

The City of Waltham



**Invites
Interested Parties
To propose the best offer and or bid
For the service or product herewith described:**

**PROSPECT STREET FIRE STATION, SLAB REPLACEMENT,
Issue 2, 2016**

The GENERAL BID is due: **Thursday March 31, 2016 at 10:00 am**

PRE BID Meeting and Briefing on Site: **Wednesday March 23, 2016 at 10:00 am**
(Meet at 35 Prospect Street, Waltham)

Last Day for Written QUESTIONS: **12 noon March 24, 2015**

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DIVISION 0

**SECTION 00050
CITY OF WALTHAM
MASSACHUSETTS**

NOTICE TO BIDDERS,

**PROSPECT STREET FIRE STATION, SLAB REPLACEMENT
35 PROSPECT STREET, WALTHAM, MASSACHUSETTS**

The City of Waltham, Massachusetts invites sealed bids from Contractors for the replacement of the Slab, Prospect Street Fire Station at 35 Prospect Street, Waltham, Massachusetts. The work includes the replacement of the floor slab which is supported by four (4) steel beams.

PLANS, SPECIFICATIONS and other Contract Documents may be obtained by visiting the City's Web Site at www.city.waltham.ma.us/open-bids

Copies of Addenda will be e- mailed to the registered Bidders without charge. Addenda will also be posted on the web site above

Sealed **GENERAL BIDS** for this project will be accepted from eligible bidders at the Purchasing Department, Waltham City Hall, 610 Main Street, Waltham, MA 02452 until **10:00 AM Thursday March 31, 2016**, at which place and time they shall be publicly opened, read aloud and recorded for presentation to the Awarding Authority.

A **PRE-BID CONFERENCE** will be held for all interested parties at **10:00 AM Wednesday March 23, 2016** at the site at the **Prospect Street Fire Station, 35 Prospect Street Street, Waltham, MA**. Attendance at this pre-bid conference is strongly recommended, but it is not required, for parties submitting a bid. It will be the only opportunity to visit the site prior to the bid opening.

Each general bid shall be accompanied by a bid deposit in the form of a bid bond, certified check, or a treasurer's or cashier's check issued by a responsible bank or trust company, payable to the City of Waltham in the amount of five percent (5%) of the value of the bid. Bid deposits will be dealt with as provided in Massachusetts General Laws, Chapter 149, Section 44B.

To be given consideration, all general bids and all sub-bids must be accompanied by a copy of the Bidder's Certificate of Eligibility (DCAMM Form CQ7) and an Update Statement (DCAMM Form CQ3). The General Bidder must be certified eligible in the General Building category.

Bids shall be made on the basis of the Minimum Wage Rates as determined by the Commissioner of Labor and Industries, Pursuant to the Provisions of Chapter 149, Sections 26 to 27D inclusive of Massachusetts General Laws, a copy shall be found at www.city.waltham.ma.us/open-bids and is made a part of the Contract.

Bidders' selection procedures and contract award shall be in conformity with applicable statutes of the Commonwealth of Massachusetts.

Performance and Labor & Materials payment bonds in the full amount of the contract price will be required from the successful bidder.

The Awarding Authority reserves the right to reject any or all general bids, if it be in the public interest to do so, and to reject any sub-bid on any sub-trade if it determines that such sub-bid does not represent the sub-bid of a person competent to perform the work as specified or that less than three such sub-bids were received and that the prices are not reasonable for acceptance without further competition.

The successful bidder will be required to furnish a Certificate of Insurance, naming the City of Waltham as a Named Additional Insured with a waiver of subrogation, for General Liability and Vehicle Liability in the amount of \$500,000 per occurrence and \$1,000,000 in the aggregate and Worker's Compensation Insurance as prescribed by law.

In accordance with M.G.L.Ch 149 the undersigned certifies that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by OSHA that is at least 10 hours in duration at the time the employee begins work and shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.

CITY ORDINANCE. APPROVAL OF CONTRACTS BY MAYOR. SEC. 3-12 OF THE CITY ORDINANCES.

All contract made by any department, board or commission where the amount involved is two thousand dollars (\$2,000) or more shall be in writing, and no such contract shall be deemed to have been made or executed until the approval of the Mayor is affixed thereto. Any construction contract shall, and all other contracts may, where the contract exceed five thousand dollars (\$5,000) be required to be accompanied by a bond with sureties satisfactory to the Mayor.

CITY OF WALTHAM

Joseph Pedulla, CPO
Purchasing Department
City Hall, 610 Main Street
Waltham, MA 02452

SECTION 00100 - INSTRUCTION TO BIDDERS

PART 1 - GENERAL

1.1 SCHEDULE OF DATES

- A. Advertisement appears in Central Register, Plans and Specifications ready for Bidders at the Offices of the Waltham Purchasing Agent after 8:30 P.M. on September 15, 2015.
- B. **Pre-bid** walkthrough on **Wednesday March 23, 2016, at 10:00 AM** at Prospect Street Fire Station 35 Prospect Street, Waltham, MA.
- C. Questions and requests for interpretations may be submitted in writing via e-mail ONLY to Jpedulla@city.waltham.ma.us up to and including: October 2, 2015, 12:00 Noon,
- D. Addenda will be issued with interpretations as determined by the Purchasing Department only via e-mail and posting on the web site.
- E. General Bids Deadline: **10:00 A.M. on Thursday March 31, 2016**, in the Purchasing Department, City Hall, 610 Main Street, Waltham, MA 02452, Attn: J. Pedulla, CPO, where the bids will be publicly open and read.

1.2 BIDDING PROCEDURE

- A. Bids for the work are subject to the provisions of General Laws, Chapter 149, Sections 44A-44L inclusive, as amended. Regulations governing the bidding procedures as set forth in the above mentioned amended General Laws must be followed.
- B. In the event of any inconsistencies between any of the provisions of these Contract Documents and of the cited statute, anything herein to the contrary notwithstanding, the provisions of the said statute shall control.
- C. No General Bid received by the Awarding Authority after the time respectively established herein for the opening of General Bids will be considered, regardless of the cause for the delay in the receipt of any such bid.

1.3 WITHDRAWAL OF BIDS

- A. Bids may be withdrawn prior to the time respectively established for the opening of General Bids only on written request to the Awarding Authority.

1.4 INTERPRETATION OF CONTRACT DOCUMENTS

- A. No oral interpretation will be made to any bidder. All questions or requests for interpretations must be made in writing to the Architect.
- B. Every interpretation made to a bidder will be in the form of an Addendum to the drawings and/or specifications, which will be made available to all persons to whom Contract Documents have been issued.
- C. Failure of the Awarding Authority to send, or of any bidder to receive any such Addendum shall not relieve any bidder from obligation under his bid as submitted.
- D. All such Addenda shall become a part of the Contract Documents.

1.5 EXAMINATION OF SITE AND CONTRACT DOCUMENTS

- A. Each bidder may visit the site of the proposed work and acquaint himself with conditions as they exist, and shall also thoroughly examine the Contract Documents. Failure of any bidder to visit the site and acquaint himself with the Contract Documents shall not relieve any bidder from any obligation with respect to his bid.
- B. By submitting a bid, the bidder agrees that the Contract Documents are adequate and that the required result for a full and complete installation can be produced. The successful bidder shall furnish any and all labor, materials, insurance, permits and all other items needed to produce the required result to the satisfaction of the Awarding Authority.

1.6 BID SECURITY

- A. The General Contractor's bid must be accompanied by bid security in the amount of five percent (5%) of the bid.
- B. At the option of the bidder, the security may be a bid bond, certified, treasurer's or cashier's check issued by a responsible bank or trust company. No other type of bid security is acceptable. Bid Bonds shall be issued by a Surety Company qualified to do business under the laws of the Commonwealth of Massachusetts.
- C. Certified, Treasurer's or Cashier's check shall be made payable to the City of Waltham, Massachusetts.
- D. The bid security shall secure the execution of the Contract and the furnishing of a Performance and Payment Bond by the successful General Bidder for 100% of the contract value.
- E. Should any General Bidder to whom an award is made fail to enter into a contract therefore within five (5) days, Saturdays, Sundays and Legal Holidays, excluded, after

notice of award has been mailed to him or fail within such time to furnish a Performance Bond and also a Labor and Materials or Payment Bond as required, the amount so received from such General Bidder through his Bid Bond, Certified, Treasurer's or Cashier's check as bid deposit shall become the property of the City of Waltham, Massachusetts as liquidated damages; provided that the amount of the bid deposit, which becomes the property of the City of Waltham, Massachusetts, shall not in any event exceed the difference between his bid price and the bid price of the next lowest responsible and eligible bidder; and provided further that, in case of death, disability, bona fide clerical error or mechanical error of a substantial nature, or other unforeseen circumstances affecting the General Bidder, his deposit shall be returned to him.

1.7 BID FORM

- A. General Bids shall be submitted on the "FORM FOR GENERAL BID" enclosed. Erasures or other changes must be explained or noted over the signature of the bidder.
- B. Bid forms must be completely filled in. Bids which are incomplete, conditional, or obscure, or which contain additions not called for will be rejected.
- C. General Bidders shall submit one set of executed bid forms to the Awarding Authority.

1.8 SUBMISSION OF BIDS AND BID SECURITIES

- A. Each bid submitted by a General Contractor shall be enclosed in a sealed envelope that shall be placed with the bid security in an outer envelope. The outer envelope shall be sealed and clearly marked as follows:

(Firm Name): _____
General Bid and Bid Security for:
Prospect street Fire Station, Slab Replacement

1.9 AWARD OF CONTRACT

- A. The Contract shall be awarded to the lowest responsible and eligible General Bidder on the basis of competitive bids in accordance with the procedure set forth in the provision of Section 44B-44L inclusive, as amended or inserted, of Chapter 149 of the General Laws of the Commonwealth of Massachusetts.
- B. If the bidder selected as the General Contractor fails to perform his agreement to execute a contract in accordance with the terms of his General Bid, and furnish a Performance Bond and also a Labor and Materials or Payment Bond, as stated in his General Bid in accordance with Section 44F, an award shall be made to the next lowest responsible and eligible bidder.
- C. The words "lowest responsible and eligible bidder" shall be the bidder whose name is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work and who shall certify that he is able to furnish labor

that can work in harmony with all other elements of labor employed, or to be employed, on the work. Essential information in regard to such qualifications shall be submitted in such form as the Awarding Authority may require.

- D. Action on the award will be taken within sixty (60) days, Saturdays, Sundays and Legal Holidays excluded after the opening of the bids.

1.10 SECURITY FOR FAITHFUL PERFORMANCE

- A. The successful bidder must deliver to the Awarding Authority simultaneously with his delivery of the executed contract, an executed Performance Bond, and also a Labor and materials or Payment Bond, each issued by a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the Awarding Authority and each in the sum of One Hundred Percent (100%) of the Contract Price, as surety for the faithful performance of his contract, and for the payment of all persons performing labor or furnishing materials in connection therewith. Said bonds shall provide that, if the General Contractor fails or refuses to complete the Contract, the Surety Company will be obligated to do so.
- B. Premiums are to be paid by the General Contractor, and are to be included in the Contract Price.

1.11 EQUAL OPPORTUNITY

- A. The City of Waltham is an Equal Opportunity employer and will require compliance with the minority business enterprise plan (MBE) on file in the Purchasing Department

1.12 PRE-BID WALK-THRU

- A. A **pre-bid conference** will be held at the site on **Wednesday March 23, 2016, at 10:00 AM.** at the Prospect Street Fire Station, 35 Prospect Street, Waltham, MA. Interested parties are encouraged to attend given that this will be the only time the building is open prior to the submission of bids. Further, prior to the bid opening, potential bidders may not go onto the site any time other than the aforementioned pre-bid conference.

1.13 SITE VISITS

- A. Prospective bidders are prohibited from going onto the site prior to the Bid Opening or any time other than the pre-bid walk-thru, as set forth in Section 1.12 above, unless authorized by the City in an Addendum to the bid documents.

1.14 CONTRACT DOCUMENTS

- A. The Awarding Authority shall make available the bid documents and addenda in the City Web site at www.city.waltham.ma.us/open-bids. No plans will be mailed.

1.15 EQUALITY

- A. Except where otherwise specifically provided to the contrary, the words “or approved equal” are hereby inserted immediately following the name or description of each article, assembly, system, or any component part thereof in the Contract Documents. It is the Contractor’s responsibility to provide all the research and documentation that would prove a product or assembly is “equal”. Failure to provide research or documentation does not alleviate the Contractor’s responsibility to meet the schedule.

1.16 TAX FREE NUMBER

- A. The City of Waltham has a tax-free number, ST-2 and St-S Forms.

1.17 SCHEDULE

- A. The work of the Contract shall be Substantially Complete in **75 calendar days** after the date of the Notice-to-Proceed.

1.18 LATE PENALTY FEES

- A. If the work is not Substantially Complete as specified in 1.17, the Contractor shall be charged Five Hundred Dollars (\$500.00) per day to pay for consulting and testing fees required to manage and arrange for the completion of the project. Late fees will be deducted from the Contract via Change Order.

1.19 WEEKLY JOB MEETINGS

- A. There will be a weekly job meeting at the site on the same agreed-upon day and time. Time will be provided to discuss and view the progress of the work and to answer questions. The Contractor’s job Superintendent and Project Manager shall attend each meeting. Weekly Job meetings shall be held on the job site

1.20 PROJECT SUPERINTENDENT

- A. The Contractor shall provide the same person as Superintendent for the entire duration of the project. Failure to maintain the same person in this position shall result in a One Thousand Dollar (\$1,000.00) penalty per incident which shall cover the Architect’s time to re-orient new personnel.

1.21 AWARD

- A. The Awarding Authority reserves the right to reject any or all bids if it be in the public interest to do so, and to act upon the bids and make its award in any lawful manner.

1.22 PREVAILING WAGE SCHEDULE

- A. Bids shall be made on the basis of the Prevailing Wage Schedule, as determined by the Commissioner of Labor and Industries, pursuant to the provision of Chapter 149, Section 26 to 27D inclusive, of the Massachusetts General Laws. The Prevailing wage Schedule for this project can be found in the City's web Site at www.city.waltham.ma.us/open-bids

1.23 CONFLICT OF INTEREST

- A. A bidder filing a proposal thereby certifies that the proposal is made in good faith, without fraud, collusion, or connection of any kind with any other bidder for the same work, and that the bidder is competing solely on its own behalf without connection with, or obligation to, any undisclosed person or firm.

1.24 PROCEED ORDERS

- A. No bidder is to proceed without a proceed order as set out in the contract.

1.25 STAGING

- A. The General Contractor shall provide all the vertical access (which includes staging, vertical lifts, etc.) for the work of the Contract for the General Bidder and his/her non File Sub-bid subcontractor.

1.26 COMPLIANCE WITH MASSACHUSETTS GENERAL LAWS

- A. Pursuant to Massachusetts General Laws, Chapter 62C, Section 49A, I certify under the penalty of perjury that I, to the best of my knowledge and belief have filed all state tax returns and paid all the state taxes required under law.

1.27 CONSTRUCTION BARRICADES

- A. The General Contractor shall provide all barricades to enclose the work area to prevent unauthorized access to the site.
 - 1. The barricades shall provide enough room for all construction activities to be performed while separated from pedestrians, students, and staff on site.
 - 2. Safety is the sole responsibility of the Contractor and any barricades necessary to protect the work and the public shall be provided.
 - 3. Provide entrance protection.

1.28 INSURANCE

A. The contractor shall purchase and maintain, at his expense all insurance required by the Contract. Documents and all insurance required by the applicable laws of Massachusetts, including but not limited to, General Laws, Chapter 146, in connection with all hoisting equipment.

B. The Contractor shall purchase and maintain such insurance as will protect him from claims under workmen's compensation acts and from claims for damages because of bodily injury, including death and all property damage including, without limitation, damage to buildings and adjoining the site of construction which might arise from and during operations under this contract, whether such operations be by himself or by any subcontractor or anyone directly or indirectly employed by either of them including:

1. Statutory Worker's Compensation and Employer's Liability

The contractor shall provide insurance for the payment of compensation and the furnishing of other benefits under Chapter 152 of the General Laws (so-called Worker's Compensation Act) to all persons to be employed under this contract and shall continue in force such insurance as aforesaid shall be deemed a material breach of this Contract and shall operate as an immediate termination thereof. The contractor shall, without limiting the generality of the foregoing, conform to the provisions of Section 34A of Chapter 149 of the General Laws, which Section is incorporated herein by reference and made a part of hereof.

2. Comprehensive General Liability Insurance

Minimum bodily injury limits of \$ 500,000 per person and \$ 1,000,000 per accident, and property damage limits of \$ 500,000 per accident and \$ 1,000,000 aggregate during any 12 month period, shall include the following:

- a. Public liability (bodily injury and property damage)
- b. X.C.U. (explosion, collapse, and underground utilities)
- c. Independent contractor's protective liability.
- d. Products and completed operations.
- e. Save harmless agreement for Owner and Architects set forth in ARTICLE 10.11 of the GENERAL CONDITIONS.

3. Comprehensive All Risk Motor Vehicle Liability Insurance

Minimum bodily injury limits of \$ 500,000 per person, \$ 1,000,000 per accident, and property damage limit of \$ 1,000,000 per accident.

4. All Risk Insurance

Covering all Contractor's equipment with a provision for Waiver of Subrogation against the Owner.

5. Excess Liability Insurance in Umbrella Form with combined Bodily Injury and Property Damage Limit of \$ 1,000,000.

6. City of Waltham is a Named Additional Insured for General Liability with a Waiver of Subrogation on the insurance policy for this project.

1.29 SITE ACCESS

- A. The General Contractor shall gain access to the site via routes approved by the Owner.
 1. The General Contractor as part of the bid price will restore all roads, curbs, driveways, walks and grassed or landscaped areas damaged during construction.

1.30 CONSTRUCTION TRAILER

- A. The General Contractor shall locate the construction trailer at locations approved by the City.
- B. The General Contractor shall locate all on site stored or staged materials within the enclosed area designated by the City.

1.31 BUILDING PERMIT FEES

- A. Building permit fees will be waived for this project. However, the General Contractor is expected to obtain all proper permits as required by State Laws and City Ordinances

1.32 COMPLETE BID FORMS

- A. Please Note: Each bidder must fill in all the blanks on all the bid forms, even if the information is “zero dollars” or “not applicable”. Also, please acknowledge all Addenda as received by your company.

1.321 READ ALL DOCUMENTS.

Bidders should familiarize themselves with all the documents contained herein; it is mandatory that all Bids be in compliance with all the provisions contained in said documents.

1.33. FORMS AND ATTACHMENTS.

Bids are to be completed on the forms provided ONLY and enclosed in a sealed envelope marked on the outside “BID (title)” and the name and address of bidder. Attachments submitted in addition to the Waltham Purchasing Department produced forms may not be considered.

1.34. PRINTED OR TYPED RESPONSE.

All information must be typewritten or printed in ink, including the price the bidder offers in the space as provided on the bid form.

1.35. CORRECTIONS.

Bids that are submitted containing cross outs, white outs or erasures, will be rejected. All corrections or modifications to the original bid are to be submitted in a separate envelope, properly marked on the outside, "CORRECTION/ MODIFICATION TO BID (title)" and submitted prior to the bid opening.

ALL DOCUMENTS SUBMITTED WITH YOUR RESPONSE WILL BE INCORPORATED INTO THE CONTRACT.

1.36. PRICE IS ALL INCLUSIVE.

Bid prices shall encompass everything necessary for furnishing all items, materials, supplies or services as specified, and in accordance with the specifications, including proper packing, cost of delivery, and in the case of services, completion of same, as per specifications.

1.37. PRICE DISCREPANCY.

In the event of a discrepancy between the Unit Price and the Extension, the Unit Price shall prevail.

1.38. EXPLANATIONS, EXCEPTIONS

Explanations, exceptions or other information pertinent to the specifications may be made in writing and included in the same envelope with the bid.

1.39. BID DEPOSITS.

Bid deposits are to be made payable to the City of Waltham. In the event that the successful bidder fails to execute a Contract within (10) days of the receipt of said contract, such security shall be retained by the city as liquidated damages. Unsuccessful bidders' deposits will be returned immediately following the award to said successful bidder.

1.40. WITHDRAW.

A Bid may be withdrawn by written request prior to the schedule for the Bid Opening. No withdrawals are permitted after the bid opening date and time. Withdrawals after the bid opening date will cause the forfeit of the bid Deposit.

1.41. AWARD.

Bids will be awarded not later than (90) ninety days after the scheduled bid opening date, unless otherwise stated, in the specifications. Unless otherwise specified, bids will be evaluated on the basis of, completeness of your RFP response, responsiveness, responsibility, best price and experience.

1.42. AWARD CRITERIA.

Qualified and responsive proposals will be evaluated based on Price, Technical, and Compliance requirements.

1.43. DISCOUNTS.

Discounts for prompt payments will be considered when making awards.

1.44. TAX EXEMPT.

Purchases by the City of Waltham are exempt from any Federal, State or Massachusetts Municipal Sales and/or Excise Taxes.

1.45. SAMPLES.

The City of Waltham may require the submission of samples either before or after the awarding of a contract. Samples are to be submitted, at no charge to the City, so as to ascertain the product's suitability. If specifically stated in the Bid that samples are required, said samples must be submitted with the Bid prior to the Official Bid Opening. Failure to submit said samples would be cause for rejection of Bid. All samples must be called for and picked up within (30) thirty days of award or said samples will be presumed abandoned and will be disposed of.

1.46. ACTIVE VENDOR LIST.

Vendors who wish to remain on the Active Bid List must either submit a Bid, No Bid, or a letter requesting same, no later than the Official Bid Opening. This is applicable to those vendors who have received the Invitation to Bid.

1.47. FUNDS APPROPRIATION.

THE CONTRACT OBLIGATION ON BEHALF OF THE CITY IS SUBJECT TO PRIOR APPROPRIATION OF MONIES FROM THE GOVERNMENTAL BODY AND AUTHORIZATION BY THE MAYOR.

1.48. THE AWARDING AUTHORITY RESERVES THE RIGHT TO REJECT ANY OR ALL BIDS, OR ANY PART OF ANY BID, WHICH IN THE OPINION OF THE AWARDING AUTHORITY, IS IN THE BEST INTERESTS OF THE CITY OF WALTHAM.

1.49. THE TAX ATTESTATION CLAUSE, CERTIFICATION OF NON-COLLUSION AND THE CERTIFICATE OF VOTE AUTHORIZATION, are required by statute and are an integral part of the Invitation for Bid and must be completed and signed by the person submitting the Bid, or by the person/persons who are officially authorized to do so. Failure to do so may disqualify the bid.

1.50. STANDARD OF QUALITY.

Where, in the specifications, one certain kind, type, catalog number, brand or manufacturer of material is named, it shall be regarded as the required standard of quality. Where two or more are named, these are presumed to be equal and the Bidder

may select one or the other. If the Bidder proposes to offer a substitute as an equal, he shall so indicate on the Bid Form, the kind, type, catalog number, brand, or manufacturer of material that is offered as an equal, and describe where it differs from the specifications. Substituted items must be capable of performing all the functions and/or operational features described or indicated in the specifications. Failure to indicate the description of any substitute item on the Bid will be interpreted to mean that the Bidder will furnish the item or service as specified.

1.51. MODIFICATION.

No agreement, understanding, alteration or variation of the agreement, terms or provisions herein contained shall bind the parties, hereto unless made and executed in writing by the parties hereto.

1.52. ASSIGNMENT.

The final payment for work done under this Contract shall be made only after the Contractor has signed a statement under the penalty of perjury, certifying that he has completed the work described in the final estimate. Neither party hereto shall assign this Contract or sublet it in part or as a whole without the prior written consent of the other party hereto. The Contractor shall not assign any sum or sums due or becoming due to him hereunder without the prior written consent of the City.

1.53. DELIVERIES:

a) The Contractor shall pay all freight and delivery charges. The City Of Waltham does not pay for shipping and packaging expenses. Items must be delivered as stipulated in the specifications. All deliveries must be made to the inside of city buildings. Sidewalk deliveries will not be accepted. City personnel are not required to assist in the deliveries and contractors are cautioned to notify their shippers that adequate assistance must be provided at the point of delivery, when necessary.

b) All items of furniture must be delivered inside the building, set up, in place and ready for use. Deliveries are to be made between the hours of 8:30 a.m. and 3:00 p.m., Monday through Friday, except on holidays.

c) All damaged items, or items which do not comply with specifications will not be accepted and title therefore will not vest to the Waltham Purchasing Department until such items are accepted and signed for, in good order, by the receiving department.

d) The contractor must replace, without further cost to the Waltham Purchasing Department, such damaged or non-complying items before payment will be made.

1.54. LABELING.

All packages cartons or other containers must be clearly marked with (a) building and room destination; (b) description of contents of item number from specifications; (c) quantity; (d) City of Waltham Purchase Order Number and (e) Vendor's name and order number.

1.56. GUARANTEES.

Unless otherwise stipulated in the specifications, furniture, equipment and similar durable items shall be guaranteed by the contractor for a period of not less than one year from the

date of delivery and acceptance by the receiving department. In addition, the manufacturer's guarantee shall be furnished. Any items provided under this contract which are or become defective during the guarantee period shall be replaced the contractor free of charge with the specific understanding that all replacements shall carry the same guarantee as the original equipment. The contractor shall make such replacement immediately upon receiving notice from the Purchasing Agent.

1.57. CHANGE ORDERS.

Change orders are not effective until, if, as and when signed by the Mayor and no work is to commence until the change orders are fully executed.

1.58. BID OPENING INCLEMENT WEATHER

If, at the time of the originally scheduled bid opening, City Hall is closed to inclement weather or another unforeseeable event, the bid opening will be extended until 2:00 PM on the next normal business day. Bids will be accepted until that date and time.

Signature of Individual or Corporate Name

By:

(Signature of Corporate Officer if applicable)

Title: _____

Federal Identification Number: _____

END OF SECTION

FORM FOR GENERAL BID
SECTION 00110
CITY OF WALTHAM
PROSPECT STREET FIRE STATION, SLAM REPLACEMENT

DUE: 10.00 AM Thursday March 31, 2016

This bid must be accompanied by a bid deposit in the form of a bid bond, or a certified check, treasurer's check, or cashier's check, payable to the City of Waltham (hereinafter referred to as the "Owner", or the "Awarding Authority" or "the City") in the amount of five percent (5%) of the value of the bid including alternates if any. No other form of bid security will be accepted.

By submitting this bid the undersigned represents to the Owner that he/she has examined and understands the Invitation for Bids, Instructions to Bidders, Contract Forms, Conditions of the Contract (General and Supplementary), Drawings, Specifications and all other Contract Documents and has examined the site, as defined therein, and that this bid is made with distinct reference and relation to all said Contract Documents; but the undersigned declares that in regard to the conditions affecting the work to be done and the labor and materials needed, this bid is based solely on his/her own investigation and research and not in reliance upon any drawings, surveys, measurements, dimensions, calculations, estimates, borings, pile tests or other tests or representations of any employee, officer, agent or consultant of the Owner. By submitting this bid, the undersigned agrees that it shall be subject to the jurisdiction of the courts of the Commonwealth of Massachusetts with respect to any action arising out of or related to this bid or any contract that may be entered into based upon his bid, and that any such actions commenced by the undersigned shall be commenced in the courts of the Commonwealth of Massachusetts.

A bidder wishing to amend this bid after transmittal to the Owner may do so only by withdrawing this bid and resubmitting another bid prior to the deadline for submitting bids.

TO: CITY OF WALTHAM

A. The undersigned proposes to furnish all labor, materials, equipment and services required for **PROSPECT STREET FIRE STATION, SLAM REPLACEMENT, 35 Prospect Street Waltham, MA** all in accordance therewith, for the contract price specified below, subject to additions and deductions according to the terms of the specifications.

B. This bid includes addenda numbered: _____

C. The proposed not-to-exceed contract price is: _____ dollars
(Total bid in words)

In dollars (\$ _____)

In the event of an inconsistency between words and figures, the lowest amount shall control.

Name of General Bidder: _____

- E. The undersigned agrees that each of the above-named sub-bidders will be used for the work indicated at the amount stated, unless a substitution is made. The undersigned further agrees to pay the premiums for the Performance Bond and labor and Materials Bond as requested herein and that all of the costs of all such premiums is included in the amount set forth in Item No. 1 of the bid.
- F. The undersigned agrees that, if he is selected as general contractor, he will within five days, Saturdays, Sundays, and legal holidays excluded, after presentation thereof by the Authority, execute a contract in accordance with the term of this general bid and furnish a Performance Bond and a Labor and Materials Bond, each of a surety company qualified to do business under the laws of the Commonwealth of Massachusetts and satisfactory to the Authority and each in the sum of at least one hundred percent of the contract price, the premiums for which are to be paid by the general contractor and are included in the contract price.
- G. Security in the sum of 5% of bid amount, including alternates if any, in the form of check or bid bond is submitted herewith in accordance with the specifications.
- H. The undersigned hereby certifies that this bid does not include the excise imposed by Chapter 14, Acts of 1966, upon the purchase or rental of materials, supplies, services and the equipment to be used in the work to furnish all labor, materials, equipment and services required to complete the work.
- I. The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; 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 at 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; and that he will comply fully with all laws and regulations applicable to awards made subject to section 44A.
- J. The undersigned certifies under penalty 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.
- K. The Contractor shall start the work under this Contract on written Notice to Proceed (NTP) set by the Owner and continue to completion with all practical dispatch and regularity so that the entire project shall be completed within **75 days rain or shine.**

Date: _____

 (Name of General Bidder)

Business Address: _____

 By: _____
 (Name of Person Signing Bid)

_____ Title: _____

(Telephone number)

COMPLIANCE FORMS

(PLEASE COMPLETE AND SUBMIT THESE FORMS WITH YOUR RESPONSE)

SECTION 00120

NON-COLLUSION FORM AND TAX COMPLIANCE FORM

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. The undersigned certifies that no representations made by any City officials, employees, entity, or group of individuals other than the Purchasing Agent of the City of Waltham was relied upon in the making of this bid

_____, _____
(Signature of person signing bid or proposal) Date

(Name of business)

TAX COMPLIANCE CERTIFICATION

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

_____, _____
Signature of person submitting bid or proposal Date

Name of business

NOTE

Failure to submit any of the required documents, in this or in other sections, with your bid response package may cause the disqualification of your proposal.

CERTIFICATE OF VOTE OF AUTHORIZATION

Date:

I _____, Clerk of _____ hereby certify that at a meeting of the Board of Directors of said Corporation duly held on the _____ day of _____ at which time a quorum was present and voting throughout, the following vote was duly passed and is now in full force and effect:

VOTED: That _____ (*name*) is hereby authorized, directed and empowered for the name and on behalf of this Corporation to sign, seal with the corporate seal, execute, acknowledge and deliver all contracts and other obligations of this Corporation; the execution of any such contract to be valid and binding upon this Corporation for all purposes, and that this vote shall remain in full force and effect unless and until the same has been altered, amended or revoked by a subsequent vote of such directors and a certificate of such later vote attested by the Clerk of this Corporation.

I further certify that _____ is duly elected/appointed _____ of said corporation

SIGNED:

(Corporate Seal)

Clerk of the Corporation:

Print Name: _____

COMMONWEALTH OF MASSACHUSETTS

County of _____

Date:

Then personally appeared the above named and acknowledged the foregoing instrument to be their free act and deed before me, _____

Notary Public;

My Commission expires: _____

CORPORATION IDENTIFICATION

The bidder for the information of the Awarding Authority furnishes the following information.

If a Corporation:

Incorporated in what state _____

President _____

Treasurer _____

Secretary _____

Federal ID Number _____

If a foreign (out of State) Corporation – Are you registered to do business in Massachusetts?

Yes _____, No _____

If you are selected for this work you are required under M.G.L.ch. 30S, 39L to obtain from the Secretary of State, Foreign Corp. Section, State House, Boston, a certificate stating that you Corporation is registered, and furnish said certificate to the Awarding Authority prior to the award.

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's name:

Name of Firm _____

Name of Individual _____

Business Address _____

Residence _____

Date _____

Name of Bidder _____

By _____

Signature _____

Title _____

Business Address _____ (POST OFFICE BOX NUMBER NOT ACCEPTABLE)

City _____

State _____

Telephone Number _____

Today's Date _____

WEEKLY PAYROLL RECORDS REPORT & STATEMENT OF COMPLIANCE

In accordance with Massachusetts General Law c. 149, §27B, a true and accurate record must be kept of all persons employed on the public works project for which the enclosed rates have been provided, A Payroll Form has been printed on the reverse of this page and includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the contract. In addition, every contractor and subcontractor is required to submit, on a weekly basis, a copy of his or her weekly payroll records to the awarding authority. For every week in which an apprentice is employed, a photocopy of the apprentice's identification card must be attached to the payroll report. Once collected, the awarding authority is also required to preserve those reports for three years. In addition, each such contractor, subcontractor, or public body shall furnish to the awarding authority directly, within fifteen days after completion of its portion of the work, a statement, executed by the contractor, subcontractor or public body who supervises the payment of wages, in the following form:

STATEMENT OF COMPLIANCE

_____, 201__

I _____,
(Name of signatory party) _____ (Title)

I do hereby state that I pay or supervise the payment of the persons employed by

_____ On the _____
(Contractor, subcontractor or public body) (Building or project)

and that all mechanics and apprentices, teamsters, chauffeurs and laborers employed on said project have been paid in accordance with wages determined under the provisions of sections twenty-six and twenty-seven of chapter one hundred and forty nine of the General Laws.

Signature _____, Title _____

Print _____, Date _____

RIGHT TO KNOW LAW

Any vendor who receives an order or orders resulting from this invitation agrees to submit a Material Safety Data Sheet (MSDS) for each toxic or hazardous substance or mixture containing such substance, pursuant to M.G.L. c. 111F, §§8,9 and 10 and the regulations contained in 441 CMR 21.06 when deliveries are made. The vendor agrees to deliver all containers properly labeled pursuant to M.G.L. c. 111F §7 and regulations contained in 441 CMR 21.05. Failure to furnish MSDS and/or labels on each container may result in civil or criminal penalties, including bid debarment and action to prevent the vendor from selling said substances, or mixtures containing said substances within the Commonwealth. All vendors furnishing substances or mixtures subject to Chapter 111F or M.G.L. are cautioned to obtain and read the laws, rules and regulations referenced above. Copies may be obtained from the State House Bookstore, Secretary of State, State House, Room 117, Boston, MA (617) 727-2834.

Authorized Signature Indicating Compliance with the Right-to-know laws:

Signature

Date

Print Name

NOTE

Failure to submit any of the required documents, in this or in other sections, with your bid response package may cause the disqualification of your proposal.

DEBARMENT CERTIFICATION

In connection with this bid and all procurement transactions, by signature thereon, the respondent certifies that neither the company nor its principals are suspended, debarred, proposed for debarment, declared ineligible, or voluntarily excluded from the award of contracts, procurement or non procurement programs from the Commonwealth of Massachusetts, the US Federal Government and /or the City of Waltham. "Principals" means officers, directors, owners, partners and persons having primary interest, management or supervisory responsibilities with the business entity. Vendors shall provide immediate written notification to the Purchasing Agent of the City of Waltham at any time during the period of the contract of prior to the contract award if the vendor learns of any changed condition with regards to the debarment of the company or its officers. This certification is a material representation of fact upon which reliance will be placed when making the business award. If at any time it is determined that the vendor knowingly misrepresented this certification, in addition to other legal remedies available to the City of Waltham, the contract will be cancelled and the award revoked.

Company Name _____

Address _____

City _____, State _____, Zip Code _____

Phone Number (____) _____

E-Mail Address _____

Signed by Authorized Company Representative: _____

Print name. _____, Date _____

10 HOURS OSHA TRAINING CONFIRMATION

Chapter 306 of the Acts of 2004

CONSTRUCTION PROJECTS

AN ACT RELATIVE TO THE HEALTH AND SAFETY ON PUBLIC

The undersigned hereby certifies that all employees to be employed at a worksite for construction, reconstruction, alteration, remodeling, repair, installation, demolition, maintenance or repair of any public work or any public building estimated to cost more than \$10,000.00 have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at 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 payroll report for each employee and will comply with all laws and regulations applicable to awards of subcontracts subject to section 44F.

Company Name: _____

Address: _____

Signature: _____

Title: _____

Print Name _____

Date _____

See following Chapter 306 of the Acts of 2004

NOTE

Failure to submit any of the required documents, in this or in other sections, with your bid response package will be cause for the disqualification of your company.

PROOF OF CONTRACTOR'S RESPONSIBILITY

Before a contract will be awarded to any bidder, he/she will be required to furnish evidence satisfactory to the City that he/she has all of the following qualifications:

- A. Ability, equipment, organization, and financial resources sufficient or enable him/her to construct and complete the work successfully within the time required.
- B. Experience during the past three (3) years in the successful completion of turf restoration projects, the magnitude of which shall be not less than one-half (1/2) the work herein specified. In this connection, the attention of the bidder is directed to the "Bidder's Experience" attached hereto, which shall be used in determining the responsibility of the bidder. The City may require additional information as necessary to determine the responsibility of the bidder.
- C. An experienced bidder shall be construed to mean that the bidder has an individual within his/her organization with the experience to supervise a job of this nature.

In the event the bidder fails, refuses, or neglects to submit any required information within the reasonable time stated in any request or fails to qualify as a responsible bidder, his/her bid guaranty shall be forfeited to the use of the owner, not as a penalty, but as liquidated damages.

The determination of whether a bidder is responsible shall rest solely with the City.

BIDDER'S EXPERIENCE

The following is a list of the projects similar in character and scope to the work specified under this contract, which have been successfully completed by this bidder during the past three years.

This information must be furnished by each bidder. A completed project is one that has been accepted and the final payment received from the City or authorized representative.

Bidder's Signature

Date

SECTION 00130 Scope of Work

Existing Field Conditions:

The existing structure is a two level brick building, with a full basement below grade, located at 35 Prospect Street, and occupied by the City of Waltham Fire Department. The existing building was constructed in 1949, replacing the original building which was constructed in 1874. The main entrance is at ground level accessible from Prospect Street, via two overhead doors which serve as a main entrance for the fire apparatus, and with one personnel door on each side of the building (left and right). A number of other doors connect the garage area (fire engine parking area) to adjacent rooms and offices.

The garage floor consists of a concrete slab measuring approximately 5" to 6" thick and reinforced at the top and bottom with steel reinforcing bars (rebars). The slab is supported by four (4) steel beams consisting of an approximate depth of 14" which were installed during the 1949 building re-construction. Our limited field measurements indicate a flange width of 6 3/4 inches, and when compared to available beams of this flange width we find the beam to be consistent with a 14 x 6 3/4 beam. This beam designation and properties is listed on the AISC Manual of Steel Construction 6th edition. Based on these measurements, we believe the top flange of the original steel beams to be embedded 4" into the concrete slab (the 4" embedment was obtained by measuring the distance from the bottom of the concrete slab to the bottom of the steel beam bottom flange) as the beam bottom flange is set about 10" below the bottom of the concrete slab. The concrete slab is seated over the top of the beam bottom flange, embedding the web in concrete and formed in the shape of a concrete corbel.

In our opinion the bottom mat of rebars likely terminates at the face of the beam web, as it is unlikely that the beam web was drilled to allow the reinforcing bars to pass through the web (this condition cannot be verified at this time without excavating the concrete and exposing the bottom rebar mat). The top rebar mat is continuous over the beam top flange, which was visually confirmed at a large spall located above the 3rd original steel beam between the 3rd and 4th bay from the front entrance. The concrete over this beam is spalled and was excavated by the City to provide an opening approximately 2" deep, 5 ft long and 10ft. wide, exposing the beam top flange and the top rebar mat with the encasement above the beam bottom flange providing the vertical support for the slab.

As previously noted, the slab is supported by four steel beams installed at the time of the original construction. These beams are installed in a transverse orientation, parallel to the front and rear walls of the building. cursory measurements indicate the spacing to be 11'-8" ± on center. Since the original construction the support for the slab has been partially modified by installing two additional steel beams within the second and third bays. Field measurements using a caliper during our inspection are consistent with the measurements of a W8x28 beam (dimensions for comparison purpose taken from the AISC Manual of Steel Construction, Ninth Edition). These beams were set between the original steel beams, thereby reducing the span of the concrete deck and modifying the behavior of the existing concrete slab from simply supported spans with reinforcement in the negative region into two equal continuous spans between the beams, retaining the initial configuration over the original beams. The first, fourth and fifth bays from the front entrance have not been modified and are as per the original construction.

The underside of the slab in the 5th bay from the front wall is partially covered with salt efflorescence and shows signs of water leaching through the slab. In addition there is rust staining on the underside of the slab which indicates rusting of the rebars in this area. The 5th beam has some rust along the bottom flange and the 6th bay has a longitudinal crack starting at steel beam no. 5 and terminating at beam no. 6. The crack in the slab exhibits isolated areas where the concrete is spalling. The remaining portion of the slab area is in good condition.

The basement area on the left side of the fire station is generally in fair condition, with exceptions of minor spalls surrounding the drain line, and some rust staining and random concrete cracking in this area. At isolated areas we noted some water staining with salt efflorescence. **Photo 22 & 23.**

The 2nd bay (reference front wall) has a large concrete patch on the underside of the slab with a crack starting in the first bay and continuing to the face of the 5th beam and 5th bay. Bays 2 and 5 have been previously patched, and the crack is resurfacing in the area of the patch. Similar to the right half of the basement area the 2nd and 4th beams have also been installed in this area as a slab reinforcing measure. Similarly, the space over the top flange of the added beams and the underside of the slab which originally had been filled with grout exhibits gaps where the grout has fallen out of place. The exposed bottom flange of the beams is beginning to rust as a possible result of water leaching through the concrete slab. The remaining two bays in this section of the basement are in good condition. The two new steel beams are supported on steel seat angles connected to the adjacent side concrete walls. At these seat angles there are two drilled holes in the bottom flange and seat angles for connection purposes, but the bolts are missing and should be installed. Photo 20, 24 & 25

Complete Slab Replacement

This consists of a full replacement of the existing slab, removing the deteriorated (and possibly chloride contaminated concrete), cleaning (with wire brush or blast cleaning) and painting the existing steel beams, and reconstructing the slab using epoxy coated rebars and a high performance concrete. The high performance concrete includes silica fume and other admixtures to create a less permeable concrete thereby reducing the potential of water and salt from infiltration. Use epoxy coated reinforcing bars to provide an added protection against chloride ions attacking the reinforcing steel, thereby extending the life of the new slab.

END OF SECTION



PROSPECT STREET FIRE STATION
FRONT ENTRANCE
PHOTO- 1



PROSPECT STREET FIRE STATION RIGHT ELEVATION
PHOTO-2



RIGHT SIDE INTERIOR WALL

PHOTO-3



PROSPECT STREET FIRE STATION ENTRANCE DRIVEWAY
DETERIORATED CONCRETE PHOTO-4



FIRE STATION LEFT SIDE INTERIOR WALL

PHOTO -5



FIRE STATION INTERIOR GARAGE-LEFT SIDE
PHOTO-6



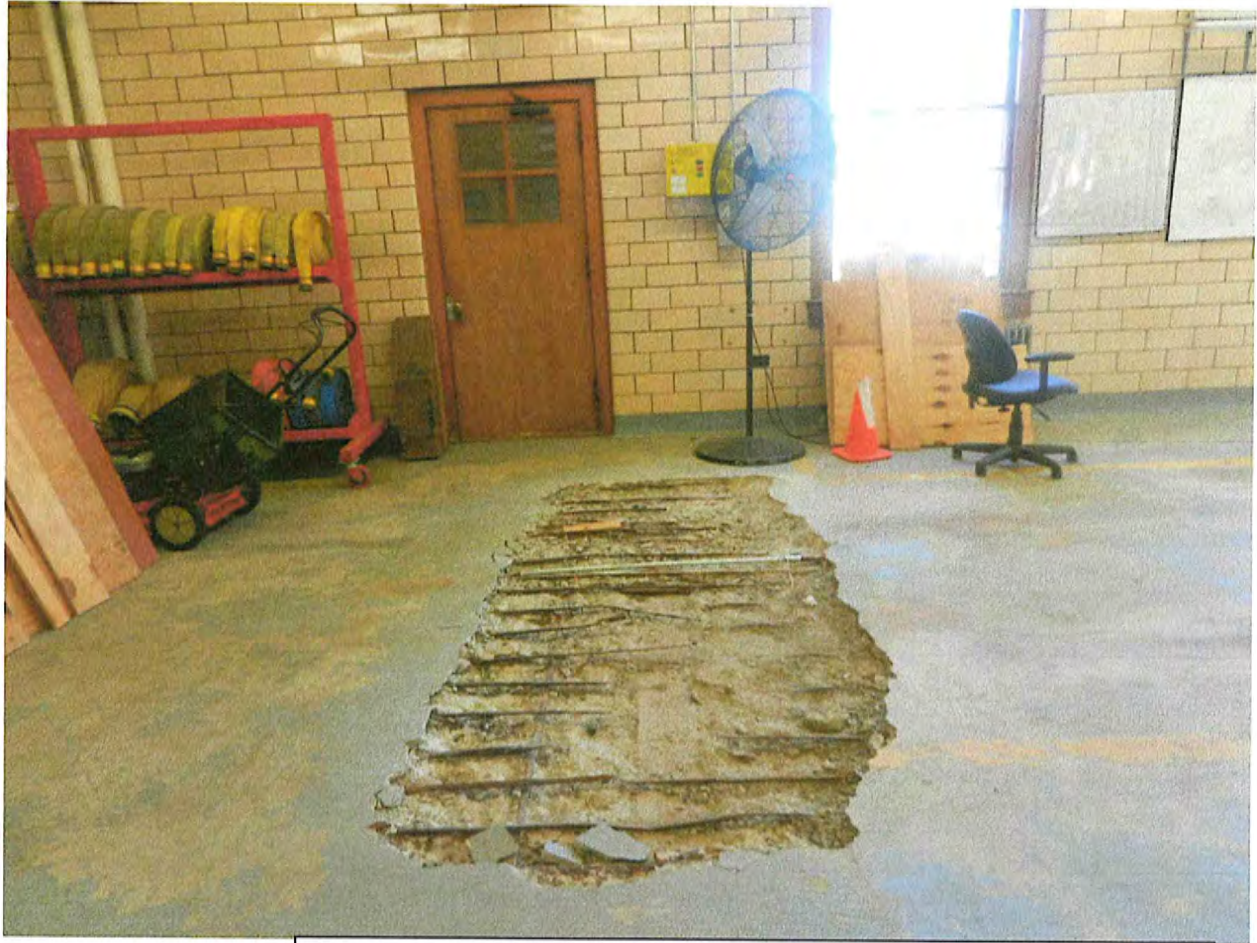
FIRE STATION INTERIOR GARAGE- RIGHT SIDE
PHOTO-7



MINOR CONCRETE SPALLS WITH EXPOSED REBAR AND MISC. MAP CRACKS PHOTO-8



MINOR CONCRETE SPALL
PHOTO-9



FAILED RUSTED REBARS WITH EXPOSED RUSTED STEEL BEAM TOP FLANGE EXCAVATED CONCRETE AREA 5 FT LONG BY 10 FT WIDE

PHOTO-10



TRANSVERSE CRACK IN CONCRETE SLAB
W/RUST STAIN IN VARIOUS LOCATIONS
PHOTO-11



EXISTING FLOOR DRAINS AT ENTRANCE
DOORS PHOTO-12



CONCRETE WALL HORIZONTAL CRACK WITH
WATER STAIN PHOTO-13



UNDERSIDE OF SLAB FRONT WALL
CONCRETE SPALLS WITH EXPOSED
RUSTED REBARS AND WATER STAIN

PHOTO-14



FIRST BAY FROM FRONT WALL RIGHT SIDE OF BASEMENT AREA
SPALL ED CONCRETE WITH WATER AND RUST STAIN AND
MINOR RUST IN BEAM BOTTOM FLANGES PHOTO-15



SECOND BAY FROM FRONT WALL, CRACK IN CONCRETE SLAB WITH RUST STAIN, SPALLS WITH RUSTED REBAR AND W8 BEAM SET BETWEEN 1ST & 2ND ORIGINAL STEEL BEAMS PHOTO-16



3rd BAY FROM FRONT WALL WITH W8 BEAM, CONCRETE CRACK WITH RUST AND WATER STAIN. PHOTO-17



LONGITUDINAL CONCRETE CRACK IN
SECOND BAY FROM FRONT WALL AND
RUSTED STEEL BEAM BIOTTOM FLANGE

PHOTO-18



UNDERSIDE OF SLAB WITH LONGITUDINAL CRACK
AND RUSTED BOTTOM FLANGE PHOTO-19



W8 BEAM WITH CONNECTION BOLTS
MISSING AT SUPPORT PHOTO-20



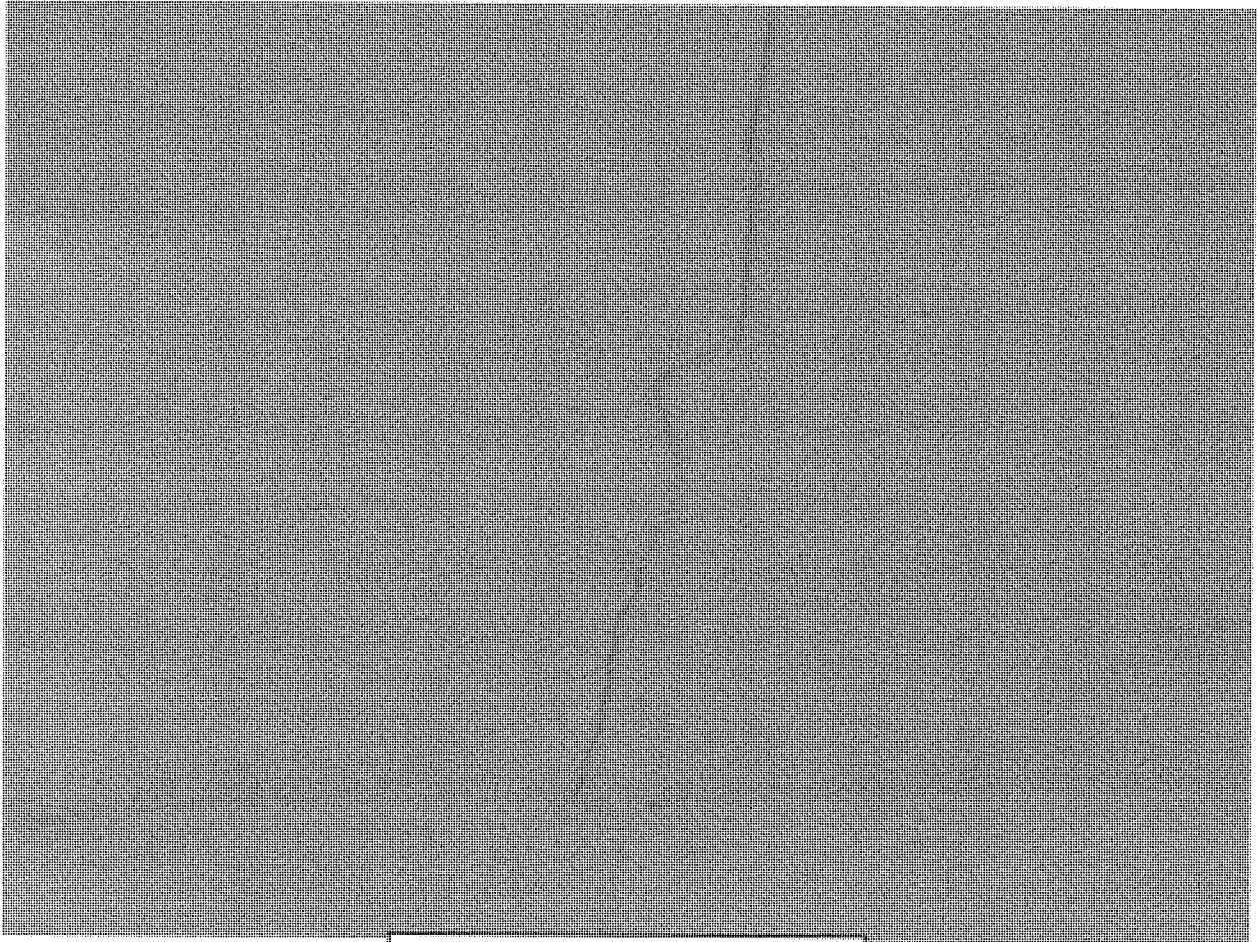
CONCRETE CRACK ON UNDERSIDE OF
SLAB AND MINOR SPALL PHOTO-21



BASEMENT AREA FRONT WALL LEFT SIDE
PHOTO-22



CONCRETE SPALLS WITH RUST STAIN
AROUND FLOOR DRAIN PHOTO-23



CONCRETE CRACK ON UNDERSIDE
OF SLAB LEFT SIDE PHOTO-24



CONCRETE PATCH ON UNDERSIDE OF SLAB
WITH LONGITUDINAL CRACK-LEFT SIDE

PHOTO-25

DIVISION 1

SECTION 01010 SUMMARY OF WORK

PART 1 – GENERAL

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions apply to work of this Section.

1.1 REQUIREMENTS INCLUDED

- A. Work covered by the contract documents.
- B. Contractor use of premises.
- C. Occupancy
- D. Safety regulations.
- E. Coordination.
- F. Field Engineering
- G. Project Meetings.
- H. Site Visitations
- I. Location
- J. Site Visitations
- K. Contract Time

1.2 WORK COVERED BY THE CONTRACT DOCUMENTS

Work of this contract includes the Design Drawings, Specifications, the General and any Special Conditions including but not limited to the following:

Demolition and removal of concrete slab and building components as shown.

Furnish and install concrete slab and flooring system. Furnishing and installing joint fillers, dams, and similar items required in conjunction with the concrete work. Furnishing and installing dowels for masonry walls.

Installing embedded steel anchorages provided by others for the attachment of structural steel. Furnish and install steel support angles.

Remove and reset structural steel members as shown. Furnish and install new structural steel.

Shop priming and field painting of new steel material. Cleaning, prime and painting of reset steel members.

Furnish and install all miscellaneous items including, but not limited to: anchors, bolts, screws, nuts, washers, etc., as indicated on the drawings and as necessary to complete the work.

Provide all work to remove, store and reinstall piping, lighting and other electrical components necessary to perform the work under this contract. Temporally support piping and lighting as necessary. Provide conduit, wiring and connections

Furnish and install floor drains in new concrete slab where shown

Perform all work and testing as indicated and specified to provide operationally ready electrical systems.

Removal and legal disposal of demolished materials off site except those items specifically designated to be relocated, reused, or turned over to the facility.

Obtain all necessary permits required to complete the work

1.3 CONTRACTOR USE OF PREMISES

- A. During the work, the Contractor shall control limit general access to the work area so as not to endanger the public or present the risk of damage to the City of Waltham's property.
- B. Coordinate the use of the use of the premises under the direction of the City of Waltham.
- C. All existing structures to remain shall be protected to the fullest extent possible.

1.4 OCCUPANCY

- A. Safe conduct of this construction project shall be the sole responsibility of the Contractor.
- B. Use of streets for construction operations may be required. Unless directed otherwise by the City of Waltham, all site unloading, loading and access shall be through the existing gates. All loading and unloading shall take place within the building or within 30 feet of the entrance.

- C. Use of the sidewalks by the public must not be prevented or in any way made unsafe. The public shall not be diverted into the street during any operations by this contract. During any operations where the Contractor is temporarily using sidewalks, walkways or pathways, the Contractor shall provide signage, safety personnel or other methods approved by the Engineer to clearly indicate to the public his operations and shall direct the public safely through said sidewalk construction operations. Signage shall be professionally designed and executed and subject to the approval of the Engineer.

1.5 SAFETY REGULATIONS

- A. Work of this project shall comply with all state and federal safety regulations concerning project safety. The Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

1.6 COORDINATION

- A. The Contractor shall coordinate work to assure an efficient and orderly sequence of installation of construction elements.

1.7 FIELD ENGINEERING

- A. The Contractor shall be responsible for properly laying out the work and for lines and measurements for the work. Verify the figures shown on the drawings before conducting any work and notify the City of Waltham of any discrepancies.

1.8 PROJECT MEETINGS

- A. Progress meeting shall be held at the discretion of the City of Waltham.

1.9 LOCATION

- A. Prospect Street Fire Station, located at 35 Prospect Street, Waltham MA.

1.10 SITE VISITATIONS

- A. Each Bidder and/or Contractor is urged to visit and inspect the site and building to determine all existing conditions, measurements, etc. A pre bid meeting and site inspection is scheduled for **10.00 am** Wednesday March 23, 2016. Meet at the job site. Under no circumstances are the plans to be scaled for lengths, areas, or distances, or for any purposes to determine quantities or price. The measurements taken at the building shall be by the individual bidders and they shall be responsible for errors or omissions as a result of their own investigations and measurements.

1.11 CONTRACT TIME

- A. Contract time shall commence upon the execution of this Contract by the City of Waltham. The Contractor shall bring the Work to Substantial Completion **within 75 calendar days** from the date of the notice to proceed

END OF SECTION

SECTION 01020
MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions apply to work of this Section.
- B. The Contractor shall furnish all labor, materials, tools and equipment and do all operations necessary to complete all work specified or shown. All supervision, overhead items, protection and precautions and all other costs, incidental to the construction work, complete and as specified are included.
- C. A complete, finished, working job as intended by the general nature of these specifications shall be produced whether or not any particular working or direction is omitted or inadvertently not clearly stated.
- D. Payment for work under this contract shall be Lump Sum and shall be paid on the basis of percentage of work completed.
- E. The Lump Sum price stated in the bid shall constitute full compensation as herein specified for each item of work completed in accordance with the Contract Documents.

END OF SECTION

01020-1

SECTION 01300
SUBMITTAL

PART 1 - GENERAL

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions apply to work of this Section.

1.1 DESCRIPTION OF WORK

- A. Wherever possible throughout the Contract Documents, the minimum acceptable quality of workmanship and materials has been defined by the manufacturer's name and catalog description, reference to recognized industry and government standards, or description of the required attributes and performance.
- B. So that the specified products are furnished and installed in accordance with the design intent, procedures have been established for submittal of items to the City of Waltham.

1.2 QUALITY ASSURANCE

- A. Prior to each submittal, the Contractor shall carefully review and coordinate all aspects of each item being submitted and verify that each item and the submittal conform in all respects with the requirements of the Contract Documents. The Contractor must stamp and approve each submittal. By affixing any stamp, bearing the name of the Contractor, to each submittal the Contractor shall certify that this verification and coordination has been performed.

PART 2 - PRODUCTS

2.1 SUBMITTALS

- A. Within 30 days after receiving a notice to proceed, the Contractor shall submit three copies all shop drawings, catalog cuts, project data to the City of Waltham for approval
- B. Product Data:
Manufacturers' standard schematic drawings.
Manufacturers' catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data.

- C. Samples:
Office samples of sufficient size and quantity shall clearly illustrate functional characteristics of product or material, with integrally related parts and attachment devices.

Full range of color samples.

PART 3 - EXECUTION

3.1 GENERAL

- A. A review of the shop drawings will be performed by the City of Waltham. Corrections, comments or omissions made on the shop drawings during this review do not relieve the Contractor from compliance with the requirements of the drawings and specifications. This check is only for review of the general conformance with the design concept of the project and general compliance with the information given in the contract documents. The Contractor is responsible for confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.
- B. Make all submittals far enough in advance of scheduled installation dates to provide sufficient time for reviews, for securing necessary approvals, for possible revisions and resubmittals and for placing orders and securing delivery on time.

END OF SECTION

01300-2

SECTION 01450
QUALITY CONTROL

PART 1 - GENERAL

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions apply to work of this Section.

1.1 CONTRACTOR QUALITY CONTROL

- A. Contractor Quality Control: Contractor is responsible for the overall quality of all its own work and the work performed by their consultants and subcontractors working under this contract. The quality of any part of the work installed must not be less than that required by the technical divisions of this specification. If the City of Waltham determines that the quality of work does not conform to the applicable specifications and drawings, the Contractor will be advised in writing of the areas of nonconformance, and within 7 days the Contractor must correct the deficiencies and advise the City of Waltham in writing of the corrective action taken.

1.2 SUBMITTALS

- A. Contractor Quality Control Plan: Indicate the following.
 - 1. Quality Control Organization: In chart form, showing relationship of Quality Control organization to other elements of Contractor's organization.
 - 2. Names and qualifications of personnel in Quality Control organization, including Contractor Quality Control Representative, inspectors, Independent Testing and Inspection Laboratory
 - 3. Testing and inspection schedule, keyed to Construction Schedule, indicating tests and inspections to be performed, names of persons responsible for inspection and testing for each segment of Work including preparatory, initial, and follow-up.

1.3 QUALITY CONTROL PROCEDURES

- A. Monitor quality control over Contractor staff, subcontractors, suppliers, manufacturers, products, services, site conditions, and workmanship.
- B. Comply fully with manufacturer's published instructions, including each step in sequence of installation.
- C. Should manufacturer's published instructions conflict with Contract Documents, request clarification from City of Waltham before proceeding.

- D. Comply with specified standards as a minimum quality for Work, except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons who are thoroughly qualified and trained in their respective trade, to produce workmanship of specified quality.
- F. Perform tests required by governing authorities having jurisdiction and utilities having jurisdiction.

1.4 COMPLETION AND INSPECTION OF WORK

- A. Prior to final acceptance by City of Waltham, submit a certification signed by Contractor to City of Waltham stating that all Work has been inspected and all Work, except as specifically noted, is complete and in compliance with Contract Documents.

1.5 CERTIFIED WELDERS

- A. Structural welds shall be made only by operators who have been qualified by tests, as prescribed in the "Standard Qualification Procedure" of the American Welders Society, to perform the type of work required.
- B. Pipe welds shall be made only by operators who have been qualified by the National Certified Pipe Welding Bureau and each operator's qualification record shall be submitted to the City of Waltham before any work is performed.
- C. Shop welding shall be in accordance with the "Code for Welding in Building Construction."

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions apply to work of this Section.

1.2 REQUIREMENTS

- A. Temporary Water (Article 1.3)
- B. Temporary Power (Article 1.4)
- C. Hoisting Equipment and Machinery (Article 1.5)
- D. Staging (Article 1.6)
- E. Maintenance of Access (Article 1.7)
- F. Roof Protection (Article 1.8)
- G. Dust Control (Article 1.9)
- H. Noise Control (Article 1.10)
- I. Temporary Protection (Article 1.11)
- J. Enclosures (Article 1.12)
- K. Cleaning During Construction (Article 1.13)
- L. Field Office (Article 1.14)
- M. Sanitary Facilities (Article 1.15)
- N. Safety Regulations (Article 1.16)

1.3 TEMPORARY WATER

- A. The Contractor must provide and maintain a temporary water supply system for construction purposes
- B. Any temporary pipe lines and connections from the permanent service lines either outside or within the building, necessary for the use of the Contractor and his Subcontractors shall be installed, protected and maintained at the expense of the Contractor.

1.4 TEMPORARY POWER

- A. Light and power for construction purposes will be made available at no cost to the Contractor at the nearest existing service outlets of such characteristics as are in existence and in such amounts as can be made available without hampering the operation of the building.
- B. The Contractor shall provide his own power for welding equipment. Under no circumstances shall welding equipment be connected to the building electrical system.
- C. Any temporary wiring of a special nature shall be paid for by the Contractor such as, but not limited to:
 - 1. Special circuits required by electric welders, lifts or other special equipment requiring high-ampage and/or special voltage service, etc.
 - 2. Exterior lighting circuits for protection against vandalism, public warning lights and lights for advertising, etc.
- D. The Contractor and all Subcontractors, individually, shall furnish all extension cords, sockets, motors, and accessories required for their work. They shall also pay for all temporary wiring of construction offices and buildings used by them, except that the offices of the Contractor and the City of Waltham specified in the Contract Form.
- E. All temporary wiring and fixtures installed shall be removed after it has served its purpose.
- F. Electric energy, if provided by the City of Waltham, may be discontinued if, in the opinion of the City of Waltham, it is wastefully used. Then, the City of Waltham will direct the Contractor to pay for the furnishing and installing of a watt-hour demand meter and associated current transformers and if required, potential transformers to measure energy consumed from the City of Waltham. The Contractor shall then pay for the energy consumed from the Commonwealth for the remainder of the construction period.

1.5 HOISTING EQUIPMENT AND MACHINERY

- A. All hoisting equipment and machinery required for the proper and expeditious prosecution and progress of the work shall be furnished, installed, operated and maintained in safe condition by the Contractor for the use of all material and/or equipment delivered to the designated hoisting. All costs for hoisting operating services shall be borne by the Contractor unless specifically excepted in the Contract Documents.

1.6 STAGING

- A. All staging, exterior and interior shall be furnished and erected by the Contractor and maintained in a safe condition by him for proper execution of their work.

1.7 MAINTENANCE OF ACCESS

- A. The Contractor shall provide and maintain for the duration of his contract, a means of access to, around and within the construction areas within the building.
- B. The Contractor shall not block any means of access or egress to or from the building during the course of his work.

1.8 ROOF PROTECTION

- A. During the construction period, the Contractor shall take strict precautions against unnecessary traffic on the roof surface. Protect roof with plywood if necessary.
- B. After the satisfactory completion of all work, the Contractor shall be responsible for damages to the roof caused by work or materials of the other trades.

1.9 DUST CONTROL

- A. The Contractor shall provide adequate means for the purpose of preventing dust caused by construction operations throughout the period of the construction contract.
- B. The Contractor shall provide suitable dust protection to prevent all dust and debris from entering other parts of the building and for the protection of the building occupants. All temporary dust protection shall be approved by the City of Waltham.

1.10 NOISE CONTROL

- A. Develop and maintain a noise-abatement program and enforce strict discipline over all personnel to keep noise to a minimum.
- B. Execute construction work by methods and by use of equipment which will reduce excess noise.
 - 1. Equip air compressors with silencers, and power equipment with mufflers.
 - 2. Manage vehicular traffic and scheduling to reduce noise.

1.11 TEMPORARY PROTECTION

- A. The Contractor shall:
 - 1. Protect sills, jambs, and heads of openings through which materials are handled.
 - 2. Protect all floors against mechanical damage, mortar droppings, oil, grease, paint, or other material which will stain the floor.
- B. The temporary protection shall be furnished by the Contractor as not to interfere with access to or egress from any occupied part of the building and so as to cause no interference with the operation of the building or any essential service thereof. All floors of the present building will be in operation during construction. Locations of temporary protection shall be approved by the City of Waltham.
- C. All temporary protection and coverings shall be removed by Contractor at the completion of the work.

1.12 ENCLOSURES

- A. Provide temporary partitions and ceilings as required to separate work areas from User Agency's occupied areas, to prevent penetration of dust and moisture into User Agency's occupied areas, to prevent damage to existing areas and equipment. Construction shall be framing and sheet materials with closed joints and sealed edges at intersections with existing surfaces.

1.13 CLEANING DURING CONSTRUCTION

- A. Unless otherwise specified under the various trade Sections of the Specifications, the Contractor shall perform clean- up operations during construction as herein specified.
- B. Control accumulation of waste materials and rubbish; periodically dispose of off-site. The Contractor shall bear all costs, including fees resulting from such disposal.
- C. Clean interior areas prior to start of finish work and maintain areas free of dust and other contaminants during finishing operations.
- D. Maintain project in accordance with all local, Commonwealth of Massachusetts and Federal Regulatory Requirements.
- E. Store volatile wastes in covered metal containers, and remove from premises.
- F. Prevent accumulation of wastes which create hazardous conditions.
- G. Provide adequate ventilation during use of volatile or noxious substances.
- H. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
 - 1. Do not burn or bury rubbish and waste materials on site.
 - 2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
 - 3. Do not dispose of wastes into streams or waterways.
- I. Use only those materials which will not create hazards to health or property and

which will not damage surfaces.

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- J. Use only those cleaning materials and methods recommended by manufacturer of surface material to be cleaned.
- K. Execute cleaning to ensure that the buildings, the sites, and adjacent properties are maintained free from accumulations of waste materials and rubbish and windblown debris, resulting from construction operations.
- L. Provide on-site containers for collection of waste materials, debris and rubbish.
- M. Remove waste materials, debris and rubbish from the site periodically and dispose of at legal disposal areas off the construction site.
- N. Handle material in a controlled manner with as few handlings as possible. Do not drop or throw materials from heights.
- O. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not damage surrounding surfaces.

1.14 FIELD OFFICE

- A. The Contractor shall coordinate with the city regarding available office space to be used for the Contractor's field office.
- B. The office shall be accessible at all times to the authorized agents of the City of Waltham and the Designer.

1.15 SANITARY FACILITIES

- A. Toilets for the sanitary necessities of all persons employed on the work, beginning with the first workman of the site, shall be provided by the Contractor.
- B. The Contractor shall arrange for and with the City of Waltham regarding which, if any, existing facilities may be used. Such facilities shall be kept in a clean and picked-up condition by the Contractor at all times.

1.16 SAFETY REGULATIONS

- A. This project is subject to compliance with Public Law 91-596 "Occupational Safety and Health Act of 1970" (OSHA), with respect to all rules and regulations pertaining to construction, including Volume 36, numbers 75 and 105, of the Federal Register, as amended and as published by the U.S. Department of Labor.

END OF SECTION

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SECTION 01600

PRODUCT REQUIREMENTS

1.1 GENERAL PROVISIONS

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions apply to work of this Section.

1.2 REQUIREMENTS INCLUDED

- A. Products include material, equipment, and systems.
- B. Comply with Specifications and referenced standards as minimum requirements.
- C. Components required to be supplied in quantity within a Specification Section shall be the same, and shall be interchangeable.
- D. Do not use materials and equipment removed from existing structures, except as specifically required, or allowed, by the Contract Documents.
- E. In the case of an inconsistency between Drawings and the Project Manual, or within either document which is not clarified by addendum, the product of greater quality or greater quantity of work shall be provided in accordance with the Designer's interpretation.

1.3 WORKMANSHIP

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- B. Perform work by persons qualified to produce workmanship of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

1.4 MANUFACTURERS' INSTRUCTIONS

- A. When work is specified to comply with manufacturers' instructions, submit copies as specified in Section 01300 – SUBMITTALS, distribute copies to persons involved, and maintain one set in field office.

- B. Perform work in accordance with details of instructions and specified requirements.

1.5 TRANSPORTATION AND HANDLING

- A. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturers' labeled and unopened containers or packaging, dry
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.
- C. Promptly inspect shipments to assure that products comply with requirements, that quantities are correct, and products are undamaged.

1.6 STORAGE AND PROTECTION

- A. Store products in accordance with manufacturers' instruction, with seals and labels intact and legible. Store sensitive products in weather tight enclosures; maintain within temperature and humidity ranges required by manufacturers' instructions.
- B. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.
- C. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.
- D. Arrange storage to provide access for inspection. Periodically inspect to assure that products are undamaged, and are maintained under required conditions.
- E. Protect masonry and stone products from damage and staining.
- F. Protect finished materials, including window frames and doors, with protection acceptable to the City of Waltham.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01710
FINAL CLEANING

PART 1 - GENERAL

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions apply to work of this Section.
- B. During its progress, the work and the adjacent areas affected thereby shall be kept cleaned up and all rubbish, surplus materials and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
- C. Upon written notification by the City of Waltham, the Contractor shall within 24 hours clean up those areas which in the City of Waltham's opinion, are in violation of this section.
- D. The Contractor must employ at all times during the progress of his work adequate safety precautions to prevent injuries to persons or damage to property. The Contractor shall immediately, upon direction by the City of Waltham, provide adequate material, equipment and labor to correct any and all areas deemed unsafe by the Onwer.

1.1 MATERIAL OR DEBRIS IN DRAINAGE FACILITIES

- A. Where material or debris has washed or flowed into or been placed in existing ditches, gutters, drains, pipes, structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work and the ditches, gutters, drains, pipes, structures and work, etc., shall upon completion of the work, be left in a clean and neat condition.

1.2 REMOVAL OF TEMPORARY FACILITIES AND EQUIPMENT

- A. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary works, tools, and machinery or other construction equipment furnished by him; shall remove, acceptably disinfect and cover all organic matter and material containing organic matter in, under and around privies, houses and other buildings used by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.

1.3 RESTORATION OF DAMAGED PROPERTY

- A. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. Suitable materials, equipment and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.

- B. The Contractor shall thoroughly clean all materials and equipment installed by him and his subcontractors, and on completion of the work, shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.

END OF SECTION

SECTION 02110

DEMOLITION

PART 1 - GENERAL

GENERAL PROVISIONS

Drawings and General Provisions of the Contract, including General and Supplementary Conditions apply to work of this Section.

1.1 DESCRIPTION OF WORK

A. Work Included:

- A. Demolition and removal of concrete slab and building components as shown.
- B. Temporally support piping and lighting as necessary. Remove, store and reinstall lighting fixtures and piping as required for the work
- C. Removal and legal disposal of demolished materials off site except those items specifically designated to be relocated, reused, or turned over to the facility. All existing removed materials, items, trash and debris shall become property of the Contractor and shall be completely removed from the site and legally disposed of at her/his expense.
- D. Scheduling and sequencing operations without interrupting utilities serving occupied areas. If interruption is required, obtain written permission from the utility company and the Owner. Schedule interruption when the least amount of inconvenience will result.
- E. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
Section 01500 CONSTRUCTION FACILITIES AND TEMPRARY CONTROLS
Section 16050 ELECTRICAL

1.2 SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate the following:
 - A. Detailed sequence of selective demolition and removal work, with early and late starting and finishing dates for each activity.

- B. Coordination for shutoff, capping, and continuation of utility services.
- C. Locations of proposed dust- and noise-control temporary partitions and means of egress, including for other occupants affected by selective demolition operations.
- D. Coordination of Owner continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- E. Means of protection for items to remain and items in path of waste removal from building.

1.3 QUALITY ASSURANCE

- B. Examination of Existing Conditions: The Contractor shall examine the Contract Drawings for demolition. Verify all existing conditions and dimensions before commencing work. The Contractor shall visit the site and examine the existing conditions as he finds them and shall inform herself/himself of the character, extent and type of demolition and removal work to be performed. Submit any questions regarding the extent and character of the demolition and removal work in the manner and within the time period established for receipt of such questions during the bidding period.
- C. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.
- E. Predemolition Conference: Conduct conference at Project site.
 - A. Inspect and discuss condition of construction to be selectively demolished.
 - B. Review structural load limitations of existing structure.
 - C. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - D. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - E. Review areas where existing construction is to remain and requires protection.

1.4. WARRANTY

- F. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that designated utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - A. Arrange to shut off indicated utilities with utility companies and Owner.
 - B. Where slab is to be removed, existing services/systems will be removed and reinstalled.
 - C. Prior to commencing cutting work in existing surfaces, take all precautionary measures to assure that mechanical and electrical services to the particular area have been made inactive.
 - D. If, during the process of cutting work, existing utility lines are encountered which are not indicated on the Drawings, regardless of their condition, immediately report such items to the Owner. Do not proceed with work in such areas until instructions are issued by the Owner. Continue work in other areas.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - A. Comply with requirements for access and protection specified in Section 01500.
 - B. Maintain adequate passage to and from all exits at all times. Before any work is done which significantly alters access or egress patterns, consult with

the Designer and obtain approval of code required egress. Under no condition block or interfere with the free flow of people at legally required exits, or in any way alter the required condition of such exits.

- B. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - A. Strengthen or add new supports when required during progress of selective demolition.
 - B. Remove temporary shoring, bracing and structural supports when no longer required.
 - C. Post warning signs and place barricades as applicable during placement and removal of temporary shoring.
- C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around demolition area(s).
- D. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with demolition operations.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - A. Proceed with selective demolition systematically.
 - B. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - C. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - D. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during and after flame-cutting operations.
 - E. Maintain adequate ventilation when using cutting torches.

- F. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - G. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 - H. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Removed and Reinstalled Items:
- A. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 - B. Protect items from damage during transport and storage.
 - C. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

3.5 PROTECTION OF PUBLIC AND PROPERTY

- A. Provide all measures required by federal, state and municipal laws, regulations, and ordinances for the protection of surrounding property, the public, workmen, and Commonwealth's employees during all demolition and removal operations.
- B. Every precaution shall be taken to protect against movement or settlement of the building. Provide and place at the Contractor's own expense, all necessary bracing and shoring in connection with demolition and removal work.
- C. Remove portions of structures with care by using tools and methods that will not transfer heavy shocks to existing structures, both internal and external of the particular work area.
- D. Provide and maintain in proper condition, suitable fire resistive dust barriers around areas where interior demolition and removal work is in progress. Dust barriers shall prevent the dust migration to adjacent areas. Remove dust barriers upon completion of major demolition and removal in the particular work area.
- E. Protect unaltered portions of existing construction, including finishes, furnishings and equipment
- F. Provide secure weather protection where demolition has removed a portion of the exterior envelope.

3.6 DISCOVERY OF HAZARDOUS MATERIALS

- A. If hazardous materials, such as chemicals, asbestos-containing materials, or other hazardous materials are discovered during the course of the work, cease work in affected area only and immediately notify the Designer and the Owner of such discovery. Do not proceed with work in such areas until instructions are issued by the Designer. Continue work in other areas.
- B. If unmarked containers are discovered during the course of the work, cease work in the affected area only and immediately notify the Designer and the Owner of such discovery. Do not proceed with work in such areas until instructions are issued by the Designer. Take immediate precautions to prohibit endangering the containers integrity. Continue work in other areas.

3.7 CUTTING

- A. Perform all cutting of existing surfaces in a manner which will ensure a minimal difference between the cut area and new materials when patched. Use extreme care when cutting existing surfaces containing concealed utility lines which are indicated to remain and bear full responsibility for repairing or replacement of all such utilities that are accidentally damaged.

3.8 DISPOSAL OF DEMOLISHED MATERIALS

- A. Do not allow demolished materials to accumulate on-site.
- B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- C. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- D. Burning: Do not burn demolished materials.

3.9 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Premises shall be left in a clean condition and ready to accept alteration work and new construction.

END OF SECTION

SECTION 03300

CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Furnish and install all reinforced concrete with forms and reinforcement, and its curing and finishing. Shop drawings, tools, ways, apparatus, and equipment necessary for concrete production, installation, and finish are included. The work under this Section includes, but is not limited to, the following:
 - 1. Furnish and install concrete slab
 - 2. Furnishing and installing joint fillers, and similar items required in conjunction with the concrete work.
 - 3. Installing items furnished by other Sections and required to be built into the concrete work.
 - 4. Furnishing and installing dowels for masonry walls.
 - 5. Installing embedded steel anchorages provided by others for the attachment of structural steel.
 - 6. Furnish and install floor drains in new concrete slab where shown
 - 7. All other items of concrete and related work shown on the Drawings, specified herein, or needed to make the work of this Section complete.
- B. Specification Sections that directly relate to the work of this Section include, but are not limited to, the following:
 - 1. Section 05500 – Structural Steel.

1.3 REFERENCED STANDARDS

- A. Follow the guidelines contained in the latest editions of the following codes, specifications, and standards, including references contained in each document, except where more-stringent requirements are shown or specified.
- B. American Concrete Institute (ACI):

1. ACI 211.1 – Recommended Practice for Selecting Proportions for Normal Weight Concrete.
2. ACI 214 – Recommendation for Evaluation of Compression Test Results of Field Concrete.
3. ACI 301 – Standard Specification for Structural Concrete.
4. ACI 304 – Recommended Practice for Measuring, Mixing and Placing Concrete.
5. ACI 305 – Recommended Practice for Hot Weather Concreting.
6. ACI 306 – Recommended Practice for Cold Weather Concreting.
7. ACI 306.1 – Standard Specification for Cold Weather Concreting
8. ACI 308 – Recommended Practice for Curing Concrete.
9. ACI 309 – Recommended Practice for Consolidation of Concrete.
10. ACI 311 – Recommended Practice for Concrete Inspection.
11. ACI 315 – Manual of Standard Practice for Detailing Reinforced Concrete Structures.
12. ACI 318 – Building Code Requirements for Reinforced Concrete.
13. ACI 613 – Recommended Practice for Selecting Proportions for Concrete.

C. ASTM International (ASTM):

1. ASTM C31 – Standard Method of Making and Curing Concrete Test Specimens in the Field.
2. ASTM C33 – Standard Specification for Concrete Aggregates.
3. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
4. ASTM C94 – Standard Specification for Ready-Mixed Concrete.
5. ASTM C143 – Standard Method of Test for Slump of Portland Cement Concrete.
6. ASTM C150 – Standard Specification for Portland Cement.
7. ASTM C173 – Standard Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method.
8. ASTM C192 – Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Laboratory.
9. ASTM C231 – Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method.
10. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete.
11. ASTM C309 – Standard Specification for Liquid Membrane – Forming Compounds for Curing Concrete.
12. ASTM C494 – Standard Specifications for Chemical Admixtures of Concrete.
13. ASTM C595 – Standard Specification for Blended Hydraulic Cement.
14. ASTM E329 – Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used in Construction.

D. National Ready Mixed Concrete Association (NRMCA):

1. NRMCA Check List for Certification of Ready Mixed Concrete Production Facilities.

SUBMITTALS

E. General:

1. Submittals shall be made in compliance with the Conditions of the Contract and Division 1 Specification Section 01300 – Submittals
2. Review of submittals is of a general nature only, and the responsibility for conformance with intent of Drawings shall remain with the Contractor. Review does not imply or state that the fabricator has correctly interpreted the construction documents.

F. Submit the following action submittals for review and approval:

1. Concrete mix design for each type of concrete. The Contractor shall warrant by the submission of the design mixes that such mixes are totally representative of the concrete that he intends to supply to meet the requirements of the Contract Documents. Submit new design mixes for review and approval when any change in materials is required or needed. Include the following information for each concrete mix design:
 - a. Method used to determine the proposed mix design (per ACI 301, Article 3.9).
 - b. Compressive Strength at Seven and Twenty-Eight Days: Submit strength test records, mix design materials, conditions, and proportions for concrete used for record of tests, standard deviation calculation, and determination of required average compressive strength.
 - c. Gradation of Fine and Coarse Aggregates: Testing data confirming that the proposed coarse aggregate meets ASTM C33 class designation. Include ASTM test results for aggregates subject to freeze-thaw environment.
 - d. Proportions of all ingredients, including all admixtures to be added either at the time of batching or at the jobsite.
 - e. Water-cement ratio.
 - f. Slump tested in accordance with ASTM C143.
 - g. Air content of freshly mixed concrete by the pressure method, ASTM C231, or the volumetric method, ASTM C173.
 - h. Unit weight of concrete, ASTM C138.
 - i. Mill test reports of fly ash chemical and physical analysis and certification of compliance with ASTM C618, Class C or F, if used.
 - j. Manufacturer's Spec Data Sheets of each concrete admixture, including brand name, manufacturer, and dosage rate range.

2. Shop drawings for reinforcement detailing, fabricating, bending, and placing concrete reinforcement. Comply with ACI 315 – Manual of Standard Practice for Detailing Reinforced Concrete Structures – showing bar schedules, stirrup spacing, bent bar diagrams, and arrangement of concrete reinforcement. Include special reinforcing required for openings through concrete structures.
 3. Product Data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, curing compounds, and others if requested by the Designer.
 4. Proposed methods for curing cast-in-place concrete.
- G. Submit the following informational submittals for record:
1. Health and Safety Data Sheets for each concrete admixture.
 2. Proposed Schedule of Concrete Placement. The Contractor shall keep a permanent log of the dates and times of concrete placement and where on the project the concrete was cast. This log shall be made available to the Designer for inspection, upon request.
 3. Qualifications of Concrete Foreman showing five years' experience with this type of concrete installation.
 4. Tickets for each batch of concrete delivered to the jobsite containing the following information:
 - a. The compressive strength of the concrete being delivered.
 - b. The volume of concrete in the delivery truck.
 - c. The time the concrete was batched (i.e., the time that water was discharged into the delivery truck to mix with the cement and aggregates).
 - d. List of admixtures.
 - e. Slump of concrete as placed.
 - f. Volume of water added to the delivery truck after initial batching.
 - g. Location where the concrete is being placed.
- H. Submit welding certificates for all welders.

1.4 QUALITY ASSURANCE

- A. Foreman's Qualifications: Concrete work shall be done under the supervision of an experienced concrete foreman having at least five years of foreman experience with "cast-in-place" concrete similar to that used on this project.
- B. The Contractor shall perform all work in strict accordance with all applicable laws and regulations of the building code and with all other authorities having jurisdiction. All such requirements shall take precedence over the requirements of the Specifications except in cases where the requirements of the Specifications are more exacting or stringent.

- C. Concrete Mix Design: The Contractor shall employ an independent testing laboratory, acceptable to the City of Waltham, to perform material evaluation tests and to design concrete mixes or, when acceptable to the Engineer, provide copies of recently made material tests and mix designs.
1. If, at any time during construction, the concrete resulting from the approved mix design deviates from Specification requirements, the Contractor shall have his laboratory modify the design, subject to approval, until the specified concrete is obtained.
- D. Testing of materials and inspections of installed work shall be completed throughout the duration of the project, as directed by the Engineer. The Contractor shall provide free and safe access to material stockpiles and facilities for inspectors.
1. Retesting of rejected materials or reinspection of deficient work shall be done at the Contractor's expense.
- E. The Contractor is responsible for correction of concrete work that does not conform to the specified requirements, including strength, mix proportions, air void system, tolerances, and finishes. Correct deficient concrete as directed by the Engineer.
- F. All finishing crewmembers shall be ACI Certified Concrete Flatwork Technicians and Finishers. The supervisor shall be an ACI Certified Flatwork Technician and shall have input to the crew's placement and finishing procedures regarding the application of ACI Standards for quality flatwork. The ACI Standards that shall be observed are contained in the ACI – Concrete Craftsman Series.
- G. The Designer will reject cast-in-place concrete that exhibits the following defects:
1. Bulging: Concrete surfaces that bulge due to insufficiently secured formwork, undersized ties, or flat bar clamps.
 2. Wavy Concrete: Concrete surfaces that exhibit waves along plywood joints due to moisture migration into unsealed cuts of plywood sheets causing swellings.
 3. Spalling: Concrete spalling due to shale, alkali reactivity, rusting steel too close to the surface, carbonation, improper removal of formwork, expansion of cast-in steel during the welding process, or other reasons.
 4. Cracking and Cracking: Concrete cracking and crazing due to lack of control joints or high water-cement ratio above 0.50.
 5. Air Holes: Air holes resulting from improper vibration and excessive heights of individual layers of pours between vibration. Air holes due to spreading of concrete with vibrators rather than moving buckets or hoses.
 6. Honeycombing: Concrete honeycombing, including loss of fines from leaking formwork or other causes.

7. Discoloration: Concrete discoloration caused by any reason, including inconsistent concrete mix, different sources of cement and aggregates, temperature variation between individual pour and curing phases, improper and inconsistent use of vibrators, variation of time span of concrete in formwork, form oils, and migration of plasticizer into concrete from exposed sealant beads on formwork and around cast-in items such as electrical outlet boxes.
 8. Visible Pour Joints: Visible pour joints in concrete resulting from leaking formwork due to lack of gaskets and insufficient overlap with old concrete preventing proper tightening of formwork. Placement of concrete layers in excessive heights and spreading concrete with vibrator.
 9. Debris in Concrete: Concrete that includes debris, whether caused by insufficient cleaning of formwork or lack of cleanout and access doors at base of formwork.
- H. The Contractor shall schedule a Concrete Preconstruction Meeting at least thirty days prior to placement of any concrete. Attendance at the meeting shall include the Construction Manager, Ready Mix Supplier, Concrete Pumping Subcontractor, Field Testing Laboratory, and the City of Waltham. The agenda of the meeting shall be prepared by the Contractor and shall include, but not be limited, to the following:
1. Review of concrete mix designs.
 2. Field testing and quality control.
 3. Concrete placing sequence and schedule.
 4. Formwork, shoring, reshoring, and stripping.
 5. Placing, jointing, and finishing procedures.
 6. Curing and protection procedures.
- I. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- J. Welding: Qualify procedures and personnel according to AWS D1.4 – Structural Welding Code – Reinforcing Steel.
- K. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301 – Specification for Structural Concrete – Sections 1 through 5 and Section 7, "Lightweight Concrete."
 2. ACI 117 – Specifications for Tolerances for Concrete Construction and Materials.
- L. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

M. Design Mixture

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials.
2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, forms and form removal limitations, tolerances, steel reinforcement installation, slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.
- B. Water stops: Store water stops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 1. Plywood, metal, or other approved panel materials.
 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1 or better.
 - b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
 - c. Structural 1, B-B or better; mill oiled and edge sealed.
 - d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Form-Release Agent: Commercially formulated form-release agent with a maximum of 350 g/L volatile organic compounds (VOC) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

2.2 STEEL REINFORCEMENT

- A. Epoxy-Coated Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed bars, epoxy coated, with less than 2% damaged coating in each 12 in. bar length.
- B. Plain-Steel Wire: ASTM A82, as drawn.
- C. Epoxy-Coated Wire: ASTM A884/A884M, Class A, Type 1 coated, plain steel wire, with less than 2% damaged coating in each 12 in. (300 mm) wire length.

2.3 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A615/A615M, Grade 60, plain-steel bars, cut bars true to length with ends square and free of burrs.
- B. Epoxy-Coated Joint Dowel Bars: ASTM A615/A615M, Grade 60, plain-steel bars, ASTM A775/A775M epoxy coated.
- C. Epoxy Repair Coating: Liquid two-part epoxy repair coating compatible with epoxy coating on reinforcement and complying with ASTM A775/A775M.
- D. Zinc Repair Material: ASTM A780, zinc-based solder, paint containing zinc dust, or sprayed zinc.
- E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
 3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.4 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 1. Portland Cement: ASTM C150, Type II. Supplement with the following:

- a. Fly Ash: ASTM C618.
 - b. Ground Granulated Blast-Furnace Slag: ASTM C989, Grade 100 or 120.
- B. Silica Fume: ASTM C1240, amorphous silica.
- C. Normal-Weight Aggregates: ASTM C33, coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least ten years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
- 1. Maximum Coarse-Aggregate Size: 3/4 in. nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Lightweight Aggregate: ASTM C330, 3/4 in. nominal maximum aggregate size.
- E. Water: ASTM C94/C94M and potable.

2.5 ADMIXTURES

- A. General Admixture Requirements:
- 1. Concrete supplier and Contractor shall use manufacturer's product identified in this Section or submit alternate manufacturer product for approval by Designer.
 - 2. All admixtures used in the concrete shall be produced by a single manufacturer.
 - 3. Concrete supplier and Contractor shall certify compatibility of all ingredients in each mix design. Use admixtures in strict accordance with manufacturer's recommendations.
 - 4. Concrete supplier and Contractor shall account for admixture volume in the concrete mix proportions in accordance with admixture manufacturer's recommendations.
 - 5. Do not use calcium chloride or admixtures containing more than 0.1% chloride ions.
- B. Air-Entraining Admixture: ASTM C260, certified by manufacturer to be compatible with other required admixtures. Subject to compliance with requirements, provide one of following, or approved equivalent:
- 1. Air-Tite, Cormix Construction Chemicals.
 - 2. Air-Mix or Perma-Air, Euclid Chemical Co.
 - 3. Darex AEA or Daravair, W.R. Grace & Co.
 - 4. MB-VR or Micro-Air, Master Builders, Inc.
 - 5. Sealtight AEA, W.R. Meadows, Inc.
 - 6. Sika AER, Sika Corp.

- C. Water-Reducing Admixture: ASTM C494, Type A. Subject to compliance with requirements, provide one of following, or approved equivalent:
1. Chemtard, ChemMasters Corp.
 2. PSI N, Cormix Construction Chemicals.
 3. Eucon WR-75, Euclid Chemical Co.
 4. WRDA, W.R. Grace & Co.
 5. Pozzolith Normal or Polyheed, Master Builders, Inc.
 6. Metco W.R., Metalcrete Industries.
 7. Prokrete-N, Prokrete Industries.
 8. Plastocrete 161, Sika Corp.
- D. Water-Reducing and Retarding Admixture: ASTM C494, Type D. Subject to compliance with requirements, provide one of following, or approved equivalent:
1. PSI-R Plus, Cormix Construction Chemicals.
 2. Eucon Retarder 75, Euclid Chemical Co.
 3. Daratard-17, W.R. Grace & Co.
 4. Pozzolith R, Master Builders, Inc.
 5. Protard, Prokrete Industries.
 6. Plastiment, Sika Corporation.
- E. Water-Reducing, Accelerating Admixture: ASTM C494, Type E. Subject to compliance with requirements, provide one of following, or approved equivalent:
1. Q-Set, Conspec Marketing & Manufacturing Co.
 2. Lubricon NCA, Cormix Construction Chemicals.
 3. Accelguard 80, Euclid Chemical Co.
 4. Daraset, W.R. Grace & Co.
 5. Pozzutec 20, Master Builders, Inc.
 6. Accel-Set, Metalcrete Industries.

2.6 WATERSTOPS

- A. Self-Expanding Rubber Strip Waterstops: Manufactured rectangular or trapezoidal strip, bentonite-free hydrophilic polymer modified chloroprene rubber, for adhesive bonding to concrete, 3/8 by 3/4 in (10 by 19 mm). Subject to compliance with requirements, provide one of following, or approved equivalent:
1. Deneef Construction Chemicals; Swellseal.
 2. Greenstreak; Hydrotite.
 3. Mitsubishi International Corporation; Adeka Ultra Seal.
 4. Progress Unlimited, Inc.; Superstop.

2.7 CURING MATERIALS

- A. Absorptive Cover: AASHTO M182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz/sq yd when dry.
- B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.

2.8 FLOOR AND SLAB TREATMENTS

- A. See Section 03301

2.9 CONCRETE MIXTURES, GENERAL

- A. Concrete shall be 4000 PSI, $\frac{3}{4}$ IN., 585 HP Cement Concrete and shall conform to all material requirements contained in Subsection M4.06.1 High Performance Cement Concrete of the Massachusetts Highway Department Supplemental Specifications dated June 15 2012.
- B. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- C. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 - 1. Fly Ash: 25%.
 - 2. Combined Fly Ash and Pozzolan: 25%.
 - 3. Ground Granulated Blast-Furnace Slag: 50%.
 - 4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50% portland cement minimum, with fly ash or pozzolan not exceeding 25%.
 - 5. Silica Fume: 10%.
 - 6. Combined Fly Ash, Pozzolans, and Silica Fume: 35% with fly ash or pozzolans not exceeding 25% and silica fume not exceeding 10%.
 - 7. Combined Fly Ash or Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50% with fly ash or pozzolans not exceeding 25% and silica fume not exceeding 10%.

- D. Limit water-soluble, chloride-ion content in hardened concrete to 1.00% by weight of cement.
- E. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.
 - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 - 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious-materials ratio below 0.50.
 - 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
- F. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

2.10 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Slabs: Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: As indicated at twenty-eight days.
 - 2. Maximum Water-Cementitious-Materials Ratio: 0.45.
 - 3. Slump Limit: 4 in. \pm 1 in. (25 mm).
 - 4. Air Content: Do not allow air content of troweled finished floors to exceed 3%.

2.11 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.12 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94, and furnish batch ticket information.
 - 1. When air temperature is between 85°F and 90°F, reduce mixing and delivery time from 1-1/2 hrs to 75 min.; when air temperature is above 90°F, reduce mixing and delivery time to 60 min.

FLOOR DRAINS

- A. Floor drains shall be furnished and installed in kind by the contractor. He shall be responsible for correctly setting these drains to the proper grade to assure proper drainage from surrounding areas. New floor drains shall be the same size and type as the existing floor drains.

PART 3 - EXECUTION

3.1 GENERAL

Coordinate the installation of joint materials, floor drains, and other related materials with placement of forms and reinforcing steel.

3.2 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so that concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
 - 1. Class A, 1/8 in. for smooth-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and

securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

- H. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- I. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- J. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- K. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.3 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
 - 2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 - 3. Install dovetail anchor slots in concrete structures as indicated.

3.4 SHORES AND RESHORES

- A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.
 - 1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.

3.5 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack-weld crossing reinforcing bars.
 1. Weld reinforcing bars according to AWS D1.4, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.
- F. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D3963/D3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.

3.6 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so that strength and appearance of concrete are not impaired, at locations indicated or as approved by the Designer.
 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 2. Form keyed joints as indicated. Embed keys at least 1-1/2 in. into concrete.
 3. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 4. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 5. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.7 WATERSTOPS

- A. Flexible Water stops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed water stops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.
- B. Self-Expanding Strip Water stops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.8 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Designer.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 in. into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

- E. Deposit and consolidate concrete for slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Consolidate concrete during placement operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When average high and low temperature is expected to fall below 40°F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

- G. Hot-Weather Placement: Comply with ACI 301 and as follows:
 - 1. Maintain concrete temperature below 90°F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided that water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.9 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces not exposed to public view

- B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture

matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.10 FINISHING FLOORS AND SLABS

- A. See Section 00331

3.11 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq ft x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12 in. lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 in., and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

- a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Maintain continuity of coating and repair damage during curing period.
 - a. Do not use curing compound for concrete surfaces to receive floor coverings unless using a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Repeat process 24 hrs later and apply a second coat. Maintain continuity of coating and repair damage during curing period.
 - a. Do not use curing compound for concrete surfaces to receive floor coverings unless using a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3.12 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 in. deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.13 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by the Designer. Remove and replace concrete that cannot be repaired and patched to the Designer's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two-and-one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 in. in any dimension in solid concrete, but not less than 1 in. in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by the Designer.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 in. wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 2. After concrete has cured at least fourteen days, correct high areas by grinding.
 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 in. to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

6. Repair defective areas, except random cracks and single holes 1 in. or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4 in. clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes 1 in. or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hrs.
- E. Perform structural repairs of concrete, subject to the Designer's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to the Designer's approval.

3.14 QUALITY ASSURANCE

- A. Testing and Inspecting: The City of Waltham will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
1. Steel reinforcement placement.
 2. Steel reinforcement welding.
 3. Headed bolts and studs.
 4. Verification of use of required design mixture.
 5. Concrete placement, including conveying and depositing.
 6. Curing procedures and maintenance of curing temperature.
 7. Verification of concrete strength before removal of shores and forms from beams and slabs.

- D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu yd, but less than 25 cu yd, plus one set for each additional 50 cu yd or fraction thereof.
 2. Testing Frequency: Obtain at least one composite sample for each 100 cu yd or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 3. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 4. Air Content: ASTM C231, pressure method, for normal-weight concrete; ASTM C173/C173M, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 5. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air temperature is 40°F and below and when 80°F and above, and one test for each composite sample.
 6. Unit Weight: ASTM C567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 7. Compression Test Specimens: ASTM C31/C31M.
 - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
 - b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
 8. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at seven days and one set of two specimens at twenty-eight days.
 - a. Test one set of two field-cured specimens at seven days and one set of two specimens at twenty-eight days.
 - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

9. When strength of field-cured cylinders is less than 85% of companion laboratory-cured cylinders, the Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
 11. Test results shall be reported in writing to the Designer, concrete manufacturer, and Contractor within 48 hrs of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at twenty-eight days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both seven- and twenty-eight-day tests.
 12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Designer, but will not be used as sole basis for approval or rejection of concrete.
 13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Designer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Designer.
 14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- E. Measure floor and slab flatness and levelness according to ASTM E1155.

END OF SECTION

SECTION 03301

FLOORING

PART 1 - GENERALRELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Furnish and install new resinous flooring materials including primers, resins, hardening agents, finish or sealing coats
- B. Related Sections include the following:
 - 1. Section 03300
 - 2. Section 05500

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data, installation instructions and general recommendation for each resinous flooring material required. Include certification indicating compliance of materials with requirements.
- B. Samples: Submit, for verification purposes, 4-inch square samples of each type of resinous flooring required, applied to a rigid backing, in color and finish indicated.

1.4 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain primary resinous flooring materials including primers, resins, hardening agents, finish or sealing coats from a single manufacturer/installer with not less than twenty years of successful experience in manufacturing and installing principal materials described in this section. Manufacturer and installer must furnish certified documentation regarding the successful completion of at least 40 projects of similar size and complexity. Manufacturer's License to Manufacturer is required documentation for this project.

- B. Pre-Installation Conference
 - 1. General contractor shall arrange a meeting not less than thirty days prior to starting work.
 - 2. Attendance
 - a. General Contractor
 - b. City of Waltham's Representative
 - c. Manufacturer/Installer

1.5 MATERIAL DELIVERY, STORAGE AND HANDLING

- A. Material shall be delivered to job site and be checked by flooring installer for completeness and shipping damage prior to job start.
- B. Material shall be stored in a dry enclosed area, protected from exposure to moisture. Temperature of storage area shall be maintained between 60 and 85°F

1.6 PROJECT CONDITIONS

- A. Concrete substrate shall be properly cured for a minimum of 30 days.
- B. Utilities, including electric, water, heat (air temperature between 60 and 85°F (16 and 30° C) and finished lighting to be supplied by the City of Waltham.
- C. Job area to be free of other trades during, and for a period of 24 hours, after floor installation.
- D. Protection of finished floor from damage by subsequent trades shall be the responsibility of the General Contractor.

SECTION 2 – PRODUCTS

2.1 MANUFACTURERS

- A. The products of Engine Bay Floors, (800)573-9198, are identified below as the basis of design. Equal Products of C.A Reed, Florock or approved equal will be considered.

2.2 RESINOUS FLOORING SYSTEM

Floor Resurfacing 4000 Primer - a two component, greater than 95% solids, lower than 50 g/l VOC, epoxy primer cured with modified cycloaliphatic amine hardener with additive offering enhanced adhesion to concrete substrates.

Floor Resurfacing 4000 Mortar - a three component (epoxy resin, modified cycloaliphatic amine, silica sand mortar) with greater than 95% solids, lower than 50 g/l VOC, cementitious modified silica aggregate offering enhanced coefficient of thermal expansion resulting in better adhesion to concrete.

Floor Resurfacing 4000 Grout Coat - a three component (epoxy resin, modified cycloaliphatic amine, colorant) with greater than 95% solids, lower than 50 g/l VOC. The coating should be fast curing to minimize outgassing typically less than 6-7 hours and modified with adhesion promoters.

Floor Resurfacing 4000 Topcoat - a dimer aliphatic isocyanate urethane coating with UV blockers with greater than 92% solids, lower than 100 g/l VOC. Urethane cannot contain any extenders or diluents that are not reactive or do not come out of the film.

2.3 SYSTEM CHARACTERISTICS

- A. Color and Pattern: As selected by City of Walthams agent from manufacturer's standard colors.
- B. Wearing Surface: Textured for slip resistance per City of Waltham from manufacturer's full range.
- C. Integral Cove Base: 4 inches high with 1-1/2 inch radius.
- D. Striping: Striping guide lines must be included. Striping shall be four inches in width. Color selected for these guide lines shall be one of three to be used. Exact location shall be confirmed by the City of Waltham.
- E. Walls: Final urethane topcoat must be installed up the wall to the top of the first block off the floor as part of the scope of the work.
- F. Physical Strength Qualification: Flooring system must be durable enough to resist the constant loads of heavy engines and apparatus. The floor must be capable of dissipating high temperatures from hot tires and guaranteed to stay bonded and resistant to delamination. The contractor, in conjunction with the manufacturer, is responsible for gathering the data in regards to engine weights, load points, and temperature exposure required to guarantee this qualification.

2.4 SYSTEM COMPONENTS

- A. Primer: Type recommended by manufacturer for substrate and body coat(s) indicated.
- B. Body Coat(s):
 - 1. Resin: Epoxy
 - 2. Application method: troweled
- C. Pigmented Grout Coating
 - 1. Resin: Epoxy
 - 2. Application method: squeegee/back roll
- D. Pigmented Top Coating
 - 1. Resin: Epoxy aliphatic polyester polyurethane
 - 2. Application method: squeegee/back roll

2.5 ACCESSORY MATERIALS

- A. Patching and Fill Material: Resinous product of resinous flooring manufacturer.
- B. Joint Sealant: Type produced by manufacturer or resinous flooring system for type of service and joint condition indicated.

SECTION 3 – EXECUTION

3.1 INSPECTION

- A. Ensure area is clean and dry with adequate heat, light and ventilation. The surface must be clean and dry, physically sound, and free of contamination. Surfaces must be free of holes, voids or defects. Cracks and abrupt changes in the surface profile must be corrected. Area shall be free of other trades to allow smooth flow of installation process to ensure optimum installation.

3.2 SURFACE PREPARATION

- A. Prepare surface utilizing mechanical means where possible (i.e. self-contained Blastrac, scarifiers, scabblers, etc.)
- B. Saw cut and chase perimeter edges to provide a “key-in” of material.
- C. Ensure all static (non-moving) cracks are filled as recommended by

manufacturer/installer.

- D. Identify and mark all active (moving) joints.
- E. Enlarged cracks and spalled areas shall be filled and leveled with an epoxy fill material before coatings are applied.
- F. Pre-fill all divots/holes in the concrete surface that are larger than 2" with epoxy patching compound.

3.3 INSTALLATION

- A. General: Apply components of flooring system according to manufacturer's written instructions to produce a uniform monolithic wearing surface of thickness indicated.
 - 1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate and optimum intercoat adhesion.
 - 2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing process.
 - 3. At substrate expansion and isolation joints, provide joint in flooring to comply with flooring manufacturer's written recommendations.
- A. Installation
 - 1. Saw cut and chase perimeter edges to provide a "key-in" of material.
 - 2. Prepare surface utilizing mechanical means where possible (i.e. self-contained Blastrac, scarifiers, scabblers, etc.).
 - 3. Notched rake apply hybrid epoxy polyester polyurethane cementitious mortar overlayment at ¼" minimum thickness.
 - 4. Grind based after initial cure to ensure smooth appearance.
 - 5. Apply pigmented 100% solids epoxy grout coat.
 - 6. Broadcast for texture, (if desired).
 - 7. Apply pigmented aliphatic polyester polyurethane topcoat.
- B. Application
System Installation – Epoxy aliphatic polyester polyurethane system to be installed at a minimum total thickness of 250 mils. Finish coat to achieve even color consistency and non-slip texture as specified by City of Waltham.

3.4 FIELD QUALITY CONTROL

- A. The right is reserved to invoke the following material testing procedure at any time, and any number of times during period of floor application.
- B. If test results show material being used do not comply with specific requirements, Contractor may be directed by City of Waltham to stop work; remove non-complying materials; pay for testing; reapply flooring materials to properly prepared surfaces which had previously been coated with unacceptable materials.

3.5 CURING, PROTECTION AND CLEANING

- A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.
- B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.
- C. Cleaning: Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer.

SECTION 4 – WARRANTY

4.0 WARRANTY

- A. Guarantee and Warranty: Warranty shall be from a single source manufacturer/polymer systems applicator. The polymer system shall be warranted against defects in materials and workmanship for a period of ten years. Repair or replace any or all portions of the work that fail under normal conditions or use during the warranty period, promptly and at no cost to the customer and by using methods and materials specified for the initial construction.

END OF SECTION 00331

SECTION 05120

STRUCTURAL STEEL

PART 1 - GENERALRELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. The Work includes labor, materials, equipment, and services required for completion of Work under this Section as shown on Drawings and as specified here.
- B. This Section includes the following:
 - 1. Furnish and install new structural steel.
 - 2. Remove and reset structural steel members shown.
 - 3. Steel support angles.
 - 4. Field-installed headed shear studs.
 - 5. Grout.
 - 6. Shop priming and field painting of new steel material.
 - 7. Cleaning, prime and painting of reset steel members.
- C. Related Sections include the following:
 - 1. Section 03300
 - 2. Section 05500

The Contractor has sole responsibility for site safety.

1.3 PERFORMANCE REQUIREMENTS

- A. Detailing: Detail structural members, connections, accessories, and temporary components required for transportation and erection.
 - 1. Refer to the Drawings for miscellaneous items, tolerances, and provisions to be made for the attachment of other materials.
 - 2. Where indicated as requiring coordination, refer to approved mechanical shop drawings for exact location and dimensions of supports for mechanical equipment and penetrations.
- B. Construction: Type FR, fully restrained.
- C. Construction: Type 1, rigid frame.

SUBMITTALS

- D. Product Data: Prior to starting work, submit to the Designer, a description of methods, sequence of erection, and type of equipment proposed for use for erecting structural steel. This submission and approval of same by the Designer, shall not relieve the Contractor of his responsibility for providing proper methods, equipment, workmanship or safety precautions.
- E. Shop Drawings: Submit shop drawings of all structural steel items to Designer for approval, showing sizes and thicknesses of all members, types of materials, methods of connection and assembly, complete dimensions, clearances, anchorage, relationship to surrounding work by other trades, and other pertinent details of fabrication and installation.
 - 1. Include on detail drawings:
 - a. Details and dimensions of all pieces.
 - b. Steel material designation.
 - c. Surface preparation and finish.
 - d. Details of cuts, connections, splices, camber, holes, welds, bolts, and other pertinent data.
 - e. Identification marks cross-referenced to erection plans.
- F. Forces imposed on the base building structure by temporary attachments for bracing of cranes, hoists, or any other equipment imposing loads on the structure during construction. Provide drawings and calculations of temporary bracing stamped and signed by a Professional Engineer licensed in the state where the Work will be permanently erected.
- G. Welding Procedure Specifications including Qualification Test Reports for welds qualified by test, for each class of weld to be incorporated in the work.
- H. Welding certificates.
- I. Qualification Data: For Installer, Fabricator, and Fabricator's Engineer.
- J. Mill Test Reports: Signed by manufacturers certifying that the following products comply with requirements:
 - 1. Structural steel including chemical and physical properties.
 - 2. Bolts, nuts, and washers, including mechanical properties and chemical analysis.
 - 3. Tension-control, high-strength bolt-nut-washer assemblies.
 - 4. Shear stud connectors.
 - 5. Shop primers.
 - 6. Nonshrink grout.

- K. Source quality-control test reports.
- L. Galvanizing: Submit an original and two copies of the coating applicator's notarized Certificate of Compliance that the hot-dip-galvanized coating meets or exceeds the specified requirements of ASTM A123 or A153 as applicable.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CASE.
- B. Fabricator Qualifications: A qualified fabricator who participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category Cbd.
- C. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint Endorsement P1 or SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."
- D. Galvanizing Applicators: Company specializing in hot-dip galvanizing after fabrications and following the procedures of the Quality Assurance Manual of the American Galvanizers Association.
- E. Welding: Qualify procedures and personnel according to AWS D1.1 – Structural Welding Code – Steel.
- F. Comply with applicable provisions of the following specifications and documents as amended herein:
 - 1. AISC's "Code of Standard Practice for Steel Buildings and Bridges" March 18, 2005 Edition.
 - 2. AISC's "Specification for Structural Steel Buildings."
 - 3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts", 2004 Edition.
 - 4. AWS's "Structural Welding Code – Steel."
 - 5. SSPC's "Society for Protective Coatings: Steel Structures Painting Manual, Vol. 2."
 - 6. AGA's "Inspection of Products Hot-Dip Galvanized After Fabrication"

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off the ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.
2. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
3. Load and store galvanized articles in accordance with accepted industry standards.

1.6 COORDINATION

- A. Furnish anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A992/A992M.
- B. Channels, Angles: ASTM A36/A36M.
- C. Plate and Bar: ASTM A36/A36M.
- D. Cold-Formed Hollow Structural Sections: ASTM A500, Grade B, structural tubing.
- E. Other Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A325, Type 1, heavy hex steel structural bolts; ASTM A563 heavy hex carbon-steel nuts; and ASTM F436 hardened carbon-steel washers.
 1. Finish: Plain, hot-dip zinc coating, ASTM A153/A153M, Class C.
 2. Tap nuts after galvanizing to minimum diametral amounts in ASTM A563.
- B. High-Strength Bolts, Nuts, and Washers: ASTM A490, Type 1, heavy hex steel structural bolts or tension-control bolt-nut-washer assemblies with splined ends; ASTM A563 heavy hex carbon-steel nuts; and ASTM F436 hardened carbon-steel washers, plain.

- C. Tension-Control High-Strength Bolt-Nut-Washer Assemblies: ASTM F1852, Type 1, round-head steel structural bolts with splined ends; ASTM A563 heavy hex carbon-steel nuts; and ASTM F436 hardened carbon-steel washers.
 - 1. Finish: Plain, mechanically deposited zinc coating, ASTM B695, Class 50.
- D. Shop Installed Shear Connectors: ASTM A108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1, Type B.
- E. Unheaded Anchor Rods: ASTM F1554, Grade 55, weldable
 - 1. Configuration: Straight.
 - 2. Nuts: ASTM A563 heavy hex carbon steel.
 - 3. Plate Washers: ASTM A36/A36M carbon steel.
 - 4. Washers: ASTM F436 hardened carbon steel.
 - 5. Finish: Plain.
- F. Threaded Rods: ASTM A193/A193M].
 - 1. Nuts: ASTM A563 heavy hex carbon steel.
 - 2. Washers: ASTM F436 hardened carbon steel.
 - 3. Finish: Plain.

2.3 EXPANSION ANCHORS

- A. Available Products: Subject to compliance with requirements, provide one of the following:
 - 1. ITW Ramset/Red Head Trubolt Wedge.
 - 2. Hilti Kwik Bolt 3.
- B. Finish: Carbon steel zinc plated in accordance with ASTM B633 Type III SC 1 or stainless steel with chemical composition of AISI 304 or 316 as indicated.

2.4 ADHESIVE ANCHORS

- A. Available Products: Subject to compliance with requirements, provide one of the following:
 - 1. Hilti HY 200 System.
 - 2. Hilti HY 70 System.
 - 3. Epcon Ceramic 6.
- B. Rods: ASTM A36 or ASTM A307 carbon steel zinc plated in accordance with ASTM B633 SC 1, or stainless steel with chemical composition of AISI 304 or 316 as indicated.

- C. Nuts and Washers: Match rod material.

2.5 PRIMER

- A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer.
- B. Galvanizing Repair Paint: Formulated in accordance with ASTM A780.
 - 1. ZRC Cold Galvanizing Compound.
 - 2. Brite Zinc by Brite Products.

2.6 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, non-staining, mixed with water to consistency suitable for application and a 30 min. working time.
 - 1. Compressive Strength per ASTM C109: 8,000 psi.

2.7 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC's "Specification for Structural Steel Buildings."
 - 1. Camber structural-steel members where indicated.
 - 2. Identify high-strength structural steel according to ASTM A6/A6M and maintain markings until structural steel has been erected.
 - 3. Mark and match-mark materials for field assembly.
 - 4. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
 - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 2, "Hand Tool Cleaning."
- F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's written instructions.
- G. Holes: Provide holes required for securing other work to structural steel and for passage of other work through steel framing members.
 - 1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.]
 - 2. Base-Plate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.8 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 in.
 - 2. Surfaces to be field welded.
 - 3. Surfaces to be high-strength bolted with slip-critical connections.
 - 4. Surfaces to receive sprayed fire-resistive materials.
 - 5. Galvanized surfaces.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
 - 1. SSPC-SP 2, "Hand Tool Cleaning."
 - 2. SSPC-SP 3, "Power Tool Cleaning."
 - 3. SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning."
 - 4. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 5. SSPC-SP 7/NACE No. 4, "Brush-Off Blast Cleaning."
 - 6. SSPC-SP 8, "Pickling."
 - 7. SSPC-SP 10/NACE No. 2, "Near-White Blast Cleaning."
 - 8. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
 - 9. SSPC-SP 14/NACE No. 8, "Industrial Blast Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to the manufacturer's written instructions and at rate recommended by SSPC to provide a dry-film thickness of not less than 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
 - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2. Apply two coats of shop paint to inaccessible surfaces after assembly or erection. Change color of second coat to distinguish it from first.
- D. Painting: Apply a one-coat nonasphaltic primer complying with SSPC-PS Guide 7.00, "Painting System Guide 7.00: Guide for Selecting One-Coat Shop Painting Systems," to provide a dry-film thickness of not less than 1.5 mils.

2.9 SOURCE QUALITY CONTROL

- A. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- B. In addition to visual inspection, shop-welded shear connectors will be tested and inspected according to requirements in AWS D1.1 for stud welding and as follows:
1. Bend tests will be performed if visual inspections reveal either a less-than-continuous 360° flash or welding repairs to any shear connector.
 2. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments, with steel erector present, for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place, unless otherwise indicated.
1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings."
- B. Base and Bearing Pads: Coordinate this portion of the Work with the grouting work specified under the section "Concrete". Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.
 - 1. Set base and bearing plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Promptly pack grout solidly between bearing surfaces and base or bearing plates so that no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with the manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members forming part of the complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure.
 - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated.
- F. Remove erection bolts on welded, designerurally exposed structural steel; fill holes with plug welds; and grind smooth at exposed surfaces.
- G. Do not use thermal cutting during erection. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 REPAIRS AND PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A780 and the manufacturer's written instructions.
- B. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories, bearing plates, and abutting structural steel.

1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.
- C. Touchup Painting: Cleaning and touchup painting are specified in Division 9 painting Sections.

3.5 CLEANING

- A. Remove and dispose of away from the site: Erection bolts, erection attachments, temporary lifting lugs, safety barrier supports, and any other auxiliary or temporary steel components that interfere with other work.

END OF SECTION 05120

SECTION 05500
MISCELLANEOUS METALS

PART 1 - GENERAL

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions apply to work of this Section.

1.1 WORK TO BE PERFORMED

- A. This section includes all materials, labor, services and incidentals necessary to furnish and install all miscellaneous items including, but not limited to: anchors, bolts, screws, nuts, washers, etc., as indicated on the drawings and as necessary to complete the work.

1.2 SUBMITTALS

- A. Submit shop drawings of all steel and miscellaneous metal work showing all dimensions, details of construction, details of installation, relation to adjoining work, reinforcement, welds, fastenings, anchorage and specifications of shop finishes for approval before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All metal shall be free from defects and of the best commercial quality for use. Provide smooth unblemished metal, free of rust, scale, pitting or mill marks.
- B. Structural Steel Shapes: ASTM A-36, hot dipped galvanized after fabrication.
- B. Fastenings which are exposed shall be of same material, color and finish as the metal to which they are applied, or specified. All items employed with galvanized steel shall be hot dipped galvanized ferrous metal. All fastenings shall be of heavy gauge as customarily used in the trades to safely support the required loads.
- D. Filler Metal for Welding: Welding electrodes for manual shielded metal arc welding shall conform to AWS, E70 Series. Bare electrodes and granular flux used in the submerged-arc process shall conform to AISC Specifications.

PART 3 - EXECUTION

3.1 GENERAL

- A. Take all measurements required at the building. Check measurements and compare dimensions and other data with various trades installing adjoining work to assure proper coordination. Installation of metal fabrications shall be by experienced mechanics capable of installing each item in accordance with the drawings and specifications, in consideration of the field conditions, and the shop and erection drawings.
- B. Set work accurately in alignment and where shown. Items shall be plumb, level, free of rack and twist and set parallel or perpendicular as required to line and plane of surface.
- C. Furnish setting drawings and instructions for installation of anchors to be preset into concrete and masonry work, and for the positioning of items having anchors to be built into concrete or masonry construction. Provide temporary bracing for such items until concrete or masonry is set.

3.2 CLEANING AND ADJUSTING

- A. After installation, all exposed prefinished and plate items and all items fabricated from stainless steel, aluminum and copper alloys, shall be cleaned as recommended by the manufacturer and protected from damage until completion of the project.

3.3. WELDING

- A. Welding shall conform to American Welding Society Code for Welding in Building Construction.
- B. Welded Connections: Repair railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
- C. Weld connections to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Weld exposed corners and seams continuously, unless otherwise indicated.
 - 5. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows

END OF SECTION

05500-2

SECTION 16050

ELECTRICAL

PART 1 – GENERAL

1.1 DESCRIPTION:

- A. Provide all work to remove, store and reinstall lighting and other electrical components necessary to perform the work under this contract. Provide conduit, wiring and connections
- B. Perform all work and testing as indicated and specified to provide operationally ready electrical systems.
- C. Obtain all necessary permits required to complete the work of this Section

1.2 REFERENCES:

- A. National Electrical Safety Code (NESC)
- B. Occupational Safety and Health Administration (OSHA)
 - 1. OSHA Part 1910; Subpart S, 1910.308
 - 2. OSHA Part 1926; Subpart V, 1926.950 through 1926.960
- C. National Fire Protection Association (NFPA)
 - 1. ANSI/NFPA 70B: Electrical Equipment Maintenance
 - 2. NFPA 70E: Electrical Safety Requirements for Employer Workplaces
 - 3. ANSI/NFPA 70: National Electrical Code
 - 4. ANSI/NFPA 780: Lightning Protection Code
 - 5. ANSI/NFPA 101: Life Safety Code
- D. National Electrical Manufacturers Association (NEMA)
- E. American National Standards Institute (ANSI)
 - 1. ANSI C2: National Electrical Safety Code
 - 2. ANSI Z244-1: American National Standard for Personnel Protection
- F. Insulated Cable Consultants Association (ICEA)
- G. Instrument Society of America (ISA)
- H. Underwriters Laboratories (UL)
- I. Factory Mutual (FM)

J. International Electrical Testing Association (NETA) – Acceptance Testing Specification for Electric Power Distribution Equipment and Systems (STD)

K. Institute of Electrical and Electronics Engineers (IEEE) L.

Massachusetts Electrical Code (MEC)

M. All inspections and tests shall utilize the following references:

1. Project Design Specifications
2. Project Design Drawings
3. Project Short Circuit and Coordination Study
4. Manufacturer’s instruction manuals applicable to each particular apparatus

1.3 SUBMITTALS:

A. Shop Drawings: Submit the following in accordance with Section 01300 and as specified herein.

1. Shop Drawings and Data: Include manufacturer's drawings, bills of material, panel and equipment layouts, catalog data, schematics diagrams, interconnection diagrams, wiring diagrams and other documentary or descriptive information for each assembly submitted in one package.
2. Submit inspection and testing forms for all electrical distribution equipment to be inspected and tested under this section.
3. Submit data sheets for the insulation resistance testing of conductors and equipment prior to performing operating testing. List all cables and equipment to be tested.
4. Provide space on data sheet forms to enter the results of testing, instruments used with serial numbers, and name of personnel performing testing. This data to be filled out during testing.

1.4 QUALITY ASSURANCE:

- A. Provide in accordance with Section 01400 and as specified herein.
- B. Install electrical Work in conformance with latest rules and requirements of National Fire Protection Association Standard No. 70 (National Electrical Code) and the Massachusetts Electrical Code.

1.5 INTERFERENCE AND ERRONEOUS LOCATIONS:

- A. Locations of electrical equipment, devices, and outlets as indicated, are

approximate only. Exact locations shall be determined during construction.

- B. Verify in field, all data and final locations of Work installed under other Sections required for placing of electrical Work.
- C. Do not run conduit in floor slabs or walls of buildings unless indicated.

1.6 APPROVAL AND MARKING EQUIPMENT:

- A. All devices and materials shall be listed and/or labeled by Underwriters' Laboratories, Inc., wherever standards have been established by that agency. Where Underwriters' Laboratories listing is not available for equipment, submit certified test reports of recognized, independent testing laboratory, approved by the local inspecting authority, indicating that equipment is in conformance with local code requirements or any other applicable requirements.
- B. Mark equipment, devices and material with name or trademark of manufacturer and rating in volts and amperes and other information on a nameplate.

1.7 EQUIPMENT SPECIFIED ELSEWHERE:

- 1. The following shall be provided
 - 1. Conduit, fittings, and supports.
 - 2. Wire, cables, and conductors, including splicing.

1.8 CODE, INSPECTION AND FEES:

- A. Obtain all permits and arrange for all inspections.

1.9 TESTS AND SETTINGS:

- A. Test systems and equipment furnished under Division 16 and replace all defective Work and equipment at no additional cost.

1.10 INTERPRETATION OF DRAWINGS

- A. Verify the exact locations and mounting heights of lighting fixtures, switches and receptacles prior to installations.
- B. Except where dimensions are shown, the locations of equipment, fixtures, and outlets indicated are approximate only.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PROTECTION OF ELECTRICAL EQUIPMENT:

A. Protect electrical equipment from the weather, from water dripping or splashing upon it, at all times during shipment, storage, and construction. Do not store equipment outdoors.

B. Provide uniformly distributed source of heat in electrical equipment to prevent condensation and damage to electrical insulation systems.

3.2 DEFECTIVE OR DAMAGED EQUIPMENT:

A. Defective or damaged equipment shall be replaced as determined by the City of Waltham, at no additional cost.

3.3 INSTALLATION:

A. Provide conduit, wire and field connections

1. All dimensions shall be field verified at the job site and coordinated with the Work of all other trades.

2. Provide electrical installation working drawings containing the following:

a. Concealed and buried conduit layouts, shown on floor plans.

b. Coordinate all Work with other divisions. Concrete slab containing concealed conduits shall not be poured until conduit layouts have been reviewed and approved by the City of Waltham.

3.5 CUTTING AND PATCHING:

A. Arrange installation of all Work such that cutting and patching is not required.

B. Do not cut joints, beams, girders, columns or any other structural members.

3.6 CONTRACT CLOSEOUT:

4 Contract closeout shall be as per Section 01700.

3.7 BASIS OF PAYMENT

A. No separate measurement or payment will be made for work under this section, but all costs in connection therefore shall be included in the contract lump sum price for each modular building.

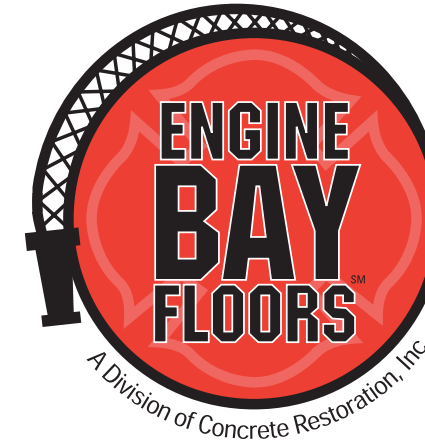
END OF SECTION

DIVISION 2

List of Drawings

Plan, Elevations & Details (2 pages)

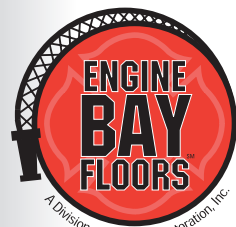
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CHEMI-TOP™ 1600

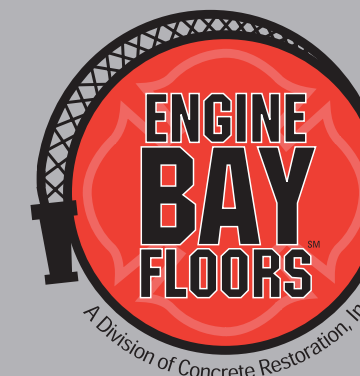
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