

**CITY OF
LOWELL, MASSACHUSETTS**

IFB 15-62

**INFORMATION FOR BIDDERS
BID PROPOSAL, CONTRACT
GENERAL CONDITIONS, SPECIAL CONDITIONS
AND TECHNICAL SPECIFICATIONS
FOR**

HAMILTON CANAL DISTRICT

JACKSON STREET EXTENSION

CITY MANAGER – KEVIN J. MURPHY

**DIVISION OF PLANNING AND DEVELOPMENT
ASSISTANT CITY MANAGER & DIRECTOR, DIANE TRADD**

**DEPARTMENT OF PUBLIC WORKS
CITY ENGINEER, LISA DEMEO**

**City of Lowell
Purchasing Department
Lowell, Massachusetts**

February 4, 2015

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NOTICE TO CONTRACTORS

INVITATION TO BID - CITY OF LOWELL

HAMILTON CANAL DISTRICT JACKSON STREET EXTENSION

DUE DATE: Sealed bids will be received at the office of the Lowell City Hall Purchasing Department, Room 51, 375 Merrimack Street, Lowell, MA 01852, up to 2:00 PM, local time, **February 24, 2015** which time and place, they will be publicly open and read. **BIDDERS ARE REQUIRED TO SUBMIT A BID INCLUDING ALL BID FORMS CONTAINED IN THIS PACKAGE. DO NOT REMOVE PAGES.**

PREBID: A pre-bid meeting is scheduled for 10:00 A.M. **February 12, 2015** in the Department of Planning and Development conference room, 50 Arcand Drive Lowell, MA 01852.

The bids will be for all labor, materials, equipment, tools, appliances etc. necessary for construction of **JACKSON STREET EXTENSION**

Bid Documents, including Plans and Specifications may be obtained after **February 4, 2015** at City of Lowell Purchasing Department Room 51, 375 Merrimack Street, Lowell, MA 01852. Or downloaded at the City's website:

<http://www.lowellma.gov/Purchasing/Pages/General/OpenSolicitations.aspx>

Each bid proposal must be secured by an accompanying deposit of five percent (5%) of the total bid amount and submitted in a sealed envelope clearly marked, "Proposal for **JACKSON STREET EXTENSION**". The deposit shall be in the form of a Bid Bond, Certified Check, Cashier's or Treasurer's Check, made payable to the City of Lowell, or cash.

The successful bidder must furnish a Payment Bond and a Performance Bond of an amount equal to One Hundred (100%) Percent of the total Contract Price, issued by a Surety Company, satisfactory to the Commissioner of Public Works.

Attention of the Bidders is particularly called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

Attention of the Bidders is particularly called to the requirements of the conditions of employment to be observed and the prevailing wage rates to be paid on this project, as determined by the State Department of Labor Division of Occupational Safety and the U.S. Department of Labor under the Davis Bacon and related Acts.

Bidders shall be prequalified through the Prequalification and Contracts Manager of the Massachusetts Highway Department Ten Park Plaza, Boston, Massachusetts. Contractors intending to bid on this project must complete and submit a "Request for Proposal Form" to the

Contracts Engineer at Mass Highway. Forms for submittal can be obtained at the Contracts Managers Office.

Note: Bidders must also comply with Certification of Compliance G.L.C. 30 & 39S Public Construction More Than \$10,000.00. See page BP-28

The City of Lowell, acting through its Chief Procurement Officer, reserves the right to waive any informality in, to reject any or all bids or to accept the one which appears in the best interest of the City of Lowell.

MBE's are encouraged to submit proposals. EOE/AA.

Project Value: **\$670,000**

P. M. Vaughn - CHIEF PROCUREMENT OFFICER

| | | |
|-------------|-----------------------|------------------|
| ADVERTISED: | Central Register, | February 4, 2015 |
| | Wednesday Lowell Sun, | February 4, 2015 |

INFORMATION FOR BIDDERS

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INFORMATION FOR BIDDERS

1. RECEIPT AND OPENING OF BIDS

The City of Lowell herein called the "Owner" invites sealed bids on the separate copies of Bid Forms furnished for that purpose, all blanks of which must be appropriately filled in. The bound-in Bid Forms in the Contract Documents are for continuity and the convenience of Bidders and are not to be detached from the Contract Documents, filled out or executed.

Bids will be received by the OWNER at the Office of the Chief Procurement Officer, P. Michael Vaughn, City Hall, Purchasing Department, 375 Merrimack Street, Room 51, Lowell, MA 01852 until 2:00 P.M. local time, **February 24, 2015** and then at said Office publicly opened and read aloud. The envelope containing the bids for the **JACKSON STREET EXTENSION** shall be sealed, addressed to the City of Lowell, Purchasing Department and designated as "Bid for the **JACKSON STREET EXTENSION**"

The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 60 days after the actual date of the opening thereof.

2. PREPARATION OF BID

Each bid for the **JACKSON STREET EXTENSION** shall be submitted on the prescribed bid forms.

All blank spaces for bid prices must be filled in, with ink or typewriter, in both words and figures, and both of the foregoing Certifications must be fully completed and executed when submitted.

Each bid for the **JACKSON STREET EXTENSION** must be submitted in a sealed envelope bearing on the outside the name of the bidder, his address, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified above.

3. BLANK

4. BLANK

5. QUALIFICATIONS OF BIDDER

The OWNER may make such investigations as he deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the OWNER all such information and data for this purpose as the OWNER may request. The OWNER reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the OWNER that such bidder is properly qualified to carry out the obligations of the Contract and to complete the work contemplated therein. Conditional bids will not be accepted.

- A. Subject to the requirements of Chapter 29, Section 8B of the General Laws, each prospective Bidder proposing to bid on this project must be prequalified and certified by the Massachusetts Highway Department to perform this work in accordance with the “Regulations Governing Classification and Rating of Prospective Bidders.”

Each bid **must include** evidence of the Bidder’s ability to complete the Work in accordance with the Contract Documents. Each bid **must include** the name of the Superintendent who is to be used on this project, and his/her experience.

Each bid must include:

1. A comprehensive list of any and all citations and /or violations issued by regulatory agencies and/or judgments against bidder from a court of law.
2. All assessed penalties or liquidated damages, and the project in which they occurred.
3. Any and all contract terminations.
4. A list of at least five references, use forms on page I-9 and I-10.

6. BID SECURITY

Each bid shall be accompanied by cash, a certified check, treasurer’s check, or cashier’s check issued by a responsible bank or trust company, made payable to the City of Lowell in the amount of 5% of the bid or a bid bond prepared in the form of bid bond; duly executed by the bidder as principal and having as surety thereon a surety company listed on the Department of the Treasury’s approved listing (Department Circular 570), licensed to do business in the Commonwealth of Massachusetts, approved by the OWNER, in the amount of 5% of the bid, but in no event less than one hundred dollars not more than fifty thousand dollars.

Subbids shall be submitted for the following items for work: NONE

All bid deposits of general bidders, except those of the three lowest responsible and eligible bidders, will be returned within five (5) days, Saturdays, Sundays and legal holidays excluded, after the opening of the general bids.

The bid deposits of the three lowest responsible and eligible bidders shall be returned upon the execution and delivery of the Contract, or if no award is made, upon the expiration of 60 days, Saturdays, Sundays, and legal holidays excluded, except that, if any bidder fails to perform his agreement to execute a Contract and furnish a Performance Bond and also a Labor and Materials Payment Bond as stated in his bid, his bid deposit shall become and be the property of the City of Lowell as liquidated damages; provided that the amount of the bid deposit which becomes the property of the City of Lowell 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 or other unforeseen circumstances affecting the bidder, his bid deposit may be returned. The sixty day time limit shall not be applicable to the

next lowest eligible bidder, with his and his subbidder's consent, if the original award made within the time limit is invalidated.

All bid deposits of subbidders, except (a) of the subbidders named in the general bids of the three lowest responsible and eligible general bidders, and (b) those of the three lowest responsible and eligible subbidders for each subtrade, will be returned within five days (Saturdays, Sundays, and legal holidays excluded), after the execution of the general contract; except that, if a selected subbidder fails to perform his agreement to execute a subcontract with the general bidder selected as the general contractor contingent upon the execution of the general contract and if requested to do so in the general bid by such a general bidder, to furnish a Performance and Payment Bond as stated in his subbid, the bid deposit which becomes the property of the City of Lowell shall not, in any event, exceed the difference between his subbid price and the subbid price of the next lowest responsible and eligible subbidder; and provided further that, in case of death, disability or other unforeseen circumstances affection any such subbidder, his bid deposit may be returned to him.

7. DAMAGES FOR FAILURE TO ENTER INTO CONTRACT

The successful bidder, upon his failure or refusal to execute and deliver the contract and bonds required within 10 days after he has received notice of the acceptance of his bid, shall forfeit to the OWNER, as liquidated damages for such failure or refusal, the security deposited with his bid.

8. DURATION OF CONTRACT

The contract shall be for the period beginning on or about **April 15, 2015** or as stated in the **NOTICE TO PROCEED, WHICHEVER IS LATER** and end on or before **June 30, 2016**.

Failure to complete the work by the dates herein specified, or any proper extensions thereof granted by the OWNER will be subject to liquidated damages.

9. CONDITIONS OF WORK

Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions of his contract insofar as possible the contractor, in carrying out his work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

10. ADDENDA AND INTERPRETATIONS

No interpretation of the meaning of the plans, specifications or other pre-bid documents will be made to any bidder orally.

Every request for such interpretation should be in writing addressed to Chief Procurement Officer, City Hall, Purchasing Department, 375 Merrimack Street, Room 51, Lowell, Massachusetts 01852 and to be given consideration must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be mailed by certified mail with return receipt requested to all prospective bidders (at the respective addresses furnished for such purposes), not later than three days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligations under his bid as submitted. All addenda so issued shall become part of the contract documents.

11. SECURITY FOR FAITHFUL PERFORMANCE

Simultaneously with his delivery of the executed Contract, the Contractor shall furnish a surety bond or bonds as security for faithful performance of this Contract and for the payment of all persons performing labor on the project under this Contract and furnishing materials in connection with this Contract, as specified in the General Conditions included herein. The surety on such bond or bonds shall be a duly authorized surety company listed on the Department of the Treasury's approved listing (Department Circular 570), licensed to do business in the Commonwealth of Massachusetts and satisfactory to the OWNER.

12. POWER OF ATTORNEY

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

13. NOTICE OF SPECIAL CONDITIONS

The Bidder's attention is particularly called to those parts of the contract documents and specifications which deal with the following:

- (a) Inspection and testing of materials
- (b) Insurance requirements
- (c) Wage rates
- (d) Non-discrimination in employment

14. LAWS AND REGULATIONS

The bidder's attention is directed to the fact that all applicable State Laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract throughout, and they will be deemed to be included in the Contract the same as through herein written out in full.

15. METHOD OF AWARD - LOWEST QUALIFIED BIDDER

If at the time this contract is to be awarded, the lowest base bid submitted by a responsible bidder does not exceed the amount of funds then estimated by the OWNER as available to finance the Project, the Contract will be awarded on the base bid. If such bid exceeds such amount, the OWNER may reject all bids.

16. OBLIGATION OF BIDDER

At the time of the opening of bids it is presumed that each bidder has inspected the site and has read and is thoroughly familiar with the plans and contract documents (including all addenda). The failure or omission of any bidder to examine any form, instrument or document shall in no way relieve any bidder from any obligation in respect to his bid.

17. LIST OF UTILITIES IN THE AREA:

The following are the names of owners and representatives of the principal utilities affected, but completeness of this list is not guaranteed by the City:

CITY OF LOWELL

Lowell Engineering Department
City Hall - Room 61
375 Merrimack Street
Lowell MA 01852

Lisa DeMeo, P.E.
City Engineer
Phone:(978) 970-3331

Lowell Fire Department
99 Moody Street
Lowell, MA 01852

Chief Edward Pitta
Phone:(978) 459-5553

Lowell Police Department
50 Arcand Drive
Lowell, MA 01852

Supt. Kenneth Lavallee
Phone:(978) 937-3225

WATER

Lowell Regional Water Utility
815 Pawtucket Blvd.
Lowell, MA 01854

Erick Gitschier
Phone:(978) 674-1675

SEWER

Lowell Regional Wastewater Utility
451 First Street
Lowell, MA 01850

Mark Young
Phone:(978) 970-4248

FIRE ALARM

Lowell City Electrician
1365 Middlesex Street
Lowell, MA 01851

Steve Coutu
Phone :(978) 674-1813

ELECTRIC

National Grid
25 Research Drive
Westborough, MA 01582

Ann Wyman
Phone :(978) 907-3280

TELEPHONE

Verizon
385 Myles Standish Blvd.
Taunton, MA 02780

David Wood
Phone :(860) 763-6005

GAS

National Grid Gas
40 Sylvan Street
Waltham, MA 02451

Melisa Owens
Phone: (781) 907-2845

CABLE

AT&T
157 Green Street, Suite 2
Foxborough, MA 02035

Scott Ferreira
Phone: (508) 216-0059

COMCAST

4 Liberty Way
Westford, MA 01886
03109

Jody Gaudet
Phone: (617) 279-6412

OTHER AFFECTED PARTIES ARE:

Lowell Division of Planning & Development
JFK Civic Center
50 Arcand Drive
Lowell, MA 01852

CraigThomas
Phone: (978) 674-1445
cthomas@lowellma.gov

Vanasse Hangen Brustlin, Inc.
101 Walnut Street
Watertown, MA 02471-9151

Ms. Trish Domigan
Project Manager
Phone: (617) 924-1770

The Contractor shall notify the controlling utility agency at least 72 hours in advance of its intent to excavate in any way or manner, within six feet of any existing utility agency owned pole, anchor guy, underground duct, conduit, pipe, valve or manhole. No excavation shall take place within six feet of any existing utility agency owned pole, anchor guy, underground duct, conduit, pipe, valve or manhole owned by a utility agency without this notification.

The Contractor shall make his own investigation to assure that no damage to existing structures, drainage lines, traffic signal conduits, and other utilities will occur as a result of construction operations.

The Contractor shall notify "Mass. DIG SAFE" and procure a DIG SAFE number of each location prior to disturbing ground in any way.

"DIG-SAFE" Call Center: Telephone 1-888-344-7233

18. TESTING OF MATERIALS

The bidder shall note that inspection of work and testing of materials is a requirement of this contract. The Bidder shall provide a list, including resume and qualifications of all anticipated third party inspectors, testing labs, ect. required to perform the work in accordance with the Contract Specifications

19. NONDISCRIMINATION IN EMPLOYMENT

Contracts for work under this proposal will obligate the Contractors and subcontractors not to discriminate in employment practices.

Bidders must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain their eligibility to receive the award of the Contract.

The successful bidder must be prepared to comply in all respects with the Contract Provisions regarding Equal Employment Opportunity which are located in the Special Conditions Section of these Specifications.

20. AFFIRMATIVE ACTION

The Bidder's attention is called to the Notice for Affirmative Action to ensure equal employment opportunity (Executive Order 11246 and 41CFR Part 60-4) and the notice of Minimum Minority Percentages to be applied to State and State Assisted Contracts within the Commonwealth. To meet the State and Federal requirements Construction Participation for this project are as follows: **MBE's (7.4%) and (WBE's (6.9%))**

21. SALES TAX

Materials and equipment purchased for permanent installation in this project will be exempt from the Massachusetts Sales and Use Tax. The exemption certificate number will be furnished to the Contractor. Each bidder shall take this exemption into account in calculating his bid for the work.

22. BLANK

23. COMPLIANCE WITH AIR AND WATER ACTS

This contract is subject to the requirements of the Clean Air Act, as amended, 42 U.S.C. 1857 et. seq., the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et. seq. and the regulations of the Environmental Protection Agency with respect thereto, 40 CFR Part 15, as amended from time to time.

24. INTEREST OF MEMBERS, OFFICERS, or EMPLOYEES of the OWNER, MEMBERS of LOCAL GOVERNING BODY, or OTHER PUBLIC OFFICIALS

No member, officer, or employee of the OWNER, or its designees or agents, no member of the governing body of the locality in which the program is situated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the program during his tenure of for one year thereafter, shall have any interest, direct or indirect, in any contract or subcontract, or the proceeds thereof, for work to be performed in connection with this Contract.

BID PROPOSAL

GENERAL BID

CITY OF LOWELL, MASSACHUSETTS

Project: **JACKSON STREET EXTENSION**
Lowell, Massachusetts

To the City of Lowell, Massachusetts (hereinafter called OWNER)

Gentlemen:

The Bidder, in compliance with your invitation for bids for the construction of the proposed project having examined the plans and specifications with related documents as prepared by Vanasse Hangen Brustlin, Inc., and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the project in accordance with the contract documents, within the time set forth therein, and at the prices stated below. This price is to cover all expenses incurred in performing the work required under the contract documents, of which this proposal is a part.

Bidder hereby agrees to commence work under this Contract on or before a date to be specified in a written "notice to proceed" of the OWNER, meet interim specified milestones and to fully complete the Contract by June 30, 2016 as stipulated in the specifications.

Bidder understands that the OWNER reserves the right to reject any or all bids and to waive any informalities in the bidding.

The bidder agrees that this bid shall be good and may not be withdrawn for a period of **30 calendar days** after the scheduled closing time for receiving bids.

Upon receipt of written notice of the acceptance of this bid, bidder will execute the formal contract within 10 days and deliver a Surety Bond or Bonds as required.

The Bid Security attached in the sum of _____

(\$ _____)

is to become the property of the OWNER in the event the contract and bonds are not executed within the time above set forth, as liquidated damages for the delay and additional expense to the OWNER caused thereby.

Bidder acknowledges receipt of the following addendum(s):

Bidder agrees to perform all the work described in the specifications and shown on the plans for the following unit prices:

NOTE: All prices should be written in ink, in words as well as figures, for the entire proposal. In case of discrepancy the amount shown in words will govern.

The CONTRACTOR agrees that its attention has been called to the provisions of the "Reserve System" Ordinance of the City of Lowell, which is now incorporated in "The Code of the City of Lowell, Massachusetts", passed by the City Council on April 26, 1988 and amendments thereto and that each purchase order, so-called, issued in accordance with Section 7 - 76 of Said Code to cover the services to be rendered under this contract shall be made a part hereof by reference. It is further agreed that no obligation shall be considered to have been incurred under this Contract unless and until a purchase order shall have been issued and approved. And further, that the obligation incurred shall be limited to the amount set forth in each purchase order, or purchase orders, duly issued and approved.

The CONTRACTOR further agrees that his attention has been called to the duration of contract on Pages I-4 and SC-2 of this Contract.

BASIS OF AWARD

JACKSON STREET EXTENSION

In accordance with the Specifications, and under the terms and conditions mentioned above, I (We) hereby offer to furnish and deliver to departments described above the following services which shall in all respects meet the attached specifications, as required during the terms mentioned above for the following prices:

TOTAL COST (except police services): _____

IN WORDS: _____

POLICE SERVICES ALLOWANCE: \$2,000

IN WORDS: Two Thousand Dollars

TOTAL COST (Add Total Cost and Police Services) _____

IN WORDS: _____

The BASIS OF AWARD is the lowest responsive and responsible bidder offering the lowest TOTAL COST.

Note 1: The contract unit bid prices shall include all Labor, Materials, Equipment and Incidental costs required to complete this work, except for Police Services, which will be paid for on a reimbursable basis.

Note 2: Bidders are to include a **Two Thousand Dollar (\$2,000) allowance** for the furnishing of police services in their bid (**include in the Total Cost section**).

Signature of Bidder: _____

Print Name and Title: _____

Company Name and Address:

Telephone Number: _____

CERTIFICATION OF COMPLIANCE
G.L.c.30, §39S
PUBLIC CONSTRUCTION MORE THAN \$10,000.00

I certify under the pains and penalties of perjury that:

1. the Contractor is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work;
2. 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 (“OSHA”) that is at least 10 hours in duration and the time the employee begins works and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and
3. that all employees to be employed in the work subject to this bid have successfully completed a course in construction safety and health approved by OSHA that is at least 10 hours in duration.

Signature of Individual or Corporate
Name (Mandatory)

By: Corporate Officer
(Mandatory, if applicable)

Approval of a contract or other agreement will not be granted unless this certification clause is signed by the applicant.

The undersigned offers the following information as evidence of his qualifications to perform the work as bid upon according to all requirements of the Plans and Specifications.

1. Have been in business under present business name of _____

for _____ years.

2. Ever failed to complete any work? _____

3. List one or more recent projects with names of Community and Engineer on which you served as general contractor similar to work required for this project.

| Project and Engineer | Community | Date | Amount |
|----------------------|-----------|------|--------|
|----------------------|-----------|------|--------|

a) _____

b) _____

c) _____

4. Bank Reference _____

The undersigned agrees that, if he is selected as general contractor, he will within ten (10) days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the awarding authority, execute a contract in accordance with the terms of the general bid and furnish a performance bond and also a labor and materials or payment bond, each of 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, the premiums for which are to be paid by the general contractor and are included in the contract price.

The undersigned hereby certifies that he is able to furnish labor and can work in harmony with all other elements of labor employed or to be employed on the work.

Date: _____

(Name of General Bidder)

BY _____
(Signature)

(Title of Signer)

(Business Address)

(City and State)

(Phone Number)

NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

State of _____)

ss

County of _____)

_____ being duly sworn,
deposes and says that:

(1) He is (owner, partner, office representative or agent) of _____

_____ the Bidder that has submitted the
attached bid;

(2) He is fully informed respecting the preparation and contents of the attached bid and of all
pertinent circumstances respecting such bid;

(3) Such bid is genuine and is not a collusive or sham bid;

(4) Neither the said bidder nor any of its officers, partners, owners, agents, representatives,
employees or parties in interest, including this affiant, has in any way colluded, conspired,
connived or agreed, directly or indirectly, with any other Bidder, firm or person to submit a
collusive or sham bid in connection with the Contract for which the attached bid has been
submitted, or to refrain from bidding in connection with such contract, or has in any manner
directly or indirectly, sought by agreement or collusion or communication or conference with
any other Bidder, firm or person to fix the price or prices in the attached bid, or of any other
Bidder; or to fix any overhead, profit or cost element of the bid price, or the bid price of any
other Bidder; or to secure through any collusion, conspiracy, connivance or unlawful agreement
any advantage against the **CITY OF LOWELL** or any person interested in the proposed
Contract; **JACKSON STREET EXTENSION**

(5) The price or prices quoted in the attached bid are fair and proper and are not tainted by
any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of
its agents representatives, owners, employees, or parties in interest, including this affiant.

(Signed)

(Title)

Subscribed and sworn to before me on
this _____ day of _____, 20__

Title

My commission expires _____

A. Contractors' Certification

A contractor will not be eligible for award of a contract unless such contractor has submitted the following certification, which is deemed a part of the resulting contract:

CONTRACTOR'S CERTIFICATION

_____ certifies that:
Contractor

1. It intends to use the following listed construction trades in the work under the contract

_____ ; and

2. Will comply with the minority manpower ratio and specific affirmative action steps contained herein; and

3. Will obtain from each of its subcontractors and submit to the contracting or administering agency prior to the award of any subcontract under this contract the subcontractor certification required by these bid conditions.

(Signature of authorized representative of contractor)

B. Subcontractors' Certification

Prior to the award of any subcontract, regardless of tier, the prospective subcontractor must execute and submit to the Prime Contractor the following certification, which will be deemed a part of the resulting subcontract:

SUBCONTRACTORS' CERTIFICATION

_____ certifies that:
Subcontractor

1. It tends to use the following listed construction trades in the work under the subcontract

_____ ; and

2. Will comply with the minority manpower ratio and specific affirmative action steps contained herein; and

3. Will obtain from each of the subcontractors prior to the award of any subcontract under this subcontract the subcontractor certification required by these bid conditions.

(Signature of authorized representative of subcontractor)

In order to ensure that the said subcontractors' certification becomes a part of all subcontractors under the prime contract, no subcontract shall be executed until an authorized representative of the state agency (or agencies) administering this project has determined, in writing, that the said certification has been incorporated in such subcontract, regardless of tier. Any subcontract executed without such written approval shall be void.

**NOTICE OF REQUIREMENTS FOR AFFIRMATIVE ACTION
TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY
(EXECUTIVE ORDER 11246 AND 41 CFR PART 60-4)**

The following Notice shall be included in, and shall be a part of all solicitations for offers and bids on all Federal and federally assisted construction contracts or subcontracts in excess of \$10,000.

The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

| Timetables | Goals for minority participation for each trade | Goals for female participation for each trade |
|------------|---|---|
| | 7.4% | 6.9% |

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non federally involved construction. The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 604.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is:

State of _____
County of _____
City of _____

**MINIMUM MINORITY PERCENTAGES TO BE APPLIED TO
STATE AND STATE ASSISTED CONTRACTS
WITHIN THE COMMONWEALTH OF MASSACHUSETTS**

The Construction Reform Law, Chapter 193 of the Acts of 2004, and the revisions it made to M.G.L. c. 23A, §44 and M.G.L. c. 7, §40N, include a new municipal affirmative marketing program. Municipalities (hereinafter Awarding Authorities) must now incorporate Minority Business Enterprise (MBE) and Women Business Enterprise (WBE) goals into both their design and construction procurement for municipal contracts for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or public work by any city or town that includes funding provided by the Commonwealth, in whole or in part (such as funding under the School Building Assistance Program, funding in any legislative appropriation, grant awards, reimbursements, municipal commitments to use state funds and the like). To count towards participation the business must be a State Office of Minority and Women Business Assistance (SOMWBA) certified WBE or MBE. Certification as a disadvantaged business enterprise (DBE), certification as an MBE/WBE by any agency other than SOMWBA, or submission of an application to SOMWBA for certification as an MBE/WBE shall not confer MBE or WBE status on a firm for purposes of participation credit. You can access the new law on The General Court of Massachusetts website:

<http://www.mass.gov/legis/laws/mgl/7-40n.htm> and

<http://www.mass.gov/legis/laws/mgl/23a-44.htm>

Affirmative Marketing Participation Goals Each Municipality must enforce the Affirmative Marketing Goals developed by the Division of Capital Asset Management (DCAM) in consultation with SOMWBA as follows:

Design Participation: MBEs (8%) and WBEs (4%)

Construction Participation: MBEs (7.4%) and WBEs (4%)

A list of currently certified MBEs and WBEs in the design and construction fields is available on SOMWBA's website at:

<http://www.somwba.state.ma.us>.

Construction Participation for this Project : MBEs (7.4%) and WBEs (6.9%)

EXHIBIT A

**SCHEDULE FOR PARTICIPATION
BY MINORITY/WOMEN BUSINESS ENTERPRISES**

Project Number _____

Project Location _____

Project Name _____

- A. Filed Sub-bidders utilizing MBE/WBE firms, and MBE/WBE Sub-bidders - attach to Filed Sub-bid.
- B. General Contractor must submit to the Awarding Authority within five (5) working days of the opening of General Bids.

BIDDER CERTIFICATION:

The Bidder agrees that if awarded the contract it will expend at least the amount of the contract set forth below for MBE/WBE participation. For purposes of this commitment, the MBE and WBE designation means that a business has been certified by SOMWBA as either a MBE, WBE or MBE/WBE. The Bidder must indicate the MBE/WBE firms it intends to utilize on the project as follows (attach additional sheets if necessary):

| Company Name & Address | M B E o r W B E | Describe MBE/WBE Scopes of Work (clarify "Labor Only", "Material Only" or "Labor and Material") | If Supplier, Indicate Total Value of Supplies (60% of Total Counts toward Participation) | Total Dollar Value of Participation |
|------------------------|--------------------|---|--|-------------------------------------|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |

MBE Goal: \$ _____ **Total Dollar Value of MBE Commitment:** \$ _____

WBE Goal: \$ _____ **Total Dollar Value of WBE Commitment:** \$ _____

The undersigned hereby certifies that he/she has read the terms and conditions of the contract with regard to MBE/WBE participation and is authorized to bind the Bidder to the commitment set forth above.

Name of Firm _____

Business Address _____

Print Name _____

Authorized Signature _____

Title _____

Telephone No. _____ **Fax No.** _____

Date _____

EXHIBIT B

**LETTER OF INTENT
MINORITY/WOMEN BUSINESS ENTERPRISES PARTICIPATION**

(To be completed by MBE/WBE, and submitted by the General Bidder to the Municipal Affirmative Marketing Construction Officer (AMCO) within five (5) working days of the opening of General Bids or by Filed Sub-bidder with its bid.)

Project Number _____
Project Name _____
Project Location _____
To _____
Name of General Bidder/Sub-bidder _____

Indicate SOMWBA Certification: _____ MBE _____ WBE _____ M/WBE

This firm intends to perform work in connection with the above project.
This firm is currently certified by SOMWBA to perform the work identified below, and has not changed its minority/women ownership, control, or management without notifying SOMWBA within thirty (30) days of such a change.
This firm understands that if the General Bidder/Sub-bidder referenced above is awarded the contract, the Bidder intends to enter into an agreement with this firm to perform the activity described below for the prices indicated. This firm also understands that the above-referenced firm, as General Bidder/Sub-Bidder, will make substitutions only as allowed by the terms of the Contract.
This firm understands that under the terms of the contract, only work actually performed by an MBE/WBE will be credited toward MBE/WBE participation goals, and this firm cannot assign or subcontract out any of its work without prior written approval of the Awarding Authority, and that any such assignment or subcontracting will not be credited toward MBE/WBE participation goals.

MBE/WBE PARTICIPATION

| Section/Item Number (If Applicable) | Describe MBE/WBE Scopes of Work (Clarify "Labor Only", "Material Only" or "Labor and Material") | If Supplier, Indicate Total Value of Supplies (60% of Total Counts Toward Participation) | Dollar Value of Participation |
|--|--|---|--------------------------------------|
| | | | |

Total Dollar Value: \$ _____

Name of MBE/WBE Firm _____

Business Address _____

Print Name _____

Authorized Signature _____

Title _____

Telephone No. _____ **Fax No.** _____

Date _____

EXHIBIT C

**CONTRACTOR PROGRESS PAYMENT REPORT
MINORITY/WOMEN BUSINESS ENTERPRISES PARTICIPATION**

Project Number: _____

Project Name: _____

Project Location: _____

Date: _____

Periodical Payment No.: _____

General Contractor: _____

MBE and/or WBE: _____

One copy of this report is to be submitted for each Minority Business Enterprise (MBE) and/or Women Business Enterprise (WBE) at the time of submitting a request for payment. Copies of the report must be sent to the Minority Business Enterprise (MBE) and/or Women Business Enterprise (WBE) named above and to the municipalities Affirmative Marketing Construction Officer (AMCO). The AMCO will forward a copy of each Contractor Progress Payment Report to SOMWBA on a quarterly basis.

1. The total price to be paid to the above-named Minority Business Enterprise _____ and/or Women Business Enterprise _____: \$ _____
2. The amount remitted to the Minority Business Enterprise and/or Women Business Enterprise as of the above date for work performed under this project: \$ _____
3. Balance due the Minority Business Enterprise and/or Women Business Enterprise as of the above date for work performed under the above-named project: \$ _____
4. Comments or explanation of amounts indicated under items 1 and 2 above:

5. We hereby certify that the information supplied herein (including pages attached) is correct and complete.

General Contractor:

Minority and/or Women Business Enterprise

(Signed)

(Signed)

(Title)

(Title)

(Date)

(Date)

CITY OF LOWELL
AFFIRMATIVE ACTION CONTRACT REQUIREMENTS
CONTRACTORS' CERTIFICATION

NAME OF PROJECT: JACKSON STREET EXTENSION

A contractor will not be eligible for award of a contract unless such contractor has submitted the following certification, which is deemed a part of the resulting contract:

CONTRACTOR'S CERTIFICATION

_____ certifies that

1. It intends to use the following listed construction trades in the work under the contract _____

_____ ; and,

2. Will comply with the minority manpower ratio and specific affirmative action steps contained herein; and

3. Will obtain from each of its subcontractors and submit the contracting or administering agency prior to the award of any subcontract under this contract the subcontractor certification required by these bid conditions.

(Signature of Authorized Representative of Contractor)

CITY OF LOWELL
AFFIRMATIVE ACTION CONTRACT REQUIREMENTS
SUBCONTRACTORS' CERTIFICATION

NAME OF PROJECT: JACKSON STREET EXTENSION

Prior to the award of any subcontract, regardless of tier, the prospective subcontractor must execute and submit to the Prime Contractor the following certification, which will be deemed a part of the resulting subcontract:

SUBCONTRACTOR'S CERTIFICATION

_____ certifies that

1. It intends to use the following listed construction trades in the work under the subcontract _____

_____ ; and,

2. Will comply with the minority manpower ratio and specific affirmative action steps contained herein; and

3. Will obtain from each of the subcontractors prior to the award subcontract under this subcontract, the subcontractor certification required by these bid conditions.

(Signature of Authorized Representative of Contractor)

In order to ensure that the said subcontractor's certification becomes a part of all subcontracts under the Prime Contract, no subcontract shall be executed until an authorized representative of the City administering this project has determined, in writing, that the said certification has been incorporated in such subcontract, regardless of tier. Any subcontract executed without such written approval shall be void.

CITY OF LOWELL
AFFIRMATIVE ACTION CONTRACT REQUIREMENTS
BIDDERS' CERTIFICATION

The bidder hereby certifies he shall comply with the minority manpower ratio and specific action steps contained in the Appendix EEO attached hereto, including compliance with the minority contractor compliance specified in Section V of said Appendix. The contractor receiving the award of the contract shall be required to obtain from each of its subcontractors and submit to the contracting or administering agency prior to the performance of any work under said contract a certification by said subcontractor, regardless of tier, that it will comply with the minority manpower ratio and specific affirmative action steps contained in the Appendix EEO.

Signature of Bidder

Name of Firm

Title

Date

CERTIFICATION REGARDING LOBBYING
(This Certification is required pursuant to 31 U.S.C. 1352)

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$11,000 and not more than \$110,000 for each such failure.

Please check appropriate box.

- No nonfederal funds have been used or planned to be used for lobbying in connection with this application /award/contract.
- or
- Attached is Standard Form LLL, "Disclosure of Lobbying Activities," which describes the use (past or planned) of nonfederal funds for lobbying in connection with this application/award/contract.

Executed this _____ day of _____, 20 _____

By _____
(Type or Print Name)

(Title of Executing Officer)

(Signature of Executing Official)

(Name of Organization/Applicant)

CONTRACT CLAUSE NEW RESTRICTIONS ON LOBBYING

This contract, subcontract, or subgrant is subject to Section 319 of Public Law 101-121, which added section 1352, regarding lobbying restrictions, to Chapter 13 of Title 31 of the United States Code. The new section is explained in the common rule, 15 CFR Part 28 (55 FR 6736-6748, 2/26/90). Each bidder/applicant/recipient of this contract subcontract, or subgrant and subrecipients are generally prohibited from using Federal funds for lobbying the Executive or Legislative Branches of the Federal Government in connection with this Award.

Contract Clause Threshold

This Contract Clause regarding lobbying must be included in each application for a subgrant and in each bid for a contract or subcontract exceeding \$100,000 of Federal funds at any tier under the Federal Award.

Certification and Disclosure

Each applicant/recipient of a subgrant and each bidder/applicant/ recipient of a contract or subcontract exceeding \$100,000 of Federal funds at any tier under the Federal Award must file a "Certification Regarding Lobbying" and, if applicable, Standard Form LLL, "Disclosure of Lobbying Activities," regarding the use of any nonfederal funds for lobbying. Certifications shall be retained by the next higher tier. All disclosure forms, however, shall be forwarded from tier to tier until received by the Recipient of the Federal Award (grant), who shall forward all disclosure forms to the Federal agency.

Continuing Disclosure Requirement

Each subgrantee, contractor, or subcontractor that is subject to the Certification and Disclosure provision of this Contract Clause is required to file a disclosure form at the end of each calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed by such person. Disclosure forms shall be forwarded from tier to tier until received by the Recipient of the Federal Award (grant) who shall forward all disclosure forms to the Federal agency.

Indian Tribes, Tribal Organizations, or Other Indian Organizations

Indian tribes, tribal organizations, or any other Indian organizations, including the Alaskan Native organizations, are excluded from the above lobbying restrictions and reporting requirements, but only with respect to expenditures that are by such tribes or organizations for lobbying activities permitted by other Federal law. An Indian tribe or organization that is seeking an exclusion from Certification and Disclosure requirements must provide (preferably in an attorney's opinion) EDA with the citation of the provision or provisions of Federal law upon which it relies to conduct lobbying activities that would otherwise be subject to the prohibitions in and to the Certification and Disclosure requirements of Section 319 of Public Law No. 101-121. Note, also, that a non-Indian subgrantee, contractor, or subcontractor under an award (grant) to an Indian tribe, for example, is subject to the restrictions and reporting requirements.

DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352
(See reverse for public burden disclosure.)

Approved by OMB
0348-0046

| | | |
|--|---|--|
| 1. Type of Federal Action: <input type="checkbox"/> a. contract <input type="checkbox"/> b. grant <input type="checkbox"/> c. cooperative agreement <input type="checkbox"/> d. loan <input type="checkbox"/> e. loan guarantee <input type="checkbox"/> f. loan insurance | 2. Status of Federal Action: <input type="checkbox"/> a. bid/offer/application <input type="checkbox"/> b. initial award <input type="checkbox"/> c. post-award | 3. Report Type: <input type="checkbox"/> a. initial filing <input type="checkbox"/> b. material change For Material Change Only: year _____ quarter _____ date of last report _____ |
| 4. Name and Address of Reporting Entity: <input type="checkbox"/> Prime <input type="checkbox"/> Subawardee Tier _____, if known: Congressional District, if known: 4c | 5. If Reporting Entity in No. 4 is a Subawardee, Enter Name and Address of Prime: Congressional District, if known: | |
| 6. Federal Department/Agency: | 7. Federal Program Name/Description: CFDA Number, if applicable: _____ | |
| 8. Federal Action Number, if known: | 9. Award Amount, if known: \$ | |
| 10. a. Name and Address of Lobbying Registrant <i>(if individual, last name, first name, MI):</i> | b. Individuals Performing Services <i>(including address if different from No. 10a)</i> <i>(last name, first name, MI):</i> | |
| 11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure. | Signature: _____ Print Name: _____ Title: _____ Telephone No.: _____ Date: _____ | |
| Federal Use Only: | | Authorized for Local Reproduction Standard Form LLL (Rev. 7-97) |

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.

(b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).
11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503.

CONTRACT

THIS AGREEMENT, made this the _____ day of _____,
20____, by and between the City of Lowell, Massachusetts acting herein through its
Commissioner of the Public Works Department, hereinafter called "OWNER" and
*(1)_____

an individual doing business as, a partnership, a corporation of the _____

Hereinafter called "Contractor".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the OWNER, the CONTRACTOR hereby agrees with the OWNER to commence and complete the construction of Contract described as follows: **JACKSON STREET EXTENSION** hereinafter called the Project for the sum of

_____ Dollars (\$)_____

and all extra work in connection therewith, under the terms as stated in the General and Special Conditions of the Contract; and at his/her (its or their) own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance and other accessories and services necessary to complete the said Project in accordance with the conditions and prices stated in the Proposal, the General and Special Conditions of the Contract, the Plans, which include all maps, plates, blue prints, and other drawings and printed or written explanatory matter thereof, the Specifications and contract documents therefore as prepared by Vanasse Hangen Brustlin, Inc on behalf of the City of Lowell, City Engineer herein entitled "Engineer", and as herein enumerated all of which are made a part hereof and collectively evidence and constitute the contract.

The Contractor hereby agrees to commence work under this Contract on or before a date to be specified in a written "Notice to Proceed" of the OWNER, to meet interim specified milestones and to fully complete the project **600** Consecutive calendar days thereafter.

The OWNER agrees to pay the CONTRACTOR in current funds for the performance of the Contract, subject to additions and deductions, as provided in the General Conditions of the Contract, and to make payments on account thereof as provided in Paragraph 25, "Progress Payments", of the General Conditions.

IN WITNESS WHEREOF, the parties to these presents have executed this Contract in five (5) counterparts, each of which shall be deemed an original, in the year and day first above mentioned.

ATTEST:

Secretary

CITY OF LOWELL, MASSACHUSETTS

Witness

BY _____
City Manager, Kevin J Murphy

Secretary

Contractor

BY _____
Witness

Address

APPROVED AS TO FORM

City Solicitor, Christine P. O'Connor

BY _____
Chief Procurement Officer, P.M. Vaughn

APPROVED AS TO AVAILABILITY OF FUNDS

City Auditor, Sheryl Wright

X (1) Strike out inapplicable terms. Secretary of the OWNER should attest. If Contractor is corporation, Secretary should attest. Give proper title of each person executing Contract.

DUAL OBLIGEE RIDER

TO BE ATTACHED TO AND MADE A PART OF PERFORMANCE AND
PAYMENT BONDS NO. _____
ISSUED BY _____ (SURETY) ON BEHALF
OF _____ (PRINCIPAL) IN
THE AMOUNT OF _____
_____ (\$ _____) AND DATED _____
IN FAVOR OF _____ (OBLIGEE).

In consideration of \$1.00 and other valuable consideration the receipt whereof is acknowledged,
the name (s) of _____ shall be added to said Bonds as a named
Dual Obligee.

The Dual Obligee shall have the same rights and be subject to the same conditions and
obligations as the original Obligee under the Bonds. Nothing in this Dual Obligee Rider shall be
interpreted to extend or increase the liability of the Surety beyond that provided by the Bonds.
At Surety's election, any payment due either Obligee may be made by its check issued jointly to
both.

(Principal)

By: _____

(Obligee)

By: _____

(Surety)

By: _____

(Dual Obligee)

By: _____

PERFORMANCE BOND

Bond Number: _____

Contract Number: _____

CONTRACTOR PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, That We,

_____, a _____ corporation, as Surety
("Surety"), are held firmly bound unto _____
("Owner") and such other obligees as listed in the attached Obligee Rider (Owner
and such other obligees are together referred to as the "Obligees"), in the sum of
_____ Dollars (\$ _____) for payment of which well and truly
to be made we bind ourselves, our heirs, executors, successors and assigns, jointly
and severally, firmly by these presents.

WHEREAS, Principal has entered into a contract with Owner dated _____
("Contract"), requiring Principal to furnish, install and perform the work on the
_____ ("Project"), all as more fully described and
detailed in the Contract; the provisions, terms and conditions of the Contract, being
fully incorporated herein and made part of this Bond with the same force and effect
as if fully set forth herein;

NOW, THEREFORE, the condition of this obligation is such that if the Principal
shall faithfully perform and fulfill the Contract in the manner and at the times
required by the Contract, and shall fully indemnify and save the Obligees harmless
from all liability, cost, damage, expense, delay and/or schedule related damages,
liquidated damages, and attorneys' fees and expenses related to the Principal's default
(such attorneys' fees and expenses include, without limitation, the costs and fees
associated with any mediation, arbitration, and litigation proceeding, and any effort
to realize or execute on any award), which the Obligees may suffer by reason of
Principal's default under the Contract, and if the Principal shall fully reimburse and
repay the Obligees for making good any such default, including but not limited to
guaranty and warranty obligations and claims, then this obligation shall be null and
void; otherwise it shall remain in full force and effect.

The Surety, for value received, agrees that no change, extension of time, alteration,
addition, omission and/or any other modification to the Contract, to the Plans or
Specifications referenced therein, or to any of the work to be performed thereunder,
nor any forbearance on the part of either the Principal or the Obligees shall in any
way impair or affect its obligations under this Bond and hereby waives notice of any
and all such changes, extensions of time, alterations, additions, omissions and/or any
other modifications or any forbearance on the part of either the Principal or
Obligees.

In addition, the Surety, for value received, agrees that in the event that the Principal is declared by Owner to be in default of the Contract, the Surety shall, within twenty calendar days of written notice of Owner's election:

commence and then continue to promptly complete the Contract in accordance with its terms and conditions; or

obtain a bid or bids for submission to Owner for completion of the Contract in accordance with its terms and conditions, and upon determination by Owner of the lowest responsible and acceptable bidder for such work, arrange for a contract between such bidder and Owner in a form and under terms and conditions which are acceptable to Owner, and make available as the work progresses (even should there be a default or a succession of defaults under the contract or contracts of completion arranged under this subparagraph) sufficient funds to pay for the costs of completion of the Contract work and the other costs and damages for which the Surety may be liable hereunder, less the Balance of the Contract Price. As used in this Subparagraph "Balance of the Contract Price" shall mean the total amount payable by Owner to the Principal under the Contract and any amendments thereto as shown on the most recent application for payment or requisition submitted by Principal and approved by Owner in the immediate month preceding the default declared by Owner, less the amount previously paid by Owner and less other offsets or credits due Owner from the Principal under the Contract or otherwise.

Should the Surety fail to so promptly perform Owner's election, Owner shall have the right, in its sole discretion and without further notice to the Surety, to arrange for full completion of the Contract Work and the Surety shall, in addition to its other obligations and liabilities, be liable for all costs and expenses related to such completion of the Contract Work.

The Surety's obligations under this Bond shall not be satisfied by, and the amount of this Bond shall not be reduced or limited by, any payments made by Surety to or on behalf of subcontractors, suppliers, claimants or other creditors of Principal or to any claimant under any payment or lien bond issued for or on behalf of Principal related to the Project.

No right of action shall accrue under this Bond to or for the use of any person or corporation other than the Obligees or their successors or assigns.

Surety shall be liable to the Obligees for all liabilities, costs, damages, expenses, delay and/or schedule related damages, liquidated damages, and attorneys' fees and expenses related to the Principal's default. Such attorneys' fees and expenses include, without limitation, the costs and fees associated with any mediation, arbitration, and litigation proceeding (and any effort to realize or execute on any award), which the Obligees may suffer by reason of Principal's default under the Subcontract and/or in the Obligees' enforcement of their rights under this Performance Bond.

Judgment and/or arbitration award in favor of any Obligee against the Principal shall be fully binding on the Surety, including, without limitation, an assessment of punitive or statutory damages of any kind arising from the actions of the Principal.

IN WITNESS WHEREOF, the Principal and Surety have hereunto executed this Bond as an instrument under Seal executed by a duly authorized representative below as of the _____ day of _____, 2010.

PRINCIPAL

SURETY

By: _____

By: _____

Printed Name:

Printed Name:

Its Duly Authorized:

Its Duly Authorized Attorney In Fact

ATTEST: _____

ATTEST: _____

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute Bond.

PAYMENT BOND

Bond Number: _____
Contract Number: _____

CONTRACTOR PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, That We,
_____ ("Principal"), and

_____, a _____ corporation, as Surety ("Surety"), are held firmly bound unto _____ ("Owner") and such other Obligees as listed in the attached Dual Obligee Rider (Owner and such Obligees are together referred to as the "Obligees), in the sum of _____ Dollars (\$ _____) for payment of which well and truly to be made we bind ourselves, our heirs, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Owner and Principal have entered into a Contract dated _____, 201__, requiring Principal to furnish, install and perform the work on the Project ("Contract"), all as more fully described and detailed in the Contract; the provisions, terms and conditions of the Contract being fully incorporated herein and made part of this Bond with the same force and effect as if fully set forth herein;

NOW, THEREFORE, the condition of this obligation is such that if the Principal shall promptly pay persons having just claims for (a) labor, materials, services, insurance, supplies, machinery, equipment, rentals, fuel, oils, implements, tools, and/or appliances and any other items of whatever nature, furnished for, used or consumed in prosecution of the Subcontract work and all any all modifications thereto, whether lienable, non-lienable and whether or not permanently incorporated in said work; (b) pensions, welfare, vacation and/or any supplemental employee benefit contributions payable under collective bargaining agreements with respect to persons employed upon said work; (c) federal, state, and local taxes and contributions required by law to be withheld and or paid with respect to the employment of persons upon said work; and (d) otherwise fully indemnify and save the Obligees harmless from and against any claims or liens asserted by any party as a result of payment claimed due or concerning the Contract, including attorneys' fees and expenses; then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety, for value received, agrees that no change, extension of time, alteration, addition, omission and/or any other modification to the Contract or to any of the work to be performed thereunder or any forbearance on the part of either the Principal or the Obligees shall in any way impair or affect its obligations under this Bond and hereby waives notice of any and all such changes, extensions of time, alternations, additions, omissions and/or any other modifications or any forbearance on the part of either the Principal or the Obligees.

The Principal and the Surety, for value received, agree that this Bond shall inure to the benefit of all persons with just claims as aforesaid whether or not they have any direct contractual relationship with the Principal, as well as to the benefit of the Obligees, and that such persons may maintain independent actions based upon this Bond in their names.

IN WITNESS WHEREOF, the Principal and Surety have hereunto executed this Bond as an instrument under Seal executed by a duly authorized representative below as of the _____ day of _____, 201__.

PRINCIPAL

SURETY

By: _____

By: _____

Printed Name:

Printed Name:

Its Duly Authorized:

Its Duly Authorized Attorney In Fact

ATTEST:

ATTEST:

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute Bond.

CONTRACT

CERTIFICATE OF OWNER'S ATTORNEY

I, the undersigned
the duly authorized and acting legal representative, of the City of Lowell,
Massachusetts,

do hereby certify as follows:

I have examined the foregoing Contract and surety bonds and the manner of

execution thereof, and I am of the opinion that each of the aforesaid agreements has been

duly executed by the proper parties thereto acting through their duly authorized

representatives; that said representatives have full power and authority to execute said

agreements on behalf of the respective parties named thereon; and that the foregoing

agreements constitute valid and legally binding obligations and provisions thereof.

Date: _____

GENERAL CONDITIONS

SUBSECTION

1. Definitions
2. Notice
3. Intent
4. Codes, Regulations and Issue Date of Standard Specifications
5. Drawings and Specifications
6. Conflicting Conditions
7. Samples
8. Quality of Equipment and Materials
9. Shop Drawings
10. Equipment and Material Approval
11. Rejected Work and Materials
12. Separate Contracts
13. Rights of Various Interests
14. Notice to Proceed
15. Time for Completion and Liquidated Damages and Incentives
16. The Contractor's Duties and Rights
17. The Engineer's Authority
18. The Owner's Duties and Rights
19. Assignment
20. Oral Agreements
21. Insurance
22. Contract Security
23. Extra Work
24. Extension of Contract Time
25. Progress Payments
26. Acceptance and Final Payment
27. Correction of Faulty Work after Final Payment
28. Substitutions and Deletions
29. Provisions Required by Law Deemed Inserted
30. Protection of Lives and Health
31. Obstructions Encountered
32. Standard Specifications

GENERAL CONDITIONS

1. DEFINITIONS

1. CONTRACT AND CONTRACT DOCUMENTS

The Contract comprises the following documents, including all additions, deletions and modifications incorporated therein before the execution of the Contract:

- a. Legal and Procedural Documents
 - 1) Invitation to Bid
 - 2) Information for Bidders
 - 3) Bid Proposal
 - 4) Certifications of Bidders
 - 5) Contract Agreement
 - 6) Performance Bond
 - 7) Payment Bond
 - 8) Certificate of OWNER'S Attorney
 - 9) Form for Sub-bid (when required)
- b. General Conditions
- c. Special Conditions
- d. Technical Specifications, Drawings, and Addenda as enumerated in the Special Conditions

2. ENGINEER: City of Lowell, City Engineer or Vannasse Hangen Brustlin, Inc.

3. STATE: The Commonwealth of Massachusetts

4. OWNER, AWARDING AUTHORITY OR MUNICIPALITY: The party of the first part designated in the Contract or any board, officer or agent duly authorized to act for the said party of the first part in the matter covered by the Contract. The OWNER is the City of Lowell, acting through its Commissioner of the Department of Public Works.

5. CONTRACTOR: The General Contractor, and is the CONTRACTOR, and is the CONTRACTOR named in the Contract Documents.

6. SUBCONTRACTOR: Any person, firm or corporation with a direct contract with the CONTRACTOR who acts for or in behalf of the CONTRACTOR in executing any part of the Contract, but does not include one who merely furnishes material.

7. **WORK ON (AT) THE PROJECT:** Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the CONTRACTOR and any Subcontractor.

8. **DIRECTED, REQUIRED APPROVED, ACCEPTABLE:** Whenever they refer to the work or its performance, “Directed”, “Required”, “Permitted”, “Ordered”, “Designated”, “Prescribed” and words of like import shall imply the direction, requirement, permission, order, designation or prescription of the ENGINEER, and “Approved”, “Acceptable”, “Satisfactory”, “In the Judgement of” and words of like import shall mean approval by, or acceptable to, or satisfactory to or in the judgement of the ENGINEER.

9. **PROPOSAL:** The offer of a bidder to perform the work described by the Contract Documents when made out and submitted on the prescribed form properly signed and guaranteed.

10. **PROPOSAL GUARANTEE:** The bid deposit accompanying the proposal submitted by the bidder, as a guaranty that the bidder will enter into a Contract with the OWNER for the construction of the work if the Contract is awarded to him.

11. **CONTRACT:** The agreement covering the performance of the work described in the Contract Documents and Plans including all supplemental agreements thereto and all general and special provisions pertaining to the work or materials therefor.

12. **PERFORMANCE AND PAYMENT BONDS:** the approved forms of security furnished by the CONTRACTOR and his Surety as a guaranty of good faith on the part of the CONTRACTOR to execute the work in accordance with the terms of the Contract.

13. **SURETY:** The person, firm or corporation who executes the CONTRACTOR’S Performance and Payment Bonds.

14. **SPECIFICATIONS:** The Legal and Procedural Documents, General Conditions, Special Conditions and Technical Specifications with all addenda thereto.

15. **DRAWINGS:** Those listed herein in the Special Conditions.

16. **PROVIDE:** Furnish and install.

17. **SHOP DRAWINGS:** Fabrication and erection drawings and instructions.

18. **ACT OF GOD:** An earthquake, flood, cyclone, or other cataclysmic phenomenon of nature. Rain, wind, flood, or other natural phenomenon of normal

intensity for the locality shall not be construed as and Act of God and no reparation shall be made to the CONTRACTOR for damages to the work resulting therefrom.

19. **EXTRA WORK:** Work other than that required either expressed or implied by the Contract in its present form.

20. **SITE:** The area upon or in which the CONTRACTOR'S operations are carried on and such other areas adjacent thereto as may be designated as such by the ENGINEER.

21. **CHANGE ORDER:** A written order issued by the ENGINEER to the CONTRACTOR directing certain changes, additions, or reductions in the work or in the materials or methods to be used.

2. NOTICE

Written notice shall be considered as served when delivered in person or sent by certified mail to the individual, firm or corporation or to the last business address known to him who serves the Notice. It shall be the duty of each party to advise the other parties to the Contract as to any change in his business address until completion of the Contract.

3. INTENT

1. The intent of the Contract Documents is that the CONTRACTOR shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every nature, and all other services and facilities of every nature whatsoever necessary to execute, complete, and deliver the work within the specified time.

2. Any work performed after regular working hours, on Sundays or Legal Holidays, shall be performed without additional expense to the OWNER.

4. CODES, REGULATIONS AND ISSUE DATE OF STANDARD SPECIFICATIONS.

1. Where standard specifications, codes, regulations and similar publications of governmental agencies, technical societies, manufacturer's associations and regulatory groups or bureaus are referred to in these specifications, the applicable portion thereof shall be of the same effect as if fully printed herein, and the work done in full accordance therewith. The edition current as of the date of issue of this specification shall be used except where publication date is specifically stated.

5. DRAWINGS AND SPECIFICATIONS

1. Except as provided for otherwise, all required copies of Drawings and Specifications necessary for the execution of the work shall be furnished to the CONTRACTOR without charge. One complete set of all Drawings and Specifications shall be maintained at the job site and shall be available to the ENGINEER at all times.

2. All Drawings and Specifications and other data prepared by the ENGINEER shall remain the property of the ENGINEER, and they shall not be re-used on other work.

3. Figured dimensions on the Plans will be used in preference to scaling the Drawings. Where the work of the CONTRACTOR is affected by finish dimensions, these shall be determined by the CONTRACTOR at the site, and he shall assume the responsibility therefor.

4. Any discrepancies found between the Drawings and Specifications and site conditions of any errors or omissions in the Drawings and Specifications shall be immediately reported to the ENGINEER, who shall promptly correct such error or omission in writing. Any work done by the CONTRACTOR after his discovery of such discrepancies, errors or omissions without notifying the ENGINEER shall be done at the CONTRACTOR'S risk.

6. CONFLICTING CONDITIONS

1. Anything shown on any plans and not mentioned in the Specifications, or mentioned in the Specifications and not shown on the Plans, shall have the same effect as if shown or mentioned respectively on both. On the Plans, the dimensions shown shall govern in case of any discrepancy between a scaled distance and the figures shown. Either party shall take advantage of any obvious error or omission in the contract documents. Any apparent discrepancies shall be submitted to the ENGINEER for determination. The decision of the ENGINEER thereupon shall be conclusive.

2. The fact that specific mention of a fixture, or any part of the work is omitted in the Specifications, whether intentionally or otherwise, when the same is clearly shown or indicated on the Plans, or is usually and customarily required to complete fully such work as is specified herein, will not entitle the CONTRACTOR to consider action in the manner of any claim for extra compensation, but the same fixtures or work, or both, must be installed or done the same as if called for by both the Plans and Specifications.

7. SAMPLES

All samples called for in the Specifications or required by the ENGINEER shall be furnished by the CONTRACTOR at his expense and shall be submitted to the ENGINEER for his approval. Samples shall be furnished so as not to delay fabrication, allowing the ENGINEER reasonable time for the consideration of the samples submitted. CONTRACTOR shall furnish such samples of materials, and workmanship shall be in accordance with approved samples.

8. QUALITY OF EQUIPMENT AND MATERIALS

1. Everything furnished and provided shall be new and all materials and equipment shall be of the quality specified. All unspecified materials and equipment shall be equal in grade and quality to specified materials.

2. In order to establish standards of quality, ENGINEER has, in the detailed Specifications, referred to certain products by name and catalog number. This procedure is not to be construed as eliminating from competition other products of equal or better quality by other manufacturers where fully suitable in design.

3. The CONTRACTOR shall furnish one complete list of proposed desired substitutions prior to signing of the Contract, together with such engineering catalog data and sketches the ENGINEER may require.

4. The CONTRACTOR shall abide by the ENGINEER'S judgement when proposed substitute materials or items or equipment are judged to be unacceptable and shall furnish the specified materials or item of equipment in such cases. All proposals for substitutions shall be submitted in writing by the General CONTRACTOR and not by individual trades or material suppliers. The ENGINEER will approve or disapprove proposed substitutions in writing within a reasonable time. No substitute materials shall be used unless approved in writing.

9. SHOP DRAWINGS

1. The Contractor shall submit shop drawings and working drawings for all items fabricated or manufactured to be incorporated into the work, including but not limited to concrete reinforcement, structural details, piping layouts (including hangers and supports), manholes and appurtenances, wiring, materials fabricated especially for the Contract, all mechanical equipment without exception, and materials and equipment for which such drawings are specifically requested. All submittal of shop drawings will consist of six (6) BLACK LINE prints and one transparent ozalid.

2. Such Drawings shall show the principal dimensions, weight structural and operating features, space required, clearances, type and/or brand of finish or shop coat, grease fittings, etc., depending on the subject of the Drawings. When it is customary to do so, when the dimensions are of particular importance, or when so

specified, the Drawings shall be certified by the manufacturer or fabricator as correct for the Contract.

3. When so specified or if considered by the ENGINEER to be acceptable, manufacturer's specifications, catalog data, descriptive matter, illustrations, etc., may be submitted for approval in place of shop and working drawings. In such case the requirements shall be as specified for shop and working drawings, insofar as applicable.

4. The CONTRACTOR shall be responsible for the prompt and timely submittal of all shop and working drawings so that there shall be no delay to the work due to the absence of such drawings.

5. No material or equipment shall be purchased or fabricated especially for the Contract until the required shop and working drawings have been submitted as hereinabove provided and approved as conforming to the Contract requirements. All such materials and equipment and the work involved in their installation or incorporation into the work shall then be as shown on and represented by said drawings.

6. Until the necessary approval has been given, the CONTRACTOR shall not proceed with any portion of the work (such as the construction of foundations), the design or details of which are dependent upon the design or details of work, materials, equipment or other features for which approval is required.

7. All shop and working drawings shall be submitted to the ENGINEER by and /or through the CONTRACTOR, who shall be responsible for obtaining shop and working drawings from drawings from his subcontractors and returning approved drawings to them. All drawings shall be clearly marked with the names of the OWNER, CONTRACTOR, and building, equipment, or structure to which the drawing applies, and shall be suitably numbered. Each shipment of drawings shall be accompanied by a letter of transmittal giving a list of the drawing numbers and the names mentioned above.

8. Only drawings which have been checked and corrected by the fabricator should be submitted to the CONTRACTOR by his subcontractors and vendors. Prior to submitting drawings to the ENGINEER, the CONTRACTOR shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the Drawings and Specifications in all respects. **ALL DRAWINGS WHICH ARE CORRECT SHALL BE MARKED WITH THE DATE, CHECKER'S NAME AND SUBMITTED TO THE ENGINEER: OTHER DRAWINGS SHALL BE RETURNED FOR CORRECTION.**

9. The approval of shop and working drawings, etc., will be general only and shall not relieve or in any respect diminish the responsibility of the CONTRACTOR for details of design, dimensions etc., necessary for proper fitting and construction of the work as required by the Contract and for achieving the result and performance specified thereunder.

10. Should the CONTRACTOR submit for approval equipment that requires modifications to the structures, piping, layout, etc., detailed on the Drawings, he shall also submit for approval details of the proposed modifications. Any modifications to structures or substitute designs submitted for approval must carry the stamp of a Registered Professional ENGINEER with the State. If such equipment and modifications are approved, the CONTRACTOR, at no additional cost to the OWNER, shall do all work necessary to make such modifications.

11. One marked-up transparent ozalid copy of the shop and working drawings or two marked-up copies of catalog cuts will be returned to the CONTRACTOR. The CONTRACTOR shall furnish additional copies of such drawings or catalog cuts when so requested.

10. EQUIPMENT AND MATERIAL APPROVAL

1. As soon as practical and within fifteen (15) days after date of award of Contract and before any materials, fixtures or equipment are purchased, the CONTRACTOR shall furnish three copies of complete catalog data for every manufactured item of equipment and all components to be used in the work, including specific performance data, material description, rating, capacity, working pressure and general type. This submittal shall be compiled by the CONTRACTOR and approved by the ENGINEER before any of the equipment is ordered. Each data sheet or catalog in the submittal shall be indexed according to specifications section and paragraph for easy reference.

2. If prior to the expiration of the above specified period or of any authorized extension thereof, the CONTRACTOR fails to submit a list of materials, fixtures and equipment as specified above, the selection made by the ENGINEER shall be final and binding and all items shall be furnished and installed by the CONTRACTOR without change in contract price or time of completion.

3. Where conformance to any standard is specified, the catalog data for that item shall state that the item conforms to that standard; or after the ENGINEER'S approval of the item subject to conformance to the standard, the CONTRACTOR shall furnish a notarized affidavit on the manufacturer's letterhead signed by an officer certifying compliance to the standard. The CONTRACTOR shall stamp all such affidavits by which it is understood that the item certified is the item provided.

4. The name and address of and organization authorized by the manufacturer to service each item of equipment shall be included with the submittal. Proof of authorization shall be furnished on request. If the ENGINEER decides that the service organization is too far distant for practical servicing, such equipment shall be rejected.

5. After written approval, this submission shall become a part of the Contract, and may not be deviated from except upon written approval of the ENGINEER.

6. Catalog data for equipment approved by the ENGINEER does not in any case supersede the ENGINEER'S Contract Documents. The approval of the ENGINEER shall not relieve the CONTRACTOR from responsibility for deviations from Drawings or Specifications unless he has in writing called to the ENGINEER'S attention such deviations at the time of submission, nor shall it relieve him from responsibility for errors of any in the items submitted. The CONTRACTOR shall check the work described by the catalog data with the ENGINEER'S Contract Documents for deviations and errors.

7. It shall be the responsibility of the Contractor to ensure that items to be furnished fit the space available. He shall make necessary field measurements to ascertain space requirements, including those for connections, and shall order such sizes and shapes of equipment that the final installation shall suit the true intent and meaning of the Drawings and Specifications.

8. Where equipment requiring different arrangement of connections from those shown is approved, it shall be the responsibility of the CONTRACTOR to install the equipment to operate properly and in harmony with the intent of the Drawings and Specifications, and to make all changes in the work required by the different arrangement of connections.

9. Manufactured articles, material and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer unless herein specified to the contrary.

10. After the execution of the Contract, substitution of equipment of makes other than those named in the Contract will be considered only if the equipment proposed for substitution is equal in construction and/or efficiency to that named in the Contract. It will be assumed that the cost to the CONTRACTOR of the equipment proposed to be substituted is less than the equipment named in the Contract and if the substitution is approved, the Contract Price shall be reduced a corresponding amount.

To receive consideration, requests for substitution must be accompanied by documentary proof of the actual difference in cost to the CONTRACTOR in the form of certified copies of Equipment Company's quotation to the CONTRACTOR covering the original equipment and also equipment proposed for substitution or other proof satisfactory to the OWNER. It is the intention that the OWNER shall receive the full benefit of the savings in cost involved in any substitution. In all cases the burden of proof that the equipment offered for substitution is equal or superior in construction and/or efficiency to that named in the Contract shall rest on the CONTRACTOR, and unless the proof is satisfactory to the OWNER, the substitution will not be approved. Requests for substitution on the grounds that better delivery can be obtained on the equipment proposed for substitution will not

be approved for it will be assured that the CONTRACTOR in his proposal has named equipment on which he has received proposals from equipment manufacturers giving a delivery time which will permit completion of the project within the contract time. Requests for substitution of equipment which the CONTRACTOR can not prove to the satisfaction of the OWNER to be equal or superior in construction and/or efficiency to that so named in the Contract will not be approved.

In the event that the CONTRACTOR obtains the ENGINEER'S approval on equipment other than that which is shown on the Plans and specified herein, the CONTRACTOR shall, at his own expense, make any changes in the structures, buildings or piping necessary to accommodate the equipment.

11. REJECTED WORK AND MATERIALS

1. All materials which do not conform to the requirements of the Contract Documents, are not equal to samples approved by the ENGINEER, or are in any way unsatisfactory or unsuitable for the purpose for which they are intended, shall be rejected. Any defective work, whether the result of poor workmanship, use of defective materials, damage through carelessness or any other cause, shall be removed within ten (10) days after written notice is given by the ENGINEER, and the work shall be re-executed by the CONTRACTOR. The fact that such defective work may not have been reported on previous inspections shall not constitute an acceptance of any part of it.

2. Should the CONTRACTOR fail to remove rejected work or materials within ten (10) days after written notice to do so, the OWNER may remove the rejected work and then may store the materials.

3. The removal of rejected work or materials and storage of materials by the OWNER shall be paid for by the CONTRACTOR within thirty (30) days after the written notice to pay is given by the OWNER. If the CONTRACTOR does not pay the expense of such removal and after ten (10) days written notice being given by the OWNER of his intent to sell the materials, the OWNER may sell the materials at auction or at a private sale and shall pay to the CONTRACTOR the net proceeds therefrom after deducting all the costs and expenses that should have been borne by the CONTRACTOR.

12. SEPARATE CONTRACTS

The OWNER may let other contracts in connection with the work of the CONTRACTOR. The Contractor shall cooperate with other CONTRACTORS with regard to storage of materials and execution of their work. It shall be the CONTRACTOR'S responsibility to inspect all work by other CONTRACTORS affecting his work and to report to the ENGINEER any irregularities which will not permit him to complete his work in a satisfactory manner. His failure to notify the ENGINEER of such irregularities shall indicate the work of other CONTRACTORS has been satisfactorily completed to receive his work. The CONTRACTOR shall

not be responsible for defects of which he could not have known which develop in the work of others after the work is completed. It shall be the responsibility of the CONTRACTOR to measure the completed work in place and report to the ENGINEER immediately any difference between completed work by others and the Drawings.

13. RIGHTS OF VARIOUS INTERESTS

Whenever work being done by the OWNER'S forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the ENGINEER, to secure the completion of the various portions of the work in general harmony.

14. NOTICE TO PROCEED

Following the execution of the Contract by the OWNER, Written Notice to Proceed with the work shall be given to the CONTRACTOR. Computation of Contract Time shall commence on a date to be specified in the Notice to Proceed and every calendar day following, except as herein provided, shall be counted in the time for completion.

15. TIME FOR COMPLETION, LIQUIDATED DAMAGES AND INCENTIVES

1. It is hereby understood and mutually agreed by and between the CONTRACTOR and the OWNER, that the date of beginning and the time for completion as specified in the Information to Bidders of the Work to be done hereunder are ESSENTIAL CONDITIONS of this Contract; and it is further mutually understood and agreed that the work embraced in this Contract shall commence on a date to be specified in the "NOTICE TO PROCEED".

2. The CONTRACTOR agrees that said work shall be prosecuted regularly, diligently, and uninterruptedly at such rate of progress as will ensure full completion thereof within the time specified. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

3. If the said CONTRACTOR shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extensions thereof granted by the OWNER, then the CONTRACTOR does hereby agree, as a part consideration for the awarding of this Contract, to pay to the OWNER the **\$1,000 per day**, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the CONTRACTOR shall be in default after the time stipulated in the Contract for completing the work.

4. The said amount (\$1,000 per day) is fixed and agreed upon by and between the CONTRACTOR and the OWNER because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the OWNER would in such event sustain, and said amount is agreed to be the amount of damages which the OWNER would sustain and said amount shall be retained from time to time by the OWNER from current periodic estimates.

5. It is further agreed that time is of the essence of each and every portion of this Contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the Contract and additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this Contract. Provided, that the CONTRACTOR shall not be charged with liquidated damages or any excess cost when the OWNER determines that the CONTRACTOR is without fault and the CONTRACTOR'S reasons for the time extension are acceptable to the OWNER: provided, further, that the CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due;

(a) To any preference, priority or allocation order duly issued by the Government;

(b) To unforeseeable cause beyond the control and without the fault or negligence of the CONTRACTOR, including, but not restricted to Acts of God, or of the public enemy, acts of the OWNER, acts of another CONTRACTOR in the performance of a contract with the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes and severe weather.

6. The CONTRACTOR shall begin within ten (10) days from the beginning of any such delay, unless the OWNER shall grant a further period of time prior to the date of final settlement of the Contract, notify the OWNER, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the CONTRACTOR within a reasonable time of its decision in the matter.

16. THE CONTRACTOR'S DUTIES AND RIGHTS

1. The CONTRACTOR shall begin and shall prosecute the work regularly and uninterruptedly after Notice to Proceed has been given (unless otherwise directed in writing by the OWNER) with such force as to secure the completion of the work, in and acceptable manner, within the time stated in the Proposal.

2. The CONTRACTOR shall submit at such times as may reasonably be requested by the ENGINEER, schedules which shall show the order in which the CONTRACTOR proposes to carry on the work, with dates at which the

CONTRACTOR will start the several parts of the work, and estimated dates of completion of the several parts.

3. For Lump Sum items the CONTRACTOR shall within ten (10) days of receipt of Notice to Proceed, submit a complete breakdown of the Contract Amount showing the value assigned to each part of the work, including an allowance for profit and overhead. Upon approval of the breakdown of the Contract Amount by the Engineer, it shall be used as the basis for all Requests for Payments.

4. The CONTRACTOR shall utilize the services of specialty subcontractors on those parts of the work which under normal contracting practices are performed by specialty subcontractors; provided that if the ENGINEER shall determine that the specialty work in question has been customarily performed by the CONTRACTOR'S own organization and that such organization is presently competent to perform such work, the CONTRACTOR shall be permitted to do so; provided further that, if the ENGINEER shall determine that the performance of any specialty work by specialty subcontractors will result in materially increased costs or inordinate delays, the requirements of this paragraph shall not apply. At the time specified by the Contract Documents or when requested by the ENGINEER, the CONTRACTOR shall submit in writing to the OWNER for the ENGINEER, the names of the subcontractors proposed for the work. Subcontractors may not be changed except at the request of the CONTRACTOR with the approval of the ENGINEER. The CONTRACTOR is responsible to the OWNER for the acts and omissions of his subcontractors, and of their direct and indirect employees to the same extent as he is responsible for the acts and omissions of his employees. The Contract Documents shall not be construed as creating any contractual relation between any subcontractor and the OWNER. The CONTRACTOR shall bind every subcontractor by the terms of the Contract Documents. For convenience of reference the Specifications are separated into titled sections. Such separations shall not, however, operate to make the ENGINEER an arbiter to establish limits to the contracts between CONTRACTOR and Subcontractors.

The CONTRACTOR shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the CONTRACTOR by the terms of the Contract Documents insofar as applicable to the work of subcontractors and to give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise over the CONTRACTOR under any provision of the Contract Documents.

5. The CONTRACTOR shall develop and make all detail surveys necessary for construction, including setting the construction baselines, slope stakes, batter boards, stakes for pile locations and other working points, lines and elevations. The ENGINEER will provide base lines ties and bench marks for the use of the CONTRACTOR in laying out the work. The CONTRACTOR shall be responsible for the accuracy of all lines and levels and of the work as built in accordance therewith. The CONTRACTOR shall have the responsibility to carefully preserve bench marks, reference points and stakes established by the ENGINEER and in the case of destruction thereof by the CONTRACTOR or resulting from his negligence,

resulting therefrom and shall be responsible for any mistakes that may be caused by the unnecessary loss or disturbance of such bench marks, reference points and stakes.

6. The CONTRACTOR, if required, shall employ at his own expense a competent surveyor or engineer registered in the STATE as a Professional Engineer or Land Surveyor, and necessary assistants who shall stake out all structures and other parts of the work, using as reference the base lines and bench marks established by the ENGINEER. The CONTRACTOR shall be responsible for the accuracy of all levels of the work as built in accordance therewith.

7. The CONTRACTOR shall secure and pay for all permits and licenses necessary for the prosecution of the work.

8. The CONTRACTOR shall give all notices and comply with all Federal, State and Local laws, or ordinances and regulations in any manner affecting the conduct of the work, and all such orders and decrees as exist, or may be enacted by bodies or tribunals having any jurisdiction or authority over the work, and shall indemnify and save harmless the OWNER against any claim or liability arising from or based on, the violation of any such law, ordinance, regulation, order or decree, whether by himself or his employee.

9. The CONTRACTOR shall pay all royalties and license fees for any design, device, material or process covered by letters, patent or copyright by legal agreement with the owner of the patent or a duly authorized licensee of such owner, and shall save harmless the OWNER from any and all loss or expense on account thereof, including its use by the OWNER.

10. The CONTRACTOR shall confine his apparatus and storage of materials and operation of his workmen to those areas described in the Drawings and Specifications and such additional areas which he may provide as approved by the ENGINEER.

11. The CONTRACTOR shall not enter upon private property for any purpose without obtaining permission, and he shall be responsible for the preservation of all public property, trees, monuments, etc., along and adjacent to the street and/or right -of-way, and shall use every precaution necessary to prevent damage or injury thereto. He shall use suitable precautions to prevent damage to pipes, conduits, and other underground structures, and shall protect carefully from disturbance or damage all monuments and property marks until an authorized agent has witnessed or otherwise referenced their location and shall not remove them until directed.

12. The CONTRACTOR shall provide adequate signs, barricades, red lights and watchman and take all necessary precautions for the protection of the work and the safety of the public. All barricades and obstructions shall be protected at night by red signal lights which shall be of substantial construction and shall be painted white or whitewashed to increase their visibility at night. Suitable warning

signs shall be so placed and illuminated at night as to show in advance where construction, barricades, or detours exist.

13. The CONTRACTOR shall conduct his work at all times to ensure the least possible obstruction to traffic and inconvenience to the general public and the residents in the vicinity of the work, and to ensure the protection of persons and property in a manner satisfactory to the ENGINEER. No road or street shall be closed to the public except with the permission of the ENGINEER and proper governmental authority. Fire hydrants on or adjacent to the work shall be kept accessible to fire fighting equipment at all times. Temporary provisions shall be made by the CONTRACTOR to ensure the use of sidewalks and the proper functioning of all gutters, sewer inlets, drainage ditches, and irrigation ditches, which shall not be obstructed except as approved by the ENGINEER.

14. The CONTRACTOR shall secure written permission from the proper authority before executing new construction when such new construction crosses highways, railroad, streets or utilities under jurisdiction of State, County, or other public agency, public utility or private entity. A copy of this written permission must be filed with the ENGINEER or OWNER before any work is done.

The CONTRACTOR will be required to furnish a release from the proper authority before final acceptance of the work.

15. The CONTRACTOR shall provide and maintain such sanitary accommodations for the use of his employees and those of his subcontractors as may be necessary to comply with the requirements and regulations of the Local and State Departments of Health and as directed by the ENGINEER.

16. The CONTRACTOR shall maintain on the work a qualified superintendent who is acceptable to the ENGINEER, and who shall give efficient supervision to the work until its completion. The Superintendent shall have full authority to act in behalf of the CONTRACTOR, and all directions given to the Superintendent shall be considered given to the CONTRACTOR. In general, the ENGINEER'S instructions shall be confirmed in writing and always upon written request from the CONTRACTOR.

17. The CONTRACTOR shall be responsible for the conduct and discipline of his employees and/or any subcontractor or persons employed by subcontractors. All workmen must have sufficient knowledge, skill, and experience to perform properly the work assigned to them. Any foreman or workman employed by the CONTRACTOR or subcontractor who, in the opinion of the ENGINEER, does not perform his work, in a skillful manner or appears to be incompetent or to act in a disorderly or intemperate manner shall, at the written request of the ENGINEER, be discharged immediately and shall not be employed again in any portion of the work without approval of the ENGINEER.

18. The CONTRACTOR shall provide suitable on-site storage for all equipment and materials necessary for use in construction of the project. All

materials improperly stored shall be subject to rejection by the ENGINEER. Private property shall not be used for storage purposes without the written permission of the owner or lessee.

19. The CONTRACTOR shall perform any work and shall furnish and install any materials and equipment necessary during an emergency endangering life or property. In all cases he shall notify the ENGINEER of the emergency as soon as practical but he shall not wait for instructions before proceeding to properly protect both life and property.

20. The CONTRACTOR shall do all necessary cutting and patching of the work that may be required to properly receive the work of the various trades or as required by the Drawings and Specifications to complete the structure. He shall restore all such cuts or patch work as directed by the ENGINEER. Cutting of existing structures that shall endanger the work, adjacent property, workmen or the public shall not be done unless approved by the ENGINEER and under his direction.

21. The CONTRACTOR shall keep the OWNER'S property free at all times from accumulations of waste materials or rubbish and shall remove from the OWNER'S property, and from all public and private property, all temporary structures, rubbish, and waste materials resulting from his operation or caused by his employees, and remove all surplus materials resulting from his operation or caused by his employees, leaving the site smooth, clean and true to line and grade.

22. The CONTRACTOR shall pay for all transportation and utility services not later than the twentieth day of the calendar month following that in which such services are rendered; pay for all materials, tools and other expendable equipment to the extent of 90 percent of the cost thereof, not later than the twentieth day of the calendar month following that in which such materials, tools and equipment are delivered at the site of the project, and the balance of the cost thereof not later than the thirtieth day following the completion of that part of the work in or on which such materials, tools and equipment are incorporated or used; and pay to each of his subcontractors not later than the fifth day following each payment to the CONTRACTOR, the respective amounts allowed to CONTRACTOR on account of the work performed by his subcontractors, to the extent of each subcontractor's interest therein.

23. The CONTRACTOR shall at the termination of this Contract before acceptance of the work by the ENGINEER, remove all his equipment, tools and supplies from the property of the OWNER. Should the CONTRACTOR fail to remove such equipment, tools and supplies, the OWNER shall have the right to remove them, and the CONTRACTOR shall pay all costs incurred by the OWNER in removing them.

24. The CONTRACTOR shall deliver to the OWNER a complete release of all liens arising out of this Contract before the retained percentage or before the final Request for Payment is paid. If any lien remains unsatisfied after all payments are made, the CONTRACTOR shall refund to the OWNER such amounts as the

OWNER may have been compelled to pay in discharging such liens including all costs and a reasonable attorney's fee.

25. The CONTRACTOR shall warrant all material and equipment furnished and work performed by him for a period of one year from the date of written acceptance of the work, and furnish all guarantees applicable to definite parts of the work as stipulated in the sections of the Technical Provisions.

26. The CONTRACTOR shall have the right to suspend work or terminate the Contract upon ten (10) days written notice to the OWNER and the ENGINEER, for any of the following reasons:

a. If an order of any court, or other public authority caused the work to be stopped or suspended for a period of ninety (90) days through no act of the CONTRACTOR or his employees.

b. If the ENGINEER should fail to act upon any Request for Payment within fifteen (15) days after it is presented in accordance with the General Conditions of the Contract.

c. If the OWNER should fail to act upon any Request for Payment within thirty (30) days after its approval by the ENGINEER.

27. Blank

28. When a set of drawings has been produced for a job the CONTRACTOR shall maintain at the site a set of the drawings. On this set shall be accurately shown the actual installation of all work under each section, indicating thereon any variations from the Contract Drawings, including changes in sites, locations and dimensions. For this purpose the ENGINEER will furnish two sets of black or blue line on white drawings. At the conclusion of the work, both sets of prints showing the entire work as actually installed shall be delivered to the ENGINEER for approval and shall become property of the OWNER.

17. THE ENGINEER'S AUTHORITY

1. The ENGINEER shall have general supervision and direction of the work. The ENGINEER shall decide any and all questions which may arise as to the quality and acceptability of materials furnished, work performed, rate of progress of work, interpretation of Drawings and Specifications and all questions as to the acceptable fulfillment of the Contract on the part of CONTRACTOR. All claims of the OWNER or the CONTRACTOR shall be presented to the ENGINEER for decision which shall be made in writing within a reasonable time. All decisions of the ENGINEER shall be final.

2. The ENGINEER shall have the authority to suspend the work, wholly or in part, for such period or periods, as he may deem necessary, due to unsuitable weather, or such other conditions as are considered unfavorable for prosecution of

the work, or failure on the part of the CONTRACTOR to carry out the provisions of the Contract or to supply materials meeting the requirements of the Specifications. The CONTRACTOR shall not suspend operations due to unsuitable weather without the ENGINEER'S permission.

3. In the event of temporary suspension of work or during inclement weather or whenever the ENGINEER shall direct, the CONTRACTOR will and will cause his subcontractors to protect carefully his and their work and materials against damage or injury from the weather. If, in the opinion of the ENGINEER, any work or materials shall have been damaged or injured from the weather, by reason of failure on the part of the CONTRACTOR or any of his subcontractors so to protect his work, such materials shall be removed and replaced at the expense of the CONTRACTOR.

4. The ENGINEER shall have the authority at all times to inspect all materials and each part or detail of the work and the CONTRACTOR will be held strictly to the true intent of the Specifications in regard to quality of materials, workmanship and the diligent execution of the Contract. Such inspection may include mill, plant or shop inspection, and any material furnished under these Specifications is subject to such inspections. The ENGINEER shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the CONTRACTOR as is required to make a complete detailed inspection.

5. The ENGINEER shall have the authority at any time before acceptance of the work to direct the CONTRACTOR to remove or uncover any portions of the finished work. After examination, the CONTRACTOR shall restore said portions of the work to the standard required by the Specifications. Should the work thus exposed or examined prove acceptable, the uncovering or removing, and the replacing of the covering or making good of the parts removed shall be paid for as Extra Work, but should the work so exposed or examined prove unacceptable, the uncovering, removing and replacing shall be at the CONTRACTOR'S expense.

6. The ENGINEER shall have the authority to direct the CONTRACTOR to correct work that has been damaged or that was not performed in accordance with the Contract Documents. An equitable deduction from the Contract Amount shall be made to compensate the OWNER from the uncorrected work.

18. THE OWNER'S DUTIES AND RIGHTS

1. The OWNER will provide the land shown on the Drawings upon which the work under the Contract is to be performed and to be used for rights-of-way for access. Any delay in furnishing these lands by the OWNER shall be deemed proper cause for adjustment in the Contract Amount and in time of completion.

2. The OWNER shall have the right to suspend the work or any portion thereof at any time provided that he gives the CONTRACTOR five (5) days written

notice of suspension which shall set forth the date on which work is to be resumed. The CONTRACTOR shall resume the work upon written notice from the OWNER and within ten (10) days after the date set forth in the notice of suspension, the CONTRACTOR may abandon that portion of the work so suspended and shall be entitled to payment for all work done on the portions so abandoned, plus 15 percent of the value of the abandoned work to compensate for overhead, plant expense, and anticipated profit.

3. The OWNER, acting upon the recommendation of its ENGINEER, shall have the authority to suspend the work wholly or in part, for such period or periods, as may be deemed necessary, due to unsuitable weather, or such other conditions as are considered unfavorably for prosecution of the work, or failure on the part of the CONTRACTOR to carry out the provisions of the Contract or to supply materials meeting the requirements of the Specifications. The CONTRACTOR shall not suspend operations due to unsuitable weather without the OWNER'S permission.

4. In the event of temporary suspension of work or during inclement weather or whenever the OWNER, acting upon the recommendation of the ENGINEER, shall direct, the CONTRACTOR and his subcontractors will protect carefully his and their work and materials against damage or injury from the weather. If, in the opinion of the OWNER, acting upon the recommendation of the ENGINEER, any work or materials shall have been damaged or injured from the weather, by reason of failure on the part of the CONTRACTOR or any of his subcontractors to protect his work, such materials shall be removed and replaced at the expense of the CONTRACTOR.

5. The OWNER shall have the right to correct any deficiencies, without prejudice to any other remedy he may have, upon failure of the CONTRACTOR to perform the work in accordance with the CONTRACT documents, including any requirements with respect to the Schedule of Completion, after five (5) days written notice to the CONTRACTOR and receipt of written approval from the ENGINEER. The cost of the work so performed by the owner shall be paid for by the CONTRACTOR.

6. The OWNER, acting upon the recommendation of the ENGINEER, shall have the authority to direct the CONTRACTOR not to correct work that has been damaged, or that was not performed in accordance with the Contract Documents. An equitable deduction from the Contract Amount shall be made to compensate the OWNER for the uncorrected work.

7. The OWNER shall have the right to terminate the employment of the CONTRACTOR giving ten (10) days written notice of termination to the CONTRACTOR in the event of any default by the CONTRACTOR and upon receiving written notice from the ENGINEER certifying cause for such action in the event of such termination, the OWNER may take possession of the work and of all materials, tools and equipment thereon and may finish the work by whatever method

and means he may select. It shall be considered a default by the CONTRACTOR whenever he shall:

- a.) Declare bankruptcy, become insolvent, or assign his assets for the benefit of his creditors.
- b.) Disregard or violate important provisions of the Contract Documents of the ENGINEER'S instructions, or fail to prosecute the work according to the agreed Schedule of Completion including extensions thereof.
- c.) Fail to provide a qualified superintendent, competent workmen or subcontractors, or proper materials, or fail to make prompt payment therefor.

If the right of the CONTRACTOR to proceed is so terminated, the OWNER may take possession of and utilize in completing the work such materials, appliances, supplies, plant and equipment as may be on the site of the work, and necessary therefor. Upon termination of the Contract by the OWNER, no further payments shall be due the CONTRACTOR until the work is completed. If the unpaid balance of the Contract Amount shall exceed the cost of completing the work including all overhead costs, the excess shall be paid to the CONTRACTOR.

If the cost of completing the work shall exceed the unpaid balance, the Contractor and his sureties shall pay the difference to the OWNER. The cost incurred by the OWNER, as herein provided, and the damage incurred through the CONTRACTOR'S default, shall be certified by the OWNER, and approved by the ENGINEER.

8. The OWNER shall have the right to order changes in the work through additions, deletions or modifications without invalidating the Contract. Compensation and time completion affected by the change shall be adjusted at the time of ordering such change.

9. The OWNER shall have the right to take possession of and use any completed or partially completed portions of the work, notwithstanding that the time for completing the entire work or such portions may not have expired; but such taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents. If such prior use increases the cost of or delays the completion of uncompleted work or causes refinishing of completed work, the CONTRACTOR shall be to such extra compensation, or extension of time or both, as the ENGINEER may determine.

19. ASSIGNMENT

Neither the CONTRACTOR nor the OWNER shall sublet, sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or of his right, title or interest therein, or his obligations thereunder, without written consent of the other party.

20. ORAL AGREEMENTS

No oral order, objection, claim or notice by any party to the others shall affect or modify any of the terms or obligations contained in any of the Contract Documents shall be held to be waived or modified by reason of any act whatsoever, other than by a definitely agreed waiver or modification thereof in writing, and no evidence shall be introduced in any proceeding of any other waiver or modification.

21. INSURANCE

The CONTRACTOR shall not commence work under this Contract until he has obtained all the insurance required hereunder and such insurance has been approved by the OWNER, nor shall the CONTRACTOR allow any subcontractor to commence work on his subcontract until all similar insurance required of the subcontractor has been so obtained and approved. Approval of the insurance by the OWNER shall not relieve or decrease the liability of the CONTRACTOR hereunder. The amounts of such Insurance shall not be less than those enumerated hereinafter. Certificates from the CONTRACTOR'S insurance, carriers stating the coverage provided, the limits of liability, and expiration dates shall be filed in triplicate with the ENGINEER before operations are begun.

21.1 The CONTRACTOR shall carry public liability insurance with an insurance company satisfactory to the City so as to save the City harmless from any and all claims for damages arising out of bodily injury to, or death of, any person or persons and for all claims for damages arising out of injury to, or destruction of, property caused by accidents resulting from the use of implements, equipment or labor used in the performance of the Contract or from any neglect, default omission or want of proper care or misconduct on the part of the CONTRACTOR or of any one in his employ during the execution of the work. Such insurance shall include coverage for blasting and explosion, if explosives are to be used.

21.2 The CONTRACTOR shall carry any other types of insurance as may be required elsewhere in the Contract Documents.

21.3 General Requirements

21.3.1 All insurance policies required in the Contract Documents shall be provided by companies satisfactory to the City. Any insurance carrier utilized to fulfill the insurance requirements of this Contract shall be licensed by the Massachusetts Division of Insurance to do business in the Commonwealth of Massachusetts shall have a minimum A.M. rating. The CONTRACTOR must provide the required insurance at its own expense.

21.3.2 CONTRACTOR shall either (1) require each subcontractor to procure and to maintain during the life of its subcontract, Subcontractor's General Liability and Property Damage Insurance of the same type and in the same manner as specified herein, or (2) insure activities of his subcontractors in his own policy.

21.3.3 Each policy must list the City as an additional insured and shall be primary to and non-contributory to any coverage maintained by the City.

21.3.4 All insurance shall be written on an occurrence basis, unless the City approves in writing coverage on a claims-made basis. Insurance coverage whether written on an occurrence or a claims-made basis shall be maintained without interruption from the date of commencement of the work until the date of final payment and termination of any coverage required to be maintained after final payment.

21.3.5 Certificates of Insurance acceptable to the City and confirming the insurance coverage required herein are attached to the Contract. Certificates of Insurance evidencing (1) either the claims-made or occurrence form coverage, (2) work description/location, (3) CONTRACTOR's corporate name, and (4) naming the City as an additional insured must be furnished to the City within five (5) business days after presentation of the Contract to the CONTRACTOR for execution. The City shall have no obligation to execute the Contract and may award the Contract to the next lowest responsible and responsive bidder, if such insurance certificates have not been provided to the City. The Certificate must provide that the insured will give Notice of Accident and Notice of Claim to the insurance company as soon as practicable after receiving such notice. The CONTRACTOR shall promptly provide the City with Certificates of Insurance evidencing policies' annual renewal.

21.3.6 In the event of paid claims, the CONTRACTOR shall bear costs of any amount deductible.

21.3.7 All insurance policies must contain a minimum thirty (30) day written notice of cancellation clause, and provide that the insurance company will notify the City via registered mail, of any cancellation, change or expiration of the policy. The CONTRACTOR shall furnish to the City copies of any said cancellation, change or expiration. Prior to the effective date of any such cancellation the CONTRACTOR shall take out new insurance to cover the policies so cancelled. The Insurance Companies shall remain liable, however, until new and satisfactory insurance policies have been delivered to, and accepted by, the City.

21.3.8 In the event of the cancellation of any policy during the term of this Contract, or the failure to keep in effect the insurance required by this section, the City may, on twenty-four (24) hours notice and at its option, procure or renew such insurance on the account of the CONTRACTOR. The CONTRACTOR agrees to repay the City's expense with interest thereon at the rate of eighteen percent (18%) annually from the date of the expenditure by the City.

21.3.9 The insurance required under 21.4 through shall include all major divisions of coverage and shall be on a comprehensive general basis including Premise and Operations (including X-C-U), Owner's Protective (as a separate policy), Products and Completed Operations, and Owned, Non-owned, Leased, and Hired Vehicles. Such insurance shall be written for not less than any limits of

liability required by law or the limits set forth in said insurance amounts under 21.4 through , whichever are greater.

21.3.10 The City reserves the right, at its sole discretion, to amend the insurance requirements contained herein.

21.3.11 The CONTRACTOR and all Subcontractors waive subrogation rights against the City for all losses.

21.3.12 Unless greater amounts of insurance coverage are required elsewhere in the Contract Documents, the amounts of insurance shall not be less than the minimum amounts set forth below.

21.4 Commercial General Liability Insurance – for personal injury, bodily injury and property damage in an amount not less than \$1,000,000 for any one person, \$2,000,000 per occurrence and \$3,000,000 in the aggregate covering all work performed on or adjacent to City property including:

All premises and operations;

Contractual liability;

Coverage for the so-called “X, C, U” hazards, i.e, collapse of building, blasting, and damage to underground property;

Products and Completed Operations (for a period of at least two (2) years following acceptance by the City or the completed Contract);

Asbestos abatement, when applicable.

21.4.1 This policy (ies) shall include coverage relating to explosion, collapse, and underground property damage and contractual liability coverage.

21.4.2 Additionally, CONTRACTOR shall provide the following coverage against loss or damage by fire and against loss or damage covered by the special perils insurance endorsement on all Work: Special Perils 80% of Contract Price minimum. Upon completion of Work at City buildings, CONTRACTOR shall provide an installation floater, in the full amount of the Contract Price, for the requirements set forth above. The policy or policies shall specifically state that they are for the benefit and payable to the City, the CONTRACTOR, and all persons furnishing labor or labor and materials for the Work, as their interests may appear.

21.4.3 Personal & Advertising Injury, on an occurrence basis, \$1,000,000 each occurrence.

21.5 Automobile Liability Insurance – including the use of all vehicles owned, non-owned, leased and/or hired in an amount not less than \$2,000,000 combined single limit or Bodily Injury, each person in an amount no less than \$ 500,000 and each accident in amount no less than \$ 2,000,000 and Property Damage, each occurrence \$2,000,000.

21.6 Worker’s Compensation Insurance – CONTRACTOR shall provide during the life of this Contract Worker's Compensation Insurance in accordance with the Worker's Compensation Act of the Commonwealth of Massachusetts (G.L. c. 149 §

34A and G.L. c. 152) including Employees Liability Insurance, covering all work as follows:

21.6.1 Coverage A is statutory;

21.6.2 Coverage B in amounts no less than the following: each accident - \$500,000; Disease Policy limit - \$500,000; and Disease- each employee - \$500,000.

Further, in addition to the General Requirements, CONTRACTOR shall provide by insurance for the payment of compensation and the furnishing of other benefits under M.G.L. c. 152 to all persons to be employed under the Contract, and the CONTRACTOR shall continue such insurance in full force and effect during the term of the Contract. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of the Contract and shall operate as an immediate termination thereof. No cancellation of such insurance, whether by the insurer or by the insured, shall be valid unless written notice thereof is given by the party proposing cancellation to the other party and to the City at least fifteen (15) days prior to the intended effective date thereof, which date shall be expressed in said notice. Contractor Worker's Compensation coverage

21.7 Umbrella Liability Coverage – in an amount not less than \$5,000,000 combined single limit and \$5,000,000 in the aggregate.

21.8 Hazardous Materials Insurance – if work involves hazardous materials, the following coverage is required:

21.8.1 Pollution Liability Insurance – for sudden and/or gradual occurrences in an amount not less than \$1,000,000 per occurrence and \$5,000,000 in the aggregate arising out of the work, including but not limited to all hazardous materials identified in the contract;

21.8.2 When applicable, CONTRACTOR will designate the disposal site and furnish a Certificate of Insurance from the Disposal Facility for Environmental Impairment Liability Insurance for (a) sudden and accidental occurrences in an amount no less than \$3,000,000 per occurrence and \$6,000,000 in the aggregate and (b) non-sudden occurrences in the amount no less than \$5,000,000 per occurrence and \$10,000,000 in the aggregate.

21.8.3 Certificates of Insurance will clearly state the hazardous materials exposure work being performed.

21.8.4 Further, the CONTRACTOR shall be responsible for the confirmation, verification, remediation, and disposal of all environmental impact and hazardous materials consistent with accomplishing the work of the contract documents. The CONTRACTOR shall adhere to the Massachusetts Contingency Plan, U.S.

Environmental Protection Agency, Massachusetts Department of Environmental Protection, regulatory groups and bureaus, as well as all state, federal, local, health, and environmental codes, rules, publications, ordinances, regulations, recommendations, and laws consistent with the removal and disposal of Environmental Impact and Hazardous Materials, to include, but not limited to: lead paint, asbestos, presumed asbestos, oils, refrigerants, fluids, chemical waste, general waste, tanks, polychlorinated biphenyls, Mercury, antifreeze, fluorescent light ballasts, capacitors, drums and containers, pigeon guano, dead animals, unknown or unidentified materials, contaminated soils, etc. The edition of the publication and/or governing agency current as of the date of the identification of the environmental impact and hazardous material item shall be used for accomplishing the work of the contract documents.

21.9 Builder's Risk Insurance - covering loss by fire and extended coverage in the amount of the total insurable value of all structures, materials, and equipment to be built and installed. The policy shall indicate the City, the CONTRACTOR, and all subcontractors as the named insured with loss payable to the City as Trustee. The policy shall provide for a thirty (30) day notice to the City of cancellation or restrictive amendment.

21.9.1 A copy of this insurance policy shall be furnished to the City.

21.9.2 The Builder's Risk Insurance shall be obtained before the work is started and shall be maintained until the date of completion of the work, or until the City occupies or otherwise takes possession of the project, whichever occurs first.

21.10 Owner's Protective Liability (requires a separate policy) - in an amount not less than \$2,000,000 per occurrence and \$5,000,000 in the aggregate.

21.11 Optional Insurance

21.11.1 Excess Liability Insurance - The CONTRACTOR may purchase and maintain excess liability insurance in the umbrella form in order to satisfy the limits of liability required for the insurance to be purchased and maintained in accordance with the requirements set forth above. Any such amounts must be in addition to the umbrella limits required, must list all underlying policies, and must list the City as an additional insured. Evidence of such excess liability shall be delivered to the City in the same form and manner as the required insurance policies.

21.11.2 Property Insurance - The City does not intend to purchase property Insurance covering the Project or the Work. The City shall not be required to provide such insurance, but the CONTRACTOR may, if it so desires, procure property insurance which will protect the interests of the CONTRACTOR, Subcontractor and Sub-subcontractors in the Work. The CONTRACTOR understands that such property insurance is solely the CONTRACTOR's responsibility, and the CONTRACTOR, its Subcontractors and Sub-subcontractors shall have no claim against the City on account of the City's failure to provide such property insurance

21.12 Limitation Of Liability - Notwithstanding anything herein to the contrary, the Contractor's maximum aggregate liability for any loss or damages (other than death or personal injury) incurred by the City as a result of or in consequence of the acts or omissions of the Contractor, its employees, subcontractors or agents in the performance of services covered by this Agreement shall not exceed one hundred percent (100%) of the Contract value plus any adjusted value per executed change order; provided, however, that if the Contractor's applicable insurance coverage is greater than this amount, the limit of liability for the Contract shall be the total insurance coverage.

IT IS AGREED AND UNDERSTOOD THAT THE CITY SHALL BE ENTITLED TO RECOVER DIRECT DAMAGES INCLUDING "BENEFIT-OF-THE-BARGAIN" EXPECTATION DAMAGES AND DAMAGES FOR BREACH OF WARRANTY SUBJECT TO THE LIMITATION OF LIABILITY, AND THAT IN NO EVENT SHALL CONTRACTOR BE LIABLE FOR ANY LOSS OF PROFITS, LOSS OF REVENUES OR LOSS OR FAILURE TO REALIZE ANTICIPATED SAVINGS OR EFFICIENCIES ARISING IN CONNECTION WITH THIS AGREEMENT.

21.13 Indemnification of the City - The Contractor agrees to indemnify, save harmless, and defend the City and all of its officers, agents, and employees from and against any and all third party suits, claims, or proceedings ("Claims"), and any losses, damages, charges or expenses, whether direct or indirect, and liability of every name and nature related to such Claims ("Liabilities") for or due to any loss or injury to persons or damages to real or tangible property to the extent caused by the Contractor or its employees, subcontractors or agents.

22. CONTRACT SECURITY

1. The CONTRACTOR shall furnish a performance bond in an amount at least equal to one hundred percent (100%) of the Contract price as security for the faithful performance of this Contract and also a labor and materials payment bond in an amount not less than One Hundred Percent (100%) of the Contract price as security for the payment of all persons performing labor on the project under this Contract and furnishing materials in connection with this Contract; each such bonds naming the OWNER as obliges under an oblige rider (attached in appendix)

2. The Sureties of all bonds shall be such surety company or companies as are approved by the OWNER, and are authorized to transact business in the State.

3. If at any time the OWNER, for justifiable cause, shall be or become dissatisfied with any surety or sureties then upon the Performance or Payment Bonds, the CONTRACTOR shall within five (5) days after notice from the OWNER to do so, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums on such bond shall be paid by the CONTRACTOR. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished such and acceptable bond to the OWNER.

23. EXTRA WORK

Payment for extra work shall be governed by Sec. 9.03 of the "Standard Specifications for Highways and Bridges", published by the Commonwealth of Massachusetts, Massachusetts Highway Department, dated 1988 including the Supplemental Specifications dated June 15, 2012.

24. EXTENSION OF CONTRACT TIME

When extra work is ordered at any time during the progress of the work which, in the sole judgment of the ENGINEER, unavoidably increases the time for the completion of the work, an extension of time shall be granted.

A delay beyond the CONTRACTOR'S control occasioned by an Act of God, an act of omission on the part of the OWNER or by strikes, lockouts, fires, etc., may entitle the CONTRACTOR to an extension of time in which to complete the work as determined by the ENGINEER, provided however, that the CONTRACTOR shall immediately give written notice to the ENGINEER of the cause of such delay, together with a statement of the portions of work so delayed. Delays in work for which necessary material has not been received by the CONTRACTOR will not be recognized or allowed until after receipt of such necessary material.

25. PROGRESS PAYMENTS

1. The CONTRACTOR may submit once each month, a Request for Payment for work done. The CONTRACTOR shall furnish the ENGINEER all reasonable facilities required for obtaining the necessary information relative to the progress and execution of the work. Each Request for Payment shall be computed from the work completed on all items listed in the detailed breakdown of Contract Amount, less Five percent (5%) to be retained until final completion and acceptance of the work, and less previous payments.

If the ENGINEER determines that the progress of the Work will be benefitted by the delivery to the site of certain materials and equipment, when available, in advance of actual requirement therefore and if such materials and equipment are delivered and properly stored and protected, the cost to the CONTRACTOR or subcontractor as established, by invoices or other suitable vouchers satisfactory to the ENGINEER, less the retained percentages as above provided, may be included in the progress estimates; provided always that there be duly executed and delivered by the CONTRACTOR to the ENGINEER at the same time a Bill of Sale in form satisfactory to the OWNER, transferring and assigning to the OWNER, full ownership and title to such materials or equipment.

2. Within fifteen (15) days of submission of any Request for Payment by the CONTRACTOR, the ENGINEER shall:

- a.) Approve the Request for Payment as submitted, or
- b.) Approve such other amount as he shall decide is due to the CONTRACTOR, informing the CONTRACTOR in writing of his reasons for approving the amended amount, or
- c.) Withhold the Request for Payment, informing the CONTRACTOR in writing of his reasons for withholding it.

3. Within thirty (30) days from the date of approval of a Request for Payment by the ENGINEER, the OWNER shall:

- a.) Pay the Request for Payment as approved, or
- b.) Withhold payment in whole or in part on an approved Request for Payment to the extent necessary to protect itself from loss on account of any of the following causes discovered subsequent to approval of Request for Payment by the ENGINEER provided he informs the CONTRACTOR and the ENGINEER in writing of his reasons for withholding payment in whole or in part:

1. Defective Work
2. Evidence indicating the probable filing of claims by other parties against the CONTRACTOR.

3. Failure of the CONTRACTOR to make payments to Subcontractors, material suppliers or labor.

4. Damage to another CONTRACTOR.

5.

26. ACCEPTANCE AND FINAL PAYMENT

When the CONTRACTOR shall have completed the work in accordance with the terms of the Contract Documents, the ENGINEER shall certify his acceptance to the OWNER and his approval of the CONTRACTOR'S final Request for Payment, less any money to be retained for repairs if so specified in the Special Conditions Section of these Specifications, which shall be the Contract Amount plus all approved additions less all approved deductions and less previous payments made. The CONTRACTOR shall furnish evidence that he has fully paid all debts for labor, materials and equipment incurred in connection with the work, following which the OWNER shall accept the work and release the CONTRACTOR except as to the conditions of the Performance Bond, any legal rights of the OWNER, required guarantees, and Corrections of Faulty Work after final payment and shall pay the CONTRACTOR'S final Request for Payment. The CONTRACTOR must allow sufficient time between the time of completion of the work and approval of the final Request for Payment for the ENGINEER to assemble and check the necessary data.

27. CORRECTION OF FAULTY WORK AFTER FINAL PAYMENT

The approval of the Final Request for Payment by the ENGINEER and the making of the final payment by the OWNER to the CONTRACTOR shall not relieve the CONTRACTOR of the responsibility for faulty materials or workmanship. The OWNER shall promptly give notice of faulty materials or workmanship and the CONTRACTOR shall promptly replace any such defects discovered within one year from the date of written acceptance of the work. The ENGINEER shall decide all questions arising under this paragraph.

28. SUBSTITUTIONS AND DELETIONS

Substitutions and deletions in the work shall be accomplished by the CONTRACTOR upon written order from the OWNER as approved by the ENGINEER or upon written order from the ENGINEER: which order shall state the reasons for original inclusion and subsequent elimination or substitution for materials, fixtures or equipment; and that the deviation does not materially injure the project as a whole, is in the best interest of the OWNER and is of the same cost and quality as originally specified or giving the amount in dollars of any equitable adjustment to which the parties have agreed.

29. PROVISIONS REQUIRED BY LAW DEEMED INSERTED

Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party the Contract shall forth will be physically amended to make such insertion or correction.

30. PROTECTION OF LIVES AND HEALTH

In order to protect the lives and health of his employees under this Contract, the CONTRACTOR and his Subcontractors shall comply with all pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work, arising out of and in course of employment on work under the Contract. He alone shall be responsible for the safety, efficiency, ad adequacy of his plant, appliances, and methods, and for any damage which may result from their failure or their improper construction, maintenance or operation.

31. OBSTRUCTIONS ENCOUNTERED

The Drawings may show certain information which has been obtained by the OWNER regarding the existing structure and various pipe lines and other utilities which exist at the location of the project.

The OWNER expressly disclaims any responsibility for the accuracy or completeness of the information given on the Drawings with regard to existing structures and utilities, and the CONTRACTOR will not be entitled to any extra compensation on account of inaccuracy or incompleteness of such information, said structures and utilities being shown only for the convenience of the CONTRACTOR, who must verify the information to his own satisfaction. The giving of this information upon the Contract Drawings will not relieve the CONTRACTOR of his obligations to support and protect all utilities and other structures which may be encountered during the construction of the work, and to make good all damages done to such utilities and structures, as provided in these Specifications.

32. STANDARD SPECIFICATIONS

For the purpose of governing the work to be done under this contract, the OWNER has adopted as its Standard Specifications format the **1988 Massachusetts Highway Department Standard Specifications for Highways and Bridges; the Supplemental Specifications, dated June 15, 2012; the latest Interim Supplemental Specifications; the Technical specifications contained in this book; the 2014 Construction Standard Details; the 1996 Construction and Traffic Standard Details (as related to traffic standard details only), the latest “Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)” with Massachusetts amendments; the 1990 Standard Drawings for Signs and Supports; the 1968 Standard Drawings for Traffic Signals and Highway Lighting; the latest edition of American Standards for Nursery Stock, City of Lowell Standards, the Plans, and these Special Provisions.**

These Standard Specifications shall apply as if reprinted herein except as modified by the General Conditions, Special Conditions and Technical Specifications.

In case of conflict between these documents, the Supplement to Standards and the Special Provisions of these Specifications shall govern.

SPECIAL CONDITIONS

SUBSECTION

1. Location and Description
2. Duration of Contract
3. Safety Signs, Barricades, Etc
4. Architectural Access Board Tolerances
5. Qualified Superintendent
6. Delivery and Storage of Materials
7. Material Slips
8. Construction Schedule
9. Work Schedule
10. Protection of utilities and properties
11. Communication
12. Owner's Rights
13. Daily Cleanup
14. Prevailing Wage Rates
15. Record Retention
16. Qualified Electricians
17. Materials Removed and Stacked
18. Disposal of Surplus Materials
19. Drainage
20. Hazardous Materials
21. (DEP) File Number Sign
22. Project Funding Source sign
23. As Built Plans

SPECIAL CONDITIONS

1. LOCATION AND DESCRIPTION

The work under this contract consists of the construction of the Jackson Street Extension which extends from Canal Street to about 610 feet west of Canal Street. Jackson Street Extension is also located adjacent to the Hamilton Canal and is designed to accommodate two travel lanes, on-street parking on both sides of the roadway and sidewalks. The project will complete the improvements to Jackson Street while facilitating both the future development planned along this section of roadway and the future connection to Thorndike Street.

The work includes full depth hot mix asphalt pavement, granite curb, hot mix asphalt berm, cement concrete sidewalks and wheelchair ramps, drainage, street lighting, pavement markings and other incidental items required to complete the work.

This work shall be bid on a unit cost basis. The Contract unit price shall include all labor, materials, equipment and incidental costs required to complete the work.

2. DURATION OF CONTRACT

The contract shall be for the period beginning on or about **April 15, 2015** or as stated in the **NOTICE TO PROCEED, WHICHEVER IS LATER** and end on or before **June 30, 2016**

Failure to complete the work by the dates herein specified, or any proper extensions thereof granted by the OWNER will be subject to liquidated damages.

3. SAFETY SIGNS, BARRICADES, ETC.

The CONTRACTOR shall conduct his operations in a safe manner at all times. The public shall be protected at all times with temporary fencing, adequate warning signs, barrels or barricades, warning tapes, etc. around the work area. Safety controls for construction operations shall be done in accordance with the relevant provisions of Section 850 of the Standard Specifications, the Manual on Uniform Traffic Control Devices and the Traffic Management Plan. The cost of providing and maintaining the signs, barrels, barricades, etc. shall be included in the unit price bid for the applicable item.

The CONTRACTOR shall provide temporary safe access for pedestrian traffic around the construction site at all times. The cost of temporary access not covered under contract items shall be incidental to the CONTRACTOR'S Total price bid.

Protection of the CONTRACTOR'S work shall be the responsibility of the CONTRACTOR and the cost for any protection of the work shall be included in the CONTRACTOR'S total price bid.

When it is determined by the Lowell Police Department that a uniformed Police Officer should be present during working hours for safety of the public in the CONTRACTOR'S area of

work, a uniformed Police Officer shall be provided by the Contractor and paid for under the Police Services Allowance.

4. ARCHITECTURAL ACCESS BOARD TOLERANCES

The Contractor is hereby notified that they are ultimately responsible for constructing all project elements in strict compliance with the current AAB/ADA rules, regulations and standards.

All construction elements in this project associated with sidewalks, walkways, wheelchair ramps and curb cuts are controlled by 521CMR – Rules and Regulations of the Architectural Access Board.

The AAB Rules and Regulations specify maximum slopes and minimum dimensions required for construction acceptance. There is no tolerance allowed for slopes greater than the maximum slope nor for dimensions less than the minimum dimensions.

Contractors shall establish grade elevations at all wheelchair ramp locations, and shall set transitions lengths according to the appropriate table in the Construction Standards (or to the details shown on the plans).

All wheelchair ramp joints and transition sections which define grade changes shall be formed, staked and checked prior to placing cement concrete. All grade changes are to be made at joints.

5. QUALIFIED SUPERINTENDENT

The CONTRACTOR shall maintain at the work site a qualified superintendent who is acceptable to the ENGINEER, and who shall give efficient supervision to the work until its completion. The Superintendent shall have full authority to act in behalf of the CONTRACTOR, and all directions given to the Superintendent shall be considered given to the CONTRACTOR.

6. DELIVERY AND STORAGE OF MATERIALS

Materials and equipment shall be progressively delivered at the site so that there will be neither delay in the progress of the work nor an accumulation of materials that is not to be used within reasonable time. Approved portions of the right-of-way may temporarily be used for storage purposes but must be removed and cleaned up at the end of the working day. Any additional space required for storage must be provided by the Contractor at his expense.

7. MATERIAL SLIPS

At the conclusion of each working day, the CONTRACTOR shall deliver to the ENGINEER the material slips, in triplicate, for all materials delivered to the job site that day. The ENGINEER shall sign the material slips and retain one copy for the City.

8. CONSTRUCTION SCHEDULE

Within 10 days of Notice to Proceed the CONTRACTOR shall deliver to the OWNER an estimated construction progress schedule in a format satisfactory to the OWNER, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract Documents, including clear identification of the early action items and contract milestones. The schedule shall also identify the anticipated amount of each monthly payment that will become due to the contractor in accordance with the progress schedule.

Before work is begun on each phase of work, the CONTRACTOR shall discuss fully with the ENGINEER the order and manner of doing the work, and the operating procedures shall comply with the requirements of the ENGINEER.

9. WORK SCHEDULE

No work that will disrupt travel on Jackson Street or Canal Street (lane closures, lane shifts, equipment placement, etc.) shall be done from 7:00AM to 9:00AM and from 2:30PM to 4:00PM during weekdays. Work on the Jackson Street Extension within the protected area shall be unrestricted within the normal work hours defined in the access permit that is approved by the City of Lowell. A written request to the City of Lowell shall be issued by the Contractor for any requested deviation to the work day or times indicated in the access permit.

10. PROTECTION OF UTILITIES AND PROPERTY

Written notice shall be given by the Contractor to all public service corporations or municipal and State officials owning or having charge of publicly or privately owned utilities at least one week in advance of the commencement of operations that will affect the utilities. The Contractor shall, at the same time, file a copy of such notice with the Engineer.

Before commencing work on service connections, the Contractor shall be responsible for contacting the Electric Company servicing the area to obtain construction requirements, standards, and to give adequate notice of commencement of work.

The Contractor, in constructing or installing facilities alongside or near sewers, drains, water or gas pipes, electric or telephone conduits, poles, sidewalks, walls, vaults or other structures shall sustain them securely in place. The Contractor shall coordinate with the officers and agents of the various utility companies and municipal departments to assure that the services of these structures are maintained. The Contractor shall also be responsible for the repair or replacement, at no additional cost to the Owner, of any damage to such structures caused by construction operations. The Contractor is responsible to leave them in the same condition as they existed prior to commencement of the work. In case of damage to utilities, the Contractor shall promptly notify the utility owner and shall, if requested by the Engineer, furnish labor and equipment to work temporarily under the utility owner's direction. Pipes or other structures damaged by the operation of the Contractor may be repaired by the Department or by the utility owner which suffers the loss. The cost of such repairs shall be borne by the Contractor, without compensation therefor.

If during construction there is an existing utility and/ or structure found to be in conflict with the proposed work under this Contract, the Contractor shall protect and maintain the services to the utilities and structures. The Engineer will, as soon as possible identify the utilities to be relocated or other such activities deemed suitable for resolution.

If live service connections are to be interrupted by excavations of any kind, the Contractor shall not break the service until new services are provided. Abandoned services shall be plugged off or otherwise made secure.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals for doing all the work involved in protecting or repairing property as specified in this Section, shall be considered included in the prices paid for the various Contract items of work and no additional compensation will be allowed therefore.

For overhead connections, the Electric Company servicing the area will make the connection from the top of the riser on the utility pole to the power source. The Contractor shall supply all labor, materials and equipment to install the service connection, complete in place and in accordance with the Electric Company procedures, from the controller to and including the riser with enough wire coiled above the riser to permit the Electric Company servicing the area to make the final connection.

For underground connections, the Electric Company servicing the area will perform the actual wiring of the service connections from its power source to the sweep at the local controllers, but all steel sweeps, ducts, entrance holes into manholes, patching and all other necessary labor, materials and equipment required to install the electric service, complete in place, shall be furnished by the Contractor.

The Contractor shall pay the Electric Company servicing the area for their services rendered for the connection of overhead and underground service connections.

Before starting work at existing manholes, the Contractor shall test for gas and blow out the manholes.

11. COMMUNICATION

The Contractor must furnish a portable phone (Nextel) to communicate with the Engineer's field engineer. The Contractor's foreman/supervisor must have radio/phone to the engineer before start of work. The Contractor shall pay all phone charges reasonable within contract scope of work. The Contractor shall receive no additional compensation for communications for the duration of the contract.

12. OWNER'S RIGHTS

OWNER'S Rights to be exercised by the Department of Public Works wherever in this Contract the OWNER is to give or receive a notice or provisions are included for the exercise of rights and privileges and without limiting the generality thereof, the acts dealing with the OWNER'S prerogatives in the Contract shall be exercised by the Commissioner of Public Works or his authorized representative for and in behalf of the OWNER.

13. DAILY CLEAN UP

Before completion of each day's work, the CONTRACTOR shall be responsible for cleaning up and removing and relocating all removed material, debris, equipment and the like from adjacent roadways. Sweeping and cleaning of surfaces beyond the limits of the project required clean up material caused by spillage or vehicular tracking during the various phases of the work shall be considered as incidental to the work being performed under the Contract and there will be no additional compensation.

14. PREVAILING WAGE RATES – (See Appendix)

Attention of the Bidders is particularly called to the requirements of the conditions of employment to be observed and the prevailing wage rates to be paid on this project, as determined by the State Department of Labor Division of Occupational Safety and the U.S. Department of Labor under the Davis Bacon and related Acts. In the case of differences between the two wage requirements the greater wage shall prevail.

15. RECORD RETENTION

All records pertinent to this contract shall be kept retained for a period of three years from the date of submission of the final project closeout.

16. QUALIFIED ELECTRICIANS

Within 10 days after opening of bids, the low bidder shall submit a list of the Journeyman Electricians (Massachusetts License) who will perform the electrical work in this contract.

Also, the low bidder shall submit copies of each Journeyman Electrician's current Massachusetts License.

17. MATERIAL REMOVED AND STACKED

The Contractor shall carefully remove, transport and stack all material that, in the opinion of the Engineer, is salvageable. The material shall be stacked at a location approved by the City of Lowell. The Contractor shall coordinate with the City of Lowell to schedule drop-off time and location.

18. DISPOSAL OF SURPLUS MATERIAL

Surplus materials obtained from any type of excavation, and not needed for further use as determined by the Engineer shall become the property of the Contractor and shall be removed from the site during the construction period and legally disposed of. The removal and disposal of surplus material shall adhere to the regulations and requirements of local authorities governing the disposal of such materials, at no additional compensation.

19. DRAINAGE

All pipes and structures installed as part of this Contract shall be left in a clean and operable condition at the completion of the work.

All existing pipes to be abandoned shall be plugged with brick masonry not less than 8 inches in thickness in conformance with the Standard Specifications, Section 201.62.

No separate payment will be made for the maintenance of the existing drainage system or for plugging of pipes, but all costs in connection therewith shall be included in the unit prices bid for the various Contract items.

Where new pipe is shown on the drawings to be connected into an existing drainage structure to remain, the existing structure shall be first cleaned to remove all mud, debris and other material. The existing structure wall shall be carefully and neatly cut to provide the minimum size opening required for the insertion of the new pipe. The proposed pipe end shall be set or cut off flush with the inside face of the existing structure wall and the remaining space around the pipe completely filled with cement grout for the full thickness of the structure wall.

Existing shaped inverts shall be reconstructed as necessary to provide a smooth and uniform flow channel from the new pipe through the existing structure.

No separate payment will be made for the cost of connecting new pipes into existing structures, cleaning and necessary alterations of existing structures, but all costs in connection therewith shall be included in the unit prices bid for the various pipe items.

20. HAZARDOUS MATERIALS

There are no hazardous materials anticipated within the project limits. However, soil, sediments or groundwater may be considered suspect if they exhibit non-natural discoloration, petroleum or chemical odor, the presence of petroleum liquid or sheening on the ground or surface water or any abnormal gas, debris or materials in the ground. In addition, existing or prior land uses (for example, historic industrial or commercial uses, etc.) may render the soils, sediments or groundwater as suspect. At the direction of the Engineer, the LSP shall evaluate any suspect soils, sediment or groundwater by appropriate field screening and/or laboratory analysis.

The Contractor's LSP shall review available environmental reports, meet with the City of Lowell and the City's LSP, perform additional test pits and soil testing as appropriate and prepare a draft memorandum describing the protocol related to the reuse and/or export of material excavated on-site and the import of fill material. The City's LSP will review the protocol and the Contractor's LSP will prepare a draft memorandum.

The Phase 1 Reports prepared by Watermark that are available are:

- a. Phase I Environmental Site Assessment and Subsurface Investigation Report, 169/171 Jackson Street, Lowell Massachusetts"; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated August 2006.
- b. "Phase I Environmental Site Assessment and Subsurface Investigation Report ADDENDUM, 169/171 Jackson Street, Lowell Massachusetts"; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated October 2006.
- c. "Response Action Outcome Statement, 169/171 Jackson Street, Lowell, Massachusetts, RTN 3-26422"; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated June 2007.
- d. "Phase I Environmental Site Assessment and Subsurface Investigation Report, 291 Jackson Street, Lowell Massachusetts"; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated August 2006.
- e. "Phase I Environmental Site Assessment and Subsurface Investigation Report ADDENDUM, 291 Jackson Street, Lowell Massachusetts"; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated October 2006.
- f. "Release Abatement Measure Plan, 291 Jackson Street, Lowell, Massachusetts"; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated June 2008.
- g. "Release Abatement Measure Plan Modification and Status Report No. 1, 291 Jackson Street, Lowell, Massachusetts"; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated October 2008.
- h. "Release Abatement Measure Completion Report, 291 Jackson Street, Lowell, Massachusetts"; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated April 2009.
- i. "Response Action Outcome Statement, 291 Jackson Street, Lowell, Massachusetts"; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated July 2009.

21. MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) FILE NUMBER SIGN

This project is subject to Massachusetts General Laws, Chapter 131, Section 40 as amended. Signs shall be in accordance with the latest MHD Construction Standards. No separate payment will be made for the signs, but all costs for the manufacture, erection, maintenance, moving, and removal of the signs shall be included in the prices bid for the various Contract items. For this project the Massachusetts Department of Environmental Protection File Number is 206-0638

22. PROJECT FUNDING SOURCE SIGNS

The project consists of one major funding source. Identification signs and supports shall be furnished and installed by the Contractor.

Project funding source identification signs are to be placed in such a manner so that road users can easily identify the project the sign applies to. Signs shall be placed only where they do not obscure the road user's view of other traffic control devices. Where possible, signs shall be installed behind protected areas, subject to the restrictions noted above and as approved by the Engineer. Upon completion of the project the signs, including support posts, shall be removed

No separate payment will be made for the signs, but all costs for the manufacture, erection, maintenance, moving, and removal of the sign shall be included in the unit prices bid for the various Contract items.

23. AS BUILT PLANS

The Contractor shall furnish Mylar "AS BUILT" plans of the completed project to the Engineer. These "AS BUILT" plans shall be furnished prior to the date of final acceptance. Full compensation for these plans shall be included in the prices bid for the various Contract items of work and no additional compensation will be allowed therefore.

The Engineer will make the original drawings available to the Contractor for use in preparing the as-built drawings. However, the Contractor may request a CADD version of the contract drawings as an alternative method for preparing the "AS BUILT" plans. In either case, final "AS BUILT" plans shall contain all information shown on the contract drawings and shall clearly indicate areas where changes were made during construction.

The "AS BUILT" plans shall be titled "AS BUILT" and stamped and dated by a Professional Engineer registered in the Commonwealth of Massachusetts. The Professional Engineer's stamp is required to certify any changes made to the contract drawings and shall not dictate responsibility for the original design drawings.

The "AS BUILT" plans will provide a record of constructed improvements for future reference; therefore partial plan sets will not be accepted. The Contractor may elect to use a combination of reproducible duplicates of the design drawings and revised CAD drawings to provide a complete set of "AS BUILT" plans.

TECHNICAL SPECIFICATIONS

All work done under this Contract shall be in conformance with the 1988 Massachusetts Highway Department Standard Specifications for Highways and Bridges; the Supplemental Specifications, dated June 15, 2012; the latest Interim Supplemental Specifications; the Technical specifications contained in this book; the 2014 Construction Standard Details; the 1996 Construction and Traffic Standard Details (as related to traffic standard details only), the latest “Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)” with Massachusetts amendments; the 1990 Standard Drawings for Signs and Supports; the 1968 Standard Drawings for Traffic Signals and Highway Lighting; the latest edition of American Standards for Nursery Stock, City of Lowell Standards, the Plans, and these Special Provisions.

The General Conditions, Supplementary Conditions and Special Provisions shall take precedence over the General Requirements of Division I of the Standard Specifications.

ITEM 102.51

INDIVIDUAL TREE PROTECTION

EACH

The work under this item shall conform to the relevant provisions of Sections 101 and 771 and the following:

The purpose of this item is to prevent damage to branches, stems and root systems of existing individual trees to remain and to ensure their survival. Provisions under this item include steps to minimize soil and root disturbance and to construct protection measures for trees close to construction areas.

Examination of Conditions

The Contractor shall be solely responsible for judging the full extent of the work requirements, including, but not necessarily limited to any equipment and materials necessary for providing tree protection.

Prior to any construction activities, the Contractor and Arborist shall walk the site with the Engineer and the DCR’s Arborist to identify which trees will require protection and to determine approved measures. The Arborist shall make recommendations as to appropriate methods to preserve trees. The Engineer will have final decision as to tree protection and methods.

The Contractor is responsible for the protection of all existing trees and plants within and immediately adjacent to the construction area that are not designated to be removed for the length of the construction period.

Incidental to the cost of these items, the Contractor shall retain the services of a certified arborist, who shall make recommendations as to the specific appropriate treatment of trees within or near the work zone.

ITEM 102.51 (Continued)

Submittals

Incidental to this item, the Contractor shall provide to the Engineer one (1) copy each of American National Standards Institute (ANSI) Standard Z-133.1 and A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance, Part 1: Pruning. These references shall be kept by the Engineer at his office for the length of the Contract.

Prior to start of work, the Contractor shall submit to the Engineer the name and certification number of the Massachusetts Certified Arborist referenced herein. Cost for Certified Arborist for all activities pertaining to this Item shall be incidental to this item.

Materials

Fence and temporary fence posts shall be subject to the approval of the Engineer. Fencing for individual plants shall be polyethylene fencing or chain link fence (new or used).

Staking for individual tree protection fencing shall be steel posts or 2x4 inch stock as directed and approved by the Engineer.

Wood chips shall conform to provisions of Wood Chip Mulch under Materials Section M6.04.3.

Trunk protection shall be 2x4 inch (50x100 mm) cladding, at least 8 feet in length, clad together with wire. Trunk protection shall include burlap.

Incidental to these items, the Contractor shall provide water for maintaining plants in the construction area that will have exposed root systems for any period during construction.

Construction Methods

To the extent possible, to avoid soil compaction within the root zone, construction activities including, but not limited to, vehicle movement, excavation, embankment, staging and storage of materials or equipment shall not occur underneath the canopy (drip line) of trees to remain. Where these activities will occur within 10 feet of the canopy of trees, the Contractor shall provide Individual Tree Protection as specified herein.

Tree Fencing and Armoring

For individual tree protection, the Contractor shall set posts and fencing at the limits of the tree canopy or as directed by the Engineer and/or Arborist. Where construction activities closer to the trees is unavoidable, the contractor shall tie branches out of the way and place wood chips to a depth of 6 inches on the ground to protect the root systems. The Contractor shall wrap the area of the trunk of the tree with burlap prior to armoring with 2x4 inch cladding. Cladding for tree trunks shall extend from the base of the tree to at least 8 feet from the base.

Where excavation within canopy is unavoidable, the Contractor shall use equipment and methods that shall minimize damage to the tree roots, per recommendations of the Certified Arborist. Such methods may require root pruning prior to, as well as during, any excavation activities.

ITEM 102.51 (Continued)

All fencing, trunk protection, branch protection, and woodchips shall be maintained throughout the duration of the contract. Protective fencing shall be repaired and woodchip mulch replaced as necessary during the duration of the contract at no additional cost.

Cutting and Pruning

Some pruning of roots and branches may be a necessary part of construction. Pruning will be performed on the same side of the tree that roots have been severed.

The Contractor shall retain the services of a Massachusetts State Certified Arborist to oversee any cutting of limbs, stem or roots of existing trees. All cuts shall be clean and executed with an approved tool. Under no circumstances shall excavation in the tree protection area be made with methods that might substantially damage the existing root systems. Excavation operations in these areas shall be monitored by the Certified Arborist to ensure that the impact to root systems is held to a minimum.

Any tree root area exposed by construction shall be covered and watered immediately. Exposed tree roots shall be protected by dampened burlap at all times until they can be covered with soil.

Watering

Water each tree within the construction area where work is in progress twice per week until the surrounding soil of each tree is saturated for the duration of construction activities.

Removal of Protection

After all other construction activities are complete, but prior to final seeding, wood chips, temporary fencing, branch protection, and trunk protection materials shall be removed and disposed off site by the Contractor at no additional cost.

Tree Damage

The Contractor shall be held responsible for the health and survival of the existing trees in the immediate vicinity of the of the construction area. Damage that, in the Engineer's opinion, can be remedied by corrective measures shall be repaired immediately. Broken limbs shall be pruned according to industry standards. Wounds shall not be painted. Trees or shrubs that are damaged irreparably shall, at the Engineer's discretion, be replaced per the requirements of Division I of these Special Provisions. Cost of replacement trees shall be borne by the Contractor.

Measurement and Payment

Individual Tree Protection will be measured and paid for at the contract unit price per each, which price shall include full compensation for all labor, equipment, materials, and incidentals for the satisfactory completion of the work, including the services of a certified arborist, water and fertilizer, fencing, mulch, equipment, tools and the subsequent removal and satisfactory disposal of the protective materials upon completion of the contract, and incidental costs required to complete the work.

ITEM 102.51 (Continued)

Item payment shall be scheduled throughout the length of contract: 30 percent of value shall be paid upon installation, 30 percent approximately halfway through the contract, and the remainder to be paid at the end of the contract after completion of construction operations that would disturb plants and after the protection materials have been removed and properly disposed of off-site by the Contractor.

No separate payment will be made for the fencing or the wood chips, but all costs in connection therewith shall be included in the price bid for Individual Tree Protection.

ITEM 120.1

UNCLASSIFIED EXCAVATION

CUBIC YARD

The work under this item shall conform to the relevant provisions of Section 120 of the Standard Specifications and the following:

The work shall include the disposal of existing materials shown on the drawings to be removed and reset, but which in the judgment of the Engineer are unsuitable for reuse in the proposed work and their disposal is not paid for under a separate item.

The work shall also include the excavation of material and debris of every description regardless of the type encountered; from within the project limits as shown on the drawings and as directed by the Engineer, except materials for which excavation is included with the work specified to be performed under other items.

No separate payment will be made for the off-site disposal of all existing material unsuitable for reuse in the proposed work, but all costs in connection therewith shall be included in the price bid for unclassified excavation.

ITEM 180.1**HEALTH AND SAFETY PLAN****LUMP SUM**

The work under this item shall include the preparation of a Health and Safety Plan (HASP). It is the Contractor's ultimate responsibility to ensure the health and safety of all of the Contractor's employees and subcontracting personnel, the Engineer's representatives, and the public and environment from any on-site chemical contamination.

A Certified Industrial Hygienist shall prepare the Health and Safety Plan or other competent person with the appropriate OSHA-required training to prepare such a plan. It shall include the components required by OSHA 29 CFR 1910.120(b). The preparer's name and work experience shall be included as part of the Health and Safety Plan submittal. The plan shall be designed to identify, evaluate, and control health and safety hazards and provide for emergency response, if needed.

The Health and Safety Plan shall be a dynamic document with provisions for change to reflect new information, new practices or procedures, changing site environmental conditions or other situations, which may affect site workers and the public. Health and safety procedures provided by the Contractor shall comply with all federal, state and local regulations that address employee working conditions (e.g. OSHA, RCRA, CERCLA, MADOS, etc.). Equipment used for the purpose of health and safety shall be approved by appropriate agencies and meet pertinent standards and specifications of the appropriate regulatory agencies.

The Health and Safety Plan shall be submitted to the Engineer for approval with compliance with these specifications at least four weeks prior to commencement of work. The review and acceptance of the plan by the Engineer does not relieve the Contractor of the responsibility for attaining the required degree of protection and training, or to comply with all laws, rules, regulations, standards or guidelines in effect during the execution of the Contract.

A copy of the Health and Safety Plan shall be maintained on-site at all times by the Contractor. The on-site copy shall contain the signature of the preparer, the Contractor's Project Manager, and each on-site employee and subcontractors. The employee's signature on the Health and Safety Plan shall be deemed prima facie evidence that the employee has read and understands the plan. A copy of the plan with signatures shall be submitted to the Engineer at the conclusion of the Contract, or at the Engineer's request. Signature sheets shall be submitted monthly, or at the request of the Engineer.

Health and safety plan will be paid for at the lump sum price bid for Item 180.1, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

ITEM 180.2 IMPLEMENTATION OF HEALTH AND SAFETY PLAN HOUR

The work under this item shall include the provision of a Site Health and Safety Officer for the implementation of the Health and Safety Plan. For all construction activities in which handling or exposure to potentially hazardous materials, the Health and Safety Plan shall specify an on-site Safety Officer. The Site Health and Safety Officer duties shall include, but are not limited to: implementation of the Site Health and Safety Plan, training, evaluating risks, safety oversight, determining levels of personnel protection required, and performing any required monitoring at the site. A Daily log shall be kept by the on-site Safety Officer and provided weekly to the Engineer. This log shall be used to record a description of the weather conditions, levels of personnel protection being employed, monitoring data and any other information relevant to on-site safety conditions. The Site Health and Safety Officer shall sign and date the Daily log.

In the event that subsurface contamination is discovered during construction, the Site Safety Officer shall be present to oversee all handling, storage, sampling, and transport of such contaminated materials by others.

The level of protection, relative to respiratory and dermal hazards, required to ensure the health and safety of on-site personnel shall be stipulated in the Health and Safety Plan and will be subject to modification by the on-site Safety Officer based on changing site and weather conditions and the following factors: type of operation or activity (job hazard analysis), chemical compounds identified on-site, concentration of the chemicals, physical state of the hazardous materials, potential duration of exposure to hazardous materials, dexterity required to perform work, decontamination procedures, necessary personnel and equipment, and type of equipment to be utilized.

The Contractor shall provide appropriate personnel protective equipment for anyone working in an area either containing or suspected of containing a hazardous environment. This work will include both individuals physically working in these areas and those directing their work. Contingencies for upgrading the level of protection for on-site workers shall be identified in the Health and Safety Plan and the Contractor shall have the necessary materials/equipment on hand to implement the level of protection upgrade in a timely manner. Payment for this level of upgrade protection shall be paid for under Item 180.3 Personal Protection Level "C" Upgrade.

Implementation of Health and Safety Plan will be measured for payment by the number of working day hours the Health and Safety Plan is implemented, as determined by the Engineer and shall include the cost of enforcement by an on-site Safety Officer.

Implementation of health and safety plan will be paid for at the Contract unit price per hour, which price shall include all labor, materials, equipment and incidental costs required for the work.

No separate payment will be made for personnel protective clothing and equipment below Level 'C', but all costs in connection therewith shall be included in the unit price bid.

ITEM 180.3

PERSONNEL PROTECTION LEVEL 'C' UPGRADE

HOOR

The work under this item shall include the provision of personnel protective clothing and equipment, Level 'C', required for the removal of hazardous material(s).

The Contractor shall provide disposable, protective clothing appropriate to the hazard level of the work to all workers. The protective clothing and equipment and its use shall be in strict compliance with the Health and Safety Plan (Item 180.1) included as part of these Contract Documents and all appropriate regulations that address employee working conditions.

Personnel protection Level 'C' will be measured for payment by the actual number of hours the protective clothing and equipment is used times the number of personnel supplied with the Level 'C' clothing and equipment.

Personnel protection Level C will be paid for at the Contract unit price per hour, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

**ITEM 180.4 MONITORING/HANDLING AND STOCKPILING CUBIC YARD
OF CONTAMINATED SOILS**

The work under this item shall include the testing of contaminated soils, and suspected contaminated soils, and their excavation, handling and stockpiling.

Upon discovery of any contaminated or potentially contaminated soils or sediments, the Contractor shall immediately notify the Engineer and the City's LSP. The Contractor will arrange for the Contractor's Licensed Site Professional (Contractor's LSP) to evaluate and assess potential contamination.

The Contractor's LSP shall be responsible for the evaluation of conditions evidencing possible contamination, such as non-natural discoloration of soil, petroleum or chemical odor, the presence of petroleum liquid or sheening on surface or groundwater, buried debris or any abnormal gas or materials in the ground which are known or suspected to be contaminated with oil or hazardous materials. Such evaluation shall include appropriate field tests in conformance with DEP and EPA protocols, and stockpile sampling and laboratory analysis. Sampling under this Item shall all include confirmatory sampling of excavations prior to backfill. All laboratories utilized shall meet the certification requirements of the Massachusetts Department of Environmental Protection (DEP).

Excavated materials determined to be contaminated or identified as potentially contaminated by the Contractor's LSP shall be stockpiled onsite in locations approved by the City's LSP and by the Engineer. The Contractor shall provide a description and plan of proposed stockpile areas for approval by the Engineer prior to their use. Then City's LSP may require the Contractor to pre-characterize the soils within 2 feet of the surface at select stockpile locations to document existing conditions. Throughout the duration of the project, the Contractor will provide a written log which tracks the disposition of all soils excavated, identifying location of excavation, stockpile designation and ultimate disposition of all soil. This log shall be provided to the Engineer and updated no less frequently than every two weeks.

Contaminated or potentially contaminated soil shall not be mixed or stockpiled with clean soil. Stockpile areas will be graded such that stormwater runoff is diverted from the stockpiles soils; haybales or equivalent barriers will be placed around the perimeter of the stockpiles to prevent contact of runoff with contaminated soils. Leachate from stockpiles sediments shall be contained/controlled and not allowed to run off or mix with stormwater. Appropriate security will be established to minimize worker and passerby contact with stockpiles. The first lift of the stockpiled soils will be placed on a minimum of two layers of six-mil-thick or one layer of 20-mil-thick polyethylene barrier over existing soils or pavement. Stockpiles will be covered with six-mil-thick black polyethylene cover or equivalent covering to form a continuous waterproof barrier over the soil. The cover must be maintained by the Contractor throughout the stockpile period to prevent water from entering the soils and to prevent blowing dust. The transfer of soil shall be performed in such a manner as to prevent the spread of contaminated or potentially contaminated materials. Unless approved by the Engineer, stockpiles shall be no greater than 500 cubic yards. Each stockpile must be clearly separable from adjacent stockpiles and shall be marked via appropriate signage to conform to the contaminated material tracking log and

ITEM 180.4 (Continued)

stockpile plan. The Contractor's LSP shall be responsible for monitoring the Contractor's performance on material transport and stockpile management.

Based on pre-characterization data and analysis, the Contractor's LSP may determine that it is possible to live-load trucks for off-site disposition in order to save stockpiling expense.

Stockpiled soils will be characterized for purposes of onsite reuse, off-site disposal or recycling based on sampling and analysis to be conducted by the Contractor's LSP. Additional sampling may be required for soils requiring off-site disposal/recycling to meet the requirements of the proposed receiving facility. Costs for disposal-related sampling shall be paid for under the Item 181.11.

The Contractor shall be required to supply all personnel and materials necessary to comply with this section and to support the anticipated levels of testing, protection and monitoring described above.

Monitoring/handling and stockpiling of contaminated soils will be measured for payment by the cubic yard of contaminated material monitored, handled and/ or stockpiled as measured in place.

Monitoring/handling and stockpiling of contaminated soils will be paid at the Contract unit price per cubic yard, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

ITEM 180.5 LICENSED SITE PROFESSIONAL (LSP) SERVICES PER HOUR

A Licensed Site Professional (LSP) will be required to manage the reuse and/or disposal of on-site materials and provide the services necessary to comply with the requirements of the Massachusetts Contingency Plan (MCP), 310 CMR 40.000 and related Federal and state laws, with respect to the scope of work for this Contract. The Contractor's LSP services are needed solely to support construction activities as needed at an open disposal site and the associated 21E Bill of Lading Paperwork. Ongoing follow-up MCP response actions are outside the scope of the contract. The Contractor shall submit the name and qualifications of the Licensed Site Professional (LSP) and all personnel working under this item to the Engineer and City's LSP for review and approval at least two weeks prior to initial site activities. The Contractor's LSP will have a current, valid license issued by the Massachusetts Board of Registration of Hazardous Waste Site Cleanup Professionals. The Contractor's LSP shall have significant experience in the oversight of MCP activities at active construction sites.

Within the project limits, soil, sediments or groundwater may be considered suspect if they exhibit non-natural discoloration, petroleum or chemical odor, the presence of petroleum liquid or sheening on the ground or surface water or any abnormal gas, debris or materials in the ground. In addition, existing or prior land uses (for example, historic industrial or commercial uses, etc.) may render the soils, sediments or groundwater as suspect. At the direction of the Engineer, the LSP shall evaluate any suspect soils, sediment or groundwater by appropriate field screening and/or laboratory analysis.

The Contractor's LSP shall review available environmental reports, meet with the City of Lowell and the City's LSP, perform additional test pits and soil testing as appropriate and prepare a draft memorandum describing the protocol related to the reuse and/or export of material excavated on-site and the import of fill material. The City's LSP will review the protocol and the Contractor's LSP will prepare a draft memorandum.

The Phase 1 Reports prepared by Watermark that are available are:

- j. Phase I Environmental Site Assessment and Subsurface Investigation Report, 169/171 Jackson Street, Lowell Massachusetts"; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated August 2006.**
- k. "Phase I Environmental Site Assessment and Subsurface Investigation Report ADDENDUM, 169/171 Jackson Street, Lowell Massachusetts"; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated October 2006.**
- l. "Response Action Outcome Statement, 169/171 Jackson Street, Lowell, Massachusetts, RTN 3-26422"; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated June 2007.**
- m. "Phase I Environmental Site Assessment and Subsurface Investigation Report, 291 Jackson Street, Lowell Massachusetts"; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated August 2006.**

ITEM 180.5 (Continued)

- n. **“Phase I Environmental Site Assessment and Subsurface Investigation Report ADDENDUM, 291 Jackson Street, Lowell Massachusetts”; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated October 2006.**
- o. **“Release Abatement Measure Plan, 291 Jackson Street, Lowell, Massachusetts”; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated June 2008.**
- p. **“Release Abatement Measure Plan Modification and Status Report No. 1, 291 Jackson Street, Lowell, Massachusetts”; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated October 2008.**
- q. **“Release Abatement Measure Completion Report, 291 Jackson Street, Lowell, Massachusetts”; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated April 2009.**
- r. **“Response Action Outcome Statement, 291 Jackson Street, Lowell, Massachusetts”; prepared for the City of Lowell, by Watermark Environmental of Lowell, Massachusetts, dated July 2009.**

Generally, the Contractor and Contractor’s LSP will follow this protocol:

- Set-up a pre-construction meeting with the City’s LSP, the Contractor, the Contractor’s LSP and the Engineer to introduce players and discuss responsibilities;
- Contractor’s LSP to evaluate available environmental reports applicable to the site;
- Contractor’s LSP shall recommend the pre-characterization activities;
- LSP to perform test pits, take grab samples, send to lab for environmental and geotechnical testing as needed to supplement existing testing info;
- LSP to evaluate lab results and prepare a draft “pre-characterization memo” describing the contaminant limits for imported and exported soil, testing frequency and reporting requirements. Watermark, DPD and VHB will review and comment. LSP to issue final memorandum.
- LSP and Contractor will implement protocol and will provide email copies of all related correspondence, testing results, Chain of custody documentation, etc. to DPD, Watermark and VHB. Watermark will review the data with regard the MCP standards and VHB will review data with regard to MHD standards for ordinary borrow.
- Contractor’s LSP shall monitor soil conditions via field screening instruments to evaluate consistency with pre-characterization data and to minimize additional analytical testing needs;
- Where possible, the pre-characterization data should be used to support offsite disposition to avoid redundancy of analytical data.

ITEM 180.5 (Continued)

The Contractor's LSP will be required to perform and document physical observations and field screening of soils during excavation activities; perform and document collection of samples for laboratory environmental analysis; evaluate physical observations, field screening results, and laboratory analytical data and perform and document classification of soils; perform soil management (i.e. oversee and document proper handling, reuse, and disposal of excavated soils by directing the segregation and stockpiling of soil suitable for on-site reuse, designating soil for off-site recycling, reuse or disposal, etc.); and ensure compliance with the Massachusetts Contingency Plan and the requirements of this Item. The Contractor's LSP shall maintain written records in a clear and concise format which track the excavation, stockpiling, analysis and reuse/disposal of all suspect and contaminated soils, sediments and groundwater. These records shall be up-to-date and available to the Engineer on a bi-weekly basis. Written records shall be maintained for all field screening procedures and results, sampling points, and segregation and classification of stockpiles. The Contractor's LSP shall maintain written records documenting sampling locations and method of collection for all samples requiring laboratory analysis. The laboratory report together with the Chain of Custody form for all analytical results shall be submitted to the Engineer within fourteen (14) days after completion of such analyses.

The Contractor's LSP will prepare, perform/execute, and implement Preliminary Response Actions and Risk Reduction Measures, including but not limited to, Immediate Response Action (IRA) Plan(s), Imminent Hazard Evaluation(s), and Utility-Related/Release Abatement Measure (RAM) Plans, Status Reports and Completion Reports, Response Action Outcome Statements, and any supporting documentation for submittal to the Department of Environmental Protection (DEP). In certain circumstances, the Contractor's LSP may prepare other MCP submissions such as Release Notification Forms, Risk Assessments, etc. and related documents such as site-specific Health and Safety Plans as directed by the Engineer. The Contractor's LSP will prepare and sign all Bills of Lading, including LSP Opinion, and waste manifests or other disposal tracking forms as appropriate subject to the approval of the City's LSP; make determinations with respect to handling of any contaminated groundwater encountered during dewatering; obtain any discharge permits for dewatering activities; conduct any required Public Involvement Activities; and perform any other activities necessary to properly execute the work of this Contract. Note: Where the requirements of this Item call for physical observations, field screening, environmental sampling, and the like, such activities may be delegated by the Contractor's LSP to other individuals under the LSP's supervision that possess the necessary qualifications and training. Nonetheless, the Contractor's LSP shall be held responsible for the proper performance of this work.

The Contractor's LSP and the Contractor shall both be held responsible for performing the Work in accordance with all applicable Federal and State laws and regulations. In addition, the work will conform to the regulatory policies and recognized standard practices and codes related to contaminated soil excavation, characterization, handling, transportation, and reuse/disposal activities. The City or City's LSP shall not be responsible at any time for the Contractor's LSP or the Contractor's violation of pertinent State or Federal regulations or endangerment of laborers or others. The Contractor's LSP and Contractor shall be held responsible for the

ITEM 180.5 (Continued)

submission of all MCP documents to the Engineer so as to meet the timeframes specified in the MCP and for the timely submission of data and tracking information as noted within this Item.

The Contractor's LSP will coordinate all activities with City of Lowell and the Massachusetts Department of Environmental Protection through the Engineer or his/her designee. Unless otherwise directed by the Engineer, the Contractor's LSP shall submit no information directly to DEP without the prior written approval from the City, except as otherwise provided for at 309 CMR 4.03 (4) (b).

Work under this Item shall be paid at the Contract bid price per hour of service provided to perform the work as described above except as noted herein. The bid price shall reflect the cost of the Contractor's LSP and all environmental technicians to perform all work tasks and field screening, and produce all documentation. The cost of analyses conducted in accordance with the laboratory sampling and assessment requirements for compliance with the MCP will be paid for within the unit bid price for Item 180.4 – Monitoring/Handling and Stockpiling of Contaminated Soils. The cost of laboratory analyses conducted for waste profiles for disposal purposes will be paid for within the unit bid price for the appropriate disposal Item.

ITEM 181.21

DISPOSAL OPTIONS FOR CONTAMINATED SOILS

TON

The work under this item shall include the transportation and disposal options of contaminated material excavated, or excavated and stockpiled. It shall also include the cost of any additional laboratory analyses required by a particular disposal facility beyond the standard disposal test set.

The Contractor shall be responsible for the proper disposal or recycling of contaminated soils. The proper methods of disposal and recycling of contaminated soils shall comply with the methods described under Item 180.4 and in accordance with all Massachusetts Department of Environmental Protection and Environmental Protection Agency statutes, policies, and regulations. The following are disposal options for contaminated soils. MassDOT prefers methods involving recycling options.

DISPOSAL OF SPECIAL WASTE SOIL

PETROLEUM CONTAMINATED SOIL RECYCLED AT ASPHALT BATCH FACILITY

USED AS DAILY COVER AT A LINED LANDFILL

Excavation of existing subsurface materials may include the excavation of contaminated soils. The Contractor shall be responsible for the proper coordination of characterization, transport and disposal, recycling or reuse of contaminated soils. Disposal, recycling or reuse will be referred to as “disposal” for the remainder of this specification unless otherwise stated. However, regardless of the use of the term herein, there will be no compensation under these Items for reuse within the project limits.

Decontamination of Equipment

Tools and equipment which are to be taken and reused off site shall be decontaminated in accordance with applicable local, state and federal regulations. This requirement shall include, but not be limited to, all tools, heavy machinery and excavating and hauling equipment used during excavation, stockpiling and handling of contaminated material. Decontamination of equipment is considered incidental to the applicable excavation Item, Item 180.4 and this Item.

Method of Measurement

Measurement shall be made by the weight, in tons, of contaminated material removed from the site and delivered to an approved landfill, disposal facility, or recycling facility, and includes any costs for approvals, permits, testing, transportation and disposal.

Basis of Payment

The work under the appropriate method shall be paid at the contractor’s unit bid price, per ton, which payment shall be considered full compensation for all labor, tools, equipment, permits, shipping papers and materials required to do the work as described above.

ITEM 194.2

MISCELLANEOUS SOIL TESTING

EACH

The work under this item shall conform to all relevant provisions of the Standard Specifications and the following:

The Engineer may, from time to time, direct the Contractor to obtain soil samples from various locations in the project area and to perform laboratory analyses on those soil samples to assess onsite and/or offsite reuse and/or disposal options.

The Contractor shall collect soil samples from locations within individual soil piles or specific land area identified by the Engineer. The soil samples shall be collected at a depth specified by the Contractor's LSP or as required by the Department of Environmental Protection's (DEP's) approved sampling procedures. The samples shall be delivered to a DEP approved laboratory for to be analyzed in accordance with the MassDEP Compendium of Analytical Methods (CAM).

The Contractor shall also collect require Toxicity Characteristic Leaching Procedure (TCLP) analyses (Method 1311) for metals as required based on analytical results, (e.g., exceeding the theoretical 20 x rule).

The Contractor shall review and summarize the laboratory data from the soil sampling analyses. The data will be compared to Massachusetts Contingency Plan (MCP) soil standards and acceptance criteria for soil recycling and landfill disposal facilities. A letter report shall be delivered to the Engineer outlining the soil sampling methods, laboratory analyses results and proposed options for reuse or disposal of the soil.

Measurement and Payment

Miscellaneous Soil Testing shall be measured by each round of samples collected, tested and reported on to the Engineer. A round of samples shall include a total of six samples: the three samples obtained for analysis of corrosivity, pH, free liquids, ignitability, reactive sulfide, reactive cyanide, total solids, total organic carbon, RCRA 8 metals, PCBs, VOCs, SVOCs and TPH and the three samples obtained for TCLP analyses.

Miscellaneous Soil Testing shall be paid for at the contract unit price for each sample collected, tested and reported upon as described above and as approved by the Engineer, which price shall include all labor, materials, equipment, laboratory costs and other incidental costs required to complete the work.

| | | |
|--------------------------|--|--------------------|
| <u>ITEM 201</u> | <u>CATCH BASIN</u> | <u>EACH</u> |
| <u>ITEM 202</u> | <u>MANHOLE</u> | <u>EACH</u> |
| <u>ITEM 203.1</u> | <u>SPECIAL MANHOLE – 5.0’ DIAMETER</u> | <u>EACH</u> |
| <u>ITEM 220</u> | <u>DRAINAGE STRUCTURE ADJUSTED</u> | <u>EACH</u> |
| <u>ITEM 222.3</u> | <u>FRAME AND GRATE (OR COVER)</u> <u>MUNICIPAL STANDARD</u> | <u>EACH</u> |
| <u>ITEM 223</u> | <u>FRAME AND GRATE (OR COVER)</u> <u>REMOVED AND RESET</u> | <u>EACH</u> |
| <u>ITEM 223.2</u> | <u>FRAME AND GRATE (OR COVER)</u> <u>REMOVED AND DISCARDED</u> | <u>EACH</u> |

The work under these items shall conform to the relevant provisions of Section 201 and 220 of the Standard Specifications and the following:

All proposed catch basins shall be constructed with a minimum 4-foot sump and hood.

Special manhole – 5-foot in diameter shall be constructed as located on the plans and shall have a 5-foot inside diameter.

The special manhole shall be constructed over the existing pipe and the work shall include the connecting of the pipe to the manhole structure and the necessary cutting and removal of the existing pipe within the manhole. The existing pipe shall be neatly cut to provide a smooth uniform face flush with the inside wall surface of the manhole and totally removed or neatly cut longitudinally and partially removed to retain the lower half of the existing pipe barrel to form the required manhole shaped invert.

New catch basin and drainage manhole castings shall be per City of Lowell Standards, as shown on the plans.

New or reset drainage structure castings located within the roadway shall be set to intermediate course.

The work shall also consist of removing and discarding existing frames and grates (or covers) that are found to be unsuitable for re-use, that do not meet the City of Lowell Standards, and as directed by the Engineer. Said items shall become the property of the Contractor and shall be removed from the project and disposed of legally.

ITEM 201 Through 222.3 (Continued)

Measurement and Payment

Catch Basins and Manholes shall be measured for payment per structure, complete in place, which price shall include all labor, material, equipment and incidental costs required to complete the work.

Catch basin hoods will not be paid for separately, but will be included in the unit price bid for Item 201, Catch Basin.

The measurement and payment for Item 203.1 shall also include the construction of the manhole over the existing pipe. No separate payment will be made for the cement concrete, steel reinforcing and other incidental work, but all costs in connection therewith shall be included in the price bid for Item 203.1.

Frame and Grate (or Cover) Municipal Standard shall be measured by each, complete in place.

Frame and Grate (or Cover) Municipal Standard shall be paid for at the contract unit price each, which price shall include all labor, materials, equipment and other incidental costs required to complete the work.

Frame and grate (or cover) removed and discarded will be measured by the unit each, and shall include its associated casting.

Frame and grate (or cover) removed and discarded will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

| | | |
|--------------------------|--|--------------------|
| <u>ITEM 220.6</u> | <u>SANITARY STRUCTURE REBUILT</u> | <u>FOOT</u> |
| <u>ITEM 220.7</u> | <u>SANITARY STRUCTURE ADJUSTED</u> | <u>EACH</u> |
| <u>ITEM 220.8</u> | <u>SANITARY STRUCTURE REMODELED</u> | <u>EACH</u> |

The work under these items shall conform to the relevant provisions of Sections 201 and 220 of the Standard Specifications and the following:

The work shall include the adjusting, remodeling and rebuilding of existing sewer manholes as shown on the plans to meet the proposed grades.

For remodeling or rebuilding of sanitary structures, the precast cone sections and frames shall be removed. Additional precast concrete barrel sections shall be added as needed to increase or decrease the manhole height and the existing cone sections and frames shall be reset.

New watertight plastic seals shall be placed between precast sections prior to installation.

If frame and grate locations require horizontal adjustment, new or additional access steps shall be added as required as to maintain safe access into the structure.

Steps shall be steel reinforced copolymer polypropylene steps conforming to ASTM C478.

Debris, excess mortar or other material resulting from the work shall be removed from the manhole.

All sanitary sewer structures to be remodeled or rebuilt shall be pressure tested to ensure a watertight seal has been constructed. The pressure testing shall be completed by an outside testing firm.

Adjusting, remodeling and rebuilding sanitary structures shall include the installation of a watertight insert from the frame to the bottom of the structure chimney. The insert shall be Parson Environmental FlexRib Seal, Protective Liner Systems PerpectuSeal, Cretex Classic Internal Chimney Seal, A-Lok Water-Lok Expandable Grade Ring Liner or approved equivalent. The insert shall be installed per manufacturer's specifications.

Measurement and Payment

No separate payment will be made for the watertight inserts or steps, but all costs in connection therewith shall be included in the Contract unit price bid for Sanitary Structure Adjusted and Sanitary Structure Remodeled.

Sanitary structures remodeled will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

Sanitary structures rebuilt will be paid for at the Contract unit price per foot, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

ITEM 220.6 Through 220.8 (Continued)

In the event where a sanitary structure is tested and found to be inadequately sealed, the contractor shall make the necessary modifications to ensure a watertight seal. This shall be repeated if necessary until the structure passes testing. No additional payment will be made for each additional modification and test.

ITEM 250.08 8 INCH POLYVINYL CHLORIDE SANITARY SEWER PIPE FOOT

The work under this item shall conform to the relevant provisions of Sections 230 of the Standard Specifications and the following:

Polyvinyl chloride pipe and fittings for sewer shall be polyvinyl chloride (PVC) SDR 21 with full diameter. Pipe shall conform to ASTM D2241, with material per ASTM D1784, Grade 1, Type 1.

All joints are to be made water-tight bell and spigot type in accordance with the requirements specified herein.

Pipe shall be jointed in strict accordance with the Pipe manufacturer's instruction. Jointing of all pipes shall be done entirely in the trench.

Installation

Lubricant for jointing of Bell and Spigot PVC pipe shall be applied as specified by the pipe manufacturer. Use only lubricant supplied by the pipe manufacturer.

Bell and Spigot PVC Pipe shall be pushed home by hand or use of bar and block. The use of power equipment such as a backhoe bucket is not allowed.

To join field-cut pipe, pipe end shall be cut square. The cut end of the pipe surface shall be properly beveled to the size and shape of a factory-finished beveled end. All sharp edges shall be rounded off.

Bedding for PVC sanitary sewer pipe shall be Sand Borrow, per section M1.04.0 of the Standard Specifications, to the limits shown on the plans.

Measurement and Payment

8 inch polyvinyl chloride sanitary sewer pipe will be paid for at the Contract unit price per foot, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

No separate payment will be made for sand borrow, lubricant, cutting, beveling or jointing, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 470.2

**HOT MIX ASPHALT BERM,
TYPE A - MODIFIED**

FOOT

The work under this item shall conform to the relevant provisions of Section 470 of the Standard Specifications and the following:

Hot mix asphalt berm, type A - modified, shall be constructed by means of an approved extrusion machine in conformance with the dimensions and at the locations shown on the plans.

Prior to placing the HMA berm, the surface shall be swept clean and RS-1 asphalt emulsion shall be applied to the surface.

Measurement and Payment

Hot mix asphalt berm, type A - modified will be measured for payment by the foot, complete in place, along the gutter line.

Hot mix asphalt berm, type A—modified, will be paid for at the Contract unit price per foot, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

Asphalt emulsion will be paid for under Item 464.

ITEM 482.3

SAWING ASPHALT PAVEMENT

FOOT

ITEM 482.4

SAWING CEMENT CONCRETE

FOOT

The work under these items shall conform to the relevant provisions of Section 120 of the Standard Specifications and the following:

The work shall include the sawcutting of existing asphalt and cement concrete pavements where shown on the plans, and as directed by the Engineer.

Sawcut equipment shall be approved by the Engineer prior to commencing work.

The existing pavement shall be sawcut through its full depth, or to the elevation of the abutting proposed pavement subgrade, whichever is lesser, and at all joints between existing and proposed pavements, and at all utility trenches through existing pavement to remain, to provide a uniform, vertical surface for the proposed pavement joint with the existing pavement.

Sawcut edges which become broken, ragged or undermined as a result of the Contractor's operations shall be re-sawcut prior to the placement of abutting proposed pavement at no additional cost to the Owner.

Sawcut surfaces in asphalt pavement shall be sprayed or painted with a uniform, thin coat of RS-1 asphalt emulsion immediately before placement of hot mix asphalt material against the surfaces. Sawcut surfaces abutting the proposed pavement top course shall be coated with hot-poured rubberized asphalt sealer.

Sawing cement concrete will be measured for payment by the foot on the pavement surface complete in place.

Sawing concrete pavement overlain with asphalt pavement will be measured for payment under Item 482.4.

Sawing asphalt pavement and sawing cement concrete will be paid for at the respective Contract unit prices per foot, which prices shall include all labor, materials, equipment, and incidental costs required to complete the work.

Asphalt emulsion will be paid for under Item 464.

Hot-poured rubberized asphalt sealer will be paid for under Item 464.5.

ITEM 504.5

GRANITE CURB TYPE VA-4 – MOUNTABLE

FOOT

Work under these items shall conform to the relevant provisions of Section 500 of the Standard Specifications and the following:

The work under this item shall also include providing chamfered curb and transitioned chamfered curb to the dimensions shown on the plans.

No separate payment will be made for cutting or shaping of curb, cement concrete, thermal finishing, dressing of the curb or other incidental work required to complete the work, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 509.

**GRANITE TRANSITION CURB FOR
WHEELCHAIR RAMPS - STRAIGHT**

FOOT

The work under these items shall conform to the relevant provisions of Section 501 of the Standard Specifications and the following:

The work under Item 509. shall also include transition curb for driveways and at locations shown on the plans and as directed by the Engineer.

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|-------------------------|--|--------------------|
| <u>ITEM 580.</u> | <u>CURB REMOVED AND RESET</u> | <u>FOOT</u> |
| <u>ITEM 581.</u> | <u>CURB INLET REMOVED AND RESET</u> | <u>EACH</u> |
| <u>ITEM 594.</u> | <u>CURB REMOVED AND DISCARDED</u> | <u>FOOT</u> |
| <u>ITEM 595.</u> | <u>CURB INLET REMOVED AND DISCARDED</u> | <u>EACH</u> |

Work under these items shall conform to the relevant provisions of Section 500 of the Standard Specifications and the following:

Existing granite curb and curb inlets shall be cleaned by sandblasting to remove any paint, joint mortar, asphalt material or other undesirable material adhered to the granite before resetting, as required by the Engineer. The Contractor shall only reset existing curbing that has been approved by the Engineer for re-use. All unsuitable curbing shall be legally disposed of off-site.

Curved granite curb with different radius than the proposed curb are unsuitable for reuse. Damaged curb stones are unsuitable for reuse.

All stones to be reused which have damaged curb ends shall be sawcut square with the top plane so when stones are placed end to end the joint opening does not exceed one half inch.

Reset curb stones shall be reset contiguously. New curb stones shall be installed contiguously. Alternating new and old stones shall not be permitted.

The Contractor is advised that granite curb and curb inlets removed may be reset elsewhere at a different location within the Contract limits and all costs incurred for handling and transporting existing curb shall be included in the prices bid for the respective items.

Work under these items shall include all types of curbing removed and reset or discarded.

No separate payment will be made for storage, transporting and handling of existing granite curb and curb inlets to be reused or discarded, concrete to set curbing and other incidental work, but all costs in connection therewith shall be included in the Contract unit prices bid for the respective items.

ITEM 657.**TEMPORARY FENCE****FOOT**

The work under this item shall conform to the relevant provisions of Section 644 of the Standard Specifications and the following:

The work of this section consists of furnishing and installing, removing and resetting and the dismantling of temporary fence to separate construction activities from public access.

The temporary fence shall be constructed at locations as shown on the plans or directed by the Engineer. The Contractor shall install and maintain temporary construction fences around the construction site, stockpile areas, and any and all exposed excavations located outside the defined roadway area, accessible to the public until such time it is no longer necessary as determined by the Engineer. Carefully protect all areas of the site from intrusion and trespass. Protect public health, safety and welfare at all times.

The Contractor is responsible for relocating the fence as many times as required to properly protect construction activities.

Unless otherwise indicated, the type of temporary chain link fencing shall be Contractor's option. Following types are acceptable:

1. New materials or previously used salvaged chain link fencing in good condition.
2. Posts: Galvanized steel pipe of diameter to provide rigidity. Post shall be suitable for setting in concrete footings, driving into ground, anchoring with steel base plates, or inserting in precast concrete blocks.
3. Fabric: Woven galvanized steel wire mesh. Provide in continuous lengths to be wire tied to fence posts or prefabricated into modular pipe-framed fence panels.

Gates:

The contractor may provide personnel and vehicle gates only as approved by the Engineer. Any gates used shall meet the following requirements:

1. Fabricate of same material as used for fencing.
2. Vehicle gates:
 - a. Minimum width: 20 feet to allow access for emergency vehicles.
 - b. Capable of manual operation by one person.

Fence fabric shall be fastened to posts by means of No. 6 gauge zinc coated wire clips. No post tops are required.

ITEM 657 (Continued)

Gates shall be fabricated using welded construction or heavy pressed steel or malleable corner fitting securely riveted. Gates shall be properly braced and diagonally trussed to eliminate any possible sagging. Hinges shall be of sufficient strength and design to permit easy and trouble free operation. All single swing gates shall be equipped with two H.O. hinges and one yoke latch per gate. All double swing gates shall be equipped with a positive type latching device with padlock fitting.

Gate Posts: Posts for swing gates shall be 2.875 inches outside diameter standard weight galvanized steel pipe, weight 5.79 lbs. per linear foot.

Installation of temporary fencing shall not deter or hinder access to existing or proposed fire hydrants. Maintain 3 feet diameter clear space around fire hydrants. Where fire hydrant is blocked by fencing, provide access gate.

Measurement and Payment

Temporary fence will be measured by the foot installed from end post to end post, including gates.

Temporary fence will be paid for at the Contract unit price per foot, which shall include all labor, materials, equipment and incidental costs required to complete the work.

No separate payment will be made for removing and resetting of temporary fence, fence posts, gate posts, concrete, footings, or gates, but all costs in connection therewith shall be included in the unit price bid.

ITEM 697.1

SILT SACK

EACH

Work under this item shall conform to the relevant provisions of Section 670 of the Standard Specifications and the following:

The work under this item includes the furnishing, installation, maintenance and removal of a reusable fabric sack to be installed in drainage structures for the protection of wetlands and other resource areas and the prevention of silt and sediment from the construction site from entering the storm water collection system. Devices shall be ACF Environmental (800)-448-3636; Reed & Graham, Inc. Geosynthetics (888)-381-0800; The BMP Store (800)-644-9223; or approved equal.

Construction

Silt sacks shall be installed in retained existing and proposed catch basins within the project limits and as required by the Resident Engineer.

The silt sack shall be as manufactured to fit the opening of the drainage structure under regular flow conditions, and shall be mounted under the grate. The insert shall be secured from the surface such that the grate can be removed without the insert discharging into the structure. The filter material shall be installed and maintained in accordance with the manufacturer's written literature and as directed by the City.

Silt sacks shall remain in place until the placement of the pavement overlay or top course and the graded areas have become permanently stabilized by vegetative growth. All materials used for the filter fabric will become the property of the Contractor and shall be removed from the site.

The Contractor shall inspect the condition of silt sacks after each rainstorm and during major rain events. Silt sacks shall be cleaned periodically to remove and disposed of accumulated debris as required. Silt sacks, which become damaged during construction operations, shall be repaired or replaced immediately at no additional cost to the Department.

When emptying the silt sack, the contractor shall take all due care to prevent sediment from entering the structure. Any silt or other debris found in the drainage system at the end of construction shall be removed at the Contractors expense. The silt and sediment from the silt sack shall be legally disposed of offsite. Under no condition shall silt and sediment from the insert be deposited on site and used in construction.

All curb openings shall be blocked to prevent stormwater from bypassing the device.

Handling and disposal of all debris accumulated in silt sacks shall be included under Item 227.3, Removal of Drainage Structure Sediment.

Measurement and Payment

Silt sacks will be measured and paid at the Contract unit price per each, complete in place, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for removal and disposal of the sediment from the insert, but all costs in connection therewith shall be included in the Contract unit price bid.

| | | |
|--------------------------|---|---------------------------|
| <u>ITEM 701.2</u> | <u>CEMENT CONCRETE SIDEWALK</u> | <u>SQUARE YARD</u> |
| <u>ITEM 701.1</u> | <u>CEMENT CONCRETE SIDEWALK AT DRIVEWAYS</u> | <u>SQUARE YARD</u> |
| <u>ITEM 701.2</u> | <u>CEMENT CONCRETE WHEELCHAIR RAMP</u> | <u>SQUARE YARD</u> |

The work under this item shall conform to the relevant provisions of Section 701 of the Standard Specifications and the following:

Cement concrete sidewalk and cement concrete wheelchair ramp shall be constructed with a depth or 4 inches. All concrete shall contain 6-inch by 6-inch W-1.4 x W1.4 welded wire mesh reinforcing as shown on the plans.

Cement concrete sidewalk and cement concrete wheelchair ramp shall be constructed with a depth or 6 inches. All concrete shall contain 6-inch by 6-inch W-2.9 x W2.9 welded wire mesh reinforcing as shown on the plans.

Cement concrete wheelchair ramps in shall be constructed at locations shown on the Plans and in conformance with the Architectural Access Board’s Rules and Regulations dated February 23, 1996, as amended and the MHD Wheelchair Ramp Standards, as shown in the Metric/English Supplemental Drawings dated April 2003. Concrete score lines as specified in Section 701 shall be continuous throughout the wheelchair ramps.

Detectable tactile warning surface shall be “Replaceable Wet-Set Truncated Dome Detectable Warning System”, color black, as manufactured by ADA Solutions, Inc, North Billerica, MA, www.adatile.com, or approved equal.

Detectable Tactile warning surface shall conform to the requirements as shown on the MassDOT Construction Standard Detail E 107.6.5R.

Cement concrete sidewalk, cement concrete sidewalk at driveways and cement concrete wheelchair ramp will be measured for payment by the square yard of surface, complete in place.

Cement concrete sidewalk, cement concrete sidewalk at driveways and cement concrete wheelchair ramp will be paid for at the Contract unit prices per square yard, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

No separate payment will be made for the detectable warning panels, but all costs in connection therewith shall be included in the unit price bid for cement concrete wheelchair ramp.

No separate payment will be made for the welded wire mesh reinforcing, but all costs in connection therewith shall be included in the unit prices bid.

ITEM 702.3**CHIPSEAL HOT MIX ASPHALT PAVEMENT****SQUARE YARD**

The work under this item shall conform to the relevant provisions of Section 700 of the Standard Specifications and the following:

The work of this Section consists of all chip and seal paving work and related items as indicated on the Drawings and or as specified herein.

References and Standards

The following standards and definitions are applicable to the work of this Section to the extent referenced herein:

1. ASTM: American Society for Testing and Materials.
2. AASHTO: American Association of State Highway and Transportation Officials.

Samples and submittals

Submit the following:

Design mix for hot mix asphalt paving.
Sieve analysis of aggregate for top course
Material sample of aggregate for surface course

Construct one 5 foot x 5 foot sample panel of chip and seal pavement with hot mix asphalt subbase, bitumen for tack coat, and aggregate surfacing. The sample panel to be approved by the Engineer prior to the installation of pavement.

Materials**Base and subbase**

Base and subbase materials shall consist of dense graded crushed stone (M2.01.7) and compacted gravel borrow (M1.03.0, Type C) as shown on Drawings.

Aluminum Edging

Aluminum edging shall be PermaLoc Aluminum Edging, manufactured by PermaLoc, Holland, MI 49424 or approved equal. Aluminum edging shall be shop fabricated from aluminum alloy 6063-T6, 3/16 inch thick x 4 inches deep, with standard black baked-on acrylic paint finish. Edging shall be furnished in 16-foot lengths. Aluminum edging shall have undulated faces providing "locking system" with stakes. Aluminum stakes shall have grooved edges and shall be 18-inch length. Wider aluminum stakes shall be available for "locking" abutting sections of edging together.

Hot Mix Asphalt

Hot mix asphalt shall be Class I, Type I-1, furnished in accordance with MHD Specifications Section M3, except as modified herein.

ITEM 702.3 (Continued)

Total Compacted Pavement Thickness shall be as indicated on the Contract Documents.

Binder course shall consist of one lift of Binder Course hot mix asphalt to thickness as shown on the Contract Documents.

Finished top course shall consist of one lift of Top Course hot mix asphalt to thickness as shown on the Contract Documents.

Hot mix asphalt material shall conform to MHD Specifications Paragraph M3.11.03, Table A, except as amended herein. Top course for sidewalks shall conform to composition for "Dense Mix".

Asphaltic Emulsion

Asphaltic emulsion shall be asphalt cement (AC-20) as specified in Section M3.01.0.

Aggregate Surface

Crushed stone aggregate shall consist of processed natural stone. Color of chips shall be a natural tan and shall harmonize with general character of native stone in the landscape as approved by the Engineer. Aggregate shall be stone of inert, durable, fractured face, uniform quality meeting the following sieve gradation analysis by weight:

| Sieve | Percent |
|-------|---------|
| 3/8 | 100 |
| 1/4 | 85-100 |
| 1/8 | 0-15 |

The Aggregate shall be cleaned and washed before use. The aggregate shall be free from dust, clay, soot from burner fuel, or any other deleterious substances and shall also be essentially dry, with a water content less than 0.5 percent. Prior to delivery of the aggregate to the project site it shall be thoroughly washed to ensure that no dust particles adhere to the surfaces of the stone.

Natural tan stone shall be obtained from East Templeton Sand and Gravel, East Templeton, MA; or an approved equal source.

Construction Methods

Base and subbase shall be furnished and installed per the requirements of the Standard Specifications.

Aluminum edging shall be installed at locations indicated on the Drawings. Where required, edging shall be cut square and accurately to required length. Aluminum edging shall be securely staked in required position. Stakes shall be driven every 30 inches on-center along length of edging. Adjacent lengths of edging shall abut and be "locked" together with widened stake.

ITEM 702.3 (Continued)

Edging shall be set plumb and vertical at required line and grade. Straight sections shall not be wavy. Curved sections shall be smooth with no kinks or sharp bends.

Hot mix asphalt pavement

Contractor shall obtain written approval of the base and subbase condition from the Engineer prior to beginning any paving operations.

Make any corrections necessary to crusher run stone or gravel borrow subbases furnished and installed, to bring subbase materials to the sections and elevations shown on the drawings and as directed by Engineer.

Place binder and top course hot mix asphalt in conformance to applications and depths required by Drawings and specifications herein. All depths referenced shall be compacted thicknesses.

No asphalt material shall be applied when the temperature is below 32 degrees F. The temperature of hot mix asphalt mixture when delivered to the site shall conform to the following, with a tolerance of plus or minus 15 degrees F:

| <u>Base temp. degrees F on which mix is placed</u> | <u>Material temp. in degrees F for course thickness in inches</u> | | | |
|--|---|----------------|-----------|------------|
| | <u>1"</u> | <u>1- 1/2"</u> | <u>2"</u> | <u>3"+</u> |
| 35-40 degrees F | | 305 | 295 | 280 |
| 41-50 degrees F | 310 | 300 | 285 | 275 |
| 51-60 degrees F | 300 | 295 | 280 | 270 |
| 61-70 degrees F | 290 | 285 | 275 | 265 |
| 71-80 degrees F | 285 | 280 | 270 | 265 |
| 81-90 degrees F | 275 | 270 | 265 | 260 |
| 91 degrees and over | 270 | 265 | 260 | 255 |

The Engineer may require the Contractor to remove and replace at Contractor's own expense a defective mix not conforming to the specified mix formula.

If, before the final acceptance of the work, soft, imperfect places or spots shall develop in the surface, all such places shall be removed and replaced with new materials and then compacted until the edges at which the new work connects with the old become invisible.

Spreading and Finishing

The equipment for spreading and finishing shall be mechanical, self-powered pavers, capable of spreading and finishing the mixture true to lines, grades, widths and crowns by means of fully automated controls for both longitudinal and transverse slopes.

ITEM 702.3 (Continued)

If, during construction, it is found that the spreading and finishing equipment in use leaves tracks or indented areas, or produces other permanent blemishes in the pavement, which are not satisfactorily corrected by the scheduled operations, the use of such equipment will be discontinued and other satisfactory spreading and finishing equipment will be provided by the Contractor.

The mixtures shall be placed and compacted only at such times as to permit the proper inspection and checking by the Engineer.

The mixtures shall be placed only upon approved surfaces that are clean from foreign materials and dry; and when weather conditions are suitable.

The contact surfaces of curbs, manholes, catch basins or other appurtenant structures in pavement shall be painted thoroughly with a thin uniform coating of bitumen just before a mixture is placed against them. This requirement shall be included as work incidental to paving operations.

Machine Spreading: All mixtures shall be deposited in an approved mechanical spreader and immediately spread thereby, and then struck off in a uniform layer to the full width required and of such depth that each course, when compacted, shall have the required thickness and shall conform to the grade and cross section contour specified.

Hand Spreading: Spreading by hand methods will be permitted only for particular locations in the work which because of irregularity, inaccessibility or other unavoidable obstacles do not allow mechanical spreading and finishing.

Compaction

After paving mixture has been properly sealed, compaction shall be obtained by the use of power rollers of approved design and weight per inch of roller. The rollers shall be steel wheeled supplemented with pneumatic-tired rollers where required.

Along structures and all places not accessible with a roller, the mixture shall be thoroughly compacted with mechanical tamping devices. The surface of the mixture after compaction shall be smooth and true to the established grade.

The densities of completed compaction shall be no less than 95% of the density obtained from laboratory compaction of a mixture composed of the same materials in like proportions.

All areas of finished paving on which water stands or which are found excessively uneven shall be promptly brought to the correct grade and line. When tested with a 10 foot straightedge, there shall be no deviation from true surface planes represented by the grade elevations shown on the Drawings in excess of 1/4 inch.

Do repair or patching pavements outside the project site damaged by work of the contract.

ITEM 702.3 (Continued)

No vehicular traffic shall be allowed to pass over the newly finished surface until it has had time to set. twenty-four (24) hours will be considered sufficient time for the pavement to set in most cases, but this period may be extended by the Engineer as required by weather or other reasons.

Chip and seal top course

Hot mix asphalt base shall be clean, free from dirt, water, and deleterious material prior to application of the chip and seal top course.

Asphaltic emulsion shall be applied as defined in Section 400 of the Standard Specifications except as modified herein. Asphaltic emulsion shall be uniformly applied at 0.2 gal/yd² to 0.35 gal/yd² at a minimum of 290 degrees F and maximum of 325 degrees F. Ambient temperatures at the time of tack coat and fabric placement shall be a minimum of 50 degrees F. No emulsion shall be placed outside the limits of the hot mix asphalt base. The Contractor shall be responsible for protection of adjacent surfacing from overspray.

Aggregate shall be placed in and rolled into asphaltic emulsion immediately following the placement of the asphaltic emulsion. No more emulsion shall be placed that can be covered by aggregate within one minute.

The placed aggregate shall be rolled immediately with a pneumatic roller to seat the aggregate soundly into the asphaltic emulsion. Rolling should be stopped when the asphaltic emulsion has set up. Further rolling will break the bond between the aggregate and asphaltic emulsion.

Aggregate shall be placed to completely cover the hot mix asphalt base and asphaltic emulsion. No bare patches will be acceptable. All excess aggregate shall be removed from the paving following completion of the paving operation. No asphalt work shall be done during rainy weather or when weather conditions such as temperature or otherwise are, in the Architect's judgment, unfavorable for obtaining satisfactory results.

Prevention of Overspray. During application of hot mix asphalt coating, adequate provision shall be made to absolutely prevent overspray of adjacent pavement structures, vehicles, plant materials, or personal property. All adjacent vertical or horizontal surfaces of finish materials such as granite curbing, coping, and steps and concrete coping and sidewalks shall be masked prior to hot mix asphalt spraying as approved by the Engineer. Upon the occurrence of areas of excessive bitumen, blotting shall be instituted immediately with aggregate material of approximately half the size of the aggregate finish. The blotting material shall be on hand at the start of bitumen distribution.

ITEM 702.3 (Continued)

Aggregate Distribution:

1. Preparation. The application of aggregate shall follow as close as possible behind application of the hot mix asphalt which shall not be spread further in advance of the aggregate spread than can be immediately covered. Construction equipment or other vehicles shall not drive on uncured pavement. Aggregate may be preheated before application but to a temperature not to exceed 300 degrees F.
2. Transporting and Spreading. The dry aggregate shall be transported across the previously finished work to the work area by wheel barrow or ATV, dumped, and spread uniformly by hand with flat spreading rakes at a rate of spread between 30 and 40 pounds per square yard. Chip and seal gravel shall completely cover the asphalt material, allowing workers and equipment, including rollers, to deliver, spread and compact the material without coming in contact with liquid bitumen, and rendering the asphalt material completely hidden (invisible). Any deficient areas shall be immediately covered with additional aggregate.
3. Rolling. Rolling shall commence immediately following spread of aggregate using pneumatic-tire rollers for primary rolling. Small steel drum rollers of self propelled and hand operated types shall be used to roll along edges and in difficult to-reach areas. There shall be at least three complete passes by the rollers to embed the aggregate particles firmly into the hot mix asphalt coating and hot mix asphalt base course. Size of roller shall be commensurate with the scale and intricacy of the work area but shall not be so heavy as to cause crushing of stone. Water ballast in machines shall be adjusted accordingly to prevent crushing.
4. Construction Joints. Joints shall be reasonably true to line. The overlap in application of the hot mix asphalt shall be the minimum to assure complete coverage. Where any construction joint occurs, there shall be no gaps, depressions, ridges, overlap or detectable seams. When it is necessary to terminate a spread of aggregate, stop the bitumen/aggregate application over heavy paper or polyethylene sheet. Upon resuming application, remove the paper or sheet leaving neat, sharp edge to the work, and lay fresh paper or sheet back over the previously finished work at this edge. Initiate bitumen/aggregate application over this paper or sheet, leaving the lateral joint between the two runs without gap, overlap, ridging, or detectable seaming. Any lateral joints shall be similarly executed.
5. Removal of Excess Aggregate. After a period of at least several days of curing and setting time, as determined sufficient by the Engineer, all loose aggregate shall be swept up, collected, and removed from the project site in a manner approved by the Engineer that will not displace more than a well distributed 5% of the embedded aggregate nor damage the hot mix asphalt below.

ITEM 702.3 (Continued)

6. Setting of Aggregate Surfacing Material. No vehicular traffic of any kind shall be allowed to pass over the newly finished surface until it has had time to set. 24 hours will be considered sufficient time for the pavement to set in most cases, but this period may be extended by the Engineer as required by the weather or other reasons.

Maintenance

After applying and rolling the cover aggregate, lightly broom or otherwise maintain surface as directed for a period of four days. Distribute cover coat material over the surface to absorb any free asphalt material and cover any area deficient in cover coat material without displacing imbedded material. Sweep excess material from entire surface with rotary brooms, as directed.

Measurement and Payment

Chipseal hot mix asphalt pavement will be measured by the square yard, installed complete in place.

Chipseal hot mix asphalt pavement will be paid for at the contract unit price per square yard, which price shall be full compensation for complete compliance with requirements of this item. Aluminum edging, shall be considered incidental to the work and not paid for separately.

ITEM 756.

**NPDES STORMWATER
POLLUTION PREVENTION PLAN**

LUMP SUM

This Item addresses the preparation and implementation of a Storm Water Pollution Prevention Plan required by the National Pollutant Discharge Elimination System (NPDES) and applicable Construction General Permit.

Pursuant to the Federal Clean Water Act, construction activities which disturb one acre or more are required to apply to the U.S. Environmental Protection Agency (EPA) for coverage under the NPDES General Permit for Storm Water Discharges From Construction Activities. On February 16, 2012 (77 FR 12286), EPA issued the final NPDES Construction General Permit (CGP) for construction activity. The 2012 CGP replaces the 2008 CGP (which expired on February 15, 2012), and will provide coverage for eligible new and existing construction projects for a period of five years.

The NPDES CGP requires the submission of a Notice of Intent (NOI) to the U.S. EPA prior to the start of construction (defined as any activity which disturbs land, including clearing and grubbing). There is a fourteen (14) day review period commencing from the date on which EPA enters the Notice into their database. The Contractor is advised that, based on the review of the NOI, EPA may require additional information, including but not limited to, the submission of the Storm Water Pollution Prevention Plan for review. Work may not commence on the project until final authorization has been granted by EPA. Any additional time required by EPA for review of submittals will not constitute a basis for claim of delay.

In addition, if the project discharges to an Outstanding Resource Water, vernal pool, or is within a coastal ACEC as identified by the Massachusetts Department of Environmental Protection (DEP), a separate notification to DEP is required. DEP may also require submission of the Storm Water Pollution Prevention Plan for review and approval. Filing fees associated with the notification to DEP and, if required, the SWPPP filing to DEP shall be paid by the Contractor.

The General Permit also requires the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the afore-mentioned statutes and regulations. The Plan will include the General Permit conditions and detailed descriptions of controls of erosion and sedimentation to be implemented during construction. It is the responsibility of the Contractor to prepare the SWPPP to meet the requirements of the most recently issued CGP. The Contractor shall submit the Plan to the City for approval at least four weeks prior to any site activities. It is the responsibility of the Contractor to be familiar with the General Permit conditions and the conditions of any state Wetlands Protection Act Order, Water Quality Certification, Corps of Engineers Section 404 Permit and other environmental permits applicable to this project and to include in the Stormwater Pollution Prevention Plan the methods and means necessary to comply with applicable conditions of said permits (reference to Part 9.1.1 of the 2012 CGP).

It is the responsibility of the Contractor to complete the SWPPP in accordance with the EPA Construction General Permit, provide all information required, and obtain any and all certifications as required by the Construction General Permit. Any amendments to the SWPPP required by site conditions, schedule changes, revised work, construction methodologies, and the like are the responsibility of the Contractor. Amendments will require the approval of the City prior to implementation.

ITEM 756 (Continued)

Included in the General Permit conditions is the requirement for inspection of all erosion controls and site conditions on a weekly basis as well as after each incidence of rainfall exceeding 0.25 inches in twenty-four hours. For multi-day storms, EPA requires that an inspection must be performed during or after the first day of the event and after the end of the event. The Contractor shall choose a qualified individual who will be on-site during construction to perform these inspections. The Engineer must approve the contractor's inspector. In addition, if the Engineer determines at any time that the inspector's performance is inadequate, the Contractor shall provide an alternate inspector. Written weekly inspection forms, storm event inspection forms, and Monthly Summary Reports must be completed and provided to the Engineer. Monthly Summary Reports must include a summary of construction activities undertaken during the reporting period, general site conditions, erosion control maintenance and corrective actions taken, the anticipated schedule of construction activities for the next reporting period, any SWPPP amendments, and representative photographs.

The Contractor is responsible for preparation of the Plan, all SWPPP certifications, inspections, reports and any and all corrective actions necessary to comply with the provisions of the General Permit. Work associated with performance of inspections is not included under this Item. The Standard Specifications require adequate erosion control for the duration of the Contract. This Item addresses acceptable completion of the SWPPP, any revisions/amendments required during construction, and preparation of monthly reports. In addition, any erosion controls beyond those specified in bid items elsewhere in this contract which are selected by the Contractor to facilitate and/or address the Contractor's schedule, methods and prosecution of the work shall be considered incidental to this item.

The CGP requires the submission of a Notice of Termination (NOT) from all operators when final stabilization has been achieved, as well as removal and proper disposal of all construction materials, waste and waste handling devices, removal of all equipment and construction vehicles, removal of all temporary stormwater controls, etc.. Approval of final stabilization by the Engineer and confirmation of submission of the NOT will be required prior to submission of the Resident Engineer's Final Estimate. The permittee is required to use EPA's electronic NOI system or "eNOI system" to prepare and submit NOT. The electronic NOT form can be found at www.epa.gov/npdes/stormwater/cgpenoi. If you are given approval by the EPA Regional Office to use a paper NOT, you must complete the form in Appendix K of the 2012 CGP.

Compensation

Payment for all work under this Item shall be made at the contract unit price, lump sum, which shall include all work detailed above, including Plan preparation, required revisions, revisions/addenda during construction, monthly reports and filing fees.

Payment of fifty (50) % of the contract price shall be made upon acceptance of the Stormwater Pollution Prevention plan. Payment of forty (40) % of the contract price shall be made in equal installments for implementation of the Stormwater Pollution Prevention plan. Payment of the final ten (10) % of the contract price shall be paid upon satisfactory submissions of a Notice of termination (NOT) when final stabilization has been achieved.

ITEM 767.12

COMPOST FILTER TUBE

FOOT

The work under this item shall consist of installing mulch filter tubing that provides a barrier of organic material to prevent or contain sedimentation.

The compost filter sock shall consist of non-biodegradable poly propylene or HPDE 3/8-inch knitted mesh material or biodegradable cotton or burlap 3/8-inch knitted fabric material, or other approved equivalent mesh material. The mesh sock should be sized to create a round or oval tube 12 inches in diameter when filled with organic material. Sock material shall be used in 100-foot lengths.

Infill material shall consist of organic compost or mulch material and shall be between 20-100 percent (dry weight basis) organic material as determined by ASTM D2974 (method A) Standard Test Methods for moisture, ash and organic matter of peat and other organic materials.

Moisture content shall be <150 percent by dry weight as measured by ASTM D2216 Standard Test Method for Laboratory Determination of Water Content of Soil and Rock and ASTM D2974.

Particle size of the organic material as measured by sieving shall be as follows:

| Sieve No. | Sieve Size (mm) | Sieve Size (in) | Percent Passing |
|-----------|-----------------|-----------------|-----------------|
| 75 mm | 75 | 3 | 100 |
| 19 mm | 19 | 0.75 | 70 – 100 |
| 4 | 4.75 | 0.187 | 30 – 75 |
| 20 | 0.850 | 0.0334 | 20 – 40 |

Method of Construction

Mulch or compost material shall be blown in to the fiber sock using a mulch blower and shall be filled at the project site and at the approximate location of the final installation.

The filled sock shall be reposition as needed to the correct location as noted on the plans and staked with oak stakes, 1-inch by 1-inch and 3 feet long every 10 feet along the length of the sock. Silt fence should be installed prior to installation of the compost sock.

If necessary, joints between socks should be overlapped at least 3 feet and staked. Ensure the sock ends at any joint maintains good contact with the ground.

The ground surface under the compost filter sock should be smooth and free of sharp rocks, limbs, sticks, stumps or other materials that will interfere with good contact with the ground surface or that could cut the filter sock material.

ITEM 767.12 (Continued)

Excavation to embed the compost sock is not required.

Measurement and Payment

Compost filter tube for erosion control shall be paid for each foot of length, not including any overlapping sections, and shall include all materials, labor and equipment necessary for the installation. If biodegradable sock material is used, the item cost will include labor, material and equipment needed to remove and dispose of any sedimentation contained by the mulch filter tube. If non-biodegradable sock material is used, the price will include labor, materials and equipment to cut the tube open and disperse the compost material and disposal of the sock material, as well as removal and disposal of any sedimentation contained by the mulch filter tube.

ITEM 771.9

TRANSPLANTING TREES

EACH

The work under this item shall consist of transplanting existing trees on-site. The work includes careful protection, removal and transplanting of existing trees on-site. The Contractor shall properly support, anchor, fertilize, backfill soil mix, maintain the existing trees and clean up the work area.

Submittals:

Manufacturer's Product Data

Submit material manufacturer's literature and installation instructions where applicable attesting that the following materials meet the requirements specified:

1. Fertilizer.
2. Antidesiccant.
3. Tree paint.

Soil Test Reports

Prior to ordering the topsoil, submit soil test report to the Engineer for review and approval. Do not order materials until the Engineer's approval has been obtained. Delivered materials shall closely match the approved samples.

Topsoil: The Contractor shall employ a certified testing laboratory to test the material and submit test reports directly to the Engineer. Reports shall include:

1. Tests for phosphorus, potassium, calcium, soluble salts, and indicate acidity of the soil, and soil pH. Submittal shall be made at least one month before any topsoil spreading is scheduled to be done.
2. Location of sample/source.

Maintenance Manual

The landscape subcontractor shall submit a written manual prepared for the Owner that outlines a schedule for the proper maintenance of the transplanted trees. This maintenance schedule should include timing and methods for watering, fertilization, mulching, pruning and other maintenance operations.

Submittal Schedule

Before installation:

1. Manufacturer's Product Data.
2. Soil Test Reports.

After installation and before acceptance:

1. Maintenance Manual.

Quality Assurance

ITEM 771.9 (Continued)

All transplanting operations shall be performed by experienced personnel under competent supervision. Education, experience and certification or license by appropriate organization may be reviewed to evaluate competence.

Testing

All topsoil obtained from either on-site and off-site sources proposed to be used for work of this Contract shall be tested prior to being spread or mixed. All testing shall be done by an approved independent test laboratory. Contractor shall provide required representative samples of material for testing facility.

Test analysis shall include:

1. Classification of soil.
2. Percent sand, silt and clay particles.
3. Percent organic content.
4. Percent soluble salt index.

Test reports shall include specific recommendations as to the exact types, times and rates of application of soil additives and fertilizers based upon the soil test results and type of material to be planted.

Specified soil additive and fertilizer types and requirements are approximate and that all soil additives shall be adjusted to comply with test reports.

Inspection for Acceptance

After the minimum thirty (30) day maintenance period, the Contractor shall request the Engineer, in writing, for an inspection to determine whether the plant material is acceptable. If the plant material and workmanship are acceptable, written acceptance will be given by the Engineer.

Products:

Existing Trees to be Transplanted

The existing trees designated to be transplanted on the Drawings shall be transplanted to the new locations shown on the Drawings. The plants shall be moved only in the planting season specified below.

Soil Conditioning Materials

Apply conditioning materials in accordance with the recommendations of testing laboratory.

ITEM 771.9 (Continued)

Commercial Fertilizer shall conform to state and federal fertilizer laws. Fertilizer shall be uniform in composition, dry and free flowing and shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's guaranteed analysis. Any fertilizer which becomes caked or otherwise damaged, making it unsuitable for use, will not be accepted. At least 50 percent by weight of the nitrogen contents of the fertilizer shall be derived from organic sources. A minimum of 35 percent of the nitrogen shall be water insoluble. Fertilizer shall contain not less than percentage of weight of ingredients as follows or as recommended by soil analysis:

| Plant Material to be Fertilized /Fertilizer Type | Nitrogen N | Phosphorus P | Potassium K |
|--|------------|--------------|-------------|
| Deciduous Trees and Shrubs (dry) | 10% | 6% | 4% |
| Deciduous Trees and Shrubs (water soluble) | 6% | 19% | 16% |
| Evergreen Trees and Shrubs (dry) | 7% | 7% | 7% |
| Evergreen Trees and Shrubs (water soluble) | 21% | 7% | 7% |

Humus shall be natural humus, reed peat or sedge peat. Humus shall be free from excessive amounts of zinc, low in wood content, free from hard lumps, and shall be provided in a shredded or granular form. 100 percent material shall pass through a 1/2 inch mesh screen. According to the AOAC International (AOAC) methods of testing, the pH shall be approximately 5.5 to 7.6 and the organic content shall be not less than 60 percent as determined by drying at 105 degrees C. The minimum water absorbing ability of humus shall be 200 percent by weight on an oven-dry basis.

Peat Moss shall be composed of the partly decomposed stems and leaves of any or several species of sphagnum moss. Peat moss shall be free from wood, decomposed colloidal residue, and other foreign matter. Peat moss shall have a pH of 3.5 to 5.5 as determined in accordance with AOAC methods of testing. The minimum water absorbing ability of peat moss shall be 1,100 percent by weight on an oven-dry basis.

ITEM 771.9 (Continued)

Manure shall be well-rotted, unleached stable manure not less than eight months and not more than two (2) years old. Manure shall be free from sawdust, shavings, or refuse of any kind and shall contain 25 percent or less straw. The Contractor shall furnish information as to kind of disinfectant or chemicals, if any, that may have been used in storage of the manure.

Bone Meal shall be fine ground, steam-cooked, packing house bone with a minimum analysis of 23 percent phosphoric acid and 1.0 percent nitrogen.

Leaf Mold shall be a highly organic dark brown to black spongy residue resulting from the well aerated composting of deciduous tree parts, free of plants and their roots, debris, and other extraneous matter and shall be uncontaminated by foreign matter and substances harmful to plant growth. The organic matter shall not be less than 85 percent by weight as determined by the loss on ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 16 degrees C. The inorganic residue after ignition shall not be finer textured than 4 percent by weight passing the number 200 sieve with washing.

Mulch shall be a native shredded pine bark, 100 percent organic, having a moisture content not to exceed 40 percent, and shall be free of any disease and insects. The particles shall pass a 1-inch square mesh and be retained on a 1/8-inch square mesh.

Plant Backfill Mixture

Plant backfill mixture shall consist of 75 percent in-situ topsoil and 25 percent peat moss or leaf mold by volume, thoroughly mixed together. Plant backfill mixture shall have fertilizer, cow manure, and other additives added as required by recommendations of the testing laboratory reports.

Plant backfill mixture shall have a pH range of 5.5 to 7.6.

Water

Water shall be furnished by the Contractor in such quantities as required to maintain healthy plant growth. Water shall be suitable for irrigation and free from ingredients harmful to plant life. Hose and other watering equipment required for the work shall be furnished by the Contractor.

Support Materials

Wire for staking and guying shall be pliable annealed twisted galvanized steel wire, galvanized eyebolts, and galvanized turnbuckles of sufficient strength to withstand wind pressure.

Protective rubber cover for staking and guying wire shall be made from two-ply reinforced rubber garden hose not less than 1/2 inch in diameter, black in color.

ITEM 771.9 (Continued)

Stakes shall be hardwood stakes, unpainted, and sharp pointed at one end. Size and length of stakes shall be as required for secure staking and guying.

Material for supporting trees shall be in accordance with the following schedule:

| <u>Tree Type/ Tree Size</u> | <u>Staking or Guying Material</u> | <u>Wire</u> | <u>Turnbuckle or Flag</u> |
|---------------------------------|---|--|---|
| <u>Deciduous Trees</u> | | | |
| 2 to 3-1/2 in. caliper | 2 in. x 2 in. cedar stake (3 required) | 1/8 in. dia. single stranded wire | 3-1/2 in. with flag |
| 3-1/2 to 6 in. caliper | 6 in. ground anchor or 6 in. diameter deadman by 2 ft. (3 required) | 3/16 in. dia. triple stranded cable | 5/16 in. by 4-1/2 in., galv. with flag |
| 6 to 8 in. caliper | 6 in. ground anchor or 6 in. diameter deadman by 3 ft. long (3 required) | 3/16 in. dia. cable | 5/16 in. by 4-1/2 in. galv. with flag |
| 8 to 10 in. caliper | 8 in. ground anchor or 8 in. diameter deadman by 3 ft. long (4 required) | 1/4 in. dia. cable | 3/8 in. by 6 in., galv. with flag |
| 10 to 12 in. caliper | 10 in. ground anchor or 10 in. diameter deadman by 3 ft. long (4 required) | 5/16 in. dia. cable | 1/2 in. by 8 in., galv. with flag |

Stabilizing Materials

Root Stabilizers: Root staples made of cold rolled, perforated, steel tubing, 1" outside diameter; cross member 1" x 1/4" pot rolled steel; of length and quantity recommended by manufacturer for the species and caliper of tree and as noted on the drawings.

Acceptable manufacturers:

1. Tree Staple
2. Tomahawk
3. Or approved equivalent

ITEM 771.9 (Continued)

Tree Paint

Non-toxic, waterproof, adhesive and elastic tree paint product manufactured for the purpose.

AntiDesiccant

Antidesiccant emulsion that will provide a protective film over plant surfaces, permeable enough to permit transpiration, delivered in containers with manufacturer's directions. Antidesiccant shall be Wiltpruf, manufactured by Nursery Specialty Products, Inc., Stubbins Road, Groton Falls, NY, or approved equivalent. Apply according to manufacturer's recommendations.

Execution:

Transplanting Dates

Deciduous trees:

1. Spring: April 1 – June 1.
2. Fall: October 1 – November 15.

Planting shall be prohibited in frozen or muddy ground.

Special conditions may warrant a variance in the above dates. The Contractor shall notify the Construction Manager of the conditions and the proposed variance. Permission will be given if the variance is warranted.

Approximate planting date schedules shall be furnished by Contractor to the Construction Manager for approval. Material planted out-of-season shall be given extra care and attention by the Contractor.

Root Pruning

Trees over 5 inches caliper to be transplanted shall be root pruned at least one growing season prior to transplanting.

Size of root ball shall be 12 inches diameter for every 1 inch diameter of caliper size. Mechanical tree spades may be used for root pruning trees up to 6-1/2 inches caliper, provided that above trunk caliper to ball diameter ratio is maintained.

Root pruning shall consist of the complete severance of two thirds of the bottom and side roots. No plant will be accepted if it has not completely recovered from the shock of its last root pruning. (Recovery may take one or more growing seasons.)

Transplanting

All plants shall be moved with the root systems as solid units with balls of earth firmly wrapped with burlap. The diameter and depth of balls of earth shall comply with ANSI 'American Standard for Nursery Stock', ANSI Z60.1; published by the American Nursery & Landscape Association (AN&LA).

ITEM 771.9 (Continued)

The balling of trees shall be accomplished by manual methods or by mechanical tree spade.

Root balls shall be treated in the following manner:

1. No tap root shall be present.
2. The majority of lateral roots extending beyond the dimensions of the ball shall be fibrous and pliable enough to allow combing out and saving. The roots must be pliable enough to bend around the ball of the plant without breakage or rupture.
3. A lateral root over 3/4 inches in diameter at its protrusion beyond the dimension of the ball shall not be considered pliable enough to save. These shall be cleanly pruned using sharp pruners or saws.
4. The length of the majority of lateral roots protruding beyond the ball shall not be greater than will allow the smallest fibrous rootlets at their tips to be saved. Lateral roots which extend beyond the ball more than approximately one-half the diameter of the ball, shall not be considered practical to save.

Carefully lift the tree and supported root ball out of the ground. If possible, immediately move tree to its permanent location and replant.

If tree is in leaf, spray the foliage with antidesiccant to protect it from excessive moisture loss.

Contractor shall take care that adequate clearance exists for safe passage by utility lines, overpasses, or existing vegetation.

Plants that cannot be immediately planted at their permanent location shall be placed in a shaded location and their root balls covered with soil. The balls shall be thoroughly watered when stored and kept moist until the time of permanent planting.

Excavation of Tree Pits and Shrub Beds

Stake out on the ground locations for trees and outlines of all planting beds. Obtain approval of the Engineer before excavation.

If rock, utilities, tree roots, or obstructions are encountered in the excavation of shrub beds and tree pits, alternate locations may be selected by the Engineer.

Test drainage of plant beds and pits by filling with water twice in succession. Conditions permitting the retention of water for more than 24 hours shall be brought to attention of the Engineer.

Notify the Engineer in writing of all soil or drainage conditions which the Contractor considers detrimental to growth of plant material.

Excavate tree pits to depths required.

ITEM 771.9 (Continued)

Planting

Place plants in the center of the holes. Use planting mix to backfill plant pits. Place planting mix in layers not to exceed 8 inches thick.

Set the trunk flare of the plant slightly above finish grade in the same relationship it was to the ground from which it was dug. Set plant plumb and brace in position until the planting mix has been lightly tamped around the root ball. When plant pits have been backfilled approximately two-thirds full, water thoroughly to eliminate air pockets before installing remainder of the planting soil. Cut ropes or wires from top two-thirds of ball after plant has been set. Cut away and remove all visible burlap wrapping from around root balls. Loosen surface soil of root ball and comb out any exposed roots. Remove synthetic wrap completely.

Form saucers, 3 in. deep around tree pits.

Mulch all pits and beds immediately after planting and first watering.

Water all plants immediately after planting. All plants shall be flooded with water twice within the first 24 hours of planting.

Tree Support

Firmly anchor all trees immediately after planting, if recommended.

Plants shall stand plumb after anchoring.

Stakes shall be plumb and neat, and installed in accordance with the details shown on the Drawings.

Pruning

Each transplanted tree shall be pruned in accordance with ANSI A300 Standards to preserve the natural character of the plant.

Pruning shall include the following:

1. Remove all dead wood, suckers, and broken or badly bruised branches. Never cut a leader.
2. Use only clean, sharp tools.

Apply antidesiccant to foliage if conditions warrant.

Clean-Up

Soil or other material deposited on paved areas shall be promptly removed. Keep paved areas clean at all times.

Upon completion of planting, all excess stones, debris, and soil shall be cleaned up and removed from the site.

ITEM 771.9 (Continued)

Broom and hose clean all pavements.

Maintenance and Protection of Transplantings

Maintenance shall begin immediately after each plant is transplanted and shall continue until acceptance.

Maintenance shall include:

1. Pruning, watering, cultivating, weeding, mulching, tightening and repairing of anchors, resetting plants to proper grades or upright position, restoration of the planting saucer, and furnishing and applying sprays required to keep the planting free of insects and disease.
2. Protect planting areas and plants against trespassing and damage of all kinds for the duration of the maintenance period. If any plants become damaged or injured, they shall be treated or replaced as required.
3. All plantings shall be thoroughly saturated at least twice per week during maintenance period.

Measurement & Payment

Transplanting trees will be paid for at the Contract unit price per each, which price shall include all labor, material, equipment and incidental costs required to complete the work.

No separate payment will be made for manuals, schedules, testing, Engineer, plant pit excavation, soil preparation, soil amendments, planting mix preparation, soil wetting agents, planting, fertilizers, plant protection, mulch (including placement), watering, maintenance, disposal of unsuitable soils, and all other incidentals required for furnishing and installing the plantings in accordance with the drawings, and as directed by the Engineer. Payment will not be approved until satisfactory completion of the Maintenance Period.

| | | |
|----------------------------|---|--------------------|
| <u>ITEM 775.028</u> | <u>ELM - CHINESE 3-3.5 INCH CALIPER</u> | <u>EACH</u> |
| <u>ITEM 777.546</u> | <u>PLANETREE - LONDON 3-3.5 INCH CALIPER</u> | <u>EACH</u> |

General

This Section supersedes Section 771 PLANTING TREES, SHRUBS AND GROUNDCOVER of the Standard Specifications for the items of work specified herein.

The work of this Section consists of amendment of soils, planting mix, staking and guying, aged bark mulch, peastone mulch, planting trees, shrubs, ornamental grasses, guarantee of plants and related items as indicated on the Drawings or specified herein.

Related Work Under Other Sections

1. Section 120 Excavation
2. Section 170 Grading

References and Standards

The following related terms are used herein and shall mean:

1. Standard Specification: State of Massachusetts, City of Public Works Standard Specification for Highways and Bridges, latest edition.
2. ASNS: "American Standard for Nursery Stock," ASNS 260.1, latest edition, published by the American Association of Nurserymen, (AAN).
3. SPN: "Standardized Plant Names," latest edition, by the American Joint Committee on Horticultural Nomenclature.
4. AOAC: Association of Official Agricultural Chemists.
5. Pruning Standards: The "Standards for Pruning Shade Trees" of the National Arborist Association, 174 Route 101, Bedford, NH 03102.

Samples and Submittals

At least 30 days prior to ordering the below listed materials, submit certified testing results and representative samples to Engineer for selection. No materials shall be ordered or delivered until required samples, certifications, manufacturer's literature and test results have been reviewed by Engineer. Delivered materials shall closely match the approved samples.

Sampling and testing of loam borrow.

Sampling and testing of existing on-site topsoil.

ITEMS 775.028 & 777.546 (Continued)

Modifying, screening, placing, spreading and grading of loam borrow.

Modifying, screening, placing, spreading and grading of existing, on-site topsoil.

Providing all other sampling, testing, supplying, placing, spreading and grading of planting soils as required by this Section.

Fertilizer: Submit one sample packet of planting fertilizer.

Antidesiccant: Submit manufacturer's literature.

Sampling and testing of Aged Bark Mulch.

Sampling and testing of Stone Mulch.

Tree staking: Submit manufacturer's literature.

Examination of Conditions

All areas to be planted, shall be inspected by the Contractor before starting work and any defect such as incorrect grading shall be reported to the Engineer prior to beginning this work.

The Contractor shall be solely responsible for judging the full extent of work requirements involved, including but not limited to the potential need for storing and maintaining plants temporarily and re-handling plants prior to final installation.

Plant Materials

The Contractor shall furnish all plants shown on the Drawings, as specified, and in quantities listed on the PLANT SCHEDULE. The Contractor shall be responsible for the procurement of all plants EXCEPT DECIDUOUS TREES within this contract. The Lowell Parks and Conservation Trust shall purchase all deciduous trees within this contract at a local nursery unless otherwise specified by the Owner. The Contractor shall be responsible for pickup, delivery, installation, maintenance and guarantee of these trees as specified herein. No substitutions will be permitted. All plants shall be nursery grown. The Engineer and Contractor shall accompany the Lowell Parks and Conservation Trust representative to the nursery for selection of all plant material.

Plants shall be in accordance with the ASNS Standards of the American Association of Nurserymen (AAN) as a minimum requirement for acceptance. Plants designated as "Specimen Quality" on the Drawings shall have a form of higher quality (as determined by the Engineer), than typical plants of their species and shall be selected in the nursery by the Engineer. Botanical plant names shall be in accordance with plant designations included in Standardized Plant Names.

ITEMS 775.028 & 777.546 (Continued)

All plants other than those designated on the Drawings as "Specimen Quality" shall be typical of their species or variety and have a normal habit of growth. All plants including "Specimen Quality" shall be legibly tagged with the proper name. Only plant stock grown within hardiness Zones 1 through 5, as established by the Arnold Arboretum, Jamaica Plain, Massachusetts, will be accepted. The Contractor's suppliers must certify in writing that the stock has actually been grown under Zone 5 or hardier conditions. Plants not so certified will not be accepted.

The root system of each plant shall be well provided with fibrous roots. All parts shall be moist and show active green cambium when cut. They shall be sound, healthy, and vigorous, well-branched and densely foliated when in leaf. They shall be free of disease, insect pests, eggs, or larvae.

All plants must be moved with the root systems as solid units with balls of earth firmly wrapped with untreated 8 ounce burlap, firmly held in place by a stout cord or wire in containers of a size as specified or of adequate size to allow root development for the plant size as per ASNS requirements. Plants prepared with plastic or other non-biodegradable wrappings will not be accepted. The diameter and depth of the balls of earth on balled and burlapped plants must be sufficient to encompass the fibrous root feeding system necessary for the healthy development of the plant. No plant will be accepted when the ball of earth surrounding its roots has been badly cracked or broken prior to, or during the process of planting or after the burlap, staves, ropes, container or platform required in connection with its transplanting have been removed. The plants and balls shall remain intact during all operation. All balled and burlapped plants that cannot be planted at once must be heeled in by setting in the ground and covering the balls with soil and watering.

Deciduous Trees

As stated above, all deciduous trees will be procured through the Lowell Parks and Conservation Trust or as directed by the Owner. The Contractor shall be responsible for pickup, delivery, installation, maintenance and guarantee of these trees as specified herein.

All deciduous trees shall meet the following standards:

Trees shall have a single, straight trunk, well formed, and sturdy. No part of the trunk shall be conspicuously crooked as compared with normal trees of the same variety.

Trees with multiple leaders shall conform to all standards noted in this Section, for single leader trees and shall be accepted only as noted on the PLANT SCHEDULE.

All pruning wounds shall show vigorous bark on all edges at the time of harvest. Trees shall be free from all signs of pest and disease damage. The trunk shall be free from sun scald, frost cracks, and wounds resulting from abrasions, fire, animal damage, or other causes.

ITEMS 775.028 & 777.546 (Continued)

Pruning scars within the crown of any tree shall be clean cut and shall leave no protrusion beyond the branch collar.

All trees shall have healthy, vigorous leaves or needles of normal size, color, shape, and texture for the particular species and variety.

Deciduous shade trees and deciduous flowering trees shall have fall color typical for their species and variety.

Unless otherwise indicated on the PLANT SCHEDULE, the height and spread of deciduous shade trees shall be the minimum requirements.

Take caliper measurements for deciduous trees 6 inches above ground level up to and including 4 inches caliper size and 12 inches above ground for larger sizes.

No deciduous tree shall be pruned after the Engineer has tagged the plant in the nursery except as directed by the Engineer.

Unless otherwise noted on the PLANT SCHEDULE, shade trees for use in paved areas shall have no branches lower than 6.5 feet from finish grade and no higher than 7.5 feet from finish grade. Flowering trees for use in areas away from pedestrian traffic shall have the first branch of their crowns no higher than 4 feet from finish grade.

Branching of all deciduous trees shall be best quality representatives of the species, cultivar or variety with lateral branching around the entire trunk to form a symmetrical tree for 80 percent to 100 percent of the tree's outer perimeter. All branches on deciduous trees shall meet the trunk at angles no less than 30 degrees and no greater than 90 degrees from the vertical.

Container Grown Stock

Each plant shall have an extensive, symmetrically balanced fibrous root system. Any root ball which shows signs of asymmetry, injury, or damage to the root system shall be rejected.

Curling or spiraling of the roots along the walls of rigid containers will not be accepted.

All parts of the fibrous root system of all plants shall be moist and fresh with a white color when washed of soil. When the plant is removed from the container, the visible root mass shall be healthy with white root tips. The root systems of all plants shall be free of disease, insect pests, eggs, or larvae.

ITEMS 775.028 & 777.546 (Continued)

All trees, and all shrubs which are not grown in containers must be moved with the root systems as solid units with balls of earth firmly wrapped with untreated 8 ounce natural, biodegradable fabric burlap, firmly laced with stout, natural biodegradable cord or twine. The base of the tree trunks shall be wrapped with a protective burlap layer, surrounded by a cardboard trunk protector, and loosely tied with twine.

The diameter and depth of the balls of earth must encompass the fibrous and root feeding system necessary for the healthy recovery of the plant. Minimum root ball diameters and depths shall be in accordance with ASNS standards.

No plants shall be loose in the container.

Container grown plants which have roots growing out of the container will be rejected.

Plants delivered by truck and plants requiring storage on site shall be properly wrapped and covered to prevent wind-drying and desiccation of branches, leaves or buds; plant balls shall be firmly bound, unbroken, reasonably moist to indicate watering prior to delivery and during storage and tree trunks shall be free from fresh scars and damage in handling. No trees with double-leaders or twin-heads will be acceptable without the written approval of the Engineer. No plant material from cold storage will be accepted.

Planting Fertilizer

Fertilizer shall be provided for each plant through the use of slow-release fertilizer packets which are designed and certified by the manufacturer to provide controlled release of fertilizer over a minimum 3 year period. Each packet shall consist of 4 ounces of water soluble fertilizer with a minimum guaranteed analysis of available elements as follows:

16% Nitrogen, 8% Phosphoric Acid, and 16% Potash

Bone meal shall be fine ground, steam-cooked, packing house bone with a minimum analysis of 23 percent phosphoric acid and 1.0 percent of nitrogen.

Planting Mix

Planting mix shall be approved loam which has been pH adjusted according to particular planting applications and improved through the addition of organic matter as directed below. Planting loam shall conform to the following pH levels:

- a. For ericaceous plants and broad-leaved evergreens requiring an acid soil, planting loam shall have a true pH of 4.5 to 5.5. If it does not, it shall be amended by the Contractor to the proper pH range by mixing with sulfur as specified herein.

ITEMS 775.028 & 777.546 (Continued)

- b. Planting loam for general planting of non-acid loving plants shall have a true pH value of 5.5 to 6.5. If it does not, it shall be amended by the Contractor to the proper pH range by mixing with dolomitic limestone as specified herein.
- c. The amount of either sulfur or limestone required to adjust the planting loam to the proper pH range (above) shall be approved by the Engineer on the basis of soil tests as specified herein. It is not possible to safely add more than two hundred pounds (200 lbs.) of limestone/one thousand (1,000) square feet of loam, incorporated into the soil, or fifty pounds (50 lbs.) of limestone/one thousand (1,000) square feet of loam, surface application, within a single season. Therefore loam shall have a starting pH of no lower than 4.2 for ericaceous plants and broad-leaved evergreens, and a starting pH of no lower than 5.0 for general planting of non-acid loving plants.

Planting mix shall consist of pH adjusted loam which has been thoroughly premixed with organic material in the proportions of one (1) part organic matter, (leaf compost or peat), with five (5) parts of approved loam.

Aged Pine Bark Mulch

Aged Pine Bark Mulch shall be pine bark mulch aged a minimum of six (6) months and not longer than two (2) years. The mulch shall be dark brown in color, free of pieces of wood thicker than one-quarter inch. Bark mulch shall be shredded to a uniform size; free of dirt, debris and foreign matter; with pieces no thicker than 1/4 in (6 mm). Mulch must be free of stringy material over 4 inches in length, free of pieces over 3 inches in width and shall not contain, in the judgement of the Engineer, an excess of fine particles.

Antidesiccants

Antidesiccants shall be emulsions or other materials which will provide a protective film over plant surfaces permeable enough to permit transpiration and specifically manufactured for that purpose. Manufacturer of antidesiccant shall be subject to the Engineer's approval. Antidesiccant shall be delivered in containers of the manufacturer and shall be mixed according to the manufacturer's instructions.

Water

The Contractor shall be responsible to furnish his own supply of water to the site at no extra cost. If possible, the Owner shall furnish the Contractor upon request with an adequate source and supply of water at no charge. However, if the Owner's water supply is not available or not functioning, the Contractor shall be responsible to furnish adequate supplies at his own cost. All work injured or damaged due to the lack of water, or the use of too much water, shall be the Contractor's responsibility to correct. Water shall be free from impurities injurious to vegetation.

ITEMS 775.028 & 777.546 (Continued)

Tree Staking

Tree staking: Tree stakes shall be a below-grade stabilizing system designed to secure root balls into subsoil, structural planting medium and planting soil back fill without use of above ground components.

1. Stakes shall be fabricated from steel pipe per ASTM A53 and flat bar stock per ASTM A36. Steel shall be lightly oiled to prevent scale and rust from forming prior to installation.
2. Stakes shall be as shown on the Contract Documents.
3. Stakes shall be sized to accommodate tree sizes noted herein. At a minimum below-grade stakes shall have long prong 42 inches in length, short prong 12 inches in length and connecting bar stock 12 inches in length.
4. Provide a minimum of three stakes per tree.

Construction Methods

Planting

Furnishing and planting of plant material shall include, but shall not be limited to, the digging of the pits and plant beds, amendment of loam as required to produce planting soil mix, provision of soil additives required to adjust for pH requirements of specific plants, furnishing the plants as specified as well as the labor of planting, fertilizing, mulching, guying, and maintenance.

The Contractor shall locate plant material sources and ensure that plants are shipped in timely fashion for installation.

Contractor shall locate all underground utilities within 10 feet of the proposed planting pits and notify the Engineer of any conflicts prior to digging plant pits.

Location for all trees and shrubs and outlines for groundcover and bulb planting areas shall be staked on the ground by the Contractor for approval by the Engineer before any plant pits or plant beds are dug. Notify the Engineer no less than 3 days prior to desired date of inspection of staking to schedule site visit.

Seasons for Planting:

Spring: Deciduous materials - March 21 through May 1
 Evergreen materials - April 15 through June 1

Fall: Deciduous materials - Oct. 1 through Dec. 1
 Evergreen materials - Aug. 15 through October 15

ITEMS 775.028 & 777.546 (Continued)

Certain trees, as shown on the Plant List on the Drawings, shall only be planted in the spring. Contractor shall arrange project schedule as necessary to allow for spring planting of these trees. Substitutions of other plants for the trees specified in order to perform fall planting will not be accepted.

Planting:

Loam fill shall be installed as per requirements of Section 751.

At least one month prior to the expected planting date, the Contractor shall request that the Engineer provide a representative to select and tag stock to be planted under this Section. The Contractor shall pay for the transportation, subsistence, and overnight accommodations, if necessary, for the Engineer's representative during the period of time required to select and tag the plant material. Time spent to locate plant material shall be paid for by Contractor only if Engineer is sent to site where materials were not satisfactory to Engineer or cannot be located.

A representative of the Contractor shall accompany the Engineer on all plant material selection field trips, unless otherwise ordered by the Engineer.

All trees, a representative sample of each shrub species, and all plants designated as "specimen quality" on the Plant Schedule shall be selected by the Engineer at the place of growth prior to digging for conformity to specification requirements as to quality, size, and variety. Such approval shall not impair the right of inspection and rejection upon delivery at the site or during the progress of the work. Cost of replacement of materials rejected by the engineer at the site shall be borne by the Contractor.

All plants for the project shall be individually tagged prior to digging with the Engineer's seals. No plants shall be accepted for delivery to the site without such seals.

Tree trunks shall be protected during shipping by a heavy walled cardboard sleeve or other suitable material, then unwrapped for inspection by Engineer after installation. Trees shall then be rewrapped as specified herein unless instructed otherwise by Engineer.

All trees and shrubs shall be planted within 5 working days of arrival on site or shall be rejected by the Engineer. Container grown shrubs stored on site shall be shaded from direct sunlight at all times and shall not be stored on paved surfaces.

Plant pits shall be excavated as shown on Drawings. Holes for trees and planting mix backfill shall be at least 4 feet greater in diameter than the ball and one foot deeper than the ball. Tree planting excavations shall extend a total of 6 feet from the center of each tree. The area greater than 2 feet from the tree's rootball shall be 18 inches deep. Shrub planting beds shall be excavated 2 feet below proposed finish grade and shall extend a minimum of 1 foot beyond the rootball of shrubs placed at the edge of the planting bed.

ITEMS 775.028 & 777.546 (Continued)

Loosen the perimeter roots on the rootball of all container-grown shrubs, groundcovers and perennials prior to planting, as directed by the Engineer.

Remove groundcovers and perennials from their pots immediately before planting. Handle plants carefully to prevent damaging roots. Place each plant in individual hole and firm the loam around the roots. Water thoroughly and mulch as shown on the Drawings. Groundcover plants may be planted after the bark mulch is placed.

All plant roots and earth balls must be damp and thoroughly protected from sun and wind from the beginning of the digging operation, during transportation and at the site until the final planting. Remove container plants from containers prior to planting. Trees and shrubs shall be placed in the center of plant pits, plumb with the crown of their roots exposed and located above the surrounding finish grade. After completion of planting installations, remove rope, burlap and wire baskets from only the top 1/3 of the root balls. Loam shall be backfilled in layers of not more than 6 inches and each layer watered sufficiently to settle before the next layer is put in place. Enough loam shall be used to bring the surface to finished grade when settled. A saucer shall be formed around each plant at a depth of 6 inches for trees and 4 inches for shrubs.

At the time of planting, install fertilizer packets at a depth of 6 to 8 inches equally spaced around the plant as it is being backfilled. Packets shall be placed approximately 3 inches away from the plant roots or plant ball. Packets shall not be cut, ripped or damaged. If it becomes necessary to remove and replace dead or unhealthy plants, any damaged or broken packets shall be replaced with new packets. The application rates for fertilizer packets shall be as follows:

| <u>Type of Plant</u> | <u>Rate</u> |
|---|---|
| Deciduous Shade Trees | One packet for each inch of caliper |
| Evergreen and Small Flowering Trees | One packet for each 18 inches of height |
| Shrubs | One packet for each 12 inches of height or spread |

All plants shall be watered immediately following planting as necessary to thoroughly moisten rootball and plant pit loam and thereafter shall be inspected frequently for watering needs and watered, as required, to provide adequate moisture in the planting pit. The Contractor shall inspect tree pits 24 hours after initial watering to confirm that they are draining properly. If surface water or excessively saturated plant pit soils exist, the Contractor shall immediately notify the Engineer. The Engineer shall recommend remedial measures based upon site conditions which shall be paid for as an extra to the contract.

775.028 & 777.546 (Continued)

Keeping Trees Plumb:

Contractor shall keep trees plumb and upright at all times. Monitor plants on a regular basis and, if a tree is moved out of plumb, then straighten the tree to a vertical, upright condition.

All trees shall be firmly staked with approved below-grade stabilizing system at the time of planting. Stakes shall be installed as follows:

- a. Contractor shall verify locations of all subsurface utilities prior to placement of tree stakes. Contractor is responsible for all damage to utilities caused by staking installation and shall repair all damages at no cost to the Owner.
- b. After trees have been backfilled but prior to forming saucer install below-grade staking system.
- c. Place stakes so that the long prongs are set at 120 degree points around root ball. Long prongs shall be set against edge of rootballs but shall not pierce burlap of ball's vertical face.
- d. Short prongs shall be placed in a counter clockwise rotation around top of rootball. Horizontal bar stock and short prongs shall be placed no closer than 4 inches from the trunk of the tree. In no circumstances shall horizontal bar stock press against visible root flares.
- e. Drive long prongs into the subsoil, planting soil, structural planting medium to full depth so that horizontal bar is pressed firmly into burlap and top surface of rootball. Short prongs shall driven into rootball so that top of short prongs will not protrude above bark mulch.
- f. Do not penetrate aeration piping with filter fabric sleeves when driving below-grade stakes.
- g. Rake out planting soil around and above rootball to ensure a smooth surface with intact saucer.

Aged Pine Bark Mulch shall be placed in tree and shrub planting beds to a depth shown on the drawings, after settlement, no later than one week after planting. No bark mulch shall be placed in contact with tree trunks or shrub stems. No mulch shall be applied prior to the first watering of the plant materials.

ITEMS 775.028 & 777.546 (Continued)

Pruning:

- a. Trees and shrubs shall be pruned following planting in accordance with the American Nurserymen's Association Standards for Class I, fine pruning, to preserve the natural character of the plant, as directed by the Engineer.
- b. Tree pruning as required, shall be undertaken to the full height of affected trees.
- c. All dead wood or suckers and all broken or badly bruised branches shall be removed. Never cut a leader.

Antidesiccant shall be applied to all evergreen and other plants in the late fall as directed by the Engineer.

Absolutely no debris may be left on the site. Excavated material shall be removed as directed. Repair any damage to site or structures to restore them to their original condition as directed by the Engineer, at no cost to the Department.

Plant Maintenance

Contractor shall maintain all new plantings as indicated below. Maintenance shall begin immediately after each plant is planted and shall continue for a minimum of two years following the completion of all planting installations, or until the final acceptance of all planting work, whichever is a longer period of time.

Maintenance of new plantings shall consist of keeping the plants in a healthy growing condition and shall include but is not limited to watering, weeding, cultivating, pruning, re-mulching, tightening and repairing of guys, removal of dead material, resetting plants to proper grades or upright position, and maintaining the planting saucer.

1. Plants shall be inspected for watering needs at least twice each week and watered as necessary to promote plant growth and vitality.
2. Planting beds shall be kept free of weeds, and mulch shall be maintained at the required depth. Beds and individual pits shall be neat in appearance with clearly defined edges and maintained to the designed layout.
3. Plants that die during the maintenance period shall be removed by the Contractor within one week of notification and replaced during that growing season.
4. Guy wires and anchoring cables shall be tightened and repaired weekly.

ITEMS 775.028 & 777.546 (Continued)

Work of pruning, fertilizing, spraying, and similar activities shall be undertaken only by certified arborists and chemical applicators, as pertinent to the work being performed.

During the maintenance period, any decline in the condition of existing trees and new plantings shall require the Contractor to take immediate action to identify potential problems and undertake corrective measures. If required, the Contractor shall engage professional arborists and/or horticulturalists to inspect plant materials and to identify problems and recommend corrective procedures. The Engineer shall be immediately advised of such actions. Inspection and recommendation reports shall be submitted to the Engineer.

Clean Up

Absolutely no debris may be left on the site. Repair any damage to site or structures to restore them to their original condition, as directed, at no cost to the Department.

Acceptable Standards

General

1. The Engineer will inspect the work upon the request of the Contractor. Requests for inspection shall be received by the Engineer at least ten days before the anticipated date of inspection.
2. The inspection dates shall follow the minimum maintenance periods called out for respective work items.
3. Upon acceptance of the work, the Engineer shall issue a written Certificate of Acceptance notice to the Contractor.

Planting

1. At the time of inspection, if the plant materials and workmanship are acceptable by the Engineer, the date of the inspection shall establish the end of the maintenance period and the commencement of the required guarantee period for planting work.
2. At the time of inspection or if, in the Engineer's opinion plant materials and/or workmanship is deficient, acceptance will not be granted, and the Contractor's responsibility for deficiencies are corrected. All dead and unsatisfactory plants shall be removed promptly from the project. Replacement plants shall conform in all respects to the Specifications for the original plants and shall be planted in the same manner.

Plant Material Replacements

All shrubs, vines, groundcovers, and trees shall be inspected by the Engineer two years after acceptance and shall be alive and in satisfactory growth at the end of that time.

ITEMS 775.028 & 777.546 (Continued)

Each plant shall show at least 75 percent healthy growth and shall have the natural character of a plant of its species as determined by the Engineer. Plants found to be unacceptable shall be removed promptly from the site and replaced immediately or during the next normal planting season, as permitted by the specifications, until the replaced plants live for two full years. A final replacement inspection will be made after the replacement plantings have lived through two full years.

All replacements shall be plants of the species, variety and size specified in the PLANT LIST. The cost shall be borne by the Contractor, including deciduous trees, except for possible replacements due to vandalism or neglect on the part of others.

Compensation

Method of Measurement

The method of measurement shall be in units of each plant. Excavation, loam borrow, soil amendments, water, staking, antidesiccant, planting fertilizer, and aged pine bark mulch shall be considered incidental to the work and not paid for separately.

Basis for Payment

Items 775.028 and 777.546 will be measured per each, installed complete in place including plants, planting mix (loam and amendments), mulch, tree stabilizers and guys, guarantee of plants and all which price and payment shall constitute full compensation for complete compliance with requirements of this item, including all labor, equipment, materials, tools, incidental work, and construction methods.

| | | |
|---------------------------|--|--------------------|
| <u>ITEM 804.7</u> | <u>3" ELECTRIC CONDUIT TYPE NM</u> | <u>EACH</u> |
| <u>ITEM 806.2</u> | <u>3" ELECTRIC CONDUIT TYPE RM - GALVANIZED STEEL</u> | <u>EACH</u> |
| <u>ITEM 811.1</u> | <u>TYPE HH ELECTRIC HAND HOLE WITH GALVANIZED STEEL FRAME AND COVER</u> | <u>EACH</u> |
| <u>ITEM 812.1</u> | <u>TYPE LI LIGHTING STANDARD, PRECAST POLE UNDERGROUND CONDUIT AND WIRING</u> | <u>EACH</u> |
| <u>ITEM 813.11</u> | <u>EQUIPMENT GROUNDING AT TYPE HH HAND HOLE</u> | <u>EACH</u> |
| <u>ITEM 813.3</u> | <u># 4 AWG COPPER TYPE 7 WIRE</u> | <u>EACH</u> |
| <u>ITEM 814.1</u> | <u>INSTALLATION AND SPLICING OF TYPE L1 LUMINAIRE, LIGHTING STANDARD AND RESPECTIVE HAND HOLE</u> | <u>EACH</u> |

Add the following section to the 1988 Mass Highway Standard Specifications and its latest Supplements and Interim Supplemental Specifications:

SECTION 800.1
STREET LIGHT AND POWER

The Contractor shall furnish and install the secondary electrical system for the work shown on the contract drawings for new STREET LIGHTING AND POWER for the project as shown on Sheet 9 of 24 through Sheet 16 of 24 and the specifications provided herein in conjunction with the 1988 Mass Highway Standard Specifications it's latest Supplements and as follows:

The work shall include, but not be limited, to providing new underground conduits for the new street lights and receptacles, excavation, backfill, trenching, underground conduit banks, precast concrete hand hole structures, luminaires, (light fixtures), lighting standards (lighting poles), precast concrete bases for light poles (light standard as indicated on the Contract Drawings and as directed by the Engineer.

All work shown on the contract drawings shall be installed by Massachusetts Electrical Journeyman Electricians holding "Certificate B" issued by the State Examiners of Electricians.

The underground "STREET LIGHTING AND POWER" conduit system shall be furnished and installed in accordance with the requirements of Section 801 – CONDUIT, MANHOLES, HAND HOLES, and PULL BOXES AND FOUNDATIONS as follows:

Replace paragraph 801.20 General A.1 with the following:

ITEMS 804.7 through 814.1 (Continued)

Type NM Rigid Nonmetallic conduit shall be used for all underground nonmetallic runs, unless specified otherwise on the contract plans and shall be UL listed and meet NEMA TC-2 and Federal Specification WC1094A and be installed in accordance with Article 352 of NFPA 70 as amended by 527 CMR 12.00 of the Massachusetts Electrical Code.

Type NM shall be type schedule 80 extra heavy wall plastic conduit with extra heavy wall fittings. Horizontal elbows shall have a minimum radius of 5'-0". PVC vertical elbows shall not be used. All vertical elbows shall be Type RM galvanized rigid steel. All joints shall be cemented using a low VOC solvent/cement.

Replace paragraph 801.20 General A.2 with the following:

Type RM – Rigid Metallic (Galvanized Rigid Steel) - shall be used for all above ground conduit runs, unless specified otherwise on the contract plans, be UL listed and meet standards ANSIC80.1, Federal Spec WWC581 and be installed in accordance with Article 344 of NFPA 70 as amended by 527CMR 12.0 of the Massachusetts Electrical Code. Threadless type RM conduit fittings are prohibited.

Where Type RM - Rigid Metallic (Galvanized Rigid Steel) is run underground, as noted on the contract plans, it shall be PVC coated. Special tooling and procedures in accordance with the manufacturer's installation requirements shall be adhered to for proper installation so that the PVC coating is not damaged during conduit installation.

Exterior Type RM conduit terminations shall be made using weatherproof hubs also known as Myers hubs. Locknuts shall only be allowed inside cabinets when connecting nipples to equipment. These terminations shall be provided with threaded metal bushings. Plastic or fiber bushings shall not be provided. Metal threaded conduit bushings shall be provided where shown on the plans.

Support hardware for type RM conduit shall be stainless steel or galvanized, including hex head bolts, nuts, flat washers, etc. Individual conduits shall be supported to equipment cabinets using galvanized or malleable iron type one hole clamps with spacer base plates. Use of electroplated hardware or support materials is prohibited.

Delete paragraph 801.20 General B.

Delete paragraph 801.20 General C.

Delete paragraph 801.20 General D.

Delete Section 801.40 General.

ITEMS 804.7 through 814.1 (Continued)

Replace the second sentence of paragraph 801.60 Conduit A with the following:

The trench for conduits shall be excavated to a minimum width of 18” to a depth not less than that required to provide the minimum conduit cover requirements from the final finished grade. Refer to details on the contract drawings. Depths shall be increased as necessary where there are conduit crossings with other underground utilities shown on the contract plans.

Replace the last sentence of paragraph 801.60 A Conduit with the following:

The grade of the finished trench shall be parallel to the required minimum conduit burial depth.

Add the following sentence to paragraph 801.60 Conduit B. Preparation of Bed:

A 4” sand blanket shall be laid above the gravel base for placement of conduit. A 4” sand blanket shall be placed over the final conduit bank assembly to protect conduits during backfilling and compaction of clean fill. All conduit runs shall include a magnetic PVC warning tape as detailed on the contract plans.

Replace the last sentence of paragraph 801.60 Conduit C. Laying Conduits with the following:

Multiple conduit runs shall utilize base and intermediate plastic spacers maintaining a 3” space between conduits placed at 8’-0” centers minimum. Spacer assemblies shall be secured using steel tie wire. Conduit bank joints shall be staggered. All conduit runs shall include a magnetic PVC warning tape as detailed on the contract plans.

Replace section 801.61 Electric Manholes, Hand Holes, Pull Boxes and Junction Boxes, A. General with the following:

Electric hand holes shall be fabricated and installed in accordance with the details as shown on the contract drawings. Hand holes shall be engraved “ELECTRIC”.

Add the following sentence at the beginning of section 801.61 Electric Manholes, hand holes, Pull Boxes and Junction Boxes B. Cast in Place Concrete Units:

No cast-in place foundation shall be allowed to be furnished and installed.

Replace section 801.61 Electric Manholes, Hand Holes, Pull Boxes and Junction boxes, C. with the following:

Pre-Cast concrete units shall be provided as detailed on the contract drawings and in accordance with applicable sections of Section 901 Concrete Cement Masonry.

ITEMS 804.7 through 814.1 (Continued)

Delete section 801.61 Electric Manholes, Hand Holes, Pull Boxes and Junction boxes D. Metallic units

Replace the first paragraph of section 801.62 Foundations with the following:

Light pole (Light Standard) base foundations shall be provided as detailed on the contract drawings and in accordance with applicable sections of Section 901 Concrete Cement Masonry.

Replace the third sentence of Section 801.80 Method of Measurement of Payment with the following:

Type HH precast hand holes and Precast Type Light Pole (Light Standards) base foundations shall be measured for payment for each structure installed.

The STREET LIGHT AND POWER underground electrical system will be measured for payment by the feet of duct bank and for each structure installed.

ITEMS 804.7 through 814.1 (Continued)

Revise Section 801.82 Payment Items to read as follows:

| Item Number | Description | Unit |
|-------------|---|------|
| 804.1 | 3/4" ELECTRIC CONDUIT TYPE NM | FOOT |
| 804.2 | 1 " ELECTRIC CONDUIT TYPE NM | FOOT |
| 804.3 | 1 1/2" ELECTRIC CONDUIT TYPE NM | FOOT |
| 804.4 | 2-1 1/2" ELECTRIC CONDUIT TYPE NM | FOOT |
| 804.5 | 2 1/2" ELECTRIC CONDUIT TYPE NM | FOOT |
| 804.6 | 2-2 1/2" ELECTRIC CONDUIT TYPE NM | FOOT |
| 804.7 | 3" ELECTRIC CONDUIT TYPE NM | FOOT |
| 804.8 | 1-2 1/2",1- 3" ELECTRIC CONDUIT TYPE NM | FOOT |
| 804.9 | 2-2 1/2",2- 3" ELECTRIC CONDUIT TYPE NM | FOOT |
| 804.10 | 3- 3" ELECTRIC CONDUIT TYPE NM | FOOT |
| 806.1 | 2 1/2" ELECTRIC CONDUIT TYPE RM | FOOT |
| 806.2 | 3" ELECTRIC CONDUIT TYPE RM | FOOT |
| 806.3 | 3/4" ELECTRIC CONDUIT TYPE RM (PVC COATED) | FOOT |
| 806.4 | 2-2 1/2" ELECTRIC CONDUIT TYPE RM CONCRETE ENCASED | FOOT |
| 810.1 | 1" ELECTRIC CONDUIT TYPE NM CONCRETE ENCASED | FOOT |
| 810.2 | 2 1/2" ELECTRIC CONDUIT TYPE NM CONCRETE ENCASED | FOOT |
| 810.3 | 2-2" ELECTRIC CONDUIT TYPE NM CONCRETE ENCASED | FOOT |
| 810.4 | 2-2 1/2" ELECTRIC CONDUIT TYPE NM CONCRETE ENCASED | FOOT |
| 810.5 | 2-3" ELECTRIC CONDUIT TYPE NM CONCRETE ENCASED | FOOT |
| 810.6 | 2-4" ELECTRIC CONDUIT TYPE NM CONCRETE ENCASED | FOOT |
| 811.1 | TYPE HH ELECTRIC HAND HOLE WITH GALVANIZED STEEL FRAME AND COVER | EACH |
| 812.1 | TYPE L1 LIGHTING STANDARD PRECAST CONCRETE BASE UNDERGROUND CONDUIT | EACH |

AND WIRING

ITEMS 804.7 through 814.1 (Continued)

The underground “STREET LIGHTING AND POWER” wiring system shall be furnished and installed in accordance with the requirements of Section 813 – WIRING, GROUNDING AND SERVICE CONNECTIONS of the 1988 Mass Highway Standard Specifications, the 2006 Supplemental Specifications and 2008

Standard Special Provisions as amended herein as follows:

Replace the first sentence of Section 813.20 General with the following:

This work shall consist of furnishing and installing wire and cable for branch circuits for Street Light Fixtures (Luminaires)/Light Standards (Poles).

Revise section 813.21 A. Cable Types and Uses as follows:

Delete Wire types 1 thru 6. They are not applicable to Street Light and Power Conductors.

Revise Wire Type 7 as follows:

Type 7 - Street Light and Power systems wiring in conduit, conduit banks, Light Standards (Light poles) and Luminaires (Light fixtures) and other electrical raceways.

Delete wire types 9 thru 13. They are not applicable to Street Light and Power Conductors.

Revise Wire Type 10 as follows:

Type 10 – Equipment Grounding and Bonding of Street Light and Power systems equipment.

Replace Section 813.40 General. A. Wire and Cable as follows:

Unless specified otherwise, all Street Light and Power wire and cable, Type 7 and Type 10, shall be copper stranded conductors, not less than #12 AWG, as scheduled on the contract plans. Materials shall meet the requirements specified in Section M8; except that conductors shall be RHH/RHW/USE only. XHHW insulation shall not be accepted.

Replace Section 813.40 General. B. Equipment Grounding as follows:

Equipment grounding conductors shall be sized as indicated on the contract plans. Bare copper conductors shall be “tinned”. Materials shall meet the requirements of Section M8.16.7 except as noted herein.

Section 813.40 General. C. Ground Electrodes as follows:

ITEMS 804.7 through 814.1 (Continued)

The ground electrode system shall consist of the man-made type (ground rods).

Ground Rods shall be ¾" x 10'-0" long, copper clad type. Connections to ground rods are to be made using bare tinned copper stranded ground electrode conductors exothermically welded to ground rod. Mechanical connectors are not to be used. Refer to specific details as shown on the Contract drawings.

Delete Section 813.60 Wire and Cable A. Steel Messenger Cable Fittings in its entirety.

Revise Section 813.60 Wire and Cable C. Splicing as follows:

Splices shall be made only in hand holes, Street Light and Power; Light Poles (Light Standards) behind access hand whole cover plate and Luminaires (Light fixtures) using splicing methods as shown in the contract drawings.

Conductors shall be joined in Hand Holes designated as "Termination" Hand Holes using back to back copper compression type single barrels lugs joined using durium bronze hardware and insulated using a Raychem Gel Cap water resistant stub splice cover as detailed on the contract drawings.

Stub cable splices in Termination hand holes reduce the Street Lighting branch circuitry cable size used to mitigate voltage drop to a smaller conductor size to allow termination of branch circuits at lighting contactors and branch circuit breakers.

Conductors shall be joined in Hand holes, except those designated as "Termination" Hand Holes, using Raychem Gel Cap SL splice cover with a three barrel connector, Raychem # Gel Cap-SL-2/0-3 hole. Splice is water proof with run cable mechanical lug barrel with single barrel tap wire to Light Standard (Light pole) hand hole as detailed on the contract drawings.

Conductors shall be joined in Light Standards (Light Poles) and Light Fixtures (Luminaires), using a crimp type connector with insulated cap by Buchanan, IDEAL or other approved manufacturer. Conventional wire nuts or WAGO type insertion connectors shall not be allowed.

Insulated equipment grounding conductors in Hand holes shall be terminated with Burndy compression type H copper splice with cover. Connections shall be dressed with an oxide inhibiting compound. Splices to be insulated using Burndy splice covers as detailed on the contract drawings.

Insulated equipment grounding conductors in Light Standard (Light Pole) Hand Holes shall be terminated with insulated ring tongue compression connectors as detailed on the contract drawings. Connections shall be dressed with an oxide inhibiting compound.

ITEMS 804.7 through 814.1 (Continued)

Revise Section 813.60 Wire and Cable D. Highway Lighting Circuit Identification to read as follows “Street Lighting Power and Power Circuit Identification”.

Delete Section 813.60 Wire and Cable E. Traffic Control Signal Circuit Identification.

Revise Section 813.61 Equipment Grounding as follows:

A green insulated equipment grounding conductor shall be run with each Street Light and Power cable /wire run, to which equipment shall be bonded in accordance with Article 250 of 527CMR 12.0 sized as shown and detailed on the Contract drawings.

Add sentence to Section 813.62 Ground Electrodes B. Resistance Tests as follows:

Grounding Resistance Testing shall be provided by an independent testing agency. The agency must be a member in good standing of and certified by the International Electrical Testing Association.

Delete Section 813.63 Service Connections.

Revise Section 813.82 Payment Items to read as follows:

| Item Number | Description | Unit |
|-------------|--|------|
| 813.1 | # 10 AWG copper Type 7 wire | FOOT |
| 813.2 | # 8 AWG copper Type 7 wire | FOOT |
| 813.3 | # 4 AWG copper Type 7 wire | FOOT |
| 813.4 | # 6 AWG copper Type 7 wire | FOOT |
| 813.5 | # 10 AWG copper Type 10 wire | FOOT |
| 813.6 | # 8 AWG copper Type 10 wire | FOOT |
| 813.7 | # 6 AWG copper Type 10 wire | FOOT |
| 813.11 | Equipment grounding at Type HH Hand hole | EA |

ITEM 874.23**MISCELLANEOUS SIGN POSTS****EACH**

Under this item, the Contractor shall furnish and install, parking “Pay Here” posts and parking space number signs at locations indicated on the Contract Drawings and as directed by the Engineer. Work and methods of installation shall be in conformance with the details included with these special provisions and the following:

Pay here sign posts shall be P5 posts.

Parking space number sign posts shall be PVC vinyl coated Galvanized Pipe; Schedule 40. The bottom of the pipe shall be flattened to provide a flared, tapered end. A 1/2-inch diameter hole shall be drilled through one wall of the post, after installation, at a height 3 inches above finished grade. The posts are to be reamed inside and deburred outside on both ends.

All posts are to be 18 inches on center from the face of curb except when otherwise instructed by the Engineer.

All posts are to be installed prior to the construction of the finished sidewalks. No coring of the concrete sidewalks shall be allowed.

Posts will be measured for payment as a unit complete in place.

Measurement & Payment

Miscellaneous Sign Posts will be measured per each, complete in place in the locations shown on the drawings.

Miscellaneous Sign Posts will be paid for at the Contract unit price per each, which price shall include all labor, equipment and incidental costs required to complete the work.

ITEM 875.6**PARKING METER KIOSK FOUNDATION****EACH**

The work under this item shall conform to the relevant provisions of Section 900 of the Standard Specifications and the following:

The work under this item shall include the furnishing and installation of concrete foundations and installation of City of Lowell supplied parking meter kiosks as shown on the plans or as directed and to close conformity to the lines and grades established by the Engineer.

Cast-in-Place Concrete: Concrete shall be air-entrained concrete with minimum 28-day compressive strength of 4,000 pounds per square inch, conforming to the requirements and applicable provisions of M4.02. Concrete shall be air-entrained 5 percent minimum +/-1 percent, by volume.

The contractor shall coordinate construction of the concrete footing with the installation of the surrounding sidewalk. Final location shall be reviewed and approved by the Engineer prior to pouring the foundation.

The Contractor shall set the Cradle Base Plate and kiosk to the lines and grades as approved and in conformance with the manufactures specifications.

The City of Lowell will supply the Kiosk, Cradle Base Plate and any associated hardware required for the kiosk installation.

Measurement and Payment

Parking Meter Kiosk Foundation will be measured for payment as a unit, complete in place.

Parking Meter Kiosk Foundation will be paid for at the Contract unit price per each, which price shall include all labor, material, equipment and incidental costs required to complete the work.

No separate payment will be made for excavation, backfill or gravel borrow, but all costs in connection therewith shall be included in the unit price bid.

ITEM 999**CONSTRUCTION STAKING****LUMP SUM**

Under this item, the Contractor shall layout and set all baselines, grades, and measurements necessary for construction of the work. Information for horizontal and vertical control is provided on the plans.

All staking shall be directed and performed by qualified engineering or surveying personnel who are trained, experienced and skilled in construction layout of the type required under this Contract. The Contractor shall submit the qualifications of the survey personnel to the Owner for review and approval. The Owner reserves the right to reject any personnel which, in the Owner's judgment, are not adequately qualified. The Owner also reserves the right to evaluate the performance of the survey personnel during the course of the work and to require the replacement of any personnel whose work, in the judgment of the Owner, is unsatisfactory.

The Engineer may check the layout as established by the Contractor at any time as the work progresses. The Contractor shall be informed of the results of these checks, but the Engineer by doing so in no way relieves the Contractor of his responsibility for the accuracy of the layout work. The Contractor shall correct or replace any deficient layout and construction work which may be the result of inaccuracies in the Contractor's layout at no additional cost to the Owner.

The Contractor shall obtain accurate elevations of the existing pavement in the area of overlap at Jackson Street and compare them with the proposed elevations shown on the drawings to determine the extent and depth leveling course required within the proposed pavement overlay areas.

Measurement and Payment

Construction staking will be paid for at the Contract lump sum price, which price shall include all labor, material, equipment and incidental costs required to complete the work.

ITEM 999.1

POLICE SERVICES

ALLOWANCE

The Contractor shall furnish police services required to direct traffic on existing roadways where traffic is maintained.

The Contractor shall provide such police officers as may be deemed necessary by either the Engineer or the City for the direction and control of all traffic traveling within and through the project area. The police officers shall be obtained from the City of Lowell Police Department as applicable. The police officers shall be paid by the Contractor at the prevailing rate of wages established by the City of Lowell.

Police employed by the Contractor on a temporary basis are considered to be employees of the Contractor, and the Contractor shall issue W-2 "Statements of Earnings and Taxes Withheld" to the employees and must submit copies thereof to the Massachusetts Department of Taxation and Corporations in the usual manner prescribed by law.

Allowance for Police Services

An allowance of Two Thousand Dollars (\$2,000) for the furnishing of police services has been included in all bids. This allowance is determined by multiplying the number of hours estimated as necessary by the prevailing hourly rate of wages established for such services. The Contractor shall submit certified copies of itemized bills of services rendered for review and approval by the Engineer. The allowance will be adjusted to the actual amount paid for authorized and approved police services as stipulated and shall include other payments due to any legal requirements of the State and Federal governments.

APPENDIX

PREVAILING WAGE RATES