type="checkbox"/> NO | COMPLETE BID ITEMS FORM |
| <input type="checkbox"/> YES <input type="checkbox"/> NO | COMPLETE GENERAL BIDDER QUALIFICATIONS FORM |
| <input type="checkbox"/> YES <input type="checkbox"/> NO | CERTIFICATE OF NON-COLLUSION & ATTESTATION STATEMENT FORM |
| <input type="checkbox"/> YES <input type="checkbox"/> NO | OSHA CERTIFICATION FORM |
| <input type="checkbox"/> YES <input type="checkbox"/> NO | CERTIFICATION OF BIDDER REGARDING SEGREGATED FACILITIES |
| <input type="checkbox"/> YES <input type="checkbox"/> NO | STATEMENT OF CORPORATE AUTHORITY FORM |

If all "yes" continue; if one "no" may be cause for rejection.

☐ YES ☐ NO 5% BID DEPOSIT

The bid deposit must be sealed in a separate envelope from the bid and attached to the bid-containing envelope.

If all "yes" continue; if "no" may be cause for rejection.

☐ YES ☐ NO MEETS ALL MINIMUM EVALUATION CRITERIA

If "yes", continue; if "no" then may be cause for rejection.

FORMAL BID COVER SHEET

NAME OF BIDDER: _____

ADDRESS: _____

_____ **ZIP CODE** _____

TO: Whitney Haskell
Purchasing Department
Salem City Hall Annex,
120 Washington Street, 3rd Floor
Salem, MA 01970

- I. The Undersigned submits this bid for providing contracted services necessary to meet the specifications contained herein for **“Salem Port Expansion Project – Commercial Marina, Blaney Street, Salem, MA”** and declares that it is made without collusion with any other person, firm or corporation making any other proposal or who otherwise would make a proposal, and agrees to furnish the Contracted Services in strict accordance with the specifications which consist of this bid form and all attached documents and instructions.
2. The Chief Procurement Officer, acting as the Awarding Authority for the City of Salem reserves the right to reject any or all bids, or any part of any bid, and/or to waive any minor informalities which in the opinion of the Awarding Authority is in the best interest of the City of Salem.
3. Bidder has checked bid carefully and will be held to his/her bid.

SIGNATURE OF BIDDER: _____

TITLE OF BIDDER: _____

TELEPHONE NO. WITH AREA CODE: () _____

Please check one of the following:

() Corporation, incorporated under the State of _____

() Partnership, names of partners are: _____

() Individual - name and address of Owner: _____

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

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 than 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. 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.

6. 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.

7. 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: _____

In conjunction with the words and figures submitted above for the requisite bid items, and as an integral part of said bid submission, the Undersigned certifies that:

The undersigned also hereby declares to be the only person interested in this Proposal; that it is made without any connection with any other person making any bid for the same work; that no person acting for, or employed by the Owner is directly or indirectly interested in this Proposal, or in any Contract which may be made under it, or in expected profits to arise therefrom; and it is made without directly or indirectly influencing or attempting to influence any other person or corporation to bid or to refrain from bidding or to influence the amount of the bid of any other person or corporation; and that this Proposal is made in good faith, without collusion or connection with any other person bidding for the same work; and that this Proposal is made with distinct reference and relation to the Bid Documents prepared for this case, and herein mentioned.

If a notice of award and at least four (4) unsigned copies of the Contract (and all other applicable Contract Documents) is delivered to the Undersigned within ninety (90) days, not including Saturdays, Sundays, and legal holidays, after the date of receipt of such notification, he/she shall execute and return all copies of the Contract (and all other applicable Contract Documents) to the City. The premiums for all bonds required shall be paid by the Contractor and shall be included in the contract price.

Accompanying this Proposal is a bid deposit in the amount of 5% of the value of the Base Bid which shall become the property of the City of Salem (Owner) if, in case this Proposal shall be accepted by the said Owner, the undersigned shall fail to comply with the statutes as herein before specified, if it is a foreign corporation, or in any event fails to execute the Contract with, and give a bond to, said Owner, according to the requirements of the Notice to Contractor in the form annexed to said form of Contract, within the time hereinafter specified.

The Undersigned hereby agrees that the contract term shall not extend beyond **June 30, 2016**, unless an extension is provided, and to fully complete the work in accordance with the Contract as stipulated. The undersigned further agrees to pay the City, as liquidated damages, One Thousand Dollars (\$1000.00) per calendar day that the Contractor fails to complete the work in accordance with the Contract Documents.

Amounts shall be shown in both words and figures, where indicated. In case of discrepancy, the amount shown in words will govern. The above prices shall include all labor, materials, overhead, profit, insurance, and incidentals required to complete the Work.

The undersigned proposes to furnish all labor and materials in accordance with the Drawings and Specifications prepared by BOURNE CONSULTING ENGINEERING, 3 BENT STREET, FRANKLIN, MA for the Contract Price specified below, subject to additions and deductions according to the terms of the Specifications.

The Undersigned further certifies under the penalties of perjury that the said Undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

Furthermore, pursuant to M.G.L., Chapter 62C, Section 49A, I certify under the penalties of perjury that I, to my best knowledge and belief, have filed all state tax returns and paid all state taxes required under the law.

The undersigned under penalties of perjury certifies that this bid is in all respects true, accurate, bonafide, fair, and made without collusion or fraud with any other person. As used in this section, the word "person" shall mean any natural person, joint venture partnership, corporation, or other business or legal entity.

BID ITEMS

- A. Bidder Agrees to perform all the work including all incidental labor, materials and equipment necessary for the satisfactory completion of the work and in full compliance with the contents and intent of the specifications and/or plans of the work, for the aforementioned prices.
- B. All prices shall be stated in both words and figures. In the event of a discrepancy between the price in words and figures, the words shall govern.

Alteration may void the bid. All prices shall be typewritten or written by hand in ink.

Signed this ____ day _____, 20__.

Social Security Number or
Federal Identification Number

(seal)

Signature of Individual or Corporate Name
Corporate Name

By: _____
Partner or Corporate Officer (if applicable)

- C. The undersigned agrees that, if he/she is selected as Contractor, he/she will within 10 calendar days, after presentation thereof by the Owner, execute the Contract in accordance with the terms of this bid and furnish a performance bond and a payment bond for the full amount of the Contract Price, each with a Surety company qualified to do business under the laws of the Commonwealth and satisfactory to the Owner, the premiums for which are to be paid by the Contractor and are included in the Contract Price.
- D. The bidder hereby certifies that in the event he/she is awarded the Contract he/she shall comply with the minority manpower ratio and all specific action steps contained in the State of Massachusetts Equal Employment Opportunity Anti-Discrimination and Affirmative Action Programs.
- E. The undersigned hereby certifies that he/she is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on this work.
- F. The undersigned further certifies under penalties of perjury that this bid is in all respects bona fide, fair, and made without collusion or fraud with any other person. As used in this subsection, the work "person" shall mean any natural person, joint venture, partnership, corporation, or other business or legal entity.
- G. I hereby certify that I have been informed that this project is sales tax exempt. I further certify that the bid prices contained herein do not include any calculations for sales tax.

Date: _____
(Name of General Bidder)

By _____

(Print Name as Signed Above)

(Title)

(Business Address)

Note: If the bidder is a corporation, indicate State of incorporation; if a partnership, give full names and addresses of all partners; and if an individual, give residential address if different from business address. Incorporated in what State: _____

President: _____
Treasurer: _____
Secretary _____

If a Partnership: (Name all Partners)

Name of Partner: _____
Residence: _____
Name of Partner: _____
Residence: _____

If an Individual:

Name: _____
Residence: _____

If an Individual doing business under a firm name:

Name of Firm: _____
Name of Individual: _____
Business Address: _____
Residence: _____

The bidder will give below the name and address of the Surety Company who will sign the bonds.

GENERAL BIDDER QUALIFICATIONS FORM

The undersigned certifies the following:

There is enclosed herewith a properly executed bid bond, cash, or a certified check or cashier's check, made payable without condition, to the order of the City in the amount required, and a duly executed consent of surety from an approved surety company agreeing to furnish the required performance and payment bonds upon the award of the contract.

The cash, check, or bid bond is as stipulated in the Instructions to Bidders and it is understood and agreed that such bid security is subject to the terms and conditions of the Contract Documents. The bid bond is executed by a surety licensed to conduct business in the Commonwealth of Massachusetts having a local agent as follows:

The undersigned hereby agrees to each and every stipulation in the Contract Documents pertaining to the submission of bids and further, if awarded the Contract, agrees to execute and secure the required contract and Contract Documents within five (5) days after the notice of award.

THE CITY MAY DISQUALIFY ANY BIDDER WHO DOES NOT SUPPLY SATISFACTORY RESPONSES TO THE FOLLOWING:

How many years has the bidder been in business as a General Contractor under the name in which its representatives propose to execute this Contract?

The undersigned states that the full names and addresses of all persons interested in this bid as principals are as follows:

The bidder shall state on the line below, if a corporation, the name of the State in which it is incorporated and the date of such incorporation:

If a partnership or corporation, give the name of all partners or all officers of the corporation with the address of each:

The undersigned states that s/he is a citizen of the United States and that all the partners, associates or principals interested herein are citizens of the United States, except:

The undersigned offers the following information relative to the facilities, experience, and financial resources to demonstrate its ability to perform the work and comply with the terms and conditions of this Contract:

FACILITIES/EQUIPMENT: Bidder owns and/or has available for immediate use on the work under this Contract the following equipment:

GENERAL EXPERIENCE: Bidder has performed the following similar work: (give location, date, type of work, size or cost, and reference to name and address of client).

| | <u>Location</u> | <u>Date</u> | <u>Type of Work</u> | <u>Size/Cost</u> |
|----|-----------------|-------------|---------------------|------------------|
| 1. | | | | |
| | | | | |
| | | | | |

Reference: _____

Was the bidder the general contractor or sub-contractor? _____

| | | | | |
|----|--|--|--|--|
| 2. | | | | |
| | | | | |
| | | | | |

Reference: _____

Was the bidder the general contractor or sub-contractor? _____

| | | | | |
|----|--|--|--|--|
| 3. | | | | |
| | | | | |
| | | | | |

Reference: _____

Was the bidder the general contractor or sub-contractor? _____

4.

Reference: _____

Was the bidder the general contractor or sub-contractor? _____

Has the Contractor ever failed to complete any work awarded to it? If so, state when, where, and why:

State any additional related business experience:

MARINE CONSTRUCTION EXPERIENCE:

1. Is marine construction a customary part of the General Contractor's business?

Circle: **YES** **NO**

2. If yes, provide the name of the construction supervisor and describe the supervisor's experience in marine construction.

3. If no, what is the primary trade of the sub-contractor who will complete the marine work?

4. In the marine work will be completed by a subcontractor, list the number of years have the general contractor and subcontractor worked together.

FINANCIAL RESOURCES: Information relative to the bidder's financial resources will be supplied by the following upon request (Give name, business address, and telephone number):

The bidder may be requested to amplify the foregoing statements as necessary to satisfy the City that the bidder is able to perform the work on an emergency basis in accordance with the Contract Documents.

Bidder agrees to submit upon request, audited financial statements which describe its financial position for the past three (3) years, including without limitation, a balance sheet and income statement.

Bidders are encouraged to supply complete information in direct response to the preceding questions. Any attachments should be keyed by number to the question to which they respond. The City will appreciate bidders' efforts to supply succinct responses to avoid redundant material. Pre-printed brochures or other promotional materials should be avoided entirely in favor of specifically targeted, straightforward, factually detailed responses.

The City of Salem will disqualify any bidder who provides false information in response to the questions above.

Signed this ____ day _____, 20__.

Social Security Number or
Federal Identification Number

Signature of Individual or
Corporate Name

By: _____
Partner or Corporate Officer
(if applicable)

(seal)

CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

Dated:

Name of Company or Corporation

Authorized Official's Signature

ATTESTATION STATEMENT

Pursuant to M.G.L. Ch. 62C, Sec. 49A, I certify under the penalties of perjury that I, to the best of my knowledge and belief, am in compliance with all the laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

State tax paid to _____ using Federal ID or Social Security

Number _____.

Dated:

Company of Corporation

Authorized Official's Signature

STATEMENT OF CORPORATE AUTHORITY

At a duly authorized meeting of the Board of Directors of _____
held on _____ at which time all voted that
_____ be and hereby is authorized to execute contracts and bonds
in the name and behalf of said Company, and affix its Corporate seal thereto, and such execution of
any contract of obligation in this Company's name on its behalf by such person
_____ under seal of the Company, shall be valid and binding upon
this Company.

A TRUE COPY,
ATTEST: _____

PLACE OF BUSINESS:

DATE OF THIS CONTRACT:

I hereby certify that I am Clerk of _____ and that
_____ is duly elected _____
of said Company, and that the above vote has not been amended or rescinded and remains in full
force and effect as of the date of this contract.

(Clerk's Signature)

(CORPORATE SEAL)

CONTRACT NO. _____

Chapter 306 of the Acts of 2004
An Act Relative to the Health and Safety on Construction Projects

GENERAL CONTRACTOR'S OSHA CERTIFICATION

_____ (Name of General Bidder) hereby certifies that it, and all its subcontractors who are not filed subbidders shall:

certify that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is a least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.

Signed under the penalties of perjury. _____ (date)

Signature of authorized representative of contractor

Print name of authorized representative of contractor

CERTIFICATION OF NON SEGREGATED FACILITIES

The Bidder certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The bidder certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location under his control where segregated facilities are maintained.

The bidder agrees that a breach of this certification will be a violation of the Equal Opportunity clause in any contract resulting from acceptance of this bid. As used in this certification the term "segregated facilities" means any waiting rooms, work area, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise.

The bidder agrees that (except where he has obtained identical certification from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractor prior to the award of subcontracts which are not exempt from the provisions of the Equal Opportunity clause, and that he will retain such certification in his files.

Note: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

Signature: _____

Date: _____, 20 _____

By: _____

Title

Company Address

CITY OF SALEM- CONTRACT FOR SERVICES

For informational purposes only

This agreement is made and entered into by and between the City of Salem, 93 Washington Street, Salem, MA 01970 (hereinafter the CITY), a municipal corporation organized and existing under the laws of the Commonwealth of Massachusetts, and _____, (hereinafter the CONTRACTOR).

ARTICLE I. DEFINITION.

This CONTRACT as used herein shall mean these articles, and the “contract documents” which include but are not limited to the following identified items and all documents, and forms submitted therewith, or attached hereby.

- Attachment A: Scope of Services, and other bid package materials
- Attachment B: Additional Contract Terms and Conditions
- Attachment C: Statement of Corporate Authority
- Addenda through # _____

ARTICLE II. AMOUNT AND DURATION.

This CONTRACT in an amount not to exceed \$ _____ shall commence on or about _____ and shall terminate no later than _____, unless a written amendment to renew or extend this CONTRACT is executed in accordance with the provisions of this CONTRACT.

If the CONTRACTOR shall fail to complete the work by the date agreed upon, or within any extended time allowed by the CITY under this CONTRACT, and the CITY shall certify in writing that the work could reasonably have been completed by the said date, or within the extended time, the CONTRACTOR shall pay or allow to the CITY the sum of Seven Hundred Dollars (\$750.00) per day as liquidated and ascertained damages for every day beyond the said date or extended time, as the case may be, during which the work shall remain unfinished, and such damages may be deducted by the CITY from any moneys due the CONTRACTOR.

ARTICLE III. PERFORMANCE.

The CONTRACTOR agrees to provide all goods and/or services set forth in the Invitation for Bid/Request for Proposal Documents, Scope of Service, the CONTRACTOR’S proposal for

_____ and/or as outlined in ATTACHMENT A - SCOPE OF SERVICES.

ARTICLE IV. TERMINATION.

- i) Without Cause. The CITY may terminate this CONTRACT on sixty (60) calendar days notice, or may suspend this CONTRACT for up to sixty (60) calendar days upon receipt of notice, when in the best interests of the CITY by providing notice to the CONTRACTOR, which shall be in writing and shall be deemed delivered and received when given in person to the CONTRACTOR, or when received by fax, express mail, certified mail return receipt requested, regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the CONTRACTOR.

- ii) For Cause. If the CONTRACTOR is determined by the CITY to be in default of any term or condition of CONTRACT, the CITY may terminate this CONTRACT on thirty (30) days notice by providing notice to the CONTRACTOR, which shall be in writing and shall be deemed delivered and received when given in person to the CONTRACTOR, or when received by fax, express mail, certified mail return receipt requested, regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the CONTRACTOR. If the CITY is determined by the CONTRACTOR to be in default of any term or condition of this CONTRACT the CONTRACTOR may terminate this CONTRACT on thirty (30) days notice by providing notice to the CITY, which shall be in writing and shall be deemed delivered and received when given in person to the CITY, or when received by fax, express mail, certified mail return receipt requested, regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the CITY.
- iii) Default. The following shall constitute events of default under this CONTRACT: a) any material misrepresentation made by the CONTRACTOR to the CITY, b) any failure to perform any of its obligations under this CONTRACT including, but not limited to the following: (i) failure to commence performance of this CONTRACT at the time specified in this CONTRACT due to a reason or circumstance within the CONTRACTOR'S reasonable control, (ii) failure to perform this CONTRACT with sufficient personnel and equipment or with sufficient material to ensure the completion of this CONTRACT within the specified time due to a reason or circumstance within the CONTRACTOR'S reasonable control, (iii) failure to performance this CONTRACT in a manner reasonably satisfactory to the CITY, (iv) failure to promptly re-perform with reasonable time the services that were rejected by the CITY as unsatisfactory, or erroneous, (v) discontinuance of the services for reasons not beyond the CONTRACTOR'S reasonable control, (vi) failure to comply with a material term of this CONTRACT, including, but not limited to, the provision of insurance and nondiscrimination, and (vii) any other acts specifically and expressly stated in this CONTRACT as constituting a basis for termination of this CONTRACT, and (viii) failure to comply with any and all requirements of state law, and/or regulations, and City ordinances, and/or regulations.

ARTICLE V. REMEDIES OF THE CITY.

The CITY may deduct the cost of any substitute contract or performance for expenses, losses, and all damages, including incidental and consequential damages as a result of any event of non-conformance or non-performance of the CONTRACTOR in complying with the terms of this CONTRACT, and shall withhold such expenses, losses, and damages from sums due to become due.

ARTICLE VI. REMEDIES OF THE CONTRACTOR.

If the damages, other than loss, non-conformance, or non-performance, are actually sustained by the CONTRACTOR due to any act or omission for which the CITY is legally responsible the CITY shall allow a sum equal to the amount of such damages sustained by the CONTRACTOR as determined by the CITY in writing, provided the CONTRACTOR shall have provided to all signatories of the CONTRACT a detailed written statement of such damages and cause thereof within 30 days of the act of omission by the CITY.

ARTICLE VII. ASSIGNABILITY.

The CONTRACTOR shall not assign, subcontract or in any way transfer any interest in this CONTRACT without the prior written consent of the Procurement Officer of said CITY. In the event of such occurrence the CITY reserves the right to deal with any assignee subcontractor or transferee directly and the CONTRACTOR agrees to remain bound by all terms and conditions of this CONTRACT in accordance with its original tenor. The provisions of this CONTRACT shall be binding upon, and shall inure to the benefit of, the successors and assigns of the CONTRACTOR and any public body or bodies succeeding the interests of the CITY.

ARTICLE VIII. INDEMNIFICATION.

The CONTRACTOR shall assume the defense, indemnify and hold harmless the CITY, the CITY'S agents and employees, from and against all losses and all claims, demands, payments, suits, actions, recoveries and judgments of every nature and description brought or recovered against them by reason of acts, in actions, omissions, negligence, reckless or intentional misconduct of the said CONTRACTOR, its agent(s), officers, employees, or subcontractors; in the execution of the work or in guarding the same. Unless otherwise provided by law, the CITY may elect to indemnify the CONTRACTOR for claims arising in tort if it is determined that the CONTRACTOR performed its obligations under this CONTRACT pursuant to the direct supervision and control of the CITY or its designated agent(s).

ARTICLE IX. WORKER'S COMPENSATION AND OTHER INSURANCE.

The CONTRACTOR shall provide by insurance for the payment of compensation and the furnishing of other benefits under Chapter 152 of the General Laws of Massachusetts (The Worker's Compensation Act) to all employees of the CONTRACTOR who are subject to the provisions of Chapter 152 of the General Laws of Massachusetts.

Failure to provide and continue in force such insurance during the period of this contract shall be deemed a material breach of this contract, shall operate as an immediate termination thereof, and CONTRACTOR shall indemnify the CITY for all losses, claims, and actions resulting from the failure to provide the insurance required by this Article.

The CONTRACTOR shall furnish to the CITY evidence of such insurance prior to the execution of this CONTRACT and before the same shall be binding on the parties thereto, except if specifically waived in Attachment B.

Prior to commencement of any work and until completion of its work under this CONTRACT shall maintain the following insurance coverage, at its cost, from insurance acceptable to the CITY, giving evidence of such coverage to the CITY prior to execution of this CONTRACT, a copy of such insurance coverage to be attached herewith:

1. Comprehensive Automobile Liability Insurance covering the use of all owned, non-owned and hired automobiles in connection with its operations with a combined single limit of \$1,000,000. The comprehensive Automobile Liability insurance may be provided through primary and excess or umbrella insurance policies.
2. CONTRACTOR'S Equipment Coverage (or a certification of self-insurance satisfactory to the CITY) must be provided on an "All Risks" basis, covering physical damage to all tools and equipment, including automotive equipment owned, rented, or used by the CONTRACTOR.

3. Commercial General Liability Insurance coverage which may be provided through primary and excess or umbrella liability policies for limits of \$1,000,000 general aggregate, and \$500,000 per occurrence.

All required insurance must be endorsed to name the CITY as Additional Insured. All required insurance shall be endorsed to waive the insurer's rights of subrogation against the CITY. All policies and certificate for insurance must contain language that the insurance shall not be canceled, materially changed or non-renewed without at least thirty (30) days advance written notice to the CITY. The CONTRACTOR under this CONTRACT shall not allow its subcontractors to begin work until similar insurance has been so obtained and certificates of insurance approved by the CONTRACTOR.

ARTICLE X. CORPORATE CONTRACTOR.

If CONTRACTOR is a corporation, CONTRACTOR shall endorse the Certificate of Corporate Authority for the CONTRACTORS' signatory (Attachment C), or shall otherwise provide a form similar in nature and substance acceptable to the CITY.

If CONTRACTOR is a non-profit corporation, CONTRACTOR shall provide satisfactory proof of present status as a non-profit corporation. Such proof shall be in the form of a certification from the Massachusetts Secretary of State's office and/or from the Internal Revenue Service and shall provide the Federal Tax Identification Number of the non-profit corporation. This agreement shall not be enforceable against the CITY unless and until the CONTRACTOR complies with this section. Failure to inform the CITY in writing of revocation, or other loss of non-profit status shall be deemed a material breach of this contract and operate as an immediate termination thereof.

ARTICLE XI. SUBJECT TO APPROPRIATION.

The obligations of the CITY under this CONTRACT shall be subject to appropriation. In the absence of appropriation this CONTRACT shall be immediately terminated without liability for damages, penalties, or other charges.

In the requisite circumstances, the obligations of the CITY under this CONTRACT shall be subject to the formal award of the state, federal grant.

ARTICLE XII. DOCUMENTS, MATERIALS, ETC.

Any materials, reports, information, data, etc. given to or prepared or assembled by the CONTRACTOR under this CONTRACT are to be kept confidential and shall not be made available to any individual or organization by the CONTRACTOR (except agents, servants, or employees of the CONTRACTOR) without the prior written approval of the CITY, except as otherwise required by law. The CONTRACTOR understands that he/she/it may acquire or have access to "personal data" otherwise kept by the CITY. The CONTRACTOR shall comply with the provisions Chapter 66A of the General Laws of Massachusetts as it relates to public documents, and all other state and federal laws and regulations relating to confidentiality, security privacy and use of confidential data.

Any materials produced in whole or in part under this CONTRACT shall not be subject to copyright, except by the CITY, in the United States or any other country. The CITY shall have unrestricted authority to, without payment of any royalty, commission, or additional fee of any type

or nature, publicly disclose, reproduce, distribute and otherwise use, and authorize other to use, in whole or in part, any reports, data or other materials prepared under this CONTRACT.

All data, reports, programs, software, equipment, furnishings, and any other documentation or product paid for by the CITY shall vest in the CITY at the termination of this CONTRACT. The CONTRACTOR shall at all times, during or after termination of this CONTRACT, obtain the prior written approval of the CITY before making any statement bearing on the work performed or data collected under this CONTRACT to the press or issues any material for publication through any medium.

ARTICLE XIII. AUDIT, INSPECTION, RECORDKEEPING.

At any time during normal business hours, and as often as the CITY may deem it reasonably necessary, there shall be made available in the office of the CONTRACTOR for the purpose of audit, examination, and/or to make excerpts or transcripts, all records, contracts, invoices, materials, payrolls, records of personnel, conditions of employment and other data relating to all matters covered by this agreement.

Further the CONTRACTOR agrees to make its work papers, records and other evidence of audit available to the CITY for a period of three years after final payment under his CONTRACT. The CITY shall be entitled to reproduce any or all such documents at its own expense, for which provision shall be made at such time.

ARTICLE XIV. WEEKLY PAYROLL RECORDS REPORT.

In accordance with Massachusetts General Law c. 149, s. 27B, a true and accurate record must be kept of all individuals employed on a public works construction project for which prevailing wage rates are applicable.

In addition, every contractor and subcontractor is required to submit, on a weekly basis, a copy of their weekly payroll records to the awarding authority. Once collected, the awarding authority is also required to preserve those records for three years.

ARTICLE XV. CONFLICT OF INTEREST.

- i) CITY. No officer, member or employee of the CITY and no members of its governing body who exercise any function or responsibility in review or approval of the undertaking or carrying out of this CONTRACT shall participate in any decision relating to the CONTRACT which affects his/her personal interests or the interest of any corporation, partnership, or association in which he/she has a direct or indirect pecuniary interest. None of the services to be provided by the CONTRACTOR shall be used for any partisan political activity or further the election or defeat of any candidate for political office in the CITY. Compliance with this section shall be material to the CONTRACT.
- ii) CONTRACTOR. CONTRACTOR agrees that his/her/its agents, servants, and employees have neither presently nor during the period of this CONTRACT any interest direct or indirect which would impair, detract, or conflict in any manner or degree with the performance of services required under this CONTRACT. The CONTRACTOR, his/her/its agents, servants or employees further stipulates that in the performance of this CONTRACT, no person having any such interest shall be employed. Conflicts of Interest include but are not limited to (a) immediate family relationships with officials of the CITY, (b) instances where the CONTRACTOR, his/her/it agents, servants or employees during

the period of this CONTRACT was connected as an officer, employee or member of the governing body of the CITY, and (c) instances where the CONTRACTOR has an interest in any CITY department, its agents, servants or employees or parcels of land within the CITY. Compliance with this section shall be material to the CONTRACT.

ARTICLE XVI. PAYMENT.

The City agrees to make all reasonable efforts to pay to the CONTRACTOR the sum set forth in the CONTRACTOR'S bid or proposal within thirty (30) days of receipt of an invoice at the Department of Planning and Development detailing the work completed.

Subject to pending statutory appeal rights, CONTRACTOR agrees that all sums otherwise due and payable to the CITY for outstanding taxes, fines, fees and or other municipal charges may be deducted from the sum(s) otherwise payable under this CONTRACT prior to disbursement to the CONTRACTOR.

ARTICLE XVII. CONFLICT.

In the event there is a conflict between these Articles and Attachment A, Attachment A shall supersede these Articles.

ARTICLE XVIII. WAIVER AND AMENDMENT.

The provisions contained in this CONTRACT may be modified only as specifically provided by ATTACHMENT B - ADDITIONAL TERMS AND CONDITIONS. Amendments, or waivers of any additional term, condition, covenant, duty or obligation contained in this CONTRACT may be made only by written amendment executed by all signatories to the original agreement, prior to the effective date of the amendment.

To the extent allowed by law, all conditions, duties, and obligations contained in this CONTRACT may be waived only by written agreement by both parties.

Forbearance or indulgence in any form or manner by a party shall not be construed as a waiver, nor in any manner limit the legal or equitable remedies available to that party. No waiver by either party of any default or breach shall constitute a waiver of any subsequent default or breach of a similar or different matter.

ARTICLE XIX. CERTIFICATION.

IN WITNESS WHEREOF, THE CONTRACTOR CERTIFIES, UNDER THE PAINS AND PENALTIES OF PERJURY, THAT THE CONTRACTOR IS IN COMPLIANCE WITH EACH OF THE FOLLOWING:

- a. TAXES. PURSUANT to M.G.L. c. 62C, s. 49A, the CONTRACTOR has filed all state tax returns and complied with all laws of the Commonwealth relating to taxes.
- b. DEBARMENT. The CONTRACTOR is not currently debarred or suspended by the Commonwealth of Massachusetts, or any of its entities or subdivisions.
- c. AMERICANS WITH DISABILITIES ACT. The CONTRACTOR is aware of the recently enacted Americans with Disabilities Act which prohibits discrimination based upon disability and shall meet any relevant standards, and/or conditions set out in the bid/proposal documents, bid/proposal specifications, and/or ATTACHMENT A - SCOPE OF SERVICES.

ARTICLE XX. FORUM AND CHOICE OF LAW

This CONTRACT and any performance herein shall be governed by and be construed in accordance with the laws of Commonwealth. Any and all proceedings or actions relating to subject matter herein shall be brought and maintained in the courts of the Commonwealth or the federal district court sitting in the Commonwealth, which shall have exclusive jurisdiction thereof.

This paragraph shall not be construed to limit any other legal rights of the parties.

IN WITNESS WHEREOF the parties have hereto and to three other identical instruments set forth their hands the day and year first above written.

City of Salem

THE CONTRACTOR

Kimberley Driscoll, Mayor

Company Name

Whitney Haskell
Purchasing Agent

Status (Corporation/Non-corporate)

Signature & Title

Lynn Goonin Duncan, AICP
Director, DPCD

Please Print Name & Title

Date

APPROVED AS TO FORM:

Taxpayer Identification Number

Elizabeth Rennard, Esq.,
City Solicitor

**PERFORMANCE BOND
CITY OF SALEM**

KNOW ALL MEN BY THESE PRESENTS:

That we, _____ as Principal, and _____, as Surety, are held and firmly bound unto the City of Salem, as Obligee, in the sum of _____ dollars (\$ _____), to be paid to the Obligee, for which payments, well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said Principal has made a contract with the Obligee, bearing the date of _____, 2016, for _____
(identify project and location)

NOW, the condition of this obligation is such that if the Principal and all Subcontractors under said contract shall well and truly keep and perform all the undertakings, covenants, agreement, terms and conditions of said contract on its part to be kept and performed during the original term of said contract and any extensions thereof that may be granted by the Obligee, with or without notice to the Surety, and during the life and any guarantee required under the contract, and shall also well and truly keep and perform all the undertakings, covenants, agreements, terms and conditions of any and all duly authorized modifications, alterations, changes or additions to said contract that may hereafter be made, notice to the Surety of such modifications, alterations, changes or additions being hereby waived, then this obligation shall become null and void; otherwise, it shall remain in full force and virtue.

IN THE EVENT, that the contract is abandoned by the Principal, or the Obligee, of said contract terminates the employment of the Principal or the authority of the Principal to continue the work, said Surety hereby further agrees that said Surety shall, if requested in writing to the Obligee, take such action as is necessary to complete said contract.

IN WITNESS WHEREOF, the Principal and Surety have hereto set their hands and seals this _____ day of _____, 2016.

PRINCIPAL

SURETY

(Name and Seal)

(Attorney-in-Fact and Seal)

(Title)

Attest: _____

Attest: _____

The rate for this bond is _____% for the first \$ _____ and _____% for the next \$ _____.

The total premium for this bond is \$ _____.

**PAYMENT BOND
CITY OF SALEM**

KNOW ALL MEN BY THESE PRESENTS:

That we, _____, as Principal, and _____, as Surety, are held and firmly bound unto the City of Salem, as Obligee, in the sum of _____ dollars (\$_____), to be paid to the Obligee, for which payments, well and truly to be made, we find ourselves, our respective heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said Principal has made a contract with the Oblige, bearing the date of _____, 2016, for _____
(identify project and location)

NOW, the condition of this obligation is such that if the Principal and all Subcontractors under said contract shall pay for all labor performed or furnished and for all materials used or employed in said contract and in any and all duly authorized modifications, alterations, extensions of time, changes or additions to said contract that may hereafter be made, notice to the surety of such modifications, alterations, extensions of time, changes, or additions being hereby waived, the foregoing to include any other purposes or items set out in, and to be subject to, provisions of M.G.L. c.30 § 39A, and M.G.L. c.149 § 29, as amended, then this obligation shall become null and void; otherwise it shall remain in full force and virtue.

IN WITNESS WHEREOF, the Principal and Surety have hereto set their hands and seals this _____ day of _____, 2016.

PRINCIPAL

SURETY

(Name and Seal)

(Attorney-in-Fact and Seal)

(Title)

Attest: _____

Attest: _____

The rate for this bond is _____% for the first \$_____ and _____% for the next \$_____.

The total premium for this bond is \$_____

GENERAL CONDITIONS

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| | |
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GENERAL CONDITIONS

ARTICLE I GENERAL

- a. Every provision of this Contract shall have the same force and effect as if included and repeated in every division or subdivision of the Contract under which it may apply.
- b. Headings, letterings, and numbers of the various divisions and subdivisions of and in the Contract are intended for convenience of reference only and have no force or effect whatever on the intent of the Contract.

ARTICLE II DEFINITIONS

Wherever the words defined in this Article or pronouns used in their stead occur in this Contract, they shall have the meanings here given.

- a. The words "Contract Documents" and "the Contract" shall mean this Contract and shall include Advertisement for Bids, Information for Bidders, Proposal, Bid Bond, Agreement, Payment Bond, General Conditions, Special Conditions Technical Specifications, Drawings, Addenda, Notice of Award, Notice to Proceed, and Change Orders. The Contract Documents represent the entire and integrated agreement between the Owner and the Contractor. The Contract shall not be construed to create any contractual relationship of any kind between The Owner's Representative and the Contractor, but The Owner's Representative shall be entitled to performance of obligations intended for his benefit and to enforcement thereof. Nothing in the Contract Documents shall create any contractual relationship between the Owner or The Owner's Representative and any Subcontractor.
- b. The word "Owner" or "Project Sponsor" or "Awarding Authority", shall mean the City of Salem.
- c. The word "State" shall mean the Commonwealth of Massachusetts.
- d. The word "Commonwealth" shall mean the Commonwealth of Massachusetts.
- e. The words "Approval of the Owner" or "Approved by the Owner," "Approval of Bourne Consulting Engineering" or "Approved by Bourne Consulting Engineering," shall mean approval in writing.
- f. The word "Contractor" shall mean the party termed as such by the Agreement, his/her heirs, executors, administrators, successors, or assigns as regards the obligations of the Contract.

- g. "Subcontractor." A person, firm, or corporation supplying labor and materials, or only labor, for work at the site of the project under separate Contract or agreement with the Contractor.
- h. The word "Contract Drawings" or words of like effect shall mean the Drawings listed by that number and title herein.
- i. The words "as permitted," "as required," or words of like effect shall mean that the permission or requirement of The Owner's Representative is intended; the words "approved," "acceptable," "satisfactory," or words of like import shall mean approved by, or acceptable to, or satisfactory to The Owner's Representative - and the words "necessary," "suitable," "equal," or words of like import shall mean necessary, suitable, or equal in the opinion of The Owner's Representative .
- j. The Owner is treated as if it were of singular number and neuter gender and the Contractor and The Owner's Representative are treated as if each were of the singular number and masculine gender.
- k. The words "Notice to Proceed" shall mean a written notice to the Contractor of the date on which he is to begin the prosecution of the work for which he has contracted.
- l. Any communication to the Owner shall be addressed to the City of Salem Department of Planning and Community Development, 120 Washington Street, Salem, MA 01970.
- m. The word "work" shall mean all performance, including the furnishing of materials, labor, tools, equipment and incidentals required of the Contractor under the terms of this Contract, including the transportation of the materials and supplies to or from the location of the project by employees of the Contractor and any subcontractor.

ARTICLE III INTERPRETATION OF CONTRACT

The Contractor shall at this own proper cost and expense provide and do everything necessary to prepare for and perform everything required under the conditions and requirements of the Contract, and he hereby agrees that The Owner's Representative shall in the first instance be the interpreter of the Contract Documents, and all the work contemplated and described therein shall be so done as to satisfy him that its intent is fulfilled. The Owner's Representative shall promptly render impartial decision on all claims of either party against the other and on all other matters governed by this intent, including questions as to the execution and progress of the work, the quality and types of materials and workmanship, the suitability of methods, and costs and values. The determination and decision of The Owner's Representative shall be final and binding on both parties, and shall be a condition precedent to the right of the Contractor to receive any money hereunder, except as to those areas of disputed work covered under ARTICLE XII - DISPUTED WORK, DETERMINATION OR ORDER.

ARTICLE IV DRAWINGS AND SPECIFICATIONS

The Owner will furnish to the Contractor, at no charge, two copies of the Contract Drawings, and two copies of the Contract Specifications. The Owner will also furnish the Contractor, at no charge, electronic PDF files of Contract Drawings and Specifications and electronic AutoCAD files of the Contract Drawings. Additional copies of the Contract Drawings and Contract Specifications shall be provided at the Contractor's expense.

The Plans, Drawings, Specifications and other data and documents prepared for use in connection with this Contract are intended to be complementary to each other, but should any discrepancy appear or any misunderstanding arise as to the import of anything contained in them or any of them, except to those areas of disputed work covered by ARTICLE XII - DISPUTED WORK, DETERMINATION OR ORDER the explanation or decisions of The Owner's Representative shall be final and binding on the parties hereto.

Any errors or omissions in Plans, Drawings or Specifications or in other data or documents may be corrected by The Owner's Representative when such correction is necessary for the proper fulfillment of their intention as construed by him, such correction to govern only from the time that The Owner's Representative gives notice in writing thereof to the Contractor.

The Contractor shall not take any advantage, or make any claim for damages on account of any omission, discrepancy or error in any soundings, borings, estimates, schedules, specifications, drawings, plans, or other data or documents furnished him, but shall report same to The Owner's Representative as soon as it comes to his knowledge.

ARTICLE V NOT TO SUBLET OR ASSIGN

The Contractor shall keep the Contract under his control; and shall not assign, by power of attorney or otherwise, any portion of said work, or any moneys payable under the Contract or his claim thereto, unless by the previous approval of the Owner and the Surety. No part of this work shall be sublet except to parties skilled in and equipped properly for the same and satisfactory to The Owner's Representative and approved by the Owner.

ARTICLE VI INSURANCE REQUIREMENTS

The Contractor shall, before commencing performance of the Contract, provide by insurance for the payment of compensation and the furnishing of other benefits under Chapter 152 of the General Laws (Tercentenary Edition), to all persons to be employed within the Commonwealth under the Contract, and he shall continue such insurance in full force and effect during the term of the Contract.

- a. The Contractor shall take out and maintain during the life of this Contract such comprehensive Public Liability and Property Damage Insurance as shall protect him and any subcontractor performing work covered by this Contract from claims for Damages for bodily injury, including wrongful death, as well as from claims for property damages which may arise from operations under this Contract, whether such operations be by himself or by any subcontractor or anyone directly or indirectly employed by either of them. Public Liability Insurance shall be in an amount not less than One Million (\$1,000,000) Dollars for injuries, including wrongful death, to any one person, and, subject to the same limit for each person, in an amount not less than One Million (\$1,000,000) Dollars on account of one accident. Property Damage Insurance shall be in an amount not less than One Million (\$1,000,000) Dollars, including explosion, collapse and underground damage coverage, for each accident, and not less than One Million (\$1,000,000) Dollars aggregate.
- b. The Contractor shall also take out and maintain during the life of this Contract a "Builders Risk" Insurance with extended coverage upon the entire project in an amount not less than the full insurable value of the interest. The policy shall cover not less than the losses due to fire, explosion, collapse, underground damage, hail, lightning, vandalism, malicious mischief, wind, tornado, riot, riot attending strike, aircraft, vehicle, and smoke damage. The loss, if any, is to be made payable to the Owner and/or to the Contractor as their interests may appear.
- c. The Contractor shall take out and maintain during the life of the Contract complete Owner's Protective Liability and Property Damage Insurance insuring the Owner and its agents, servants, representatives and employees and extended to The Owner's Representative , and their agents and subcontractors in the amounts specified herein before for Public Liability Insurance and for Property Damage Insurance. The Contractor shall supply, prior to commencing work under the Contract, to the Owner and The Owner's Representative , in a form satisfactory to each of them, evidence of its full compliance with this paragraph.
- d. The Contractor shall also take out and maintain during the life of this Contract Contractor's Protective Liability Insurance to protect themselves against any liability which might attach to themselves as a result of an accident arising out of work performed by any subcontractor.
- e. The Contractor shall carry Completed Operations Liability Insurance in the same amounts as for Public Liability, Property Damage and Automotive Vehicles. This insurance shall be maintained for the full guarantee period.
- f. The Contractor shall take out and maintain during the life of the Contract, Workmans Compensation and Employers Liability Insurance as specified in M.G.L.c.149s.34A.
- g. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of the Contract and shall constitute grounds for immediate termination thereof.

ARTICLE VII ALTERATIONS OF WORK

- a. The Owner may make alterations in the form or character of any of the work done, or to be done, and in the requirements of the Contract Documents, and the Purchasing Agent may order in writing such alterations to be made. Such order shall be by means of a written Change Order, supplemented with drawings when in the opinion of the Purchasing Agent it is necessary, which shall include a description of the change with revised specifications, estimated quantities, and prices of the work involved in the alterations made. Each Change Order shall make provisions for revising the time of completion of all work to be done under this Contract or shall state that no revision of time is necessary. All such Change Orders shall be approved in writing by the Owner and accepted in writing by the Contractor before they become effective. If the Owner and Contractor do not agree on the revised prices of the work involved in the alterations, the work shall be paid for on the cost-plus basis as provided for Extra Work in ARTICLE VIII -EXTRA WORK.
- b. All work involved in the alterations shall be made under the terms of and as a part of this Contract, and the security for the performance of the Contract shall in no way be invalidated, but shall be held to secure in like manner the performance of the work involved in the alterations made under the Contract.

ARTICLE VIII EXTRA WORK

- a. For the purpose of this Contract all Change Orders which include extra work shall be referred to as Extra Work Orders.
- b. The Contractor shall do any work in addition to the obligations required under the Contract in the original form of its Contract Documents and not herein otherwise provided for as ordered in writing by The Owner's Representative . Such work shall be termed Extra Work. All orders for Extra Work shall contain particular reference to this Article. Before any work is commenced under any Extra Work Order, the order shall be approved by the Owner in writing and accepted in writing by the Contractor. It is understood that the Owner may, at its option, have other parties do work in connection with the work to be done under this Contract, which is not within the limits or is not an integral part of the work herein specified, in lieu of having such work done as Extra Work under this Contract.
- c. All requirements of this Contract and its documents shall be applicable to Extra Work. The Contractor shall not receive any compensation for Extra Work, regardless of its nature, unless the work was ordered done in the manner prescribed above. The Contractor waives all rights to claim any compensation for any work done except (a) that provided for payment as stated in the Proposal, (b) alterations of the work as provided for in ARTICLE VII ALTERATIONS OF WORK, and (c) that provided for as Extra Work ordered done as described in this Article.

- d. All written orders for Extra Work issued by The Owner's Representative shall be accompanied by drawings, if in the opinion of The Owner's Representative drawings are necessary: all orders shall describe the work to be done, shall make provisions for revising the time of completion of all work to be done under this Contract or shall state no revision of time is necessary, and shall prescribe unit prices or the total cost of the Extra Work agreed to by the Owner and Contractor for the work to be done. If the Owner and the Contractor do not agree on unit prices or the total cost of the Extra Work to be done, the orders for Extra Work shall provide for the work to be done on a cost-plus basis, so that the Contractor will receive for full compensation for providing and doing everything required to prepare for and perform everything included in the Extra Work Order the actual cost to him of the following items applicable to the Extra Work Order:
1. All labor directly on the Contractor's payroll at specified rates;
 2. Salaries of Contractor's employees stationed at the field office, engaged at shops or on the road in expediting the production or transportation of material;
 3. Fees for licenses and permits required particularly for the extra work involved and not required for the work as planned in the original Contract;
 4. Minor expenses, such as telegrams, telephone service, express, and similar petty cash items;
 5. Cost of hand tools not owned by the workmen consumed in the prosecution of the work, and depreciation of such tools used but not consumed and which shall remain the property of the Contractor;
 6. Cost of moving equipment from and to the Contractor's yard; and
 7. Cost of Bonds
- e. To the cost of items 1 to 7, inclusive, there shall be added a fixed fee to be agreed upon but not to exceed 15 percent of the total of items 1 to 7, inclusive. The fee shall be compensation to cover the cost of general supervision, overhead, profit, and other general expenses.
- f. If the work is done by a subcontractor, and the cost is determined on the actual cost basis, there shall be added an additional fixed fee to be agreed upon but not to exceed 5 percent of the total of item 1 to 7, inclusive. This additional fee shall be compensation to cover the General Contractor. In no case shall the combined overhead and profit allowed to the Subcontractor and General Contractor exceed 20 percent.

- g. The Contractor shall furnish to The Owner's Representative an itemized statement of all costs incurred in Extra Work during any calendar month on or about the first of the next following month. All quantities (labor, equipment, etc.) shall be agreed upon on daily basis, in writing, by the Contractor and The Owner's Representative .
- h. Unless otherwise specifically provided for in the Extra Work Orders, the compensation agreed to, whether unit prices, total cost or the cost-plus basis as described above, includes payment for any damages or expense caused the Contractor by any delays to other work to be done under the Contract resulting from or on account of Extra Work, and the Contractor waives all rights to any compensation for such damage or expense except as may be provided for in the Extra Work Orders.

ARTICLE IX PAYMENTS

- a. The Owner shall pay and the Contractor shall receive as full compensation for providing and doing everything required to prepare for and perform everything called for by this Contract, and as full compensation also for all loss or damage arising out of the nature of the work under the Contract, or from the action of the elements, or from fire, or from any unforeseen obstructions or difficulties which may be encountered in the prosecution of the said work; also for all expenses incurred by, or in consequence of, the suspension or discontinuance of said work in accordance with the Contract, including all work incidental thereto, the prices stated in the bid Schedule of Prices, or the prices revised, if such are revised as provided for in ARTICLE VII ALTERATIONS OF WORK, and also the cost of Extra Work authorized under ARTICLE VIII EXTRA WORK.
- b. It is understood and agreed that the Contractor shall receive payment in accordance with the Schedule of Prices in the bid forms.
- c. In accordance with Massachusetts General Law c.149, s.27B, every Contractor and Subcontractor is required to submit a copy of their weekly payroll records to the awarding authority. The City reserves the right to hold payment of any monies outstanding under this contract until the Contractor or subcontractor complies with the requirements of this law.
- d. Within fifteen days after receipt from the Contractor of a periodic estimate requesting payment of the amount due for the preceding month, the Awarding Authority will make a periodic payment to the Contractor for the work performed during the preceding month and for the materials not incorporated in the work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the Contractor has title or to which a Subcontractor has title and has authorized the Contractor to transfer title to the Awarding Authority, less (1) a retention based on its estimate of the fair value of its claims against the Contractor and less (2) a retention for direct payments to Subcontractors based on demands for same in accordance with the provisions of Section Thirty-Nine, and less (3) a retention not exceeding five percent of the approved amount of the periodic payment. After receipt of

a periodic estimate requesting final payment and within sixty-five days after (A) the Contractor fully completes the work or substantially completes the work so that the value of the work remaining to be done is, in the estimate of the Awarding Authority, less than one percent of the original contract price, or (B) the Contractor substantially complete the work and the Awarding Authority takes possession for occupancy, whichever occurs first, the Awarding Authority shall pay the Contractor the entire balance due on the contract less (1) a retention based on its estimate of the fair value of its claims against the Contractor and of the cost of completing the incomplete and unsatisfactory items of work.

- e. A certificate from The Owner's Representative to the effect that the Contractor has fully or substantially completed the work shall be conclusive for the purposes of this section.

ARTICLE X GUARANTEE

- a. The Contractor guarantees that the work and services to be performed under the Contract, and all workmanship, materials and equipment performed, furnished, used or installed in the construction of the same, shall be free from defects and flaws, and shall be performed and furnished in strict accordance with the Drawings, Specifications and other Contract Documents, that the strength of all parts of all manufactured equipment shall be adequate and as specified and that the performance test requirements of the Contract shall be fulfilled. This guarantee shall be for a period of one year from and after the date of completion which date of completion shall be determined under the provisions of ARTICLE IX PAYMENTS herein. If part of the work is accepted in accordance with the Special Conditions, the guarantee for that part of the work shall be for a period of one year from the date fixed for such acceptance. Said guarantees are in addition to any other guarantees provided by law or otherwise.
- b. If at any time within the said period of guarantee any part of the work requires repairing, correction or replacement, the Owner may notify the Contractor in writing to make the required repairs, corrections, or replacements. If the Contractor neglects to commence making such repairs, corrections, or replacements to the satisfaction of the Owner within seven (7) days from the date of receipt of such notice, or having commenced failed to prosecute such work with diligence, the Owner may employ other persons to make the same, and all direct and indirect costs of making said repairs, corrections or replacements, including compensation for additional professional services, shall be paid by the Contractor.

ARTICLE XI RIGHT OF THE OWNER TO TERMINATE CONTRACT

- a. If the Contractor shall be adjudged bankrupt or if he shall make a general assignment for the benefit of his creditors, or if a receiver shall be appointed of his property, or if the work to be done under this Contract shall be abandoned, or if this Contract or any part thereof shall be sublet without the previous written consent of the Owner, or if the Contract or any claim thereunder shall be assigned by the Contractor otherwise than as herein specified, or if at

any time The Owner's Representative shall certify in writing to the Owner that the rate of progress of the work or any part thereof is unsatisfactory or that the work or any part thereof is unnecessarily or unreasonably delayed, or that the Contractor has violated any of the provisions of this Contract, the Owner may notify the Contractor to discontinue all work or any part thereof; and thereupon, the Contractor shall discontinue such work or such part thereof as the Owner may designate and charge the entire expense of so completing the work or part thereof to the Contractor; and for such completion, the Owner for itself or its contractors may take possession of and use or cause to be used in the completion of the work or part thereof any of such materials, machinery, implements and tools of every description as may be found upon the site of the Contractor's operations. The Owner may at its option require the surety or sureties to complete the Contract.

- b. All expenses charged under this Article shall be deducted and paid by the Owner out of any money then due or to become due the Contractor under this Contract or any part thereof; and in such accounting, the Owner shall not be held to obtain the lowest figures for the work of completing the Contract or any part thereof, or for insuring its proper completion, but all sums actually paid therefore shall be charged to the Contractor. In case the expenses so charged are less than the sum which would have been payable under this Contract if the same had been completed by the Contractor, the Contractor shall be entitled to receive the difference, but only for work actually completed by the Contractor. If such expenses shall exceed the said sum, the Contractor shall pay the amount of the excess to the Owner upon completion of the work without further demand being made therefor.

ARTICLE XII DISPUTED WORK, DETERMINATION OR ORDER

- a. If the Contractor is of the opinion that any work ordered to be done as Contract work by The Owner's Representative is in fact Extra Work and not Contract work, or that any determination or order of The Owner's Representative violates the provisions of this Contract, he must promptly, and before proceeding with such work or complying with the determination or order, notify the Owner and The Owner's Representative in writing of his contentions with respect thereto and request a final determination thereon.
- b. If the Owner determines that the work is Contract work and not Extra Work, or that the determination or order complained of is proper, it will direct The Owner's Representative to order the Contractor to proceed and the Contractor must promptly comply. However, in order to reserve the right to claim compensation for such work or damages resulting from such compliance, the Contractor must, within five days after receiving notice of the Owner's determination, notify the Owner and the Owner's Representative in writing that the work is being performed or that the determination is being complied with under protest.
- c. If the Contractor fails to so appeal to the Owner and the Owner's Representative, or having appealed, should the Contractor fail to notify the Owner and the Owner's Representative in writing of his doing the work under protest, the Contractor shall be deemed to have waived

any claim for extra compensation or damages. No oral appeals or oral protests shall be deemed as compliance with the provisions of this Article.

ARTICLE XIII MINIMUM WAGE RATES

- a. The work is subject to MA Prevailing Wage Rates. The established minimum wage rates to be paid to employees of the Contractor, Sub-contractor and suppliers, as attached to this document. The Contractor shall comply with the wage rates, shall keep them posted in a conspicuous place at the work site, and shall, at the completion of the work and as one of the conditions of the Owner's acceptance of the work, certify, on the form supplied with the wage rates, his compliance.
- b. The Contractor is advised to review the advisory issued by the Division of Fair Labor and Business Practices, Criminal Bureau through the Office of the Massachusetts Attorney General, a copy of which is at the end of these General Conditions.
- c. The Contractor and each sub-contractor shall preserve its payroll records for a period of three years from the date of completion of the Contract.

ARTICLE XIV CITY CONDITIONS

- a. The following words, terms and phrases, when used in this article, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:
 1. **Salem resident:** any person for whom the principal place of residence is within the City of Salem.
 2. **Salem area resident:** any person for whom the principal place of residence is within a ten-mile radius of the City limits.
- b. All bidders and subcontractors under the bidder shall as a condition for bidding or award of a subcontract, verify under oath and in writing that they comply with the following conditions:
 1. The bidder and subcontractors under the bidder must pay the appropriate wage rates to their employees.
 2. The bidder and subcontractors under the bidder must maintain or participate in an apprentice training program for each apprenticeable trade or occupation represented in their workforce.
 3. The bidder and subcontractors under the bidder must furnish at their expense hospitalization and medical benefits and/or coverage for all mechanics and apprentices, teamsters, chauffeurs, and laborers.

4. The bidder and all subcontractors under the bidder must maintain appropriate industrial accident insurance coverage for all employees.
 5. The bidder and all subcontractors under the bidder must classify employees as such, rather than independent contractors and treat them accordingly for purpose of worker's compensation insurance coverage, unemployment taxes, social security taxes, and income tax withholding.
- c. A bid that is submitted by a bidder or subcontractor under the bidder that does not comply with the conditions listed above will be rejected.
 - d. The bidder and subcontractors awarded the contract must comply with the conditions listed above for the entire duration of the project. An officer of each bidder or subcontractor under the bidder shall certify under oath and in writing on a weekly basis to the purchasing agent that they are in compliance with such obligations. Such certificate shall constitute a condition precedent to any payment obligation of the City.
 - e. The bidder or subcontractor under the bidder who fails to comply with the conditions listed above may be subject to the following sanctions: Termination of work until compliance is achieved, withholding of payment until compliance is achieved, permanent removal from further work on the project, or liquidated damages to the City in the amount of 5% the dollar value of the contract.
 - f. Any contractor or subcontractor that has been determined by the city or by any court or agency to have violated any of the obligations set forth in subsections (b) and (d) above shall be barred from performing any work on any future projects for six months for a first violation, for three years for a second violation and permanently for a third violation.
 - g. The Purchasing Agent shall be the enforcement and compliance officer for these conditions. All notices, records and/or other written verification of compliance shall be directed to the purchasing agent.
 - h. All bidders and subcontractors under the bidder shall make a good faith effort to provide at all times at least 20% of the total employee work hours in each trade, at every tier, to be performed by a Salem resident or Salem area resident.
 - i. Contractors shall submit to the purchasing agent workforce charts listing each of its workers and those of its subcontractors of all tiers, by name, residence, craft, job category and hours worked. Submission of said workforce charts shall constitute condition precedent to any payment obligation of the city.
 - j. Any person who provides false information regarding his or her residential address, or in the case of a contractor or bidder who knowingly provides false information regarding address of any employee, shall be subject to a fine of \$300.00 for each violation.

- k. The Purchasing Agent shall establish criteria and procedures for compliance herewith, and shall report to the mayor and city council annually.
- l. Where the provision of any federal or state statute or regulation provide that no procedure or requirement shall be imposed which will operate to discriminate against the employment of labor from any other state, possession or territory of the United States, the terms of this section shall not apply.

SPECIAL CONDITIONS

| <u>NUMBER</u> | <u>TITLE</u> |
|----------------------|--|
| 1. | COMMENCEMENT |
| 2. | LIQUIDATED DAMAGES |
| 3. | PROTECTION OF WORK AND MATERIALS |
| 4. | CHANGED CONDITIONS |
| 5. | SUPERINTENDENCE, SKILLED LABOR, AND EMPLOYEES |
| 6. | PROTECTION OF UTILITIES |
| 7. | FIRE PROTECTION |
| 8. | USE OF PORTIONS BEFORE ENTIRE COMPLETION OF WORK |
| 9. | MASSACHUSETTS SALES TAX EXEMPTION |
| 10. | ANTI-DISCRIMINATION CLAUSE |
| 11. | COORDINATION OF WORK BY OTHERS |
| 12. | MISPLACED MATERIALS |
| 13. | CONTRACT AND REFERENCE DRAWINGS |
| 14. | SUBSTANTIAL COMPLETION |
| 15. | OSHA SITE REQUIREMENTS |

SPECIAL CONDITIONS

1. COMMENCEMENT

- a. The Contractor shall commence work within ten (10) calendar days after the dates specified in the Notice to Proceed and shall complete the work fully and acceptable as herein prescribed within the Contract time specified in the Agreement.

2. LIQUIDATED DAMAGES

- a. Contractor agrees to pay as liquidated damages, the sum of \$1,000 for each consecutive calendar day that Contractor is in default of completing the work.
- b. It is hereby understood and mutually agreed by and between the Contractor and the Owner that the date of beginning and the time for completion are ESSENTIAL CONDITIONS of this Contract; and it is further mutually understood and agreed that the work embraced in this Contract shall be commenced as stated in the Contract Documents.

3. PROTECTION OF WORK AND MATERIALS

The Contractor shall protect all work, equipment and materials from deterioration and damage. All work of whatever kind, which during its progress or before the final acceptance of the work as established by the Owner's Representative's Certificate of Completion may have become damaged from any cause, shall be removed and replaced by good and satisfactory work, and at no additional cost to the Owner, both for labor and materials.

4. CHANGED CONDITIONS

- a. If, during the progress of the work, the Contractor or the Owner discovers that the actual sub-surface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the Contract Documents either the Contractor or the Owner may request an equitable adjustment in the Contract Price of the Contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to each other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a Contractor, or upon its own initiative, the Owner will make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plan or indicated in the Contract Documents and are of such a nature as to cause an increase or decrease in the cost of performance of the work or a change in the construction methods required for the performance of the work which results in an increase or decrease in the cost of the work, the Owner will make an equitable adjustment in the Contract Price and the Contract will be modified in writing accordingly.

- b. Any adjustment in compensation and/or any adjustment in Contract time because of a change or changes resulting from one or more of the conditions described in the foregoing paragraph will be made in accordance with the provisions of ARTICLE VII - ALTERATIONS OF WORK contained within the General Conditions.

5. SUPERINTENDENCE, SKILLED LABOR, AND EMPLOYEES

- a. The Contractor shall employ qualified personnel for scheduling all materials and equipment to be used in the Project and for preparation of suitable working drawings. The Contractor shall employ a suitable superintendent and foremen to represent him at all the several parts of the work and they shall be present at all times while the work entrusted to them is in progress and shall be informed thoroughly regarding it. The foremen, workers, and others employed by the Contractor shall be skilled and experienced in the particular work which is given them to do.

6. PROTECTION OF UTILITIES

Location and depth of existing utilities are estimated and should not be relied upon by the Contractor. The Contractor shall check and verify the location of all existing utilities, both underground (by test pits or other approved means) and overhead before proceeding to begin the work or to order materials. Excavation, if any, shall be in accordance with Chapter 502 of the Acts of 1980 entitled, "An Act Further Regulating Excavation in Public Ways," which became effective in the Commonwealth of Massachusetts on October 12, 1980, including any amendments thereto, and all other statutes, by-laws, rules and regulations of any city, state or federal agency that may be applicable. Any damage to the existing utilities and any other costs arising out of said excavation or by reason thereof shall be the Contractor's sole responsibility.

7. FIRE PROTECTION

The Contractor shall take all necessary precautions to prevent fires adjacent to the work and its buildings and shall prevent the spread of fires to areas outside the limits of the work. It shall provide adequate facilities for extinguishing fires.

8. USE OF PORTIONS BEFORE ENTIRE COMPLETION OF WORK

The Owner and its duly authorized representative may enter upon and use any portions of the work for the Owner's benefit before final completion of the whole work to be done under this Contract, without any claim by the Contractor for payment for said use, or for any damage for delay caused by such use.

9. MASSACHUSETTS SALES TAX EXEMPTION

Materials for use in the work under this Contract are exempt from the Massachusetts Sales Tax. The Tax Exemption number will be provided.

10. ANTI-DISCRIMINATION CLAUSE

In connection with the performance of work under this Contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of race, color, religious creed, national origin, age or ancestry. The aforesaid provision shall include but not be limited to the following: employment upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; conditions or privileges of employment; and selection for training, including apprenticeship. The Contractor agrees to post hereafter in conspicuous places available for employees and applicants for employment, notices to be provided by the Massachusetts Commission Against Discrimination setting forth the provisions of the fair employment practice law of the Commonwealth. The aforesaid provision shall be binding upon all subcontractors, except subcontractors for standard commercial supplies or raw materials.

11. COORDINATION OF WORK BY OTHERS

Before beginning any portion of the work, the Contractor shall coordinate with and give current users (Salem Ferry and SPT Offshore LLC) due notice of work activities along with ample time for making their necessary preparations.

12. MISPLACED MATERIALS

Should the Contractor during the progress of the work, lose, dump, sink, or misplace any material, plant, machinery, or appliance, which in the opinion of The Owner's Representative or Owner is unsatisfactory, the Contractor shall recover and remove the same with the utmost dispatch.

If such material must be removed by the Owner, the cost of such removal may be deducted from any money due the Contractor, or may be recovered under its bond.

13. CONTRACT AND REFERENCE DRAWINGS

The work shall conform to specifications contained herein and **Sheets 1 through 12** for the **Salem Port Expansion Project – Commercial Marina, Blaney Street, Salem, MA.**

14. SUBSTANTIAL COMPLETION

Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

The Owner's Representative will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion. The Contractor shall forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor. The Owner's Representative will issue a final Certificate for Payment upon compliance with the requirements of the Contract Documents.

In all events, the Owner shall make the final decision on whether to make payment to the Contractor in accordance with the Contractor's Applications for Payment.

The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time. If, in the opinion of the Owner, the Contractor falls behind the approved schedule, the Contractor shall take all steps necessary to improve its progress, including those that may be required by the Owner, without additional cost to the Owner. In these circumstances, the Owner may require the Contractor to increase the number of shifts,

overtime operations, days of work, and/or the amount of construction planned, and to submit for approval any supplementary schedule or schedules in such detail and form as the Owner's Representative or Owner deems necessary to demonstrate how the approved rate of progress shall be regained.

Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can utilize the Work for its intended use.

When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Owner a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Upon receipt of the Contractor's list, the Owner's Representative will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Owner's Representative's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Owner's Representative. In such case, the Contractor shall then submit a request for another inspection by the Owner's Representative to determine Substantial Completion.

When the Work or designated portion thereof is substantially complete, the Owner's Representative will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

15. OSHA SITE REQUIREMENTS

Pursuant to M.G.L. c.30, §39S, any person signing a contract to work on a public building or public works project estimated to cost more than \$10,000, must certify under the pains and penalties of perjury that all employees employed on the worksite, or in work subject to the bid, have successfully completed at least ten hours of OSHA approved training. Proof of OSHA certification of all workers onsite will be required by the City prior to the start of work.

WAGES

Massachusetts Prevailing Wage Rates

W-1



CHARLES D. BAKER
Governor

KARYN E. POLITO
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS

Prevailing Wage Rates

**As determined by the Director under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H**

RONALD L. WALKER, II
Secretary

WILLIAM D MCKINNEY
Director

Awarding Authority: City of Salem
Contract Number: R-44 **City/Town:** SALEM
Description of Work: Supply and installation of timber floats, steel mooring piles, water and electrical services for Salem Commercial Marina
Job Location: Blaney Street, Salem, MA

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule from the Department of Labor Standards ("DLS") if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
- All apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentice must keep his/her apprentice identification card on his/her person during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **If an apprentice rate is not listed on the prevailing wage schedule for the trade in which an apprentice is registered with the DAS, the apprentice must be paid the journeyworker's rate for the trade.**
- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule. Awarding authorities are required to request these updates no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. Contractors are required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The annual update requirement is not applicable to 27F "rental of equipment" contracts.
- Every contractor or subcontractor which performs construction work on the project is required to submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. A sample of a payroll reporting form may be obtained at <http://www.mass.gov/dols/pw>.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may report the violation to the Fair Labor Division of the office of the Attorney General at (617) 727-3465.
- Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|--|----------------|-----------|---------|---------|------------------------------|------------|
| Construction | | | | | | |
| (2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i> | 12/01/2015 | \$31.65 | \$10.41 | \$10.08 | \$0.00 | \$52.14 |
| | 06/01/2016 | \$32.15 | \$10.41 | \$10.08 | \$0.00 | \$52.64 |
| | 08/01/2016 | \$32.15 | \$10.91 | \$10.08 | \$0.00 | \$53.14 |
| | 12/01/2016 | \$32.15 | \$10.91 | \$10.89 | \$0.00 | \$53.95 |
| (3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i> | 12/01/2015 | \$31.72 | \$10.41 | \$10.08 | \$0.00 | \$52.21 |
| | 06/01/2016 | \$32.22 | \$10.41 | \$10.08 | \$0.00 | \$52.71 |
| | 08/01/2016 | \$32.22 | \$10.91 | \$10.08 | \$0.00 | \$53.21 |
| | 12/01/2016 | \$32.22 | \$10.91 | \$10.89 | \$0.00 | \$54.02 |
| (4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i> | 12/01/2015 | \$31.84 | \$10.41 | \$10.08 | \$0.00 | \$52.33 |
| | 06/01/2016 | \$32.34 | \$10.41 | \$10.08 | \$0.00 | \$52.83 |
| | 08/01/2016 | \$32.34 | \$10.91 | \$10.08 | \$0.00 | \$53.33 |
| | 12/01/2016 | \$32.34 | \$10.91 | \$10.89 | \$0.00 | \$54.14 |
| ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 1)</i> | 08/01/2015 | \$88.29 | \$9.80 | \$19.23 | \$0.00 | \$117.32 |
| AIR TRACK OPERATOR <i>LABORERS - ZONE 2</i> | 12/01/2015 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 06/01/2016 | \$32.40 | \$7.45 | \$12.65 | \$0.00 | \$52.50 |
| | 12/01/2016 | \$33.15 | \$7.45 | \$12.65 | \$0.00 | \$53.25 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| ASBESTOS REMOVER - PIPE / MECH. EQUIPT. <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i> | 12/01/2015 | \$34.38 | \$10.40 | \$5.95 | \$0.00 | \$50.73 |
| ASPHALT RAKER <i>LABORERS - ZONE 2</i> | 12/01/2015 | \$31.40 | \$7.45 | \$12.65 | \$0.00 | \$51.50 |
| | 06/01/2016 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 12/01/2016 | \$32.65 | \$7.45 | \$12.65 | \$0.00 | \$52.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$43.73 | \$10.00 | \$14.90 | \$0.00 | \$68.63 |
| | 06/01/2016 | \$44.48 | \$10.00 | \$14.90 | \$0.00 | \$69.38 |
| | 12/01/2016 | \$45.73 | \$10.00 | \$14.90 | \$0.00 | \$70.63 |
| | 06/01/2017 | \$46.73 | \$10.00 | \$14.90 | \$0.00 | \$71.63 |
| | 12/01/2017 | \$47.73 | \$10.00 | \$14.90 | \$0.00 | \$72.63 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| BACKHOE/FRONT-END LOADER <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$43.73 | \$10.00 | \$14.90 | \$0.00 | \$68.63 |
| | 06/01/2016 | \$44.48 | \$10.00 | \$14.90 | \$0.00 | \$69.38 |
| | 12/01/2016 | \$45.73 | \$10.00 | \$14.90 | \$0.00 | \$70.63 |
| | 06/01/2017 | \$46.73 | \$10.00 | \$14.90 | \$0.00 | \$71.63 |
| | 12/01/2017 | \$47.73 | \$10.00 | \$14.90 | \$0.00 | \$72.63 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 2</i> | 12/01/2015 | \$31.40 | \$7.45 | \$12.65 | \$0.00 | \$51.50 |
| | 06/01/2016 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 12/01/2016 | \$32.65 | \$7.45 | \$12.65 | \$0.00 | \$52.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 2</i> | 12/01/2015 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 06/01/2016 | \$32.40 | \$7.45 | \$12.65 | \$0.00 | \$52.50 |
| | 12/01/2016 | \$33.15 | \$7.45 | \$12.65 | \$0.00 | \$53.25 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|-----------------------|----------------|-----------|--------|---------|------------------------------|------------|
| BOILER MAKER | 01/01/2015 | \$40.32 | \$6.97 | \$16.21 | \$0.00 | \$63.50 |
| BOILERMAKERS LOCAL 29 | 01/01/2016 | \$41.62 | \$6.97 | \$16.21 | \$0.00 | \$64.80 |
| | 01/01/2017 | \$42.92 | \$6.97 | \$16.21 | \$0.00 | \$66.10 |

Apprentice - BOILERMAKER - Local 29

Effective Date - 01/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 65 | \$26.21 | \$6.97 | \$10.54 | \$0.00 | \$43.72 |
| 2 | 65 | \$26.21 | \$6.97 | \$10.54 | \$0.00 | \$43.72 |
| 3 | 70 | \$28.22 | \$6.97 | \$11.35 | \$0.00 | \$46.54 |
| 4 | 75 | \$30.24 | \$6.97 | \$12.16 | \$0.00 | \$49.37 |
| 5 | 80 | \$32.26 | \$6.97 | \$12.97 | \$0.00 | \$52.20 |
| 6 | 85 | \$34.27 | \$6.97 | \$13.78 | \$0.00 | \$55.02 |
| 7 | 90 | \$36.29 | \$6.97 | \$14.59 | \$0.00 | \$57.85 |
| 8 | 95 | \$38.30 | \$6.97 | \$15.40 | \$0.00 | \$60.67 |

Effective Date - 01/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 65 | \$27.05 | \$6.97 | \$10.54 | \$0.00 | \$44.56 |
| 2 | 65 | \$27.05 | \$6.97 | \$10.54 | \$0.00 | \$44.56 |
| 3 | 70 | \$29.13 | \$6.97 | \$11.35 | \$0.00 | \$47.45 |
| 4 | 75 | \$31.22 | \$6.97 | \$12.16 | \$0.00 | \$50.35 |
| 5 | 80 | \$33.30 | \$6.97 | \$12.97 | \$0.00 | \$53.24 |
| 6 | 85 | \$35.38 | \$6.97 | \$13.78 | \$0.00 | \$56.13 |
| 7 | 90 | \$37.46 | \$6.97 | \$14.59 | \$0.00 | \$59.02 |
| 8 | 95 | \$39.54 | \$6.97 | \$15.40 | \$0.00 | \$61.91 |

Notes:

Apprentice to Journeyworker Ratio:1:5

| | | | | | | |
|---|------------|---------|---------|---------|--------|---------|
| BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) | 08/01/2015 | \$49.86 | \$10.18 | \$18.57 | \$0.00 | \$78.61 |
| BRICKLAYERS LOCAL 3 (LYNN) | 02/01/2016 | \$50.43 | \$10.18 | \$18.57 | \$0.00 | \$79.18 |
| | 08/01/2016 | \$51.33 | \$10.18 | \$18.65 | \$0.00 | \$80.16 |
| | 02/01/2017 | \$51.90 | \$10.18 | \$18.65 | \$0.00 | \$80.73 |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|----------------|----------------|-----------|--------|---------|------------------------------|------------|
|----------------|----------------|-----------|--------|---------|------------------------------|------------|

Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Lynn

Effective Date - 08/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 50 | \$24.93 | \$10.18 | \$18.57 | \$0.00 | \$53.68 |
| 2 | 60 | \$29.92 | \$10.18 | \$18.57 | \$0.00 | \$58.67 |
| 3 | 70 | \$34.90 | \$10.18 | \$18.57 | \$0.00 | \$63.65 |
| 4 | 80 | \$39.89 | \$10.18 | \$18.57 | \$0.00 | \$68.64 |
| 5 | 90 | \$44.87 | \$10.18 | \$18.57 | \$0.00 | \$73.62 |

Effective Date - 02/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 50 | \$25.22 | \$10.18 | \$18.57 | \$0.00 | \$53.97 |
| 2 | 60 | \$30.26 | \$10.18 | \$18.57 | \$0.00 | \$59.01 |
| 3 | 70 | \$35.30 | \$10.18 | \$18.57 | \$0.00 | \$64.05 |
| 4 | 80 | \$40.34 | \$10.18 | \$18.57 | \$0.00 | \$69.09 |
| 5 | 90 | \$45.39 | \$10.18 | \$18.57 | \$0.00 | \$74.14 |

Notes:

Apprentice to Journeyworker Ratio:1:5

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| BULLDOZER/GRADER/SCRAPER <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$43.31 | \$10.00 | \$14.90 | \$0.00 | \$68.21 |
| | 06/01/2016 | \$44.06 | \$10.00 | \$14.90 | \$0.00 | \$68.96 |
| | 12/01/2016 | \$45.29 | \$10.00 | \$14.90 | \$0.00 | \$70.19 |
| | 06/01/2017 | \$46.28 | \$10.00 | \$14.90 | \$0.00 | \$71.18 |
| | 12/01/2017 | \$47.27 | \$10.00 | \$14.90 | \$0.00 | \$72.17 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| CAISSON & UNDERPINNING BOTTOM MAN <i>LABORERS - FOUNDATION AND MARINE</i> | 12/01/2015 | \$36.45 | \$7.45 | \$13.75 | \$0.00 | \$57.65 |
| | 06/01/2016 | \$37.20 | \$7.45 | \$13.75 | \$0.00 | \$58.40 |
| | 12/01/2016 | \$38.20 | \$7.45 | \$13.75 | \$0.00 | \$59.40 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| CAISSON & UNDERPINNING LABORER <i>LABORERS - FOUNDATION AND MARINE</i> | 12/01/2015 | \$35.30 | \$7.45 | \$13.75 | \$0.00 | \$56.50 |
| | 06/01/2016 | \$36.05 | \$7.45 | \$13.75 | \$0.00 | \$57.25 |
| | 12/01/2016 | \$37.05 | \$7.45 | \$13.75 | \$0.00 | \$58.25 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| CAISSON & UNDERPINNING TOP MAN <i>LABORERS - FOUNDATION AND MARINE</i> | 12/01/2015 | \$35.30 | \$7.45 | \$13.75 | \$0.00 | \$56.50 |
| | 06/01/2016 | \$36.05 | \$7.45 | \$13.75 | \$0.00 | \$57.25 |
| | 12/01/2016 | \$37.05 | \$7.45 | \$13.75 | \$0.00 | \$58.25 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 2</i> | 12/01/2015 | \$31.40 | \$7.45 | \$12.65 | \$0.00 | \$51.50 |
| | 06/01/2016 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 12/01/2016 | \$32.65 | \$7.45 | \$12.65 | \$0.00 | \$52.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| CARPENTER <i>CARPENTERS -ZONE 2 (Eastern Massachusetts)</i> | 03/01/2015 | \$35.75 | \$9.80 | \$16.48 | \$0.00 | \$62.03 |

Apprentice - CARPENTER - Zone 2 Eastern MA**Effective Date - 03/01/2015**

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 50 | \$17.88 | \$9.80 | \$1.63 | \$0.00 | \$29.31 |
| 2 | 60 | \$21.45 | \$9.80 | \$1.63 | \$0.00 | \$32.88 |
| 3 | 70 | \$25.03 | \$9.80 | \$11.59 | \$0.00 | \$46.42 |
| 4 | 75 | \$26.81 | \$9.80 | \$11.59 | \$0.00 | \$48.20 |
| 5 | 80 | \$28.60 | \$9.80 | \$13.22 | \$0.00 | \$51.62 |
| 6 | 80 | \$28.60 | \$9.80 | \$13.22 | \$0.00 | \$51.62 |
| 7 | 90 | \$32.18 | \$9.80 | \$14.85 | \$0.00 | \$56.83 |
| 8 | 90 | \$32.18 | \$9.80 | \$14.85 | \$0.00 | \$56.83 |

Notes:**Apprentice to Journeyworker Ratio:1:5**

CEMENT MASONRY/PLASTERING

07/01/2015

\$45.82

\$10.90

\$18.71

\$1.30

\$76.73

BRICKLAYERS LOCAL 3 (LYNN)

01/01/2016

\$46.44

\$10.90

\$18.71

\$1.30

\$77.35

Apprentice - CEMENT MASONRY/PLASTERING - Eastern Mass (Lynn)**Effective Date - 07/01/2015**

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 50 | \$22.91 | \$10.90 | \$12.21 | \$0.00 | \$46.02 |
| 2 | 60 | \$27.49 | \$10.90 | \$13.71 | \$1.30 | \$53.40 |
| 3 | 65 | \$29.78 | \$10.90 | \$14.71 | \$1.30 | \$56.69 |
| 4 | 70 | \$32.07 | \$10.90 | \$15.71 | \$1.30 | \$59.98 |
| 5 | 75 | \$34.37 | \$10.90 | \$16.71 | \$1.30 | \$63.28 |
| 6 | 80 | \$36.66 | \$10.90 | \$17.71 | \$1.30 | \$66.57 |
| 7 | 90 | \$41.24 | \$10.90 | \$18.71 | \$1.30 | \$72.15 |

Effective Date - 01/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 50 | \$23.22 | \$10.90 | \$12.21 | \$0.00 | \$46.33 |
| 2 | 60 | \$27.86 | \$10.90 | \$13.71 | \$1.30 | \$53.77 |
| 3 | 65 | \$30.19 | \$10.90 | \$14.71 | \$1.30 | \$57.10 |
| 4 | 70 | \$32.51 | \$10.90 | \$15.71 | \$1.30 | \$60.42 |
| 5 | 75 | \$34.83 | \$10.90 | \$16.71 | \$1.30 | \$63.74 |
| 6 | 80 | \$37.15 | \$10.90 | \$17.71 | \$1.30 | \$67.06 |
| 7 | 90 | \$41.80 | \$10.90 | \$18.71 | \$1.30 | \$72.71 |

Notes:

Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

Apprentice to Journeyworker Ratio:1:3

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|---|----------------|-----------|---------|---------|------------------------------|------------|
| CHAIN SAW OPERATOR <i>LABORERS - ZONE 2</i> | 12/01/2015 | \$31.40 | \$7.45 | \$12.65 | \$0.00 | \$51.50 |
| | 06/01/2016 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 12/01/2016 | \$32.65 | \$7.45 | \$12.65 | \$0.00 | \$52.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$44.73 | \$10.00 | \$14.90 | \$0.00 | \$69.63 |
| | 06/01/2016 | \$45.48 | \$10.00 | \$14.90 | \$0.00 | \$70.38 |
| | 12/01/2016 | \$46.73 | \$10.00 | \$14.90 | \$0.00 | \$71.63 |
| | 06/01/2017 | \$47.73 | \$10.00 | \$14.90 | \$0.00 | \$72.63 |
| | 12/01/2017 | \$48.73 | \$10.00 | \$14.90 | \$0.00 | \$73.63 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$30.13 | \$10.00 | \$14.90 | \$0.00 | \$55.03 |
| | 06/01/2016 | \$30.65 | \$10.00 | \$14.90 | \$0.00 | \$55.55 |
| | 12/01/2016 | \$31.52 | \$10.00 | \$14.90 | \$0.00 | \$56.42 |
| | 06/01/2017 | \$32.21 | \$10.00 | \$14.90 | \$0.00 | \$57.11 |
| | 12/01/2017 | \$32.90 | \$10.00 | \$14.90 | \$0.00 | \$57.80 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| DELEADER (BRIDGE) <i>PAINTERS LOCAL 35 - ZONE 2</i> | 07/01/2015 | \$48.56 | \$7.85 | \$16.10 | \$0.00 | \$72.51 |
| | 01/01/2016 | \$49.51 | \$7.85 | \$16.10 | \$0.00 | \$73.46 |
| | 07/01/2016 | \$50.46 | \$7.85 | \$16.10 | \$0.00 | \$74.41 |
| | 01/01/2017 | \$51.41 | \$7.85 | \$16.10 | \$0.00 | \$75.36 |

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 07/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 50 | \$24.28 | \$7.85 | \$0.00 | \$0.00 | \$32.13 |
| 2 | 55 | \$26.71 | \$7.85 | \$3.66 | \$0.00 | \$38.22 |
| 3 | 60 | \$29.14 | \$7.85 | \$3.99 | \$0.00 | \$40.98 |
| 4 | 65 | \$31.56 | \$7.85 | \$4.32 | \$0.00 | \$43.73 |
| 5 | 70 | \$33.99 | \$7.85 | \$14.11 | \$0.00 | \$55.95 |
| 6 | 75 | \$36.42 | \$7.85 | \$14.44 | \$0.00 | \$58.71 |
| 7 | 80 | \$38.85 | \$7.85 | \$14.77 | \$0.00 | \$61.47 |
| 8 | 90 | \$43.70 | \$7.85 | \$15.44 | \$0.00 | \$66.99 |

Effective Date - 01/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 50 | \$24.76 | \$7.85 | \$0.00 | \$0.00 | \$32.61 |
| 2 | 55 | \$27.23 | \$7.85 | \$3.66 | \$0.00 | \$38.74 |
| 3 | 60 | \$29.71 | \$7.85 | \$3.99 | \$0.00 | \$41.55 |
| 4 | 65 | \$32.18 | \$7.85 | \$4.32 | \$0.00 | \$44.35 |
| 5 | 70 | \$34.66 | \$7.85 | \$14.11 | \$0.00 | \$56.62 |
| 6 | 75 | \$37.13 | \$7.85 | \$14.44 | \$0.00 | \$59.42 |
| 7 | 80 | \$39.61 | \$7.85 | \$14.77 | \$0.00 | \$62.23 |
| 8 | 90 | \$44.56 | \$7.85 | \$15.44 | \$0.00 | \$67.85 |

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|---|------------|---------|--------|---------|--------|---------|
| DEMO: ADZEMAN LABORERS - ZONE 2 | 12/01/2015 | \$35.50 | \$7.45 | \$13.55 | \$0.00 | \$56.50 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| DEMO: BACKHOE/LOADER/HAMMER OPERATOR LABORERS - ZONE 2 | 12/01/2015 | \$36.50 | \$7.45 | \$13.55 | \$0.00 | \$57.50 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| DEMO: BURNERS LABORERS - ZONE 2 | 12/01/2015 | \$36.25 | \$7.45 | \$13.55 | \$0.00 | \$57.25 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| DEMO: CONCRETE CUTTER/SAWYER LABORERS - ZONE 2 | 12/01/2015 | \$36.50 | \$7.45 | \$13.55 | \$0.00 | \$57.50 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| DEMO: JACKHAMMER OPERATOR LABORERS - ZONE 2 | 12/01/2015 | \$36.25 | \$7.45 | \$13.55 | \$0.00 | \$57.25 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| DEMO: WRECKING LABORER LABORERS - ZONE 2 | 12/01/2015 | \$35.50 | \$7.45 | \$13.55 | \$0.00 | \$56.50 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|--|----------------|-----------|---------|---------|------------------------------|------------|
| DIRECTIONAL DRILL MACHINE OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$43.31 | \$10.00 | \$14.90 | \$0.00 | \$68.21 |
| | 06/01/2016 | \$44.06 | \$10.00 | \$14.90 | \$0.00 | \$68.96 |
| | 12/01/2016 | \$45.29 | \$10.00 | \$14.90 | \$0.00 | \$70.19 |
| | 06/01/2017 | \$46.28 | \$10.00 | \$14.90 | \$0.00 | \$71.18 |
| | 12/01/2017 | \$47.27 | \$10.00 | \$14.90 | \$0.00 | \$72.17 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| DIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i> | 08/01/2015 | \$58.86 | \$9.80 | \$19.23 | \$0.00 | \$87.89 |
| DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i> | 08/01/2015 | \$42.04 | \$9.80 | \$19.23 | \$0.00 | \$71.07 |
| DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i> | 08/01/2015 | \$63.06 | \$9.80 | \$19.23 | \$0.00 | \$92.09 |
| DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i> | 08/01/2015 | \$88.23 | \$9.80 | \$19.23 | \$0.00 | \$117.26 |
| DRAWBRIDGE OPERATOR (Construction) <i>ELECTRICIANS LOCAL 103</i> | 09/01/2015 | \$45.67 | \$13.00 | \$15.89 | \$0.00 | \$74.56 |
| | 03/01/2016 | \$46.17 | \$13.00 | \$16.39 | \$0.00 | \$75.56 |
| For apprentice rates see "Apprentice- ELECTRICIAN" | | | | | | |
| ELECTRICIAN <i>ELECTRICIANS LOCAL 103</i> | 09/01/2015 | \$45.67 | \$13.00 | \$15.89 | \$0.00 | \$74.56 |
| | 03/01/2016 | \$46.17 | \$13.00 | \$16.39 | \$0.00 | \$75.56 |

Classification

Effective Date Base Wage Health Pension Supplemental
Unemployment Total Rate

Apprentice - ELECTRICIAN - Local 103
Effective Date - 09/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 40 | \$18.27 | \$13.00 | \$0.55 | \$0.00 | \$31.82 |
| 2 | 40 | \$18.27 | \$13.00 | \$0.55 | \$0.00 | \$31.82 |
| 3 | 45 | \$20.55 | \$13.00 | \$11.86 | \$0.00 | \$45.41 |
| 4 | 45 | \$20.55 | \$13.00 | \$11.86 | \$0.00 | \$45.41 |
| 5 | 50 | \$22.84 | \$13.00 | \$12.23 | \$0.00 | \$48.07 |
| 6 | 55 | \$25.12 | \$13.00 | \$12.58 | \$0.00 | \$50.70 |
| 7 | 60 | \$27.40 | \$13.00 | \$12.95 | \$0.00 | \$53.35 |
| 8 | 65 | \$29.69 | \$13.00 | \$13.32 | \$0.00 | \$56.01 |
| 9 | 70 | \$31.97 | \$13.00 | \$13.69 | \$0.00 | \$58.66 |
| 10 | 75 | \$34.25 | \$13.00 | \$14.06 | \$0.00 | \$61.31 |

Effective Date - 03/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 40 | \$18.47 | \$13.00 | \$0.55 | \$0.00 | \$32.02 |
| 2 | 40 | \$18.47 | \$13.00 | \$0.55 | \$0.00 | \$32.02 |
| 3 | 45 | \$20.78 | \$13.00 | \$11.84 | \$0.00 | \$45.62 |
| 4 | 45 | \$20.78 | \$13.00 | \$11.84 | \$0.00 | \$45.62 |
| 5 | 50 | \$23.09 | \$13.00 | \$12.71 | \$0.00 | \$48.80 |
| 6 | 55 | \$25.39 | \$13.00 | \$13.07 | \$0.00 | \$51.46 |
| 7 | 60 | \$27.70 | \$13.00 | \$13.39 | \$0.00 | \$54.09 |
| 8 | 65 | \$30.01 | \$13.00 | \$13.81 | \$0.00 | \$56.82 |
| 9 | 70 | \$32.32 | \$13.00 | \$14.18 | \$0.00 | \$59.50 |
| 10 | 75 | \$34.63 | \$13.00 | \$14.55 | \$0.00 | \$62.18 |

Notes :

App Prior 1/1/03; 30/35/40/45/50/55/65/70/75/80

Apprentice to Journeyworker Ratio:2:3***

| | | | | | | |
|-------------------------------|------------|---------|---------|---------|--------|---------|
| ELEVATOR CONSTRUCTOR | 01/01/2015 | \$53.30 | \$13.58 | \$14.21 | \$0.00 | \$81.09 |
| ELEVATOR CONSTRUCTORS LOCAL 4 | 01/01/2016 | \$54.53 | \$14.43 | \$14.96 | \$0.00 | \$83.92 |
| | 01/01/2017 | \$55.86 | \$15.28 | \$15.71 | \$0.00 | \$86.85 |

Apprentice - ELEVATOR CONSTRUCTOR - Local 4

Effective Date - 01/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$26.65 | \$13.58 | \$0.00 | \$0.00 | \$40.23 |
| 2 | 55 | \$29.32 | \$13.58 | \$14.21 | \$0.00 | \$57.11 |
| 3 | 65 | \$34.65 | \$13.58 | \$14.21 | \$0.00 | \$62.44 |
| 4 | 70 | \$37.31 | \$13.58 | \$14.21 | \$0.00 | \$65.10 |
| 5 | 80 | \$42.64 | \$13.58 | \$14.21 | \$0.00 | \$70.43 |

Effective Date - 01/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$27.27 | \$14.43 | \$0.00 | \$0.00 | \$41.70 |
| 2 | 55 | \$29.99 | \$14.43 | \$14.96 | \$0.00 | \$59.38 |
| 3 | 65 | \$35.44 | \$14.43 | \$14.96 | \$0.00 | \$64.83 |
| 4 | 70 | \$38.17 | \$14.43 | \$14.96 | \$0.00 | \$67.56 |
| 5 | 80 | \$43.62 | \$14.43 | \$14.96 | \$0.00 | \$73.01 |

Notes:

Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| ELEVATOR CONSTRUCTOR HELPER | 01/01/2015 | \$37.31 | \$13.58 | \$14.21 | \$0.00 | \$65.10 |
| ELEVATOR CONSTRUCTORS LOCAL 4 | 01/01/2016 | \$38.17 | \$14.43 | \$14.96 | \$0.00 | \$67.56 |
| | 01/01/2017 | \$39.10 | \$15.28 | \$15.71 | \$0.00 | \$70.09 |
| For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR" | | | | | | |
| FENCE & GUARD RAIL ERECTOR | 12/01/2015 | \$31.40 | \$7.45 | \$12.65 | \$0.00 | \$51.50 |
| LABORERS - ZONE 2 | 06/01/2016 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 12/01/2016 | \$32.65 | \$7.45 | \$12.65 | \$0.00 | \$52.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY | 11/01/2015 | \$40.49 | \$10.00 | \$14.55 | \$0.00 | \$65.04 |
| OPERATING ENGINEERS LOCAL 4 | 05/01/2016 | \$41.38 | \$10.00 | \$14.55 | \$0.00 | \$65.93 |
| | 11/01/2016 | \$41.97 | \$10.00 | \$14.55 | \$0.00 | \$66.52 |
| | 05/01/2017 | \$42.85 | \$10.00 | \$14.55 | \$0.00 | \$67.40 |
| | 11/01/2017 | \$43.58 | \$10.00 | \$14.55 | \$0.00 | \$68.13 |
| | 05/01/2018 | \$44.29 | \$10.00 | \$14.55 | \$0.00 | \$68.84 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY | 11/01/2015 | \$41.93 | \$10.00 | \$14.55 | \$0.00 | \$66.48 |
| OPERATING ENGINEERS LOCAL 4 | 05/01/2016 | \$42.82 | \$10.00 | \$14.55 | \$0.00 | \$67.37 |
| | 11/01/2016 | \$43.42 | \$10.00 | \$14.55 | \$0.00 | \$67.97 |
| | 05/01/2017 | \$44.31 | \$10.00 | \$14.55 | \$0.00 | \$68.86 |
| | 11/01/2017 | \$45.04 | \$10.00 | \$14.55 | \$0.00 | \$69.59 |
| | 05/01/2018 | \$45.76 | \$10.00 | \$14.55 | \$0.00 | \$70.31 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|--|----------------|-----------|---------|---------|------------------------------|------------|
| FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i> | 11/01/2015 | \$21.71 | \$10.00 | \$14.55 | \$0.00 | \$46.26 |
| | 05/01/2016 | \$22.23 | \$10.00 | \$14.55 | \$0.00 | \$46.78 |
| | 11/01/2016 | \$22.58 | \$10.00 | \$14.55 | \$0.00 | \$47.13 |
| | 05/01/2017 | \$23.11 | \$10.00 | \$14.55 | \$0.00 | \$47.66 |
| | 11/01/2017 | \$23.53 | \$10.00 | \$14.55 | \$0.00 | \$48.08 |
| | 05/01/2018 | \$23.96 | \$10.00 | \$14.55 | \$0.00 | \$48.51 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 103</i> | 09/01/2015 | \$45.67 | \$13.00 | \$15.89 | \$0.00 | \$74.56 |
| | 03/01/2016 | \$46.17 | \$13.00 | \$16.39 | \$0.00 | \$75.56 |
| For apprentice rates see "Apprentice- ELECTRICIAN" | | | | | | |
| FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS</i> | 09/01/2015 | \$34.25 | \$13.00 | \$14.06 | \$0.00 | \$61.31 |
| <i>LOCAL 103</i> | 03/01/2016 | \$34.63 | \$13.00 | \$14.55 | \$0.00 | \$62.18 |
| For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN" | | | | | | |
| FIREMAN (ASST. ENGINEER) <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$36.34 | \$10.00 | \$14.90 | \$0.00 | \$61.24 |
| | 06/01/2016 | \$36.96 | \$10.00 | \$14.90 | \$0.00 | \$61.86 |
| | 12/01/2016 | \$38.00 | \$10.00 | \$14.90 | \$0.00 | \$62.90 |
| | 06/01/2017 | \$38.84 | \$10.00 | \$14.90 | \$0.00 | \$63.74 |
| | 12/01/2017 | \$39.67 | \$10.00 | \$14.90 | \$0.00 | \$64.57 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| FLAGGER & SIGNALER <i>LABORERS - ZONE 2</i> | 12/01/2015 | \$20.50 | \$7.45 | \$12.65 | \$0.00 | \$40.60 |
| | 06/01/2016 | \$20.50 | \$7.45 | \$12.65 | \$0.00 | \$40.60 |
| | 12/01/2016 | \$20.50 | \$7.45 | \$12.65 | \$0.00 | \$40.60 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE I</i> | 09/01/2015 | \$41.59 | \$9.80 | \$17.53 | \$0.00 | \$68.92 |

Apprentice - FLOORCOVERER - Local 2168 Zone I

Effective Date - 09/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 50 | \$20.80 | \$9.80 | \$1.79 | \$0.00 | \$32.39 |
| 2 | 55 | \$22.87 | \$9.80 | \$1.79 | \$0.00 | \$34.46 |
| 3 | 60 | \$24.95 | \$9.80 | \$12.16 | \$0.00 | \$46.91 |
| 4 | 65 | \$27.03 | \$9.80 | \$12.16 | \$0.00 | \$48.99 |
| 5 | 70 | \$29.11 | \$9.80 | \$13.95 | \$0.00 | \$52.86 |
| 6 | 75 | \$31.19 | \$9.80 | \$13.95 | \$0.00 | \$54.94 |
| 7 | 80 | \$33.27 | \$9.80 | \$15.74 | \$0.00 | \$58.81 |
| 8 | 85 | \$35.35 | \$9.80 | \$15.74 | \$0.00 | \$60.89 |

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|---|----------------|-----------|---------|---------|---------------------------|------------|
| FORK LIFT/CHERRY PICKER <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$43.73 | \$10.00 | \$14.90 | \$0.00 | \$68.63 |
| | 06/01/2016 | \$44.48 | \$10.00 | \$14.90 | \$0.00 | \$69.38 |
| | 12/01/2016 | \$45.73 | \$10.00 | \$14.90 | \$0.00 | \$70.63 |
| | 06/01/2017 | \$46.73 | \$10.00 | \$14.90 | \$0.00 | \$71.63 |
| | 12/01/2017 | \$47.73 | \$10.00 | \$14.90 | \$0.00 | \$72.63 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| GENERATOR/LIGHTING PLANT/HEATERS <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$30.13 | \$10.00 | \$14.90 | \$0.00 | \$55.03 |
| | 06/01/2016 | \$30.65 | \$10.00 | \$14.90 | \$0.00 | \$55.55 |
| | 12/01/2016 | \$31.52 | \$10.00 | \$14.90 | \$0.00 | \$56.42 |
| | 06/01/2017 | \$32.21 | \$10.00 | \$14.90 | \$0.00 | \$57.11 |
| | 12/01/2017 | \$32.90 | \$10.00 | \$14.90 | \$0.00 | \$57.80 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) <i>GLAZIERS LOCAL 35 (ZONE 2)</i> | 07/01/2015 | \$38.06 | \$7.85 | \$16.10 | \$0.00 | \$62.01 |
| | 01/01/2016 | \$39.01 | \$7.85 | \$16.10 | \$0.00 | \$62.96 |
| | 07/01/2016 | \$39.96 | \$7.85 | \$16.10 | \$0.00 | \$63.91 |
| | 01/01/2017 | \$40.91 | \$7.85 | \$16.10 | \$0.00 | \$64.86 |

Apprentice - GLAZIER - Local 35 Zone 2

Effective Date - 07/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$19.03 | \$7.85 | \$0.00 | \$0.00 | \$26.88 |
| 2 | 55 | \$20.93 | \$7.85 | \$3.66 | \$0.00 | \$32.44 |
| 3 | 60 | \$22.84 | \$7.85 | \$3.99 | \$0.00 | \$34.68 |
| 4 | 65 | \$24.74 | \$7.85 | \$4.32 | \$0.00 | \$36.91 |
| 5 | 70 | \$26.64 | \$7.85 | \$14.11 | \$0.00 | \$48.60 |
| 6 | 75 | \$28.55 | \$7.85 | \$14.44 | \$0.00 | \$50.84 |
| 7 | 80 | \$30.45 | \$7.85 | \$14.77 | \$0.00 | \$53.07 |
| 8 | 90 | \$34.25 | \$7.85 | \$15.44 | \$0.00 | \$57.54 |

Effective Date - 01/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$19.51 | \$7.85 | \$0.00 | \$0.00 | \$27.36 |
| 2 | 55 | \$21.46 | \$7.85 | \$3.66 | \$0.00 | \$32.97 |
| 3 | 60 | \$23.41 | \$7.85 | \$3.99 | \$0.00 | \$35.25 |
| 4 | 65 | \$25.36 | \$7.85 | \$4.32 | \$0.00 | \$37.53 |
| 5 | 70 | \$27.31 | \$7.85 | \$14.11 | \$0.00 | \$49.27 |
| 6 | 75 | \$29.26 | \$7.85 | \$14.44 | \$0.00 | \$51.55 |
| 7 | 80 | \$31.21 | \$7.85 | \$14.77 | \$0.00 | \$53.83 |
| 8 | 90 | \$35.11 | \$7.85 | \$15.44 | \$0.00 | \$58.40 |

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|---|----------------|-----------|---------|---------|------------------------------|------------|
| HOISTING ENGINEER/CRANES/GRADALLS <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$43.73 | \$10.00 | \$14.90 | \$0.00 | \$68.63 |
| | 06/01/2016 | \$44.48 | \$10.00 | \$14.90 | \$0.00 | \$69.38 |
| | 12/01/2016 | \$45.73 | \$10.00 | \$14.90 | \$0.00 | \$70.63 |
| | 06/01/2017 | \$46.73 | \$10.00 | \$14.90 | \$0.00 | \$71.63 |
| | 12/01/2017 | \$47.73 | \$10.00 | \$14.90 | \$0.00 | \$72.63 |

Apprentice - OPERATING ENGINEERS - Local 4

Effective Date - 12/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 55 | \$24.05 | \$10.00 | \$0.00 | \$0.00 | \$34.05 |
| 2 | 60 | \$26.24 | \$10.00 | \$14.90 | \$0.00 | \$51.14 |
| 3 | 65 | \$28.42 | \$10.00 | \$14.90 | \$0.00 | \$53.32 |
| 4 | 70 | \$30.61 | \$10.00 | \$14.90 | \$0.00 | \$55.51 |
| 5 | 75 | \$32.80 | \$10.00 | \$14.90 | \$0.00 | \$57.70 |
| 6 | 80 | \$34.98 | \$10.00 | \$14.90 | \$0.00 | \$59.88 |
| 7 | 85 | \$37.17 | \$10.00 | \$14.90 | \$0.00 | \$62.07 |
| 8 | 90 | \$39.36 | \$10.00 | \$14.90 | \$0.00 | \$64.26 |

Effective Date - 06/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 55 | \$24.46 | \$10.00 | \$0.00 | \$0.00 | \$34.46 |
| 2 | 60 | \$26.69 | \$10.00 | \$14.90 | \$0.00 | \$51.59 |
| 3 | 65 | \$28.91 | \$10.00 | \$14.90 | \$0.00 | \$53.81 |
| 4 | 70 | \$31.14 | \$10.00 | \$14.90 | \$0.00 | \$56.04 |
| 5 | 75 | \$33.36 | \$10.00 | \$14.90 | \$0.00 | \$58.26 |
| 6 | 80 | \$35.58 | \$10.00 | \$14.90 | \$0.00 | \$60.48 |
| 7 | 85 | \$37.81 | \$10.00 | \$14.90 | \$0.00 | \$62.71 |
| 8 | 90 | \$40.03 | \$10.00 | \$14.90 | \$0.00 | \$64.93 |

Notes:

Apprentice to Journeyworker Ratio:1:6

| | | | | | | |
|---|------------|---------|---------|---------|--------|---------|
| HVAC (DUCTWORK) <i>SHEETMETAL WORKERS LOCAL 17 - A</i> | 08/01/2015 | \$43.31 | \$10.20 | \$21.48 | \$2.25 | \$77.24 |
| | 02/01/2016 | \$44.31 | \$10.20 | \$21.48 | \$2.25 | \$78.24 |
| | 08/01/2016 | \$45.46 | \$10.20 | \$21.48 | \$2.25 | \$79.39 |
| | 02/01/2017 | \$46.56 | \$10.20 | \$21.48 | \$2.25 | \$80.49 |
| | 08/01/2017 | \$47.66 | \$10.20 | \$21.48 | \$2.25 | \$81.59 |
| | 02/01/2018 | \$48.81 | \$10.20 | \$21.48 | \$2.25 | \$82.74 |

For apprentice rates see "Apprentice- SHEET METAL WORKER"

| | | | | | | |
|---|------------|---------|---------|---------|--------|---------|
| HVAC (ELECTRICAL CONTROLS) <i>ELECTRICIANS LOCAL 103</i> | 09/01/2015 | \$45.67 | \$13.00 | \$15.89 | \$0.00 | \$74.56 |
| | 03/01/2016 | \$46.17 | \$13.00 | \$16.39 | \$0.00 | \$75.56 |

For apprentice rates see "Apprentice- ELECTRICIAN"

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|--|----------------|-----------|---------|---------|------------------------------|------------|
| HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 17 - A</i> | 08/01/2015 | \$43.31 | \$10.20 | \$21.48 | \$2.25 | \$77.24 |
| | 02/01/2016 | \$44.31 | \$10.20 | \$21.48 | \$2.25 | \$78.24 |
| | 08/01/2016 | \$45.46 | \$10.20 | \$21.48 | \$2.25 | \$79.39 |
| | 02/01/2017 | \$46.56 | \$10.20 | \$21.48 | \$2.25 | \$80.49 |
| | 08/01/2017 | \$47.66 | \$10.20 | \$21.48 | \$2.25 | \$81.59 |
| | 02/01/2018 | \$48.81 | \$10.20 | \$21.48 | \$2.25 | \$82.74 |
| For apprentice rates see "Apprentice- SHEET METAL WORKER" | | | | | | |
| HVAC (TESTING AND BALANCING -WATER) <i>PIPEFITTERS LOCAL 537 (Local 138)</i> | 09/01/2015 | \$47.36 | \$9.70 | \$14.89 | \$0.00 | \$71.95 |
| | 03/01/2016 | \$48.36 | \$9.70 | \$14.89 | \$0.00 | \$72.95 |
| | 09/01/2016 | \$49.36 | \$9.70 | \$14.89 | \$0.00 | \$73.95 |
| | 03/01/2017 | \$50.36 | \$9.70 | \$14.89 | \$0.00 | \$74.95 |
| For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER" | | | | | | |
| HVAC MECHANIC <i>PIPEFITTERS LOCAL 537 (Local 138)</i> | 09/01/2015 | \$47.36 | \$9.70 | \$14.89 | \$0.00 | \$71.95 |
| | 03/01/2016 | \$48.36 | \$9.70 | \$14.89 | \$0.00 | \$72.95 |
| | 09/01/2016 | \$49.36 | \$9.70 | \$14.89 | \$0.00 | \$73.95 |
| | 03/01/2017 | \$50.36 | \$9.70 | \$14.89 | \$0.00 | \$74.95 |
| For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER" | | | | | | |
| HYDRAULIC DRILLS <i>LABORERS - ZONE 2</i> | 12/01/2015 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 06/01/2016 | \$32.40 | \$7.45 | \$12.65 | \$0.00 | \$52.50 |
| | 12/01/2016 | \$33.15 | \$7.45 | \$12.65 | \$0.00 | \$53.25 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| INSULATOR (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i> | 09/01/2015 | \$43.81 | \$11.50 | \$13.80 | \$0.00 | \$69.11 |
| | 09/01/2016 | \$45.81 | \$11.50 | \$13.80 | \$0.00 | \$71.11 |
| | 09/01/2017 | \$47.81 | \$11.50 | \$13.80 | \$0.00 | \$73.11 |
| | 09/01/2018 | \$50.06 | \$11.50 | \$13.80 | \$0.00 | \$75.36 |
| | 09/01/2019 | \$52.56 | \$11.50 | \$13.80 | \$0.00 | \$77.86 |

Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston

Effective Date - 09/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 50 | \$21.91 | \$11.50 | \$10.05 | \$0.00 | \$43.46 |
| 2 | 60 | \$26.29 | \$11.50 | \$10.80 | \$0.00 | \$48.59 |
| 3 | 70 | \$30.67 | \$11.50 | \$11.55 | \$0.00 | \$53.72 |
| 4 | 80 | \$35.05 | \$11.50 | \$12.30 | \$0.00 | \$58.85 |

Effective Date - 09/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 50 | \$22.91 | \$11.50 | \$10.05 | \$0.00 | \$44.46 |
| 2 | 60 | \$27.49 | \$11.50 | \$10.80 | \$0.00 | \$49.79 |
| 3 | 70 | \$32.07 | \$11.50 | \$11.55 | \$0.00 | \$55.12 |
| 4 | 80 | \$36.65 | \$11.50 | \$12.30 | \$0.00 | \$60.45 |

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|-----------------------------------|----------------|-----------|--------|---------|---------------------------|------------|
| IRONWORKER/WELDER | 09/16/2015 | \$42.40 | \$7.80 | \$20.85 | \$0.00 | \$71.05 |
| IRONWORKERS LOCAL 7 (BOSTON AREA) | 03/16/2016 | \$43.40 | \$7.80 | \$20.85 | \$0.00 | \$72.05 |
| | 09/16/2016 | \$44.05 | \$7.80 | \$20.85 | \$0.00 | \$72.70 |
| | 03/16/2017 | \$44.65 | \$7.80 | \$20.85 | \$0.00 | \$73.30 |

Apprentice - IRONWORKER - Local 7 Boston

Effective Date - 09/16/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 60 | \$25.44 | \$7.80 | \$20.85 | \$0.00 | \$54.09 |
| 2 | 70 | \$29.68 | \$7.80 | \$20.85 | \$0.00 | \$58.33 |
| 3 | 75 | \$31.80 | \$7.80 | \$20.85 | \$0.00 | \$60.45 |
| 4 | 80 | \$33.92 | \$7.80 | \$20.85 | \$0.00 | \$62.57 |
| 5 | 85 | \$36.04 | \$7.80 | \$20.85 | \$0.00 | \$64.69 |
| 6 | 90 | \$38.16 | \$7.80 | \$20.85 | \$0.00 | \$66.81 |

Effective Date - 03/16/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 60 | \$26.04 | \$7.80 | \$20.85 | \$0.00 | \$54.69 |
| 2 | 70 | \$30.38 | \$7.80 | \$20.85 | \$0.00 | \$59.03 |
| 3 | 75 | \$32.55 | \$7.80 | \$20.85 | \$0.00 | \$61.20 |
| 4 | 80 | \$34.72 | \$7.80 | \$20.85 | \$0.00 | \$63.37 |
| 5 | 85 | \$36.89 | \$7.80 | \$20.85 | \$0.00 | \$65.54 |
| 6 | 90 | \$39.06 | \$7.80 | \$20.85 | \$0.00 | \$67.71 |

Notes:

** Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:**

| | | | | | | |
|--------------------------------------|------------|---------|--------|---------|--------|---------|
| JACKHAMMER & PAVING BREAKER OPERATOR | 12/01/2015 | \$31.40 | \$7.45 | \$12.65 | \$0.00 | \$51.50 |
| LABORERS - ZONE 2 | 06/01/2016 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 12/01/2016 | \$32.65 | \$7.45 | \$12.65 | \$0.00 | \$52.75 |

For apprentice rates see "Apprentice- LABORER"

| | | | | | | |
|-------------------|------------|---------|--------|---------|--------|---------|
| LABORER | 12/01/2015 | \$31.15 | \$7.45 | \$12.65 | \$0.00 | \$51.25 |
| LABORERS - ZONE 2 | 06/01/2016 | \$31.65 | \$7.45 | \$12.65 | \$0.00 | \$51.75 |
| | 12/01/2016 | \$32.40 | \$7.45 | \$12.65 | \$0.00 | \$52.50 |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|----------------|----------------|-----------|--------|---------|---------------------------|------------|
|----------------|----------------|-----------|--------|---------|---------------------------|------------|

Apprentice - LABORER - Zone 2

Effective Date - 12/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 60 | \$18.69 | \$7.45 | \$12.65 | \$0.00 | \$38.79 |
| 2 | 70 | \$21.81 | \$7.45 | \$12.65 | \$0.00 | \$41.91 |
| 3 | 80 | \$24.92 | \$7.45 | \$12.65 | \$0.00 | \$45.02 |
| 4 | 90 | \$28.04 | \$7.45 | \$12.65 | \$0.00 | \$48.14 |

Effective Date - 06/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 60 | \$18.99 | \$7.45 | \$12.65 | \$0.00 | \$39.09 |
| 2 | 70 | \$22.16 | \$7.45 | \$12.65 | \$0.00 | \$42.26 |
| 3 | 80 | \$25.32 | \$7.45 | \$12.65 | \$0.00 | \$45.42 |
| 4 | 90 | \$28.49 | \$7.45 | \$12.65 | \$0.00 | \$48.59 |

Notes:

Apprentice to Journeyworker Ratio:1:5

| | | | | | | |
|---|------------|---------|--------|---------|--------|---------|
| LABORER: CARPENTER TENDER LABORERS - ZONE 2 | 12/01/2015 | \$31.15 | \$7.45 | \$12.65 | \$0.00 | \$51.25 |
| | 06/01/2016 | \$31.65 | \$7.45 | \$12.65 | \$0.00 | \$51.75 |
| | 12/01/2016 | \$32.40 | \$7.45 | \$12.65 | \$0.00 | \$52.50 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| LABORER: CEMENT FINISHER TENDER LABORERS - ZONE 2 | 12/01/2015 | \$31.15 | \$7.45 | \$12.65 | \$0.00 | \$51.25 |
| | 06/01/2016 | \$31.65 | \$7.45 | \$12.65 | \$0.00 | \$51.75 |
| | 12/01/2016 | \$32.40 | \$7.45 | \$12.65 | \$0.00 | \$52.50 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER LABORERS - ZONE 2 | 12/01/2015 | \$31.35 | \$7.45 | \$12.60 | \$0.00 | \$51.40 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| LABORER: MASON TENDER LABORERS - ZONE 2 | 12/01/2015 | \$31.40 | \$7.45 | \$12.65 | \$0.00 | \$51.50 |
| | 06/01/2016 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 12/01/2016 | \$32.65 | \$7.45 | \$12.65 | \$0.00 | \$52.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| LABORER: MULTI-TRADE TENDER LABORERS - ZONE 2 | 12/01/2015 | \$31.15 | \$7.45 | \$12.65 | \$0.00 | \$51.25 |
| | 06/01/2016 | \$31.65 | \$7.45 | \$12.65 | \$0.00 | \$51.75 |
| | 12/01/2016 | \$32.40 | \$7.45 | \$12.65 | \$0.00 | \$52.50 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| LABORER: TREE REMOVER LABORERS - ZONE 2 | 12/01/2015 | \$31.15 | \$7.45 | \$12.65 | \$0.00 | \$51.25 |
| | 06/01/2016 | \$31.65 | \$7.45 | \$12.65 | \$0.00 | \$51.75 |
| | 12/01/2016 | \$32.40 | \$7.45 | \$12.65 | \$0.00 | \$52.50 |
| This classification applies to all tree work associated with the removal of standing trees, and trimming and removal of branches and limbs when the work is not done for a utility company for the purpose of operation, maintenance or repair of utility company equipment. For apprentice rates see "Apprentice- LABORER" | | | | | | |
| LASER BEAM OPERATOR LABORERS - ZONE 2 | 12/01/2015 | \$31.40 | \$7.45 | \$12.65 | \$0.00 | \$51.50 |
| | 06/01/2016 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 12/01/2016 | \$32.65 | \$7.45 | \$12.65 | \$0.00 | \$52.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|-------------------------------------|----------------|-----------|---------|---------|------------------------------|------------|
| MARBLE & TILE FINISHERS | 08/01/2015 | \$38.08 | \$10.18 | \$17.25 | \$0.00 | \$65.51 |
| BRICKLAYERS LOCAL 3 - MARBLE & TILE | 02/01/2016 | \$38.53 | \$10.18 | \$17.25 | \$0.00 | \$65.96 |
| | 08/01/2016 | \$39.23 | \$10.18 | \$17.33 | \$0.00 | \$66.74 |
| | 02/01/2017 | \$39.69 | \$10.18 | \$17.33 | \$0.00 | \$67.20 |

Apprentice - MARBLE & TILE FINISHER - Local 3 Marble & Tile

Effective Date - 08/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 50 | \$19.04 | \$10.18 | \$17.25 | \$0.00 | \$46.47 |
| 2 | 60 | \$22.85 | \$10.18 | \$17.25 | \$0.00 | \$50.28 |
| 3 | 70 | \$26.66 | \$10.18 | \$17.25 | \$0.00 | \$54.09 |
| 4 | 80 | \$30.46 | \$10.18 | \$17.25 | \$0.00 | \$57.89 |
| 5 | 90 | \$34.27 | \$10.18 | \$17.25 | \$0.00 | \$61.70 |

Effective Date - 02/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 50 | \$19.27 | \$10.18 | \$17.25 | \$0.00 | \$46.70 |
| 2 | 60 | \$23.12 | \$10.18 | \$17.25 | \$0.00 | \$50.55 |
| 3 | 70 | \$26.97 | \$10.18 | \$17.25 | \$0.00 | \$54.40 |
| 4 | 80 | \$30.82 | \$10.18 | \$17.25 | \$0.00 | \$58.25 |
| 5 | 90 | \$34.68 | \$10.18 | \$17.25 | \$0.00 | \$62.11 |

Notes:

Apprentice to Journeyworker Ratio:1:3

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| MARBLE MASONS,TILELAYERS & TERRAZZO MECH | 08/01/2015 | \$49.90 | \$10.18 | \$18.57 | \$0.00 | \$78.65 |
| BRICKLAYERS LOCAL 3 - MARBLE & TILE | 02/01/2016 | \$50.47 | \$10.18 | \$18.57 | \$0.00 | \$79.22 |
| | 08/01/2016 | \$51.37 | \$10.18 | \$18.65 | \$0.00 | \$80.20 |
| | 02/01/2017 | \$51.94 | \$10.18 | \$18.65 | \$0.00 | \$80.77 |

Classification
Effective Date
Base Wage
Health
Pension
**Supplemental
Unemployment**
Total Rate
Apprentice - MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile
Effective Date - 08/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 50 | \$24.95 | \$10.18 | \$18.57 | \$0.00 | \$53.70 |
| 2 | 60 | \$29.94 | \$10.18 | \$18.57 | \$0.00 | \$58.69 |
| 3 | 70 | \$34.93 | \$10.18 | \$18.57 | \$0.00 | \$63.68 |
| 4 | 80 | \$39.92 | \$10.18 | \$18.57 | \$0.00 | \$68.67 |
| 5 | 90 | \$44.91 | \$10.18 | \$18.57 | \$0.00 | \$73.66 |

Effective Date - 02/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 50 | \$25.24 | \$10.18 | \$18.57 | \$0.00 | \$53.99 |
| 2 | 60 | \$30.28 | \$10.18 | \$18.57 | \$0.00 | \$59.03 |
| 3 | 70 | \$35.33 | \$10.18 | \$18.57 | \$0.00 | \$64.08 |
| 4 | 80 | \$40.38 | \$10.18 | \$18.57 | \$0.00 | \$69.13 |
| 5 | 90 | \$45.42 | \$10.18 | \$18.57 | \$0.00 | \$74.17 |

Notes:
Apprentice to Journeyworker Ratio:1:5

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| MECH. SWEEPER OPERATOR (ON CONST. SITES) | 12/01/2015 | \$43.31 | \$10.00 | \$14.90 | \$0.00 | \$68.21 |
| OPERATING ENGINEERS LOCAL 4 | 06/01/2016 | \$44.06 | \$10.00 | \$14.90 | \$0.00 | \$68.96 |
| | 12/01/2016 | \$45.29 | \$10.00 | \$14.90 | \$0.00 | \$70.19 |
| | 06/01/2017 | \$46.28 | \$10.00 | \$14.90 | \$0.00 | \$71.18 |
| | 12/01/2017 | \$47.27 | \$10.00 | \$14.90 | \$0.00 | \$72.17 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| MECHANICS MAINTENANCE | 12/01/2015 | \$43.31 | \$10.00 | \$14.90 | \$0.00 | \$68.21 |
| OPERATING ENGINEERS LOCAL 4 | 06/01/2016 | \$44.06 | \$10.00 | \$14.90 | \$0.00 | \$68.96 |
| | 12/01/2016 | \$45.29 | \$10.00 | \$14.90 | \$0.00 | \$70.19 |
| | 06/01/2017 | \$46.28 | \$10.00 | \$14.90 | \$0.00 | \$71.18 |
| | 12/01/2017 | \$47.27 | \$10.00 | \$14.90 | \$0.00 | \$72.17 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| MILLWRIGHT (Zone 1) | 04/01/2015 | \$37.64 | \$9.80 | \$16.21 | \$0.00 | \$63.65 |
| MILLWRIGHTS LOCAL 1121 - Zone 1 | | | | | | |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|----------------|----------------|-----------|--------|---------|------------------------------|------------|
|----------------|----------------|-----------|--------|---------|------------------------------|------------|

Apprentice - MILLWRIGHT - Local 1121 Zone 1

Effective Date - 04/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 55 | \$20.70 | \$9.80 | \$4.48 | \$0.00 | \$34.98 |
| 2 | 65 | \$24.47 | \$9.80 | \$13.36 | \$0.00 | \$47.63 |
| 3 | 75 | \$28.23 | \$9.80 | \$14.18 | \$0.00 | \$52.21 |
| 4 | 85 | \$31.99 | \$9.80 | \$14.99 | \$0.00 | \$56.78 |

Notes:

Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

| | | | | | | |
|---|------------|---------|---------|---------|--------|---------|
| MORTAR MIXER LABORERS - ZONE 2 | 12/01/2015 | \$31.40 | \$7.45 | \$12.65 | \$0.00 | \$51.50 |
| | 06/01/2016 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 12/01/2016 | \$32.65 | \$7.45 | \$12.65 | \$0.00 | \$52.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| OILER (OTHER THAN TRUCK CRANES,GRADALLS) OPERATING ENGINEERS LOCAL 4 | 12/01/2015 | \$22.27 | \$10.00 | \$14.90 | \$0.00 | \$47.17 |
| | 06/01/2016 | \$22.66 | \$10.00 | \$14.90 | \$0.00 | \$47.56 |
| | 12/01/2016 | \$23.31 | \$10.00 | \$14.90 | \$0.00 | \$48.21 |
| | 06/01/2017 | \$23.82 | \$10.00 | \$14.90 | \$0.00 | \$48.72 |
| | 12/01/2017 | \$24.34 | \$10.00 | \$14.90 | \$0.00 | \$49.24 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| OILER (TRUCK CRANES, GRADALLS) OPERATING ENGINEERS LOCAL 4 | 12/01/2015 | \$26.08 | \$10.00 | \$14.90 | \$0.00 | \$50.98 |
| | 06/01/2016 | \$26.54 | \$10.00 | \$14.90 | \$0.00 | \$51.44 |
| | 12/01/2016 | \$27.29 | \$10.00 | \$14.90 | \$0.00 | \$52.19 |
| | 06/01/2017 | \$27.89 | \$10.00 | \$14.90 | \$0.00 | \$52.79 |
| | 12/01/2017 | \$28.50 | \$10.00 | \$14.90 | \$0.00 | \$53.40 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| OTHER POWER DRIVEN EQUIPMENT - CLASS II OPERATING ENGINEERS LOCAL 4 | 12/01/2015 | \$43.31 | \$10.00 | \$14.90 | \$0.00 | \$68.21 |
| | 06/01/2016 | \$44.06 | \$10.00 | \$14.90 | \$0.00 | \$68.96 |
| | 12/01/2016 | \$45.29 | \$10.00 | \$14.90 | \$0.00 | \$70.19 |
| | 06/01/2017 | \$46.28 | \$10.00 | \$14.90 | \$0.00 | \$71.18 |
| | 12/01/2017 | \$47.27 | \$10.00 | \$14.90 | \$0.00 | \$72.17 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| PAINTER (BRIDGES/TANKS) PAINTERS LOCAL 35 - ZONE 2 | 07/01/2015 | \$48.56 | \$7.85 | \$16.10 | \$0.00 | \$72.51 |
| | 01/01/2016 | \$49.51 | \$7.85 | \$16.10 | \$0.00 | \$73.46 |
| | 07/01/2016 | \$50.46 | \$7.85 | \$16.10 | \$0.00 | \$74.41 |
| | 01/01/2017 | \$51.41 | \$7.85 | \$16.10 | \$0.00 | \$75.36 |

Apprentice - PAINTER Local 35 - BRIDGES/TANKS**Effective Date - 07/01/2015**

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 50 | \$24.28 | \$7.85 | \$0.00 | \$0.00 | \$32.13 |
| 2 | 55 | \$26.71 | \$7.85 | \$3.66 | \$0.00 | \$38.22 |
| 3 | 60 | \$29.14 | \$7.85 | \$3.99 | \$0.00 | \$40.98 |
| 4 | 65 | \$31.56 | \$7.85 | \$4.32 | \$0.00 | \$43.73 |
| 5 | 70 | \$33.99 | \$7.85 | \$14.11 | \$0.00 | \$55.95 |
| 6 | 75 | \$36.42 | \$7.85 | \$14.44 | \$0.00 | \$58.71 |
| 7 | 80 | \$38.85 | \$7.85 | \$14.77 | \$0.00 | \$61.47 |
| 8 | 90 | \$43.70 | \$7.85 | \$15.44 | \$0.00 | \$66.99 |

Effective Date - 01/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 50 | \$24.76 | \$7.85 | \$0.00 | \$0.00 | \$32.61 |
| 2 | 55 | \$27.23 | \$7.85 | \$3.66 | \$0.00 | \$38.74 |
| 3 | 60 | \$29.71 | \$7.85 | \$3.99 | \$0.00 | \$41.55 |
| 4 | 65 | \$32.18 | \$7.85 | \$4.32 | \$0.00 | \$44.35 |
| 5 | 70 | \$34.66 | \$7.85 | \$14.11 | \$0.00 | \$56.62 |
| 6 | 75 | \$37.13 | \$7.85 | \$14.44 | \$0.00 | \$59.42 |
| 7 | 80 | \$39.61 | \$7.85 | \$14.77 | \$0.00 | \$62.23 |
| 8 | 90 | \$44.56 | \$7.85 | \$15.44 | \$0.00 | \$67.85 |

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *

* If 30% or more of surfaces to be painted are new construction,

NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2

| | | | | | |
|------------|---------|--------|---------|--------|---------|
| 07/01/2015 | \$39.46 | \$7.85 | \$16.10 | \$0.00 | \$63.41 |
| 01/01/2016 | \$40.41 | \$7.85 | \$16.10 | \$0.00 | \$64.36 |
| 07/01/2016 | \$41.36 | \$7.85 | \$16.10 | \$0.00 | \$65.31 |
| 01/01/2017 | \$42.31 | \$7.85 | \$16.10 | \$0.00 | \$66.26 |

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New
Effective Date - 07/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$19.73 | \$7.85 | \$0.00 | \$0.00 | \$27.58 |
| 2 | 55 | \$21.70 | \$7.85 | \$3.66 | \$0.00 | \$33.21 |
| 3 | 60 | \$23.68 | \$7.85 | \$3.99 | \$0.00 | \$35.52 |
| 4 | 65 | \$25.65 | \$7.85 | \$4.32 | \$0.00 | \$37.82 |
| 5 | 70 | \$27.62 | \$7.85 | \$14.11 | \$0.00 | \$49.58 |
| 6 | 75 | \$29.60 | \$7.85 | \$14.44 | \$0.00 | \$51.89 |
| 7 | 80 | \$31.57 | \$7.85 | \$14.77 | \$0.00 | \$54.19 |
| 8 | 90 | \$35.51 | \$7.85 | \$15.44 | \$0.00 | \$58.80 |

Effective Date - 01/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|---------------------------|------------|
| 1 | 50 | \$20.21 | \$7.85 | \$0.00 | \$0.00 | \$28.06 |
| 2 | 55 | \$22.23 | \$7.85 | \$3.66 | \$0.00 | \$33.74 |
| 3 | 60 | \$24.25 | \$7.85 | \$3.99 | \$0.00 | \$36.09 |
| 4 | 65 | \$26.27 | \$7.85 | \$4.32 | \$0.00 | \$38.44 |
| 5 | 70 | \$28.29 | \$7.85 | \$14.11 | \$0.00 | \$50.25 |
| 6 | 75 | \$30.31 | \$7.85 | \$14.44 | \$0.00 | \$52.60 |
| 7 | 80 | \$32.33 | \$7.85 | \$14.77 | \$0.00 | \$54.95 |
| 8 | 90 | \$36.37 | \$7.85 | \$15.44 | \$0.00 | \$59.66 |

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|---------------------------------------|------------|---------|--------|---------|--------|---------|
| PAINTER (SPRAY OR SANDBLAST, REPAINT) | 07/01/2015 | \$37.52 | \$7.85 | \$16.10 | \$0.00 | \$61.47 |
| PAINTERS LOCAL 35 - ZONE 2 | 01/01/2016 | \$38.47 | \$7.85 | \$16.10 | \$0.00 | \$62.42 |
| | 07/01/2016 | \$39.42 | \$7.85 | \$16.10 | \$0.00 | \$63.37 |
| | 01/01/2017 | \$40.37 | \$7.85 | \$16.10 | \$0.00 | \$64.32 |

Classification
Effective Date
Base Wage
Health
Pension
**Supplemental
Unemployment**
Total Rate
Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint
Effective Date - 07/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 50 | \$18.76 | \$7.85 | \$0.00 | \$0.00 | \$26.61 |
| 2 | 55 | \$20.64 | \$7.85 | \$3.66 | \$0.00 | \$32.15 |
| 3 | 60 | \$22.51 | \$7.85 | \$3.99 | \$0.00 | \$34.35 |
| 4 | 65 | \$24.39 | \$7.85 | \$4.32 | \$0.00 | \$36.56 |
| 5 | 70 | \$26.26 | \$7.85 | \$14.11 | \$0.00 | \$48.22 |
| 6 | 75 | \$28.14 | \$7.85 | \$14.44 | \$0.00 | \$50.43 |
| 7 | 80 | \$30.02 | \$7.85 | \$14.77 | \$0.00 | \$52.64 |
| 8 | 90 | \$33.77 | \$7.85 | \$15.44 | \$0.00 | \$57.06 |

Effective Date - 01/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 50 | \$19.24 | \$7.85 | \$0.00 | \$0.00 | \$27.09 |
| 2 | 55 | \$21.16 | \$7.85 | \$3.66 | \$0.00 | \$32.67 |
| 3 | 60 | \$23.08 | \$7.85 | \$3.99 | \$0.00 | \$34.92 |
| 4 | 65 | \$25.01 | \$7.85 | \$4.32 | \$0.00 | \$37.18 |
| 5 | 70 | \$26.93 | \$7.85 | \$14.11 | \$0.00 | \$48.89 |
| 6 | 75 | \$28.85 | \$7.85 | \$14.44 | \$0.00 | \$51.14 |
| 7 | 80 | \$30.78 | \$7.85 | \$14.77 | \$0.00 | \$53.40 |
| 8 | 90 | \$34.62 | \$7.85 | \$15.44 | \$0.00 | \$57.91 |

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|----------------------------|------------|---------|--------|---------|--------|---------|
| PAINTER (TRAFFIC MARKINGS) | 12/01/2015 | \$31.15 | \$7.45 | \$12.65 | \$0.00 | \$51.25 |
| LABORERS - ZONE 2 | 06/01/2016 | \$31.65 | \$7.45 | \$12.65 | \$0.00 | \$51.75 |
| | 12/01/2016 | \$32.40 | \$7.45 | \$12.65 | \$0.00 | \$52.50 |

For Apprentice rates see "Apprentice- LABORER"

| | | | | | | |
|--|------------|---------|--------|---------|--------|---------|
| PAINTER / TAPER (BRUSH, NEW) * | 07/01/2015 | \$38.06 | \$7.85 | \$16.10 | \$0.00 | \$62.01 |
| * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2 | 01/01/2016 | \$39.01 | \$7.85 | \$16.10 | \$0.00 | \$62.96 |
| | 07/01/2016 | \$39.96 | \$7.85 | \$16.10 | \$0.00 | \$63.91 |
| | 01/01/2017 | \$40.91 | \$7.85 | \$16.10 | \$0.00 | \$64.86 |

Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW**Effective Date - 07/01/2015**

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 50 | \$19.03 | \$7.85 | \$0.00 | \$0.00 | \$26.88 |
| 2 | 55 | \$20.93 | \$7.85 | \$3.66 | \$0.00 | \$32.44 |
| 3 | 60 | \$22.84 | \$7.85 | \$3.99 | \$0.00 | \$34.68 |
| 4 | 65 | \$24.74 | \$7.85 | \$4.32 | \$0.00 | \$36.91 |
| 5 | 70 | \$26.64 | \$7.85 | \$14.11 | \$0.00 | \$48.60 |
| 6 | 75 | \$28.55 | \$7.85 | \$14.44 | \$0.00 | \$50.84 |
| 7 | 80 | \$30.45 | \$7.85 | \$14.77 | \$0.00 | \$53.07 |
| 8 | 90 | \$34.25 | \$7.85 | \$15.44 | \$0.00 | \$57.54 |

Effective Date - 01/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 50 | \$19.51 | \$7.85 | \$0.00 | \$0.00 | \$27.36 |
| 2 | 55 | \$21.46 | \$7.85 | \$3.66 | \$0.00 | \$32.97 |
| 3 | 60 | \$23.41 | \$7.85 | \$3.99 | \$0.00 | \$35.25 |
| 4 | 65 | \$25.36 | \$7.85 | \$4.32 | \$0.00 | \$37.53 |
| 5 | 70 | \$27.31 | \$7.85 | \$14.11 | \$0.00 | \$49.27 |
| 6 | 75 | \$29.26 | \$7.85 | \$14.44 | \$0.00 | \$51.55 |
| 7 | 80 | \$31.21 | \$7.85 | \$14.77 | \$0.00 | \$53.83 |
| 8 | 90 | \$35.11 | \$7.85 | \$15.44 | \$0.00 | \$58.40 |

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT)

PAINTERS LOCAL 35 - ZONE 2

| | | | | | |
|------------|---------|--------|---------|--------|---------|
| 07/01/2015 | \$36.12 | \$7.85 | \$16.10 | \$0.00 | \$60.07 |
| 01/01/2016 | \$37.07 | \$7.85 | \$16.10 | \$0.00 | \$61.02 |
| 07/01/2016 | \$38.02 | \$7.85 | \$16.10 | \$0.00 | \$61.97 |
| 01/01/2017 | \$38.97 | \$7.85 | \$16.10 | \$0.00 | \$62.92 |

Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT**Effective Date - 07/01/2015**

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 50 | \$18.06 | \$7.85 | \$0.00 | \$0.00 | \$25.91 |
| 2 | 55 | \$19.87 | \$7.85 | \$3.66 | \$0.00 | \$31.38 |
| 3 | 60 | \$21.67 | \$7.85 | \$3.99 | \$0.00 | \$33.51 |
| 4 | 65 | \$23.48 | \$7.85 | \$4.32 | \$0.00 | \$35.65 |
| 5 | 70 | \$25.28 | \$7.85 | \$14.11 | \$0.00 | \$47.24 |
| 6 | 75 | \$27.09 | \$7.85 | \$14.44 | \$0.00 | \$49.38 |
| 7 | 80 | \$28.90 | \$7.85 | \$14.77 | \$0.00 | \$51.52 |
| 8 | 90 | \$32.51 | \$7.85 | \$15.44 | \$0.00 | \$55.80 |

Effective Date - 01/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 50 | \$18.54 | \$7.85 | \$0.00 | \$0.00 | \$26.39 |
| 2 | 55 | \$20.39 | \$7.85 | \$3.66 | \$0.00 | \$31.90 |
| 3 | 60 | \$22.24 | \$7.85 | \$3.99 | \$0.00 | \$34.08 |
| 4 | 65 | \$24.10 | \$7.85 | \$4.32 | \$0.00 | \$36.27 |
| 5 | 70 | \$25.95 | \$7.85 | \$14.11 | \$0.00 | \$47.91 |
| 6 | 75 | \$27.80 | \$7.85 | \$14.44 | \$0.00 | \$50.09 |
| 7 | 80 | \$29.66 | \$7.85 | \$14.77 | \$0.00 | \$52.28 |
| 8 | 90 | \$33.36 | \$7.85 | \$15.44 | \$0.00 | \$56.65 |

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|---|------------|---------|--------|---------|--------|---------|
| PANEL & PICKUP TRUCKS DRIVER <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i> | 12/01/2012 | \$30.28 | \$9.07 | \$8.00 | \$0.00 | \$47.35 |
| PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i> | 08/01/2015 | \$42.04 | \$9.80 | \$19.23 | \$0.00 | \$71.07 |
| PILE DRIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i> | 08/01/2015 | \$42.04 | \$9.80 | \$19.23 | \$0.00 | \$71.07 |

Apprentice - PILE DRIVER - Local 56 Zone 1**Effective Date - 08/01/2015**

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 50 | \$21.02 | \$9.80 | \$19.23 | \$0.00 | \$50.05 |
| 2 | 60 | \$25.22 | \$9.80 | \$19.23 | \$0.00 | \$54.25 |
| 3 | 70 | \$29.43 | \$9.80 | \$19.23 | \$0.00 | \$58.46 |
| 4 | 75 | \$31.53 | \$9.80 | \$19.23 | \$0.00 | \$60.56 |
| 5 | 80 | \$33.63 | \$9.80 | \$19.23 | \$0.00 | \$62.66 |
| 6 | 80 | \$33.63 | \$9.80 | \$19.23 | \$0.00 | \$62.66 |
| 7 | 90 | \$37.84 | \$9.80 | \$19.23 | \$0.00 | \$66.87 |
| 8 | 90 | \$37.84 | \$9.80 | \$19.23 | \$0.00 | \$66.87 |

Notes:**Apprentice to Journeyworker Ratio:1:3****PIPEFITTER & STEAMFITTER***PIPEFITTERS LOCAL 537 (Local 138)*

| | | | | | |
|------------|---------|--------|---------|--------|---------|
| 09/01/2015 | \$47.36 | \$9.70 | \$14.89 | \$0.00 | \$71.95 |
| 03/01/2016 | \$48.36 | \$9.70 | \$14.89 | \$0.00 | \$72.95 |
| 09/01/2016 | \$49.36 | \$9.70 | \$14.89 | \$0.00 | \$73.95 |
| 03/01/2017 | \$50.36 | \$9.70 | \$14.89 | \$0.00 | \$74.95 |

Apprentice - PIPEFITTER Local 537 (Local 138)**Effective Date - 09/01/2015**

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 40 | \$18.94 | \$9.70 | \$5.50 | \$0.00 | \$34.14 |
| 2 | 45 | \$21.31 | \$9.70 | \$14.89 | \$0.00 | \$45.90 |
| 3 | 60 | \$28.42 | \$9.70 | \$14.89 | \$0.00 | \$53.01 |
| 4 | 70 | \$33.15 | \$9.70 | \$14.89 | \$0.00 | \$57.74 |
| 5 | 80 | \$37.89 | \$9.70 | \$14.89 | \$0.00 | \$62.48 |

Effective Date - 03/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 40 | \$19.34 | \$9.70 | \$5.50 | \$0.00 | \$34.54 |
| 2 | 45 | \$21.76 | \$9.70 | \$14.89 | \$0.00 | \$46.35 |
| 3 | 60 | \$29.02 | \$9.70 | \$14.89 | \$0.00 | \$53.61 |
| 4 | 70 | \$33.85 | \$9.70 | \$14.89 | \$0.00 | \$58.44 |
| 5 | 80 | \$38.69 | \$9.70 | \$14.89 | \$0.00 | \$63.28 |

Notes:

** 1:3; 3:15; 1:10 thereafter / Steps are 1 yr.

Refrig/AC Mechanic **1:1;1:2;2:4;3:6;4:8;5:10;6:12;7:14;8:17;9:20;10:23(Max)

Apprentice to Journeyworker Ratio:**

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|--|----------------|-----------|--------|---------|---------------------------|------------|
| PIPELAYER <i>LABORERS - ZONE 2</i> | 12/01/2015 | \$31.40 | \$7.45 | \$12.65 | \$0.00 | \$51.50 |
| | 06/01/2016 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 12/01/2016 | \$32.65 | \$7.45 | \$12.65 | \$0.00 | \$52.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| PLUMBER <i>PLUMBERS & GASFITTERS LOCAL 12 (Local 138)</i> | 09/01/2015 | \$46.38 | \$10.82 | \$15.14 | \$0.00 | \$72.34 |
| | 03/01/2016 | \$47.53 | \$10.82 | \$15.14 | \$0.00 | \$73.49 |
| | 09/01/2016 | \$48.58 | \$10.82 | \$15.14 | \$0.00 | \$74.54 |
| | 03/01/2017 | \$49.58 | \$10.82 | \$15.14 | \$0.00 | \$75.54 |

Apprentice - PLUMBER/GASFITTER - Local 12 (Local 138)

Effective Date - 09/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 35 | \$16.23 | \$10.82 | \$5.63 | \$0.00 | \$32.68 |
| 2 | 40 | \$18.55 | \$10.82 | \$6.37 | \$0.00 | \$35.74 |
| 3 | 55 | \$25.51 | \$10.82 | \$8.56 | \$0.00 | \$44.89 |
| 4 | 65 | \$30.15 | \$10.82 | \$10.03 | \$0.00 | \$51.00 |
| 5 | 75 | \$34.79 | \$10.82 | \$11.48 | \$0.00 | \$57.09 |

Effective Date - 03/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 35 | \$16.64 | \$10.82 | \$5.61 | \$0.00 | \$33.07 |
| 2 | 40 | \$19.01 | \$10.82 | \$6.36 | \$0.00 | \$36.19 |
| 3 | 55 | \$26.14 | \$10.82 | \$8.56 | \$0.00 | \$45.52 |
| 4 | 65 | \$30.89 | \$10.82 | \$10.02 | \$0.00 | \$51.73 |
| 5 | 75 | \$35.65 | \$10.82 | \$11.48 | \$0.00 | \$57.95 |

Notes:

Steps are 1 yr
Step 4 with lic\$54.05 Step5 with lic\$60.13

Apprentice to Journeyworker Ratio:1:5

| | | | | | | |
|---|------------|---------|--------|---------|--------|---------|
| PNEUMATIC CONTROLS (TEMP.) <i>PIPEFITTERS LOCAL 537 (Local 138)</i> | 09/01/2015 | \$47.36 | \$9.70 | \$14.89 | \$0.00 | \$71.95 |
| | 03/01/2016 | \$48.36 | \$9.70 | \$14.89 | \$0.00 | \$72.95 |
| | 09/01/2016 | \$49.36 | \$9.70 | \$14.89 | \$0.00 | \$73.95 |
| | 03/01/2017 | \$50.36 | \$9.70 | \$14.89 | \$0.00 | \$74.95 |
| For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER" | | | | | | |

| | | | | | | |
|---|------------|---------|--------|---------|--------|---------|
| PNEUMATIC DRILL/TOOL OPERATOR <i>LABORERS - ZONE 2</i> | 12/01/2015 | \$31.40 | \$7.45 | \$12.65 | \$0.00 | \$51.50 |
| | 06/01/2016 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 12/01/2016 | \$32.65 | \$7.45 | \$12.65 | \$0.00 | \$52.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |

| | | | | | | |
|---|------------|---------|--------|---------|--------|---------|
| POWDERMAN & BLASTER <i>LABORERS - ZONE 2</i> | 12/01/2015 | \$32.15 | \$7.45 | \$12.65 | \$0.00 | \$52.25 |
| | 06/01/2016 | \$32.65 | \$7.45 | \$12.65 | \$0.00 | \$52.75 |
| | 12/01/2016 | \$33.40 | \$7.45 | \$12.65 | \$0.00 | \$53.50 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|---|----------------|-----------|---------|---------|------------------------------|------------|
| POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$43.73 | \$10.00 | \$14.90 | \$0.00 | \$68.63 |
| | 06/01/2016 | \$44.48 | \$10.00 | \$14.90 | \$0.00 | \$69.38 |
| | 12/01/2016 | \$45.73 | \$10.00 | \$14.90 | \$0.00 | \$70.63 |
| | 06/01/2017 | \$46.73 | \$10.00 | \$14.90 | \$0.00 | \$71.63 |
| | 12/01/2017 | \$47.73 | \$10.00 | \$14.90 | \$0.00 | \$72.63 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$43.73 | \$10.00 | \$14.90 | \$0.00 | \$68.63 |
| | 06/01/2016 | \$44.48 | \$10.00 | \$14.90 | \$0.00 | \$69.38 |
| | 12/01/2016 | \$45.73 | \$10.00 | \$14.90 | \$0.00 | \$70.63 |
| | 06/01/2017 | \$46.73 | \$10.00 | \$14.90 | \$0.00 | \$71.63 |
| | 12/01/2017 | \$47.73 | \$10.00 | \$14.90 | \$0.00 | \$72.63 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$30.13 | \$10.00 | \$14.90 | \$0.00 | \$55.03 |
| | 06/01/2016 | \$30.65 | \$10.00 | \$14.90 | \$0.00 | \$55.55 |
| | 12/01/2016 | \$31.52 | \$10.00 | \$14.90 | \$0.00 | \$56.42 |
| | 06/01/2017 | \$32.21 | \$10.00 | \$14.90 | \$0.00 | \$57.11 |
| | 12/01/2017 | \$32.90 | \$10.00 | \$14.90 | \$0.00 | \$57.80 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| READY-MIX CONCRETE DRIVER <i>TEAMSTERS LOCAL 42</i> | 11/01/2015 | \$22.78 | \$8.49 | \$9.89 | \$0.00 | \$41.16 |
| | 04/30/2016 | \$22.78 | \$8.49 | \$10.25 | \$0.00 | \$41.52 |
| | 05/01/2016 | \$24.15 | \$8.49 | \$10.68 | \$0.00 | \$43.32 |
| | 04/30/2017 | \$24.15 | \$8.49 | \$11.07 | \$0.00 | \$43.71 |
| | 05/01/2017 | \$24.21 | \$8.49 | \$11.54 | \$0.00 | \$44.24 |
| | 04/30/2018 | \$24.21 | \$8.49 | \$11.96 | \$0.00 | \$44.66 |
| | 05/01/2018 | \$24.24 | \$8.49 | \$12.46 | \$0.00 | \$45.19 |
| | 04/30/2019 | \$24.24 | \$8.49 | \$12.92 | \$0.00 | \$45.65 |
| RECLAIMERS <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$43.31 | \$10.00 | \$14.90 | \$0.00 | \$68.21 |
| | 06/01/2016 | \$44.06 | \$10.00 | \$14.90 | \$0.00 | \$68.96 |
| | 12/01/2016 | \$45.29 | \$10.00 | \$14.90 | \$0.00 | \$70.19 |
| | 06/01/2017 | \$46.28 | \$10.00 | \$14.90 | \$0.00 | \$71.18 |
| | 12/01/2017 | \$47.27 | \$10.00 | \$14.90 | \$0.00 | \$72.17 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| RESIDENTIAL WOOD FRAME (All Other Work) <i>CARPENTERS -ZONE 2 (Residential Wood)</i> | 04/01/2011 | \$24.24 | \$8.67 | \$15.51 | \$0.00 | \$48.42 |
| RESIDENTIAL WOOD FRAME CARPENTER ** ** The Residential Wood Frame Carpenter classification applies only to the construction of new, wood frame residences that do not exceed four stories including the basement. <i>CARPENTERS -ZONE 2 (Residential Wood)</i> As of 9/1/09 Carpentry work on wood-frame residential WEATHERIZATION projects shall be paid the RESIDENTIAL WOOD FRAME CARPENTER rate. | 05/01/2011 | \$24.24 | \$6.34 | \$6.23 | \$0.00 | \$36.81 |

Classification
Effective Date
Base Wage
Health
Pension
**Supplemental
Unemployment**
Total Rate
Apprentice - CARPENTER (Residential Wood Frame) - Zone 2
Effective Date - 05/01/2011

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 60 | \$14.54 | \$6.34 | \$0.00 | \$0.00 | \$20.88 |
| 2 | 60 | \$14.54 | \$6.34 | \$6.23 | \$0.00 | \$27.11 |
| 3 | 65 | \$15.76 | \$6.34 | \$6.23 | \$0.00 | \$28.33 |
| 4 | 70 | \$16.97 | \$6.34 | \$6.23 | \$0.00 | \$29.54 |
| 5 | 75 | \$18.18 | \$6.34 | \$6.23 | \$0.00 | \$30.75 |
| 6 | 80 | \$19.39 | \$6.34 | \$6.23 | \$0.00 | \$31.96 |
| 7 | 85 | \$20.60 | \$6.34 | \$6.23 | \$0.00 | \$33.17 |
| 8 | 90 | \$21.82 | \$6.34 | \$6.23 | \$0.00 | \$34.39 |

Notes:
Apprentice to Journeyworker Ratio:1:5

| | | | | | | |
|---|------------|---------|---------|---------|--------|---------|
| RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 2</i> | 12/01/2015 | \$31.40 | \$7.45 | \$12.65 | \$0.00 | \$51.50 |
| | 06/01/2016 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 12/01/2016 | \$32.65 | \$7.45 | \$12.65 | \$0.00 | \$52.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$43.31 | \$10.00 | \$14.90 | \$0.00 | \$68.21 |
| | 06/01/2016 | \$44.06 | \$10.00 | \$14.90 | \$0.00 | \$68.96 |
| | 12/01/2016 | \$45.29 | \$10.00 | \$14.90 | \$0.00 | \$70.19 |
| | 06/01/2017 | \$46.28 | \$10.00 | \$14.90 | \$0.00 | \$71.18 |
| | 12/01/2017 | \$47.27 | \$10.00 | \$14.90 | \$0.00 | \$72.17 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg) <i>ROOFERS LOCAL 33</i> | 08/01/2015 | \$40.11 | \$11.00 | \$12.00 | \$0.00 | \$63.11 |
| | 02/01/2016 | \$41.01 | \$11.00 | \$12.00 | \$0.00 | \$64.01 |

Classification
Effective Date
Base Wage
Health
Pension
**Supplemental
Unemployment**
Total Rate
Apprentice - ROOFER - Local 33
Effective Date - 08/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 50 | \$20.06 | \$11.00 | \$3.38 | \$0.00 | \$34.44 |
| 2 | 60 | \$24.07 | \$11.00 | \$12.00 | \$0.00 | \$47.07 |
| 3 | 65 | \$26.07 | \$11.00 | \$12.00 | \$0.00 | \$49.07 |
| 4 | 75 | \$30.08 | \$11.00 | \$12.00 | \$0.00 | \$53.08 |
| 5 | 85 | \$34.09 | \$11.00 | \$12.00 | \$0.00 | \$57.09 |

Effective Date - 02/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 50 | \$20.51 | \$11.00 | \$3.38 | \$0.00 | \$34.89 |
| 2 | 60 | \$24.61 | \$11.00 | \$12.00 | \$0.00 | \$47.61 |
| 3 | 65 | \$26.66 | \$11.00 | \$12.00 | \$0.00 | \$49.66 |
| 4 | 75 | \$30.76 | \$11.00 | \$12.00 | \$0.00 | \$53.76 |
| 5 | 85 | \$34.86 | \$11.00 | \$12.00 | \$0.00 | \$57.86 |

Notes: ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1
Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.

Apprentice to Journeyworker Ratio:**
ROOFER SLATE / TILE / PRECAST CONCRETE
ROOFERS LOCAL 33

| | | | | | |
|------------|---------|---------|---------|--------|---------|
| 08/01/2015 | \$40.36 | \$11.00 | \$12.00 | \$0.00 | \$63.36 |
| 02/01/2016 | \$41.26 | \$11.00 | \$12.00 | \$0.00 | \$64.26 |

For apprentice rates see "Apprentice- ROOFER"

SHEETMETAL WORKER
SHEETMETAL WORKERS LOCAL 17 - A

| | | | | | |
|------------|---------|---------|---------|--------|---------|
| 08/01/2015 | \$43.31 | \$10.20 | \$21.48 | \$2.25 | \$77.24 |
| 02/01/2016 | \$44.31 | \$10.20 | \$21.48 | \$2.25 | \$78.24 |
| 08/01/2016 | \$45.46 | \$10.20 | \$21.48 | \$2.25 | \$79.39 |
| 02/01/2017 | \$46.56 | \$10.20 | \$21.48 | \$2.25 | \$80.49 |
| 08/01/2017 | \$47.66 | \$10.20 | \$21.48 | \$2.25 | \$81.59 |
| 02/01/2018 | \$48.81 | \$10.20 | \$21.48 | \$2.25 | \$82.74 |

Classification
Effective Date
Base Wage
Health
Pension
**Supplemental
Unemployment**
Total Rate
Apprentice - SHEET METAL WORKER - Local 17-A
Effective Date - 08/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 40 | \$17.32 | \$10.20 | \$4.90 | \$0.00 | \$32.42 |
| 2 | 40 | \$17.32 | \$10.20 | \$4.90 | \$0.00 | \$32.42 |
| 3 | 45 | \$19.49 | \$10.20 | \$9.59 | \$1.18 | \$40.46 |
| 4 | 45 | \$19.49 | \$10.20 | \$9.59 | \$1.18 | \$40.46 |
| 5 | 50 | \$21.66 | \$10.20 | \$10.45 | \$1.27 | \$43.58 |
| 6 | 50 | \$21.66 | \$10.20 | \$10.70 | \$1.28 | \$43.84 |
| 7 | 60 | \$25.99 | \$10.20 | \$12.17 | \$1.45 | \$49.81 |
| 8 | 65 | \$28.15 | \$10.20 | \$13.04 | \$1.54 | \$52.93 |
| 9 | 75 | \$32.48 | \$10.20 | \$14.76 | \$1.72 | \$59.16 |
| 10 | 85 | \$36.81 | \$10.20 | \$15.98 | \$1.89 | \$64.88 |

Effective Date - 02/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 40 | \$17.72 | \$10.20 | \$4.90 | \$0.00 | \$32.82 |
| 2 | 40 | \$17.72 | \$10.20 | \$4.90 | \$0.00 | \$32.82 |
| 3 | 45 | \$19.94 | \$10.20 | \$9.59 | \$1.19 | \$40.92 |
| 4 | 45 | \$19.94 | \$10.20 | \$9.59 | \$1.19 | \$40.92 |
| 5 | 50 | \$22.16 | \$10.20 | \$10.45 | \$1.28 | \$44.09 |
| 6 | 50 | \$22.16 | \$10.20 | \$10.70 | \$1.29 | \$44.35 |
| 7 | 60 | \$26.59 | \$10.20 | \$12.17 | \$1.47 | \$50.43 |
| 8 | 65 | \$28.80 | \$10.20 | \$13.04 | \$1.56 | \$53.60 |
| 9 | 75 | \$33.23 | \$10.20 | \$14.76 | \$1.75 | \$59.94 |
| 10 | 85 | \$37.66 | \$10.20 | \$15.98 | \$1.92 | \$65.76 |

Notes:

Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SIGN ERECTOR

PAINTERS LOCAL 35 - ZONE 2

06/01/2013

\$25.81

\$7.07

\$7.05

\$0.00

\$39.93

Classification
Effective Date
Base Wage
Health
Pension
**Supplemental
Unemployment**
Total Rate
Apprentice - SIGN ERECTOR - Local 35 Zone 2
Effective Date - 06/01/2013

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 50 | \$12.91 | \$7.07 | \$0.00 | \$0.00 | \$19.98 |
| 2 | 55 | \$14.20 | \$7.07 | \$2.45 | \$0.00 | \$23.72 |
| 3 | 60 | \$15.49 | \$7.07 | \$2.45 | \$0.00 | \$25.01 |
| 4 | 65 | \$16.78 | \$7.07 | \$2.45 | \$0.00 | \$26.30 |
| 5 | 70 | \$18.07 | \$7.07 | \$7.05 | \$0.00 | \$32.19 |
| 6 | 75 | \$19.36 | \$7.07 | \$7.05 | \$0.00 | \$33.48 |
| 7 | 80 | \$20.65 | \$7.07 | \$7.05 | \$0.00 | \$34.77 |
| 8 | 85 | \$21.94 | \$7.07 | \$7.05 | \$0.00 | \$36.06 |
| 9 | 90 | \$23.23 | \$7.07 | \$7.05 | \$0.00 | \$37.35 |

Notes:

Steps are 4 mos.

Apprentice to Journeyworker Ratio:1:1

| | | | | | | |
|--|------------|---------|---------|---------|--------|---------|
| SPECIALIZED EARTH MOVING EQUIP < 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i> | 12/01/2015 | \$31.94 | \$10.41 | \$10.08 | \$0.00 | \$52.43 |
| | 06/01/2016 | \$32.44 | \$10.41 | \$10.08 | \$0.00 | \$52.93 |
| | 08/01/2016 | \$32.44 | \$10.91 | \$10.08 | \$0.00 | \$53.43 |
| | 12/01/2016 | \$32.44 | \$10.91 | \$10.89 | \$0.00 | \$54.24 |
| SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i> | 12/01/2015 | \$32.23 | \$10.41 | \$10.08 | \$0.00 | \$52.72 |
| | 06/01/2016 | \$32.73 | \$10.41 | \$10.08 | \$0.00 | \$53.22 |
| | 08/01/2016 | \$32.73 | \$10.91 | \$10.08 | \$0.00 | \$53.72 |
| | 12/01/2016 | \$32.73 | \$10.91 | \$10.89 | \$0.00 | \$54.53 |
| SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 550 - (Section B) Zone 2</i> | 10/01/2015 | \$49.35 | \$8.42 | \$15.65 | \$0.00 | \$73.42 |
| | 01/01/2016 | \$48.99 | \$8.67 | \$15.80 | \$0.00 | \$73.46 |
| | 03/01/2016 | \$49.89 | \$8.67 | \$15.80 | \$0.00 | \$74.36 |
| | 10/01/2016 | \$50.93 | \$8.67 | \$15.80 | \$0.00 | \$75.40 |
| | 03/01/2017 | \$51.83 | \$8.67 | \$15.80 | \$0.00 | \$76.30 |

Classification
Effective Date
Base Wage
Health
Pension
**Supplemental
Unemployment**
Total Rate
Apprentice - SPRINKLER FITTER - Local 550 (Section B) Zone 2
Effective Date - 10/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 35 | \$17.27 | \$8.42 | \$8.40 | \$0.00 | \$34.09 |
| 2 | 40 | \$19.74 | \$8.42 | \$8.40 | \$0.00 | \$36.56 |
| 3 | 45 | \$22.21 | \$8.42 | \$8.40 | \$0.00 | \$39.03 |
| 4 | 50 | \$24.68 | \$8.42 | \$8.40 | \$0.00 | \$41.50 |
| 5 | 55 | \$27.14 | \$8.42 | \$8.40 | \$0.00 | \$43.96 |
| 6 | 60 | \$29.61 | \$8.42 | \$8.40 | \$0.00 | \$46.43 |
| 7 | 65 | \$32.08 | \$8.42 | \$8.40 | \$0.00 | \$48.90 |
| 8 | 70 | \$34.55 | \$8.42 | \$8.40 | \$0.00 | \$51.37 |
| 9 | 75 | \$37.01 | \$8.42 | \$8.40 | \$0.00 | \$53.83 |
| 10 | 80 | \$39.48 | \$8.42 | \$8.40 | \$0.00 | \$56.30 |

Effective Date - 01/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 35 | \$17.15 | \$8.67 | \$8.55 | \$0.00 | \$34.37 |
| 2 | 40 | \$19.60 | \$8.67 | \$8.55 | \$0.00 | \$36.82 |
| 3 | 45 | \$22.05 | \$8.67 | \$8.55 | \$0.00 | \$39.27 |
| 4 | 50 | \$24.50 | \$8.67 | \$8.55 | \$0.00 | \$41.72 |
| 5 | 55 | \$26.94 | \$8.67 | \$8.55 | \$0.00 | \$44.16 |
| 6 | 60 | \$29.39 | \$8.67 | \$8.55 | \$0.00 | \$46.61 |
| 7 | 65 | \$31.84 | \$8.67 | \$8.55 | \$0.00 | \$49.06 |
| 8 | 70 | \$34.29 | \$8.67 | \$8.55 | \$0.00 | \$51.51 |
| 9 | 75 | \$36.74 | \$8.67 | \$8.55 | \$0.00 | \$53.96 |
| 10 | 80 | \$39.19 | \$8.67 | \$8.55 | \$0.00 | \$56.41 |

Notes: Apprentice entered prior 9/30/10:
40/45/50/55/60/65/70/75/80/85
Steps are 850 hours

Apprentice to Journeyworker Ratio:1:3

| | | | | | | |
|---|------------|---------|---------|---------|--------|---------|
| STEAM BOILER OPERATOR OPERATING ENGINEERS LOCAL 4 | 12/01/2015 | \$43.31 | \$10.00 | \$14.90 | \$0.00 | \$68.21 |
| | 06/01/2016 | \$44.06 | \$10.00 | \$14.90 | \$0.00 | \$68.96 |
| | 12/01/2016 | \$45.29 | \$10.00 | \$14.90 | \$0.00 | \$70.19 |
| | 06/01/2017 | \$46.28 | \$10.00 | \$14.90 | \$0.00 | \$71.18 |
| | 12/01/2017 | \$47.27 | \$10.00 | \$14.90 | \$0.00 | \$72.17 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN OPERATING ENGINEERS LOCAL 4 | 12/01/2015 | \$43.31 | \$10.00 | \$14.90 | \$0.00 | \$68.21 |
| | 06/01/2016 | \$44.06 | \$10.00 | \$14.90 | \$0.00 | \$68.96 |
| | 12/01/2016 | \$45.29 | \$10.00 | \$14.90 | \$0.00 | \$70.19 |
| | 06/01/2017 | \$46.28 | \$10.00 | \$14.90 | \$0.00 | \$71.18 |
| | 12/01/2017 | \$47.27 | \$10.00 | \$14.90 | \$0.00 | \$72.17 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| TELECOMMUNICATION TECHNICIAN ELECTRICIANS LOCAL 103 | 09/01/2015 | \$34.25 | \$13.00 | \$14.06 | \$0.00 | \$61.31 |
| | 03/01/2016 | \$34.63 | \$13.00 | \$14.55 | \$0.00 | \$62.18 |

Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103**Effective Date - 09/01/2015**

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 40 | \$13.70 | \$13.00 | \$0.41 | \$0.00 | \$27.11 |
| 2 | 40 | \$13.70 | \$13.00 | \$0.41 | \$0.00 | \$27.11 |
| 3 | 45 | \$15.41 | \$13.00 | \$11.03 | \$0.00 | \$39.44 |
| 4 | 45 | \$15.41 | \$13.00 | \$11.03 | \$0.00 | \$39.44 |
| 5 | 50 | \$17.13 | \$13.00 | \$11.30 | \$0.00 | \$41.43 |
| 6 | 55 | \$18.84 | \$13.00 | \$11.58 | \$0.00 | \$43.42 |
| 7 | 60 | \$20.55 | \$13.00 | \$11.86 | \$0.00 | \$45.41 |
| 8 | 65 | \$22.26 | \$13.00 | \$12.13 | \$0.00 | \$47.39 |
| 9 | 70 | \$23.98 | \$13.00 | \$12.41 | \$0.00 | \$49.39 |
| 10 | 75 | \$25.69 | \$13.00 | \$12.68 | \$0.00 | \$51.37 |

Effective Date - 03/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|------------------------------|------------|
| 1 | 40 | \$13.85 | \$13.00 | \$0.42 | \$0.00 | \$27.27 |
| 2 | 40 | \$13.85 | \$13.00 | \$0.42 | \$0.00 | \$27.27 |
| 3 | 45 | \$15.58 | \$13.00 | \$11.52 | \$0.00 | \$40.10 |
| 4 | 45 | \$15.58 | \$13.00 | \$11.52 | \$0.00 | \$40.10 |
| 5 | 50 | \$17.32 | \$13.00 | \$11.79 | \$0.00 | \$42.11 |
| 6 | 55 | \$19.05 | \$13.00 | \$12.06 | \$0.00 | \$44.11 |
| 7 | 60 | \$20.78 | \$13.00 | \$12.34 | \$0.00 | \$46.12 |
| 8 | 65 | \$22.51 | \$13.00 | \$12.62 | \$0.00 | \$48.13 |
| 9 | 70 | \$24.24 | \$13.00 | \$12.90 | \$0.00 | \$50.14 |
| 10 | 75 | \$25.97 | \$13.00 | \$13.17 | \$0.00 | \$52.14 |

Notes:**Apprentice to Journeyworker Ratio:1:1**

| | | | | | | |
|-------------------------------------|------------|---------|---------|---------|--------|---------|
| TERRAZZO FINISHERS | 08/01/2015 | \$48.80 | \$10.18 | \$18.57 | \$0.00 | \$77.55 |
| BRICKLAYERS LOCAL 3 - MARBLE & TILE | 02/01/2016 | \$49.37 | \$10.18 | \$18.57 | \$0.00 | \$78.12 |
| | 08/01/2016 | \$50.27 | \$10.18 | \$18.65 | \$0.00 | \$79.10 |
| | 02/01/2017 | \$50.84 | \$10.18 | \$18.65 | \$0.00 | \$79.67 |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|----------------|----------------|-----------|--------|---------|---------------------------|------------|
|----------------|----------------|-----------|--------|---------|---------------------------|------------|

Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile

Effective Date - 08/01/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$24.40 | \$10.18 | \$18.57 | \$0.00 | \$53.15 |
| 2 | 60 | \$29.28 | \$10.18 | \$18.57 | \$0.00 | \$58.03 |
| 3 | 70 | \$34.16 | \$10.18 | \$18.57 | \$0.00 | \$62.91 |
| 4 | 80 | \$39.04 | \$10.18 | \$18.57 | \$0.00 | \$67.79 |
| 5 | 90 | \$43.92 | \$10.18 | \$18.57 | \$0.00 | \$72.67 |

Effective Date - 02/01/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|---------|---------|---------------------------|------------|
| 1 | 50 | \$24.69 | \$10.18 | \$18.57 | \$0.00 | \$53.44 |
| 2 | 60 | \$29.62 | \$10.18 | \$18.57 | \$0.00 | \$58.37 |
| 3 | 70 | \$34.56 | \$10.18 | \$18.57 | \$0.00 | \$63.31 |
| 4 | 80 | \$39.50 | \$10.18 | \$18.57 | \$0.00 | \$68.25 |
| 5 | 90 | \$44.43 | \$10.18 | \$18.57 | \$0.00 | \$73.18 |

Notes:

Apprentice to Journeyworker Ratio:1:3

| | | | | | | |
|---|------------|---------|---------|---------|--------|---------|
| TEST BORING DRILLER <i>LABORERS - FOUNDATION AND MARINE</i> | 12/01/2015 | \$36.70 | \$7.45 | \$13.75 | \$0.00 | \$57.90 |
| | 06/01/2016 | \$37.45 | \$7.45 | \$13.75 | \$0.00 | \$58.65 |
| | 12/01/2016 | \$38.45 | \$7.45 | \$13.75 | \$0.00 | \$59.65 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i> | 12/01/2015 | \$35.42 | \$7.45 | \$13.75 | \$0.00 | \$56.62 |
| | 06/01/2016 | \$36.17 | \$7.45 | \$13.75 | \$0.00 | \$57.37 |
| | 12/01/2016 | \$37.17 | \$7.45 | \$13.75 | \$0.00 | \$58.37 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i> | 12/01/2015 | \$35.30 | \$7.45 | \$13.75 | \$0.00 | \$56.50 |
| | 06/01/2016 | \$36.05 | \$7.45 | \$13.75 | \$0.00 | \$57.25 |
| | 12/01/2016 | \$37.05 | \$7.45 | \$13.75 | \$0.00 | \$58.25 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| TRACTORS/PORTABLE STEAM GENERATORS <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$43.31 | \$10.00 | \$14.90 | \$0.00 | \$68.21 |
| | 06/01/2016 | \$44.06 | \$10.00 | \$14.90 | \$0.00 | \$68.96 |
| | 12/01/2016 | \$45.29 | \$10.00 | \$14.90 | \$0.00 | \$70.19 |
| | 06/01/2017 | \$46.28 | \$10.00 | \$14.90 | \$0.00 | \$71.18 |
| | 12/01/2017 | \$47.27 | \$10.00 | \$14.90 | \$0.00 | \$72.17 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i> | 12/01/2015 | \$32.52 | \$10.41 | \$10.08 | \$0.00 | \$53.01 |
| | 06/01/2016 | \$33.02 | \$10.41 | \$10.08 | \$0.00 | \$53.51 |
| | 08/01/2016 | \$33.02 | \$10.91 | \$10.08 | \$0.00 | \$54.01 |
| | 12/01/2016 | \$33.02 | \$10.91 | \$10.89 | \$0.00 | \$54.82 |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|--|----------------|-----------|---------|---------|------------------------------|------------|
| TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i> | 12/01/2015 | \$47.58 | \$7.45 | \$14.15 | \$0.00 | \$69.18 |
| | 06/01/2016 | \$48.33 | \$7.45 | \$14.15 | \$0.00 | \$69.93 |
| | 12/01/2016 | \$49.33 | \$7.45 | \$14.15 | \$0.00 | \$70.93 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i> | 12/01/2015 | \$49.58 | \$7.45 | \$14.15 | \$0.00 | \$71.18 |
| | 06/01/2016 | \$50.33 | \$7.45 | \$14.15 | \$0.00 | \$71.93 |
| | 12/01/2016 | \$51.33 | \$7.45 | \$14.15 | \$0.00 | \$72.93 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i> | 12/01/2015 | \$39.65 | \$7.45 | \$14.15 | \$0.00 | \$61.25 |
| | 06/01/2016 | \$40.40 | \$7.45 | \$14.15 | \$0.00 | \$62.00 |
| | 12/01/2016 | \$41.40 | \$7.45 | \$14.15 | \$0.00 | \$63.00 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i> | 12/01/2015 | \$41.65 | \$7.45 | \$14.15 | \$0.00 | \$63.25 |
| | 06/01/2016 | \$42.40 | \$7.45 | \$14.15 | \$0.00 | \$64.00 |
| | 12/01/2016 | \$43.40 | \$7.45 | \$14.15 | \$0.00 | \$65.00 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i> | 12/01/2015 | \$31.94 | \$10.41 | \$10.08 | \$0.00 | \$52.43 |
| | 06/01/2016 | \$32.44 | \$10.41 | \$10.08 | \$0.00 | \$52.93 |
| | 08/01/2016 | \$32.44 | \$10.91 | \$10.08 | \$0.00 | \$53.43 |
| | 12/01/2016 | \$32.44 | \$10.91 | \$10.89 | \$0.00 | \$54.24 |
| WAGON DRILL OPERATOR <i>LABORERS - ZONE 2</i> | 12/01/2015 | \$31.40 | \$7.45 | \$12.65 | \$0.00 | \$51.50 |
| | 06/01/2016 | \$31.90 | \$7.45 | \$12.65 | \$0.00 | \$52.00 |
| | 12/01/2016 | \$32.65 | \$7.45 | \$12.65 | \$0.00 | \$52.75 |
| For apprentice rates see "Apprentice- LABORER" | | | | | | |
| WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i> | 12/01/2015 | \$43.73 | \$10.00 | \$14.90 | \$0.00 | \$68.63 |
| | 06/01/2016 | \$44.48 | \$10.00 | \$14.90 | \$0.00 | \$69.38 |
| | 12/01/2016 | \$45.73 | \$10.00 | \$14.90 | \$0.00 | \$70.63 |
| | 06/01/2017 | \$46.73 | \$10.00 | \$14.90 | \$0.00 | \$71.63 |
| | 12/01/2017 | \$47.73 | \$10.00 | \$14.90 | \$0.00 | \$72.63 |
| For apprentice rates see "Apprentice- OPERATING ENGINEERS" | | | | | | |
| WATER METER INSTALLER <i>PLUMBERS & GASFITTERS LOCAL 12 (Local 138)</i> | 09/01/2015 | \$46.38 | \$10.82 | \$15.14 | \$0.00 | \$72.34 |
| | 03/01/2016 | \$47.53 | \$10.82 | \$15.14 | \$0.00 | \$73.49 |
| | 09/01/2016 | \$48.58 | \$10.82 | \$15.14 | \$0.00 | \$74.54 |
| | 03/01/2017 | \$49.58 | \$10.82 | \$15.14 | \$0.00 | \$75.54 |
| For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER" | | | | | | |
| Marine Drilling | | | | | | |
| BLASTER <i>MARINE DRILLING</i> | 10/01/2005 | \$27.83 | \$3.40 | \$4.50 | \$0.00 | \$35.73 |
| BOAT CAPTAIN <i>MARINE DRILLING</i> | 10/01/2005 | \$22.97 | \$3.40 | \$3.90 | \$0.00 | \$30.27 |
| BOAT MASTER <i>MARINE DRILLING</i> | 10/01/2005 | \$23.99 | \$3.40 | \$4.50 | \$0.00 | \$31.89 |
| CORE DRILLER <i>MARINE DRILLING</i> | 10/01/2005 | \$21.93 | \$3.40 | \$3.30 | \$0.00 | \$28.63 |
| CORE DRILLER HELPER <i>MARINE DRILLING</i> | 10/01/2005 | \$19.78 | \$3.40 | \$3.30 | \$0.00 | \$26.48 |
| DRILLER <i>MARINE DRILLING</i> | 10/01/2005 | \$27.30 | \$3.40 | \$4.50 | \$0.00 | \$35.20 |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|---|--|-----------|--------|---------|------------------------------|------------|
| ENGINEER <i>MARINE DRILLING</i> | 10/01/2005 | \$27.29 | \$3.40 | \$4.50 | \$0.00 | \$35.19 |
| HELPER <i>MARINE DRILLING</i> | 10/01/2005 | \$23.97 | \$3.40 | \$3.30 | \$0.00 | \$30.67 |
| MACHINIST <i>MARINE DRILLING</i> | 10/01/2005 | \$27.03 | \$3.40 | \$3.90 | \$0.00 | \$34.33 |
| OILER - MARINE DRILLING <i>MARINE DRILLING</i> | 10/01/2005 | \$23.97 | \$3.40 | \$3.30 | \$0.00 | \$30.67 |
| TUG DECKHAND <i>MARINE DRILLING</i> | 10/01/2005 | \$19.14 | \$3.40 | \$3.30 | \$0.00 | \$25.84 |
| WELDER <i>MARINE DRILLING</i> | 10/01/2005 | \$27.03 | \$3.40 | \$3.90 | \$0.00 | \$34.33 |
| Op Eng Marine (Dredging Work) | | | | | | |
| BOAT OPERATOR <i>OPERATING ENGINEERS - MARINE DIVISION</i> | 10/01/2011 | \$25.29 | \$5.20 | \$2.95 | \$0.00 | \$33.44 |
| CERTIFIED WELDER <i>OPERATING ENGINEERS - MARINE DIVISION</i> | 10/01/2011 | \$26.84 | \$5.20 | \$3.25 | \$0.00 | \$35.29 |
| CHIEF WELDER/ CHIEF MATE <i>OPERATING ENGINEERS - MARINE DIVISION</i> | 10/01/2011 | \$28.49 | \$5.20 | \$3.25 | \$0.00 | \$36.94 |
| DERRICK / SPIDER / SPILLBARGE OPERATOR <i>OPERATING ENGINEERS - MARINE DIVISION</i> | 10/01/2011 | \$28.49 | \$5.20 | \$3.25 | \$0.00 | \$36.94 |
| DRAG BARGE OPERATOR / WELDER / MATE <i>OPERATING ENGINEERS - MARINE DIVISION</i> | 10/01/2011 | \$26.14 | \$5.20 | \$2.95 | \$0.00 | \$34.29 |
| ENGINEER / ELECTRICIAN <i>OPERATING ENGINEERS - MARINE DIVISION</i> | 10/01/2011 | \$28.49 | \$5.20 | \$3.25 | \$0.00 | \$36.94 |
| LICENSED BOAT OPERATOR <i>OPERATING ENGINEERS - MARINE DIVISION</i> | 10/01/2011 | \$28.49 | \$5.20 | \$3.25 | \$0.00 | \$36.94 |
| LICENSED TUG OPERATOR OVER 1000HP <i>OPERATING ENGINEERS - MARINE DIVISION</i> | 10/01/2011 | \$32.89 | \$5.20 | \$3.25 | \$0.00 | \$41.34 |
| MAINTENANCE ENGINEER <i>OPERATING ENGINEERS - MARINE DIVISION</i> | 10/01/2011 | \$28.49 | \$5.20 | \$3.25 | \$0.00 | \$36.94 |
| OILER - MARINE DIVISION <i>OPERATING ENGINEERS - MARINE DIVISION</i> | 10/01/2011 | \$21.09 | \$5.20 | \$2.65 | \$0.00 | \$28.94 |
| OPERATOR / LEVERMAN <i>OPERATING ENGINEERS - MARINE DIVISION</i> | 10/01/2011 | \$32.89 | \$5.20 | \$3.25 | \$0.00 | \$41.34 |
| RODMAN / SCOWMAN <i>OPERATING ENGINEERS - MARINE DIVISION</i> | 10/01/2011 | \$21.09 | \$5.20 | \$2.65 | \$0.00 | \$28.94 |
| SHOREMAN / DECKHAND <i>OPERATING ENGINEERS - MARINE DIVISION</i> | 10/01/2011 | \$21.09 | \$5.20 | \$2.65 | \$0.00 | \$28.94 |
| Outside Electrical - East | | | | | | |
| CABLE TECHNICIAN (Power Zone) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> | 08/30/2015 | \$26.11 | \$7.25 | \$1.78 | \$0.00 | \$35.14 |
| | 08/28/2016 | \$26.61 | \$7.50 | \$1.80 | \$0.00 | \$35.91 |
| | 09/03/2017 | \$27.14 | \$7.75 | \$1.81 | \$0.00 | \$36.70 |
| | For apprentice rates see "Apprentice- LINEMAN" | | | | | |
| CABLEMAN (Underground Ducts & Cables) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> | 08/30/2015 | \$36.98 | \$7.25 | \$8.12 | \$0.00 | \$52.35 |
| | 08/28/2016 | \$37.70 | \$7.50 | \$8.87 | \$0.00 | \$54.07 |
| | 09/03/2017 | \$38.45 | \$7.75 | \$9.53 | \$0.00 | \$55.73 |
| | For apprentice rates see "Apprentice- LINEMAN" | | | | | |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|---|-----------------------|------------------|---------------|----------------|--------------------------------------|-------------------|
| DRIVER / GROUNDMAN CDL <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> | 08/30/2015 | \$30.46 | \$7.25 | \$8.34 | \$0.00 | \$46.05 |
| | 08/28/2016 | \$31.05 | \$7.50 | \$8.89 | \$0.00 | \$47.44 |
| | 09/03/2017 | \$31.66 | \$7.75 | \$9.44 | \$0.00 | \$48.85 |
| For apprentice rates see "Apprentice- LINEMAN" | | | | | | |
| DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> | 08/30/2015 | \$23.93 | \$7.25 | \$1.72 | \$0.00 | \$32.90 |
| | 08/28/2016 | \$24.39 | \$7.50 | \$1.73 | \$0.00 | \$33.62 |
| | 09/03/2017 | \$24.88 | \$7.75 | \$1.75 | \$0.00 | \$34.38 |
| For apprentice rates see "Apprentice- LINEMAN" | | | | | | |
| EQUIPMENT OPERATOR (Class A CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> | 08/30/2015 | \$36.98 | \$7.25 | \$12.29 | \$0.00 | \$56.52 |
| | 08/28/2016 | \$37.70 | \$7.50 | \$12.95 | \$0.00 | \$58.15 |
| | 09/03/2017 | \$38.45 | \$7.75 | \$13.61 | \$0.00 | \$59.81 |
| For apprentice rates see "Apprentice- LINEMAN" | | | | | | |
| EQUIPMENT OPERATOR (Class B CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> | 08/30/2015 | \$32.63 | \$7.25 | \$9.05 | \$0.00 | \$48.93 |
| | 08/28/2016 | \$33.26 | \$7.50 | \$9.63 | \$0.00 | \$50.39 |
| | 09/03/2017 | \$33.92 | \$7.75 | \$10.21 | \$0.00 | \$51.88 |
| For apprentice rates see "Apprentice- LINEMAN" | | | | | | |
| GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> | 08/30/2015 | \$23.93 | \$7.25 | \$1.72 | \$0.00 | \$32.90 |
| | 08/28/2016 | \$24.39 | \$7.50 | \$1.73 | \$0.00 | \$33.62 |
| | 09/03/2017 | \$24.88 | \$7.75 | \$1.75 | \$0.00 | \$34.38 |
| For apprentice rates see "Apprentice- LINEMAN" | | | | | | |
| GROUNDMAN -Inexperienced (<2000 Hrs.) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> | 08/30/2015 | \$19.58 | \$7.25 | \$1.59 | \$0.00 | \$28.42 |
| | 08/28/2016 | \$19.96 | \$7.50 | \$1.60 | \$0.00 | \$29.06 |
| | 09/03/2017 | \$20.35 | \$7.75 | \$1.61 | \$0.00 | \$29.71 |
| For apprentice rates see "Apprentice- LINEMAN" | | | | | | |
| JOURNEYMAN LINEMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> | 08/30/2015 | \$43.51 | \$7.25 | \$15.06 | \$0.00 | \$65.82 |
| | 08/28/2016 | \$44.35 | \$7.50 | \$15.83 | \$0.00 | \$67.68 |
| | 09/03/2017 | \$45.23 | \$7.75 | \$16.61 | \$0.00 | \$69.59 |

Apprentice - LINEMAN (Outside Electrical) - East Local 104

Effective Date - 08/30/2015

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 60 | \$26.11 | \$7.25 | \$3.28 | \$0.00 | \$36.64 |
| 2 | 65 | \$28.28 | \$7.25 | \$3.35 | \$0.00 | \$38.88 |
| 3 | 70 | \$30.46 | \$7.25 | \$3.41 | \$0.00 | \$41.12 |
| 4 | 75 | \$32.63 | \$7.25 | \$4.98 | \$0.00 | \$44.86 |
| 5 | 80 | \$34.81 | \$7.25 | \$5.04 | \$0.00 | \$47.10 |
| 6 | 85 | \$36.98 | \$7.25 | \$5.11 | \$0.00 | \$49.34 |
| 7 | 90 | \$39.16 | \$7.25 | \$7.17 | \$0.00 | \$53.58 |

Effective Date - 08/28/2016

| Step | percent | Apprentice Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|------|---------|----------------------|--------|---------|------------------------------|------------|
| 1 | 60 | \$26.61 | \$7.50 | \$3.30 | \$0.00 | \$37.41 |
| 2 | 65 | \$28.83 | \$7.50 | \$3.36 | \$0.00 | \$39.69 |
| 3 | 70 | \$31.05 | \$7.50 | \$3.43 | \$0.00 | \$41.98 |
| 4 | 75 | \$33.26 | \$7.50 | \$5.00 | \$0.00 | \$45.76 |
| 5 | 80 | \$35.48 | \$7.50 | \$5.06 | \$0.00 | \$48.04 |
| 6 | 85 | \$37.70 | \$7.50 | \$5.13 | \$0.00 | \$50.33 |
| 7 | 90 | \$39.92 | \$7.50 | \$7.20 | \$0.00 | \$54.62 |

Notes:

Apprentice to Journeyworker Ratio:1:2

| | | | | | | |
|---|------------|---------|--------|--------|--------|---------|
| TELEDATA CABLE SPLICER OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 | 01/01/2015 | \$28.12 | \$4.25 | \$3.09 | \$0.00 | \$35.46 |
| | 01/01/2016 | \$28.98 | \$4.25 | \$3.12 | \$0.00 | \$36.35 |
| TELEDATA LINEMAN/EQUIPMENT OPERATOR OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 | 01/01/2015 | \$26.49 | \$4.25 | \$3.04 | \$0.00 | \$33.78 |
| | 01/01/2016 | \$27.31 | \$4.25 | \$3.07 | \$0.00 | \$34.63 |
| TELEDATA WIREMAN/INSTALLER/TECHNICIAN OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 | 01/01/2015 | \$26.49 | \$4.25 | \$3.04 | \$0.00 | \$33.78 |
| | 01/01/2016 | \$27.31 | \$4.25 | \$3.07 | \$0.00 | \$34.63 |
| TREE TRIMMER OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 | 02/01/2015 | \$18.05 | \$3.55 | \$0.00 | \$0.00 | \$21.60 |
| | 01/31/2016 | \$18.51 | \$3.55 | \$0.00 | \$0.00 | \$22.06 |
| This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is not on the ground. This classification does not apply to wholesale tree removal. | | | | | | |
| TREE TRIMMER GROUNDMAN OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 | 02/01/2015 | \$15.92 | \$3.55 | \$0.00 | \$0.00 | \$19.47 |
| | 01/31/2016 | \$16.32 | \$3.55 | \$0.00 | \$0.00 | \$19.87 |
| This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is on the ground. This classification does not apply to wholesale tree removal. | | | | | | |

| Classification | Effective Date | Base Wage | Health | Pension | Supplemental Unemployment | Total Rate |
|----------------|----------------|-----------|--------|---------|------------------------------|------------|
|----------------|----------------|-----------|--------|---------|------------------------------|------------|

Additional Apprentice Information:

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentice ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)

Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

- ** Multiple ratios are listed in the comment field.
- *** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.
- **** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

SECTION A

TECHNICAL SPECIFICATIONS

Salem Port Expansion Project

COMMERCIAL MARINA

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TECHNICAL SPECIFICATIONS

December 2015

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SECTION 01300

SUBMITTALS

1. GENERAL

1.1 SHOP DRAWINGS, MANUFACTURERS' SPECIFICATIONS AND INSTALLATION INSTRUCTIONS, SAMPLES, ETC.

A. The Contractor shall review and approve all submittals prior to submittal to the Owner. Each submittal shall be numbered serially and marked with the approval of the Contractor.

1. The Contractor shall submit to the Owner for approval, **three copies** plus as many copies as required to be returned, all Shop Drawings as called for under the various headings of these specifications.
2. Each submittal shall be numbered with the project name (abbreviated), specification section and submittal number in consecutive order (Ex NAME-02550-#). Where resubmission is required a letter shall be assigned to designate each resubmission (Ex NAME-02550-#A, NAME-2550-#B, etc.)
3. The Contractor shall submit all Shop Drawings to the Owner in sufficient time for checking and processing. Shop Drawings shall be of sufficient clarity so that copies thereof will be legible.
4. All Shop Drawings submitted by subcontractors for approval shall be sent directly to the Contractor for his approval. The Contractor shall be responsible for their submission to the Owner at the proper time so as to prevent delays in delivery of materials.
5. All submissions shall be referenced properly to indicate clearly the location, service, and function of each particular item and the specification paragraph under which it is being furnished.
6. Submittals that are related to or affect each other shall be forwarded simultaneously as a package to facilitate coordinated review. Uncoordinated submittals will be rejected.
7. The Owner reserves the right to require submittals in addition to those called for in individual sections.
8. The term "Shop Drawings" includes drawings, diagrams, schematics, descriptive literature, illustrations, schedules, performance and test data, calculations and similar materials furnished by Contractor to explain in detail specific portions of the work required by the Contract.
9. The Contractor shall stamp each sheet of each submission with a rubber stamp stating that he has examined and checked the submission as above, and shall date and sign each. Any submission, which, upon examination by the Owner, shows evidence of not having been thoroughly checked will be returned to the Contractor for completion of checking before it will be considered for review.

10. All calculations shall be performed and stamped by a Professionally Licensed Engineer who is authorized to perform engineering design in the location of the proposed work unless directed otherwise. Calculations shall be organized, legible and provide clear indications of the checks being performed, the codes being followed and all assumptions being made.
 11. All details on Shop Drawings submitted for approval shall show clearly the relation of the various parts of the work, and where correct fabrication of the work depends upon field measurements; such measurements shall be made and shall be noted on the Shop Drawings before being submitted for approval.
- B. Approval by the Owner shall not relieve Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with requirements of this Contract, except with respect to variations described and approved in accordance with Paragraph C below.
- C. If shop drawings show variations from Contract requirements, Contractor shall describe such variations in writing, separate from the drawings, at time of submission. All such variation must be approved by the Owner.
- D. The Contractor shall distribute approved submittals to job site and record documents files and to suppliers and subcontractors as required.
- E. Samples required by the specifications shall be submitted after the award of the Contract to the Owner. No material for which samples are required shall be fabricated or delivered to the site for use until representative samples of same have been approved in writing by the Owner. Such samples shall be furnished and delivered by the Contractor without charge.
1. All color samples shall be reviewed and approved by the Owner prior to inclusion into the work.
 2. Each sample shall be labeled to designate the material or product, the name of its producer, the name of the Contractor, and the name and number of the project; and each submission shall be accompanied by a certificate describing each sample submitted for approval, certifying that the material, equipment or accessory submitted complies with Contract requirements, and including the name and brand of product, the name and address of manufacturer, the name of the Contractor and the name of the project.
 3. Approved samples, unless incorporated in the work or otherwise specified, shall be kept on file (and accessible for inspection by the Owner until final acceptance of the project. If return on the samples is not requested within thirty (30) days after the acceptance of the project, they will be considered unclaimed material and disposed of by the Owner.
 4. Such samples as may be required for check tests shall be furnished by the Contractor without extra charge. Check tests will be made on materials delivered for use only as frequently as the Owner considers necessary to ensure compliance of materials used with Contract requirements. The cost of testing materials, or equipment, or accessories to check for compliance with specification requirements shall be borne by the Contractor.

1.3 PROJECT RECORD DOCUMENTS

- A. Keep on file at job site one complete set of up-to-date Contract Documents, including drawings and specifications, addenda, all shop drawings and manufacturer's data, testing data, change orders, field orders and other modifications. Documents shall be neatly and securely stored in files or on racks, clearly indexed by trade activity or specification section, and shall not be used for construction purposes.
- B. Legibly mark significant field changes such as the following, using colored pencils or felt-tipped pens:
 - 1. Drawings:
 - a. Locations of concealed utilities whether existing or new
 - b. All current horizontal and vertical survey control points
 - c. Field changes including dimension, location and detail,
 - d. Changes resulting from change order or field order,
 - e. Details not on original drawings.
 - 2. Specifications: manufacturer and model number of equipment actually installed.
 - 3. Shop Drawings and manufacturers' literature: changes made after the Owner's review.
- C. At completion of work, deliver completed record documents to the Owner. Final payment for project will not be made until the Owner reviews and approves these documents.

2. PRODUCTS (Not Applicable).

3. EXECUTION (Not Applicable).

4. MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT AND PAYMENT

- A. No separate measurement or payment shall be made for the work in this Section. Measurement and Payment for this item shall be included within the work it is associated with.

*** END OF SECTION ***

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

1. GENERAL

1.1 GENERAL DESCRIPTION

- A. Work under this shall be the providing the temporary facilities and site controls throughout the construction phase and as required to perform the work specified within the contract documents including but not limited to:
 - a. Site Security
 - b. Material Storage
 - c. Site Safety
 - d. Erosion Control and conformance to regulatory approvals and conditions
 - e. Signage as required

1.2 FACILITY REQUIREMENTS

- A. Provide Site Security
 - 1. Provide secure temporary closures to prevent unauthorized entry to the contractors authorized staging and work area including:
 - a. Temporary 6 foot minimum chain link fence
 - b. Locked gate
 - 2. Furnish, install, and maintain a bulletin board, protected from the elements in a prominent location at the work site, accessible to all employees and workers at the site, on which data of concern to the employees will be posted.
 - 3. Provide marked metal containers with tight-fitting covers for edible debris, enforce their use by employees. Provide on-site dump container for collection of waste material. Periodically remove and legally dispose of waste material off-site. Schedule cleaning operations so that dust and other contaminants resulting from cleaning will not fall on wet, newly-finished surfaces. Dispose of volatile wastes such as mineral spirits, oil or paint thinner in accordance with local and state regulations.
- B. Provide for Material Storage
 - 1. Temporary structures shall be constructed in a structurally-sound, weatherproof manner.
 - 2. Confine storage of materials to within the Limit of Work and areas as may be designated.
 - 3. Provide temporary sheds or other covered facilities for storage of materials subject to weather damage. Number and size of structures shall be subject to Owner's approval. Locate structures to avoid interference with work and relocate as required by progress of work.
 - 4. Remove structures and surplus stored materials at completion of work.
- C. Maintain site, temporary structures, storage areas, temporary fencing, etc., in a neat and orderly manner.

- D. Provide staging, hoists, temporary stairs, ladders, chutes, etc., as required, complying with applicable safety codes.
- E. The Contractor, including all subcontractors, will not be permitted to display any descriptive signs indicating their company names and names of equipment of materials installed in the work beyond the specific requirements established with the contract documents.

1.3 FIELD LAYOUT

- A. Contractor shall maintain a level, rod, and total station on job, and shall employ competent personnel for use thereof. The Owner shall have reasonable use of these instruments at all times.
- B. Project survey information has been located on drawings for Contractor's use. Contractor shall establish bench marks in at least two widely separated locations, and shall establish and maintain grades, lines, levels, and other dimensional reference guides as required. Annotate project record documents (specified in SECTION 01300) to indicate all modifications of grades, utilities, etc.

1.4 EROSION CONTROL AND SITE DRAINAGE

- A. Prior to beginning work, Contractor shall review erosion and sedimentation control requirements as stipulated in the project regulatory approvals and shall coordinate activities to insure proper installation including meetings with regulatory agencies as may be stipulated within the regulatory approvals.
- B. Upon beginning site work, Contractor shall assume complete responsibility for Project Area site erosion and sedimentation control and drainage for duration of Contract, and shall maintain such erosion control measures in a manner which will cause no damage and/or erosion or sedimentation directly or indirectly into waterways or to adjacent areas.
- C. Maintain all erosion control barriers in good functional condition throughout the project. Erosion and sedimentation control measures shall be inspected weekly and after any major storm event.
- D. Take all necessary measures to prevent vehicles leaving site from depositing mud on public ways. Clean up after and repair damage caused by trucks. Comply with applicable ordinances regarding noise control.
- E. Keep excavations, pits, trenches, and other upland construction areas free of water at all times, including backing up of drains and sewers. Provide hydraulic equipment to control surface and ground water. Pumping equipment shall be adequate to remove all hydrostatic pressure from structures until sufficient strength has been developed by the structure to protect work from displacement or other damage.
- F. Maintain ground water level (non-tidal) sufficiently below excavation level at all times to maintain stable working platform. Ground water shall be controlled so as to avoid adverse effects on established ground water elevation of adjacent sites.

1.5 SAFETY AND PROTECTION

- A. Comply with applicable safety regulations, including ANSI Series A10, Safety requirements for Construction and Demolition, and OSHA Part 1926, Construction Safety and Health Regulations. Provide barricades, fences and other protection measures as required.
- B. Minimize storage of flammable materials and ensure that such material is properly handled and stored. Provide fire extinguishers per code requirements and near locations of flammable products. Install prominent signs giving locations of fire alarms. Do not permit use of open fires or salamanders.
- C. Take all necessary precautions to ensure that finished or partially-completed work is properly braced and secured against wind, rain, snow and other adverse weather conditions.
- D. Remove snow and ice from roads, walks, work area, etc., which impedes access or drainage, or presents danger to workmen, public, or property.

1.6 WORK WITHIN NAVIGABLE WATERWAY

- A. Contractor shall keep proper lights each night between sunset and sunrise upon all floating plant and equipment and any other obstructions connected with the work in accordance with CG-169, Rules of the Road, and Code of Federal Regulations, Title 33, Chapter 1, Subchapter C and Chapter 11, Part 207. Contractor shall be required to install and maintain for the duration of the Contract, standard obstruction lights upon all stakes, piles, dolphins, or upon any other obstruction connected with the work which are located in navigable waters. The obstruction light shall consist of a quick flashing white light which shows not less than sixty flashes per minute when viewed from any direction. The light shall have a luminous intensity of not less than a two-mile range.
- B. Contractor will be required to conduct the work in such a manner as to obstruct navigation as little as possible and in case Contractor's plant so obstructs vessels, it shall be promptly moved on the approach of any vessel, to such an extent as may be necessary to afford a safe practicable passage. Upon completion of the work, Contractor shall promptly remove his plant, buoys and other markers placed by him during execution of this Contract.
- C. Should the Contractor, during the progress of the work lose, dump, throw overboard, sink or misplace any materials, plant, machinery, or appliance which in the opinion of the Owner may be dangerous to berthing vessels or obstruct navigation, the Contractor shall recover and remove the same with the utmost dispatch. Should the Contractor refuse, neglect or delay compliance with the above, such obstructions may be removed by the Owner, and the cost of such removal shall be deducted from money due the Contractor.

1.7 TEMPORARY UTILITIES

- A. Maintain strict supervision to enforce conformance with applicable standards and safe practices and prevent abuse of services. Obtain necessary permits, temporary easements, etc.
- B. Light and Power:
 - 1. Provide temporary light and power for construction needs, safety and security throughout construction period. Suitably protect temporary system by fused or circuit breakers. Panelboards, safety switches and electrical outlets shall be enclosed and grounded. Provide

meters as required. Entire system shall comply with NEC requirements for temporary wiring.

2. Make necessary arrangements with power company to install temporary service, including temporary poles and transformer.

C. Heating and Ventilation:

1. Provide temporary heat and ventilation as required to protect against dampness, cold and condensation; provide heat and humidity suitable for curing and installation of materials; provide ventilation adequate for work safety and fire protection. Temporary heaters shall be smokeless portable unit heaters acceptable to Underwriter' Laboratories, local fire department and the Owner.

D. Water and Sanitary Facilities:

1. Provide temporary water for construction purposes, sanitation, drinking, first aid, fire protection and cleaning. Furnish and install all connections, pipes, fittings, meters, etc., necessary for temporary service, and maintain same in good condition. Take necessary precautions to prevent waste of water.

2. PRODUCTS (Not Applicable).

3. EXECUTION (Not Applicable).

4. MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT AND PAYMENT

- A. No separate measurement or payment shall be made for the work in this Section. Measurement and Payment for this item shall be included within the work it is associated with.

*** END OF SECTION ***

SECTION 01700

PROJECT CLOSEOUT

1. GENERAL

1.1 CLEANING

- A. Use cleaning materials as recommended by product manufacturers and appropriate specification sections. Employ experienced workmen or professional cleaners.
- B. Before inspection for substantial completion, do all necessary cleaning, including the following:
 - 1. Sweep and rinse with clear water exterior finished surfaces, rake clean other site surfaces.
 - 2. Refer to specification sections for additional requirements for particular surfaces.

1.2 SUBSTANTIAL COMPLETION AND FINAL INSPECTION

- A. Submit written certification that project, or designated portion of project, is substantially complete, and request, in writing, a final inspection. The Owner will make an inspection within 10 days of receipt of request.
- B. Should the Owner determine that the work is substantially complete, he will prepare a punch list of deficiencies that need to be corrected before final acceptance and issue a notice of substantial completion with the deficiencies noted.
- C. Should the Owner determine that the work is not substantially complete, he will immediately notify Contractor, in writing, stating reasons. After Contractor completes work, he shall re-submit certification and request for final inspection.

1.3 CLOSE-OUT SUBMITTALS

- A. Refer to EXECUTION portion of each specification section for closeout requirements, including operating and maintenance manuals; instruction of Owner's personnel in maintenance and operation of systems; submission of certifications, test reports, etc.; provision of spare parts and maintenance materials, all of which shall be neatly wrapped or packaged in standard sizes and clearly labeled.
- B. Completed project record documents specified in SUBMITTALS, SECTION 01300.
- C. Certificate of insurance for products and completed operations.
- D. Typed list of major subcontractors and suppliers with addresses and telephone numbers.
- E. Submissions specified elsewhere in Contract Documents, including consent of surety to final payment; affidavit that all bills and indebtedness connected with the Work have been paid; and certification of payment from subcontractors and suppliers, or bond satisfactory to the Owner indemnifying the Owner against liens or other claims.

1.4 ACCEPTANCE OF THE WORK

- A. After all deficiencies have been corrected, a Letter of Final Acceptance will be issued. If only designated portions of the project have been inspected, a Letter of Partial Acceptance will be issued for that portion of the Work.
- B. Acceptance may be given prior to correction of deficiencies that do not preclude operation and use of the facility; however, final payment will be withheld until all deficiencies are corrected.
- C. Until receipt of Letter of Final Acceptance, Contractor shall be responsible for the work of this Contract.

1.5 POST-CONSTRUCTION INSPECTION

- A. Prior to expiration of one year from date of final acceptance, the Owner will inspect the project to determine whether corrective work is required. Contractor will be notified in writing of all deficiencies. In accordance with terms of the General Conditions, corrective work must start on noted deficiencies within 10 days of receipt of notification to Contractor.

2. PRODUCTS (Not Applicable).

3. EXECUTION (Not Applicable).

4. MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT AND PAYMENT

- A. No separate measurement or payment shall be made for work in this Section. Measurement and Payment for this item shall be included within the work it is associated with.

*** END OF SECTION ***

SECTION 02000

SITE PREPARATION

1 GENERAL

1.1 DESCRIPTION

- A. These site preparation requirements shall apply to all project work operations within this Contract.
- B. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to prepare the site, complete, as indicated on the Contract Documents, as specified, and as follows:
 - 1. Mobilization and demobilization of all equipment, labor, materials, supervision, survey and any incidentals required to satisfactorily complete this project in accordance with these Specifications, the Contract Drawings and as directed by the Owner.
 - 2. Comply fully with all requirements and conditions of all Project Permits including performance of any miscellaneous work required to ensure full compliance and not otherwise covered by individual items in the contract.
 - 3. Perform all other miscellaneous work obviously required to complete the project, but not covered by individual items in the contract.
 - 4. Perform site work operations and the removal of debris and waste materials to assure minimum interference with navigation, streets, walks, parking facilities, buildings and all other adjacent facilities.
 - 5. Obtain governing authorities written permission, when required, to close or obstruct street, walks and adjacent facilities. Provide alternate routes around closed or obstructed traffic ways, when required by governing authorities.
 - 6. Obtainment of written permission from property owners to trespass and/or transgress their properties where an easement has not been granted.
 - 7. Control dust caused by the work. Dampen surfaces as required. Comply with pollution control regulations of governing authorities.
 - 8. Provide debris booms and siltation curtains, as required, to meet regulatory agency conditions.
 - 9. If the Contractor, in the course of excavation, uncovers or otherwise encounters any artifacts, whether historic or prehistoric, he shall bring them to the immediate attention of the Owner, and stop all work in that vicinity of said artifacts until directed by the Owner.
 - 10. If the Contractor, in the course of excavation, uncovers or otherwise encounters any suspected hazardous or unidentified substances, he shall bring them to the immediate attention of the Owner, and stop all work in that vicinity of said until directed by the Owner.

1.2 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Demolition under DEMOLITION, SECTION 02110
 - 2. Excavation under EARTHWORK, SECTION 02300

3. Dredging under DREDGING by MECHANICAL METHOD, SECTION 02410

1.3 REFERENCES

- A. The following standards shall apply to the work of this Section.
 - 1. Commonwealth of Massachusetts Highway Department (MHD) Specifications - Standard Specifications for Highways and Bridges

1.4 SUBMITTALS

- A. Location and phasing plan (if required) of staging areas and schedule for moving staging equipment into those areas shall be submitted for Owner's approval prior to mobilization and related site preparation operations

1.5 PROTECTION

- A. Protect existing structures and facilities that are adjacent to the work area from damage caused by the project operations. Repair all damage caused to the satisfaction of the Owner, at the sole expense of the Contractor.
- B. Do not interfere with use of adjacent buildings or facilities. Maintain free and safe passage to and from adjacent buildings and facilities or both and between them and the public way.
- C. Cease operations and notify Owner immediately if safety of adjacent structures, workers, or the general public appears to be endangered. Take precautions to properly support structures and protect workers and general public. Do not resume operations until safety is restored.
- D. The Contractor shall erect a security fence around the limit of work areas as defined in the staging and phasing plan.

1.6 EXISTING SERVICES

- A. Arrange and pay for disconnecting, removing, capping, and plugging utility services as indicated on the Contract Documents. Disconnect and stub off. Notify the affected utility company in advance and obtain approval before starting this work.
- B. Place markers to indicate location of disconnected services.

1.7 MAINTAINING TRAFFIC and MATERIAL DELIVERIES

- A. Do not close or obstruct roadways or other public access areas without authorization or permits.
- B. Conduct operations with minimum interference to public or private roadways. Coordinate with local and state officials, police, and emergency agencies regarding all operations on public roadways including requirements for Police Details.
- C. Contractor shall be aware of any and all limitations of truck access for delivery and removal of material and equipment to/from the site and coordinate all activities as may be required.

2 PRODUCTS

2.1 MATERIALS

- A. Materials shall be as selected by the Contractor and approved by the Owner, except as indicated on the Contract Drawings and/or in the Specifications.
- B. Construction Fence
 - 1. Unless otherwise specified on the Construction documents, Contractor shall provide chain link fencing around perimeter of work area and staging area to prevent public access and provide public safety. The Fence shall be a minimum of 6' high and constructed of galvanized steel chain link with posts at 8' on center. Fence shall be supported by concrete blocks to receive posts.
 - 2. Fence shall be installed around all areas dedicated for construction activities to prevent public access and provide for public safety.

3 EXECUTION

3.1 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. Notify "Dig Safe" and local utilities and services as applicable prior to conducting any work in order to have all known utilities and services marked out before work begins.
- B. Existing structures and utilities shall be suitably protected from damage, including but not limited to existing pavements and curbs, lighting, fencing, concrete vault, manholes, and utility lines.

3.2 PROTECTION OF CONSTRUCTION SITE

- A. It is the Contractor's responsibility to secure the construction site, both for the protection of the ongoing work and the protection of the public. The location of construction fencing used for this purpose shall be approved by the Owner.

3.3 INSPECTION

- A. The Owner will assign inspectors and/or resident engineers to this project on either a full time or part time basis, as required to cover the work under this Contract, as justified by the Owner. The inspector or resident engineer shall be the Owner's representative for this project.
- B. The Owner must be notified at least 48 hours in advance of all material shipments in order make arrangements for the shipment to be inspected as they arrive to the site.
- C. All materials that are not suitable for placement on this project and/or have been rejected by the Owner's representative shall be removed from the site immediately; the cost of the removal of these materials shall be the responsibility of the Contractor.
- D. Unless otherwise agreed upon with the Owner, no work shall be done with materials that are partially or completely buried or hidden from view without the presence of the Owner's representative. The Owner reserves the right to have all materials uncovered for inspection if placed without direct supervision, at the sole expense of the Contractor. No materials shall be paid for under this Contract that have not been examined and passed by the Owner's representative, or for any reason are placed outside the prescribed limits of the work.

- E. The Owner shall be permitted at all times to check the lines, grades, elevations, reference marks, batter boards, etc. set by the Contractor. Any errors or discrepancies in these items discovered by checks shall be corrected by the Contractor. Such checks shall not be construed as to be an approval of the Contractor's work and shall not relieve or diminish in any way the responsibilities of the Contractor for the accurate and satisfactory completion of the entire work. The Contractor shall be available to assist the Owner with these checks as needed.

4 MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

- A. Measurement for MOBILIZATION shall be made by Unit Price Lump Sum.
- B. Measurement for SITE PREPARATION shall be made by Unit Price Lump Sum.

4.2 METHOD OF PAYMENT

- A. Payment for MOBILIZATION shall be by the Unit Price Lump Sum and shall include 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.
- B. 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 requirements to provide vehicle and pedestrian access to the pier, 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.

4.3 PAYMENT ITEMS

| <u>ITEM</u> | <u>DESCRIPTION</u> | <u>UNIT</u> |
|-------------|--------------------|-------------|
| 02000-1 | Mobilization | LS |
| 02000-2 | Site Preparation | LS |

*** END OF SECTION ***

SECTION 02110

DEMOLITION

1 GENERAL

1.1 DESCRIPTION

- A. Provide all labor, materials, equipment, and supervision necessary to complete the work specified in this Section.
- B. Scope of work includes, but is not limited to the removal, relocation and/or disposal of the following:
 - 1. Rip rap stone not incorporated in work.
 - 2. Unsuitable material found during excavations
 - 3. Excess granular and stone material not incorporated into the work
 - 4. Miscellaneous hardware, steel angles, pieces of timber, concrete, rubble and other material which are encountered during the course of work which interferes with work specified to be done.
- C. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Site Preparation under SITE PREPARATION, SECTION 02000

1.2 SUBMITTALS

- A. Contractor to provide certification that all materials disposed of has been done so in accordance with all municipal, state and federal regulations

2 PRODUCTS

2.1 MATERIALS

- A. No materials are to be supplied under this specification.

3 EXECUTION

- 3.1 Bidders shall examine the site and make their own estimates of the types and quantities of demolition, which will be required to fulfill the Contract requirements.
- 3.2 All materials removed during demolition designated for disposal shall become the property of the Contractor unless otherwise noted.
- 3.3 All materials removed during demolition, except that which is to be reused, shall be disposed of off the site in conformance with all municipal, state and federal regulations.
- 3.4 During demolition activities which are over or in water, the area of the demolition work will be enclosed with a floating boom approved by the Owner.

- 3.5 Contractor shall use extreme caution when demolishing structures. Damage caused to adjacent structures or a structure to remain which is caused by the Contractor shall be repaired by the Contractor as directed by the Owner at no additional cost to the Owner.

4. MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT AND PAYMENT

- A. No separate measurement or payment shall be made for work in this Section. Measurement and Payment for this item shall be included within the work it is associated with.

*** END OF SECTION ***

SECTION 02316
STEEL PIPE PILES

1. **GENERAL**

1.1 **DESCRIPTION**

- A. Provide all labor, materials, equipment, and supervision necessary to complete work specified in this Section.
- B. Scope of work includes, but is not necessarily limited to, furnishing and installing the following:
 - 1. Steel pipe mooring piles, concrete filled.
- C. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Coating of piles under Section 09800, COATINGS.
 - 2. Concrete under Section 03000, REINFORCED CONCRETE
 - 3. Floats under Section 02400, TIMBER FLOATS

1.2 **QUALITY ASSURANCE**

- A. Except as noted, work shall conform to the latest editions of the following codes specifications and standards
 - 1. American Society for Testing and Materials (ASTM)
 - 2. American Welding Society (AWS)
 - 3. American Institute of Steel Construction (AISC)

1.3 **SUBMITTALS**

- A. Submit for approval by the Engineer proposals for the following items:
 - 1. Pipe pile materials and shop drawings.
 - 2. Pile splicing methods and materials.
 - 3. Driving plan and schedule for installation of the pipe piles.
 - 4. Method of installation of piles including size and type of pile hammer.
 - 5. Templates and falsework to be used for support and layout of piles during driving.
 - 6. Pile points and method of attachment.
- B. Certificates:
 - 1. Material specifications and certification that materials are new and meet or exceed specification requirements.
 - 2. Material List

1.4 **PRODUCT HANDLING**

- A. Piles shall be handled with care to prevent damage to pile and coating. Damaged piles will be rejected and replaced at no additional cost to the Owner. Piles shall be stored with a space beneath the piles and situated to prevent being exposed to standing water.

2. PRODUCTS

2.1 MATERIALS

- A. Mooring Piles: Pipe piles shall be 14" outside diameter with 0.5 inch wall thickness as designated on the Drawings. Pipe shall be seamless or fusion-welded and conform to ASTM A252, Grade 3 for Welded and Seamless Steel Pipe Piles.
- B. All piles to be concrete filled with uniform rounded crown at top.

3. EXECUTION

3.1 DRIVING EQUIPMENT

- A. Pile Hammers: Vibratory hammer or air, steam or diesel-powered, of a type approved by the Engineer.
 - 1. Impact Hammers: The hammer furnished shall have a capacity at least equal to the hammer manufacturer's recommendation for the total weight of pile and character of subsurface material to be encountered. The minimum driving energy of the hammer shall be 10,000 foot-pounds. For piles of any length, the maximum driving energy of the hammer shall be operated at the rate recommended by the manufacturer throughout the entire driving period. Sufficient pressure shall be maintained at the hammer so that: (1) for double-acting hammer, the number of blows per minute during and at the completion of driving of a pile is equal to at least 90% of that at which the hammer is rated; (2) for single-acting hammer, there is a full upward stroke of the ram; and (3) for differential-type hammer, there is a slight rise of the hammer base during each upward stroke.
 - 2. Vibratory Hammers: Vibratory hammers will be allowed when bearing capacity determination by blow count or driving energy is not required.
- B. Driving Helmets: The driving helmet or cap shall be capable of protecting the head of the pile, minimizing energy absorption, and transmitting hammer energy uniformly and consistently during the entire driving period. The driving helmet or cap shall fit snugly on the top of the pile so that the energy transmitted to the pile is uniformly distributed over the entire surface of the pile head. Demonstrate to the Engineer that the equipment to be used on the project performs the above functions.

3.2 HANDLING

- A. Inspect piles in the leads, and where the protective shell is impaired the piles shall be repaired unless the pile is damaged to such extent that it is rejected. Rejected piles will be replaced at no additional cost to the Owner. Support pile laterally during driving, but not unduly restrained from rotation in the leads. Where pile orientation is essential, take special care to maintain the orientation during driving.

3.3 DRIVING PILES

- A. Steel Pipe Piles:
 - 1. Drive without interruption to the required depth
 - 2. Mooring Piles:

- a. Tip Elevation: - 46 ft (MLW)
 - b. Cut-off Elevations: +20.0 MLW or as indicated on drawings
- B. Pile support: All piles shall be supported by using either a two-level driving template with the top level close to the pile cut-off elevation and the lower level approximately 15 feet below or by the use of fixed lead or by a method approved by the Engineer.
- C. Tolerances in Driving:

Heads of piles shall be within 2 inches of the location indicated. Manipulation of piles to force them into position will not be permitted. Check all piles for heave. Re-drive heaved piles to the required elevation.

Pile tolerance shall be coordinated with float pile guide location to meet specified clearance requirements

3.4 INSTALLATION

- A. All piles shall be driven without interruption. Cut off shall be as indicated on drawings.
- B. All piles shall be marked at a given distance from the bottom, which will show above the waterline after driving, so that the bottom elevation of each pile and its relation with adjacent piles can be recorded.
- C. Only one pile splice per pile shall be permitted.
- D. Contractor shall notify Engineer 48 hours prior to pile driving and no piles shall be driven to final position without the presence of the Engineer's Representative.
- E. Mooring Piles for marina shall be driven using the pile guides as the driving template.
- F. Pile coatings shall be protected from falsework or driving templates to prevent coating damage or loss.

3.5 RECORDS

- A. A complete and accurate record of each pile shall be furnished by the Contractor. The record shall indicate the pile location, diameter, length, hammer (make and model), number of blows for final 6 inches of penetration, and all other pertinent information.

3.6 DEFECTIVE WORK

- A. Piles damaged, mis-located or driven out of alignment shall be replaced as directed at no additional cost to the Owner.

4. MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

- A. Measurement for Steel Pipe Piles shall be made on a unit price basis, Each, complete in place

4.2 METHOD OF PAYMENT

- A. 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 materials, equipment, labor, supervision and incidental or appurtenant work, including all cutting, coating, concrete filling, fiberglass caps, horizontal pile movements and survey required to complete the work in accordance with these Specifications and as shown on the Contract Drawings.

4.3 PAYMENT ITEMS

| <u>ITEM</u> | <u>DESCRIPTION</u> | <u>UNIT</u> |
|-------------|--------------------|-------------|
| 02316-1 | Steel Pipe Piles | EACH |

END OF SECTION

SECTION 02400

TIMBER FLOAT

1 GENERAL

1.1 DESCRIPTION

- A. Scope of work includes, but is not necessarily limited to design, manufacture, supply and installation of the following:
 - 1. Dock Components including
 - a. Timber Floating Docks
 - b. All Float connections, flotation units, pile guides and mooring system
- B. The Contractor shall supply any and all labor, materials, tools, equipment, trucking, disposal, permits, survey, supervision and any incidentals necessary to complete the work under this Section.
- C. Related work specified elsewhere includes:
 - 1. Section 02000 Demolition
 - 2. Section 05200 Structural Aluminum
 - 3. Section 05600 Miscellaneous Metals
 - 4. Section 06310 Timber Treatment

1.2 QUALITY ASSURANCE

- A. Except as noted, work shall conform to the latest editions of the following codes specifications and standards
 - 1. American Society for Testing and Materials (ASTM)
 - 2. American Welding Society (AWS)
 - 3. American Institute of Steel Construction (AISC)
 - 4. American Institute of Timber Construction (AITC)
 - 5. American Concrete Institute (ACI)
 - 6. American Wood-Preservers Association (AWPA)
 - 7. Commonwealth of Massachusetts, Highway Department, Standard Specifications Highways and Bridges.
- B. Manufacturers of the float system must meet the following requirements
 - 1. Have a minimum of 5 years experience in the design, production, and installation of timber floating dock systems
 - 2. Warrant the product for a minimum of two years
 - 3. Life of the product is to be a minimum of 15 years with minor maintenance

1.3 SUBMITTALS

- A. Submit for approval by the Owner the following items
 - 1. Examples of previous design/installments of similar systems
 - 2. Overall plan, cross-section, and details of the proposed system
 - 3. Material list and specifications
 - 4. Schedule and method for installation of the system.

5. Design calculations of all structural components and connections in a clear organized and readable form acceptable to the Owner, complete with the signature and seal of a Registered Professional Engineer, licensed in the Commonwealth of Massachusetts, responsible for the work.
6. Shop drawings: Detailed shop drawings illustrating all structural members and connections for review and acceptance and shall indicate all material thicknesses, dimensions and show in detail all connections for approval prior to fabrication.

B. Certificates

1. Certify that all materials are new and meet or exceed specification requirements
2. Certify that the system meets or exceeds the specified performance requirements

1.4 PRODUCT HANDLING

- A. System components shall be handled and stored with care to prevent damage. Damaged members will be rejected and replaced at no additional cost to the Owner.

2 PRODUCTS

2.1 FLOAT LAYOUT

- A. The proposed dock and anchoring system are shown on the accompanying drawing(s). Noted are locations and sizes of the gangway(s) and timber floating dock(s).

2.2 MATERIALS

- A. Floating Docks: Unless otherwise specified all timber to be used shall be treated No. 1 Dense Southern Pine as graded by SPIB and with design values per NFPA National Design Specification or the equivalent for Douglas Fir as graded by WCLIB and WWP.

All new southern pine timber members to which the public may be exposed shall be treated with alkaline copper quaternary (ACQ) in accordance with AWP standards for material subject to salt water use and shall obtain a green tint due to the treatment.

All other timber members to which the public shall not be exposed shall be new and treated with Chromated Copper Arsenate (CCA) in accordance with AWP standard P5 and U1-UC5A for materials subject to salt water use and shall obtain a green tint due to the treatment.

Decking shall be a Tropical Hardwood such as Ipe

1. Tropical hardwood shall be supplied by a company that operates in the Guiana Shield countries in conformity with the International Conventions and National Forestry Regulations relating to the management of forestry concessions. Company shall enforce the protection of the endangered species listed by CITES (Convention on Trade in Endangered Species) and the bio-diversity of the ecosystems and shall respect the Intellectual Property Rights of the Indigenous Peoples, whose communities are the beneficiaries of the Company's field operation.
2. Tropical hardwood shall be supplied by a company that stresses the need for low impact forestry operations, ensuring that its forestry extraction is state of the art while constantly monitoring the effect of its logistics systems on watershed management and its use of biodegradable wood preservatives.

All timber shall be new and supplied with nominal dimensions unless otherwise noted.

B. Flotation Units

1. Encasements: All units shall be rotationally molded for seamless, one-piece construction. Nominal wall thickness of .15".

2. Encasements shall be filled with polystyrene (EPS) beads. The EPS beads are steamed together to provide less water absorption and a solid core for structural strength. Contents shall have a 1.0 to 1.5pcf density with water absorption not to exceed 3.0pcf.
- C. Pile guides: Float shall use hoop-type pile guides having the following properties:
1. Minimum 1" clearance around pile.
 2. Minimum 2" schedule 40 pre-bent to a radius, bolted to two 1.5" schedule 80 inside pipes.
 3. Pipes shall be steel and meet ASTM A36
 4. Ultra High Molecular Weight (UHMW) Polyethylene
 5. All hardware shall be heavy duty, suitable for the intended service and appropriate for a waterfront environment.
- D. High Density Polyethylene – UHMW Polyethylene used in any of the float or pile guide appurtenances shall conform to the following
- | | | |
|-----------------|------------|----------------------------|
| Izod Impact | ASTM D256 | 27 ft.-lb/inch (min.) |
| Ult. Tensile | ASTM D638 | 4.5 ksi (min.) |
| Coeff. Friction | ASTM D1894 | 0.20 static/kinetic (max.) |
- E. Mooring Cleats: All cleats and other vessel tie-up hardware shall be as indicated on the contract drawings. All tie-downs shall be through-bolted to the float structure and have sufficient bolting and dock structure to withstand 1.5 times the rated strength capacity of the hardware. All tie-downs and hardware shall be of non-corrosive metal. An 8-inch cleat is the minimum acceptable cleat size if no size is shown on the Contract Drawings.
- F. Float Fenders
1. All berthing faces of float system shall have fender protection
 2. Fendering shall be DURAMAX 100 Series DB-115 or equal with a 3-3/4 inch high" type fender and weigh a minimum of 4.5 pounds per lineal foot and made from a fungus and UV resistant PVC compound.
 3. Color shall be grey.
 4. Fendering shall be attached with lag or expansion bolts with washers spaced as required to prevent tearing separation from float by vessel movements and berthing maneuvers.
- G. All steel utilized within the system shall be hot-dip galvanized according to ASTM A-123 and A-153. All structural steel shall be fabricated from ASTM A-36 grade steel. All bolts, nuts and washers shall be fabricated in accordance with ASTM 307.
- H. New floats shall have aluminum bearing plate (1/8 inch minimum thickness by 5.5 feet by 3 feet) attached to float where new gangway bears on new timber float. Aluminum members shall be grade 6061-T6 with bolted or welded connections. All bolts or fasteners in contact with aluminum members shall be non-metallic or 6061 aluminum or 316 stainless steel.
- I. Stainless Steel
- All stainless steel shall conform to type 18-8 (300 Series), 304 or 316.

2.3 PERFORMANCE

- A. The float shall be of non-articulated design and shall function as a unified structure resisting twist and pitch, providing a suppressed conformance to wave forms. The connection between units shall be subject to approval of the Owner. Modules shall be unsinkable even if structurally damaged. The contractor shall be responsible for the float meeting the following minimum performance requirements to the approval of the Owner.

- B. Walking surfaces of adjacent floats shall align. A difference in elevation of ¼ inch or more is unacceptable. Assembled floats shall be separated one from the other at least ¼ inch such that they do not rub together. Floats shall be +/- 1/8 inch of design dimensions and shall assemble into a unified structure without field trimming or modification.
- C. The contractor shall warranty float materials, accessories, workmanship and performance for one full year from date of final acceptance of float installation.
- D. The floats shall be designed to be removed from the steel pile guides if necessary.

2.4 FLOATING DOCK DESIGN REQUIREMENTS

- A. The following design loads shall be considered the minimum loads to which the floating docks will be submitted. The floats will be able to resist these loads in any combination throughout the life of the structure. It is intended that the floats will remain in service year round.
- B. Site Environmental Conditions
 - 1. Site Exposure: Site exposure is predominately from the Southeast. Float Manufacturer shall perform their own assessment of exposure conditions including fetch, water depth and wave refraction and reflection conditions as may be required for design. Assumptions shall be included with calculations.
 - 2. Wind Conditions: Float Manufacturer shall make their own assessment of wind conditions for design of their float system but shall be, at a minimum, based on the following:
 - a 100 year wind: 65 mph for 30 sec duration
 - 3. Water Levels:
 - a Extreme Low Water - 2.0 ft
 - b Mean Low Water (MLW) 0.0 ft
 - c Mean High Water + 8.9 ft
 - d High Tide Line +11.0 ft
 - e FEMA 100 yr Condition - VE Zone +12.0 ft
 - 4. Marina - Proposed Drafts: 9 to 10 feet MLW
- C. Floats - Wave and Wake Loads
 - 1. Design wave – Extreme Condition
 - a. Wave Height: $H_s = 4$ feet, $H_{10} = 5.1$
 - b. Wave Period: 3.7 sec
 - 2. Design Wave – 25 year return period
 - a. Wave Height: $H_s = 2$ feet, $H_{10} = 2.5$
 - b. Wave Period: 3.7 sec
 - 3. Design Wake: 2 foot
- D. Float System must also be designed to withstand fatigue/torsional loads from wake/wave action.
- E. Criteria for loading survival is the ability to survive, without failure, one million cycles of a 1-foot displacement over a 30-foot length. Direction of wave shall be applied in the direction that provides the worst case loading to the system.

2.5 FLOATING DOCK LOADING REQUIREMENTS

- A. The following design loads shall be considered the minimum loads to which the floating docks will be submitted. The floats will be able to resist these loads in any combination throughout the life of the structure.

1. Vertical loads

- a. Dead Loads: Include actual weights of all permanent components including placed and attached parts. All floating docks shall have 14-20 inches of freeboard under dead loads and shall have a level floating dock surface.

- b. Uniformly distributed live loads:

All docks shall be designed structurally for 85psf live load.

Flotation

docks - 40 psf with zero freeboard

docks - 20 psf with 8 inches freeboard

- c. Concentrated live load of 400 pounds:

Concentrated load anywhere along edge at 5' from corner while maintaining 8 inches of freeboard at the load point.

- d. Docks used as landings for access ramps shall be designed to carry the pertinent ramp dead loads with the required freeboard and remain level.

2. Horizontal Loads

- a. Wind loads: Are based on a design 65 mph wind, which corresponds to a 14 psf load on unshielded vessels and a 3 psf load on shielded vessels. Similar wind loadings must also be applied to exposed profiles of the docks.

- b. Wake/Wave loads: The design wake/wave has a height of 2.5 feet from a southerly direction. The system must also be designed to withstand fatigue/torsional loads from wake/wave action. The criterion for loading survival is one million cycles of a 1-foot displacement over a 30-foot length.

- c. The installed and connected floating system shall be designed to resist impact berthing-energy of 500 foot pounds, applied at an angle of ten degrees to the longitudinal axis of the finger or walkway, at any location that energy might be applied.

3. Current loads: The design current force on the float system shall be based on 1 knot perpendicular to the float.

4. All horizontal loadings will be transmitted through the docking system to the anchor system. The anchor system will consist of steel piles. These connection points represent a "hard point" in the dock system and must be accounted for in the design.

5. Pile guide and its support shall be designed to the maximum design load, but not less than 10,000 pounds.

3 EXECUTION

3.1 INSPECTION

- A. Prior to installing the system, the Owner shall be contacted by the Contractor for inspection of all components.

- B. Prior to installing the system the Contractor shall inspect the site and all other work affecting the installation.

3.2 INSTALLATION

- A. The system shall be installed as shown on submitted plans or as agreed upon by the Owner and Contractor.

- B. Connection of the system to the anchoring system shall be done according to submitted plans or as agreed upon by the Owner and Contractor.
- C. All holes and cuts in treated timbers made after the pressure-treated process shall be given 2 brush coats of CCA preservative; the second application to be made after the first has been fully absorbed.
- D. Timber decking shall be edged with a minimum ¼ inch radius or chamfer.

3.3 DEFECTIVE WORK

- A. Any damaged portions shall be replaced as directed by the Owner at no additional cost to the Owner.
- B. Any improperly installed components shall be removed and replaced or corrected as directed by the Owner at no additional cost to the Owner.
- C. Failure of system to float level and be stable shall be considered a defect. Contractor shall make the necessary changes to correct the defect at no additional cost to the Owner.

4 MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

- A. Measurement for TIMBER FLOATS 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 supply and installation of all items.

4.2 METHOD OF PAYMENT

- A. 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

4.3 PAYMENT ITEMS

| <u>ITEM</u> | <u>DESCRIPTION</u> | <u>UNIT</u> |
|-------------|--------------------|-------------|
| 02400-01 | Timber Floats | Lump Sum |

*** END OF SECTION ***

SECTION 02600

WATER SERVICE AND APPURTENANCES

1 GENERAL

1.1 SCOPE

- A. The work of this section includes the furnishing of all labor, tools, equipment and materials and performing all operations necessary for the construction of water service, fittings, valves, sleeves, hangers, and other related items as specified herein and as shown on the Drawings. All products and materials shall conform to the latest appropriate AWWA Standards, and as otherwise specified hereinafter.

1.2 RELATED SECTIONS

- A. Sections which directly relate to the work of this Section include:
 - 1. Earthwork under EARTHWORK, SECTION 02300
 - 2. Timber floats under TIMBER FLOATS, SECTION 02400
 - 3. CHLORINATION AND PRESSURE TESTING, SECTION 02675

1.3 DESIGN CRITERIA

- A. The materials covered by this specification are intended to be standard materials of proven ability as manufactured by reputable concerns. The specifications call attention to certain features but do not purport to cover all details entering into the construction of the materials. Materials shall be designed and constructed in accordance with the best practice of the industry and shall be installed in accordance with the manufacturer's recommendations.
- B. Contractor shall verify all products, materials and installation meets with the Salem Water and Sewer Department design standards.
- C. Materials for this project shall conform with the applicable American Water Works Association (AWWA) Standards, latest edition, as referenced below:
 - 1. AWWA C800 Underground Service Lines and Fittings
 - 2. AWWA C901 Polyethylene Pressure Pipe and Tubing for Water Service

1.4 PRODUCT HANDLING

- A. All products delivered to the project site shall be accompanied by test reports certifying that the pipe conforms to the ASTM specifications listed herein. Products shall be shipped, stored and handled in a manner consistent with the written recommendations of the manufacturer and as to not to degrade quality, serviceability or appearance. Any unit found to be defective either before or after installation shall be removed from the project site and replaced with a sound unit.
- B. If stored for more than two weeks, the materials shall receive all maintenance considerations required by the manufacturer for proper storage of the materials.
- C. All pipe delivered to the project site shall include certified test reports that the pipe conforms to AWWA Standards. All tests shall be in accordance with AWWA Standards, which shall determine the acceptance or rejection of the materials. Any pipe that does not conform to the requirements of this specification shall be removed from the site immediately and replaced by conforming pipe at no expense to the Owner. All pipe when shipped shall be packed and separated by wood separators such that pipe to pipe contact is prevented during transit and/or storage.

- D. The loading, trucking, unloading, and handling of pipe and appurtenant materials shall be done by the Contractor. Care shall be taken so as not to damage the pipe, appurtenant materials or the street surface. Dropping pipe, special castings, valves, hydrants, etc. directly from the trucks upon the ground will not be permitted. Suitable effective buffers or runners shall be provided. Metal chain shall not be used for lifting pipe materials. The Contractor shall be responsible for any damage done to the pipe or appurtenant materials until they are accepted in the completed work.
- E. Distribution of pipeline materials along the line of work will not be permitted, unless approved by the Engineer. The Contractor shall not obstruct driveways, sidewalks, walkways, etc., nor shall pipeline materials be placed on private property without the express written approval of the property owner.

1.5 SUBMITTALS

- A. Submit four complete sets of shop drawings to the Engineer in accordance with these specifications and Contract Documents.
- B. Submittals required under this section include, but are not limited to the following:
 - 1. Pipe and fittings
 - 2. Gaskets
 - 3. Valves and appurtenances
 - 4. Backflow prevention device
 - 5. Sleeves
 - 6. Pipe hangers and seals
- C. As-Built Drawings
 - 1. Submit 1 Mylar and 4 bond copies of As-Built Drawings upon completion and acceptance of work.
 - 2. As-Built Drawings shall be complete and shall indicate the true measurement and location, horizontal and vertical, of all new utility system construction. As-Built drawings shall include a minimum of three ties showing the distance to each valve, valve box, water main, curb stop, corporation, tee, bend, reducer, or any other feature installed below grade from fixed permanent objects. As-Built drawings shall also contain any additional information required by the municipality, and shall be stamped with the seal of a Licensed Land Surveyor and Licensed Professional Engineer.
- D. Contractor will be required to obtain all Salem Water and Sewer Department permits and inspections prior to construction and submit proof of obtainment.

2 MATERIALS

2.1 WATER SERVICE PIPE

- A. Service Tube
 - 1. Service tube used for inshore service shall be 2 inch Type K copper tubing conforming to AWWA C901 and ASTM B88 for buried service and rated for 200 psi.
 - 2. Service Tubing shall be 2 inch HDPE polyethylene tubing conforming to AWWA C901 for buried service. Inside diameter shall be consistent with IPS inside diameter and rated for 160 psi. Stainless steel inserts shall be provided at connection points. Service tubing shall be Endopure polyethylene with blue exterior as manufactured by Endot Industries, Inc. or approved equal.
 - 3. Furnish and install all required fittings, couplings, adaptors, valves, transition couplings, etc. to connect the dock service piping (polyethylene) to the inshore piping (copper), to meet the design intent shown on the Drawings, to make a complete and operational system.
 - 4. Section of the water service to be sleeved, as indicated on the Drawings, shall be sleeved within 4 inch SDR-21 PVC.

5. Hangers shall be 316 stainless steel clevis clamps with ¾" stainless steel rods to be fastened as shown on the Drawings.
6. Link seals used at end of sleeves shall be a LS-300-S as manufactured by PSI or approved equal.
7. HDPE fittings shall be socketed; IPS inside diameter controlled, and conform to ASTM D2513 and AWWA C901, with a minimum pressure rating of 160 psi.

B. Curb Boxes

1. Curb boxes shall be Mueller (2-inch service). Covers shall have the word "WATER" cast in the top, and shall be held in place with bronze bolts. Curb box shall be a two piece sliding type design with a minimum 2-1/2 inch inside diameter, with one piece lid, five foot bury with arch pattern base, and provided with a 36 inch (minimum) stationary shut off rod.

C. Curb Stops

1. Curb stops shall be Mueller Co. Model H15209, no substitution per Salem Water and Sewer Department standard specifications. Corporation stops shall meet AWWA C800 and be manufactured of a cast alloy brass body with PTFE coated ball. Corporation stops shall have double "O" ring seals, quarter turn check, and a working pressure of 300 psi with compression ends for CTS outside diameter tubing.

- D. All brass goods shall be individually wrapped to protect threads during shipment. Corporation stops and curb stops shall open right, and shall be of the compression type.

2.2 VALVES

- A. Service line ball valves furnished for the service shall be full port bronze ball valves with threaded IPS connections for the size and at locations indicated on the Drawings. Ball valves shall NOT contain any brass components that could be exposed to the saltwater environment.
- B. Service line check valves furnished for the service shall be wye pattern bronze check valve with threaded IPS connections for the size and at locations indicated on the Drawings. Check valves shall NOT contain any brass components that are exposed to the saltwater environment.

2.3 OTHER MATERIALS

- A. Furnish all necessary materials for a complete installation, and materials required by the Engineer for the proper completion of the work as specified.

3 EXECUTION

3.1 GENERAL

- A. All work shall be done in accordance with the latest Salem Water and Sewer Department rules and regulations.
- B. New water services shall be pressure tested, disinfected and bacteria tested prior to acceptance.
- C. All valves shall open right.
- D. A 10' horizontal separation between water main and sanitary shall be maintained unless otherwise directed and approved by Salem Water & Sewer Department.

3.2 INSTALLING WATER SERVICES AND APPURTENANCES

- A. The Contractor shall examine the project work area conditions and correct any conditions detrimental to the timely and proper completion of the work. The Contractor shall not proceed with the work until all unsatisfactory conditions have been addressed.
- B. The earthwork associated with the installation of the water appurtenances shall be completed in accordance with Section 02200-Earthwork.
- C. The Contractor shall take all necessary precautions not to damage the pipe/service tube. All pipe/tube shall be stored at a minimum of 4 inches from the ground and no higher than 5 feet. The stored pipe/tube shall be supported evenly along the length of the pipe segment.
- D. Temporary watertight plugs shall be utilized at the end of each working day to prevent the intrusion of silt, debris and water into the mains. When working in areas with a high potential for flooding the main from groundwater, streams, storm drains, sewers or other water mains, or as directed by the Engineer, temporary plug shall be provided.
- E. When joined together, pipes/tubing shall form a smooth continuous line and grade on straight sections of the road and on curved sections (both vertical and horizontal) shall have uniform deflections within the required limits and conforming in general to the line and profile of the adjacent roads.
- F. Pipe/tube shall not be laid with deflection of more than one-half the maximum deflection as recommended by the manufacturer.
- G. Backfill shall be placed on both sides of the pipe/tube and compacted simultaneously with approved tamping bars.
- H. Pipe shall not be laid in areas where excavation has been carried below trench grade, or where water conditions create unstable bottoms, until the trench is excavated, refilled and compacted to the satisfaction of the Engineer.
- I. Bells or other joints shall not be installed directly under existing utilities or structures. Use short or random lengths to avoid such conditions.

3.3 WATER SERVICE

- A. Excavation, backfilling and disposal of materials shall be done in accordance with the provisions of Section 02200-Earthwork. Backfill around and up to one foot above the service tubing shall not contain any stones larger than 1 inch in diameter.
- B. Drills and/or taps shall be inspected frequently for signs of wear, and in general the Contractor shall not exceed the number of taps specified by the manufacturer before reconditioning or replacement. Service pipe shall be cut only with approved wheel cutters.
- C. Service pipe shall be laid to a minimum depth of five feet and laid in a straight line wherever practicable to the structure to be serviced or to the point of termination of existing service. No. 12 trace wire shall be installed on all service tube lines. Trace wire on service tubing curb stop and corporation shall be connected to the curb stop and corporation and looped around the service tubing at 3 foot intervals. Trace wire on the service tubing from the curb stop to the building to be serviced shall be connected to the curb stop and looped around the tubing at 3 foot intervals. Duct tape shall be installed over outlet end of curb stops dedicated for future service connections.
- D. Where required, the Contractor shall flush all new services before connecting to the existing water service. The Contractor shall also assist Water Department personnel is flushing service lines if sediment or debris from existing mains plugs piping or meters, as a result of the work under this contract.

3.4 VALVE BOXES/CURB STOP BOXES

- A. Valve/curb boxes shall be properly centered and plumbed over the operating nuts of valves and adjusted to the proper height to correspond to the finished street or ground surface.
- B. Valve/curb boxes shall be cleaned and provided with a coat of asphaltic varnish. Ferrous surfaces not requiring painting shall be provided with coat of grease or other applicable rust-resistant coating.

4 MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

- A. Measurement of WATER SERVICE shall be at the Contract unit price Lump Sum.

4.2 METHOD OF PAYMENT

- A. 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.

4.3 PAYMENT ITEMS

| <u>ITEM</u> | <u>DESCRIPTION</u> | <u>UNIT</u> |
|-------------|--------------------|-------------|
| 02600-1 | WATER SERVICE | Lump Sum |

*** END OF SECTION ***

SECTION 02735

VACUUM SEWER PUMPING STATION

1 GENERAL

1.1 DESCRIPTION

- A. Provide all labor, materials, equipment, and supervision necessary to complete the work specified in this section.
- B. Scope of work is for the supply and installation of a vessel vacuum sewer pump out system to include, but is not necessarily limited to the following
 - 1. Connection to existing vacuum pump out system located within below grade concrete vault.
 - 2. Hose stand assembly at vessel berth
 - 3. All power and controls including remote operation as required
 - 4. All piping, valves, fittings, gaskets, connections and supports as required for completion
 - 5. Connection of discharge piping to sanitary sewer manhole
 - 6. Connection of discharge piping to sump pump.
- C. The equipment and system shall be installed as shown on the Drawings and as recommended by manufacturer and shall include all work and items necessary to provide a functioning system meeting City electrical, plumbing and sewer department approvals.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Timber Floats under TIMBER FLOATS SECTION 02400.

1.3 QUALIFICATIONS

- A. The equipment shall be furnished by a manufacturer who shall have successful experience in the production of such equipment and who is reputable and qualified in the manufacture of the equipment to be furnished. The equipment shall be designed, calibrated, constructed, and installed in accordance with the best practices and methods, and shall operate accurately when installed, as shown on the Drawings.

1.4 SUBMITTALS

- A. Shop drawings of all equipment to be furnished shall be submitted to the Owner for approval including:
 - 1. Manufacturer qualifications, address, contact information including phone number(s) for primary contact person. Phone number(s) for service and maintenance department.
 - 2. Shop drawings of piping, fittings, gaskets, controls, valves and connections including layout plan and sections to scale and wiring diagrams,
 - 3. All other pertinent information relating to the installation and operation of the equipment furnished.
 - 4. As-built plan(s) for final installation and controls
 - 5. Five (5) complete sets of operation and maintenance instructions shall be furnished to the Owner at such time the operation is turned over to the Owner.

- B. A factory representative, having complete knowledge of the supplied equipment, shall be provide two (2) days (not consecutive) for instruction of representatives of the Owner on proper operation and maintenance of the equipment.
- C. Contractor will be required to obtain all Salem Water and Sewer Department permits and inspections prior to construction and submit proof of obtainment.

1.5 TOOLS AND SPARE PARTS

- A. All special tools required for normal operation and maintenance shall be furnished in containers clearly identified with indelible markings as to their contents. Each container shall be packed with its contents protected for long-term storage in a humid environment.
- B. All spare parts required for normal maintenance and operation for a 5 year period.

2 PRODUCTS

2.1 GENERAL

- A. All of the equipment specified herein is intended to be standard equipment of proven ability and accuracy with readily available repair and replacement parts.

2.2 EQUIPMENT

- A. Vacuum Sewer Pumpout Station
 - 1. Dockside Hydrants shall have
 - a) System wiring and installation shall provide for remote operator controls at the vessel berth.
 - b) White powder coated hose stand
 - c) 100ft x 1 ½” dia. Hose assembly which includes
 - i. 90 degree ball valve
 - ii. Set of four deck / drain adapters
 - iii. Sightglass (clear) check valves
 - d) Bronze Hydrant assembly
 - 2. Piping and Installation
 - a) Piping to be HDPE SDR-11 unless otherwise noted
 - b) All piping connections shall be HDPE fused joints or bronze suitable for the saltwater marine environment. Piping to be pressure tested for required service levels.
 - c) All pipe hangers, supports and attachments hardware shall be 316 stainless steel.
- B. Sewer suction line 2 inch HDPE polyethylene tubing conforming to AWWA C901 for buried service. Inside diameter shall be consistent with IPS inside diameter and rated for 160 psi. Stainless steel inserts shall be provided at connection points. Service tubing shall be Endopure polyethylene with blue exterior as manufactured by Endot Industries, Inc. or approved equal.

- C. Wye Branches or Tees shall be of the same material and of the same class and type so as to be compatible with the pipe they are used.
- D. Sewer valves shall be full port ball valves with flanged ends conforming to ANSI B16.1 (class 125). Valves shall be rated for 150 psi minimum working pressure. Valves shall be manufactured by Spears Manufacturing Company or approved equal.
- E. Hangers shall be 316 stainless steel clevis clamps with ¾" stainless steel rods to be fastened as shown on the Drawings.

3 EXECUTION

3.1 GENERAL

- A. All work shall be done in accordance with the latest Salem Water and Sewer Department rules and regulations by a drain layer licensed with the Department.
- B. The equipment manufacturer shall provide the services of a competent factory representative, familiar with the installation of the equipment furnished, to supervise the installation of each piece of equipment as required. In addition, the manufacturer shall furnish the services of a competent factory representative familiar with the operation and maintenance of each type of unit furnished.
- C. Contractor shall install all conduits for power and control wiring as required for the ultimate completed pumpout system including dockside hydrants.

3.2 INSTALLATION

- A. Installation shall be in strict accordance with the manufacturer's instructions and recommendations in the locations shown on the Drawings. Final location shall be approved by the owner in the field.
- B. Inspection And Testing
 - 1. Upon completion of installation, and in the presence of the owner and a qualified manufacturer's representative, perform a preliminary test on the vacuum system to insure the functioning of all component parts to the satisfaction of the owner.
 - 2. All labor, equipment, water and power required to perform each test shall be furnished by the Contractor.
 - 3. Approval of the preliminary test by the Owner shall not constitute final acceptance of the equipment furnished.

3.3 VISUAL INSPECTION

- A. At the conclusion of the work, all pipelines shall be visually inspected by the Engineer to insure a straight and plumb alignment.
- B. All pipelines which are not straight and plumb shall be removed and replaced

3.4 LEAKAGE AND TESTING

- A. After the completed sewer line, including service connections has been installed, the trench has been compacted to specification requirements, and manhole or joints showing noticeable streams or jets have been repaired and/or replaced the Contractor shall perform all tests. The Contractor at a minimum shall be required to perform an exfiltration test using low pressure air.
- B. The Contractor shall be responsible for furnishing all labor, materials and equipment so that such tests can be accomplished at the times and locations the Engineer deems necessary.
- C. Test Procedure
 - 1. The rate of infiltration/exfiltration shall not exceed 100 gallons per inch of pipe diameter per mile of pipe per day. Weirs shall be constructed in accordance with the drawings.
 - 2. The attention of the Contractor is directed to the strict requirements relative to maximum rates of infiltration/exfiltration and to the importance of these specifications relative to tight joints required. Sewers not meeting the above requirements shall be repaired as necessary at the Contractor's expense.
 - 3. A low pressure air test shall be the means to test all sewers unless otherwise directed by the Engineer. If infiltration is observed, the Contractor may request approval from the Engineer to conduct V-notch weir infiltration tests. If such tests show that the infiltration rate exceeds the limits specified above, he shall make all necessary repairs to reduce the infiltration to the specified limit.
- D. Exfiltration Tests
 - 1. For making low-pressure air tests, the Contractor shall use equipment specifically designed and manufactured for the purpose of testing sewer pipelines using low-pressure air. The equipment shall be provided with an air regulator valve of air safety valve so set that the internal air pressure in the pipeline cannot exceed 8 psig.
 - 2. The leakage test using low-pressure air shall be made on each manhole-to-manhole section of pipeline.
 - 3. Pneumatic plugs shall have a sealing length equal to or greater than the diameter of the pipe to be tested. Pneumatic plugs shall resist internal test pressure without requiring external bracing or blocking.
 - 4. All air used shall pass through a single control panel.
 - 5. Low-pressure air shall be introduced into the sealed line until the internal air pressure reaches 4 psig greater than the maximum pressure exerted by groundwater that may be above the invert of the pipe at the time of the test. However, the internal air pressure in the sealed line shall not be allowed to exceed 8 psig.

6. At least 2 minutes shall be allowed for the air pressure to stabilize in the section under test. After the stabilization period, the low-pressure air supply hose shall be quickly disconnected from the control panel. The time required in minutes for the pressure in the section under test to decrease from 3.5 to 2.5 psig (greater than the maximum pressure exerted by groundwater that may be above the invert of the pipe) shall not be less than that shown in the following table:

| Pipe diameter (inches) | Time (minutes) |
|---------------------------|--------------------------|
| 6 | 4.0 |
| 8 | 5.0 |
| 10 | 6.5 |
| 12 | 7.5 |
| 14 | 9.0 |
| 15 | 9.5 |
| 18 | 11.5 |
| Greater than 18 | 7.7 X Pipe Diameter (ft) |

7. When the sewer section to be tested contains more than one size of pipe, the minimum allowable time shall be based on the largest diameter pipe in the section.

4 MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

- A. Measurement of VACUUM SEWER STATION shall be at the Contract unit price Lump Sum and included with WATER SERVICE, Item 02600-1.

4.2 METHOD OF PAYMENT

- A. Payment of VACUUM SEWER STATION shall be at the Contract Unit Price Lump Sum for the supplying and installation of, all piping and conduits, all fixed sewer piping on the pier including all connects and associated hardware for its complete installation between the vault and the associated vacuum piping, flexible piping on float, hose stand, all electrical and control wiring conduit and all other items required to have a complete operational system. Work under this item shall include all valves and piping connections, labor, materials, equipment and supervision for material handling, installation, cutting to final elevation and connection to existing work.
- B. Payment for VACUUM SEWER STATION shall not be paid separately but shall be included with WATER SERVICE, ITEM 02600-1.

*** END OF SECTION ***

SECTION 03000

REINFORCED CONCRETE

1. GENERAL

1.1 DESCRIPTION

- A. Provide all labor, materials, equipment and supervision necessary to complete work specified in this Section.
- B. Scope of work includes, but is not necessarily limited to, furnishing and installing the following:
 - 1. Cast-in-place concrete
 - a. Filling of Steel Pipe Piles
 - b. As otherwise shown on contract documents or needed to complete the work
 - 2. Forms and falsework for forms
 - 3. Reinforcing steel including epoxy coated and associated accessories (Ties, Chairs, etc.) as required

1.2 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Section 02316, STEEL PIPE PILES.

1.3 QUALITY ASSURANCE

- A. Except as noted, work shall conform to the latest edition of the following code specifications and standards:
 - 1. American Society for Testing and Materials (ASTM)
 - 2. American Concrete Institute (ACI):
 - a. "Building Code Requirements for Reinforced Concrete", ACI 318.
 - b. "Specifications for Structural Concrete for Buildings", ACI 301.
 - c. "Recommended Practice for Measuring, Mixing, and Placing Concrete", ACI 304.
 - d. "Recommended Practice for Cold (Hot) Weather Concreting", ACI 305 and ACI 306.
 - e. "Guide to Formwork for Concrete ", ACI 347.
 - 3. Concrete Reinforcing Steel Institute (CRSI):
 - a. Design of Reinforced Concrete Structures - "A Manual of Standard Practice".
 - b. "Placing Reinforcing Bars".
 - c. "Field Handling Techniques for Epoxy-Coated Reinforcing Bar"

1.4 SUBMITTALS

- A. Concrete mix designs.
- B. Grout / manufacturer/design mix
- C. Name and address of Independent Testing Laboratory for approval by Owner.

1.5 TESTING OF CONCRETE

A. Quality Control

1. Test Specimens: The Contractor will be required to make, cure and have tested, a minimum of one set of four test specimens from the concrete of each day's pour and for each fifty cubic yards of concrete cast in accordance with ASTM Designations C172, C31 and C39. One cylinder shall be broken after seven days and three cylinders after twenty-eight day.
2. Slump: A slump test shall be made for each truckload of concrete in accordance with ASTM Designation C143. Slumps greater than design mix limit will be grounds for rejection of the concrete.
3. Air Content: The Contractor shall make an air content test from each day's pour of concrete by the pressure method in accordance with ASTM Designation C231. Air contents above or below the limits specified will be grounds for rejection of the concrete.
4. Testing: All personnel and laboratories testing concrete shall be licensed by the Commonwealth of Massachusetts.
5. Test Failures: In the event the compressive strength of the cylinders, when tested, is below the specified minimum, the Owner may require test cores of the hardened structure to be taken by the Testing Laboratory in accordance with ASTM C-42. If such test indicates that the core specimen is below the required strength, the concrete in question shall be removed and replaced without cost to the Owner. Any other work damaged as a result of this concrete removal shall be replaced with new materials to the satisfaction of the Owner at no additional cost to the Owner. The cost of coring will be deducted from the Contract amount. Where core cylinders have been taken by the Testing Laboratory and the concrete proves to be satisfactory, core holes shall be filled in a manner satisfactory to the Owner at no additional cost to the Owner.

- B. The Contractor shall coordinate the date and location of tests with the Owner before any concrete work is started.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

Reinforcing steel shall be transported to the site, stored, and covered in a manner which will ensure that no damage shall occur to it from moisture, dirt, grease, or any other cause that might impair bond to concrete or chip protective epoxy coating. A sufficient supply of approved reinforcing steel shall be stored on the site at all times to ensure that there will be no delay of the work. Identification of steel shall be maintained after bundles are broken.

2. PRODUCTS

2.1 MATERIALS

- A. Portland Cement: ASTM C 150, Type II of U.S. manufacture. Only one brand of cement shall be used on the project.
- B. Aggregates:
1. Fine aggregate. ASTM C 33, clean and graded from 1/4 inch to fines.
 2. Coarse aggregate. ASTM C 33, clean and graded from 1/4 inch to maximum sizes hereinafter specified.

- C. Air Entraining Agent: Conforming to ASTM C 260 for Air-Entraining Admixtures for Concrete.
- D. Water Reducing Agent: Conforming to ASTM C 494 Type A for Chemical Admixtures for Concrete.
- E. Microsilica Admixture: Packaged in easily dispersing form.
- F. Water: Clean and potable free of impurities detrimental to concrete.
- G. Reinforcing Bars: New, deformed billet steel bars, conforming to ASTM A 615, Grade 60, with Epoxy-Coating conforming to ASTM A775/A775M.
- H. Accessories: Reinforcement accessories, consisting of spacers, chairs, ties, and similar items shall be provided as required for spacing, assembling, and supporting reinforcement in place. All accessories shall be dielectric coated steel or approved plastic accessories, conforming to the applicable requirements of the CRSI Standards herein before specified.
- I. Tie wire for reinforcement shall be 16 gauge or heavier dielectric coated steel or approved plastic accessories, conforming to the applicable requirements of ASTM A-82.
- J. Form Ties and Spreaders: Standard metal form clamp assemble and plastic cone, of type acting as spreaders and leaving no metal with 1 inch of concrete face. Inner tie rod shall be left in concrete when forms are removed. No wire ties or wood spreaders will be permitted. Use 1/2" x 1" C.T. plastic cones for sinkages.
- K. Form Coatings: Non-grain raising and non-staining type that will not leave residual matter on surface of concrete or adversely affect proper bonding of subsequent application of other material applied to concrete surface, "Nox-Crete Form Coating" as manufactured by Nox-Crete Company, or approved equal. Coating containing mineral oils or the nondrying ingredients will not be permitted.
- L. Grout: A high-strength, non-shrink grout with saltwater resistance, such as Five Star Special Grout 120 or equivalent.

2.2 CONCRETE STRENGTHS AND PROPORTIONS

- A. Cast-in-place concrete shall have the following minimum compressive strength at 28 days and shall be proportioned within the following limits:

| Class | Minimum Strength at 28 days | Maximum Size of Aggregate | Water Cement Ratio | Minimum Cement Content | Maximum Cement Replacement |
|-------|-----------------------------|---------------------------|--------------------|------------------------|---------------------------------------|
| A | 5000 psi | 3/4" | 0.40 | 660 lbs/CY | Max fly ash 15% Max slag 25% |

- B. Air-Entrainment: The air content in all concrete shall be maintained at 6 to 8 percent.
- C. The exact proportions for the mix, including amounts admixture (if any), and water, shall be determined by the concrete supplier.
- D. The proportions of aggregate to cement for any concrete shall be such as to produce a mixture which will work readily into the corners and angles of the forms and around

reinforcement with the method of placing employed on the work, but without permitting the materials to segregate or excess free water to collect on the surface.

3. EXECUTION

3.1 CAST-IN-PLACE CONCRETE

A. Falsework for Forms

1. The Contractor shall build and maintain necessary falsework for the forms.

B. Construction of Forms

1. Wood forms shall be constructed of sound material, shall be of the correct shape and dimensions, mortar tight, of sufficient strength, and so braced and tied together that the movement of men, equipment, materials, or placing and vibrating the concrete will not throw them out of line or position.

2. Embedded Items

- a. Provisions shall be made for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, waterstops, and other features. No wood other than necessary nailing blocks shall be embedded in concrete. Complete cooperation shall be extended to suppliers of embedded items in their installation. Secure information for embedded items from other trades as required. All embedded items shall be securely anchored in correct location and alignment prior to placing concrete.

3. Openings for Items Passing Through Concrete

- a. Contractor shall establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections. Contractor shall be held responsible for proper coordination of all work of this nature in order that there will be no unnecessary cutting and patching of concrete. Any cutting and repairing to concrete required as a result of failure to provide for such openings shall be paid for by the Contractor at no additional expense to the Owner.

C. Removing Forms and Falsework

1. Wood forms shall not be removed for at least 48 hours after concrete has been placed.
2. Forms shall not be removed until the concrete has attained sufficient strength to insure stability.

D. Reinforcing Steel

1. Reinforcing steel shall be placed in accordance with the drawings and approved shop drawings and the applicable requirements of the "Codes and Standards" herein before specified. Install reinforcement accurately and secured against movement, particularly under the weight of workmen and the placement of concrete.
2. Reinforcing Steel Supports: Bars shall be supported on approved plastic or dielectric-coated metal chairs or spacers, accurately placed, and securely fastened to forms or steel reinforcement in place. Additional bars shall be supplied, whether specifically shown on the drawings or not, where necessary to securely fasten reinforcement in place. Support legs of accessories in forms without embedding in

form surface. Spacing of chairs and accessories shall conform with CRSI's "Recommended Practice for Placing Bar Support". Hooping and stirrups shall be accurately spaced and wired to the reinforcement. No wood will be permitted inside forms. Lifting of welded wire fabric into proper position while concrete is being poured rather than supporting fabric on chairs will not be permitted.

3. Placing and Tying: All reinforcement shall be set in place, spaced, and rigidly and securely tied or wired with tie wire at all splices and at all crossing points and intersections in the positions shown, or as directed. Rebending of bars on the job to accommodate existing conditions will not be permitted without the written approval of the Owner. Point ends of wire ties away from forms.
4. Spacing: Minimum center to center distance between parallel bars shall be in accordance with the details on the drawings, or, where not shown, the clear spacing shall be 2 times the bar diameter but in no case less than 1-1/2 inches or less than 1-1/2 times the maximum size aggregate.
5. Splices shall be in accordance with the following:
 - a. Maximum 50% of steel spliced occurring within lap length.
 - b. Top bars shall be 1.4 times values given in 3.D.5.c.
 - c. Splice lengths

| | |
|---------------------|-----------------|
| #6 bars and smaller | 30 bar diameter |
| #7 | 36 bar diameter |
| #8 | 40 bar diameter |
6. Protective Concrete covering
 - a. Except where shown otherwise on drawings, the minimum concrete coverage for steel reinforcement shall conform with the applicable revisions of the "Codes and Standards" herein before specified.

E. Mixing of Concrete

1. All concrete shall be ready-mixed concrete, and shall be mixed and delivered in accordance with the "Specification for Ready-Mixed Concrete", ASTM C-94. The batch plant of the concrete producer shall be certified for compliance with the standards established by the National Ready-Mixed Concrete Association.
2. In the event concrete is mixed at a central batching plant, the delivery shall be arranged so that intervals between batches are kept to a minimum, and in any event not more than thirty (30) minutes. Trucks shall be in first class condition and kept in constant rotation during delivery.
3. Concrete shall be placed within 90 minutes after cement has been mixed with aggregate or 45 minutes after addition of water and admixtures.
4. No admixtures, except those mentioned in paragraph 2.1 shall be used. Calcium chloride will not be permitted.
5. Truck delivery slips of all concrete delivered to the job shall indicate the quantity and quality of concrete, additives, date and time of batching and delivery, and the location of placement. Delivery slips shall be forwarded to the Owner at the end of each week.

F. Cold Weather Requirements:

1. Concrete shall not be mixed or placed when the temperature is below 40 degrees F., or when conditions indicate that the temperature will fall below 40 degrees F. within 72 hours unless precautions are taken to protect the concrete.

2. Concrete temperature shall be maintained, when deposited, at not less than 60 degrees F. Reinforcement, forms, and ground which concrete will contact must be completely free of frost.
 3. Concrete and formwork must be kept at a temperature of not less than 50 degrees F. for not less than 96 hours after placing.
 4. Calcium chloride shall not be used.
- G. Hot Weather Requirements:
1. The maximum temperature of the concrete, when deposited, shall be 85 degrees F. If the weather causes the placing temperature to exceed 85 degrees F., the mix shall be cooled by appropriate methods if approved by the Engineer.
 2. No concrete shall be deposited when the air temperature is greater than 90 degrees F.
- H. Conveying and Placing Concrete
1. Notification: Contractor shall notify Owner's Representative at least 48 hours in advance of any placement of concrete.
 2. Form Preparation: Before placing concrete, forms shall be thoroughly inspected. All chips, dirt, etc., shall be removed, all temporary bracing and cleats taken out, all openings for pipes, etc., properly boxed, all forms properly secured in their correct position and made tight, all reinforcement, anchors, and embedded items secured in their proper places. Concrete which may be on the forms or reinforcement, and which is set and dry, shall be cleaned off, and the forms and steel washed off before proceeding. Remove all foreign matter from forms and excavations.
 3. Excess Water: Water shall be removed from place of deposit before concrete is placed unless otherwise permitted by the Owner. Any flow of water into an excavation shall be diverted through proper side drains into a sump, or shall be removed by other approved methods which will avoid washing away the freshly deposited concrete.
 4. Soil on which concrete will be poured shall be thoroughly wetted (except in freezing weather).
 5. Anchors and Embedded Items: Anchors, bolts, sleeves, inserts, wood blocking, and any other items to be embedded in concrete shall be accurately secured in position before the concrete is placed. Aluminum shall not be embedded in concrete.
 6. Handling and Depositing of Concrete
 - a. Before any concrete is placed, the Contractor shall notify all whose work is in any way connected with or influenced by the concrete work, and give them reasonable time to complete all portions of their work that must be completed before concrete is deposited.
 - b. Immediately before concrete is placed, the Contractor shall inspect all forms to be sure that they are in proper position, sufficiently rigid, thoroughly clean, properly oiled and free from foreign materials, and that all reinforcement is in proper position.
 - c. Concreting, once started, shall be carried on as a continuous operation until the section of approved size and shape is completed.
 - d. Concrete shall be conveyed as rapidly as practicable from the mixer to the place of final deposit by methods, which prevent the separation or loss of

- ingredients. It shall be deposited, as nearly as practicable, in its final position to avoid rehandling or flowing.
- e. Concrete shall not be dropped freely where reinforcement will cause segregation, nor shall it be dropped freely more than six (6) feet. Concrete shall be deposited to maintain a plastic surface approximately horizontal.
 - f. Concrete that has partially hardened shall not be deposited in the work.
7. Pumping
- a. Concrete may be placed by pumping if first approved in writing by the Owner for the location proposed.
 - b. Equipment for pumping shall be of such size and design as to ensure a practically continuous flow of concrete at the delivery end without separation of materials.
 - c. The concrete mix shall be designed to the same requirements as herein before specified, and may be richer in lubricating components in order to allow proper pumping.
 - d. Concrete shall not be pumped through aluminum pipes.
 - f. All pumping operations must have full-time inspection by a recognized testing laboratory approved by the Owner and paid for by the Contractor. The cost of this full-time inspection shall be included in the Contractor's bid proposal if the option of pumping is elected.
8. Vibrating and Compacting
- a. All concrete shall be thoroughly consolidated and compacted by suitable means during the operation of placing, and shall be thoroughly worked around reinforcement, embedded items, and into the corners of the forms. All concrete against forms shall be thoroughly spaded. Internal vibrators shall be used under experienced supervision, and shall be kept out of contact with reinforcement and wood forms. Vibrators shall not be used in a manner that forces mortar between individual form members.
 - b. Vibrators shall be flexible electric type or approved compressed air type, adequately powered and capable of transmitting to the concrete not less than seven thousand (7,000) impulses per minute. Vibration shall be sufficiently intense to cause the concrete to flow or settle readily into place without separation of the ingredients. A sufficient number of vibrators shall be employed so that complete compaction is secured throughout the entire volume of each layer of concrete. At least one (1) vibrator shall be kept in readiness as a spare for emergency use. Vibrators shall be such that the concrete becomes uniformly plastic with their use.
 - c. Vibration shall be close to the forms but shall not be continued at one spot to the extent that large areas of grout are formed or the heavier aggregates are caused to settle. Care shall be taken not disturb concrete which has its initial set.
 - d. Where conditions make compacting difficult, or where the reinforcement is congested, batches of mortar containing the same proportions of cement to sand as used in the concrete shall first be deposited in the forms, to a depth of at least one inch.
 - e. The responsibility for providing fully filled out, smooth, clean, and properly aligned surfaces free from objectionable pockets shall rest entirely with the Contractor.

- I. Construction Joints: Construction joints shall be located a maximum of 40 feet apart. If, for any reason, the Contractor feels a change is necessary, he shall prepare a placing plan and submit it to the Owner for approval. Where a joint is to be made, the surface of the concrete shall be sandblasted or thoroughly picked, thoroughly cleaned, and all laitance removed. In addition to the foregoing, joints shall be thoroughly wetted, but not saturated, and slushed with a coat of grout immediately before the placing of new concrete. Approved keys shall be used at all joints, unless detailed otherwise. Forms shall be retightened before placing of concrete is continued. There shall be an interval of at least 48 hours between adjacent pours.
- J. Expansion Joints: Expansion joints shall be located as shown on Contract Drawings. The joint shall include a joint filler, a bond breaker and joint sealant and installed as indicated on Contract Drawings.
- K. Patching: Immediately after stripping forms, patch minor defects, form-tie holes, honeycombed areas, etc., before concrete is thoroughly dry. Repair gravel pockets by cutting out to solid surface, form key, and thoroughly wet before placing patching mortar consisting of 1 part cement to 2 parts fine sand; compact into place and neatly finish. Honeycombed areas or gravel pockets which, in the Owner's opinion are too large and unsatisfactory for mortar patching as described above, shall be cut out to solid surface, keyed, and packed solids with matching concrete to produce firm bond and surface.
1. The Contractor shall do the entire cutting as required by himself or other trades. All such work shall be of the minimum size required. No excessive cutting will be permitted, nor shall any structural members or reinforcement be cut.
 2. The Contractor shall do all patching after work by other trades has been installed, where required, using Portland Cement Mortar 1:2 mix.
- L. Protection and Curing
1. Protect concrete from injurious action of the elements and defacement of any nature during construction operations.
 2. Keep concrete in a thoroughly moist condition from the time it is placed until it has cured, for at least (7) days.
 3. Carefully protect exposed concrete corners from damage.
 4. Allow no slabs to become dry at any time until curing operations are complete. In general, slabs shall be cured with non-staining curing paper, hosing or fog spray; vertical surfaces shall be curing with Burlene or fog spray or an approved curing compound. Protect fresh concrete from drying winds, rain, damage, or spoiling. Curing paper shall be lapped 4 inches minimum at joints and sealed with waterproof tape.
- M. Concrete Finishes
1. Unexposed Surfaces
 - a. All unexposed surfaces shall have any form finish, at the Contractor's option.
 2. Wearing Surface Finish
 - a. The wear surface shall receive a monolithic steel trowel finish. Surfaces shall be finished with a screed, float, or steel trowel. Trowel shall be vigorously used at an angle under pressure by the finisher until troweling gives evidence of shine or gloss as required to make a smooth, hard, dense, impervious surface, free of defects. Finishers shall work from kneeboards

laid flat upon the surface. Mechanical troweling machines may be used if the desired finish and level tolerances can be obtained by their use, but finishing shall be by hand troweling.

- b. For sidewalks and where directed, finish surfaces by scoring in parallel lines with a fine hair stable broom, perpendicular to the direction of traffic or as indicated on the drawings.

3. Exposed Surfaces

- a. Surfaces exposed to view shall be finished. Within 48 hours after the forms have been removed and form ties cut back from the face of the concrete, all voids and cavities shall be filled with a stiff mortar of the same composition and air-entrainment as the mortar in the original concrete mix. The same brand and color of cement, and the same kind and color of aggregate as was used in the original concrete mix shall be used in this mortar. The mortar for filling shall have been mixed and let set for 30 minutes and then remixed before placing in the work. The surface film of all such pointed surfaces shall be carefully removed before setting of the mortar occurs.
- b. If the Owner determines these surfaces as prepared do not present a uniformly smooth, clean surface of even texture and appearance, the surface shall be treated and rubbed to obtain a satisfactory finish. The Owner shall be the sole judge of the amount of rubbing which will be required.
- c. If rubbing is required, the rubbing will start within 48 hours of notification that the rubbing is required, the surface should be wetted with clean water and rubbed with a No. 16 carborundum brick or other abrasive of equal quality until even and smooth and of uniform appearance, without applying any cement or other coating. If additional finishing is necessary it shall be obtained by a thorough rubbing with a No. 10 carborundum brick or other abrasive of equal quality. Subject to approval by the Owner, rubbing may be performed by use of satisfactory power equipment and tools, providing that the operational procedures shall be the same as those outlined above for hand rubbing.
- d. Rubbing will be kept to a minimum found necessary to produce smooth, even surfaces of uniform appearance. Rubbing will not be required to fill very small surface air bubble holes.
- e. Patches required for form ties, if carefully and properly done, may not necessitate rubbing. If however, the work is done in such a way that the patches are conspicuous; the entire exposed face on which they occur shall be rubbed.
- f. After the final rubbing is completed, and the mortar has set up, the surface shall be thoroughly drenched and kept wet with clean water for a period of five days, unless otherwise directed.
- g. No rubbing will be permitted when the air temperature is below 40 °F.
- h. Pile Caps and any formed surfaces not exposed to view, including the underside of concrete decking, shall be finished. Immediately after forms have been removed and form ties cut back from the face of the concrete, all voids and cavities shall be fixed with a stiff mortar of the same composition and air-entrainment as the mortar in the original concrete mix. The mortar for filling shall have been mixed and let set for 30 minutes and then remixed before placing in the work. In case the operation of filling is

delayed, the surface of the concrete shall be thoroughly cleaned and washed with water, if necessary, before the mortar is applied.

4. Addition of Material

- a. The addition of cement, sand, water, or mortar to any surface while finishing concrete is strictly prohibited.

N. Defective Work

- 1. The following concrete work shall be considered defective and may be ordered by the Owner to be removed and replaced at Contractor's expense:
 - a. Incorrectly formed.
 - b. Not plumb or level.
 - c. Not specified strength.
 - d. Containing rock pockets, voids, honeycomb, or cold joints.
 - e. Containing wood or foreign matter.
 - f. Otherwise not in accordance with the intent of the Drawings and Specifications.

4. MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT AND PAYMENT

- A. No separate measurement or payment shall be made for the work in this Section. Measurement and Payment for this item shall be included within the work it is associated with.

END OF SECTION

SECTION 05200

STRUCTURAL ALUMINUM

1 GENERAL

1.1 DESCRIPTION

- A. Provide all labor, materials, equipment, and supervision necessary to complete the specified work in this section.
- B. The work in this section includes but is not necessarily limited to the following:
 - 1. Supply, fabrication, and installation of aluminum gangways and associated aluminum transition and wear plates.
- C. Related work specified elsewhere includes, but is not necessarily limited to, the following:
 - 1. Timber Float under TIMBER FLOAT, SECTION 02400
 - 2. Metal fasteners under MISCELLANEOUS METALS, SECTION 05600
 - 3. Concrete under CONCRETE, SECTION 03000

1.2 QUALITY ASSURANCE

- A. Except as noted, work shall conform to the latest editions of the following codes specifications and standards:
 - 1. Aluminum Association Specifications for Aluminum Structures – Load Resistance Factor Design.
 - 2. Americans with Disabilities Act Accessibility Guidelines (ADAAG).
 - 3. American Welding Society AWS D1.2 Structural Welding Code - Aluminum.
- B. The aluminum gangways shall be fabricated by a company specializing in the fabrication of these items with a minimum of 5 years documented experience.
- C. The Contractor shall ensure the gangway provided works over the extreme tide range; Elevation -2.0 to Elevation +20 (MLW).
- D. Welders shall have current certifications to weld the various materials and positions to be incorporated in the work.
- E. Welding procedures shall be in accordance with AWS D1.2 - Structure Welding Code, Aluminum and Aluminum Construction Manual, Section 5 as applicable.
- F. Independent Weld Inspection: Contractor shall obtain the services of an independent testing laboratory, satisfactory to the Owner, to perform weld inspection utilizing visual, ultrasonic, or other techniques applicable to aluminum welding.

1.3 SUBMITTALS

- A. Submit for approval by Owner the following items:
1. Aluminum manufacturers qualifications
 2. Independent Weld Inspector qualifications
 3. Design Calculations including:
 - a. Design calculations of all structural components and connections in a clear organized and readable form acceptable to the Owner, complete with the signature and seal of a Registered Professional Engineer, licensed in the Commonwealth of Massachusetts, responsible for the work.
 - b. Designed to meet the load requirements in accordance with AASHTO "Guide Specifications for Design of Pedestrian Bridges" (latest edition) including:
 - i. Dead load of structure.
 - ii. Pedestrian live load of 100 pounds per square foot across the clear distance between handrails for the length of the element.
 - iii. Wind load for 100 mph wind per Section 1.2.2 of the AASHTO Guide.
 - iv. Allowable deflection equal or less than the length divided by 360 ($L/360$).
 - v. AASHTO Guide Section 1.3.4 Minimum Thickness of Metal is not applicable to aluminum design.
 4. Material Data: Submit material dimensional and engineering property data of all shapes incorporated into the work.
 5. Shop Drawings: Detailed shop drawings illustrating all structural shapes and connects for review and acceptance and shall indicate all material thicknesses, dimensions and show in detail all connections and welds for approval prior to fabrication.
 6. Submit field AWS D1.2 welder qualifications to the Owner for verification of current certification.
 7. Submit field and fabrication shop AWS D1.2 welding procedures to the Owner for review prior to the start of welding.
 8. Submit field in-process and final welding inspection reports performed by an American Welding Society (AWS) Certified Welding Inspector (CWI).

2 PRODUCTS

2.1 MATERIALS

- A. Material and components used shall be new and shall be free from defects which would adversely affect the performance or maintainability of individual components or of the overall assembly or structure. Materials not specified herein shall be of the same or higher quality used for the intended purpose in commercial practice.

- B. All aluminum assemblies shall be fabricated from aluminum alloy 6061-T6.
- C. All welded connections shall be Gas Metal Arc Welded (GMAW, also known as “MIG” welding) in accordance with AWS standards.
- D. The decking for the gangways, ramps, and platforms shall be non-skid with either a raised rib profile with the ribs no higher than 1/4” and perpendicular to the flow of traffic, or covered with a uniform carborundum surface. Surfaces capable of having a slope of 1:33 or greater shall have a static coefficient of friction of 0.8 or greater when wet. Surfaces where the slope will always be less than 1:22 shall have a static coefficient of friction of 0.5 or greater when wet.

2.2 CONNECTION HARDWARE

- A. All nuts, bolts and washers shall be stainless steel ASTM Series 300, type 316. All nuts shall be self-locking or provide double nuts on each bolt.
- B. The gangway connection pins and sleeves shall be type 316 stainless steel.
- C. All dissimilar metals shall be separated by plastic separation sheets or bushings not less than 1/16 inch thick. The separation sheets shall be Nylatron-GS, plastic sheet conforming to Military Specification MIL-P-15035 or other suitable material for precluding galvanic corrosion.

3 EXECUTION

3.1 WELDING

- A. Surfaces of parts to be welded shall be free from scale, paint, grease or other foreign matter. Welds shall be sufficient size and shape to develop the full strength of the parts connected by the welds. Welds shall transmit stress without permanent deformation or failure when the parts connected by the weld are subject to proof and service loading.
- B. Deficiencies revealed by this inspection shall be repaired at Contractor’s expense. Inspection reports and deficiency correction reports shall be submitted to the Owner.

3.2 PREPARATION/INSTALLATION

- A. Fabricate and install in accordance with the Aluminum Association Specifications for Aluminum Structures and American Welding Society Standards.
- B. Inspection of all field and shop fabrication welding shall be performed by an AWS CWI. CWI shall perform in process and final inspections and testing as required to certify that all work has been completed in accordance with these specifications and referenced codes. This shall include final inspection on 100% of complete welds.
- C. Field in process and final welding inspection reports shall be provided to the Owner.

4 MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

- A. Measurement for Structural Aluminum shall be made by the Contract Unit Price of Lump Sum, complete in-place, for the items indicated under the Payment Item portion of this Section.

4.2 METHOD OF PAYMENT

- A. 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, transition and wear plates and miscellaneous aluminum items and all activities required to meet the Contract Documents.

4.3 PAYMENT ITEMS

| <u>ITEM</u> | <u>DESCRIPTION</u> | <u>UNIT</u> |
|-------------|---------------------|-------------|
| 05200-1 | STRUCTURAL ALUMINUM | Lump Sum |

*** END OF SECTION ***

SECTION 05500

METAL FABRICATIONS

1. GENERAL

1.1 DESCRIPTION

- A. Provide all labor, materials, equipment, and supervision necessary to complete work specified in this Section.
- B. Scope of work includes, but is not necessarily limited to, manufacturing or shop-fabricating metal elements, itemized under MATERIALS in this Section.

1.2 QUALITY ASSURANCE

- A. Except as noted, work shall conform to the following codes and standards:
 - 1. American Society for Testing and Materials (ASTM), latest edition.
 - 2. American Institute of Steel Construction (AISC) Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings, latest editions.
 - 3. American Welding Society (AWS).

1.3 SUBMITTALS

- A. Shop drawings
 - 1. Submit for approval prior to fabrication all information necessary for the fabrication of the component parts. Indicate size and weight of members, type, and location of shop and field connections, the type, size, and extent of all welds, and welding sequences. Use American Welding Society welding symbols. Approval of shop drawings will be for size and arrangement of principal and auxiliary members and strength of connections. Any errors in dimensions shown on shop drawing shall be the responsibility of the Contractor.
- B. The Contractor shall use only certified welders and the shielded arc process for all welding performed in connection with the work of this Section. Each welder shall be certified for the particular work, prior to commencing the work, which must be accomplished.
- C. Upon completion of this portion of the work, and as a condition of its acceptance, the Contractor shall deliver to the Engineer a letter signed by an official of the miscellaneous metal fabricating firm or firms certifying that all fabricated metal has been fabricated in complete accordance with this Section of these specifications.

1.4 PRODUCT HANDLING

- A. All materials shall be delivered, stored and handled with care to prevent damage to any material or material coating. Material damaged or with damaged coating will be rejected and replaced at no additional cost to the Owner.

2. MATERIALS

2.1 STRUCTURAL STEEL AND MISCELLANEOUS ITEMS

- A. Structural steel, including rolled shapes, angles and plates, shall conform to ASTM A572, Gr. 50 unless otherwise noted.
- B. Hollow structural sections shall conform to ASTM A 500 Grade B, unless otherwise noted.
- C. Steel railing shall conform to ASTM A36.
- D. All steel items under this section shall be galvanized. Galvanizing shall be by the hot dip method according to ASTM Specifications A-123 and A-153.

2.2 WELD ELECTRODES

- A. Weld rod shall conform to AWS E70XX grade.

3. EXECUTION

3.1 FABRICATION

- A. Fabricate products in a fully-equipped facility capable of producing high grade of metal fabrication work. All work shall be straight and true, free from warpage and other defects. Joints, covers, copes, and miters shall be accurately and neatly cut, machined, filed and fitted.
- B. Carry out bolting and welding in accordance with latest approved methods, with due consideration for strength and appearance of finished product. All welding shall be done by certified welders.
- C. All steel will be free from imperfections, dirt, loose scale, paint, oil, or other foreign substances.
- D. All welds shall be made watertight.
- E. All material shall be fabricated to within + or - 1/8 inch of their theoretical dimensions as shown on the drawings.
- F. Holes for bolts shall be located as shown on the drawings and shall be drilled or burnt 1/8" in diameter larger than the galvanized bolt.

3.2 INSTALLATION

- A. Store materials on skids, not on ground, in such a fashion as to prevent bending, twisting, or similar damage. Do not dump steel off truck.
- B. Clean installed work from weld spatter, dirt and other foreign materials. Protect installed work as required from damage by subsequent building operations.

3.3 DEFECTIVE WORK

- A. Any parts damaged or improperly fabricated shall be removed and replaced or corrected as directed by the Engineer and at no additional cost to the Owner.

4.0 METHOD OF MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT AND PAYMENT

A. No separate measurement or payment shall be made for the work in this Section. Measurement and Payment for this item shall be included within the work it is associated with.

*** END OF SECTION ***

SECTION 05600

MISCELLANEOUS METALS

1. GENERAL

1.1 DESCRIPTION

- A. Provide all labor, materials, equipment, and supervision necessary to complete the work specified in this Section.
- B. Scope of work includes:
 - 1. Machine bolts and washers
 - 2. Anchor and expansion bolts
 - 3. S.S. pins
 - 4. Eye bolts
 - 5. Chain and shackles
 - 6. Mooring hardware (cleats and bollards)
 - 7. Fabricated steel elements
 - 8. Pipe hangers and pipe clamps
 - 9. Railings
 - 10. All other hardware not specified elsewhere
- C. Related work specified elsewhere:
 - 1. Timber floats under TIMBER FLOATS, SECTION 02400.
 - 2. Concrete under REINFORCED CONCRETE, SECTION 03000.
 - 3. Aluminum under STRUCTURAL ALUMINUM, SECTION 05200.
 - 4. METAL FABRICATIONS, SECTION 05500.
 - 5. Timber under HEAVY TIMBER CONSTRUCTION, SECTION 06130
 - 6. Coatings under COATINGS, SECTION 09800.

1.2 QUALITY ASSURANCE

- A. Except as noted elsewhere, work shall conform to the following codes and standards:
 - 1. American Society for Testing and Materials (ASTM).
 - 2. American Welding Society (AWS).
 - 3. American Institute of Steel Construction (AISC).

1.3 SUBMITTALS

- A. Shop drawings for all shop fabricated items shall be submitted to the Engineer for approval before beginning fabrication.
- B. Certificate of compliance with applicable ASTM specifications for all galvanized items shall be submitted to the Engineer with all materials delivered to the fabricator or site.
- C. Manufacturer's literature and specifications for all fasteners, wire rope, chains, shackles, expansion bolts, and other connection items identified within the contract drawings.
- D. List of all other hardware with quantities and material specifications.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. All materials shall be delivered, stored and handled with care to prevent damage to any material or material coating. Material damaged or with damaged coating will be rejected and replaced at no additional cost to the Owner.

2. PRODUCTS

2.1 MATERIALS

- A. Structural steel shall conform to ASTM Specification A572, Gr. 50.
- B. Machine and eye bolts shall conform to ASTM A307, Gr. A for Mild Steel Bolts unless otherwise noted.
- C. All bolted connections of steel members shall be A325, Type 1 bolts and nuts with manufacturer markings that indicate such, unless otherwise specified.
- D. All bolted connections of timber members shall be ASTM A-307 for Mild Steel unless otherwise specified.
- E. All chains, cable, shackles, and connecting links shall be the size and capacity shown on the drawings.
- F. All railings shall be stainless steel Series 300, type 316, unless otherwise specified.
- G. All stainless steel shall be Series 300, type 316, except pipe hangers and pipe clamps where stainless steel Series 300, type 304 is permitted.
- H. All steel items under this section shall be galvanized. Galvanizing shall be by the hot dip method according to ASTM Specifications A-123 and A-153.
- I. Welding rods shall conform to AWS E70XX grade. Sizes shall be as indicated on the drawings.

3. EXECUTION

3.1 FABRICATION

- A. Fabrication shall conform to AISC Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings.
- B. Workmanship shall be equal to standard commercial practice.
- C. All materials shall be clean and straight. Each assembly shall be accurately fabricated to the lines and dimensions called for and shall be free from undue twists, bends, warping, distortion, and other irregularities.
- D. Assemblies shall be fabricated to within + or - 1/8" of their theoretical dimensions.

3.2 INSTALLATION

- A. Installation shall conform to AISC Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings.
- B. Parts covered by this specification shall be installed in the work as shown on the drawings.
- C. No cutting or burning of steel shall be done to install fasteners without approval of the Engineer.

3.3 DEFECTIVE WORK

- A. The following shall be grounds for rejection and replaced at no additional cost to the Owner:
 - 1. Any damaged parts.

2. Any parts improperly installed in the work.
3. Any items found not to have the proper coating.
4. Otherwise not according to Contract Documents.

4. MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT AND PAYMENT

- A. No separate measurement or payment shall be made for the work in this Section. Measurement and Payment for this item shall be included within the work it is associated with.

*** END OF SECTION ***

SECTION 06130

HEAVY TIMBER CONSTRUCTION

1. GENERAL

1.1 DESCRIPTION

- A. Provide all labor, materials, equipment and supervision necessary to complete the work specified in this Section.
- B. Scope of work includes, but is not limited to the following:
 - 1. Supply and installation of new timber members.
- C. Related work specified elsewhere:
 - 1. Timber floats under TIMBER FLOATS, SECTION 02400.
 - 2. Fasteners, anchor bolts, and bolts under MISCELLANEOUS METALS, SECTION 05600.
 - 3. Treatments as specified under TIMBER TREATMENT, SECTION 06310.

1.2 QUALITY ASSURANCE

- A. Except as noted all work shall conform to the latest editions of the following codes, specifications, and standards:
 - 1. Southern Pine Inspection Bureau (SPIB)
 - 2. West Coast Lumber Inspection Bureau (WCLIB)
 - 3. Western Wood Products Association (WWPA)
 - 4. National Forest Products Association (NFPA)
 - 5. American Society for Testing and Materials (ASTM)
 - 6. Commonwealth of Massachusetts State Building Code (CMSBC)
 - 7. American Institute of Timber Construction (AITC)

1.3 SUBMITTALS

- A. AWP quality certification on all treated timber.
- B. Certification of timber species.
- C. Material list with treatment, sizes, and quantities

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. All timber shall be stored in stacks such that there is an air space beneath the material and situated to prevent the timber from being exposed to standing water.
- B. The material shall be stored on site in an area which will be designated by the Owner.
- C. Timber shall be handled in an approved manner such that the material will not be damaged.

2. PRODUCTS

2.1 MATERIALS

- A. Unless otherwise specified on the Contract Drawings, all timber to be used shall be No. 1 dense Southern Pine as graded by SPIB and with design values per NFPA National Design Specification or the equivalent for Douglas Fir as graded by WCLIB and WWPA.
- B. All timber shall be new and supplied with nominal dimensions unless otherwise noted.

3. EXECUTION

3.1 PREPARATION

- A. Prior to installation all demolition affecting the new work shall be completed.

3.2 INSTALLATION

- A. Coat ends of field cut members as specified under TIMBER TREATMENT, SECTION 06310.
- B. Joints are to be square, tight, and well-fastened with all members assembled in accordance with the Contract Drawings.
- C. Holes for bolts shall be drilled the same size as the bolt before galvanizing. Holes shall be swabbed with 2 coats of sealing compound as specified herein before installing the bolts.
- D. Bolts shall be tightened to provide a solid connection. No more than 1 washer shall be installed under the bolt head or nut. Bolt threads shall project no more than one bolt diameter beyond the nut.
- E. All timber shall be cut and fit in such a manner as to have full bearing over the entire contact surface.

4. MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT AND PAYMENT

- A. No separate measurement or payment shall be made for the work in this Section. Measurement and Payment for this item shall be included within the work it is associated with.

**** END OF SECTION ****

SECTION 06310

TIMBER TREATMENT

1. GENERAL

1.1 DESCRIPTION

- A. Provide all labor, materials, equipment, and supervision necessary to complete the work specified in this Section.
- B. Scope of work includes:
 - 1. The treatment of timber members with a wood preservative.
 - 2. The field application of all timber subject to field cutting.
- C. Related work specified elsewhere:
 - 1. Timber floats under TIMBER FLOATS, SECTION 02400
 - 2. Timber under HEAVY TIMBER CONSTRUCTION, SECTION 06130.

1.2 QUALITY ASSURANCE

- A. Except as noted all work shall conform to the latest editions of the following codes, specifications, and standards.
 - 1. American Society for Testing and Materials (ASTM) D-25.
 - 2. American Wood Preservatives Association (AWPA).

2. PRODUCTS

2.1 MATERIALS

- A. All new Southern Yellow Pine and Douglas Fir timber members to which the public may be exposed (decking, handrails, benches, similar) shall be treated with alkaline copper quaternary (ACQ) in accordance with AWPA Standards for material subject to salt water use and shall obtain a green tint due to the treatment.
- B. All new Southern Yellow Pine and Douglas Fir timber members to which the public shall not be exposed (framing, berthing fenders, similar) shall be treated with chromated copper arsenate (CCA) in accordance with AWPA Standard P5 and C2 for material subject to salt water use and shall obtain a green tint due to the treatment.

3. EXECUTION

- 3.1 Prior to treatment all dimension lumber shall be kiln-dried. Conditioning by heating is not permitted.
- 3.2 All timber to be treated with alkaline copper quaternary (ACQ) shall be treated to a retention of 0.6 pounds per cubic foot.
- 3.3 All timber to be treated with chromated copper arsenate (CCA) shall be treated to a retention of 2.5 pounds per cubic foot.

3.4 Sealing compound for treatment of field cuts and drilled holes shall be two (2) coats of copper naphthenate meeting AWPA standard P8.

4. MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT AND PAYMENT

- A. No separate measurement or payment shall be made for the work in this Section. Measurement and Payment for this item shall be included within the work it is associated with.

*** END OF SECTION ***

SECTION 09800

COATINGS

1. GENERAL

1.1 DESCRIPTION

A. The work of this Section includes, but is not limited to providing all labor, equipment, materials, incidental work, supervision and construction methods necessary, as indicated on the Contract Documents, as specified for preparation and application of the following coating types:

1. Fusion Bonded Epoxy (FBE) Coating for:
 - a. All steel pipe piles.
2. Hot Dipped Galvanized:
 - a. All hardware and fasteners shall be hot dipped galvanized by the hot dip method according to ASTM specifications A-123 and A-153, unless noted otherwise on the Contract Documents.
3. Epoxy Coating for:
 - a. Steel sheeting and related items.
 - b. All other structural steel.
 - c. All metal fabrications.
- B. Related work specified elsewhere includes:
 1. Steel sheeting under STEEL H-SECTION PILES, SECTION 02315.
 2. Steel pipe piles under STEEL PIPE PILES, SECTION 02316.
 4. Metal fabrications under METAL FABRICATIONS, SECTION 05500.
 5. Miscellaneous metals under MISCELLANEOUS METALS, SECTION 05600.

1.2 QUALITY ASSURANCE

- A. Except as noted, work shall conform to the latest editions of the following codes specifications and standards:
- A. Steel Structures Painting Council (SSPC): Surface Preparations Specifications, specifications and standards herein referred to.
 - B. American Society for Testing and Materials (ASTM): specifications and standards herein referred to.

1.3 SUBMITTALS

- A. Manufacturer's literature and recommended application instructions. Certification that materials meet specification requirements.
- B. Color of coatings with samples.
- C. Method for obtaining walking surface slip resistance with samples as may be required.
- D. Name and address of a licensed testing service for approval by Engineer.
- E. Test reports including:
 - a. Holiday detection.
 - b. Adhesion tests.
 - c. Thickness measurements.

1.4 FIELD TESTING

- A. Contractor shall provide an independent testing company having at least 10 years of experience on similar types of construction to perform all testing.
- B. Coatings may be inspected by the Engineer using holiday detectors, field adhesion test, or a combination of both.

1.5 PRODUCT HANDLING

- A. All coated materials shall be delivered, stored, and handled with care to prevent damage to the coating.
- B. All coated materials, especially steel sheeting and piles, shall be installed in such a manner that minimizes damage to the coating.
- C. Materials with damaged coatings will be rejected at the sole discretion of the Engineer and the materials replaced, unless otherwise agreed to by the Engineer, at no additional cost to the Owner.

2. PRODUCTS

2.1 MATERIALS

- A. Coating on all steel pipe piles shall be a fusion bonded epoxy powder coating system. The coating shall be Scotchkote #206N Fusion Bonded Epoxy Coating as manufactured by 3M Company, Electro-Products Division, St. Paul, MN; or equivalent by Armstrong Products Corporation of Warsaw, Indiana; or equivalent by Dupont Powder Coatings of Houston, Texas or approved equal.
- B. Coating on all metal fabrications and structural steel shall be Amercoat 235, Devco Bar rust 235, Sherwin Williams Seaguard 5000 HS two part epoxy with 68% solids, or approved equal. There shall be a minimum of two coats with a final dry film thickness of 14 mils (minimum, not average). There shall be a strip coat over sharp edges, cutouts and welds.
- C. All fasteners, bolts, nuts, washers, splice plates, spacer plates, and shim plates shall be hot dip galvanized by the hot dip method according to ASTM Specifications A-123 and A-153, unless noted otherwise on the Contract Documents.

D. Steel Sheeting

1. All steel sheeting and related steel fabricated items shall be coated with Amercoat 235, Devco Bar rust 235, Sherwin Williams Seaguard 5000 HS two part epoxy with 68% solids or approved equal. There shall be a minimum of two coats with a final dry film thickness **of 14 mils** (minimum, not average). There shall be a strip coat over sharp edges, cutouts, and welds. There shall be contrasting colors for each coat with the **final color black**.

E. No coating of stainless steel is required.

3. EXECUTION

3.1 SHOP SURFACE PREPARATION

A. General

1. All surfaces shall be thoroughly prepared for coating application in strict accordance with the coating manufacturer's recommendation and these specifications. All cleaning and coating work must be performed in a heated building. Preceding grit blasting, steel must be heated to at least 100 degrees F. to eliminate possibility of moisture on the surfaces to be cleaned and coated.
2. Grit blasting shall be to clean grey metal, at least equivalent to a Near White as defined by SSPC Specification SP-10. All work blasted in one day must be coated on that day.
3. Any areas of the surface which show traces of oil, grease, or other organic matter shall be removed prior to coating. The contamination shall be removed by using either a solvent or spot blasting.
4. All surfaces to be coated must be completely dry, free of moisture, soil, dust and grit and the time the coating is applied.
5. The Engineer shall have access to each part of the process and shall have the right and opportunity to witness any of the quality control test and/or perform such test himself on a random sampling basis.

3.2 APPLICATION OF COATING

A. Fusion Bonded Epoxy (FBE) Coating (Shop Coat)

1. The fusion bonded epoxy coating shall be applied in an environmentally controlled plant that is fully enclosed. The coating system shall be fully automatic with the capabilities of preheating and post baking. The grit blast cleaning machine shall be fully automatic and fully enclosed in an environmentally controlled plant.
2. The finished coating thickness shall be **10 mils nominal** as tested in accordance with ASTM-G12.
3. The coating material shall be applied strictly in accordance with the coating manufacturer's recommendation as to coating application procedure and curing schedule. In no case shall the oven temperatures or temperature of the piling during any part of the curing process, exceed 260 C. (500 F.).

4. The cured coating shall be of uniform color, gloss, and thickness, and shall be free of blisters, pinholes, fish eyes, sags, runs, and any other irregularities.

5. The coater shall be responsible for all quality control checking including visual inspection, thickness measurements, and holiday testing, and shall keep records on the results of all such inspections in a form suitable to the Engineer's Representative.

6. The Engineer's Representative shall have access to each part of the process and shall have the right and opportunity to witness any of the quality control test and/or perform such test himself on a random sampling basis.

B. High Solids Epoxy (Shop Coat)

1. All coating shall be applied by brush or spray using commercially available spray equipment. The coatings shall exhibit reasonable leveling without excessive sagging when applied at the required film thickness. Proper adhesion between coats shall be ensured, depending on method of coating application, without undue restrictions concerning timing, temperature or other conditions associated with application. Coating manufacturer's recommendations and these specifications shall be adhered to. The temperature of the coating shall be within 15 degrees F. of the temperature of the steel at the time of application of the coating.

2. Where coating on any type of surface has commenced, the complete coating operation, including priming and finishing coats when multiple coats are used on that portion of the work, shall be completed as soon as practicable, without prolonged delays. Where necessary, sufficient time shall elapse between successive coats to permit them to dry properly for recoating and this period shall be modified as necessary to suit curing conditions.

3. Coating Thickness

a. A minimum thickness (not average) of 14 mils dry film is required on all surfaces to be coated.

b. Where two coats are required to achieve the recommended film build, the interval between coats should be as short as possible. To ensure maximum intercoat adhesion, it is recommended that:

1) The next coat be applied as soon as possible after the previous coat has undergone final curing.

2) If the previous coat has cured for more than the recoat time specified by the manufacturer, wash with fresh water, then brush blast to provide an adequate mechanical bond before recoating.

4. Final Curing Time: Coated surfaces shall be permitted as long a drying time as practicable, but in any event the minimum requirements shall be in accordance with the coating manufacturer's recommendations.

5. Thinning: Whenever possible the material shall be applied without thinning. Where thinning must be done, it shall be as recommended by the coating manufacturer. If the material is thinned, it may be necessary to apply more

than the standard 1 or 2 coats to attain the **required minimum (not average) dry film thickness of 14 mils.**

6. Appearance of Finished Coating

a. The finished coating shall be generally smooth and free of sharp protuberances which could be removed by abrasion. A minor amount of sags, dimpling, or curtaining which does not exceed 2 to 3 percent of the surface will not be considered cause for rejection unless they present sharp edges which might be removed by abrasion.

b. Sharp protuberances shall be cut off using a sharp wood chisel laid flat against the surface. The area from which material has been removed shall be recoated to smooth the surface.

3.3 FIELD SURFACE PREPARATION

A. Field surface preparation and coating shall only take place on items requiring field assembly or touch up including:

1. Pile connections.
2. Weldments, scraps, chips and areas where coating has been damaged.

B. Grind, wire brush, or, otherwise clean to grey metal. Work to be at least equivalent to Power Tool Cleaning as defined by SSPC specification SP-3. All work cleaned must be coated on that day.

C. Traces of oil, grease, or other organic matter on areas of the surface shall be removed prior to coating. The contamination shall be removed by using either a solvent or spot blasting.

D. All surfaces to be coated must be completely dry, free of moisture, soil, dust and grit at the time the coating is applied.

E. No sandblasting of newly galvanized metal shall occur. Contractor to follow coating manufacturer's recommendations for primer coating of galvanized metal.

3.4 FIELD COATING

A. General

1. Prior to installation, all connections and items which will become inaccessible after installation shall be coated.

2. After coated items have been installed, field coat all accessible areas which have been scraped or chipped.

3. After field coating and touch up of coatings, the coating shall have a uniform, consistent finish, including the color and appearance of the coating. Engineer reserves the right to reject any materials considered to not have a uniform, consistent coating and have them either replaced or re-coated by the Contractor at no additional cost to the Owner.

B. Fusion Bonded Epoxy (FBE) Coating Touch Up

1. The touch up epoxy material shall be 3M Scotchkote 323/323i Liquid Epoxy Coating or an approved equivalent two-part epoxy system designed and color-matched for patching the epoxy coating utilized during shop coating and with the same manufacturer.

2. Mixing: Mix ratio of Part A to Part B shall be 1:1 by volume. The two parts must be thoroughly mixed until a uniform color is achieved. If thinning is required, thin each part separately to minimize loss of pot life with thinner recommended by the producer. Pot life should be approximately 8 hours.

3. Application: Material should be capable of being applied with ordinary brush or roller at a temperature of 55 degrees F. and above. A tack-free surface should be achieved in 2 to 3 hours at 72 degrees F. Full cure should be achieved in 3 to 5 days at 72 degrees F. Care should be exercised in handling parts before they are fully cured.

C. Epoxy Coating (High Solids) Touch Up

1. The touch up of High Solids Epoxy coating shall be with the same High Solids Epoxy coating system utilized during shop coating and with the same coating manufacturer.

2. Application of field coating shall be as recommended by the manufacturer and cleaning and curing criteria prior to installation shall be strictly adhered to.

3.5 CARE OF EXISTING WORK

A. Existing work shall be protected from spillage and spattering during application of coatings.

B. All spillages and splatterings shall be cleaned up immediately. Contractor is responsible to leave existing areas free of all such foreign materials.

3.6 DEFECTIVE MATERIALS

A. Coating which, in the opinion of the Engineer, does not meet acceptance due to improper coating, storage, handling, installation or other damage shall be rejected. The rejected materials shall be, at the sole discretion of the Engineer, either replaced with coated new material or completely cleaned to base material and re-coated in accordance with these specifications for shop coating of materials. This work shall be done at no additional cost the Owner.

4. MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT AND PAYMENT

A. No separate measurement or payment shall be made for the work in this Section. Measurement and Payment for this item shall be included within the work it is associated with.

*** END OF SECTION ***

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 losses, 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°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°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. Covers shall be secured with stainless steel lockable pull catches.

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. Bussing
 - a. Provide 1-phase 250 kcmil (minimum) mechanical lug bus.
 - 11. Devices
 - a. For barge 0A ship to shore power.
 - 1) Provide 50A, 120V, 1 phase receptacle, NEMA type SS-1 on Side #1, protected by dedicated 50A-1P branch circuit breaker.
 - 2) Provide 50A, 120V, 1 phase receptacle, NEMA type SS-1 on Side #2, protected by dedicated 50A-1P branch circuit breaker.
 - 12. Electric Meters
 - a. Provide digital electronic meter to independently meter both Side #1 and Side #2.
 - b. Provide wireless remote metering for all digital electronic meters. Provide Gateway, Software, etc. for a complete and operational system which can meter

electrical usage from within the mobile trailer. Provide start-up and testing services.

- 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:

| <u>208/120 Volts</u> | <u>Phase</u> |
|-----------------------------|---------------------|
| 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.

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.

| <u>Item Number</u> | <u>Description</u> | <u>Unit</u> |
|--------------------|---------------------------|-------------|
| 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

SECTION B

REGULATORY APPROVALS

Order of Conditions #64-567
401 Water Quality Certificate #X262080
Chapter 91 License - #14026
US Army Corps of Engineers Permit #CENAE-R-NAE-2005-1095



CITY OF SALEM CONSERVATION COMMISSION

May 9, 2014

Kathleen Winn
City of Salem Department of Planning & Community Development
120 Washington Street, 3rd floor
Salem, MA 01970

Re: Order of Conditions—DEP #64-567—10 Blaney Street Marina

Dear Ms. Winn:

Enclosed, please find the Order of Conditions for the above-referenced project. Following the 10-business-day appeal period (from May 9, 2014), this document must be recorded at the Southern Essex County Registry of Deeds (Shetland Park, 45 Congress Street, Suite 4100 Salem, Massachusetts). Once recorded, please return a copy of Page 12 of the Order, which will indicate to the Commission that the document has been recorded.

If you have any further questions, please feel free to contact me at 978-619-5685.

Sincerely,

Tom Devine
Conservation Agent/ Staff Planner

Enclosures

CC: DEP Northeast Regional Office



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

64-567

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A. General Information

Please note:
this form has
been modified
with added
space to
accommodate
the Registry
of Deeds
Requirements

Important:
When filling
out forms on
the
computer,
use only the
tab key to
move your
cursor - do
not use the
return key.



1. From: Salem
Conservation Commission

2. This issuance is for
(check one): a. ☒ Order of Conditions b. ☐ Amended Order of Conditions

3. To: Applicant:

Kathleen

Winn

a. First Name

b. Last Name

City of Salem

c. Organization

120 Washington Street

d. Mailing Address

Salem

MA

01970

e. City/Town

f. State

g. Zip Code

4. Property Owner (if different from applicant):

a. First Name

b. Last Name

City of Salem

c. Organization

93 Washington Street

d. Mailing Address

Salem

MA

01970

e. City/Town

f. State

g. Zip Code

5. Project Location:

10 Blaney Street

Salem

a. Street Address

b. City/Town

41

278

c. Assessors Map/Plat Number

d. Parcel/Lot Number

Latitude and Longitude, if known:

d. Latitude

e. Longitude



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A. General Information (cont.)

- 6 Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

Essex South

a. County

23825

c. Book

b. Certificate Number (if registered land)

116

d. Page

- 7 Dates
- a. Date Notice of Intent Filed 4/23/2014
- b. Date Public Hearing Closed 5/8/2014
- c. Date of Issuance 5/9/2014

- 8 Final Approved Plans and Other Documents (attach additional plan or document references as needed)

See attached

a. Plan Title

b. Prepared By

c. Signed and Stamped by

d. Final Revision Date

e. Scale

f. Additional Plan or Document Title

g. Date

B. Findings

- 1 Findings pursuant to the Massachusetts Wetlands Protection Act

Following the review of the above-referenced Notice of intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply.

- a. ☐ Public Water Supply
- b. ☒ Land Containing Shellfish
- c. ☐ Prevention of Pollution
- d. ☐ Private Water Supply
- e. ☒ Fisheries
- f. ☒ Protection of Wildlife Habitat
- g. ☐ Groundwater Supply
- h. ☒ Storm Damage Prevention
- i. ☒ Flood Control

- 2 This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

- a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.



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B. Findings (cont.)

Denied because:

- b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**
- c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**
3. ☐ Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) a. linear feet

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

| Resource Area | Proposed Alteration | Permitted Alteration | Proposed Replacement | Permitted Replacement |
|--|---|---|--|--|
| 4. <input type="checkbox"/> Bank | <u> </u> a. linear feet | <u> </u> b. linear feet | <u> </u> c. linear feet | <u> </u> d. linear feet |
| 5. <input type="checkbox"/> Bordering Vegetated Wetland | <u> </u> a. square feet | <u> </u> b. square feet | <u> </u> c. square feet | <u> </u> d. square feet |
| 6. <input type="checkbox"/> Land Under Waterbodies and Waterways | <u> </u> a. square feet | <u> </u> b. square feet | <u> </u> c. square feet | <u> </u> d. square feet |
| | <u> </u> e. c/y dredged | <u> </u> f. c/y dredged | | |
| 7. <input type="checkbox"/> Bordering Land Subject to Flooding | <u> </u> a. square feet | <u> </u> b. square feet | <u> </u> c. square feet | <u> </u> d. square feet |
| Cubic Feet Flood Storage | <u> </u> e. cubic feet | <u> </u> f. cubic feet | <u> </u> g. cubic feet | <u> </u> h. cubic feet |
| 8. <input type="checkbox"/> Isolated Land Subject to Flooding | <u> </u> a. square feet | <u> </u> b. square feet | | |
| Cubic Feet Flood Storage | <u> </u> c. cubic feet | <u> </u> d. cubic feet | <u> </u> e. cubic feet | <u> </u> f. cubic feet |
| 9. <input type="checkbox"/> Riverfront Area | <u> </u> a. total sq. feet | <u> </u> b. total sq. feet | | |
| Sq ft within 100 ft | <u> </u> c. square feet | <u> </u> d. square feet | <u> </u> e. square feet | <u> </u> f. square feet |
| Sq ft between 100-200 ft | <u> </u> g. square feet | <u> </u> h. square feet | <u> </u> i. square feet | <u> </u> j. square feet |



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B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

| | Proposed Alteration | Permitted Alteration | Proposed Replacement | Permitted Replacement |
|--|---|-------------------------|-------------------------|--------------------------|
| 10. <input type="checkbox"/> Designated Port Areas | Indicate size under Land Under the Ocean, below | | | |
| 11. <input checked="" type="checkbox"/> Land Under the Ocean | 46950 a. square feet | 46950 b. square feet | | |
| | 11520 c. c/y dredged | 11520 d. c/y dredged | | |
| 12. <input type="checkbox"/> Barrier Beaches | Indicate size under Coastal Beaches and/or Coastal Dunes below | | | |
| 13. <input checked="" type="checkbox"/> Coastal Beaches | 300 a. square feet | 300 b. square feet | cu yd c. nourishment | cu yd d. nourishment |
| 14. <input type="checkbox"/> Coastal Dunes | _____ a. square feet | _____ b. square feet | cu yd c. nourishment | cu yd d. nourishment |
| 15. <input checked="" type="checkbox"/> Coastal Banks | 14 a. linear feet | 14 b. linear feet | | |
| 16. <input type="checkbox"/> Rocky Intertidal Shores | _____ a. square feet | _____ b. square feet | | |
| 17. <input type="checkbox"/> Salt Marshes | _____ a. square feet | _____ b. square feet | _____ c. square feet | _____ d. square feet |
| 18. <input type="checkbox"/> Land Under Salt Ponds | _____ a. square feet | _____ b. square feet | | |
| | _____ c. c/y dredged | _____ d. c/y dredged | | |
| 19. <input type="checkbox"/> Land Containing Shellfish | _____ a. square feet | _____ b. square feet | _____ c. square feet | _____ d. square feet |
| 20. <input type="checkbox"/> Fish Runs | Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above | | | |
| | _____ a. c/y dredged | _____ b. c/y dredged | | |
| 21. <input type="checkbox"/> Land Subject to Coastal Storm Flowage | _____ a. square feet | _____ b. square feet | | |



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B. Findings (cont.)

* #22 If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5 c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here

22. ☐ Restoration/Enhancement *:

a. square feet of BVW

b. square feet of salt marsh

23. ☐ Stream Crossing(s):

a. number of new stream crossings

b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
 - a. the work is a maintenance dredging project as provided for in the Act; or
 - b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on 5/9/2014 unless extended in writing by the Department
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.



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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.
10. A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]
"File Number 64-567 "
11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.
12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
13. The work shall conform to the plans and special conditions referenced in this order.
14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.
17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.



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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. The work associated with this Order (the "Project") is (1) ☐ is not (2) ☒ subject to the Massachusetts Stormwater Standards. If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:

- i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
- ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
- iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;
- iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;
- v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion



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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement") for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following: *i.*) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and *ii.*) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.
- d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.
- e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.
- f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP.

64-567

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eDEP Transaction #

Salem

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
 2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
 3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.
- h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.
- i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.
- j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.
- k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.
- l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document)



Massachusetts Department of Environmental Protection
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D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☒ Yes ☐ No
2. The Salem Conservation Commission hereby finds (check one that applies):

- a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

1. Municipal Ordinance or Bylaw

2. Citation

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

- b. ☒ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

Wetlands Protection & Conservation Ordinance

c. 50

1. Municipal Ordinance or Bylaw

2. Citation

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

Attached special conditions are issued under the Wetlands Protection Act and are sufficient for compliance with the local ordinance.



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Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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E. Signatures

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key



This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance

Please indicate the number of members who will sign this form

This Order must be signed by a majority of the Conservation Commission

5/9/2014
1. Date of Issuance

5
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy must be mailed, hand delivered or filed electronically at the same time with the appropriate MassDEP Regional Office.

Signatures

[Handwritten signatures]

[Handwritten signature]

☒ by hand delivery on

5/9/2014
Date

☐ by certified mail, return receipt requested, on

Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request of Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Conservation Commission

Please be advised that the Order of Conditions for the Project at:

Project Location

MassDEP File Number

Has been recorded at the Registry of Deeds of:

County

Book

Page

for:

Property Owner

and has been noted in the chain of title of the affected property in:

Book

Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant



SALEM CONSERVATION COMMISSION

DEP FILE #64-567

10 Blaney Street Marina
City of Salem, Massachusetts

ADDITIONAL FINDINGS

Based on the Estimated Habitats of Rare Wildlife and Certified Vernal Pools Map (5/1/2014) from Natural Heritage & Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries and Wildlife, it has been determined that this project does not occur near any habitat of state-listed rare wildlife species nor contains any vernal pools.

This Order permits the construction of a marina and associated improvements at the above location per Notice of Intent and plans submitted 4/23/2014 (narrative revised 5/1/2014). As mitigation for the impact of this project, applicant shall remove debris from surrounding beach area by hand.

GENERAL CONDITIONS

1. This Order of Conditions must be recorded in its entirety (**including all 5 pages of Special Conditions**) at the Essex County Registry of Deeds or the Land Court for the district in which the land is located, after the expiration of the 10-day appeal period and within 30 days of the issuance. **A copy of the recording information must be submitted to the Salem Conservation Commission before any work approved in this Order commences.**
2. Approval of this application does not constitute compliance with any law or regulation other than M.G.L Chapter 131, Section 40, Wetlands Regulations 310 CMR 10.00 and the City of Salem Wetlands Protection Ordinance, Salem Code Chapter 50.
3. All work shall be performed in accordance with this Order of Conditions and approved site plan(s). No alteration of wetland resource areas or associated buffer zones, other than that approved in this Order, shall occur on this property without prior approval from the Commission.
4. Prior to any work commencing on site, a DEP Sign showing **DEP File #64-567** must be installed at the entrance to the site and seen from the public way, but not placed on a living tree.
5. No work approved in this Order may commence until the ten (10) business day appeal period has lapsed from the date of the issuance of this Order.
6. With respect to this Order, the Commission designates the Conservation Agent as its agent with powers to act on its behalf in administering and enforcing this Order.
7. The Commission or its Agent, officers, or employees shall have the right to enter and inspect the property at any time for compliance with the conditions of this Order, the Wetlands Protection Act MGL Chapter 131, Section 40, the Wetlands Regulations 310 CMR 10.00, and shall have the right to require any data or documentation that it deems necessary for that evaluation.



8. The term "Applicant" as used in this Order of Conditions shall refer to the owner, any successor in interest or successor in control of the property referenced in the Notice of intent, supporting documents and this Order of Conditions. The Commission shall be notified in writing within 30 days of all transfers of title of any portion of the property that takes place prior to issuance of the Certificate of Compliance.
9. It is the responsibility of the applicant to procure all other applicable federal, state and local permits and approvals associated with this project. These permits may include but are not necessarily limited to the following:
 - (1) Section 404 of the Federal Water Pollution Control Act (P.L. 92-500, 86 stat. 816), U.S. Army Corps of Engineers.
 - (2) Water Quality Certification in accordance with the Federal Water Pollution Control under authority of sec. 27(5) of Chapter 21 of the Massachusetts General Laws as codified in 314 CMR 9.00.
 - (3) Sewer Extension Permit from the DEP Division of Water Pollution Control under G. L. Ch. 21A ss7 and 314 CMR 7.00. Any Board of Health permit for septic system design for any portion of the septic system within 100 feet of wetlands shall be submitted to the Commission prior to construction initiation.
 - (4) Design Requirements for Construction in Floodplains under the State Building Code (780 CMR 744.).
10. If there are conflicting conditions within this Order, the stricter condition(s) shall rule.
11. All work shall be performed so as to ensure that there will be no sedimentation into wetlands and surface waters during construction or after completion of the project.
12. The Commission or its Agent shall have the discretion to modify the erosion/siltation control methods and boundary during construction if necessary.
13. The Commission reserves the right to impose additional conditions on portions of this project or this site to mitigate any actual or potential impacts resulting from the work herein permitted.
14. The work shall conform to the following attached plans and special conditions:

Final Approved Plans

Proposed Conditions, Salem Port Expansion, Commercial Marina & Dredge, sheets 1 &2

(Title)

4/11/2014

(Dated)

Ronald R. Bourne

(Signed and Stamped by)

City of Salem Conservation Commission

(On file with)

15. Any proposed changes in the approved plan(s) or any deviation in construction from the approved plan(s) shall require the applicant to file a Notice of Project Change with the Commission. The Notice shall be accompanied by a written inquiry prior to their implementation in the field, as to whether the change(s) is substantial enough to require filing a new Notice of Intent or a request to correct or amend this Order of Conditions. A copy of such request shall at the same time be sent to the Department of Environmental Protection.



16. In conjunction with the sale of this property or any portion thereof before a Certificate of Compliance has been issued, the applicant or current landowner shall submit to the Commission a statement signed by the buyer that he/she is aware of an outstanding Order of Conditions on the property and has received a copy of the Order of Conditions.
17. [Reserved]

PRIOR TO CONSTRUCTION

18. **Prior to the commencement of any activity on this site other than activities listed above, there must be a Pre-Construction Meeting** on site between the project supervisor, the contractor responsible for the work, and the Conservation Agent and/or a member of the Conservation Commission to ensure that the requirements of the Order of Conditions are understood. The staked erosion control line shall be adjusted, if necessary, during the pre-construction meeting. **Please contact the Conservation Agent at (978) 619-5685 at least forty-eight (48) hours prior to construction to arrange for the Pre-Construction Meeting.**
19. Prior to the pre-construction meeting and commencement of any activity on this site, sedimentation and erosion control barriers shall be installed as shown on the approval plan(s) and detail drawings. The Commission and/or its Agent **shall inspect and approve such installation at the pre-construction meeting.**
20. No clearing of vegetation, including trees, or disturbance of soil shall occur prior to the pre-construction meeting. Minimal disturbance of shrubs and herbaceous plants shall be allowed prior to the pre-construction meeting if absolutely necessary in order to place erosion control stakes where required.
21. Adequate additional erosion and sediment controls shall be stored onsite to be used for emergency purposes.

EROSION CONTROL

22. Appropriate erosion control devices shall be in place prior to the beginning of any phase of construction, and shall be maintained during construction in any wetland resource area and/or buffer zones. The erosion control measures shown on the approval plan(s) and provisions in the Order will be the minimum standards for this project; the Commission or its Agent may require additional measures.
23. All debris, fill and excavated material shall be stockpiled a location far enough away from the wetland resource areas to prevent sediment from entering wetland resource areas.
24. Erosion and sedimentation control devices shall be inspected after each storm event and repaired or replaced as necessary. Any accumulated silt adjacent to the barriers shall be removed.
25. The area of construction shall remain in a stable condition at the close of each construction day.
26. Any de-watering of trenches or other excavation required during construction shall be conducted so as to prevent siltation of wetland resource areas. All discharge from de-watering activities shall be filtered through hay bale sediment traps, silt filter bags or other means approved by the Commission or its Administrator.



27. Within thirty (30) days of completion of construction on any given portion of the project, all disturbed areas in the completed portion of the site shall be permanently stabilized with rapidly growing vegetative cover, using sufficient top soil to assure long-term stabilization of disturbed areas.
28. If soils are to be disturbed for longer than two (2) months, a temporary cover of rye or other grass should be established to prevent erosion and sedimentation. If the season is not appropriate for plant growth, exposed surface shall be stabilized by other appropriate erosion control measures, firmly anchored, to prevent soils from being washed by rain or flooding.

DURING CONSTRUCTION

29. A copy of this Order of Conditions and the plan(s) approved in this Order shall be available on site at all times when work is in progress.
30. No alteration or activity shall occur beyond the limit of work as defined by the siltation barriers shown on the approved plan(s).
31. All waste products, grubbed stumps, slash; construction materials, etc. shall be deposited at least 100 feet from wetland resource areas and 200 feet from river.
32. Cement trucks shall not be washed out in any wetland resource or buffer zone area, nor into any drainage system. Any deposit of cement or concrete products into a buffer zone or wetland resource area shall be immediately removed.
33. All exposed sub-soils shall be covered by a minimum of three (3) inches of quality screened loam topsoil prior to seeding and final stabilization.
34. Immediately following drainage structure installation all inlets shall be protected by silt fence, haybale barriers and/or silt bags to filter silt from stormwater before it enters the drainage system.
35. There shall be no pumping of water from wetland resource areas.
36. All equipment shall be inspected regularly for leaks. Any leaking hydraulic lines, cylinders or any other components shall be fixed immediately.
37. During construction, all drainage structures shall be inspected regularly and cleaned as necessary.
38. The applicant is hereby notified that failure to comply with all requirements herein may result in the issuance of enforcement actions by the Conservation Commission including, but not limited to, civil administrative penalties under M.G.L Chapter 21A, section 16.

AFTER CONSTRUCTION

39. Upon completion of construction and final soil stabilization, the applicant shall submit the following to the Conservation Commission to request a Certificate of Compliance (COC):
 - (1) A Completed Request for a Certificate of Compliance form (WPA Form 8A or other form if required by the Conservation Commission at the time of request).
 - (2) A letter from a Registered Professional Engineer certifying compliance of the property with this Order of Conditions.
 - (3) An "As-Built" plan signed and stamped by a Registered Professional Engineer or Land Surveyor showing post-construction conditions within all areas under the jurisdiction of the Massachusetts Wetlands Protection Act. This plan shall include at a minimum:



- (a) All wetland resource area boundaries with associated buffer zones and regulatory setback areas taken from the plan(s) approved in this Order of Conditions;
 - (b) Locations and elevations of all stormwater management conveyances, structures and best management designs, including foundation drains, constructed under this Order within any wetland resource area or buffer zone;
 - (c) Distances from any structures constructed under this Order to wetland resource areas - "structures" include, but are not limited to, all buildings, septic system components, wells, utility lines, fences, retaining walls, and roads/driveways;
 - (d) A line delineating the limit of work - "work" includes any filling, excavating and/or disturbance of soils or vegetation approved under this Order;
40. When issued, the Certificate of Compliance must be recorded at the Essex County Registry of Deeds and a copy of the recording submitted to the Salem Conservation Commission.
41. If the completed work differs from that in the original plans and conditions, the report must specify how the work differs; at which time the applicant shall first request a modification to the Order. Only upon review and approval by the Commission, may the applicant request in writing a Certificate of Compliance as described above.
42. Erosion control devices shall remain in place and properly functioning until all exposed soils have been stabilized with final vegetative cover and the Conservation Commission and/or its Agent has authorized their removal.

ADDITIONAL CONDITIONS

43. As recommended by the Massachusetts Division of Marine Fisheries (5/8/2014 letter from N. Tay Evans), all in-water, silt-producing work shall be confined to February 15 to June 30 of any year to minimize impacts on vulnerable marine species. No exception to this restriction may be made without the explicit approval of the Conservation Agent.



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker
Governor

Matthew A. Beaton
Secretary

Karyn E. Polito
Lieutenant Governor

Martin Suuberg
Commissioner

July 23, 2015

Kathleen Winn
City of Salem
120 Washington Street
Salem, MA 01970

TRANSMITTAL # X262080
DEP File # 064-0567
EEA # 14234

RE: 401 WATER QUALITY CERTIFICATION
Application for: BRP WW 07
WATER QUALITY CERTIFICATION FOR DREDGING – MAJOR PROJECT

AT: 10 Blaney Street – Salem
Salem Harbor Wharf Embayment
North Coastal Watershed

Dear Ms. Winn:

The Department of Environmental Protection (“MassDEP”) has reviewed your application for a Water Quality Certification (“WQC”), as referenced above. In accordance with the provisions of Section 401 of the Federal Clean Water Act as amended (33 U.S.C. §1251 et seq.), MGL c.21, §§ 26-53, and 314 CMR 9.00, MassDEP has determined there is reasonable assurance the project or activity will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law.

The waters of Salem Harbor are designated in the Massachusetts Surface Water Quality Standards as Class SB. Such waters are intended “as habitat for fish, other aquatic life and wildlife, and for primary and secondary contact recreation.” Anti-degradation provisions of these Standards require that “existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.” In addition, this area has been designated for Shellfishing pursuant to 314 CMR 4.00.

The above-referenced project involves the improvement dredging of approximately 13,565 cubic yards of sediment in the Salem Harbor Wharf Embayment for the creation of a commercial marina for local lobstermen and fishing boats. A 60 foot long gangway, 6,165 square feet of floating docks, 29 mooring piles, and a sheet pile wall will be installed as part of this project. The material will be removed via mechanical dredge and loaded onto dump scows, which will transport the spoils to the Massachusetts Bay Disposal Site (“MBDS”).

Alternatives Analysis: This project is the next phase in the redevelopment of the North Commercial Waterfront and was included in the 2008 revision to the Salem Port Expansion ("SPE") Project. The preferred alternative accepted by the Secretary of Energy and Environmental Affairs (the "Secretary") in the Environmental Notification Form ("ENF") Certificate [EEA # 14234] issued on July 11, 2008 included 41,600 square feet of intertidal dredging. However, through avoidance, minimization, and mitigation efforts, the intertidal impacts have been reduced from 41,600 square feet to 200 square feet.

Sediment Sampling Data: For the SPE Project, the Army Corps of Engineers (the "Corps") issued a Suitability Determination on February 29, 2008 allowing the sediment to be disposed of at the MBDS. Since that determination is only valid for 3 years, an update was required before this project could proceed. On March 25, 2015, the Corps issued an updated Suitability Determination once again approving the disposal of the sediment at the MBDS.

In general, the results of the gradation analysis reveal that the sediment is primarily fine gravel and sand.

Dredged Material Dewatering: The dredged material will not be dewatered at the dredge site.

Dredged Material Disposal or Reuse: The dredged material will be disposed of at the MBDS.

Rare Species and Wildlife Habitat: The site is not located within the Priority Habitat of Rare Species and Estimated Habitats of Rare Wildlife as indicated in the Massachusetts Natural Heritage Atlas, 13th Edition.

Time of Year Restrictions for In-Water Work: In accordance with letters dated July 23, 2014 from the Division of Marine Fisheries ("DMF") and April 9, 2015 from the National Marine Fisheries Service ("NMFS"), the Time of Year ("TOY") restrictions for any in-water, silt-producing work associated with this project are from January 15 through June 30 and from May 1 through September 30.

Public Notice: The 401 WQC Application public notice was published in the Salem News on July 25, 2014. No comments were received by MassDEP during the 21-day public comment period, which ended on August 15, 2014.

Section 61 Findings: Pursuant to M.G.L. Chapter 30, Sections 61 to 62H inclusive [the Massachusetts Environmental Policy Act ("MEPA")], the project, as referenced in Water Quality Certification Application, DEP Transmittal # X262080, is a portion of the larger SPE Project that was required to file an ENF. The City of Salem (the "Proponent") filed the ENF for the construction of the SPE Project under EEA # 14234 and noticed the ENF in the Environmental Monitor (the "Monitor") on April 23, 2008. In the Certificate issued on July 11, 2008, the Secretary determined that the impacts of the SPE Project "did not warrant the preparation of an EIR," that "no further MEPA review is required," and that "the proponent may resolve any remaining issues during the state and local permitting processes." MassDEP has reviewed the findings in the ENF Certificate and confirms that based on the avoidance, minimization, and mitigation measures

undertaken by the Proponent, in conjunction with the requirements set forth in this Certification, all outstanding issues have been addressed satisfactorily.

Therefore, based on information currently in the record, MassDEP grants a 401 Water Quality Certification for this project subject to the following conditions to maintain water quality, to minimize impact on waters and wetlands, and to ensure compliance with appropriate state law. MassDEP further certifies in accordance with 314 CMR 9.00 that there is reasonable assurance the project or activity will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law. Finally, MassDEP has determined that upon satisfying the conditions and mitigation requirements of this approval, the project provides a level of water quality necessary to protect existing uses and accordingly finds that the project to be implemented satisfies the Surface Water Quality Standards at 314 CMR 4.00.

1. The Contractor shall take all steps necessary to assure that the proposed activities will be conducted in a manner that will avoid violations of the anti-degradation provisions of the Massachusetts Surface Water Quality Standards that protect all waters, including wetlands.
2. Prior to the start of work, or for any portion of the work thereafter, MassDEP shall be notified of any change(s) in the proposed project or plans that may affect waters or wetlands. MassDEP will determine whether the change(s) requires a revision to this Certification.
3. Dredging in accordance with this Certification may begin following the 21-day appeal period and once all other permits have been received.
4. All work shall be performed in accordance with the following documents and plans:
 - Application for Water Quality Certification received June 17, 2014, Transmittal Form # X262080, as revised through July 7, 2015, with attachments.
 - Plan entitled "Marina Installation, Locus Plan, Salem Harbor," consisting of one (1) sheet [sheet 1 of 4], scale 1"=1000', dated June 16, 2014, not signed or stamped, prepared by Bourne Consulting Engineering, PC.
 - Plan entitled "Marina Installation, Existing Conditions, Salem Harbor," consisting of one (1) sheet [sheet 2 of 4], scale 1"=70', dated June 16, 2014, not signed or stamped, prepared by Bourne Consulting Engineering, PC.
 - Plan entitled "Marina Installation, Proposed Marina Layout, Salem Harbor," consisting of one (1) sheet [sheet 3 of 4], scale 1"=70', dated August 7, 2014, not signed or stamped, prepared by Bourne Consulting Engineering, PC.
 - Plan entitled "Marina Installation, Proposed Marina Section, Salem Harbor," consisting of one (1) sheet [sheet 4 of 4], various scales, dated August 7, 2014, not signed or stamped, prepared by Bourne Consulting Engineering, PC.

- Order of Conditions issued pursuant to the Massachusetts Wetlands Protection Act (M.G.L. Chapter 131, § 40) by the Salem Conservation Commission for DEP File Number 064-0567, dated May 9, 2014.
5. MassDEP shall be notified, attention Derek Standish [617-654-6611], one week prior to the start of in-water work so that MassDEP staff may inspect the work for compliance with the terms and conditions of this Certification.
 6. This Certification remains in effect for the same duration as the federal permit that requires it or five years from the date of issuance of this Certification, whichever comes first.
 7. Future maintenance dredging may be conducted as necessary for the duration of this Certification, provided that:
 - a. the initial project and any subsequent dredging has been conducted satisfactorily with no violations of the terms and conditions of this Certification;
 - b. information has been submitted to MassDEP regarding chemical characteristics and final end use/disposal of the dredged material for review and approval. Under no circumstances may future maintenance dredging commence without obtaining end use/disposal approval from MassDEP; **or** an updated Suitability Determination issued by the Army Corps of Engineers for unconfined ocean disposal at the MBDS;
 - c. coordinates of the maintenance dredge footprint are the same as the authorized dredge footprint;
 - d. a due-diligence evaluation is done to determine that no known spills of oil or other toxic substances have occurred which could have contaminated the sediment in the dredge area and submit the evaluation to MassDEP;
 - e. a bathymetric survey has been submitted to MassDEP in compliance with Condition # 14;
 - f. the volume of future maintenance dredging does not exceed 13,565 cubic yards;
 - g. MassDEP is notified prior to commencement of maintenance dredging.
 8. Dredging shall be conducted using a closed, environmental bucket.
 9. Best Management Practices ("BMPs") such as a silt curtain shall be deployed surrounding the dredge area to minimize turbidity. At a minimum, the silt curtain shall be bottom-weighted to minimize the degree of lifting/flailing and shall be of suitable material/grade appropriate with the velocity of the current at the site. Intermediate vertical floats shall be placed on the silt curtain to lift the bottom of the silt curtain at low tide so that the bottom edges of the curtain remain close to the mudline at low tide but do not rake the sediment in areas subject to tidal influence.
 10. The applicant shall submit a turbidity and dissolved oxygen monitoring plan to MassDEP for acceptance within eight weeks of the effective date of this Certification or four weeks prior to the commencement of the dredging operations whichever comes first.
 11. Dredge scow overflow is prohibited at the dredge site and within waters of the Commonwealth.

12. Neither the barge nor the dredge scow shall be allowed to ground.
13. Disposal of any volume of dredged material at any location in tidal waters is subject to approval by MassDEP and the Massachusetts Coastal Zone Management office.
14. Within 30 days of the completion of the dredging, a bathymetric survey of the Salem Harbor Wharf Embayment depicting post-dredge conditions shall be conducted. At a minimum, the survey shall include an overlay of the dredge footprint (i.e. top of slope) with sufficient coordinates in the Massachusetts State Plane (e.g. longitude and latitude) that clearly delineates the dredge footprint. The survey shall be sent within five working days after its completion to MassDEP and a copy shall be sent to the Massachusetts Office of Coastal Zone Management, attention: Robert Boeri.
15. For the protection of winter flounder, no in-water or silt producing work, including, but not limited to dredging, shall occur from January 15th to June 30th.
16. For the protection of shellfish, no in-water or silt producing work, including, but not limited to dredging, shall occur from May 1st to September 30th.
17. In-water and/or silt producing work shall occur from October 1st to January 14th.
18. The applicant, or its contractor, shall make every feasible effort to complete the project within the permitted timeframe. Should the applicant, or their contractor, fail to complete the project and wish to request an amendment to the Certification for incursion into the no-dredge period, the written request shall be received by MassDEP by January 1st. The following information shall be included in the request:
 - a. project location and transmittal number,
 - b. the date on which dredging started,
 - c. the number of days and hours per day the dredge operated,
 - d. expected daily average production rate and the actual daily average production rate,
 - e. an explanation of why the project failed to remain on schedule,
 - f. an account of efforts made to get the project back on schedule,
 - g. a plan depicting the areas that remain to be dredged,
 - h. the number of cubic yards that remain to be dredged,
 - i. an accurate estimate of the number of days required to complete the project,
 - j. an evaluation of the impact of continued dredging on the species of concern,
 - k. a description of any efforts that will be made to minimize the impacts of the project on the species of concern, and a realistic assessment of any societal/financial effects of a denial of permission to continue dredging.

MassDEP will share the information with other resource agencies and a decision to grant or deny the amendment shall be made by January 15th. Requests for amendment received after January 1st will be considered at MassDEP's discretion.

19. No later than four weeks after issuance of this Certification, the applicant shall submit a notification procedure outlining the reporting process to MassDEP for incidents relating to dredging activities that impact surrounding resource areas and habitats including, but not limited to, observed dead or distressed fish or other aquatic organisms, observed oily sheen on the surface of the water, a sediment spill, a turbidity plume beyond the deployed BMPs, and a barge or equipment accident/spill. If at any time during implementation of the project such an incident occurs, all site related activities impacting the water shall cease until the source of the problem is identified and adequate mitigating measures are deployed to the satisfaction of MassDEP.

Failure to comply with this Certification is grounds for enforcement, including civil and criminal penalties, under MGL c.21 §42, 314 CMR 9.00, MGL c. 21A §16, 310 CMR 5.00, or other possible actions/penalties as authorized by the General Laws of the Commonwealth.

This Certification does not relieve the applicant of the obligation to comply with other appropriate state or federal statutes or regulations. Any changes made to the project as described in the previously submitted Notice of Intent, 401 WQC Application, or supplemental documents will require further notification to MassDEP.

NOTICE OF APPEAL RIGHTS

A) Appeal Rights and Time Limits

Certain persons shall have a right to request an adjudicatory hearing concerning certifications by MassDEP when an application is required:

- a. the applicant or property owner;
- b. any person aggrieved by the decision who has submitted written comments during the public comment period;
- c. any ten (10) persons of the Commonwealth pursuant to M.G.L. c.30A where a group member has submitted written comments during the public comment period; or
- d. any governmental body or private organization with a mandate to protect the environment, which has submitted written comments during the public comment period.

Any person aggrieved, any ten (10) persons of the Commonwealth, or a governmental body or private organization with a mandate to protect the environment may appeal without having submitted written comments during the public comment period only when the claim is based on new substantive issues arising from material changes to the scope or impact of the activity and not apparent at the time of public notice. To request an adjudicatory hearing pursuant to M.G.L. c.30A, § 10, a Notice of Claim must be made in writing, provided that the request is made by certified mail or hand delivery to MassDEP, with the appropriate filing fee specified within 310 CMR 4.10 along with a DEP Fee Transmittal Form within twenty-one (21) days from the date of issuance of this Certificate, and addressed to:

Case Administrator
Department of Environmental Protection
One Winter Street, 2nd Floor
Boston, MA 02108

A copy of the request shall at the same time be sent by certified mail or hand delivery to the issuing office of the Wetlands and Waterways Program at:

Department of Environmental Protection
One Winter Street, 5th Floor
Boston, MA 02108

B) Contents of Hearing Request

A Notice of Claim for Adjudicatory Hearing shall comply with MassDEP's Rules for Adjudicatory Proceedings, 310 CMR 1.01(6), and shall contain the following information pursuant to 314 CMR 9.10(3):

- a. the 401 Certification Transmittal Number and DEP Wetlands Protection Act File Number;
- b. the complete name of the applicant and address of the project;
- c. the complete name, address, and fax and telephone numbers of the party filing the request, and, if represented by counsel or other representative, the name, fax and telephone numbers, and address of the attorney;
- d. if claiming to be a party aggrieved, the specific facts that demonstrate that the party satisfies the definition of "aggrieved person" found at 314 CMR 9.02;
- e. a clear and concise statement that an adjudicatory hearing is being requested;
- f. a clear and concise statement of (1) the facts which are grounds for the proceedings, (2) the objections to this Certificate, including specifically the manner in which it is alleged to be inconsistent with MassDEP's Water Quality Regulations, 314 CMR 9.00, and (3) the relief sought through the adjudicatory hearing, including specifically the changes desired in the final written Certification; and
- g. a statement that a copy of the request has been sent by certified mail or hand delivery to the applicant, the owner (if different from the applicant), the conservation commission of the city or town where the activity will occur, the Department of Environmental Management (when the certificate concerns projects in Areas of Critical Environmental Concern), the public or private water supplier where the project is located (when the certificate concerns projects in Outstanding Resource Waters), and any other entity with responsibility for the resource where the project is located.

C) Filing Fee and Address

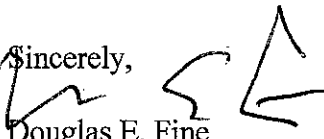
The hearing request along with a DEP Fee Transmittal Form and a valid check or money order payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
Commonwealth Master Lockbox
P.O. Box 4062
Boston, MA 02211

The request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority. MassDEP may waive the adjudicatory-hearing filing fee pursuant to 310 CMR 4.06(2) for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file an affidavit setting forth the facts believed to support the claim of undue financial hardship together with the hearing request as provided above.

Should you have any questions relative to this permit, please contact Derek Standish at (617) 654-6611.

Sincerely,



Douglas E. Fine

Assistant Commissioner
Bureau of Water Resources

cc: Salem Conservation Commission, City Hall, 93 Washington Street, Salem, MA 01970
ecc: Ronald R. Bourne, Bourne Consulting Engineering, PC, 3 Bent Street, Franklin, MA 02038
Rachel Freed, MassDEP - NERO, 205B Lowell Street, Wilmington, MA 01887
Robert Boeri, Office of Coastal Zone Management, 251 Causeway Street, Suite 800, Boston, MA 02114
Jillian Carr and Tay Evans, Division of Marine Fisheries, 30 Emerson Avenue, Gloucester, MA 01930
Karen Adams, Department of the Army, New England District, Corps of Engineers, 696 Virginia Road,
Concord, MA 01742-2751



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

December 7, 2015

Kathleen Winn
City of Salem DPCD
120 Washington Street
Salem, Massachusetts 01970

RE: ISSUANCE OF CHAPTER 91 WATERWAYS LICENSE #14026

Salem Commercial Marina and Dredging — 10 Blaney Street
Flowed Tidelands of Salem Harbor, Salem, Essex County

Dear Ms. Winn:

The Department of Environmental Protection hereby issues the above-referenced Waterways License, enclosed, authorizing you to perform certain activities pursuant to M.G.L. Chapter 91, the Public Waterfront Act and the Waterways Regulations at 310 CMR 9.00. Any change in use or alteration of any structure or fill not authorized by this License shall render this License void.

RECORDING OF THE LICENSE

This License must be recorded at your County Registry of Deeds or, if registered land, with the Land Registration Office within sixty (60) days from the date of license issuance. Failure to record this License within sixty (60) days of the date of issuance will render this License void pursuant to 310 CMR 9.18.

A Waterways License Recordation Notice Form has been enclosed for your use in notifying the Department of the recording information for this License. Failure to notify the Department of the recording of this License is a violation of 310 CMR 9.00 and is subject to enforcement action by the Department.

REQUEST CERTIFICATE OF COMPLIANCE

Pursuant to 310 CMR 9.19, once the project authorized under this License is completed you must file a Request for a Certificate of Compliance (Form BRP WW05) within 60-days of completion, but in no event later than five (5) years from the License's issuance date. The

license for any project for which such a request is not filed and certificate issued may be revoked pursuant to 310 CMR 9.26.

Please feel free to contact Frank Taormina of the Waterways Regulation Program at (617) 292-5551 or at frank.taormina@state.ma.us if you have any questions pertaining to the recording of your Waterways License or Certificate of Compliance.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ben Lynch', with a stylized, cursive script.

Ben Lynch
Program Chief
Waterways Regulation Program

Cc: Mayor Kimberley Driscoll, City of Salem
Salem City Council
Salem Planning Board
Salem Conservation Commission
Salem Harbormaster
Massachusetts Division of Marine Fisheries
WRP File

Ecc: Ron Bourne, Bourne Consulting Engineers

Enc: Waterways License #14026
Notification of Waterways License Recording Form

Frank Taormina
Department of Environmental Protection
Waterways Regulation Program
1 Winter Street, 5th Floor
Boston, Massachusetts 02108

RE: NOTIFICATION OF RECORDING CHAPTER 91 WATERWAYS LICENSE #14026

Salem Commercial Marina and Dredge – 10 Blaney Street
Flowed Tidelands of Salem Harbor, Salem, Essex County

Dear Mr. Taormina:

This is to notify you that the above referenced Waterways License was recorded with the appropriate Registry of Deeds/ Land Court for this project location and to provide your office with the following recordation information.

Date Recorded: _____

County Registry of Deeds/ Land Court: _____

Book Number _____, Page Number(s) _____

I will apply for a Certificate of Compliance with your office when the authorized work or change in use is completed.

Sincerely,

Chapter 91 Waterways Licensee

LICENSE VOID IF NOT RECORDED WITHIN 60 DAYS OF ISSUANCE

The Commonwealth of Massachusetts



NO. 14026

Whereas, The City of Salem

of -- Salem -- in the County of -- Essex -- and Commonwealth aforesaid, has applied to the Department of Environmental Protection for license to -- construct and maintain a 6,165 square foot commercial marina and the dredging and offshore disposal of 13,565 cubic yards of dredged material, as further detailed below -----

and has submitted plans of the same; and whereas due notice of said application has been given, as required by law, to the -- Mayor and City Council -- of the -- City of Salem; -----

NOW, said Department, having heard all parties desiring to be heard, and having fully considered said application, hereby, subject to the approval of the Governor, authorizes and licenses the said -----

City of Salem -- subject to the provisions of the ninety-first chapter of the General Laws, and of all laws which are or may be in force applicable thereto, to -- construct and maintain a 6,165-square-foot commercial marina consisting of 29 mooring piles, 1 gangway, and 19 floats of varying sizes as depicted on Sheet 2 of 3 of License Plan No. 14026, and installation and maintenance of a sheet pile wall as depicted on Sheet 3 of 3 of said Plans. Also, dredging a 46,950-square-foot sub-tidal area to a depth of -9 feet mean low water (MLW) with -1 foot overdredge and a 300-squarefoot inter-tidal area to a depth of -3 feet MLW with a -1 foot overdredge as depicted on Sheet 2 of 3 of said plans, resulting in a total of 13,565 cubic yards of dredged material to be disposed offshore at the Massachusetts Bay Disposal Site -----

Specific Legislative Authorizations and Licenses issued previously at the project site include: Harbor and Lands Commission License No. 3615 issued in 1911, Department of Public Works (DPW) License No. 174 issued in 1921, DPW License No. 4548 issued in 1962, Department of Environmental Protection (DEP) License No. 4916 issued in 1996, and DEP License No. 10973 issued in 2006. These authorized structures and fill shall be maintained in accordance with the terms and conditions of said licenses and plans.

The structures authorized hereby shall be limited to the following uses: commercial docking facility and boat access to navigable waters.

The structures authorized pursuant to this License are valid for an unlimited term pursuant to 310 CMR 9.15(1)(c).

The dredging component of this project is only valid for a term of five (5) years from the date of issuance.

This License is subject to the following Special Conditions and Standard Conditions:

Special Condition 1: Issuance of this authorization does not relieve the Licensee of the obligation to comply with all other applicable State or Federal statutes or regulations. Any changes made to the project as described in Waterways License Application No. W14-4148, License Plan No. 14026, or supplemental documents will require further notification and approval by the Department in accordance with 310 CMR 9.22(3) or 9.24.

Special Condition 2: The Licensee shall adhere strictly to the conditions, plans, and referenced documents in the Water Quality Certification No. X262080.

Special Condition 3: The Licensee, or its contractor, shall not perform any in-water sediment producing work during the time of year restrictions, from January 15th to June 30th and from May 1st to September 30th of any year, as required by the Massachusetts Division of Marine Fisheries and the National Marine Fisheries Services in order to protect spawning and juvenile development of marine fisheries resources. The installation of mooring piles authorized pursuant hereto can occur during said time of year restrictions.

Special Condition 4: Licensee shall notify the Brewer Hawthorne Cove Marina, the Salem Harbormaster, and the Department in writing at least three (3) days prior to commencement of dredging activities of the start date, duration, and a brief description of the dredging operation.

Special Condition 5: Dredging shall be performed by mechanical means and conducted in a manner

that will cause no unnecessary obstruction with vessel navigation.

Special Condition 6: Licensee shall utilize the United States Army Corps of Engineers methods and procedures to document dredge origin, transport, and disposal of dredged material at the approved offshore disposal site.

Special Condition 7: After completion of the work hereby authorized, the Licensee shall furnish to the Department a suitable plan showing the depths at mean low water over the area dredged.

Special Condition 8: No maintenance dredging is permitted under this License.

Special Condition 9: The Department authorizes a reconfiguration zone within the commercial marina area, as depicted on Sheet 2 of 3 of License Plan No. 14026. Accordingly, the reconfiguration of any licensed docking facility structures, including pile or bottom anchored floats, finger piers, mooring piles, etc., within the reconfiguration zone may be authorized without further licensing provided the Licensee adheres to the provisions at 310 CMR 9.39(1)(b).

Special Condition 10: All work authorized herein shall be completed within five (5) years of the date of license issuance. Said construction period may be extended by the Department for one or more one year periods without public notice, provided that the Applicant submits to the Department thirty (30) days prior to the end of the construction period, a written request to extend the period and provides adequate justification for said extension.

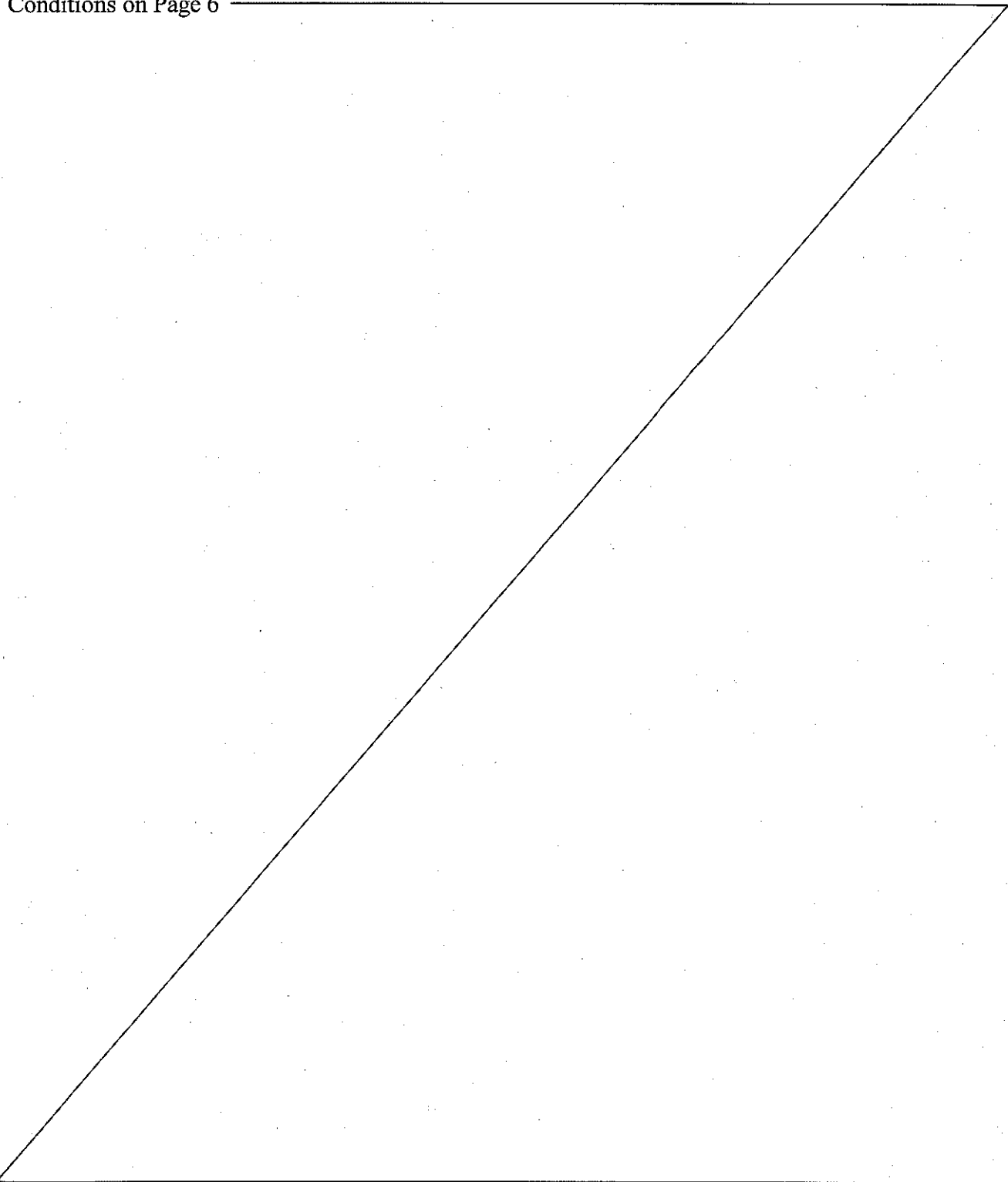
Special Condition 11: This License and accompanying plans shall be recorded at the Registry of Deeds within the chain of title of the affected properties within sixty (60) days of the date of issuance, pursuant to 310 CMR 9.18. Failure to record the License and accompanying plans within sixty (60) days will render said License void.

Special Condition 12: All structures authorized under this License shall be constructed to meet the Engineering and Construction Standards pursuant to 310 CMR 9.37 and 9.39.

Special Condition 13: The Licensee shall allow agents of the Department to enter the Project Site to verify compliance with the conditions of this License.

Special Condition 14: Within sixty (60) days of completion of the licensed project, the Licensee shall request in writing that the Department issue a Certificate of Compliance in accordance with 310 CMR 9.19. The request shall be accompanied by a certification by a registered professional engineer licensed in the Commonwealth that the project was completed in accordance with the License.

Please see following Standard License Conditions on Page 5 and following Standard Dredging Conditions on Page 6



Duplicate of said plan, License No. 14026, is on file in the office of said Department, and original of said plan accompanies this License and is to be referred to as a part hereof.

STANDARD WATERWAYS LICENSE CONDITIONS

1. Acceptance of this Waterways License shall constitute an agreement by the Licensee to conform to all terms and conditions stated herein.
2. This License is granted upon the express condition that any and all other applicable authorizations necessitated due to the provisions hereof shall be secured by the Licensee prior to the commencement of any activity or use authorized pursuant to this License.
3. Any change in use or any substantial structural alteration of any structure or fill authorized herein shall require the issuance by the Department of a new Waterways License in accordance with the provisions and procedures established in Chapter 91 of the Massachusetts General Laws. Any unauthorized substantial change in use or unauthorized substantial structural alteration of any structure or fill authorized herein shall render this Waterways License void.
4. This Waterways License shall be revocable by the Department for noncompliance with the terms and conditions set forth herein. This license may be revoked after the Department has given written notice of the alleged noncompliance to the Licensee and those persons who have filed a written request for such notice with the Department and afforded them a reasonable opportunity to correct said noncompliance. Failure to correct said noncompliance after the issuance of a written notice by the Department shall render this Waterways License void and the Commonwealth may proceed to remove or cause removal of any structure or fill authorized herein at the expense of the Licensee, its successors and assigns as an unauthorized and unlawful structure and/or fill.
5. The structures and/or fill authorized herein shall be maintained in good repair and in accordance with the terms and conditions stated herein and the details indicated on the accompanying license plans.
6. Nothing in this Waterways License shall be construed as authorizing encroachment in, on or over property not owned or controlled by the Licensee, except with the written consent of the owner or owners thereof.
7. This Waterways License is granted subject to all applicable Federal, State, County, and Municipal laws, ordinances and regulations including but not limited to a valid final Order of Conditions issued pursuant to the Wetlands Protection Act, M.G.L. Chapter 131, § 40.
8. This Waterways License is granted upon the express condition that the use of the structures and/or fill authorized hereby shall be in strict conformance with all applicable requirements and authorizations of the DEP.
9. This License authorizes structure(s) and/or fill on:

X Private Tidelands - In accordance with the public easement that exists by law on private tidelands, the licensee shall allow the public to use and to pass freely upon the area of the subject property lying between the high and low water marks, for the purposes of fishing, fowling, navigation, and the natural derivatives thereof.

X Commonwealth Tidelands - The Licensee shall not restrict the public's right to use and to pass freely, for any lawful purpose, upon lands lying seaward of the low water mark. Said lands are held in trust by the Commonwealth for the benefit of the public.

_____ a Great Pond of the Commonwealth - The Licensee shall not restrict the public's right to use and to pass freely upon lands lying seaward of the high water mark for any lawful purpose.

_____ Navigable River or Stream - The Licensee shall not restrict the public's right to use and to pass freely, for any lawful purpose, in the waterway. No restriction on the exercise of these public rights shall be imposed unless otherwise expressly provided in this license.

10. Unless otherwise expressly provided by this license, the licensee shall not limit the hours of availability of any areas of the subject property designated for public passage, nor place any gates, fences, or other structures on such areas in a manner that would impede or discourage the free flow of pedestrian movement thereon.

STANDARD WATERWAYS DREDGING CONDITIONS

1. This Waterways License is issued subject to all applicable federal, state, county, and municipal laws, ordinances, bylaws, and regulations including but not limited to a valid final Order of Conditions issued pursuant to the Wetlands Protection Act, M. G. L. Chapter 131, §. 40. In particular, this issuance is subject to the provisions of Sections 52 to 56, inclusive, of Chapter 91 of the Federal Laws, which provides, in part, that the transportation and dumping of the dredge material shall be done under the supervision of the Department, and, when required, the permittee shall provide at his/her expense a dredge inspector approved by the Department. When said inspector is required, a report certified by the dredge inspector shall be submitted to the Department within 30 days after the completion of the dredging. The report shall include daily logs of the dredging operation indicating volume of dredge material, point of origin, point of destination and other appropriate information.
2. This Waterways License is issued upon the express condition that the dredging and transport and disposal of dredged material shall be in strict conformance with the Water Quality Certificate №: X262080 issued by MassDEP on July 23, 2015.
3. All subsequent maintenance dredging and transport and disposal of this dredged material during the term of this License shall conform to all standards and conditions applied to the original dredging operation performed under this License.
4. The dredging under this License shall be conducted so as to cause no unnecessary obstruction of the free passage of vessels. In doing the dredging authorized, care shall be taken to cause no shoaling. If, however, any shoaling is caused, the Licensee shall, at his/her expense, remove the shoal areas. The permittee shall pay all costs of supervision, and if at any time the Department deems necessary a survey or surveys of the area dredged, the permittee shall pay all costs associated with such work.
5. Nothing in this License shall be construed to impair the legal rights of any person, or to authorize dredging on land not owned by the Licensee without consent of the owner (s) of such property.
6. The Licensee shall include in any contract with any person or other legal entity to perform dredging services, a provision requiring said person or legal entity to assume and pay all claims and demands arising in any manner from the work authorized herein, and shall save harmless and indemnify the Commonwealth of Massachusetts, its officers, employees, and agents from all claims, suits, damages, costs and expenses incurred by reason thereof.
7. Whosoever violates any provision of this License shall be subject to a fine of up to \$25,000 per day for each day such violation occurs or continues, or by imprisonment for not more than one year, or both such fine and imprisonment; or shall be subject to civil penalty not to exceed \$25,000 per day for each day such violation occurs or continues.
8. After completion of the work hereby authorized, the Licensee shall furnish to the Department a suitable plan showing the depths at mean low water over the area dredged.

The amount of tidewater displaced by the work hereby authorized has been ascertained by said Department, and compensation thereof has been made by the said -- City of Salem -- by paying into the Treasury of the Commonwealth -- two dollar and zero cents (\$2.00) -- for each cubic yard so displaced, being the amount hereby assessed by said Department -- (\$0.00, exempt pursuant to 310 CMR 9.16(4)(a)).

Nothing in this License shall be so construed as to impair the legal rights of any person.

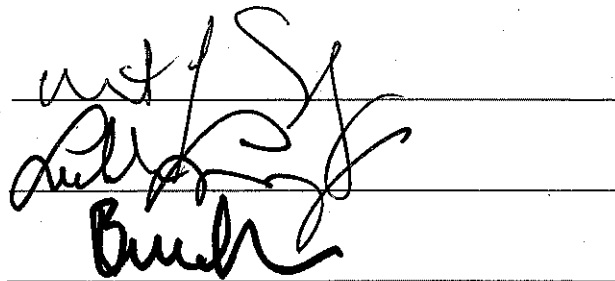
This License shall be void unless the same and the accompanying plan are recorded within 60 days from the date hereof, at the Registry of Deeds for the -- South District -- of the County of -- Essex --

IN WITNESS WHEREAS, said Department of Environmental Protection have hereunto set their hands this 7th day of December in the year two thousand and fifteen.

Commissioner

Program Director

Section Chief


Three handwritten signatures are present, each on a horizontal line. The first signature is at the top, the second in the middle, and the third at the bottom.

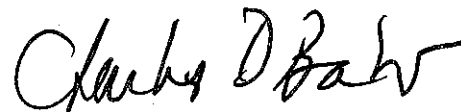
*Department of
Environmental Protection*

THE COMMONWEALTH OF MASSACHUSETTS

This license is approved in consideration of the payment into the treasury of the Commonwealth by the said -- City of Salem -- the further sum of -- zero dollars and zero cents (\$0.00, exempt pursuant to 310 CMR 9.16(4)(a)) -- the amount determined by the Governor as a just and equitable charge for rights and privileges hereby granted in the land of the Commonwealth.

BOSTON,

Approved by the Governor.


A handwritten signature in cursive script, appearing to read 'Charles D. Baker', is written over a horizontal line.

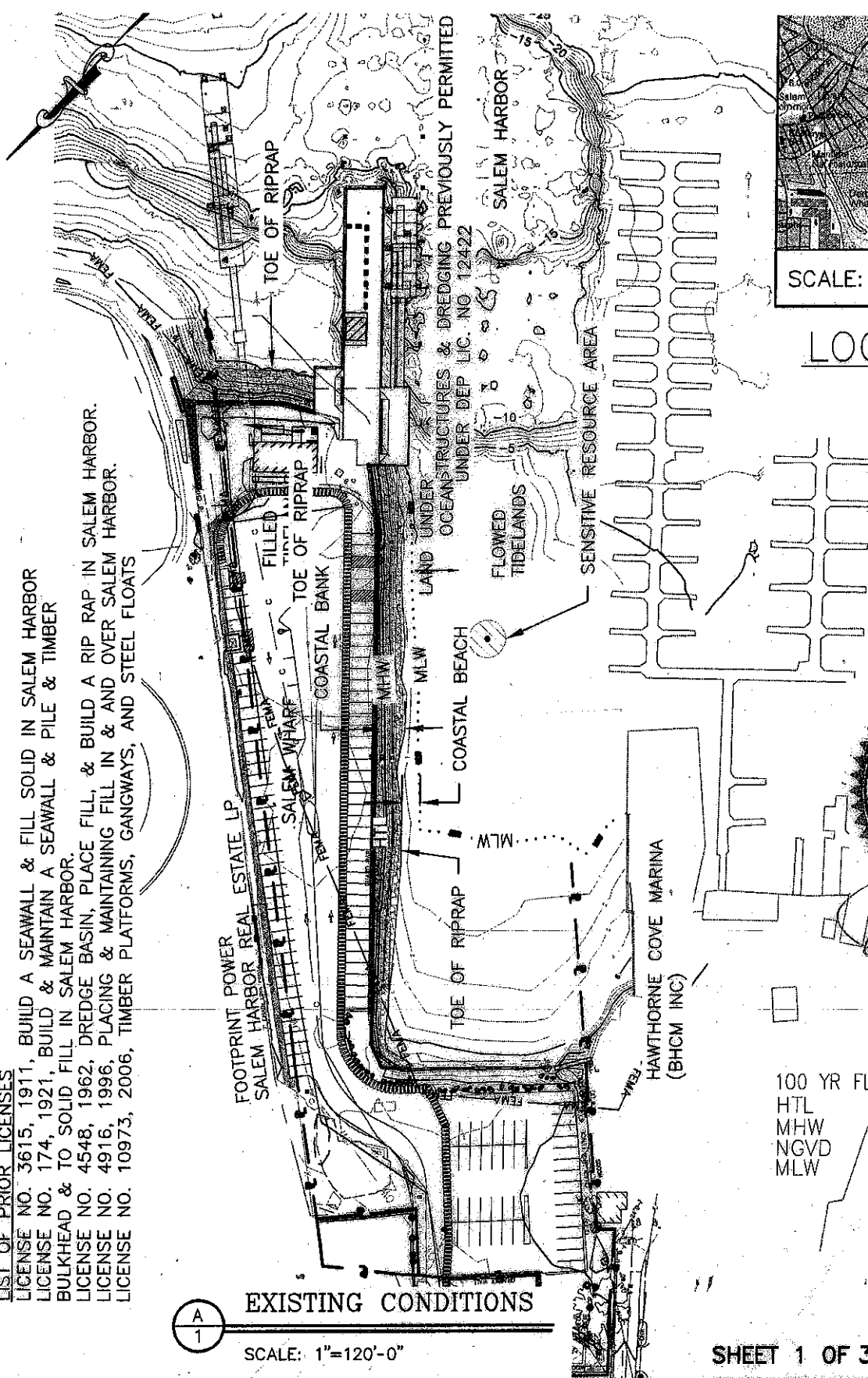
Governor

LIST OF PRIOR LICENSES

LICENSE NO. 3615, 1911, BUILD A SEAWALL & FILL SOLID IN SALEM HARBOR
 LICENSE NO. 174, 1921, BUILD & MAINTAIN A SEAWALL & PILE & TIMBER
 BULKHEAD & TO SOLID FILL IN SALEM HARBOR.
 LICENSE NO. 4548, 1962, DREDGE BASIN, PLACE FILL, & BUILD A RIP RAP IN SALEM HARBOR.
 LICENSE NO. 4916, 1996, PLACING & MAINTAINING FILL IN & OVER SALEM HARBOR.
 LICENSE NO. 10973, 2006, TIMBER PLATFORMS, GANGWAYS, AND STEEL FLOATS

PLANS ACCOMPANYING PETITION OF
 CITY OF SALEM FOR MARINA INSTALLATION
 AT 10 BLANEY ST, SALEM, MA IN SALEM
 HARBOR.

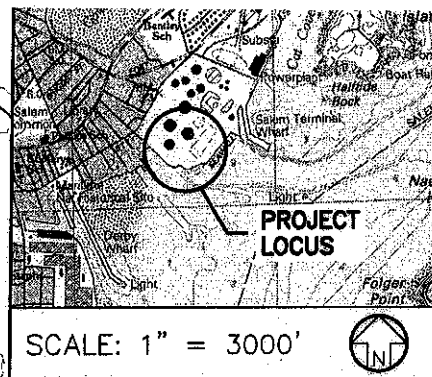
PREPARED BY
 BOURNE CONSULTING ENGINEERING, P.C.
 FRANKLIN, MA



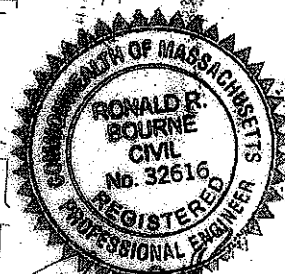
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EXISTING CONDITIONS

SCALE: 1"=120'-0"



LOCUS PLAN



| | |
|--------------|-------|
| 100 YR FLOOD | +16.2 |
| HTL | +11.0 |
| MHW | +8.9 |
| NGVD | +4.2 |
| MLW | 0.0 |

SHEET 1 OF 3

DEC X 7 2015

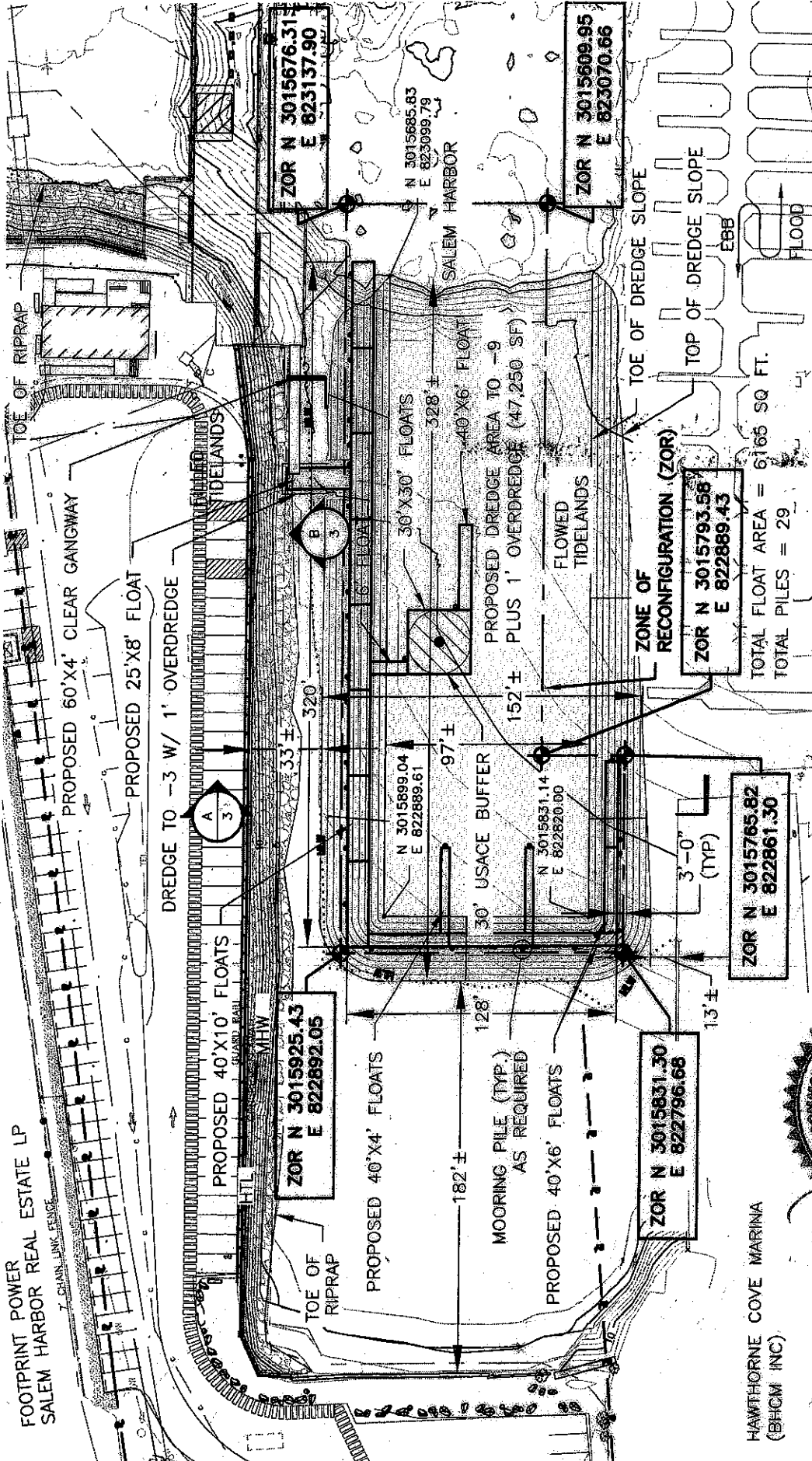
LICENSE PLAN NO. 14026

Approved by Department of Environmental Protection

[Handwritten signatures and stamps]

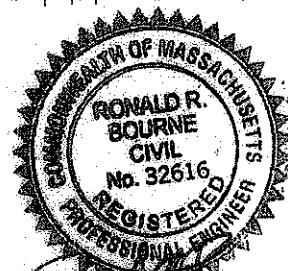
FOOTPRINT POWER
SALEM HARBOR REAL ESTATE LP

7' CHANNEL LINK FENCE



14026

DEC X 7 2015



[Signature]
11/16/15

HAWTHORNE COVE MARINA
(BHCMI INC)

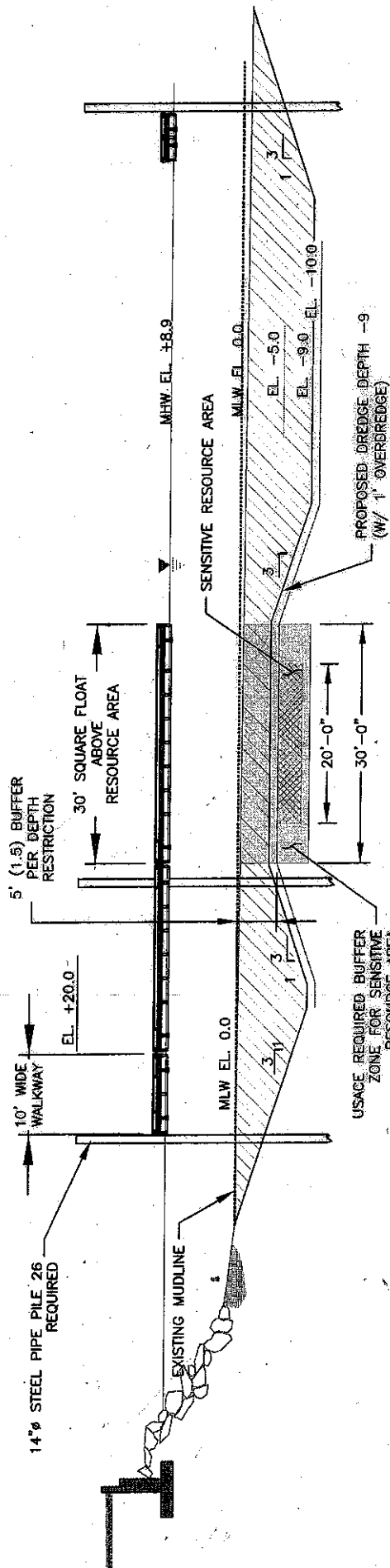


SCALE: 1"=70'-0"

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PROPOSED MARINA LAYOUT

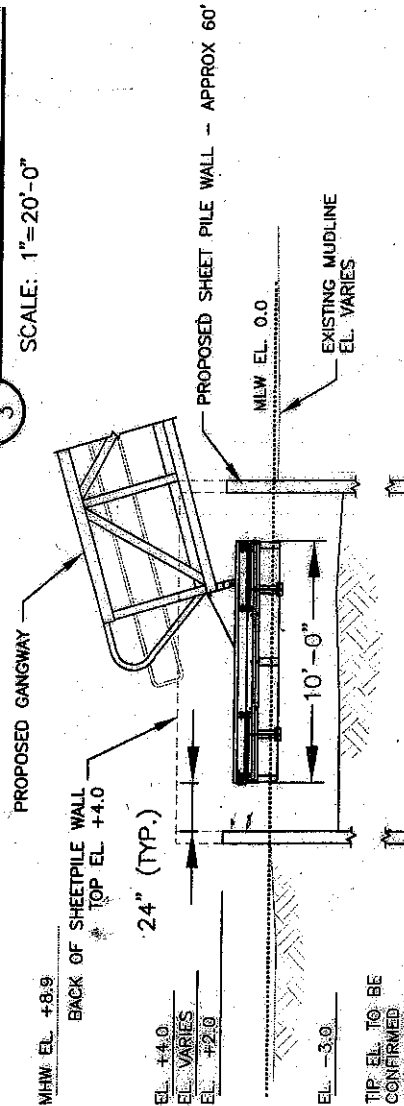
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PROPOSED SECTION

SCALE: 1"=20'-0"

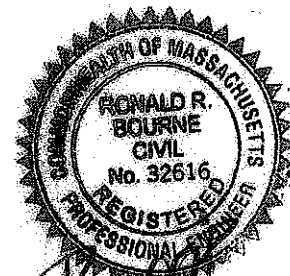
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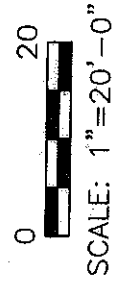
PROPOSED SECTION

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

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[Signature]
11/16/15



14026
DEC X 7 2015



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

December 21, 2015

Regulatory Division
File No. NAE-2005-1095

Honorable Kimberly Driscoll
Mayor, City of Salem
Salem City Hall
93 Washington Street
Salem, Massachusetts 01970

Dear Mayor Driscoll:

Attached are two copies of a Department of the Army permit authorizing your project in Salem Harbor off of the City's property at Blaney Street. Please sign both copies of the permit and return one signed copy to this office at the address above. The authorized work cannot start until we receive a complete, signed copy of the permit.

You are required to complete and return the attached forms to this office:

1. Work Start Notification Form at least two weeks before the anticipated work start date. If the work is under contract to start sooner than that electronic notification prior to the two weeks is acceptable.
2. Compliance Certification Form within one month following the completion of the authorized work.

Since this project requires mitigation through the Massachusetts In Lieu fee program, in accordance with Special Condition 20 of this permit you should forward the attached Massachusetts In-lieu Fee Project Impact Worksheet together with the indicated payment to Brian Kelter of the Massachusetts Department of Fish and Game.

This permit is a limited authorization containing a specific set of conditions. Please read the permit thoroughly to familiarize yourself with those conditions. If a contractor does the work for the City, both the City and the contractor are responsible for ensuring that the work is done in compliance with the permit's terms and conditions, as any violations could result in civil or criminal penalties.

The Corps of Engineers has consulted extensively with the National Marine Fisheries Service (NMFS) regarding the effects of your project on Essential Fish Habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act. The NMFS provided EFH conservation recommendations, which we included in the attached special conditions # 5 and the aforementioned # 20. These conditions will insure that the dredging is done at a time of year that would not adversely affect winter flounder spawning and juvenile development and that

the small amount of intertidal habitat being dredged is mitigated for through the Massachusetts In-Lieu-Fee program.

All dredged material must be released at a specified buoy or set of coordinates within the disposal site. Please notify the Marine Analysis Section, Regulatory Division by phone at (978) 318-8292 at least ten working days in advance of the time that disposal operations will begin, if that is feasible, so that specific coordinates for your project can be sent to you.

This letter contains a preliminary jurisdictional determination for your subject site that was issued under the earlier permit decision at this property and a proffered permit for your proposed project. If you object to either this determination or decision, you may request an administrative appeal under Corps regulations at 33 CFR 331. A combined Notification of Administrative Appeal Options and Process (NAP) and Request for Appeal (RFA) form, and flow chart explaining the appeals process and your options, are attached to this letter. If you desire to appeal this determination, you must submit a completed RFA form along with any supporting or clarifying information to James Haggerty; Administrative Appeals Review Officer; North Atlantic Division, Corps of Engineers; North Atlantic Fort Hamilton Military Community, Bldg. 301; General Lee Avenue; Brooklyn, NY 11252-6700. Contact info: (347) 370-4650 or james.w.haggerty@usace.army.mil.

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP.

You may not appeal conditions contained in the State CZM consistency determination under this program as they are automatically included in the Federal permit. This authorization does not obviate the need to obtain other Federal, state, or local authorizations required by law.

We continually strive to improve our customer service. In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey.

If you have any questions regarding this correspondence, please contact Mr. Brian Valiton at (978) 318-8166, (800) 343-4789, or use (800) 362-4367 within Massachusetts.

Sincerely,



Alan R. Anacheke-Nasemann, PWS
Chief, Permits and Enforcement Branch
Regulatory Division

Enclosures

cc:

Ron Bourne, Bourne Consulting Engineering, 3 Bent Street, Franklin, Massachusetts 02038,
rbourne@bournece.com

Chris Boelke, NMFS, 55 Great Republic Drive, Gloucester, Massachusetts 01930-2276,
Christopher.boelke@noaa.gov

Robert Boeri, MA CZM, 251 Causeway Street, Boston, Massachusetts 02114-2136,
Robert.boeri@state.ma.us

Victor Mastone, Massachusetts BUAR, 251 Causeway Street, Suite 800, Boston, Massachusetts
02114-2136, Victor.Mastone@state.ma.us

Kathryn Glenn, MA CZM, State Pier, Gloucester, Massachusetts 01930,
Kathryn.glenn@state.ma.us

Brian Kelter, CFO, Massachusetts Department of Fish and Game, 251 Causeway St., Boston,
Massachusetts 02114-2136

Laura Teracino, U.S. Environmental Protection Agency Region 1, Teracino.Laura@epa.gov

Ed Reiner, U.S. Environmental Protection Agency Region 1, reiner.ed@epa.gov

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: City of Salem Massachusetts

File Number: NAE-2005-1095

Date: 21 December
2015

Attached is:

See Section below

| | | |
|-------------------------------------|--|---|
| <input checked="" type="checkbox"/> | INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission) | A |
| <input type="checkbox"/> | PROFFERED PERMIT (Standard Permit or Letter of permission) | B |
| <input type="checkbox"/> | PERMIT DENIAL | C |
| <input checked="" type="checkbox"/> | APPROVED JURISDICTIONAL DETERMINATION | D |
| <input type="checkbox"/> | PRELIMINARY JURISDICTIONAL DETERMINATION | E |

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://usace.army.mil/inet/functions/cw/cecwo/reg> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the New England District Engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations (JD) associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the New England District Engineer. Your objections must be received by the New England District Engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the New England District Engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the New England District Engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the New England District Engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the North Atlantic Division Engineer, ATTN: CENAD-PD-PSD-O, Fort Hamilton Military Community, Building 301, General Lee Avenue, Brooklyn, NY 11252-6700. This form must be received by the North Atlantic Division Engineer within 60 days of the date of this notice with a copy furnished to the New England District Engineer.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the North Atlantic Division Engineer, ATTN: CENAD-PD-PSD-O, Fort Hamilton Military Community, Building 301, General Lee Avenue, Brooklyn, NY 11252-6700. This form must be received by the North Atlantic Division Engineer within 60 days of the date of this notice with a copy furnished to the New England District Engineer.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the North Atlantic Division Engineer, ATTN: CENAD-PD-PSD-O, Fort Hamilton Military Community, Building 301, General Lee Avenue, Brooklyn, NY 11252-6700. This form must be received by the North Atlantic Division Engineer within 60 days of the date of this notice with a copy furnished to the New England District Engineer.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

Ruth M. Ladd

CENAE-R

U.S. Army Corps of Engineers, New England District

696 Virginia Road

Concord, MA 01742-2751

Telephone: (978) 318-8818

Email: ruth.m.ladd@usace.army.mil

If you only have questions regarding the appeal process you may also contact:

Mr. James W. Haggarty

Administrative Appeals Review Officer

North Atlantic Division, Corps of Engineers Fort Hamilton

Military Community Bldg. 301, General Lee Avenue Brooklyn,
NY 11252-6700

Telephone: (347) 370-4650

Email: james.w.haggarty@usace.army.mil

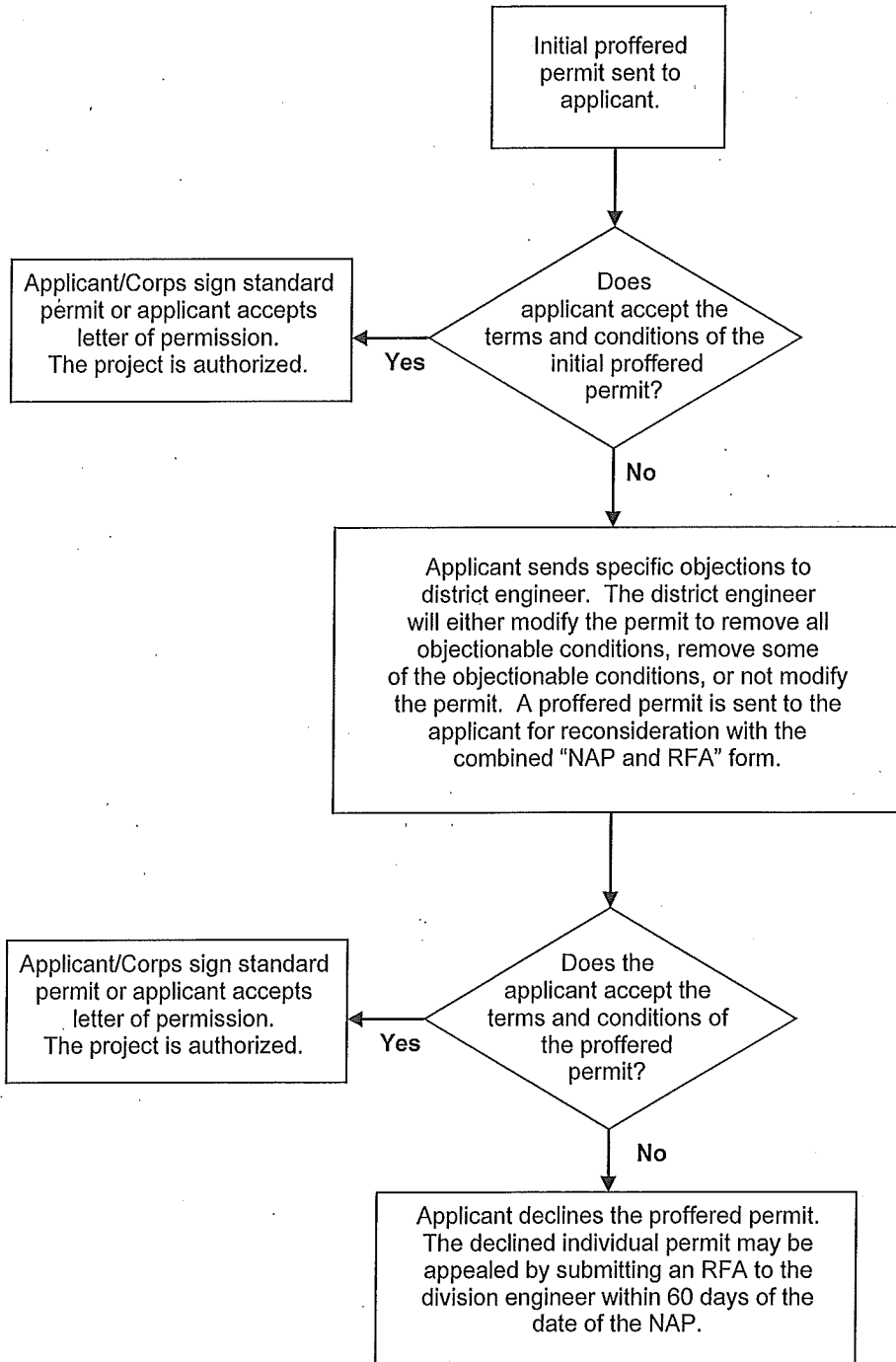
RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

Signature of appellant or agent.

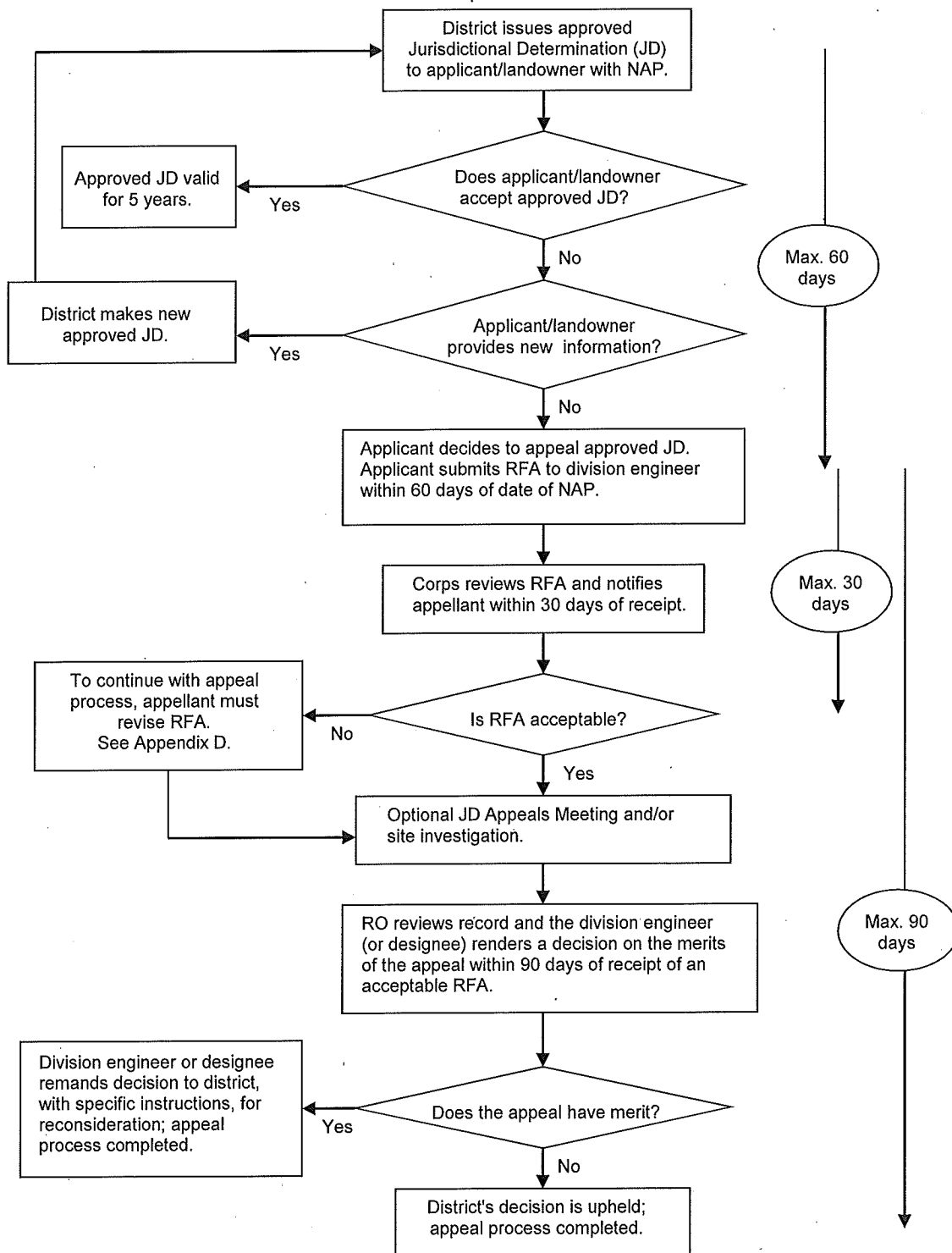
Date:

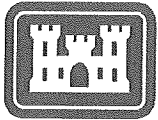
Telephone number:

Applicant Options with Initial/Proffered Permit



Administrative Appeal Process for Approved Jurisdictional Determination





**US Army Corps
of Engineers®**
New England District

(Minimum Notice: Permittee must sign and return notification
within one month of the completion of work.)

COMPLIANCE CERTIFICATION FORM

Permit Number: NAE 2005-1095

Project Manager Brian Valiton

Name of Permittee: City of Salem, Honorable Kimberly Driscoll

Permit Issuance Date: 21 December 2015

Please sign this certification and return it to the following address upon completion of the activity.

* MAIL TO: U.S. Army Corps of Engineers, New England District *
* Policy Analysis/Technical Support Branch *
* Regulatory Division *
* 696 Virginia Road *
* Concord, Massachusetts 01742-2751 *

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

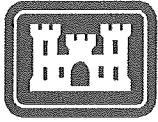
Date

Printed Name

Date of Work Completion

() _____
Telephone Number

() _____
Telephone Number



**US Army Corps
of Engineers®**
New England District

**INDIVIDUAL PERMIT
WORK-START NOTIFICATION FORM**
(Minimum Notice: Two weeks before work begins if possible)

* MAIL TO: U.S. Army Corps of Engineers, New England District *

*

* Permits and Enforcement Branch *

* Regulatory Division *

* 696 Virginia Road *

* Concord, Massachusetts 01742-2751 *

Corps of Engineers Permit No. NAE 2005-1095 was issued to the City of Salem on December 21, 2015. This work is located in Salem Harbor at 10 Blaney Street, Salem, Massachusetts. The permit authorized the permittee to dredge approx.. 13,600 cu. yds. of material from a subtidal area of approx.. 47,000 sq. ft. to a maximum depth of -10 ft. m.l.w, with ocean disposal of the material at the Mass Bay Disposal Site, and to install and maintain a commercial vessel docking facility consisting of pile-anchored floating docks.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm: _____

Business Address: _____

Telephone Numbers: () _____ () _____

Proposed Work Dates: **Start:** _____ **Finish:** _____

Permittee/Agent Signature: _____ **Date:** _____

Printed Name: _____ **Title:** _____

Date Permit Issued: _____ **Date Permit Expires:** 21 December 2018

FOR USE BY THE CORPS OF ENGINEERS

PM: Brian Valiton **Submittals Required:** Work start form, compliance certification, specified information required by permit conditions prior to commencing disposal operations at the Mass. Bay Disposal Site, post dredge survey of area near sensitive site to confirm dredging was done as authorized, and confirmation of payment into the Massachusetts In Lieu Fee program.

Inspection Recommendation: Post construction

**MASSACHUSETTS IN-LIEU FEE (ILF)
PROJECT IMPACT WORKSHEET**

1. Corps File Number NAE-2005-1095
2. Permittee(s): City of Salem, Massachusetts
3. ILF Amount: \$ 2852
4. Project location/address: 10 Blaney Street, Salem, Massachusetts
5. Service Area: Northeast coastal
6. Lat/Long of impact¹: Lat. 42.522398° N, Long. 70.882804 ° W
7. HUC8: 01090001
8. Impact area subject to compensation: 200 sq. ft. of intertidal flats
9. Corps Project Manager: Brian Valiton
10. Date: 18 December 2015
11. Resource(s) Impacted: M2US3 Marine Intertidal Unconsolidated Shore Mud

Resource Type: Cowardin, et.al, classification (PFO, PSS, PEM, M1, M2, E2, etc.), vernal pool (VP), and/or river, stream, or brook (R).

Types of impacts: May include one or more of the following: fill, conversion (e.g., forested to shrub/scrub), excavation with associated discharge, etc.

TABLE OF RESOURCES IMPACTED

| Resource Type (list all that apply) | Type of Impact (by resource type) | Square Feet of Aquatic Resources Impacted (by resource type) | Linear Feet of Streams Impacted |
|---|---|--|--|
| Intertidal habitat | Lost through dredging | 200 | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | TOTAL IMPACTS: | 200 | |

¹ If the project is linear, choose the midpoint within each service area.

DEPARTMENT OF THE ARMY PERMIT

Permittee City of Salem (Salem Wharf Commercial Marina)

Permit No. NAE 2005-1095

Issuing Office New England District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description:

To perform the following work, including dredging with ocean disposal of the material, and including the construction and maintenance of certain structures as follows:

- a. to perform new dredging/excavation of up to approx. 13, 700 cu. yds. of silty/fine sandy material from a sub-tidal area totaling a maximum of approx. 47, 250 sq. ft. to a depth of - 10' m.l.w. (-9 ft. with a 1 foot over - dredge depth) (as shown on the drawings), with ocean disposal of the material at the Massachusetts Bay Disposal Site (MBDS);
- b. to construct a new commercial marina consisting of pile-anchored floating docks totaling approx.. 6165 sq. ft. (of various widths and lengths) within an existing cove area and accessing the upland via a 60 ft. by 4 ft. wide gangway;

(Project Description continued on page 4)

Project Location:

Salem Harbor off of property at 10 Blaney Street, Salem, Massachusetts. The dredged material will be disposed of at the Massachusetts Bay Disposal Site (MBDS) which is outside of Massachusetts waters approx. 22 km southeast of Gales Point, Manchester, Massachusetts.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on December 21, 2018. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

1. The permittee shall ensure that a copy of this permit is at the work site (and the project office) authorized by this permit whenever work is being performed, and that all personnel with operational control of the site ensure that all appropriate personnel performing work are fully aware of its terms and conditions. The entire permit shall be made a part of any and all contracts and sub-contracts for work that affects areas of Corps jurisdiction at the site of the work authorized by this permit. This shall be achieved by including the entire permit in the specifications for work. The term "entire permit" means this permit (including its drawings, plans, appendices and other attachments) and also includes permit modifications.

(Special conditions continued on Page 4)

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

☒ Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

☐ Section 404 of the Clean Water Act (33 U.S.C. 1344).

☒ Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. **Reliance on Applicant's Data:** The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. **Reevaluation of Permit Decision.** This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.


b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

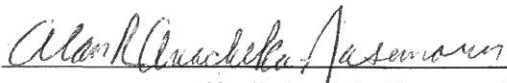
6. **Extensions.** General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.


(PERMITTEE)

12/23/15
(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.


Alan R. Anacheke-Nasemann, PWS
Chief, Permits & Enforcement Branch
Regulatory Division
For District Engineer

12/21/2015
(DATE)

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFeree)

(DATE)

(Project Description continued from Page 1)

- c. to install a 30 foot by 30 foot pile-anchored floating dock over a sensitive resource area in order to protect the underlying submerged area from impact; and,
- d. to install and maintain approx. 60 linear feet of steel sheet pile wall/bulkheading to contain the existing slope of the dredged basin.

This work is shown on the attached plans entitled, "PURPOSE: MARINA INSTALLATION APPLICATION BY: CITY OF SALEM IN: SALEM AT: SALEM HARBOR COUNTY: ESSEX STATE: MA", on 4 sheets by Bourne Consulting Engineering, and dated "6/16/14" with sheet 3 of 4 titled "PROPOSED MARINA LAYOUT" and with a revision dated 12/1/14 and sheet 4 of 4 titled "PROPOSED MARINA SECTION" and dated 08/25/14.

The location of the MBDS is shown on the attached drawing entitled Massachusetts Bay Disposal Site on one sheet and with no date.

(Special conditions continued from Page 2)

If the permit is issued after the construction specifications, but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. If the permit is issued after receipt of bids or quotes, the entire permit shall be included in the contract or sub-contract. Although the permittee may assign various aspects of the work to different contractors or sub-contractors, all contractors and sub-contractors shall be obligated by contract to comply with all environmental protection provisions contained within the entire permit, and no contract or sub-contract shall require or allow unauthorized work in areas of Corps jurisdiction.

2. The permittee shall complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work.
3. The permittee shall notify the U.S. Coast Guard, Sector Boston, Waterways Management Division, at (617) 223-5750 prior to the start of this project.
4. The permittee understands and agrees that, if future operations by the United States requires the removal, relocation, or other alteration, of the structures or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structures or work shall cause unreasonable obstruction to the free navigation of navigable waters of the United States, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
5. No in – water silt producing activities can occur between February 15 th to June 30 th of any year to avoid adverse impacts to winter flounder spawning and juvenile development. No in-water silt producing activities can occur between May 1 st to September 30 th of any year in order to protect adjacent spawning and settling shellfish resources from siltation effects.

6. Periodic maintenance dredging to the area and depth limits described herein is authorized for ten years from the date of issuance of this permit, provided disposal of the dredged material is at an upland site. However, the permittee must notify this office, in writing, 60 days before the intended date of any such dredging and shall not begin such dredging until written authorization has been obtained. This 60-day notification is not required for the initial new dredging authorized by this permit. A separate authorization shall be required for such dredging if the material to be dredged is to be deposited in open or ocean waters and/or wetlands.

7. At least ten working days in advance of the start date, the First Coast Guard District, Aids to Navigation Office, (617) 223-8355, shall be notified of the location and estimated duration of the dredging and disposal operations.

8. For the initiation of disposal activity and any time disposal operations resume after having ceased for one month or more, the permittee or the permittee's representative must notify the Corps of Engineers, New England District, Regulatory Division, PATS Branch (CENAE-R-PT) at (978) 318-8292 or (978) 318-8338 at least ten working days before the date disposal operations are expected to begin or resume. The information to be provided in this notification is: permit number, permittee name, address and phone number, dredging contractor name, address and phone number, name, address and phone number of towing contractor, estimated dates dredging is expected to begin and end, name of all disposal vessels to be employed in the work and copies of their certification documents, name of the disposal site, and estimated volume of material to be dredged. Disposal operations shall not begin or resume until the Corps issues a letter authorizing the initiation or continuation of open-water disposal. The letter will include disposal point coordinates to use for this specific project at that time. These coordinates may differ from those specified for other projects using the same disposal site or even from those specified earlier for this project. It is not necessary to wait ten days before starting disposal operations. They may start as soon as this letter is issued. For each dredging season during which work is performed, the permittee must notify the Corps upon completion of dredging for the season by completing and submitting the form that the Corps will supply for this purpose when disposal-point coordinates are specified.

9. Except when directed otherwise by the CENAE-R-PT DAMOS Program Manager for site management purposes, all disposal of dredged material shall adhere to the following. These requirements must be followed except when doing so will create unsafe conditions because of weather or sea state, in which case disposal with the scow moving only fast enough to maintain safe control (generally less than one knot) is permitted. Disposal is not permitted if these requirements cannot be met due to weather or sea conditions. In that regard, special attention needs to be given to predicted conditions prior to departing for the disposal site.

a. The permittee shall release the dredged material at a specified set of coordinates within the disposal site with the scow at a complete halt.

b. When a disposal buoy is present at the specified coordinates, disposal shall occur with the side of the scow at least 100 feet and no greater than 200 feet from the buoy to minimize collisions with the buoy.

10. Silent Inspector System Requirements

a. Every discharge of dredged material at the disposal site requires monitoring by the contractor. This disposal monitoring of dredging projects must be performed using the Silent Inspector (SI) software and hardware system developed by the Corps. The SI system must have been certified by the Corps within a year of the disposal activity. Questions regarding certification should be addressed to the SI support team at (251) 690-3011 or to the SI Point of Contact at CENAE-R-PT [Norm Farris, (978) 318-8336]. Additional information about SI can be found at <https://si.usace.army.mil/>.

b. The permittee is responsible for ensuring that the system is operational throughout the project and that project data are submitted to the SI center in accordance with the specifications provided at the aforementioned website. If any component of the system is inoperable, disposal may not take place unless otherwise authorized by the CENAE-R-PT SI Point of Contact.

c. The SI system used by the permittee must be capable of providing the information necessary for the Scow Monitoring Profile Specification. The permittee is also responsible to provide CENAE-R-PT with a record of estimated barge volume for each trip. If barge volume information is not provided through the SI system utilized, the permittee must submit a weekly report to CENAE-R-PT that provides estimated volume (cubic yards), date and disposal time for each trip. The data collected by the SI system shall, upon request, be made available to CENAE-R-PT.

11. If any material is released beyond the limits specified in this permit, the Captain or the permittee must notify CENAE-R-PT immediately by calling (978) 318-8292 or (978) 318-8338. Information provided shall include disposal coordinates, permit number, volume disposed, date and time of disposal, circumstances of incident, disposal vessel name, name of caller, and phone number of caller. If no person is reached at the number above, a voice message with the relevant information should be provided. In addition, a detailed written report must be provided to the Corps within 48 hours following any such incident.

12. Unless otherwise directed, the address, phone and fax for all submittals and coordination related to these special conditions are: PATS Branch, Regulatory Division, U.S. Army Corps of Engineers, 696 Virginia Road, Concord, MA 017420-2751; PHONE - (978) 318-8292 or (978) 318-8338; and FAX - (978) 318-8303.

13. The Coast Guard, Sector Boston, Waterways Management Division, (617) 223-5750, shall be notified prior to the start of this project.

14. From February 1 through May 30 of any year, disposal vessels including tugs, barges, and scows transiting between the dredge site and the Massachusetts Bay Disposal Site shall operate at speeds not to exceed 5 knots after sunset, before sunrise, or in daylight conditions where visibility is less than one nautical mile. Disposal shall not be permitted if these requirements cannot be met due to weather or sea conditions. In that regard, the permittee and contractor should be aware of predicted conditions before departing for the disposal site. The intent of this condition is to reduce the potential for vessel collisions with endangered species, including right whales.

15. From February 1 through May 30 of any year, an approved marine mammal observer (i.e. meeting the attached National Marine Fisheries Service (NMFS) criteria on observer qualifications, including the specified skill sets for sea turtles and whales) must be present aboard disposal vessels transiting between the dredge site and the Massachusetts Bay Disposal Site during daylight hours. The permittee shall submit to the Corps of Engineers for approval a statement of qualifications for each observer.

16. When threatened or endangered species are observed to be present, the vessel captain shall, except when precluded by safety considerations, follow the advice of the marine mammal observer to avoid harassment of or direct impact to individual animals. The observer shall be contracted and paid for by the permittee.

17. The permittee shall ensure that a separate Corps of Engineers Marine Mammal Observation Report is fully completed by the observer for every sighting and that this report is received by the CENAE-R-PT, (978) 318-8303 fax, within one week of the trip date. The permittee shall require the observer to maintain contact with NMFS, Habitat and Protected Resources Division, (508) 281-9328 and other recognized experts to provide and receive information regarding the presence and distribution of threatened and endangered species in Massachusetts Bay. The intent of this condition is to reduce the potential for vessel collisions with threatened and endangered species, including right whales, and to minimize potential impacts of dredged material disposal on threatened and endangered species.

18. Marine mammal observers shall use the following guidelines to minimize conflicts with threatened or endangered species:

a. A marine mammal observer shall be posted on lookout at all times during daylight hours when disposal vessels have left the harbor and are underway or at the disposal site.

b. Disposal vessels shall not approach threatened or endangered species closer than 100 feet (see additional condition below for approaching right whales).

c. Disposal vessels shall adhere to the attached NMFS regulations for approaching right whales, 50 CFR Part 222.32, which restrict approaches within 500 yards of a right whale and specify avoidance measures for vessels that encounter right whales.

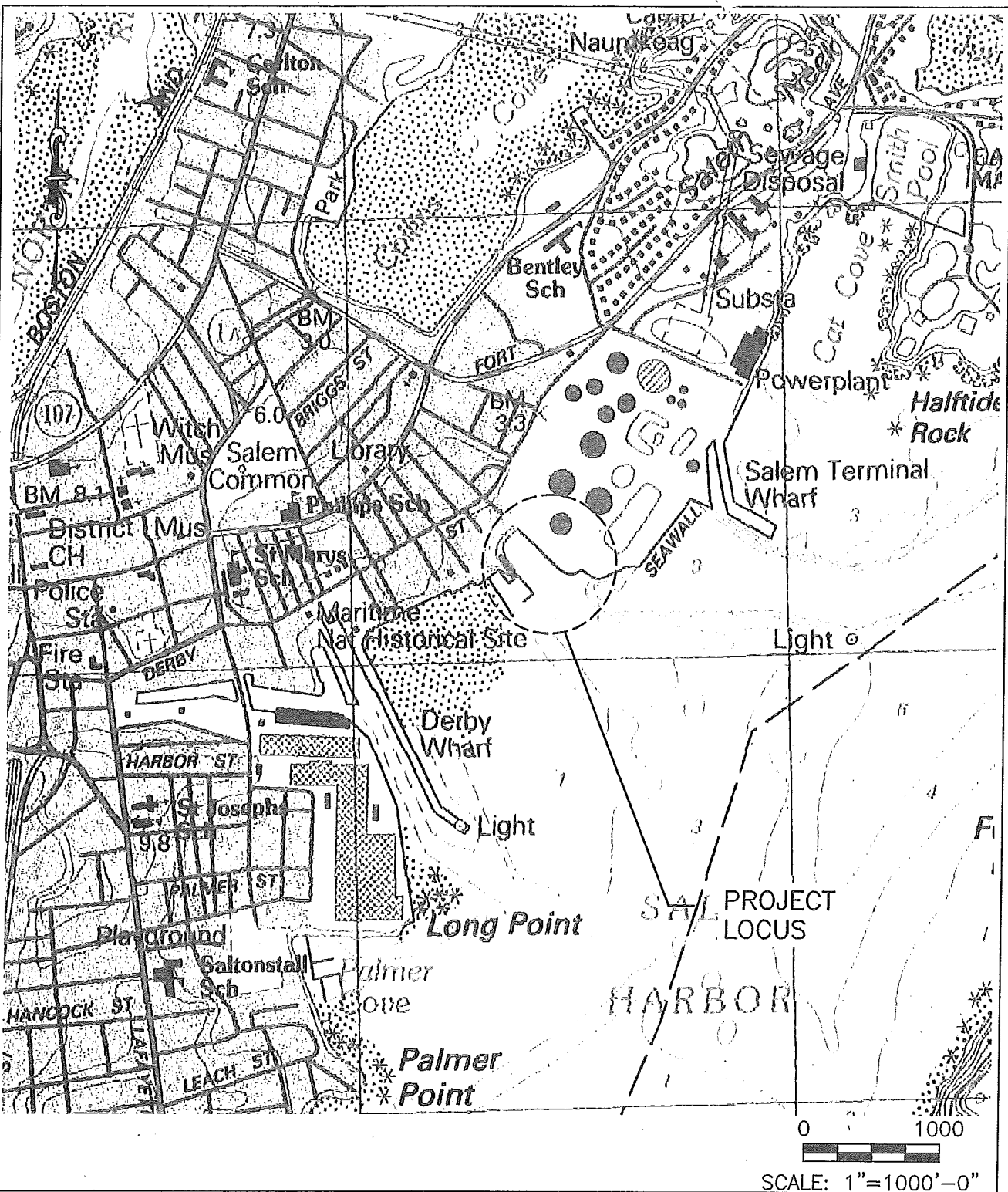
d. If threatened or endangered species are sighted within 500 feet from the disposal point, dredged material shall not be released. In this case, the vessel captain may elect to wait until the animals move away from the disposal point prior to disposal, or, subject to the judgment of the observer, may dispose at a Corps-authorized alternative disposal location under the same restrictions noted herein for disposal at the primary disposal location.

e. If threatened or endangered species are sighted between 500 feet and 1500 feet from the disposal point, the observer shall note the animals' behavior, relative position, and direction and speed of movement to determine if release of dredged material is likely to harass or endanger the animals. For example, whales actively feeding at or near the disposal point are more likely than resting whales to interact with released sediments. If the observer judges that disposal is likely to harass or endanger the animals, the observer shall inform the vessel captain and disposal shall be delayed until the animals change their behavior or move away such that the observer judges that no danger to the animals will result from disposal.


19. An important sensitive area that needs complete protection has been identified in the permit drawings. This area was the subject of an MOA in the previous permit issued for other work at this same waterfront parcel (see Special Conditions numbers 22, 23, and 24 of permit number NAE 2005-1095 issued as a letter permit amendment dated December 23, 2010). In order to protect this important sensitive resource area within the proposed dredged basin for this marina, dredging is limited to only a depth of -5 ft. m.l.w. within a specified area and a 30 foot by 30 foot square floating dock shall be placed over this area. Before the dock can be placed, the permittee must first submit a post dredge survey, signed by a registered land surveyor or engineer, confirming that the dredging in and around the sensitive area has been dredged in accordance with the permit drawings and conditions and that any variations between the permit drawings and the actual dredging conditions have been identified. The marina cannot become operational until the Corps has confirmed in writing that the work has been completed in accordance with the permit drawings and that the sensitive area has been adequately protected by the installation of the 30 foot by 30 foot floating dock. Any damage to the sensitive resource area from the project construction will be considered a violation of this condition of the Corps permit.

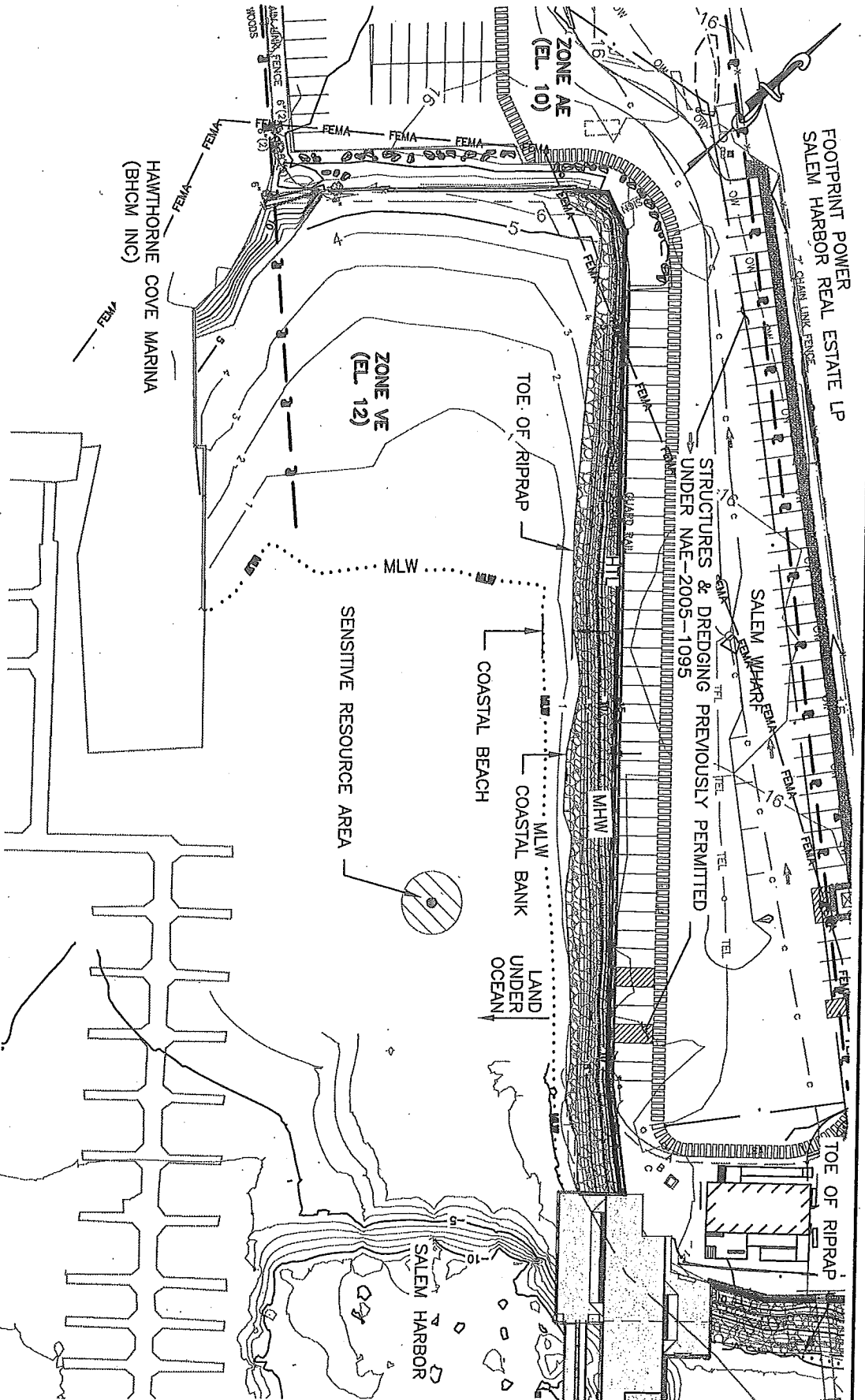
20. As mitigation for the loss of approx. 200 sq. ft. of intertidal aquatic habitat (measured between the mean low water line and mean high water line) from the dredging, the City of Salem as permittee, agrees to pay \$2852.00 to the Massachusetts in lieu fee program. Work on the proposed activities shall not begin until you have received confirmation that the payment has been received. The permittee must send a cashier's check or bank draft to Brian Kelter, CFO, Department of Fish and Game, 251 Causeway Street, Suite 400, Boston, Massachusetts 02114. The check shall be made out to "Commonwealth of Massachusetts, Department of Fish and Game Environmental Mitigation Expendable Trust" and include the Corps file number and the statement: "For ILF account only". The check must be accompanied by the enclosed "Massachusetts In-lieu Fee Project Impact Worksheet" to ensure proper crediting.

21. Should any previously unknown submerged cultural resources be encountered during the course of the project, the City will take steps to limit adverse effects and immediately notify the Board of Underwater Archaeological Resources at 617-626-1141, the Massachusetts Historic Commission at 617-727-8470 as well as the Corps of Engineers PATS Branch at 978-318-8292 or 978-318-8338 and will follow the Board's "Policy Guidance for the Discovery of Unanticipated Archaeological Resources (updated 9/28/06).



SCALE: 1"=1000'-0"

| | | |
|---|---|---|
| PURPOSE: MARINA INSTALLATION | TITLE: LOCUS PLAN | APPLICATION BY: CITY OF SALEM |
| 100 YR FLOOD +16.2 HTL +11.0 MHW +8.9 NGVD +4.2 MLW 0.0 |  Bourne Consulting Engineering, PC <small>3 Bank Street Framingham, MA 01800 TEL (508) 633-0000 FAX (508) 633-0000</small> | IN: SALEM AT: SALEM HARBOR COUNTY: ESSEX STATE: MA SHEET 1 OF 4 DATE: 06/16/14 |



FOOTPRINT POWER
SALEM HARBOR REAL ESTATE LP

STRUCTURES & DREDGING PREVIOUSLY PERMITTED
UNDER NAE-2005-1095

ZONE AE
(EL 10)

ZONE VE
(EL 12)

HAWTHORNE COVE MARINA
(BHCN INC)

| | | | |
|--------------|-------|------|------|
| 100 YR FLOOD | +16.2 | NGVD | +4.2 |
| HTL | +11.0 | MLW | 0.0 |
| MHW | +8.9 | | |

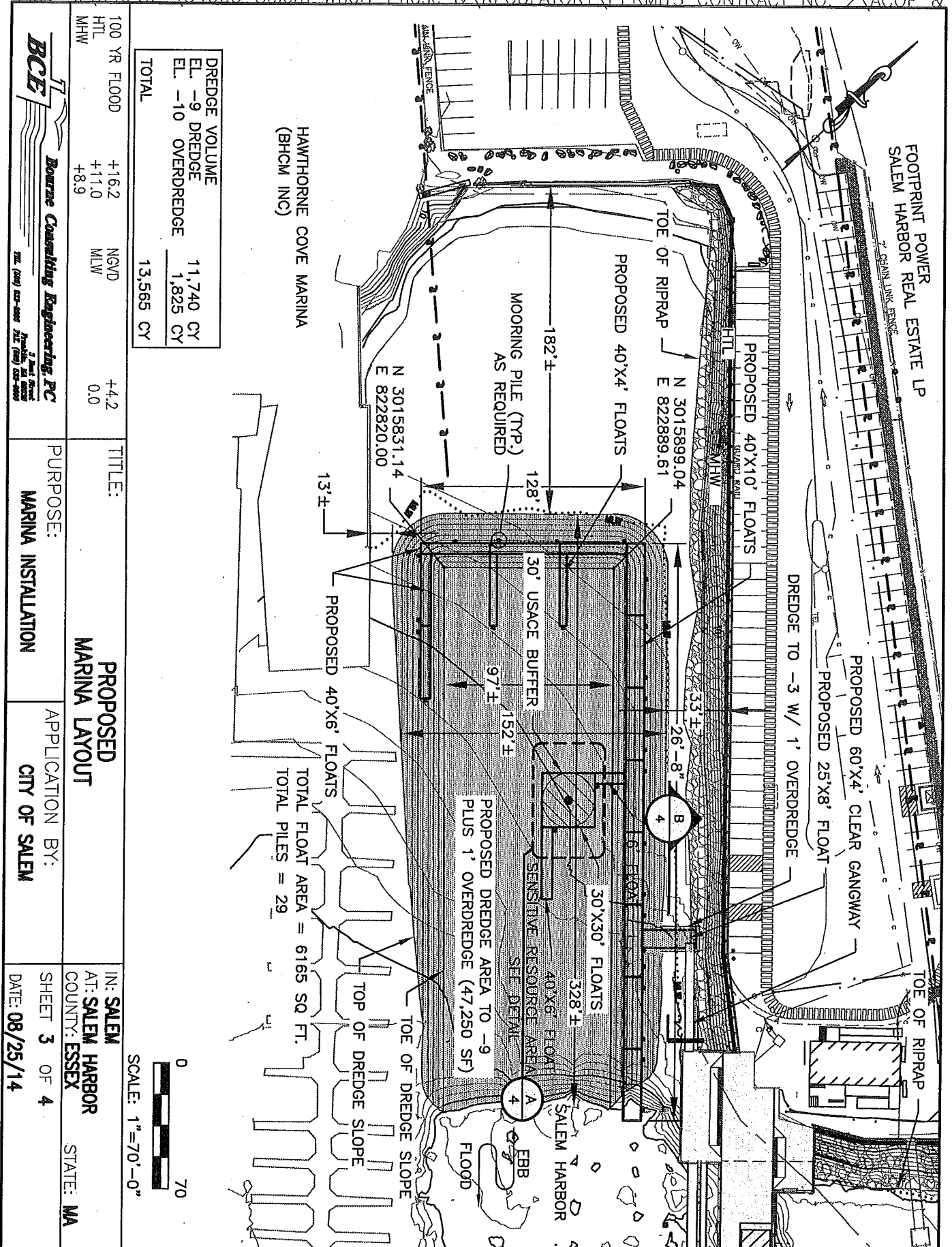
BCE
Bourne Consulting Engineering, PC
2nd Floor
100 State Street
Salem, MA 01970
TEL: (978) 552-0000 FAX: (978) 552-0000

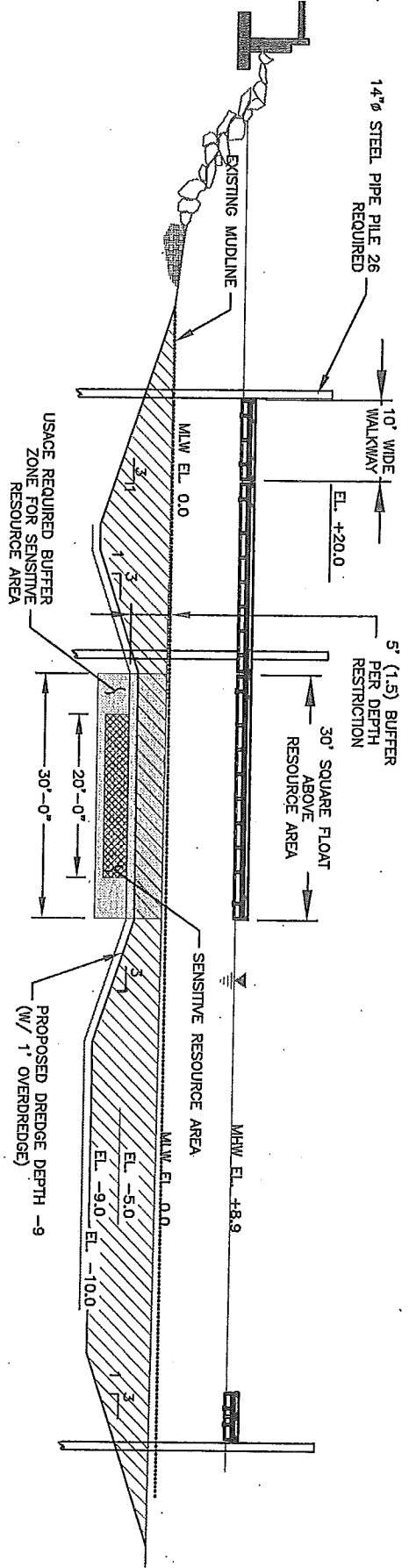
EXISTING
CONDITIONS

SCALE: 1"=70'-0"

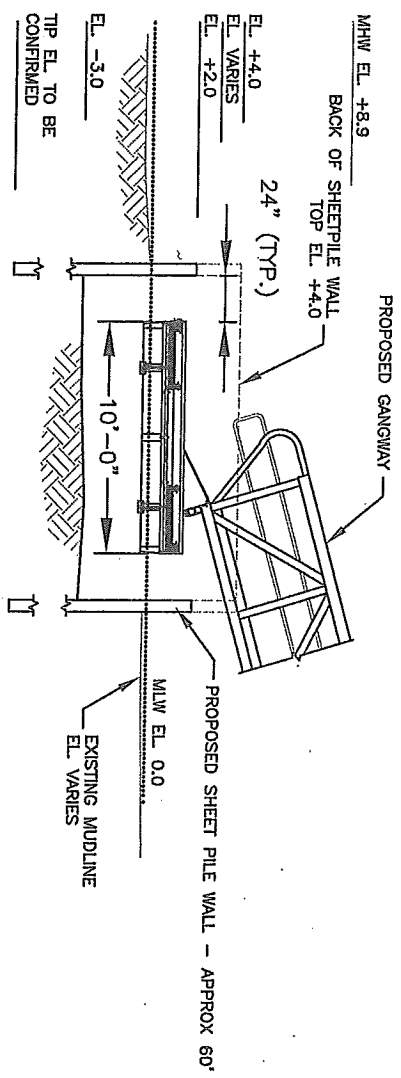


| | | | |
|--------|---------------------|-----------------|---|
| TITLE: | PURPOSE: | APPLICATION BY: | IN: SALEM AT: SALEM HARBOR COUNTY: ESSEX STATE: MA |
| | MARINA INSTALLATION | CITY OF SALEM | |
| | | | SHEET 2 OF 4 DATE: 06/16/14 |





PROPOSED SECTION A @ RESOURCE AREA
SCALE: 1"=20'-0"



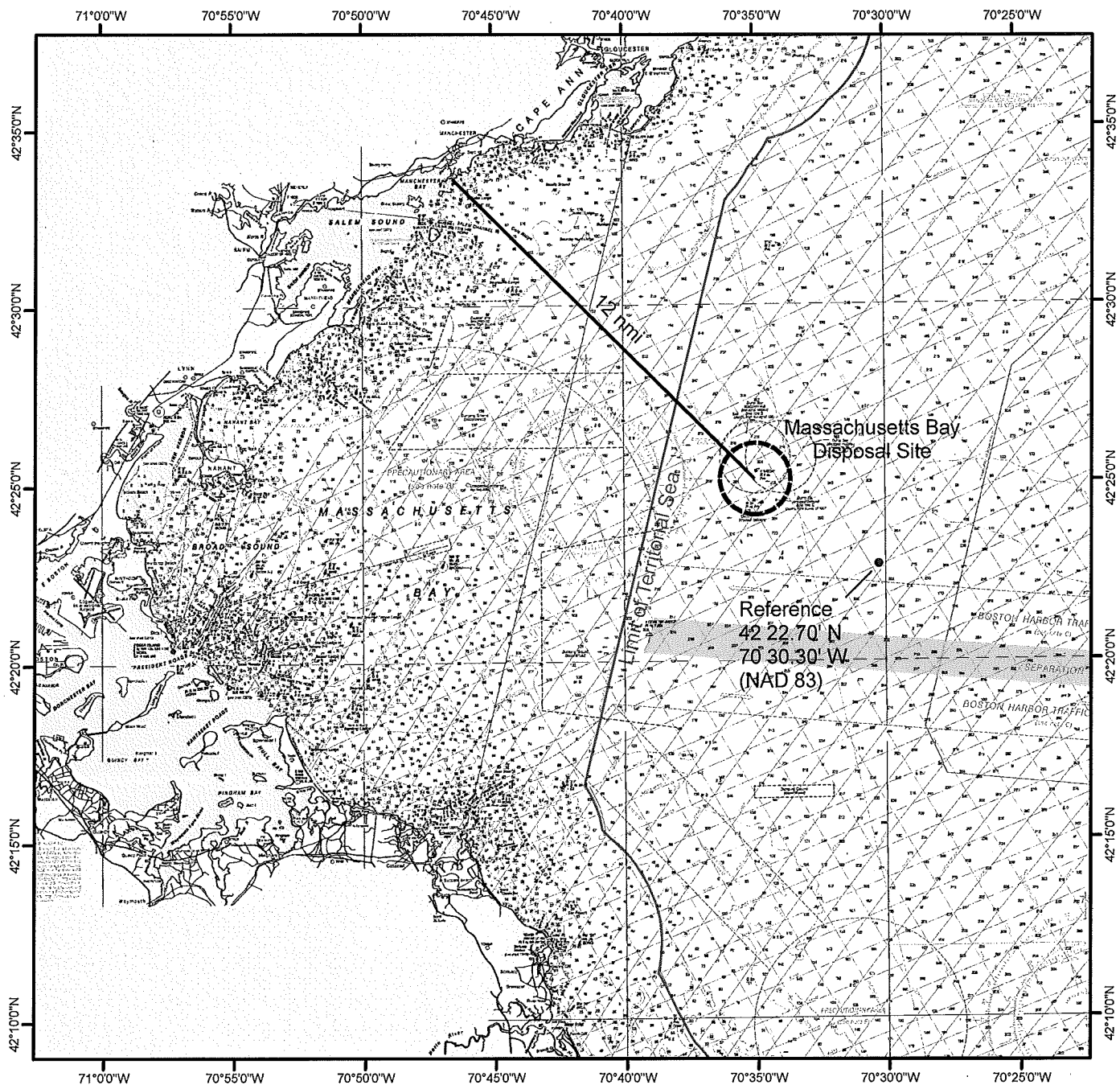
PROPOSED SECTION B
SCALE: 1/8"=1'-0"



| | | | |
|--------------|-------|------|------|
| 100 YR FLOOD | +16.2 | NGVD | +4.2 |
| HTL | +11.0 | MLW | 0.0 |
| MHW | +8.9 | | |

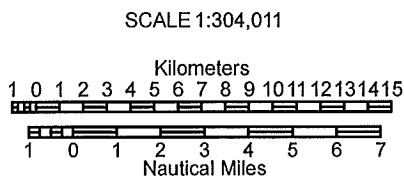
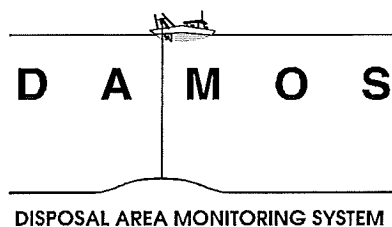
BCE
Bourne Consulting Engineering, Inc.
200 Main Street
Salem, MA 01970
TEL: (508) 552-4000 FAX: (508) 552-4000

| | | |
|-----------------|-------------------------|------------------|
| TITLE: | PROPOSED MARINA SECTION | IN: SALEM |
| PURPOSE: | MARINA INSTALLATION | AT: SALEM HARBOR |
| APPLICATION BY: | CITY OF SALEM | COUNTY: ESSEX |
| | | STATE: MA |
| | | SHEET 4 OF 4 |
| | | DATE: 08/25/14 |

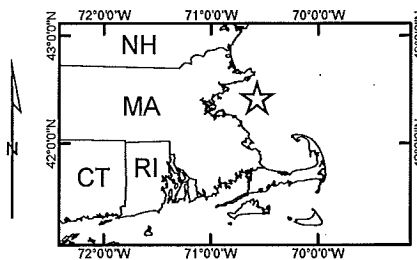


MASSACHUSETTS BAY DISPOSAL SITE

Description: The Massachusetts Bay Disposal Site (MBDS), a 2.0 nmi (3.7 km) diameter circular area centered at 42° 25.106' N, 70° 34.969' W (NAD 83), is located 12 nmi (22 km) southeast of Gales Point, MA. Water depths range from 269 to 302 ft (82 to 92 m). The authorized disposal point (within the overall disposal area) is specified for each dredging project in other project documents.



NOTE: This chart is not intended for use in navigation.



SECTION C

GEOTECHNICAL INFORMATION

Test Pit Logs, North Shore Marine, 2009
Boring Logs, Geotechnical Services, Inc., 2009
Boring, Test Pit and Monitoring Well Logs, TRC, 2004
Boring, Test Pit and Monitoring Well Logs, GEI Cons, Inc., 2001
Boring Log, New Hampshire Boring, Inc., 1998
Boring Log, Con-Tec, Inc., 1997

Note: Additional Soil Testing Data will be made available to the successful bidder upon request to the Owner.

| <div style="display: flex; justify-content: space-between; align-items: center;"> <div> <h2 style="margin: 0;">TEST BORING LOG</h2> </div> <div style="text-align: right;"> <p>Boring No. WB-1</p> <p>Page 1 of 2</p> </div> </div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------------|----------------------------|---------------|-----------------|---|--|--|---------------------|--|--|--|------------------|--|--|--|--|-----------------------|------------------------|------------------------|------|------|----------------|--|--|--|--|-----------------|---------------|-------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Project | | Salem Wharf | | Project No. | | 209196 | | Elevation | | -1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Location | | Salem, MA | | Inspector | | G. Zoladz | | Datum | | MLW | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Client | | Bourne Consulting Eng. | | Project Manager | | G. Zoladz | | Start | | 6/15/2009 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contractor | | New Hampshire Boring, Inc. | | Checked By | | C. Soydemir | | Finish | | 6/15/2009 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Driller | | P. LaBosiere | | Drill Rig | | | | Model | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Item: | | Auger | | Casing | | Sampler | | Core Barrel | | <input type="checkbox"/> Truck <input type="checkbox"/> Skid <input checked="" type="checkbox"/> Track <input type="checkbox"/> ATV <input type="checkbox"/> Bomb. <input type="checkbox"/> Geophone <input type="checkbox"/> Tripod <input type="checkbox"/> Other <input type="checkbox"/> Winch <input checked="" type="checkbox"/> Cat Head <input checked="" type="checkbox"/> Roller Bit <input type="checkbox"/> Cutting Head | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Type | | - | | HW | | S | | - | | Hammer Type: <input checked="" type="checkbox"/> Safety Hammer <input type="checkbox"/> Doughnut <input type="checkbox"/> Automatic | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inside Diameter (in.) | | - | | 4 | | 1.375 | | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hammer Weight (lb) | | - | | 300 | | 140 | | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hammer Fall (in.) | | - | | 24 | | 30 | | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Depth (ft) | Casing (Blows/ft) | Sample Data | | | | | | | Soil-Rock Visual Classification and Description (Soils - Birmister System) (Rock - U.S. Corps of Engineers System) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | No. | Depth (ft) | Rec (in.) | SPT (Blows/6-in.) | Rock RQD (%) | PID Rdg. (ppm) | Stratum Change (ft) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | | S1 | 0-2 | 18 | 3 2 1 1 | | | | Layer of gravel and shells at top of sample (mudline) V. loose, black to gr., silty fine SAND, tr. shells, organics | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | S2 | 4-6 | 24 | WOH WOH 1 1 | | | | V. loose, gr., fine SAND and SILT, tr. shells and peat fibers | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | S3 | 9-11 | 16 | 5 4 8 9 | | | | ~9 Stiff, olive gr. CLAY with seams of silt and fine sand | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | | S4 | 14-16 | 24 | 2 3 4 4 | | | | M. stiff, olive, CLAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | S5 | 19-21 | 24 | 2 2 3 3 | | | | M. stiff, olive, CLAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | | S6 | 24-26 | 24 | 1 1 | | | | V. soft to soft, gr., CLAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5">Water Level Data</th> <th rowspan="2">Sample Identification</th> <th rowspan="2">Cohesive Soils N-Value</th> <th rowspan="2">Granular Soils N-Value</th> </tr> <tr> <th>Date</th> <th>Time</th> <th colspan="3">Depth (ft) to:</th> </tr> <tr> <td></td> <td></td> <th>Bott. of Casing</th> <th>Bott. of Hole</th> <th>Water</th> <td rowspan="4"> O = Open Ended U = Undisturbed S = Split Spoon C = Rock Core G = Geoprobe </td> <td rowspan="4"> 0 to 2: Very Soft 2 to 4: Soft 4 to 8: Medium Stiff 8 to 15: Stiff 15 to 30: Very Stiff Over 30: Hard </td> <td rowspan="4"> 0 to 4: Very Loose 4 to 10: Loose 11 to 30: Medium Dense 31 to 50: Dense Over 50: Very Dense </td> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table> | | | | | | | | | | | | Water Level Data | | | | | Sample Identification | Cohesive Soils N-Value | Granular Soils N-Value | Date | Time | Depth (ft) to: | | | | | Bott. of Casing | Bott. of Hole | Water | O = Open Ended U = Undisturbed S = Split Spoon C = Rock Core G = Geoprobe | 0 to 2: Very Soft 2 to 4: Soft 4 to 8: Medium Stiff 8 to 15: Stiff 15 to 30: Very Stiff Over 30: Hard | 0 to 4: Very Loose 4 to 10: Loose 11 to 30: Medium Dense 31 to 50: Dense Over 50: Very Dense | | | | | | | | | | | | | | | |
| Water Level Data | | | | | Sample Identification | Cohesive Soils N-Value | Granular Soils N-Value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Date | Time | Depth (ft) to: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Bott. of Casing | Bott. of Hole | Water | O = Open Ended U = Undisturbed S = Split Spoon C = Rock Core G = Geoprobe | 0 to 2: Very Soft 2 to 4: Soft 4 to 8: Medium Stiff 8 to 15: Stiff 15 to 30: Very Stiff Over 30: Hard | 0 to 4: Very Loose 4 to 10: Loose 11 to 30: Medium Dense 31 to 50: Dense Over 50: Very Dense | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%) | | | | | | | | WB-1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Notes: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



TEST BORING LOG

Boring No.

WB-1

Page 2 of 2

| Project | | Salem Wharf | | GSI Project No. | | 208196 | | Date Started | 06/15/09 |
|------------|----------------------|-------------|---------------|-----------------|------------------------|--------------------|----------------------|---------------------------|--|
| Location | | Salem , MA | | Inspector | | G. Zoladz | | Date Finished | 06/15/09 |
| Depth (ft) | Casing (Blows/ft) | Sample Data | | | | | | | Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System) |
| | | No. | Depth (ft) | Rec (In.) | SPT (Bl./ 6-in.) | Rock RQD (%) | PID Rdg. (ppm) | Stratum Change (ft) | |
| 25 | | | | | 1 1 | | | | <p>Advanced Boring without Sampling to 59.5-ft to determine Marine Clay Thickness</p> <p>Water Level at 4.8-ft above mudline at approximately 11:35 am at start of drilling.</p> <p>Boring Depths Measured from Mudline.</p> <p>Borehole Location:</p> <p>43° 31.310 N</p> <p>70° 52.884 W</p> <p>Captured using GPS CHART 150 C</p> |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |
| 40 | | | | | | | | | |
| 45 | | | | | | | | | |
| 50 | | | | | | | | | |
| 55 | | | | | | | | | |
| 60 | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | Drill action indicates change in soil conditions at 59.5-ft on probable Glacial Till. |
| | | | | | | | | | Bottom of Exploration at 59.5-ft. |

Notes:

WB-1



TEST BORING LOG

Boring No. _____

WB-2

Page 1 of 2

| Project | | Salem Wharf | | Project No. | | 209196 | | Elevation | | -1.6 | |
|--|-------------------|----------------------------|---------------|-----------------|---|--------------|---|---------------------|--|--|--|
| Location | | Salem, MA | | Inspector | | G. Zoladz | | Datum | | MLW | |
| Client | | Bourne Consulting Eng. | | Project Manager | | G. Zoladz | | Start | | 6/15/2009 | |
| Contractor | | New Hampshire Boring, Inc. | | Checked By | | C. Soydemir | | Finish | | 6/15/2009 | |
| Driller | | P. LaBossiere | | Drill Rig | | | | Model | | | |
| Item: | | Auger | | Casing | | Sampler | | Core Barrel | | <input type="checkbox"/> Truck <input checked="" type="checkbox"/> Track <input type="checkbox"/> Bomb. <input type="checkbox"/> Tripod <input type="checkbox"/> Winch | |
| Type | | - | | HW | | S | | - | | <input type="checkbox"/> Skid <input type="checkbox"/> ATV <input type="checkbox"/> Geophone <input type="checkbox"/> Other | |
| Inside Diameter (in.) | | - | | 4 | | 1.375 | | - | | Hammer Type: <input checked="" type="checkbox"/> Safety Hammer <input type="checkbox"/> Doughnut <input type="checkbox"/> Automatic | |
| Hammer Weight (lb) | | - | | 300 | | 140 | | - | | <input type="checkbox"/> Cat Head <input checked="" type="checkbox"/> Roller Bit <input type="checkbox"/> Cutting Head | |
| Hammer Fall (in.) | | - | | 24 | | 30 | | - | | | |
| Depth (ft) | Casing (Blows/ft) | Sample Data | | | | | | | | Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System) | |
| | | No. | Depth (ft) | Rec (in.) | SPT (Blows/8-in.) | Rock RQD (%) | PID Rdg. (ppm) | Stratum Change (ft) | | | |
| 0 | | S1 | 0-2 | 24 | 3 2 1 1 | | | -1 | M. stiff, dark gr., SILT, tr. shells, organics | | |
| | | | | | | | | | V. loose, gr., fine SAND, tr. silt | | |
| | | S2 | 3-5 | 24 | 1 1 1 1 | | | | V. loose, gr., fine SAND and SILT | | |
| 5 | | S3 | 5-7 | 24 | WOH WOH WOH WOH | | | | V. loose, similar to S2 | | |
| | | S4 | 9-11 | 24 | WOH 1 3 5 | | | -10 | V. soft, gr., SILT, trace shells, organics | | |
| 10 | | | | | | | | | Stiff, blue/gr., CLAY | | |
| | | S5 | 14-16 | 24 | 8 11 17 21 | | | | V. stiff, olive/yellow, CLAY | | |
| 15 | | | | | | | | | | | |
| | | S6 | 19-21 | 24 | 4 5 6 8 | | | | Stiff, olive, CLAY | | |
| 20 | | | | | | | | | | | |
| | | S7 | 24-26 | 24 | 2 3 | | | | M. stiff, olive, CLAY | | |
| 25 | | | | | | | | | | | |
| Water Level Data | | | | | | | | | | Sample Identification | |
| Date | Time | Depth (ft) to: | | | O = Open Ended U = Undisturbed S = Split Spoon C = Rock Core G = Geoprobe | | Cohesive Soils N-Value | | Granular Soils N-Value | | |
| | | Bott. of Casing | Bott. of Hole | Water | | | 0 to 2: Very Soft 2 to 4: Soft 4 to 8: Medium Stiff 8 to 15: Stiff 15 to 30 Very Stiff Over 30: Hard | | 0 to 4: Very Loose 4 to 10: Loose 11 to 30: Medium Dense 31 to 50: Dense Over 50: Very Dense | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%) | | | | | | | | | | WB-2 | |



TEST BORING LOG

Boring No.
WB-2

Page 2 of 2

| | | | | | |
|----------|-------------|-----------------|-----------|---------------|----------|
| Project | Salem Wharf | GSI Project No. | 209195 | Date Started | 06/15/09 |
| Location | Salem, MA | Inspector | G. Zoladz | Date Finished | 06/15/09 |

| Depth (ft) | Casing (Blows/ft) | Sample Data | | | | | | Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System) |
|------------|-------------------|-------------|------------|-----------|-----------------|--------------|----------------|---|
| | | No. | Depth (ft) | Rec (in.) | SPT (Bl./6-in.) | Rock RQD (%) | PID Rdg. (ppm) | |
| 25 | | | | | 4 4 | | | |
| 30 | | | | | | | | Bottom of Exploration at 26-II. Water Level at 4-ft above mudline at approximately 9:00 am at start of drilling. Boring Depths Measured from Mudline. Borehole Location: 43° 31.293 N 70° 52.849 W Captured using GPS CHART 150 C |
| 35 | | | | | | | | |
| 40 | | | | | | | | |
| 45 | | | | | | | | |
| 50 | | | | | | | | |
| 55 | | | | | | | | |
| 60 | | | | | | | | |

Notes:

WB-2



TEST BORING LOG

Boring No.

HW-1


Page 1 of 2

| | | | | | |
|------------|----------------------------|-----------------|--------------------|-----------|-----------|
| Project | Salem Wharf | Project No. | 209196 | Elevation | N/A |
| Location | Salem, MA | Inspector | G. Zoladz | Datum | N/A |
| Client | Bourne Consulting Eng. | Project Manager | G. Zoladz | Start | 8/29/2009 |
| Contractor | New Hampshire Boring, Inc. | Checked By | C. Soydemir | Finish | 8/29/2009 |
| Driller | G. Levett | Drill Rig | Falling Stratastar | Model | 15 |

| | | | | | | | |
|-----------------------|-------|--------|---------|-------------|--|-----------------------------------|---|
| Item: | Auger | Casing | Sampler | Core Barrel | <input checked="" type="checkbox"/> Truck | <input type="checkbox"/> Skid | Hammer Type: |
| Type | - | HW | S | - | <input type="checkbox"/> Track | <input type="checkbox"/> ATV | <input checked="" type="checkbox"/> Safety Hammer |
| Inside Diameter (in.) | - | 4 | 1.375 | - | <input type="checkbox"/> Bomb. | <input type="checkbox"/> Geophone | <input type="checkbox"/> Doughnut |
| Hammer Weight (lb) | - | 300 | 140 | - | <input type="checkbox"/> Tripod | <input type="checkbox"/> Other | <input type="checkbox"/> Automatic |
| Hammer Fall (in.) | - | 24 | 30 | - | <input checked="" type="checkbox"/> Whinch | <input type="checkbox"/> Cat Head | <input checked="" type="checkbox"/> Roller Bit |
| | | | | | | | <input type="checkbox"/> Cutting Head |

| Depth (ft) | Casing (Blows/ft) | Sample Data | | | | | | Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System) |
|------------|-------------------|-------------|------------|-----------|----------------------|--------------|----------------|--|
| | | No. | Depth (ft) | Rec (in.) | SPT (Blows/6-in.) | Rock RQD (%) | PID Rdg. (ppm) | |
| 0 | | S1 | 0-1 | 12 | 9 8 50/0" | | | V. dense, br., silty f/m SAND, tr. gravel, c-sand |
| 5 | | S2 | 4-8 | 10 | 9 6 3 24 | | | Loose, br., f/m SAND, tr. gravel, c-sand, silt, bricks |
| 10 | | S3 | 9-11 | 12 | 7 13 11 3 | | | M. dense, black, WOOD and gray fine SAND little to tr. m-sand Note: advanced boring through WOOD b/w 12 to 13-ft Note: probable boulder or cobbles at 13 to 14-ft. |
| 15 | | S4 | 14-16 | 16 | 21 10 11 16 | | | ~14 M. dense, gr., fine SAND, little to tr. m-sand |
| 20 | | S5 | 19-21 | 20 | 3 3 6 7 | | | ~17.5 Drill action indicates change in soils at 17.5-ft Stiff, light br., SILT, tr. clay |
| 25 | | S6 | 24-28 | 24 | 7 7 | | | V. stiff, light br., SILT, tr. clay |

| Water Level Data | | | | | Sample Identification O = Open Ended U = Undisturbed S = Split Spoon C = Rock Core G = Geoprobe | Cohesive Soils N-Value 0 to 2: Very Soft 2 to 4: Soft 4 to 8: Medium Stiff 8 to 15: Stiff 15 to 30 Very Stiff Over 30: Hard | Granular Soils N-Value 0 to 4: Very Loose 4 to 10: Loose 11 to 30: Medium Dense 31 to 50: Dense Over 50: Very Dense |
|--|-------|-----------------|---------------|-------|--|---|--|
| Date | Time | Depth (ft) to: | | | | | |
| | | Bott. of Casing | Bott. of Hole | Water | | | |
| 29-Jun | 10:00 | - | - | ~8 | | | |
| | | | | | | | |
| | | | | | | | |
| Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%) | | | | | | | |
| Notes: | | | | | | | HW-1 |

|  | | <h2 style="margin: 0;">TEST BORING LOG</h2> | | | | | | Boring No. HW-1 | | | |
|---|-------------------|---|------------|-----------------|---------------------|--------------|----------------|---------------------------|--|---|--|
| | | | | | | | | Page 2 of 2 | | | |
| Project | | Salem Wharf | | GSI Project No. | | 209196 | | Date Started | | 06/29/09 | |
| Location | | Salem, MA | | Inspector | | G. Zoladz | | Date Finished | | 06/29/09 | |
| Depth (ft) | Casing (Blows/ft) | Sample Data | | | | | | | Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System) | | |
| | | No. | Depth (ft) | Rec (in.) | SPT (Bl./6-in.) | Rock RQD (%) | PID Rdg. (ppm) | Stratum Change (ft) | | | |
| 25 | | | | | 11 13 | | | | | | |
| | | S7 | 29-31 | 24 | 6 10 11 12 | | | | ~30 | V. stiff, br., SILT, tr clay | |
| 30 | | | | | | | | | | V. stiff, gr., CLAY, little to tr. fine sand, silt | |
| | | S8 | 34-36 | 24 | 2 4 6 7 | | | | | Stiff, gr., CLAY, with varves of fine sand and silt | |
| 35 | | | | | | | | | 36 | | |
| | | | | | | | | | | Bottom of Exploration at 36-ft. | |
| 40 | | | | | | | | | | | |
| | | | | | | | | | | | |
| 45 | | | | | | | | | | | |
| | | | | | | | | | | | |
| 50 | | | | | | | | | | | |
| | | | | | | | | | | | |
| 55 | | | | | | | | | | | |
| | | | | | | | | | | | |
| 60 | | | | | | | | | | | |
| Notes: | | | | | | | | | | HW-1 | |

| TEST BORING LOG | | | | | | | | | | Boring No. HW-2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-------------------|----------------------------|----------------|-----------------------|----------------------|------------------------|----------------|--|---|--|--|--|--|--|--|-----------------------|--|------------------------|--|------------------------|--|------|------|-----------------|----------------|--|--|--|--|--|--|--|--|--|---------------|-------|--|--|--|--|--|--------|-------|---|---|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | Page 1 of 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Project | | Salem Wharf | | Project No. | | 209196 | | Elevation | | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Location | | Salem, MA | | Inspector | | G. Zoladz | | Datum | | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Client | | Bourne Consulting Eng. | | Project Manager | | G. Zoladz | | Start | | 6/29/2009 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contractor | | New Hampshire Boring, Inc. | | Checked By | | C. Soydemir | | Finish | | 6/29/2009 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Driller | | G. Levett | | Drill Rig | | Failing Stratastar | | Model | | 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Item: | | Auger | | Casing | | Sampler | | Core Barrel | | <input checked="" type="checkbox"/> Truck <input type="checkbox"/> Skid <input type="checkbox"/> Track <input type="checkbox"/> ATV <input type="checkbox"/> Bomb. <input type="checkbox"/> Geophone <input type="checkbox"/> Tripod <input type="checkbox"/> Other | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Type | | - | | HW | | S | | - | | Hammer Type: <input checked="" type="checkbox"/> Safety Hammer <input type="checkbox"/> Doughnut <input type="checkbox"/> Automatic | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inside Diameter (in.) | | - | | 4 | | 1.375 | | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hammer Weight (lb) | | - | | 300 | | 140 | | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hammer Fall (in.) | | - | | 24 | | 30 | | - | | <input checked="" type="checkbox"/> Winch <input type="checkbox"/> Cat Head <input checked="" type="checkbox"/> Roller Bit <input type="checkbox"/> Cutting Head | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Depth (ft) | Casing (Blows/ft) | Sample Data | | | | | | Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | No. | Depth (ft) | Rec (in.) | SPT (Blows/6-in.) | Rock ROD (%) | PID Rdg. (ppm) | | | | | Stratum Change (ft) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | | S1 | 0-1 | 8 | 15 50/4" | | | | V. dense, gr./black, GRAVEL, little f/c sand, silt (wood lodged in spoon tip) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | S2 | 4-6 | 14 | 10 12 11 28 | | | | M. dense, br./red, BRICKS and f/m SAND, little silt, tr. gravel | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | S3 | 9-11 | 22 | 5 2 8 7 | | | ~10 | M. stiff, gr., SILT and CLAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | M. dense, gr., fine SAND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | Note: Advanced boring through WOOD b/w 13 to 14-ft. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | | S4 | 14-16 | 18 | 7 7 10 13 | | | ~14 | V. stiff, br., SILT, little to tr. fine sand (wood pieces in top of sample) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | S5 | 19-21 | 24 | 3 5 7 8 | | | | Stiff, olive, CLAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | | S6 | 24-26 | 24 | 2 2 | | | | M. stiff, olive, CLAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Water Level Data</th> <th colspan="2">Sample Identification</th> <th colspan="2">Cohesive Soils N-Value</th> <th colspan="2">Granular Soils N-Value</th> </tr> <tr> <th>Date</th> <th>Time</th> <th>Bolt. of Casing</th> <th>Depth (ft) to:</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> <tr> <th></th> <th></th> <th></th> <th>Bott. of Hole</th> <th>Water</th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>29-Jun</td> <td>13:00</td> <td>-</td> <td>-</td> <td>~10</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> | | | | | | | | | | | | Water Level Data | | | | Sample Identification | | Cohesive Soils N-Value | | Granular Soils N-Value | | Date | Time | Bolt. of Casing | Depth (ft) to: | | | | | | | | | | Bott. of Hole | Water | | | | | | 29-Jun | 13:00 | - | - | ~10 | | | | | | | | | | | | | | | |
| Water Level Data | | | | Sample Identification | | Cohesive Soils N-Value | | Granular Soils N-Value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Date | Time | Bolt. of Casing | Depth (ft) to: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Bott. of Hole | Water | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29-Jun | 13:00 | - | - | ~10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)</th> </tr> </thead> <tbody> <tr> <td colspan="4" style="text-align: right;">HW-2</td> </tr> </tbody> </table> | | | | | | | | | | | | Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%) | | | | HW-2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HW-2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Notes: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Geotechnical Services, Inc. ♦ 18 Cote Avenue, Goffstown, NH 03045 Tel. 603-624-2722 Fax. 603-624-3733 ♦ 12 Rogers Road, Haverhill, MA 02222 Tel. 978-374-7744 Fax. 978-374-7799

| | | TEST BORING LOG | | | | | Boring No. HW-2 | | |
|------------|-------------------|-----------------|------------|-----------------|------------------------|--------------|---------------------------|---------------------|--|
| | | | | Page 2 of 2 | | | | | |
| Project | | Salem Wharf | | GSI Project No. | | 209196 | | Date Started | 06/29/09 |
| Location | | Salem, MA | | Inspector | | G. Zoladz | | Date Finished | 06/29/09 |
| Depth (ft) | Casing (Blows/ft) | Sample Data | | | | | | | Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System) |
| | | No. | Depth (ft) | Rec (in.) | SPT (Bl./6-in.) | Rock RQD (%) | PID Rdg. (ppm) | Stratum Change (ft) | |
| 25 | | | | | 3 5 | | | | |
| 30 | | S7 | 29-31 | 24 | 2 2 3 5 | | | | M. stiff, gr., CLAY |
| 35 | | S8 | 34-36 | 24 | WOH WOH WOH 4 | | | | V. soft, gray, CLAY |
| 40 | | S9 | 39-41 | 24 | WOH WOH WOH 3 | | | | V. soft, gray, CLAY |
| 45 | | | | | | | | | |
| 50 | | S10 | 49-51 | 24 | WOH WOH 1 6 | | | | V. soft, gray, CLAY |
| 55 | | | | | | | | | |
| 60 | | S11 | 59-61 | 12 | 29 19 16 22 | | 61 | | Dense, gr., fine SAND. some m-sand, tr. gravel, c-sand, tr. silt |
| | | | | | | | | | Bottom of Exploration at 61-ft. |
| Notes: | | | | | | | | | HW-2 |

| TEST BORING LOG | | | | | | | | | | Boring No. HW-3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-------------------|----------------------------|---------------|-------------------|-----------------------|------------------------|------------------------|--|---|--|--|---------------------|--|---------------------|--|-------------------|-----------------------|------------------------|------------------------|-------------|------|----------------|--|--|--|--|-----------------|---------------|-------|--|--|--|--------|-------|---|---|-----|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | Page 1 of 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Project | | Salem Wharf | | Project No. | | 209196 | | Elevation | | 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Location | | Salem, MA | | Inspector | | G. Zoladz | | Datum | | MLW | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Client | | Bourne Consulting Eng. | | Project Manager | | G. Zoladz | | Start | | 6/30/2009 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contractor | | New Hampshire Boring, Inc. | | Checked By | | C. Soydemir | | Finish | | 6/30/2009 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Driller | | G. Levett | | Drill Rig | | Falling Stratastar | | Model | | 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Item: | | Auger | | Casing | | Sampler | | Core Barrel | | <input checked="" type="checkbox"/> Truck <input type="checkbox"/> Skid <input type="checkbox"/> Track <input type="checkbox"/> ATV <input type="checkbox"/> Bomb. <input type="checkbox"/> Geophone <input type="checkbox"/> Tripod <input type="checkbox"/> Other | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Type | | - | | HW | | S | | - | | Hammer Type: <input checked="" type="checkbox"/> Safety Hammer <input type="checkbox"/> Doughnut <input type="checkbox"/> Automatic | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inside Diameter (in.) | | - | | 4 | | 1.375 | | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hammer Weight (lb) | | - | | 300 | | 140 | | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hammer Fall (in.) | | - | | 24 | | 30 | | - | | <input checked="" type="checkbox"/> Winch <input type="checkbox"/> Cat Head <input checked="" type="checkbox"/> Roller Bit <input type="checkbox"/> Cutting Head | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Depth (ft) | Casing (Blows/ft) | Sample Data | | | | | | Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | No. | Depth (ft) | Rec (in.) | SPT (Blows/6-in.) | Rock RQD (%) | PID Rdg. (ppm) | | | | | Stratum Change (ft) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | | S1 | 0-2 | 16 | 9 20 13 11 | | | | Dense, br., fine SAND, tr. gravel | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | S2 | 4-6 | 6 | 7 3 6 3 | | | | Loose, br., fine SAND, little to tr., silt, tr., bricks, coal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | S3 | 8-11 | 4 | 5 5 2 7 | | | | Loose, Brick (lodged in tip) with tr. gravel size pieces of concrete and wood (probable wash) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | | S4 | 14-16 | 1 | 12 7 11 11 | | | | M. dense, GRAVEL and m/c sand (poor recovery) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | Note: advanced boring through WOOD at 17.5-ft. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | S5 | 19-21 | 12 | 3 7 14 10 | | -19 | | V. stiff, gr., SILT, little fine sand, clay, tr. gravel and wood (at top of sample) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | | S6 | 24-26 | 24 | 8 14 | | | | Hard, olive, CLAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5">Water Level Data</th> <th rowspan="2">Sample Identification</th> <th rowspan="2">Cohesive Soils N-Value</th> <th rowspan="2">Granular Soils N-Value</th> </tr> <tr> <th>Date</th> <th>Time</th> <th colspan="3">Depth (ft) to:</th> </tr> <tr> <td></td> <td></td> <th>Bott. of Casing</th> <th>Bott. of Hole</th> <th>Water</th> <td></td> <td></td> <td></td> </tr> <tr> <td>30-Jun</td> <td>10:00</td> <td>-</td> <td>-</td> <td>-10</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | | | | | | | | | | | Water Level Data | | | | | Sample Identification | Cohesive Soils N-Value | Granular Soils N-Value | Date | Time | Depth (ft) to: | | | | | Bott. of Casing | Bott. of Hole | Water | | | | 30-Jun | 10:00 | - | - | -10 | | | | | | | | | | | |
| Water Level Data | | | | | Sample Identification | Cohesive Soils N-Value | Granular Soils N-Value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Date | Time | Depth (ft) to: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Bott. of Casing | Bott. of Hole | Water | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30-Jun | 10:00 | - | - | -10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">Trace (0 to 5%),</td> <td colspan="2">Little (10 to 20%),</td> <td colspan="2">Some (20 to 35%),</td> <td colspan="2">And (35 to 50%)</td> <td colspan="2" style="text-align: center;">HW-3</td> </tr> </table> | | | | | | | | | | | | Trace (0 to 5%), | | Little (10 to 20%), | | Some (20 to 35%), | | And (35 to 50%) | | HW-3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trace (0 to 5%), | | Little (10 to 20%), | | Some (20 to 35%), | | And (35 to 50%) | | HW-3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Notes: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



TEST BORING LOG

Boring No.

HW-3

Page 2 of 2

| | | | | | |
|----------|-------------|-----------------|-----------|---------------|----------|
| Project | Salem Wharf | GSI Project No. | 209196 | Date Started | 06/30/09 |
| Location | Salem, MA | Inspector | G. Zoladz | Date Finished | 06/30/09 |

| Depth (ft) | Casing (Blows/ft) | Sample Data | | | | | | Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System) |
|---------------------------------|-------------------|-------------|------------|-----------|------------------------|--------------|----------------|--|
| | | No. | Depth (ft) | Rec (in.) | SPT (Bl./6-in.) | Rock RQD (%) | PID Rdg. (ppm) | |
| 25 | | | | | 20 27 | | | |
| 30 | | S7 | 29-31 | 24 | 4 5 6 6 | | | Stiff, gr., CLAY |
| 35 | | S8 | 34-36 | 24 | WOH WOH WOH 4 | | | V. soft, gr., CLAY |
| 40 | | | | | | | | |
| 45 | | | | | | | | |
| 50 | | | | | | | | |
| 55 | | | | | | | | |
| 60 | | | | | | | | |
| Bottom of Exploration at 36-ft. | | | | | | | | |

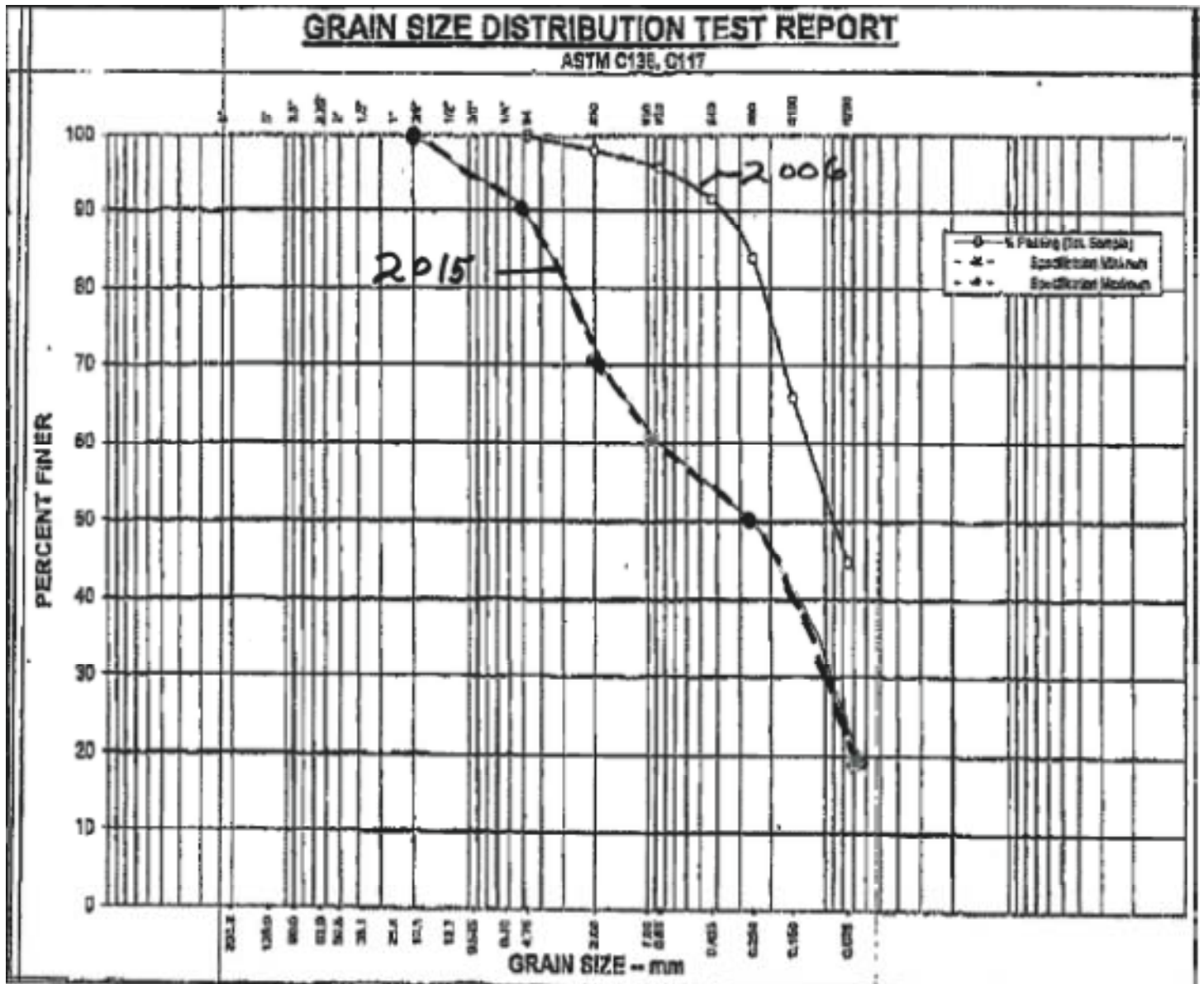
Notes:

HW-3

| | | | | | | | | |
|---|-------------------|----------------------------|--------------|-----------------|--|--|---|---|
| | | TEST BORING LOG | | | | Boring No. HW-4 | | |
| | | Page 1 of 2 | | | | | | |
| Project | | Salem Wharf | | Project No. | | 209196 | | |
| Location | | Salem, MA | | Inspector | | G. Zoladz | | |
| Client | | Bourne Consulting Eng. | | Project Manager | | G. Zoladz | | |
| Contractor | | New Hampshire Boring, Inc. | | Checked By | | C. Soydemir | | |
| Driller | | G. Levett | | Drill Rig | | Falling Stratastar | | |
| Item: | | Auger | Casing | Sampler | Core Barrel | <input checked="" type="checkbox"/> Truck <input type="checkbox"/> Skid <input type="checkbox"/> Track <input type="checkbox"/> ATV <input type="checkbox"/> Bomb. <input type="checkbox"/> Geophone <input type="checkbox"/> Tripod <input type="checkbox"/> Other | | |
| Type | | - | HW | S | - | Hammer Type: <input checked="" type="checkbox"/> Safety Hammer <input type="checkbox"/> Doughnut <input type="checkbox"/> Automatic | | |
| Inside Diameter (in.) | | - | 4 | 1.375 | - | | | |
| Hammer Weight (lb) | | - | 300 | 140 | | | | |
| Hammer Fall (in.) | | - | 24 | 30 | <input checked="" type="checkbox"/> Winch <input type="checkbox"/> Cat Head <input checked="" type="checkbox"/> Roller Bit <input type="checkbox"/> Cutting Head | | | |
| Depth (ft) | Casing (Blows/ft) | Sample Data | | | | | | Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System) |
| | | No. | Depth (ft) | Rec (in.) | SPT (Blows/6-in.) | Rock RQD (%) | PID Rdg. (ppm) | |
| 0 | | S1 | 0-2 | 16 | 11 12 17 30 | | | V. dense, br., f/m SAND and SILT, tr. gravel, concrete, bricks (asphalt lodged in spoon tip) |
| 5 | | S2 | 4-6 | 6 | 14 19 18 9 | | | Dense, br., fine SAND, little to tr. m/c sand, silt, tr. gravel Note: Advanced boring through probable boulder 9 to 10-ft. |
| 10 | | S3 | 9-11 | 8 | 60 12 32 21 | | | Dense, br., fine SAND, little to tr. m-sand, silt Note: Numerous cobbles and boulders between 9 to 19-ft. |
| 15 | | S4 | 14-16 | 1 | 12 33 13 9 | | | Dense, br., f/m SAND, tr. bricks, concrete (poor recovery, probable wash) |
| 20 | | S5 | 19-21 | 24 | 12 13 20 29 | | ~19 | Hard, olive, CLAY |
| 25 | | S6 | 24-26 | 24 | 7 10 | | | V. stiff, olive, CLAY |
| Water Level Data Sample Identification Cohesive Soils N-Value Granular Soils N-Value | | | | | | | | |
| Date Time | | Depth (ft) to: | | | O = Open Ended U = Undisturbed S = Split Spoon C = Rock Core G = Geoprobe | | 0 to 2: Very Soft 2 to 4: Soft 4 to 8: Medium Stiff 8 to 15: Stiff 15 to 30 Very Stiff Over 30: Hard | |
| | | Bot. of Casing | Bot. of Hole | Water | | | | |
| 30-Jun 14:00 | | - | - | ~10 | | | | |
| Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%) | | | | | | | | |
| Notes: | | | | | | | | HW-4 |

| | | | | | | | | | | | |
|------------|-------------------|-----------------|------------|-----------------|-------------------------|--------------|----------------|---------------------------|--|--------------------|--|
| | | TEST BORING LOG | | | | | | Boring No. HW-4 | | | |
| | | | | | | | | Page 2 of 2 | | | |
| Project | | Salem Wharf | | GSI Project No. | | 209196 | | Date Started | | 06/30/09 | |
| Location | | Salem, MA | | Inspector | | G. Zoladz | | Date Finished | | 06/30/09 | |
| Depth (ft) | Casing (blows/ft) | Sample Data | | | | | | | Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System) | | |
| | | No. | Depth (ft) | Rec (in.) | SPT (Bl./6-in.) | Rock RQD (%) | PID Adj. (ppm) | Stratum Change (ft) | | | |
| 25 | | | | | 15 17 | | | | V. stiff, olive, CLAY | | |
| 30 | | S7 | 29-31 | 24 | 4 8 11 12 | | | | | | |
| 35 | | S8 | 34-36 | 24 | 3 6 6 8 | | | Stiff, olive, CLAY | | | |
| 40 | | S9 | 39-41 | 24 | 2 2 7 | | | | | Stiff, olive, CLAY | |
| 42.3 | | S10 | 41-42.3 | 8 | 28 39 34 50/4" | | | | | | |
| 45 | | | | | | | | | Bottom of Exploration at 442.3-ft. | | |
| 50 | | | | | | | | | | | |
| 55 | | | | | | | | | | | |
| 60 | | | | | | | | | | | |
| Notes: | | | | | | | | | | HW-4 | |

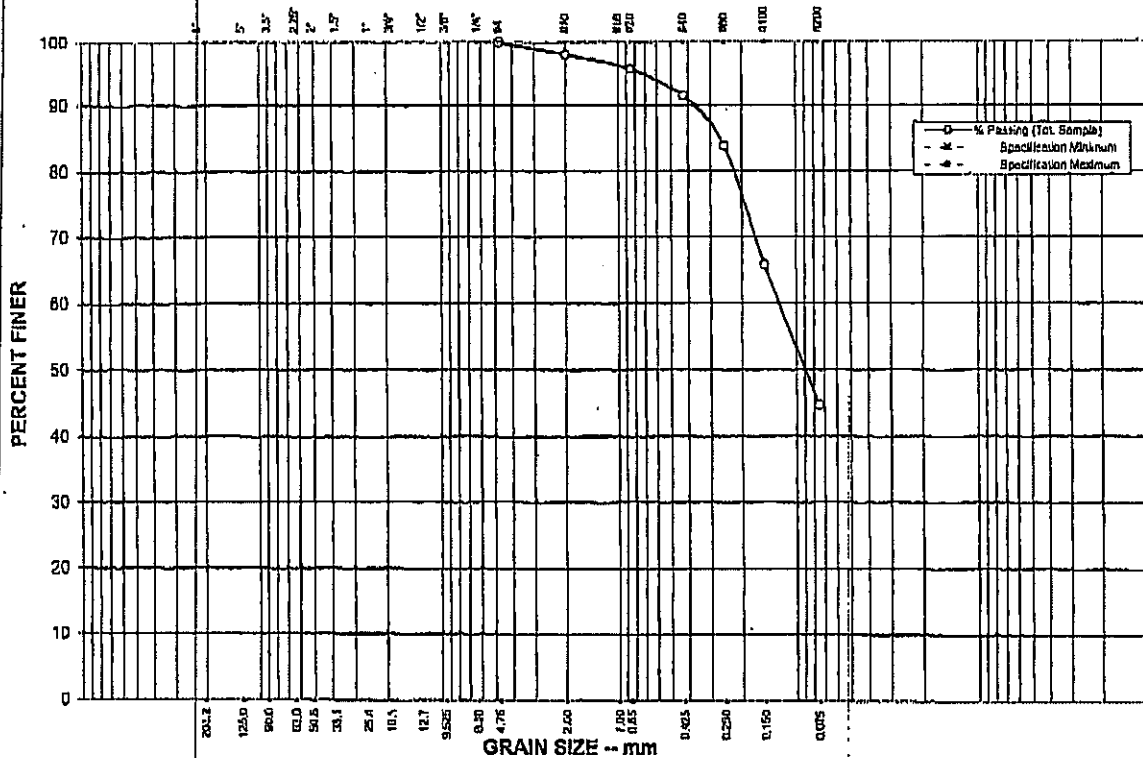
Salem Commercial Marina Grain Size Comparison
January 7, 2015



Note: Marked up grain size distribution is from December 29, 2015 testing data. Samples are taken from location SW-2.

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM C136, C117




| % Cobbles | % Gravel | Crs | Med | Fine | % Fines | |
|-----------|----------|-----|------|------|-----------------|-----------------|
| 0.0 | 0.0 | 3.4 | 12.0 | 84.6 | Silt (>0.002mm) | Clay (<0.002mm) |
| | | | | 55.2 | 44.8 | |

Classification: Dark gray fine SAND, and Silt

| Sieve Size (mm.) | Sieve Size (in./no.) | Cumulative Wt. Retnd | % Passing (Tot. Sample) | Specification Minimum | Specification Maximum |
|------------------|----------------------|----------------------|-------------------------|-----------------------|-----------------------|
| 203.200 | 8" | | | | |
| 162.400 | 6" | | | | |
| 101.600 | 4" | | | | |
| 89.900 | 3.5" | | | | |
| 75.200 | 3" | | | | |
| 50.800 | 2" | | | | |
| 38.100 | 1.5" | | | | |
| 25.400 | 1" | | | | |
| 19.050 | 3/4" | | | | |
| 12.700 | 1/2" | | | | |
| 9.525 | 3/8" | | | | |
| 4.750 | #4 | 0.00 | 100.0 | | |
| 2.000 | #10 | 1.94 | 98.1 | | |
| 0.850 | #20 | 4.31 | 95.6 | | |
| 0.425 | #40 | 8.80 | 91.2 | | |
| 0.250 | #60 | 16.77 | 83.2 | | |
| 0.150 | #100 | 35.45 | 64.5 | | |
| 0.075 | #200 | 57.20 | 42.8 | | |

Total Dry Wt. 103.57 g

| | | | |
|---|--|---|------------------------|
| Project: EnviroSystems | | Project No.: 06304L | Date: 12/19/06 |
| City: Hampton, NH | | Specification: None | Lab No: L768-06 |
| Source: ESI project #15330 | | Sampled from: 15330-001 | |
|  77 Sundial Avenue Manchester, NH 03103 (603) 847-0700 fax: (603) 847-4432 www.loeastern.com | | Remarks: Wn=27.9% Tested By: Dan Savage Reviewed By: SMC | |
| | | Date: 12/26/06 | Date: 12/28/06 |



ANALYTICAL REPORT

| | |
|-----------------|--|
| Lab Number: | L1429941 |
| Client: | Bourne Consulting Engineering 3 Bent St Franklin, MA 02038 |
| ATTN: | Kevin Dittmeier |
| Phone: | (508) 533-6666 |
| Project Name: | SALEM MARINA |
| Project Number: | 34005 |
| Report Date: | 12/29/14 |

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: NY (11627), CT (PH-0141), NH (2206), NJ NELAP (MA015), RI (LAO00299), PA (68-02089), LA NELAP (03090), FL (E87814), TX (T104704419), WA (C954), DOD (L2217.01), USDA (Permit #P330-11-00109), US Army Corps of Engineers.

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com



Project Name: SALEM MARINA
Project Number: 34005

Lab Number: L1429941
Report Date: 12/29/14

| Alpha Sample ID | Client ID | Matrix | Sample Location | Collection Date/Time | Receive Date |
|----------------------------|------------------|---------------|----------------------------|---------------------------------|---------------------|
| L1429941-01 | SW-2 | SEDIMENT | SW-2 | 12/02/14 13:00 | 12/11/14 |

Project Name: SALEM MARINA
Project Number: 34005

Lab Number: L1429941
Report Date: 12/29/14

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: SALEM MARINA
Project Number: 34005

Lab Number: L1429941
Report Date: 12/29/14

Case Narrative (continued)

Grain Size

A Laboratory Duplicate was prepared with the sample batch, however, the native sample required a different reporting method; therefore, the laboratory duplicate results could not be reported.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:  Cynthia McQueen

Title: Technical Director/Representative

Date: 12/29/14

INORGANICS & MISCELLANEOUS

Project Name: SALEM MARINA

Project Number: 34005

Lab Number: L1429941

Report Date: 12/29/14

SAMPLE RESULTS

Lab ID: L1429941-01

Client ID: SW-2

Sample Location: SW-2

Matrix: Sediment

Date Collected: 12/02/14 13:00

Date Received: 12/11/14

Field Prep: Not Specified

| Parameter | Result | Qualifier | Units | RL | MDL | Dilution Factor | Date Prepared | Date Analyzed | Analytical Method | Analyst |
|-------------------------------------|--------|-----------|-------|-------|-----|-----------------|---------------|----------------|-------------------|---------|
| Grain Size Analysis - Mansfield Lab | | | | | | | | | | |
| Cobbles | ND | | % | 0.100 | NA | 1 | - | 12/22/14 00:00 | 12,D422 | SE |
| % Coarse Gravel | ND | | % | 0.100 | NA | 1 | - | 12/22/14 00:00 | 12,D422 | SE |
| % Fine Gravel | 20.3 | | % | 0.100 | NA | 1 | - | 12/22/14 00:00 | 12,D422 | SE |
| % Coarse Sand | 8.70 | | % | 0.100 | NA | 1 | - | 12/22/14 00:00 | 12,D422 | SE |
| % Medium Sand | 12.9 | | % | 0.100 | NA | 1 | - | 12/22/14 00:00 | 12,D422 | SE |
| % Fine Sand | 41.5 | | % | 0.100 | NA | 1 | - | 12/22/14 00:00 | 12,D422 | SE |
| % Total Fines | 16.6 | | % | 0.100 | NA | 1 | - | 12/22/14 00:00 | 12,D422 | SE |



Project Name: SALEM MARINA

Project Number: 34005

Lab Number: L1429941

Report Date: 12/29/14

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information Custody Seal

Cooler

A Absent

Container Information

| Container ID | Container Type | Cooler | pH | Temp deg C | Pres | Seal | Analysis(*) |
|--------------|----------------|--------|-----|---------------|------|--------|--|
| L1429941-01A | Core | A | N/A | 5.1 | Y | Absent | A2-HYDRO-TFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-CSAND(),A2-HYDRO-COBBLER(),A2-HYDRO-FGRAVEL() |
| L1429941-01B | Core | A | N/A | 5.1 | Y | Absent | A2-HYDRO-TFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-CSAND(),A2-HYDRO-COBBLER(),A2-HYDRO-FGRAVEL() |
| L1429941-01C | Core | A | N/A | 5.1 | Y | Absent | A2-HYDRO-TFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-CSAND(),A2-HYDRO-COBBLER(),A2-HYDRO-FGRAVEL() |

*Values in parentheses indicate holding time in days

Project Name: SALEM MARINA
Project Number: 34005

Lab Number: L1429941
Report Date: 12/29/14

GLOSSARY

Acronyms

| | |
|------|---|
| EDL | - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME). |
| EPA | - Environmental Protection Agency. |
| LCS | - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes. |
| LCSD | - Laboratory Control Sample Duplicate: Refer to LCS. |
| LFB | - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes. |
| MDL | - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. |
| MS | - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. |
| MSD | - Matrix Spike Sample Duplicate: Refer to MS. |
| NA | - Not Applicable. |
| NC | - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit. |
| NI | - Not Ignitable. |
| RL | - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable. |
| RPD | - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report. |
| SRM | - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples. |

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

Report Format: Data Usability Report



Project Name: SALEM MARINA
Project Number: 34005

Lab Number: L1429941
Report Date: 12/29/14

Data Qualifiers

- G** - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- ND** - Not detected at the reporting limit (RL) for the sample.

Project Name: SALEM MARINA
Project Number: 34005

Lab Number: L1429941
Report Date: 12/29/14

REFERENCES

- 12 Annual Book of ASTM Standards. (American Society for Testing and Materials) ASTM International.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

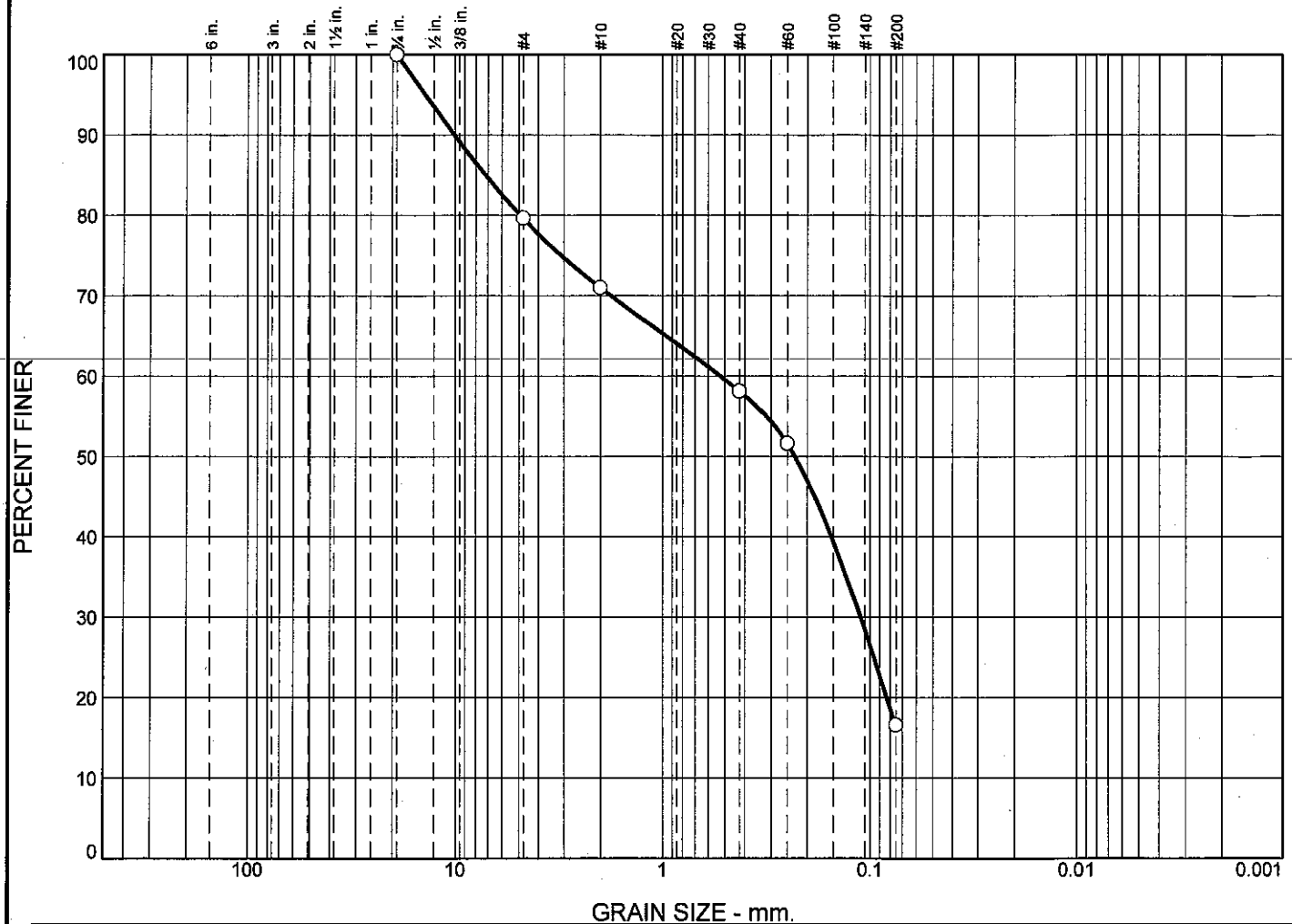
We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



ASTM D422-63

GRAIN SIZE ANALYSIS

Particle Size Distribution Report



| GRAIN SIZE - mm. | | | | | | | | | | | |
|----------------------|-----|----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|--|
| % +3" | | % Gravel | | % Sand | | | % Fines | | | | |
| | | Coarse | Fine | Coarse | Medium | Fine | Silt | | Clay | | |
| ○ | 0.0 | | 0.0 | 20.3 | 8.7 | 12.9 | 41.5 | 16.6 | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| × | LL | PL | D ₈₅ | D ₆₀ | D ₅₀ | D ₃₀ | D ₁₅ | D ₁₀ | C _c | C _u | |
| ○ | | | 7.1535 | 0.5227 | 0.2290 | 0.1108 | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Material Description | | | | | | | | USCS | AASHTO | | |
| | | | | | | | | | | | |

Project No.

Client:

Remarks:

Project:

Source of Sample: SW-2

Sample Number: L1429941-01

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

12/29/2014

Location: SW-2

Sample Number: L1429941-01

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 150.48

Tare Wt. = 7.42

Minus #200 from wash = 0.0%

| Dry Sample and Tare (grams) | Tare (grams) | Sieve Opening Size | Weight Retained (grams) | Sieve Weight (grams) | Percent Finer |
|--------------------------------------|-----------------|--------------------------|-------------------------------|----------------------------|------------------|
| 150.48 | 7.42 | 0.75 | 0.00 | 0.00 | 100.0 |
| | | #4 | 29.08 | 0.00 | 79.7 |
| | | #10 | 12.35 | 0.00 | 71.0 |
| | | #40 | 18.45 | 0.00 | 58.1 |
| | | #60 | 9.29 | 0.00 | 51.6 |
| | | #200 | 50.10 | 0.00 | 16.6 |

Fractional Components

| Cobbles | Gravel | | | Sand | | | | Fines | | |
|---------|--------|------|-------|--------|--------|------|-------|-------|------|-------|
| | Coarse | Fine | Total | Coarse | Medium | Fine | Total | Silt | Clay | Total |
| 0.0 | 0.0 | 20.3 | 20.3 | 8.7 | 12.9 | 41.5 | 63.1 | | | 16.6 |

| D ₁₀ | D ₁₅ | D ₂₀ | D ₃₀ | D ₅₀ | D ₆₀ | D ₈₀ | D ₈₅ | D ₉₀ | D ₉₅ |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | | 0.0826 | 0.1108 | 0.2290 | 0.5227 | 4.8811 | 7.1535 | 10.0767 | 13.9147 |

| Fineness Modulus |
|---------------------|
| 2.37 |

Alpha Analytical

Certification Information

Last revised December 16, 2014

The following analytes are not included in our NELAP Scope of Accreditation:

Westborough Facility

EPA 524.2: Acetone, 2-Butanone (Methyl ethyl ketone (MEK)), Tert-butyl alcohol, 2-Hexanone, Tetrahydrofuran, 1,3,5-Trichlorobenzene, 4-Methyl-2-pentanone (MIBK), Carbon disulfide, Diethyl ether.

EPA 8260C: 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene, Iodomethane (methyl iodide), Methyl methacrylate, Azobenzene.

EPA 8270D: 1-Methylnaphthalene, Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 625: 4-Chloroaniline, 4-Methylphenol.

SM4500: Soil: Total Phosphorus, TKN, NO₂, NO₃.

EPA 9071: Total Petroleum Hydrocarbons, Oil & Grease.

Mansfield Facility

EPA 8270D: Biphenyl.

EPA 2540D: TSS

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzoethiophene, 1-Methylnaphthalene.

The following analytes are included in our Massachusetts DEP Scope of Accreditation, Westborough Facility:

Drinking Water

EPA 200.8: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl; **EPA 200.7:** Ba,Be,Ca,Cd,Cr,Cu,Na; **EPA 245.1:** Mercury;

EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**

EPA 332: Perchlorate.

Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT, Enterolert-QT.

Non-Potable Water

EPA 200.8: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn;

EPA 200.7: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn;

EPA 245.1, SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2340B, SM2320B, SM4500CL-E, SM4500F-BC, SM426C, SM4500NH3-BH, EPA 350.1: Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, SM4500P-B, E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.**

EPA 624: Volatile Halocarbons & Aromatics,

EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF.

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

