

**CONTRACT DOCUMENTS
&
SPECIFICATIONS**

**RECONSTRUCTION OF BLANCHARD
ROAD**

**CITY OF CAMBRIDGE
COMMUNITY DEVELOPMENT DEPARTMENT
DEPARTMENT OF PUBLIC WORKS
JULY 2008**



**CITY OF CAMBRIDGE MASSACHUSETTS
RECONSTRUCTION OF BLANCHARD ROAD**

ADDENDUM NO. 1
JULY 24, 2008

I. MODIFICATIONS TO SPECIFICATIONS

SECTION 00300 - FORM FOR GENERAL BID

1. Pages 00300-7, 00300-12 and 00300-16 are deleted in their entirety and replaced by the attached revised Pages 00300-7, 00300-12 and 00300-16. The following changes have been made:
- New Item 153.00 Controlled Density Fill Excavatable has been added with a quantity of 10 CY.
 - The following items have been deleted:
 - **ITEM 645.148 48-INCH CHAIN LINK FENCE (PTR) VINYL COATED
(PIPE POST) FOOT**
 - **ITEM 650.048 48-INCH CHAIN LINK GATE WITH GATE POSTS
FOOT**
 - **ITEM 652.048 48-INCH CHAIN LINK FENCE END POST
EACH**
 - **ITEM 653.048 48-INCH CHAIN LINK FENCE CORNER OR
INTERMEDIATE BRACE POST
EACH**
 - The following items have been added with the same quantities as the 48-inch fence items which were deleted above:
 - **ITEM 645.160 60-INCH CHAIN LINK FENCE (PTR) VINYL COATED
(PIPE POST) FOOT**
 - **ITEM 650.060 60-INCH CHAIN LINK GATE WITH GATE POSTS
FOOT**
 - **ITEM 652.060 60-INCH CHAIN LINK FENCE END POST
EACH**
 - **ITEM 653.060 60-INCH CHAIN LINK FENCE CORNER OR
INTERMEDIATE BRACE POST
EACH**
 - New Item 856.12 Portable Changeable Message Sign has been added with a quantity of 90 UD.

SECTION 00825 – SUPPLEMENTAL CONDITIONS

1. Article 5 Traffic Control is revised.

The sixth paragraph is replaced by the following:

No separate measurement or payment will be made for Traffic Control work except for Portable Changeable Message Signs (See Section 900, Item 856.12). All preparation of traffic management plans, construction and detour signs, cones, drums, barricades, flashers, lights, pavement markings and other temporary traffic control devices necessary for compliance with the requirements of this Section, shall be furnished and installed by the Contractor at its expense, and will be considered incidental to the work of this Contract.

In the Subsection “Additional Vehicular Traffic Requirements”, the following new provision is added:

18. The Contractor will be responsible for snow removal within active work zones.

2. Article 7 Construction Schedule & Project Sequence is replaced by the following:

At the time the Contractor receives his/her contract documents for execution, he/she must contact the Engineering Division at the Cambridge Department of Public Works relative to scheduling of the work. The Contractor shall submit to the Engineer an estimated construction progress schedule showing the proposed dates of commencement, and completion of each major phase of work. A detail schedule of work to be undertaken within the first three-week period shall also be provided.

The Contractor shall update and submit the “three-week” schedule on a weekly basis, and shall update the overall “Master Schedule” every eight weeks.

3. Article 26A Coordination With Work By Others is revised.

The first paragraph is replaced by the following:

The Contractor shall be solely responsible for coordinating with construction projects and activities which may be occurring within, and/or adjacent to, the Project Limit of Work during the term of this Contract. These shall include, but not be limited to, the following:

The third paragraph is replaced by the following:

NSTAR Electric: Resetting of utility poles on Blanchard Road and related re-setting of wires and cables by NSTAR and tenant companies. The relocation of the poles is integral to the

sidewalk construction. The Contractor will be responsible for coordinating schedules, work zones and locations of poles so as to maintain the schedule and assure full ADA / AAB compliance of the sidewalks.

4. New Article 31 Record Drawings is added, as follows:

31. RECORD DRAWINGS

During the course of the work, a survey shall be performed by a Registered Land Surveyor (RLS) registered in the Commonwealth of Massachusetts. At the completion of the work, a final Record Drawing, signed and sealed by the RLS, shall be provided by the Contractor which includes the following information:

- a. Location of all project boundaries.
- b. The location and elevation of utility cutoff and capping performed by the Contractor.
- c. Locations and elevations of all new utilities installed.
- d. Elevations of sidewalks and curb cuts.

The Record Drawings shall be professionally drafted on 24" x 36" sheets, using a scale of 1" = 20', and shall be based on the Massachusetts Coordinate System Horizontal Datum and Cambridge City Base Vertical Datum. The Contractor shall submit the record drawing in both paper form, as specified above, and as an electronic AutoCADD file (latest version).

SECTION 00900 – TECHNICAL SPECIFICATIONS

1. The following Item is revised:

ITEM 102.50 TREE PROTECTION AND MAINTENANCE EACH

The first two paragraphs following "Tree protection and maintenance measures shall include the following:" are replaced by the following:

1. Wrapping the trunks of all trees with a durable material such as two by four lumber sufficient to protect tree trunks from mechanical damage. Removal of protective wrapping shall be done by the Contractor after construction in complete.
2. The proper pruning (raise pruning) of low branches to a height no greater than fourteen feet (14') above the roadway and eight feet (8') above the sidewalk. This includes trees endangered by traffic re-routing as the result of construction operations, as well as trees over existing roadways and sidewalks which do not presently meet these height requirements. The Contractor shall anticipate that up to thirty (30) trees will require pruning as part of this Item.

The second paragraph of the Subsection "Compensation" is replaced by the following:

Payment for work under this items will be at the contract unit price per each and shall include full compensation for all labor, materials, disposal, equipment, tools, and any other incidentals necessary for the satisfactory completion of this work as specified, including but not limited to pruning of up to thirty (30) trees, and furnishing, installing, maintaining, and removing tree wrap or drip line fence materials.

2. The following Item is added:

ITEM 153.00 CONTROLLED DENSITY FILL - EXCAVATABLE CUBIC YARD

Work to be done under this item shall consist of furnishing and placement of ready-mix controlled density fill (CDF) as an alternative to compacted gravel borrow in locations directed by the Engineer.

CDF shall meet the requirements of Standard Specification M4.08.0, Type 2E (Flowable, Excavatable). CDF shall be batched at a concrete plant and hauled to the job site in a ready-mix truck with a continuous agitating drum. During any waiting period prior to discharge, the mixture shall be agitated in the drum.

Compensation

Controlled Density Fill - Excavatable will be measured by the cubic yard, complete in place.

Payment for work under this item will be at the contract unit price per cubic yard and shall include full compensation for material in-place and any incidentals necessary for the satisfactory completion of this work as specified.

3. Chain Link Fence: The list of items at the beginning of this section is replaced by the following:

ITEM 645.160	60-INCH CHAIN LINK FENCE (PTR) VINYL COATED (PIPE POST)	FOOT
ITEM 645.172	72-INCH CHAIN LINK FENCE (PTR) VINYL COATED (PIPE POST)	FOOT
ITEM 650.060	60-INCH CHAIN LINK GATE WITH GATE POSTS	FOOT
ITEM 652.060	60-INCH CHAIN LINK FENCE END POST	EACH
ITEM 652.072	72-INCH CHAIN LINK FENCE END POST	EACH
ITEM 653.060	60-INCH CHAIN LINK FENCE CORNER OR INTERMEDIATE BRACE POST	EACH
ITEM 653.072	72-INCH CHAIN LINK FENCE CORNER OR INTERMEDIATE BRACE POST	EACH

4. The following Item is added:

ITEM 856.12 PORTABLE CHANGEABLE MESSAGE SIGN UNIT DAY

Work to be done under this item shall conform to the relevant provisions of Section 850 of Standard Specifications, in particular the Supplemental Specifications dated June 6, 2006.

Compensation

Work under this Item will be measured by the Unit Day. Each eight-hour period for which the unit is in place will be measured as one unit day, regardless of the number of times that the unit is positioned, repositioned, or removed. Periods of duration other than eight hours will be measured proportional to an eight-hour unit day. No measurement will be made for periods during which the unit is left in place for reasons other than construction activity.

II. PRE-BID CONFERENCE

1. Notes and sign-in sheet from the pre-bid conference of July 22, 2008 are attached.
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NOTE TO BIDDERS:

Please acknowledge receipt of this **Addendum No. 1** in your bid package.

Please note that this **Addendum No. 1** does not change the deadline for receipt of bids.

RECONSTRUCTION OF BLANCHARD ROAD

ITEM NO.	APPROX. QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		AMOUNT	
			Dollars	Cents	Dollars	Cents
151.00	1,100	Gravel Borrow, at _____ _____ Per Cubic Yard				
153.00	10	Controlled Density Fill - Excavatable, at _____ _____ Per Cubic Yard				
156.20	15	Crushed Stone, at _____ _____ Per Cubic Yard				
170.00	250	Fine Grading and Compacting (Subgrade Areas), at _____ _____ Per Square Yard				
201.00	1	Catch Basin (Pre-Cast) 4 Foot Sump, at _____ _____ Per Each				
201.05	10	Catch Basin (Pre-Cast) 6 Foot Sump, at _____ _____ Per Each				
220.00	30	Sewer or Drainage Structure Adjusted at, _____ _____ Per Each				

RECONSTRUCTION OF BLANCHARD ROAD

ITEM NO.	APPROX. QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		AMOUNT	
			Dollars	Cents	Dollars	Cents
594.00	1400	Curb Removed and Discarded, at Per Foot				
645.160	800	60" Chain Link Fence (PTR) Vinyl Coated (Pipe Post), at Per Foot				
645.172	90	72" Chain Link Fence (PTR) Vinyl Coated (Pipe Post), at Per Foot				
650.060	20	60" Chain Link Gate with Gate Posts, at Per Foot				
652.060	2	60" Chain Link Fence End Posts, at Per Each				
652.072	2	72" Chain Link Fence End Posts, at Per Each				
653.060	4	60" Chain Link Fence Corner or Intermediate Brace Posts, at Per Each				

RECONSTRUCTION OF BLANCHARD ROAD

ITEM NO.	APPROX. QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		AMOUNT	
			Dollars	Cents	Dollars	Cents
856.12	90	Portable Changeable Message Sign, at _____ _____ Per Unit Day				
864.01	275	Pavement Arrows and Legends - Reflective White Tape, at _____ _____ Per Square Foot				
864.23	85	Raised Pavement Marker - Two Way - White/Red, at _____ _____ Per Each				
864.24	1	Raised Pavement Marker - Two Way - Yellow/Red, at _____ _____ Per Each				
864.25	135	Raised Pavement Marker - Two Way - Yellow/Yellow, at _____ _____ Per Each				
866.04	4400	4" Reflectorized White Line - Thermo., at _____ _____ Per Foot				
866.12	125	12" Reflectorized White Line - Thermo., at _____ _____ Per Foot				

SECTION 00020

INVITATION TO BID

The City of Cambridge, Massachusetts, the Awarding Authority, invites sealed bids for the project:

RECONSTRUCTION OF BLANCHARD ROAD

Nature and scope of work: **ROADWAY AND SIDEWALK RECONSTRUCTION**

Bidding procedures shall be in accordance with M.G.L. c. 30, §39M, as most recently amended, and all other applicable laws.

The estimated project value is: **\$1,000,000**

Plans and specifications will be available from 8:30 a.m. to 8:00 p.m. on Mondays, 8:30 a.m. to 5:00 p.m. Tuesday through Thursday and 8:30 to noon on Fridays, at the Purchasing Department, City Hall, 795 Massachusetts Avenue, Room 303, Cambridge, MA 02139 beginning **Thursday, July 10, 2008** upon payment of a nonrefundable fee of \$ **50.00** for each set in the form of a check made payable to the City of Cambridge. **NO PARTIAL SETS WILL BE DISTRIBUTED.**

The contract documents may be examined at the Office of the Purchasing Agent, room 303, City Hall, 795 Massachusetts Avenue, Cambridge, MA 02139, or at the plan room of Dodge Reports, 24 Hartwell Avenue, Lexington, MA 02173. Sealed general bids will be received at the Purchasing Department, City Hall, 795 Massachusetts Avenue, Room 303, Cambridge, MA 02139 until **Thursday, July 31, 2008 at 2:30 pm**, at which time all general bids will be publicly opened and read aloud. **An original and one copy of the bid forms must be submitted.**

All general bids shall be accompanied by a bid deposit in the form of a certified, cashier's or treasurer's check (**NO CASH**) issued by a responsible bank or trust company made payable to the City of Cambridge or a bid bond, in an amount not less than five percent (5%) of the value of the bid.

The successful bidder will be required to furnish a Performance Bond and a Labor and Material (Payment) bond each in the amount of one hundred percent (100%) of the contract sum. Bonds shall be obtained from a surety licensed to do business in the Commonwealth of Massachusetts and the form shall be satisfactory to the City of Cambridge.

The successful bidder will also be required to comply with the provisions of Chapter 306 of the Acts of 2004 in regard to required OSHA approved safety & health training.

The City of Cambridge reserves the right to reject any or all general bids if it is in the public interest to do so.

No less than the minimum wage rates as set forth in the schedule contained in the Contract Documents must be paid on this project.

Attention is called to the following programs and ordinances of the City of Cambridge:

1. Supplemental Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program;
2. Minority Business Enterprise Program;
3. Cambridge Employment Plan: minority/women/resident hiring ordinance.

4. Cambridge Responsible Employer Plan
5. Living Wage
6. Cambridge CORI Ordinance
7. OSHA Certification

Copies of the above are bound in the bid documents and are fully integral portions of the conditions of the contract with which each contractor and sub-contractor must comply.

A pre-bid conference for all bidders will be held as follows:

Date: **Tuesday, July 22, 2008**

Time: **11:00 AM**

Place: Public Works Department Conference Room
147 Hampshire Street
Cambridge, MA 02139

All contractor questions must be submitted by Wednesday, July 23, 2008 at 4:00 p.m. No responses will be issued for questions received after this deadline.

Bidders must be pre-qualified by the Massachusetts Highway Department, Room 6260, 10 Park Plaza, Boston, MA. Plans and specifications will not be available to contractors without a "Certificate of Approval Form" from MHD.

Cynthia H. Griffin
Purchasing Agent

INFORMATION FOR AND INSTRUCTIONS TO BIDDERS

1. DEFINITIONS AND TERMINOLOGY

Article 1, Definitions, of the General Terms and Conditions of the Contract (“General Terms and Conditions”) included in the Project Manual are incorporated by reference as if fully rewritten herein. In the event of a conflict between the within definitions and those found in the General Terms and Conditions, the former govern for the purposes of these Instructions only. All other terms which are not herein defined have their ordinary dictionary meaning.

ADDENDUM (ADDENDA, PLURAL)-An Addendum is a document issued by the City prior to the opening of the General Bids which clarifies, amends, or modifies the Bidding Documents.

ALTERNATE BID-An Alternate Bid (or An Alternate) is an amount that is either added to or deducted from the Base Bid depending on the designation on the Bid form.

BASE BID-A Base Bid is the sum proposed by a Bidder to perform the Work and does not include any Alternate Bids.

BID-A Bid is a proposal to do the Work for a specified sum and includes accompanying forms which are required to be submitted.

BIDDER-A Bidder is a person who or an entity that submits a Bid pursuant to M.G.L. c. 30, §39M or c. 30B, as the case may be. The pronouns “it” and “they” are used herein when referring to a Bidder or Bidders, respectively.

BIDDING DOCUMENTS-The Bidding Documents are comprised of the entire Project Manual, which includes, but is not limited to, the Invitation to Bid (advertisement), the Instructions to Bidders, all of the forms (e.g., Bid forms, sample Agreement form, bond forms), the wage rates, the General Terms and Conditions of the Contract, any supplementary terms and conditions thereto, the Plans, the Specifications, and all addenda.

BUSINESS DAYS-Business days are defined as all days of the week excluding Saturdays, Sundays, and those holidays for which the City offices are closed for observance.

PURCHASING DEPARTMENT-The Purchasing Department refers to the City of Cambridge Purchasing Department located at 795 Massachusetts Avenue, Third Floor, Cambridge, MA 02139.

2. COPIES OF BIDDING DOCUMENTS

A Bidder may obtain complete sets of Bidding Documents upon payment of a nonrefundable fee, the amount of which is set forth in the Invitation to Bid.

No partial sets of Bidding Documents will be issued.

It is the responsibility of the Bidder to insure that it has obtained a complete set of Bidding Documents. Complete sets of Bidding Documents shall be used in preparing Bids. Neither the City nor the Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents in preparing the Bids.

Distribution of the Bidding Documents is for the sole purpose of obtaining Bids and does not confer a license or grant permission for any other use of the Bidding Documents.

3. STATE WAGE RATE REQUIREMENTS

The minimum prevailing wage rates are included with the Bidding Documents and apply to this Project.

4. QUESTIONS AND INTERPRETATIONS

All questions about the meaning or intent of the Bidding Documents shall be received in writing no later than the end of the business day seven calendar days before the date herein set for the opening of Bids. Any questions received after such time will be answered at the discretion of the City.

Written clarifications or interpretations will be issued by the Purchasing Department in the form of an Addendum. Only questions answered by an Addendum will be binding. Oral clarifications or interpretations will be without legal effect. Addenda will either be faxed or mailed to all persons having received Bidding Documents from the Purchasing Department.

Each Bidder shall be responsible for determining that it has received all Addenda issued.

5. THE BID

BIDDER'S REPRESENTATIONS.

In submitting a Bid, the Bidder represents that:

- It understands the Bidding Documents;
- It has read and examined the Bidding Documents thoroughly;
- The Bid is made in accordance with the Bidding Documents;
- It has visited the site, has become familiar with the conditions of the site and the surrounding area, and has familiarized itself with local conditions that may in any manner affect cost, progress, or performance of the Work;
- It has correlated its own observations with the Bidding Documents;
- It has found no errors, conflicts, ambiguities, or omissions in the Bidding Documents, except for those that it has brought to the

Purchasing Department's attention in writing at least seven (7) business days prior to submitting its Bid;

- It is familiar with all of the applicable Federal, State, and City laws, rules, regulations, and procedures affecting its Bid and its Bid is in conformity with those laws, rules, regulations, and procedures;
- the Bidder has complied with every requirement of these Instructions and that the Bidding Documents are sufficient in scope and detail to indicate and convey an understanding of all terms and conditions for the performance of the Work.

CONTENTS OF A BID.

A Bid must include:

- **A Bid Deposit**
- **Division 00218 – CORI Compliance Form**
- **Division 00220 - Americans With Disabilities Act**
- **Division 00300 - Form for General Bid**
- **Division 00306 - OSHA Certification Forms**
- **Division 00310 - Bid Bond**
- **Division 00311 - MBE Forms**
- **Division 00312 - Statement of Bidder's Qualifications**
- **Division 00313 - General Contractor's Certification**
- **Division 00315 - Projected Workforce Certification**
- **Division 00318 - CREP General Contractor Certification – Bid Form**

Right to Waive Informalities and Permit Curative Measures: The City reserves the right to waive any Bid informalities. The City may permit bidders who fail to include all non-statutory, City of Cambridge forms to cure such omission(s) within five (5) days of bid opening, subject to the City's discretion.

Bid Deposits: Unless otherwise stated, every Bid must be accompanied by a Bid deposit in the form of a Bid bond, certified check, or a treasurer's or cashier's check issued by, a responsible bank or trust company, payable to the City of Cambridge. The Bid bond shall be (a) in a form satisfactory to the City, (b) with a surety company qualified to do business in the Commonwealth and satisfactory to the City, and (c) conditioned upon the faithful performance by the principal of the agreements contained in the Bid. The Bid deposit shall be no less than five percent (5%) of the value of the Bid.

Bid Forms. Each Bid shall be submitted on the Bid form included in the Project Manual. Bid prices must be stated in both dollar figures and words. In the case of a conflict, written amounts shall control over numbers. All blank spaces must be filled. Do not leave any blanks. Print "N/A" in any space not needed or used. The Bid form shall be completed in ink or by typewriter.

Acknowledgment of Addenda. Each Bidder is required to acknowledge the receipt of all Addenda (the numbers of which are to be filled in on the Bid form by the Bidder). The City, in its sole discretion, may deem a Bidder's failure to acknowledge any Addendum a minor informality.

SUBMISSION OF A BID.

Prior to the deadline for receipt of Bids, each Bid must be submitted to the Purchasing Department in a sealed envelope which is plainly marked on the outside with the name and address of the Bidder, the title of the Project, the file number, the portion of the Work which the Bid represents, and the date and time of the Bid opening. Any hand delivered Bid received after the deadline will not be accepted. Any other Bid received after the deadline will be returned to the addressee. Any Bid submitted to any other office or department of the City and received by the Purchasing Department after the deadline for receipt of Bids will not be accepted. It is the responsibility of the Bidder to ensure that its Bid is received by the Purchasing Department in a timely fashion. The deadline for receipt of Bids can be extended by Addendum only.

Bids may not be submitted orally, by facsimile, by telephone, or by any other method except for the methods described above.

MODIFICATION OF A BID.

A Bid may be modified only by submitting any such modification in the form of a document executed in the same manner as a Bid, delivered in a sealed envelope in the same manner as a Bid, designated as a modification to the original Bid and submitted to the Purchasing Department prior to the time designated for the opening of Bids.

WITHDRAWAL OF A BID.

Prior to Bid opening. A Bid may be withdrawn before the time designated for opening Bids. The Bidder requesting such withdrawal must make the request in writing and in a specific manner designated by the City if the City so requires. Withdrawal of a Bid prior to the Bid opening time will not prejudice the right of a Bidder to resubmit a Bid. A Bid cannot be withdrawn after the Bid opening time except as provided by law.

After Bid opening. In the case of death, disability, bona fide clerical error or mechanical error of a substantial nature or other unforeseen circumstances affecting a Bidder, a Bidder may withdraw its Bid after the time designated for Bid opening, if within five (5) days of the date designated for opening its Bid, such Bidder submits a statement under the penalties of perjury to the Purchasing Department detailing the basis for withdrawal. The City will then make a determination as to whether such Bidder has satisfied both the statutory and City requirements for such withdrawal. If the City is satisfied, the Bid Deposit will be returned to such Bidder.

BID OPENING.

All Bids received prior to the date and time designated for the Bid opening will be opened publicly and read aloud at a location designated by the Purchasing Department.

PUBLIC BID REVIEW AND INSPECTION.

Upon opening, all Bids become public records except for portions thereof that are not subject to public disclosure as a matter of law.

Bids may be reviewed by the public in a manner set forth by the Purchasing Department.

Any Bidder who objects to a Bid may protest the Bid. In order to be considered, the protest must be received by the Purchasing Department within two (2) business days after the Bid opening date. The protest must be in writing, must state in detail the basis for the protest, and must be signed by the protester.

6. RESERVATION OF RIGHTS TO REJECT BIDS

The City reserves the right to reject any or all Bids, if it is in the public interest to do so.

The City reserves the right to reject any or all Bids, if it determines that the Bidder does not possess the qualifications to perform the Work specified in the Bidding Documents.

The City reserves the right to reject the Bid of any Bidder who the City has determined has not completed a prior project, whether with the City or elsewhere, because of the fault of the Bidder, its Subcontractors or employees; has been declared in default on a prior contract whether with the City or elsewhere; has failed to complete a prior project in a timely fashion whether with the City or elsewhere; based on its work record, is not capable of performing the Contract whether due to lack of sufficient prior experience, as determined by the City, or any other reason; has a work record of its Subcontractors demanding direct payment from the City; has a work record of its Subcontractors, employees or material suppliers complaining to the City or other awarding authority regarding the Bidder's failure to pay them; has a record of complaints made to the City or other awarding authority by persons offended by the behavior of the Bidder, its Subcontractors or employees; or has a record of its failure to comply with the Commonwealth and/or City laws or requirements. "Work record" or "record" constitutes a minimum of one event in the work history of the Bidder.

The City shall reject every Bid which is not accompanied by a Bid deposit.

7. AWARD OF CONTRACT

The City shall award the contract to the lowest responsible (demonstrably possessing the skill, ability, and integrity necessary to faithfully perform the work called for by the Contract, based upon a determination of competent workmanship and financial soundness) and eligible (able to meet all requirements for Bidders set forth in the Bidding Documents)

Bidder within ninety (90) days after the date of the opening of the Bids. If the Bidder selected as the contractor fails to perform its agreement to execute a contract in accordance with the terms of its Bid and furnish a performance bond and a labor and materials or payment bond, if required by the Bidding Documents, an award shall be made to the next lowest responsible and eligible Bidder. The forty-five day time limit shall not be applicable to a second or subsequent award made after the expiration of the time limit with the consent of the next lowest responsible and eligible bidder, and made because the original award made within the time limit was invalid, or because the bidder failed to execute the Agreement or to provide a performance and labor and materials or payment bond.

Any Bidder who fails to perform its agreement to execute a contract and furnish a performance bond and a labor and materials or payment bond shall forfeit its Bid deposit which shall become the property of the City, but shall not exceed the difference between its Bid price and the Bid price of the next lowest responsible and eligible bidder.

The City will notify the selected Bidder and all other Bidders of the award.

The City will submit to the selected Bidder at least four (4) unsigned copies of the Agreement between the City and the Contractor. The selected Bidder will be required to return to the Purchasing Department within ten (10) business days of the date notice of award all of the copies of the Agreement between the City and the Contractor signed, its performance bond, its labor and materials or payment bond and all required certificates of insurance. Failure of the selected Bidder to submit all of the required documents in a timely fashion may result in the withdrawal of the award. The City will return one fully signed copy of the Agreement to the Contractor. Time is of the essence in the performance of the Agreement.

8. COMPLETION/EXTENSION TIME

Bidder must agree to commence work on or before 7 days following the date set forth in the written "Notice to Proceed" to the Owner and to fully complete the project within **One (1) Year** from the date of Notice to Proceed thereafter. Bidder must agree also to pay as liquidated damages the sum of Two Hundred (\$200.00) dollars for each consecutive calendar day thereafter that the work remains unfinished.

CYNTHIA H. GRIFFIN
PURCHASING AGENT

ABBREVIATIONS AND REFERENCES

AASHTO - American Association of State Highways and Transportation Officials

ASTM - American Society of Testing Materials

MHD - Massachusetts Highway Department (formerly MDPW, Massachusetts Department of Public Works)

Where reference is made to a specification by one of the above-mentioned or other relevant agencies, it is understood that the latest revision thereof shall apply.

In case of conflict, the specification issued by the City of Cambridge shall take precedence over the above-noted specifications.

PERMITS AND FEES

Public Works Department permits to obstruct or excavate the public way must be obtained prior to beginning work. Permit fees shall be waived. The Cambridge Traffic and Parking Department must be contacted directly for permit requirements and fees.

Permits to excavate the public way cannot be issued until the applicant has notified the appropriate utility companies, as required by Massachusetts General Laws, Chapter 370 of the Acts of 1963. The applicant must either: 1) obtain written receipts from the affected utilities, and provide copies of same to the owner; or 2) utilize the Dig-Safe System for the required notifications, and also submit written notifications for those utilities not participating in the Dig-Safe System. Written notifications must state that utility companies have been notified and the contractor cleared to begin work.

The following utility companies must be notified in writing:

M.B.T.A.	617-222-6133
Attention: Ms. Pat Cargill	
Supt. Of Transportation	
21 Arlington Ave.	
Charlestown, MA 02129	

M.W.R.A. Sewer Division	617-242-6000
100 First Avenue	
Charlestown Navy Yard	
Boston, MA 02129	

M.W.R.A. Water Division	617-242-6000
100 First Avenue	
Charlestown Navy Yard	
Boston, MA 02129	

The following utility companies must be notified in writing or through Dig-Safe.

Algonquin Gas Transmission Corp.
Attention: Mr. John Sheridan
Manager of Land and Public Relations
1284 Soldiers Field Road
Brighton, MA 02135

617-560-1444
Evening No. 1-800-726-8383

Verizon
Attention: Mr. Bob Millirick
475 Wildwood St.
Woburn, MA 01801

781- 939-3652

NSTAR Electric
Planning
Attention: Mr. William Lemos
Right of Way
1165 Massachusetts Avenue
Dorchester, MA 02125

617-541-5736

KeySpan Gas
Attention: Mr. Dennis Peri
201 Rivermoor Street
West Roxbury, MA 02132

617-323-9210

N-Star Electric
Construction
Attention: Brian McDevitt
1165 Mass. Ave.
Dorchester, MA 02125

617-541-7805

N-Star Steam
Attention: Mr. Thomas Connelly
Supervisor of Maintenance
46 Blackstone Street
Cambridge, MA 02139

617-497-1236
x12

N-Star Gas
Attention: Mr. Kevin Kelly
101 Linwood St.
Somerville, MA 02143

617-369-5591

Comcast
Attention: Mr. Jeff Harrington
28 Travis Street
Allston, MA 02134

617-562-4241

Cambridge Public Works Department
Attn. Permits Department
147 Hampshire Street
Cambridge, MA 02139

Main Number 617-349-4800
617-349-4833

Cambridge Water Department
250 Fresh Pond Parkway
Cambridge, MA 02138

617-349-4770

Cambridge Fire Alarm Department
489 Broadway
Cambridge, MA 02138

617-349-4900

Dig-Safe

1-800-322-4844

The contractor shall have all utilities marked out along the course of this work by such means as the Engineer shall approve and shall preserve such marked locations until the work has progressed to the point where the encountered utility is fully exposed and protected as required. It shall be the contractor's responsibility to notify utilities at least 48 hours prior to the start of any excavation.

The contractor is responsible for contacting any other utilities that are not listed herein.

CAMBRIDGE EMPLOYMENT PLAN

Municipal Ordinance Sections 2.66.060, ET SEQ.

MINORITY/WOMEN/RESIDENT HIRING

HIRING REQUIREMENTS

On any construction project which is funded in whole or in part by City, State or Federal funds, or funds which the City expends or administers in accordance with a federal grant, or on any construction project for which the City is a signatory to the construction contract, the worker hours shall be performed as follows:

1. No less than **TWENTY-FIVE PERCENT (25%)** of the total employee worker hours shall be performed by **BONA FIDE CAMBRIDGE RESIDENTS**. A Cambridge resident is any person for whom the principal place where that person normally eats and sleeps and maintains his or her normal personal and household effects is within the City of Cambridge.
2. No less than **TWENTY-FIVE PERCENT (25%)** of the total employee worker hours shall be performed by **MINORITY PERSONS**. Minority Persons means and includes those persons who are Black, Hispanic, Asian, Native American or Cape Verdean.
3. No less than **TEN PERCENT (10%)** of the total employee worker hours shall be performed by **WOMEN**.

COMPLIANCE, ENFORCEMENT, SANCTIONS

1. All Contractors entering into construction contracts shall:
 - a. Certify that they have read the provisions of Cambridge Municipal Ordinance Section 2.66.060, et seq. and that they shall comply with them;
 - b. List all job openings with Employment Resources, Inc. ("ERI") and keep accurate records as to action taken on referrals from that agency;
 - c. Maintain personnel records listing names, addresses, sex and race of their employees; and require their subcontractors to do likewise. All records required to be maintained by this section shall be made available on request to representatives of said Cambridge Community Development Department. All such records shall be maintained for the duration of the construction project and for one year thereafter.
2. Failure to comply with these requirements will result in the impositions of sanctions permitted by the Cambridge Municipal Code.
3. The following standards will be used to determine whether the Contractor has acted in good faith in attempting to meet the requirements of Cambridge Municipal Ordinance Section 2.66.060, et seq. for hiring residents, minorities and women:

The Contractor must demonstrate that it has done all of the following except where such requirement would conflict with a collective bargaining agreement:

1. Prior to construction and during construction, when necessary, it posted jobs with ERI and all appropriate trade unions and requested that referrals be made in the proportions necessary to meet the Cambridge Employment Plan's employment standards;
2. Interviewed all qualified applicants and returned completed interview forms to ERI within one week of each respective interview;
3. It provided the City with the name and telephone number of the person designated as Compliance Officer to work directly with the City; and
4. It submitted to the City a projection of workforce needs over the course of construction of the project. Such submission shall reflect the needs, by trade, for each month of the construction process.

In addition, at the discretion of the City, Contractors may be required to comply with the following:

1. Placed its own ads in local and local minority newspapers or tabloids;
2. Placed a State Department Employment and Training ad.

CAMBRIDGE EMPLOYMENT PLAN

Article II. Construction Projects

2.66.060 Construction Projects - Worker Qualifications.

A. On any construction project which is funded in whole or in part by City, State or federal funds, or funds in which, in accordance with a federal grant, the City expends or administers, or in which the City is a signatory to the construction contract, the worker hours shall be performed as follows:

1. No less than twenty-five percent of the total employee worker hours shall be performed by bona fide Cambridge Residents.
2. No less than twenty-five percent of the total employee worker hours shall be performed by minority persons.
3. No less than ten percent of the total employee worker hours shall be performed by women.

B. This section shall not apply to housing rehabilitation projects including eight or fewer. (Ord. 1053 (part), 1987: prior code § 24-6)

2.66.070 Compliance, enforcement, sanctions.

A. All contractors entering into construction contracts covered by Article II of this chapter shall:

1. Certify that they know of the provisions of said Article and that they intend to comply with them;
2. List all job openings with the Employment and Training Agency or Agencies and keep accurate records as to actions taken on referrals from these agencies;
3. Maintain personnel records listing the names, addresses, sex and race of their employees; and require their subcontractors to do likewise.

B. The Cambridge Community Development Department shall develop, in consultation with the Employment and Training Agency or Agencies, good-faith measures by which to judge the affirmative actions of contractors operating under the provisions of this Article II. All records required to be maintained by this section shall be made available on request to representatives to said Department. All such records shall be maintained for the duration of the construction project and for one year thereafter.

C. Should a contractor be deemed not to have complied with the provisions of this Article II, nor to have made a good-faith effort to do so, it shall not be actively considered for future public construction contracts in Cambridge. (Ord. 1053 (part), 1987: prior code § 24-7)

TECHNICAL SPECIFICATIONS
RECONSTRUCTION OF BLANCHARD ROAD

NOTE: WHERE REFERENCE IS MADE BELOW TO THE “STANDARD SPECIFICATIONS”, THIS SHALL BE CONSTRUED TO MEAN THE LATEST EDITION, INCLUDING STANDARD SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS, OF THE **MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES** (English Units Version).

CONSTRUCTION DETAILS REFERRED TO HEREIN SHALL BE CONSTRUED TO MEAN THE CAMBRIDGE DEPARTMENT OF PUBLIC WORKS **STANDARD SPECIFICATIONS FOR STREET EXCAVATIONS AND CONSTRUCTION**, PORTIONS OF WHICH HAVE BEEN INCLUDED HEREIN. THE REMAINDER ARE AVAILABLE AT www.cambridgema.gov/TheWorks.

ITEM 102.50	TREE PROTECTION AND MAINTENANCE	EACH
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The work to be done under this Item consists of instituting and maintaining positive measures to protect and maintain public and private shade trees within and adjacent to the limits of work.

Public trees are protected by Massachusetts state law, Chapter 87. Section 12 states that a fine of up to five hundred dollars, (\$500.00) per incident of damage to public shade trees can be levied. Each branch broken or improperly pruned, each improper wounding of the trunks of the trees, and each root improperly pruned shall constitute an infraction. Section 12 further provides that anyone who negligently or willfully damages a tree will be liable to the City for all damages.

The Contractor shall take the utmost care to avoid unauthorized, unnecessary or improper wounding of public or private shade trees. Prior to construction, the Contractor shall provide a tree protection and maintenance plan and work schedule. A Massachusetts or International Certified Arborist shall be sub-contracted by the Contractor to provide a protection and maintenance plan and perform specified work. **All plans and schedules shall be subject to review and approval by the City Tree Warden. Infraction of Massachusetts state law Chapter 87 or failure to provide a protection plan and work schedule will result in fines or the immediate cancellation of the contract.**

Tree protection and maintenance measures shall include the following:

1. Wrapping the trunks of trees with a diameter at breast height (DBH) of 6” or greater with a durable material such as two by four lumber sufficient to protect tree trunks from mechanical damage. Removal of protective wrapping shall be done by the Contractor after construction in complete.
2. The proper pruning (raise pruning) of low branches to a height no greater than fourteen feet (14’) above the roadway and eight feet (8’) above the sidewalk. This includes trees endangered by traffic re-

routing as the result of construction operations, as well as trees over existing roadways and sidewalks which do not presently meet these height requirements.

3. Traffic control plans shall be designed in such a way as to direct traffic away from tree trunks and branches.
4. Tunneling shall be the preferred method of excavation adjacent to tree roots to avoid root pruning. If root pruning is unavoidable, certified personnel shall execute the operation with sufficiently sharpened had tools and in such a fashion as to have minimum negative impact on tree health and safety.
5. Trucks and heavy equipment shall not pass over or park on roots of public shade trees. A protection zone shall be established by erecting a rigid fence outside the perimeter of the dripline of the tree. For occasional or one time access over roots, ½-inch plywood overlapped may be used. Permeable materials such as gravel or wood chips shall be placed over root systems of trees which are not covered by hardscape and over which trucks and heavy equipment must travel during construction operations, when such travel is unavoidable, to prevent soil compaction and root damage. Material shall be replaced as needed.
6. During sidewalk construction adjacent to trees, suitable soil shall be maintained within tree wells. Soil shall also be maintained around surface roots outside of tree wells which may become exposed during construction.
7. Following construction, existing trees within the project area shall be mulched in accordance with the requirements for new trees, as specified in Section 910.
8. All tree protection and maintenance measures and operations shall be subject to review, approval or change by the City Tree Warden.

Compensation

Tree protection will be measured by the unit Each, for each tree provided with protective wrapping or drip line fencing as specified herein.

Payment for work under this items will be at the contract unit price per each and shall include full compensation for all labor, materials, disposal, equipment, tools, and any other incidentals necessary for the satisfactory completion of this work as specified, including but not limited required pruning, and furnishing, installing, maintaining, and removing tree wrap or drip line fence materials.

RECONSTRUCTION OF BLANCHARD ROAD

ITEM 101.00	CLEARING AND GRUBBING	ACRE
ITEM 103.00	TREE REMOVED (DIAMETER UNDER 2 FT.)	EACH
ITEM 105.00	STUMP REMOVED	EACH

Work to be done under these items shall conform to the relevant provisions of Section 101 of the Standard Specifications and to the following:

Clearing and grubbing performed within five (5) feet of existing stone masonry walls shall be performed by hand methods. Stone masonry walls shall be protected at all times per the requirements of Item 692.00.

Removals shall be as indicated on the Drawings and as directed by the Engineer. Trees to be removed shall be verified with the Engineer prior to undertaking any work under this Item. Trees shall be completely removed, including stumps, and legally disposed of off-site. Existing tree pits shall be restored as sidewalk under the appropriate sidewalk item.

Compensation

Clearing and Grubbing, and Tree and Stump removal will be measured for payment as specified in Section 101 of the Standard Specifications and the following:

Payment for work under these items will be at the contract unit price per each and shall include full compensation for all labor, materials, equipment, tools, and any other incidentals necessary for the satisfactory completion of this work as specified.

NOTES ON EXCLUSIONS: Disposal of excavated soil is not included for payment under this item and shall be paid for separately.

ITEM 120.10**UNCLASSIFIED EXCAVATION****CUBIC YARD**

Work to be done under this item shall conform to the relevant provisions of Section 120 of the Standard Specifications and to the following:

The work shall consist of the excavation of all materials encountered within the limits of the contract beyond those materials specifically classified and paid for under other items of this contract. Excavation for sidewalk and pedestrian ramp installation, including areas where any of these installations are to be located in present roadway areas, shall be considered incidental to the appropriate sidewalk or ramp items.

Excavation of existing hot mix asphalt and concrete pavements as required for full-depth roadway construction or patching; and for removing existing materials in areas of proposed lawn areas shall also be paid for under this item. (Note: Excavation required for isolated tree planting in pits will not be measured as part of this Item - see Item 775.00)

The Contractor shall exercise special care when excavating near trees. When major roots are in the way, the Contractor shall go under or between them. In no case shall the Contractor disturb the root structure of the trees without direction from the City Arborist. Exposed roots shall be covered promptly.

The Contractor shall exercise special care when excavating near existing stone boundary walls and retaining walls of any type. In no case shall the Contractor disturb such walls unless directed by the Engineer. See also Item 692.

The Contractor shall perform work in such a manner to minimize dust and utilize dust control techniques when necessary or as directed by the Engineer.

At the discretion of the Engineer, de-watering (pumping) may be required during trench excavation and the prosecution of the work. If such is the case, the Contractor shall obtain a dewatering permit from the City, United States EPA, or Massachusetts Water Resources Authority, as required, and water shall be discharged to a location accepted in advance by the Engineer.

All trench excavations shall strictly adhere to the latest OSHA requirements. Temporary trench support, in compliance with OSHA, required to excavate to a depth to prosecute the work shall along with the proper support of all existing utilities be the responsibility of the Contractor.

Compensation

Unclassified Excavation will be measured for payment as specified in Section 120 of the Standard Specifications and the following:

Payment for work under this item will be at the contract unit price per cubic yard and shall include full compensation for saw-cutting, labor, materials, equipment, tools, disposal of construction debris (concrete, asphalt, etc.) dust control and any other incidentals necessary for the satisfactory completion of this work as specified.

RECONSTRUCTION OF BLANCHARD ROAD

NOTES ON EXCLUSIONS: Disposal of excavated soil is not included for payment under this item and shall be paid for separately. Excavation which is specified as incidental to other items, including sidewalks, ramps, and utility systems, will not be paid for under Item 120.10.

NOTE FOR ITEMS 125.10 THROUGH 126.11

A minimum unit bid cost has been established for the unit price bid items 125.10 through 126.11. The Contractor is directed to review the minimum unit bid prices and increase them within the FORMS FOR GENERAL BID as the Contractor sees fit. The Contractor is not obligated to accept the minimum unit prices indicated but shall not reduce them. The minimum unit prices established may be below actual market costs and are provided to avoid unbalanced bidding. The Contractor is directed to review the minimum unit prices presented and develop competitive unit prices for inclusion in the FORMS FOR GENERAL BID. Any bids received which do not present unit prices entered by the Contractor within the FORMS OF GENERAL BID or present unit prices below the minimum unit prices established, shall be rejected as non-responsive.

125.10	SOIL AND WASTE MANAGEMENT	LUMP SUM
125.20.1	HANDLING ASBESTOS CONTAMINATED SOIL/FILL	CUBIC YARDS
125.40	REUSE EXCAVATED MATERIAL ON-SITE AS BACKFILL	CUBIC YARDS

GENERAL

- A. It is the objective of soil/fill management practices specified here to handle all soil/fill excavated from the site during the course of this contract in a cost-effective manner and in accordance with applicable state and federal regulations. The Contractor shall reuse excavated materials, as approved by the Engineer, prior to using imported fill in order to reduce the volume of material to be disposed off-site provided the material is geotechnically suitable as backfill and does not result in spreading contamination to other areas or other soil/fill strata. Excavated soil/fill, which is displaced by design features, (e.g. pipe and manholes), may be used as backfill elsewhere on the project provided the soil/fill is geotechnically suitable and does not result in spreading contamination or degrading the environmental quality at the location of reuse. Imported backfill shall be used only as accepted by the Engineer.
- B. The Contractor shall be responsible for coordinating waste disposal, and as such, shall be responsible for identifying an appropriate facility which can receive the material and, if necessary, collect additional characterization samples to satisfy local, state, and federal regulations as well as the Contractor's selected disposal facility's acceptance criteria.
- C. Unless specifically stated otherwise, terms used in this specification are as defined in the MCP, 310 CMR 40.0006.
- D. Any soils which contain exhibit petroleum or chemical odor or visual indications of oil or hazardous materials shall be handled as potentially contaminated soils. Soil which does not have any evidence of contamination can be reused within the *area of excavation*. Soil/fill which is staged and characterized can be reused within the *area of excavation* or elsewhere on site provided the

RECONSTRUCTION OF BLANCHARD ROAD

material has equal or less contamination than the point where it is to be reused.

- E. Contaminated soil/fill (including petroleum-contaminated soil/fill) which can not be reused on site shall be reused off-site, recycled, or disposed as a solid waste at an appropriately permitted facility unless it also meets the regulatory definition of hazardous waste as defined in 40 CFR part 261 or contains PCBs or asbestos.
- F. Notification Procedures:

In the event of an emergency, the Contractor shall contact the following entities at the earliest possible opportunity:

- a. Owner's designated representatives.
- b. City of Cambridge DPW
- c. City of Cambridge Fire Department
- d. Engineer
- e. Massachusetts DEP.

The Contractor shall prepare in advance of work activities a notification list, complete with phone numbers, addresses, and contact names for all parties to be notified (including, but not limited to, the parties listed above) in the event of an emergency.

- G. The Contractor shall provide the following at least two weeks prior to mobilizing onto the site:

1. Soil and Waste Management Plan (SWMP):

The SWMP shall outline measures for sampling, analysis, disposal, and shall identify a waste staging area in the event that soil is stockpiled for subsequent reuse and/or disposal or unknown materials are encountered. The SWMP shall outline procedures for securing the staging area, controlling dust and soil / fill migration, appropriate covering of stockpiles to ensure adequate wind protection and keeping the soil dry. The Contractor is advised that no City-owned or controlled areas are available to serve as waste staging areas for this Project. The Contractor's procedures shall be described in the Soil and Waste Management Plan.

2. Health and Safety Plan (HASP):

The Health and Safety Plan shall outline measures for encountering oil and hazardous material (OHM), including exposure monitoring, prevention methods, and emergency response procedures.

3. Contingency Management Plan (CMP):

The CMP shall provide details on construction methods, and site location and availability of the staging area(s) for approval by the Owner or Engineer and/or their representative.

4. Spill and Discharge Control Plan (SDCP):

This SDCP shall provide contingency measures and reporting responsibilities for potential uncontrolled spills and discharges of contaminated and/or hazardous materials, including, but not limited to, leachate, decontamination water, sewage, and other on-site waste materials.

5. Dust, Vapor, and Odor Control Plan (DVOCP):

The DVOCP shall include measures to control objectionable dust, vapors, and odors originating from the site. The DVOCP shall describe procedures to minimize the creation of dust, and the control of objectionable vapors and odors originating from the site.

COMPENSATION

Item 125.10 - Soil and Waste Management

METHOD OF MEASUREMENT:

The costs associated with excavating, handling, testing and characterizing soil and waste other than allowed for in subsequent payment items shall be incorporated into the Contractor's lump sum bid price for Item 125.10. Payment for Soil and Waste Management will be based on the lump sum price bid for this item in the proposal. Measurement for payment will be based on the percentage of project completion based on elapsed time compared to the contractual construction time limit.

BASIS OF PAYMENT / INCLUSIONS:

Payment for Soil and Waste Management shall be based on the lump sum price complete for this item in the proposal. Under the lump sum price for this item, the Contractor shall furnish all labor, materials, tools, equipment and incidentals required for Soil and Waste Management. This work includes, but is not limited to; soil / fill sampling, analytical services, transport to staging area, testing, establishment and maintenance of appropriate staging area, development and implementation of all submittals and plans specified herein.

EXCLUSIONS:

The following items are not included for payment under this item; transportation and disposal of soil and fill material; reuse of soil and fill material on site as backfill; handling asbestos contaminated material; sedimentation and erosion control for other uses besides soil management (at the staging area); all work associated with a staging area for other uses beyond soil and waste management.

RECONSTRUCTION OF BLANCHARD ROAD

Item 125.20 - Handle Asbestos Contaminated Soil / Fill

METHOD OF MEASUREMENT:

Measurement for payment for Handling Asbestos Contaminated Soil/Fill shall be based on the actual in-place volume excavated, in cubic yards, as measured by the Engineer, within the horizontal and vertical trench pay limits indicated elsewhere in the Contract Documents.

BASIS OF PAYMENT / INCLUSIONS:

Payment for Handling Asbestos Contaminated Soil/Fill shall be based on the cubic yard price complete for this item in the proposal. Under the cubic yard price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for Handling Asbestos Contaminated Soil/Fill. The work includes, but is not limited to; segregate, handle, stage, test, and characterize all soil and fill material suspected of containing asbestos-containing materials; all controls necessary to maintain compliance with Cambridge City ordinances relative to asbestos in soils; procuring all health and safety equipment; protecting the excavation from accidental entry; controlling windblown litter and the spread of airborne contaminants; all fees, permits, and taxes; and construct, maintain, and remove a secure asbestos contaminated fill staging area for stockpiling pending analytical testing, reuse, or disposal.

EXCLUSIONS:

The following items are not included for payment under this item; disposal of asbestos contaminated material; soil and waste management items covered under other bid items; handling asbestos contaminated pipe and structures; and all work associated with a staging area for other uses beyond asbestos contaminated material staging.

Item 125.40 - Reuse Excavated Material On-site as Backfill

METHOD OF MEASUREMENT:

Measurement for payment for Reuse Excavated Material On-Site as Backfill shall be on the basis of actual cubic yards of soil/fill reused on-site as backfill, as measured and determined by the Engineer, to a maximum volume calculated based on the pay limits of the excavation as indicated elsewhere in the Construction Documents. For record keeping purposes soil/fill that is reused on-site as backfill, shall be transported to and from the staging area under a Material Shipping Record.

Material reused as backfill outside of the pay limits indicated elsewhere in the Construction Documents shall be done at the Contractor's expense, at no additional cost to the Owner.

It is the intent of this item to compensate the Contractor for material which is temporarily removed from the area of excavation and staged pending reuse. If the material is immediately reused at the area of excavation or elsewhere on site, no payment will be made. This cost shall be included in the Contractor's Bid Prices for other relevant items of work.

BASIS OF PAYMENT / INCLUSIONS:

RECONSTRUCTION OF BLANCHARD ROAD

Payment for Reuse Excavated Material On-site as Backfill shall be based on the cubic yard price complete for this item in the proposal. Under the cubic yard price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for Reusing Excavated Material On-site as Backfill. The work includes, but is not limited to: Handle, load, and transport to and from the soil/fill staging area excavated materials which are determined to be geotechnically suitable for reuse as backfill on site and consistent with surrounding conditions at the point of reuse.

EXCLUSIONS:

The following items are not included for payment under this item: excavation; all work associated with a staging area; analytical testing of the material; placing the material as backfill; and compaction and compaction testing.

RECONSTRUCTION OF BLANCHARD ROAD

ITEM 126.10 DISPOSAL OF SOIL – BACKGROUND SOILS (CLASS A-1)**TON****GENERAL:**

Background Conditions (Class A-1): Background is defined in 310 CMR 40.0006 as those levels of oil and hazardous material that would exist in the absence of the disposal site of concern which are either:

- a. ubiquitous and consistently present in the environment at and in the vicinity of the disposal site of concern; and attributable to geologic or ecologic conditions, or atmospheric deposition of industrial process or engine emissions;
- b. attributable to coal ash or wood ash associated with fill material;
- c. releases to groundwater from a public water supply system;
- d. petroleum residues that are incidental to the normal operation of motor vehicles.

Any soil or fill material which meets the regulatory definition of "background" as defined in 310 CMR 40.0006 may be reused as common fill/ordinary borrow.

For record keeping purposes soil/fill that meet the definition of background, shall be transported under a Material Shipping Record.

METHOD OF MEASUREMENT:

Measurement for Payment for Disposal of Soil – Background Soils (Class A-1) shall be on the basis of tons of waste actually disposed, as measured at the disposal facility by certified scale, and documented on the return manifest or certified weight slip and accompanied by the appropriate Material Shipping Record. Measurement shall be verified as described above and the lesser tonnage, as further described above, paid for. Material excavated outside of the pay limits indicated elsewhere in the Contract Documents and not specifically directed by the Engineer, shall be done at the Contractor's expense, at no additional cost to the Owner.

COMPENSATION**BASIS OF PAYMENT / INCLUSIONS:**

Under the per ton price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for Disposal of Soil – Background Soils (Class A-1). The work includes, but is not limited to; handle, load, transport, and dispose all excess soil/fill which is suitable for general reuse as fill.

EXCLUSIONS:

The following items are not included for payment under this item; transportation and disposal of soil and fill material which does not meet the definition of soil of this classification; reuse of soil and fill material on site as backfill; furnishing and installing replacement imported backfill; staging; disposal of bituminous concrete; and disposal of construction debris.

RECONSTRUCTION OF BLANCHARD ROAD

ITEM 126.20**DISPOSAL OF SOIL – IMPACTED <RCS-1 (CLASS A-2)****TON****GENERAL:**

Impacted <RCS-1 Soil/Fill (Class A-2): Any soil or fill material which contains oil or hazardous materials (OHM) at concentrations greater than background levels but less than release notification thresholds established by 310 CMR 40.0300 and 40.1600. Impacted soil may be reused at the *area of excavation* or as fill provided it is reused in an area of equal or greater contamination.

For record keeping purposes soil/fill that meets the definition of impacted soil/fill and does not meet the definition of contaminated soil/fill or remediation waste, shall be transported under a Material Shipping Record.

METHOD OF MEASUREMENT:

Measurement for Payment for Disposal of Soil – Impacted <RCS (Class A-2) shall be on the basis of tons of waste actually disposed, as measured at the disposal facility by certified scale, and documented on the return manifest or certified weight slip and accompanied by the appropriate Material Shipping Record. Measurement shall be verified as described above and the lesser tonnage, as further described above, paid for. Material excavated outside of the pay limits indicated elsewhere in the Contract Documents and not specifically directed by the Engineer shall be done at the Contractor's expense, at no additional cost to the Owner.

COMPENSATION**BASIS OF PAYMENT / INCLUSIONS:**

Under the per ton price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for Disposal of Soil – Daily Cover Unlined Landfill (Class B-1). The work includes, but is not limited to; handle, load, transport, and dispose at an appropriately permitted, solid waste facility, all soil/fill which is unsuitable for on-site reuse and is defined as a non-hazardous solid waste suitable for reuse as daily cover at an unlined Massachusetts Landfill; placing, grading and compacting the material at the disposal site as specified; and all fees, permits, and taxes.

EXCLUSIONS:

The following items are not included for payment under this item; transportation and disposal of soil and fill material which does not meet the definition of soil of this classification; reuse of soil and fill material on site as backfill; furnishing and installing replacement imported backfill; staging; disposal of bituminous concrete; and disposal of construction debris.

RECONSTRUCTION OF BLANCHARD ROAD

ITEM 126.30

**DISPOSAL OF SOIL – DAILY COVER UNLINED
LANDFILL (CLASS B-1)**

TON

GENERAL:

Contaminated Soil/Fill (Class B): Any soil or fill material which contains oil or hazardous materials at concentrations equal to or greater than a release notification threshold established by 310 CMR 40.0300 and 40.1600, except where the presence of the material is consistent with the regulatory definition of "background" as defined in 310 CMR 40.0006.

Class B-1: Soil and Fill that meet all applicable criteria (i.e., COMM 97-001 and/or facility-specific permit requirements) for reuse as daily cover, intermediate cover, or pre-cap contouring material at in-state unlined landfills.

METHOD OF MEASUREMENT:

Measurement for Payment for Disposal of Soil – Daily Cover Unlined Landfill (Class B-1) shall be on the basis of tons of waste actually disposed, as measured at the disposal facility by certified scale, and documented on the return manifest or certified weight slip and accompanied by the appropriate DEP BWSC Bill of Lading form. Measurement shall be verified as described above and the lesser tonnage, as further described above, paid for. Material excavated outside of the pay limits indicated elsewhere in the Contract Documents and not specifically directed by the Engineer shall be done at the Contractor's expense, at no additional cost to the Owner.

COMPENSATION

BASIS OF PAYMENT / INCLUSIONS:

Under the per ton price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for Disposal of Soil – Daily Cover Unlined Landfill (Class B-1). The work includes, but is not limited to; handle, load, transport, and dispose at an appropriately permitted, solid waste facility, all soil/fill which is unsuitable for on-site reuse and is defined as a non-hazardous solid waste suitable for reuse as daily cover at an unlined Massachusetts Landfill; placing, grading and compacting the material at the disposal site as specified; and all fees, permits, and taxes.

EXCLUSIONS:

The following items are not included for payment under this item; transportation and disposal of soil and fill material which does not meet the definition of soil of this classification; reuse of soil and fill material on site as backfill; furnishing and installing replacement imported backfill; staging; disposal of bituminous concrete; and disposal of construction debris.

RECONSTRUCTION OF BLANCHARD ROAD

ITEM 126.40

**DISPOSAL OF SOIL – DAILY COVER LINED
LANDFILL (CLASS B-2)**

TON

GENERAL:

Contaminated Soil/Fill (Class B): Any soil or fill material which contains oil or hazardous materials at concentrations equal to or greater than a release notification threshold established by 310 CMR 40.0300 and 40.1600, except where the presence of the material is consistent with the regulatory definition of "background" as defined in 310 CMR 40.0006.

Class B-2: Soil and Fill that meet all applicable criteria (i.e., COMM 97-001 and/or facility-specific permit requirements) for reuse as daily cover, intermediate cover, or pre-cap contouring material at in-state lined landfills.

COMPENSATION

METHOD OF MEASUREMENT:

Measurement for Payment for Disposal of Soil – Daily Cover Lined Landfill (Class B-2) shall be on the basis of tons of waste actually disposed, as measured at the disposal facility by certified scale, and documented on the return manifest or certified weight slip and accompanied by the appropriate DEP BWSC Bill of Lading form. Measurement shall be verified as described above and the lesser tonnage, as further described above, paid for. Material excavated outside of the pay limits indicated elsewhere in the Contract Documents and not specifically directed by the Engineer shall be done at the Contractor's expense, at no additional cost to the Owner.

BASIS OF PAYMENT / INCLUSIONS:

Under the per ton price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for Disposal of Soil – Daily Cover Lined Landfill (Class B-2). The work includes, but is not limited to; handle, load, transport, and dispose at an appropriately permitted, solid waste facility, all soil/fill which is unsuitable for on-site reuse or disposal at one of the lesser unit price options and is defined as a non-hazardous solid waste suitable for reuse as daily cover at a lined Massachusetts Landfill; placing, grading and compacting the material at the disposal facility as specified; and all fees, permits, and taxes.

EXCLUSIONS:

The following items are not included for payment under this item; transportation and disposal of soil and fill material which does not meet the definition of soil of this classification.; reuse of soil and fill material on site as backfill; furnishing and installing replacement imported backfill; staging; disposal of bituminous concrete; and disposal of construction debris.

RECONSTRUCTION OF BLANCHARD ROAD

**ITEM 126.50 DISPOSAL OF SOIL – NON-HAZARDOUS SOLID WASTE TON
(CLASS B-3, B-4, B-5 AND B-6))**

GENERAL:

Probable Class B-3 through B-6 Material: Soil/Fill suspected of having high levels of contamination (i.e., equal to or greater than the applicable reportable concentration but suitable for disposal at a licensed non-hazardous solid waste facility). Soil with jar headspace results greater than 100 ppm or soil containing significant visual (i.e. >10% foreign material by volume) or strong olfactory evidence of contaminants. This material is to be sampled separately due to the potential of exceeding DEP's guidelines for reuse as daily cover at a landfill and requiring either recycling at an asphalt batch plant or as solid waste at an appropriately permitted disposal facility. The analytical results shall determine the final reuse/disposal option.

COMPENSATION

METHOD OF MEASUREMENT:

Measurement for Payment for Disposal of Soil – Non-Hazardous Solid Waste shall be on the basis of tons of waste actually disposed, as measured at the disposal facility by certified scale, and documented on the return manifest or certified weight slip and accompanied by the appropriate DEP BWSC Bill of Lading form. Measurement shall be verified as described above and the lesser tonnage, as further described above, paid for. Material excavated outside of the pay limits indicated elsewhere in the Contract Documents and not specifically directed by the Engineer shall be done at the Contractor's expense, at no additional cost to the Owner.

BASIS OF PAYMENT / INCLUSIONS:

The work includes, but is not limited to; handle, load, transport, and recycle or dispose soil/fill at an appropriately permitted, solid waste facility, all contaminated soil/fill, which is not hazardous waste but is unsuitable for other non-hazardous recycling and disposal options (Class B-1 or B-2); and all fees, permits, and taxes.

EXCLUSIONS:

The following items are not included for payment under this item; transportation and disposal of soil and fill material which does not meet the definition of soil of this classification; reuse of soil and fill material on site as backfill; furnishing and installing replacement imported backfill; staging; disposal of bituminous concrete; and disposal of construction debris.

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ITEM 126.90 DISPOSAL OF SOIL – RCRA HAZARDOUS WASTE TON
(CLASS C-1 AND C-2)

GENERAL:

Probable Class C Material: Soil/Fill suspected of being a hazardous waste as defined by the Resource Conservation and Recovery Act or the Toxic Substances and Control Act. Material with visually gross levels of contamination, including free product or containing evidence of hazardous constituents including but not limited to indications of tannery wastes or coal tar or any other waste which may contain elevated levels of pollutants, shall be placed in this category. This material is to be sampled separately due to the potential of exceeding RCRA or TSCA hazardous waste thresholds requiring disposal at an appropriately permitted hazardous waste facility.

COMPENSATION

METHOD OF MEASUREMENT:

Measurement for Payment for Disposal of RCRA Hazardous Waste (Class C-1 and C-2) shall be on the basis of tons of waste actually disposed, as measured at the disposal facility by certified scale, and documented on the return manifest or certified weight slip and accompanied by the appropriate DEP BWSC Bill of Lading form. Measurement shall be verified as described above and the lesser tonnage, as further described above, paid for. Material excavated outside of the pay limits indicated elsewhere in the Contract Documents and not specifically directed by the Engineer shall be done at the Contractor's expense, at no additional cost to the Owner.

BASIS OF PAYMENT / INCLUSIONS:

Payment for Disposal of RCRA Hazardous Waste (Class C-1 and C-2) shall be based on the per ton price complete for this item in the proposal. Under the per ton price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for Disposal of RCRA Hazardous Waste (Class C-1 and C-2). The work includes, but is not limited to; handle, load, transport and dispose at an approved RCRA-permitted hazardous waste facility all soil and fill determined through testing to be hazardous waste; and all fees, permits, and taxes.

EXCLUSIONS:

The following items are not included for payment under this item; transportation and disposal of soil and fill material which does not meet the definition of soil of this classification; reuse of soil and fill material on site as backfill; furnishing and installing replacement imported backfill; staging; disposal of bituminous concrete; and disposal of construction debris.

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ITEM 126.11**DISPOSAL OF ASBESTOS WASTE****TON****GENERAL**

Probable Asbestos Containing Material: Soil/Fill suspected of containing asbestos as evidenced by the presence of suspect asbestos-containing building debris such as cementitious piping, vinyl floor tiling, roofing paper or paper-like insulation materials or any other suspect asbestos containing material observed in the soil/fill.

COMPENSATION**METHOD OF MEASUREMENT:**

Measurement for Payment for Disposal of Asbestos Waste shall be on the basis of tons of waste actually disposed, as measured at the disposal facility by certified scale, and documented on the return manifest or certified weight slip and accompanied by the appropriate DEP BWSC Bill of Lading form.

Measurement shall be verified as described above and the lesser tonnage, as further described above, paid for. Material excavated outside of the pay limits indicated elsewhere in the Contract Documents and not specifically directed by the Engineer shall be done at the Contractor's expense, at no additional cost to the Owner.

BASIS OF PAYMENT / INCLUSIONS:

Payment for Disposal of Asbestos Waste shall be based on the per ton price complete for this item in the proposal. Under the per ton price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for Disposal of Asbestos Waste. The work includes, but is not limited to; handle, load, haul, and dispose all soil and fill material defined as asbestos-containing waste; procuring all health and safety items; compliance with local ordinances and preparing appropriate waste manifests; and all fees, permits, and taxes.

EXCLUSIONS:

The following items are not included for payment under this item; transportation and disposal of soil and fill material which does not meet the definition of soil of this classification; reuse of soil and fill material on site as backfill; furnishing and installing replacement imported backfill; staging; disposal of bituminous concrete; disposal of construction debris; segregate, handle, stage, test, and characterize all soil and fill material suspected of containing asbestos-containing materials; protecting the excavation from accidental entry; and controlling windblown litter and the spread of airborne contaminants.

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ITEM 129.02**ASPHALT PAVEMENT EXCAVATION
BY COLD-PLANER (0-3" DEPTH)****SQUARE YARD**

Work to be done under this item shall conform to the relevant provisions of Section 120 of the Standard Specifications, and in particular Section 120.66, and the following:

This work consists of removing asphalt pavement to varied depths by cold planer in designated areas. Prior to cold-planing, the Contractor shall discuss the proposed final grades and drainage concerns with the Engineer. It shall be the Contractor's responsibility to perform cold-planing in such a manner as to restore the proper roadway grades and insure proper drainage.

The cold planer shall be equipped with an elevating device capable of loading planed material directly into dump trucks while operative. It shall have all necessary safety devices such as reflectors, headlights, taillights, flashing lights, and back up signals so as to operate safely in traffic both day and/or night.

The cold planer shall be designed and built for planing flexible pavements and possess the ability to plane cement concrete patches when encountered in asphalt pavement. It shall be self-propelled and have the means for planing without tearing or gouging the underlying surface. Variable lacing patterns shall be provided to permit a rough grooved or smooth surface as directed.

A three-inch cut to predetermined grade, or any specified lesser depth, shall be required to be made in a single pass. As directed by the Engineer, the Contractor shall cold plane areas which were insufficiently cold planed during the first pass at no additional cost to the City.

The minimum width of pavement planed in each pass shall be six feet, except in areas to be trimmed and edged. The machine shall be adjustable as to crown and depth and meet the standards set by the Air Quality Act for noise and air pollution.

The milled or planed surface shall conform generally to the grade and cross slope required. The surface shall not be torn, gouged, shoved, broken or excessively grooved. It shall be free of imperfections in workmanship that prevent resurfacing after this operation. The surface texture shall be as specified by the Engineer and excess material shall be removed so that the surface is acceptable to traffic if required.

The Contractor shall perform work in such a manner to minimize dust and utilize dust control techniques when necessary or as directed by the Engineer.

The City reserves the option to direct the Contractor to truck the milled material to another site in the City for use as base material.

See Section "Supplemental Conditions" for requirements related to marking raised castings.

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Compensation

Asphalt Pavement Excavation by Cold Planer will be measured for payment as specified in Section 120 of the Standard Specifications.

Payment for work under these items will be at the contract unit price per square yard and shall include full compensation for labor, equipment, tools, disposal of all milled materials, dust control, and any other incidentals necessary for the satisfactory completion of this work as specified.

ITEM 141.11

TEST PITS

CUBIC YARD

Work to be done under this item shall conform to the relevant provisions of Section 140 of the Standard Specifications and to the following:

The work of this item consists of the excavation and backfill of test pits to establish the location of existing underground utilities, or any other structures for which the exact location is required, as directed by the Engineer or as requested by the Contractor and approved by the Engineer.

Test pits shall be excavated and backfilled using special care, including hand excavation to avoid damage to any underground utilities or structures. The Contractor shall cooperate with utility owners/operators to avoid damage to their facilities, and shall erect suitable supports, shoring, or other means of protection.

Test pits shall be covered immediately after their purpose has been accomplished. If re-excavation of the affected area is probable, and with the approval of the Engineer, test pits may be covered with steel plates. In all other cases test pits shall be immediately backfilled with suitable excavated material, or gravel borrow, and patched with asphalt pavement. Where the Engineer directs, backfill and compaction shall be performed in 6-inch lifts due to the presence of utilities or other obstructions.

Technical requirements for excavation specified under Item 120.10 shall also apply as appropriate.

Compensation

Test Pits will be measured for payment as specified under "Class A Trench Excavation" in Section 140 of the Standard Specifications.

Payment for work under this item will be at the contract unit price per cubic yard and shall include full compensation for labor, equipment, tools, supplies and any other incidentals necessary for the satisfactory completion of excavation (including removal of pavement), dewatering, temporary earth support, backfilling, disposal of construction debris (concrete, asphalt, bricks, etc.), excavation and utility support, protection of existing utilities, and placement

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and removal of steel plates.

If required, gravel borrow will be paid for under Item 151.00; and hot mix asphalt patching under Item 472.00.

NOTES ON EXCLUSIONS: Disposal of excavated soil is not included for payment under this item and shall be paid for separately.

ITEM 142.00	CLASS B TRENCH EXCAVATION	CUBIC YARD
ITEM 144.00	CLASS B ROCK EXCAVATION	CUBIC YARD

Work to be done under these items shall conform to the relevant provisions of Section 140 of the Standard Specifications and to the following:

Class B Trench Excavation shall include removal of all materials, except Class B Rock Excavation, encountered in the construction of drainage pipe greater than 5-foot depth and encountered in the construction of water pipe greater than the 6-foot depth.

Technical requirements for excavation specified under Item 120.10 shall also apply as appropriate.

Compensation

Class B Trench and Class B Rock Excavation will be measured for payment as specified in Section 140 of the Standard Specifications, and the following:

Class B Trench Excavation shall only apply to trench depths (measured from original ground to undisturbed subgrade) greater than 5 feet for drainage pipe, and greater than 6 feet for water pipe. Excavation to depths less than the above shall be included in the appropriate drainage pipe or water item.

Payment for Items 142.00 and 144.00 will be at the price bid per cubic yard complete, which price shall constitute full compensation for all labor, equipment, tools, supplies and other work necessary to complete the satisfactory excavation, backfill, removal of all materials encountered and disposal of construction debris (asphalt, concrete, bricks, etc.).

NOTES ON EXCLUSIONS: Disposal of excavated soil is not included for payment under this item and shall be paid for separately.

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ITEM 145.00	DRAINAGE STRUCTURE ABANDONED	EACH
ITEM 146.00	DRAINAGE STRUCTURE REMOVED	EACH

Work to be done under these items shall conform to the relevant provisions of Section 140 of the Standard Specifications and to the following:

Payment for Item 146.00 shall include plugging and protecting the existing outlet pipes during removal and replacement of the structures and disposal of construction debris (concrete, bricks, asphalt, structures, etc.).

NOTES ON EXCLUSIONS: Disposal of excavated soil is not included for payment under this item and shall be paid for separately.

ITEM 151.00	GRAVEL BORROW	CUBIC YARD
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Work to be done under this item shall conform to the relevant provisions of Section 401 of the Standard Specifications and to the following:

This work shall consist of furnishing, placing, fine grading, and compacting Gravel Borrow for utility trench backfill; roadway subbase; for sidewalk base and subbase; for subsoil in proposed planting areas where pavement or other unsuitable materials have been removed; and as shown on the Drawings and details and as directed by the Engineer.

The Gravel Borrow shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings, and deleterious materials, and shall conform to Standard Specifications M1.03.0., Type b.

The gravel shall be compacted to ninety-five percent (95%) of the maximum dry density at optimum moisture content as determined by the AASHTO Standard Method of Test T99 Method C; except where used as subsoil for lawn areas, where compaction shall be to sixty-five percent (65%).

The Contractor shall perform work in such a manner to minimize dust and utilize dust control techniques when necessary or as directed by the Engineer.

Compensation

Gravel Borrow will be measured for payment as specified in Section 150 of the Standard Specifications.

Payment for work under this item will be at the contract unit price per cubic yard and shall include full compensation for material in-place graded and compacted, dust control, and any incidentals necessary for the satisfactory completion of this work as specified.

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ITEM 156.20**CRUSHED STONE****CUBIC YARD**

Work to be done under this item shall consist of furnishing, placing, and compacting crushed stone at locations as directed by the Engineer.

Crushed stone shall meet the requirements specified in Subsections M2.01.4 (3/4") and M2.01.6 (3/8"), as specified herein for each particular use, of the Standard Specifications. Crushed stone for curb foundation (if applicable) or pipe bedding will not be measured under this Item, and will be considered incidental to the curb or pipe item to which it applies.

Compensation

Crushed stone will be measured by the cubic yard, complete in place.

Payment for work under this item will be at the contract unit price per cubic yard and shall include full compensation for material in-place and any incidentals necessary for the satisfactory completion of this work as specified.

ITEM 170.00**FINE GRADING AND COMPACTING
(SUBGRADE AREAS)****SQUARE YARD**

Work to be done under this item shall conform to the relevant provisions of Section 170 of the Standard Specifications and to the following:

Compensation

Grading and compaction of the subgrade will be measured for payment as specified in Section 170 of the Standard Specifications.

Payment for work under this item will be at the contract unit price per square yard and will be as specified in Section 170 of the Standard Specifications, and in accordance with the following:

This item will be measured for payment only when associated with full-depth roadway construction.

Grading and compaction for sidewalk areas and all other purposes will be included in the payment for the relevant item.

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ITEM 201.00	CATCH BASIN (PRE-CAST) 4-FOOT SUMP	EACH
ITEM 201.05	CATCH BASIN (PRE-CAST) 6-FOOT SUMP	EACH

Work to be done under these items shall conform to the relevant provisions of Section 201 of the Standard Specifications and to the following:

MATERIALS

Catch Basins:

Precast concrete catch basins shall be designed for a minimum of H-20 loading, and shall conform to the dimensions shown on the Drawings. Catch basin sump depth shall be between 4 and 6 feet as directed by the Engineer, with an outlet opening of 12 inches. Catch basins shall conform to ASTM C478 and shall be constructed with bell and spigot or tongue and groove joints.

All catch basins shall be provided with cast iron traps (see Item 225.52.)

Pipe connections into pre-cast sections shall be made with manhole seals that are cast-in at time of manufacture. Seals shall be Interpace "New-Lok Joint Flexible Sleeve"; L&L "A-Lok Manhole Sleeve"; Pre-Seal Basket Corp. "Press-Wedge II"; or approved equivalent product.

Connections to existing pipe in cast-in-place sections shall be sealed with "Kor N Seal" boot, or approved equivalent product.

CONSTRUCTION METHODS

The Contractor shall excavate to the elevation of the bottom of the structure (see Items 120.10 and 142.00 for technical requirements). The subgrade material shall be compacted prior to installation of the structure. If the subgrade material is unsuitable, it shall be replaced, as directed by the Engineer, with 3/8" crushed stone (M2.01.6) and paid for under Item 156.2.

After installation of the structure, the Contractor shall backfill with suitable material up to 5" below the finished grade in overlay areas; and 18" below the finished grade in full-depth pavement areas.

A minimum of 3 courses of bricks (12" height maximum) shall be installed for purposes of future adjustment between the pre-cast top and the frame and grate and cover of all structures.

Hot mix asphalt patching shall be performed as specified under Item 472.00.

Castings shall be set, as directed by the Engineer, so that final grade of the catch basin grate is

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flush with the top course of asphalt pavement. Material around the structure shall be compacted and high early strength concrete collars shall be placed around the castings to an elevation 2" below finished grade in overlay areas and 3 1/2" below finished grade in full depth reconstruction areas.

High early strength concrete shall be 3,500 PSI at 28 day test, 3/4" aggregate, 5% air entrained, and have a maximum 4" slump. Concrete collars shall be of the dimensions shown on the Drawings.

Should the Engineer determine that the castings cannot be set to final grade upon installation, then they shall be set to the required temporary grade, without the concrete collar. Final adjustment to grade, including installation of concrete collar, shall then be performed and paid for under Item 220.00.

COMPENSATION

Drainage structures will be measured for payment as specified in Section 201 of the Standard Specifications, except "standard unit" depth of catch basins with 6-foot sump will be 10.5 feet; and "standard unit" depth of catch basins with 4-foot sump will be 8.5 feet.

Payment for these items will be at the contract unit price for each and shall include full compensation for excavation, disposal of construction debris (asphalt, concrete, bricks, etc.), steel plating, protection of existing utilities and repair of those damaged during construction, tree protection, materials, installation, concrete collar, break-in to existing pipe; and any other incidentals necessary for the satisfactory completion of this work as specified. Where structures are constructed over existing pipes, payment shall also include cast-in-place base, and by-pass pumping as needed.

The frame and grate will be paid for under Item 222. Catch basin hood will be paid for under Item 225.52. The 12" PVC connection from the catch basin to the storm drain will be paid for under Item 234.20. Hot mix asphalt for patching will be paid for under Item 472.00.

NOTES ON EXCLUSIONS: Disposal of excavated soil is not included for payment under this item and shall be paid for separately.

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ITEM 220.00	SEWER OR DRAINAGE STRUCTURE ADJUSTED	EACH
ITEM 220.20	SEWER OR DRAINAGE STRUCTURE REMODELED	EACH

Work to be done under this item shall conform to the relevant provisions of Sections 201 and 220 of the Standard Specifications and to the following:

Castings shall be set, as directed by the Engineer, so that final grade of the manhole cover or catch basin grate is flush with the final course of asphalt pavement. Material around the structure shall be compacted and high early strength concrete collars shall be placed around the castings to an elevation 2" below finished grade in overlay areas and 4" below finished grade in full depth reconstruction areas. High early strength concrete shall be 3,500 PSI at 28 day test, 3/4 aggregate, 5% air entrained, and have a maximum 4" slump.

Existing frames and grates/covers that are deemed unfit by the Engineer for continued use shall be replaced by the Contractor and paid for under Item 221.00 or 222.00.

The Contractor shall be held responsible for the protection of the castings. Any frames, grates, or covers damaged or lost in any manner during the progress of the construction shall be replaced with new castings as specified in Items 221.00 and 222.00 at the Contractor's expense.

See Section 825 "Supplemental Conditions" for requirements related to marking raised utility castings.

Compensation

Adjustment and remodeling of sewer or drainage structures will be measured for payment as specified in Section 220 of the Standard Specifications.

Payment for this item will be at the contract unit price for each and shall include full compensation for excavation, compaction, disposal of construction debris (concrete, asphalt, bricks, etc.), high early strength concrete, rodent control and any other incidentals necessary for the satisfactory completion of this work as specified.

ITEM 220.30**DRAINAGE STRUCTURE REBUILT****VERTICAL FOOT**

Work to be done under this item shall conform to the relevant provisions of Section 201 and 220 of the Standard Specifications and to the following:

The drainage structure shall be rebuilt, as directed by the Engineer, with brick and/or block masonry up to three courses below the bottom of the casting. The last three courses below the casting shall be brick. The Contractor shall reset the casting on the final course of brick to allow for proper final grade as directed by the Engineer. Material around the structure shall be compacted and high early strength concrete collars shall be placed around the castings.

Existing frames and grates and/or covers that are deemed unfit by the Engineer for continued use shall be replaced by the Contractor and paid for under Item 221.00 or 222.00.

Compensation

Drainage Structure Rebuilt will be measured for payment as specified in Section 220 of the Standard Specifications.

Payment for this item will be at the contract unit price per vertical foot and shall include full compensation for all materials, labor, excavation, compaction, disposal, rodent control and any other incidentals necessary for the satisfactory completion of this work as specified.

ITEM 221.00**FRAME AND COVER****EACH**

This item shall conform to the relevant provisions of Sections 201 and 220 of Standard Specifications and to the following:

Castings shall be Massachusetts Standard Heavy Duty Type A Sewer Frame and Cover as manufactured by LeBaron Foundry Inc., Neenah Foundry Co., Campbell Foundry Co., or approved equivalent product.

Compensation

Frame and Cover will be measured for payment as specified in Section 220 of the Standard Specifications.

Payment for this item will be at the contract unit price per each and shall include full compensation for the frame and cover in-place and any other incidentals necessary for satisfactory compliance with this specification.

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ITEM 222.00	FRAME AND GRATE	EACH
ITEM 225.52	CATCH BASIN TRAP	EACH

These items shall conform to the relevant provisions of Sections 201 and 220 of the Standard Specifications and to the following:

Catch basin frames shall be as manufactured by E.L. LeBaron Foundry Co., model LK120D for three flange, Neenah Foundry Co., Campbell Foundry Co., or approved equivalent product.

Catch basin grates shall be cascade type, as manufactured by E.L. LeBaron Foundry Co., model L24SG18, Neenah Foundry Co., Campbell Foundry Co., or approved equivalent product.

Catch basin traps shall be installed in all catch basins in paved areas. Traps shall be cast iron and removable. Traps shall be Neenah Type R-3701, or approved equivalent product.

Compensation

Frame and Grate or Trap will be measured for payment as specified in Section 220 of the Standard Specifications.

Payment for these items shall be at the contract unit price per each and shall include full compensation for the frame and grate, and trap, in-place and any other incidentals necessary for satisfactory compliance with this specification.

ITEM 234.20	12" PVC DRAIN PIPE	FOOT
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Work to be done under these items shall include the furnishing and installation of polyvinyl chloride (PVC) pipe for connections from catch basins to existing and proposed drainage structures and pipelines, all as shown on the Drawings and as directed by the Engineer.

MATERIALS

PVC Pipe

PVC pipe and fittings shall conform to ASTM D3034, latest revision, SDR 35 minimum wall thickness, with integral wall bell and spigot joints. The bell shall consist of an integral wall section with a solid cross-section rubber ring, factory assembled. Wyes, tees, saddles, bends and adapters, and any other fittings required shall be provided. The pipe shall be colored green for in-ground identification as sewer/drain pipe.

CONSTRUCTION METHODS

Excavation

The Contractor shall perform all work necessary to excavate and support the trench to allow for

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installation of the pipe (see Items 120.10 and 142.00 for technical requirements).

Pipe Installation

Each pipe shall be handled into its position in the trench and installed in such a manner as not to damage the pipe and so as to protect at all times the jointing surfaces of the pipe. Operations shall at times be conducted so as to prevent damage to existing structures, utilities, and the work in place.

The Contractor shall furnish proper and adequate equipment such as slings, straps, hoists, and other equipment and devices necessary for the safe and suitable lifting, handling, laying, and support of all pipe and appurtenances when it is lifted and placed into position.

All pipe, fittings, and appurtenances shall be carefully inspected by the Contractor for defects before installation and all defective, unsound or damaged pipe, fittings, or other materials, shall be rejected. The Engineer will make such additional inspections as he/she deems necessary, and the Contractor shall furnish all necessary assistance for such inspection. The interior of pipe shall be carefully and thoroughly cleaned of foreign matter before being lowered into the trench, and shall be kept clean during laying operations.

All pipe shall be bedded in 12" of 3/8-inch crushed stone (M2.01.6). Crushed stone shall be compacted in 6" lifts with a vibratory plate-type compactor to at least 90 percent of maximum density as determined by ASTM D1557. The crushed stone bedding material shall be placed in the bottom of the trench and shaped and compacted to give substantial uniform support to the lower half of the full length of pipe. Pipe laying shall proceed upgrade with the spigot ends of the pipe pointing in the direction of flow so that bells are installed upstream or uphill of spigot ends. The pipe shall be laid true to line and grade and in such manner as to form a close concentric joint with the adjoining pipe and to prevent sudden offsets of the flow line.

Pipelines shall be constructed in dry trenches and shall not be laid when the condition of the trench or the weather is unsuitable for such work. At times when work is not in progress, open ends of pipe shall be securely sealed so that no trench water, earth, or other substance will enter the pipe. Pipes shall not be used as conductors for trench drainage during construction.

Diversion and control of storm water flows and de-watering shall be the responsibility of the Contractor. The Contractor shall submit its planned methods for diversion and control to the Engineer for advance review and approval.

The Contractor will also be responsible for road surface drainage/flow at all times within the work zone. This includes taking preventative measures to keep water out of the trench and preventative measure to keep excavated materials out of nearby catch basins.

If during or after construction the City's catch basins within the work zone become partially or completely full of soil and/or debris, it will be the Contractor's responsibility to clean the catch basin and properly dispose of the material at no additional expense to the City.

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Pipe Jointing

Jointing of pipe shall be done by workmen thoroughly skilled in this type of work using the watertight gasket type joints and installed in strict accordance with the printed recommendations of the pipe manufacturer, and as approved. A gasket shall be placed in the groove of the spigot end of each pipe just prior to laying the pipe. After the pipe is aligned in the trench, ready to be joined, all joint surfaces shall be thoroughly cleaned.

Immediately before jointing the pipe together the bell shall be completely covered with a lubricant, as recommended by the pipe manufacturer, then be carefully pushed home into the joint of the previously laid pipe. The position of the gasket and joint shall be carefully inspected to insure that the joint has been properly made, and that the gasket is properly positioned to insure a watertight joint. Joints that have been improperly made shall be taken apart and remade.

It shall be the Contractor's responsibility to install the pipe in a manner that will maintain the gasket in adequate compression and proper position to insure watertight joints conforming to the latest testing requirements.

The installation of pipe, the details of gasket, attachment, and joint formation shall be in accordance with the pipe manufacturer's printed recommendations, and as approved by the Engineer.

Connecting Pipe - to - Pipe

Connecting pipe to pipe shall be performed according to the manufacturers instructions or as directed by the Engineer.

Connecting/Re-Connecting Laterals

Connecting/Re-connecting laterals shall be performed in the following manner or as approved by the Engineer.

Lateral connections shall be made into the top one half of the City's main, between the 1:00 and 3:00 o'clock position or 9:00 and 11:00 o'clock position using a saddle or wye connection. The connection shall be made such that flow from the lateral is compatible with the direction of flow in the main.

Storm drain connections shall be installed at a minimum slope of 1 percent.

For main pipe sizes up to 24 inches in diameter, laterals shall be connected using either flexible saddles or wye fittings. Combination saddle-wye fittings are prohibited. Connections directly into existing pipe without a saddle or full wye fitting are not allowed, unless approved by the Engineer.

For main pipe sizes greater than 24 inches in diameter, laterals shall be connected by saddles, resilient connectors with internal expansion rings, or methods approved by the Engineer. Resilient connectors shall conform to ASTM C923-89.

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Connecting Pipe to New or Existing Structures

Connecting pipe to new or existing structures shall be performed in one of the following manners or as approved by the Engineer:

1. Flexible Pipe to Manhole Connectors- Rubber flexible pipe to manhole connectors shall be manufactured in accordance with ASTM C923. Clamps and bands used to secure the Flexible Rubber Connectors shall be stainless steel Type 304 including screws, wedges and other appurtenances required to provide secure tight connections between the manholes and the pipe. The connectors shall be specifically designed for the pipe material and size to be connected to the structure.

2. Brick & Mortar- Mortar for patching holes in structure walls and at the connections of the pipe to the structure shall conform to Standard Specifications Material Specification M4.02.15. Brick shall conform to ASTM C32. Grade SS.

Backfill

Pipe joints and/or connections shall not be covered in any way until the Engineer has inspected them. Once inspected, the pipe and/or connection shall be completely enveloped with 6 inches of pea stone or crushed stone (i.e. both sides and above the crown of the pipe) conforming to ASTM D 448 prior to trench backfill.

The excavation shall be backfilled with gravel borrow. Backfill shall be placed as follows:

Overlay areas: Backfill up to 5" below the finished grade.

Full-depth areas: Backfill up to 18" below the finished grade.

The trench shall be temporarily or permanently patched as specified under Item 472.00.

COMPENSATION

Drain pipe will be measured for payment as specified in Section 230 of the Standard Specifications.

Payment for pipe items will be at the contract unit price per foot complete in place and shall include all sawcutting of existing pavement, trench earth excavation (including support) for excavation 5 feet or less in depth, disposal of construction debris (asphalt, concrete, brick, etc.) tree protection, steel plating, protection of existing utilities and repair of utilities damaged during construction, dust control, crushed stone bedding and pipe envelope, pipe and fittings, connections to existing pipe and structures, disposal of construction debris and any other incidentals necessary for the satisfactory completion of this work as specified.

Gravel borrow will be paid for under Item 151.00. Trench excavation greater than a depth of 5

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feet will be paid for under Item 142.00. Rock excavation will be paid for under Item 144.00. Hot mix asphalt patching will be paid for under Item 472.00.

NOTES ON EXCLUSIONS: Disposal of excavated soil is not included for payment under this item and shall be paid for separately.

ITEM 357.00 WATER GATE BOX REPLACED IN ROADWAY	EACH
ITEM 358.00 WATER GATE BOX REPLACED IN SIDEWALK	EACH
ITEM 358.10 WATER GATE BOX ADJUSTED WITH ADAPTER	EACH
ITEM 358.20 WATER GATE BOX ADJUSTED	EACH

GENERAL

Work to be done under these items shall consist of adjusting and replacing gate boxes as necessitated by roadway work. All work under these Items shall conform to the applicable requirements of the Cambridge Water Department (CWD), and the Belmont Department of Public Works (BDPW), portions of which are included herein.

The Contractor shall not operate any hydrants, valves, curb stops, or corporations, nor shall they draw any water from the system, without specific approval of CWD or BDPW as appropriate. Only CWD/BDPW personnel will operate hydrants, valves, corporations and curb stops unless otherwise directed by the CWD/BDPW.

DESCRIPTION

The Contractor shall furnish all labor, materials, equipment and incidentals required to reset existing gate boxes to grade, and/or furnish and install new water gate boxes, as directed by the Engineer, prior to roadway or sidewalk paving.

MATERIALS

Gate Boxes: Shall be cast iron and of the telescopic design with two piece construction, a top with a cover and a bottom (5-inch inside diameter; 6-foot length). The top section shall have a top flange to increase the stability of the box to remain at the present height. The lower section of the box shall have a bell shaped bottom designed to enclose the operating nut and stuffing box of the valve without settling. The gate box shall come complete with a cover on which the word "WATER" shall be cast. The cover of the gate box shall be close fitting and substantially dirt tight and flush with the top of the box rim. Cast iron boxes shall be General Foundry "Buffalo" boxes or approved equivalent product.

Gate Box Adapters: Shall be Le Baron LSA 20 5 1/2" x 6 1/4" with cover. (Gate box adapters supplied by the City, if available, shall be installed as incidental to Items 460.00 and 472.00.)

CONSTRUCTION METHODS

RECONSTRUCTION OF BLANCHARD ROAD

General Requirements

All construction shall conform to the relevant provisions of Section 300 of the Standard Specifications, the American Water Works Association standards, the detail drawings included in the Specifications, and the requirements of the CWD/BDPW as appropriate.

Adjustment/Replacement of Gate Boxes

The gate box shall be set, as directed by the Engineer, so that final grade of the cover is flush with the final course of asphalt pavement or sidewalk as applicable. Material around the structure shall be compacted and high early strength concrete collars shall be placed around the castings to an elevation 2" below finished grade in overlay areas and 4" below finished grade in full depth areas. High early strength concrete shall be 3,500 PSI at 28 day test, 3/4 aggregate, 5% air entrained, and have a maximum 4" slump.

Should the Engineer determine that the gate box cannot be set to final grade upon installation, then it shall be set to the required temporary grade, without the concrete collar. Final adjustment to grade, including installation of concrete collar, shall then be performed and paid for separately.

Where existing gate boxes are not suitable to be re-set or adjusted, the Contractor shall furnish and install a water gate box adapter prior to roadway paving.

The excavation shall be backfilled with gravel borrow up to 5 1/2" below the finished grade in overlay areas; 18" below the finished grade in full-depth pavement areas and 4" or 6" below the finished grade in sidewalk or landscape areas, as appropriate.

See Section 825 "Supplemental Conditions" for requirements related to marking raised utility castings.

COMPENSATION

Adjustment/Replacement of Gate Boxes

Water gate boxes replaced in roadway or sidewalk; and adjustment of water gate boxes with or without adapters; will be measured by the unit each, complete in place.

Payment for work under Items 357.00 and 358.00 shall be at the contract unit price each and shall include full compensation for excavation, backfill, cleaning, furnishing all labor, tools, equipment, materials, water gate boxes, high early strength collars, disposal of construction debris and other incidentals necessary for the satisfactory completion of this work as specified.

Payment for work under Items 358.10 and 358.20 shall be at the contract unit price each and shall include full compensation for the gate box adapter and installation, resetting gate boxes to final grade and any other incidentals necessary for the satisfactory completion of this work as specified.

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ITEM 303.06	6-INCH DUCTILE IRON WATER PIPE (RES. JT)	FOOT
ITEM 303.16	16-INCH DUCTILE IRON WATER PIPE (RES. JT)	FOOT
ITEM 350.06	6-INCH GATE AND GATE BOX	EACH
ITEM 356.16	16-INCH BUTTERFLY VALVE AND BOX	EACH
ITEM 376.20	REMOVE AND RESET HYDRANT	EACH

GENERAL

Work to be done under these items shall consist of installing ductile iron water main, and relocating hydrants as shown on the Drawings and as directed by the Engineer. All work under this Item shall conform to the applicable requirements of the Cambridge Water Department (CWD) and Belmont Department of Public Works (BDPW), portions of which are included herein.

The Contractor shall not operate any hydrants, valves, curb stops, or corporations, nor shall they draw any water from the system, without specific approval of CWD or BDPW as appropriate. Only CWD/BDPW personnel will operate hydrants, valves, corporations and curb stops unless otherwise directed by the CWD/BDPW.

DESCRIPTION

The Contractor shall furnish all labor, materials, equipment and incidentals required to install new water main and move existing hydrants to new locations as shown on the Drawings and as directed by the Engineer. The work at hydrants will include extending the existing lateral; or abandoning the existing hydrant lateral on the hydrant side of the existing gate valve, or on the sidewalk side of the new curblin, and providing a new lateral; and removing, and reconnecting the hydrant at the new location.

MATERIALS

Pipe: Pipe shall be Class 52 ductile iron cement lined and tar coated, lining shall be a minimum of one eighth (1/8") in thickness. All pipe shall be manufactured to meet AWWA standards. Push on pipe joints unless specified. Standard gaskets shall be supplied. Approved manufactures are U.S pipe and Foundry Company, and Griffin Pipe Company. All others must be approved by CWD/BDPW.

Pipe Joints: Pipe shall be restrained joint type for the entire length of the main or branch lateral. Method of restraint shall be either an interlocking type or mechanical joint type. Mechanical joint restraint shall be incorporated into the design of the follower gland. The restraining mechanism shall consist of individually actuated wedges that increase their resistance to pull-out as pressure of external forces increase. The device shall be capable of full mechanical joint deflection during assembly and the flexibility of the joint shall be maintained after burial. The joint restraint ring

RECONSTRUCTION OF BLANCHARD ROAD

and its wedging components shall be made of grade 60A2-10 ductile iron conforming to ASTM A536-84. The wedges shall be ductile iron heat treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell conforming to ANSI/AWWA C111/A21.1 and ANSI/AWWA C153/A21.3 of the latest revision. Torque limiting twist off nuts shall be used to insure proper actuation of the restraining wedges. Joint shall have a rated work pressure of 350 psi. The joint restraint devices shall be listed by Underwriters Laboratories and be approved by Factory Mutual. The restraint shall be the Series 1100 MEGALUG restraint as produced by EBAA Iron, Inc., or approved equivalent product.

Pipe fittings: Shall be ductile iron, compact type for sizes 4"-12, cement lined, tar-coated, restrained mechanical joint, and rated for 350 psi working pressure. All nuts and bolts shall be of a type equal to ductile iron of KOR-10 steel T-bolts and nuts.

Couplings: Shall be Smith Blair, Style 441; Dresser, Style 153; Romac, Style 501; or approved equivalent product. Couplings shall be provided with plain, Grade 27, rubber gaskets and with black steel, track-head bolts and nuts.

Gate Valves: Shall be resilient seated and shall meet the requirements of AWWA C-509. Valves shall be rated for 200 psi minimum working pressure. Valves shall be iron body, bronze mounted, resilient seated, non-rising stem type fitted with "O"ring seals. The operating nut shall be 2-inches square. Bolts on the bonnet and stuffing box shall be stainless steel (A316). Valves shall have mechanical joint ends and shall be equal to ANSI/AWWA C11/A21.11. Valves shall open right (clockwise). Extensions shall be provided for all gate valves where depth exceeds 6 feet to the top of the operating nut.

Butterfly Valves: Butterfly valves (16 inch and larger) for buried service shall conform to AWWA C504, except as hereinafter provided. Butterfly valves shall be rated for class 150b and both valve operators shall be especially designed for services buried in ground and be totally enclosed type. The unit shall be permanently lubricated with grease or oil. A standard AWWA 2-inch square operating nut shall be provided on the input shaft. Valves shall open to the right (clockwise)

Gate Boxes: See above under "Adjustment/Replacement of Gate Boxes".

Anchoring Tees: New hydrant tees, if required, shall be anchor type. The branch shall have a plain end with integral gland and rotating mechanical joint restraints (see above).

CONSTRUCTION METHODS

RECONSTRUCTION OF BLANCHARD ROAD

General Requirements

All construction shall conform to the relevant provisions of Section 300 of the Standard Specifications, the American Water Works Association standards, the detail drawings included in the Specifications, and the requirements of CWD/BDPW as appropriate.

See Items 120.10 and 142.00 for technical requirements related to excavation.

Minimum depth of bury shall be 5 feet for all water lines, unless approved by CWD/BDPW.

Relocation of Hydrants

Work shall be closely coordinated with the Cambridge Water Department (CWD) and Belmont Department of Public Works (BDPW). The Cambridge or Belmont Fire Departments (as appropriate) shall be notified prior to taking an existing hydrant out of service. CWD/BDPW and Cambridge or Belmont Fire Departments will have final approval of new hydrant locations.

Hydrants and new laterals shall have at least the same depth of cover as the existing lateral (minimum 5 feet) and shall be bedded on a firm foundation. A drainage pipe 2-feet 6-inches in diameter shall be installed at the new hydrant location, filled with screened gravel and satisfactorily compacted. During backfilling, additional screened gravel shall be brought up around and 6-inches over the drain port prior to placement of backfill.

Each hydrant shall be set in true vertical alignment and shall be properly braced. The hydrant shall be tied to the pipe with suitable rods or clamps, galvanized, painted or otherwise rustproof treated. Concrete thrust blocks shall be placed between the back of the hydrant inlet and undisturbed soil at the end of the trench. Felt roofing paper shall be placed around the hydrant elbow before placing concrete. Care shall be taken to insure that concrete does not block the drain ports.

After installation of the hydrant, the Contractor shall backfill with gravel borrow up to an elevation equal to the subgrade of the proposed sidewalk or landscape area. Bituminous patching for temporary sidewalk, if required, shall be performed as specified under Item 460.50.

Where existing hydrant branch laterals are no longer to be used, the Engineer will direct the method of abandonment/removal. Abandonment/removal may include either of the following, depending on field conditions:

- 1) Gate valve shall be closed and box removed, and the branch shall be cut and plugged immediately adjacent to the hydrant side of the gate valve. Remaining lateral pipe on hydrant side of valve shall be completely removed and disposed of.
- 2) Gate and tee shall be cut and removed from water main, and replaced with spool piece. Remaining lateral pipe shall be completely removed and disposed of.

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Pressure and Leakage Testing

Shall be performed on all new lines in accordance with AWWA C600 and CWD/BDPW requirements. The Contractor shall be responsible for providing method of determining amount of water being pumped into test section; providing pressure gauge; temporary plugs and caps; pressure pumping; and all other labor and equipment required. Scheduling of tests shall be approved by CWD/BDPW and tests shall be attended by CWD/BDPW representative. Sections that fail testing shall be uncovered, repaired or replaced by the Contractor at the it's own expense. A report containing calculations and documentation pertaining to pressure and leakage tests shall be submitted to the CWD/BDPW

Disinfection and Flushing

Shall be performed by the Contractor on all new lines in accordance with AWWA C651 after pressure and leakage testing and necessary repairs are complete. Test results shall be submitted to CWD/BDPW. Chlorination procedure shall be repeated as necessary until results contained in the referenced standard are achieved. Discharge of chlorinated water shall comply with all Federal, State and Local standards, and only after notification of the Engineer. De-chlorinating facilities shall be used as required.

COMPENSATION

General

Excavation and backfill to a depth up to 6-feet; pipe couplings, plugs; fittings, pressure and leakage testing, and disinfection will not be measured for payment, but shall be considered incidental to the appropriate pipe items.

Pavement or sidewalk restoration, if required, shall be as specified under Item 460.50 or the appropriate sidewalk item.

Trench excavation greater than a depth of 6 feet will be paid for under Item 142. Rock excavation will be paid for under Item 144. Bituminous pavement patching will be paid for under Item 460.50.

Relocation of Hydrants

Ductile iron pipe associated with hydrant relocation will be measured by the foot, complete in place. Gates and gate boxes; tapping sleeve with valve and box; and hydrant removed and reset will be measured by the unit each, complete in place.

Payment for Items 303.06 and 303.16 will be at the contract unit price bid per foot and shall include full compensation for labor and materials to excavate to a maximum depth of 6 feet,

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install pipe as specified and indicated on the details, and backfill, and any other incidentals necessary for the satisfactory completion of the work as specified.

Payment for Items 350.06 and 356.16 will be at the contract unit price bid per each and shall include full compensation for labor and materials to excavate to a maximum depth of 6 feet, install gate and gate box, or butterfly valve and box as specified and indicated on the details, and backfill, and any other incidentals necessary for the satisfactory completion of the work as specified.

Payment for Item 376.20 will be at the contract unit price bid per each and shall include full compensation for labor and materials to excavate to a maximum depth of 6 feet, disconnect the hydrant from its existing location, reconnect the hydrant in its new location, install screened gravel and concrete thrust blocks, and any other incidentals necessary for the satisfactory completion of the work as specified. Abandonment/removal of existing branch laterals which are no longer required will be considered incidental to this item.

ITEM 420.00 HOT MIX ASPHALT BASE COURSE	TON
ITEM 443.00 DUST CONTROL	(INCIDENTAL)
ITEM 460.00 HOT MIX ASPHALT	TON
ITEM 464.60 HOT APPLIED ASPHALT CRACK FILLER	FOOT
ITEM 472.00 HOT MIX ASPHALT FOR MISCELLANEOUS WORK	TON

Work to be done under these items shall conform to the relevant provisions of Sections 420, 440 and 460 of the Standard Specifications and to the following:

The Hot Mix Asphalt Base Course, Binder Course, and Top Course Pavement shall be Type I-1 as specified in the Standard Specifications. The pavement thickness shall be as shown on the drawings and details in full-depth areas, and as directed by the Engineer in overlay areas. In overlay areas designated "2-inch" it is anticipated that a 2-inch thick top course will be placed, following cold-planing of a nominal 2 inches of pavement and crack sealing as directed by the Engineer. Where grades provided on the drawings indicate that proposed grade is to be raised above existing, cold planing depth and overlay thickness shall be adjusted as directed by the Engineer.

At proposed raised intersections, the Contractor shall place the hot mix asphalt base for the concrete paver field using hand spreading and finishing methods.

The work of this Section also includes (as part of Item 472.00) temporary patching of utility excavations and repaving of abutting driveways. Only driveway work which is indicated on the plans or directed by the Engineer shall be included under this Item.

At work locations where proposed finished grades are not indicated on the Drawings, the proposed grades shall be discussed with the Engineer prior to work, in order to address existing and proposed drainage concerns. The Contractor shall be responsible for ensuring that all paved areas are graded to drain, either to existing structures, or new structures.

Crack sealing shall be performed where directed by the Engineer with modified asphalts (e.g. rubber asphalt sealer). Prior to sealing a crack, it is absolutely essential that all compressible material be removed by high-pressure air or routing. If grass or vegetation is present in the crack, it may be necessary to inject a liquid herbicide to prevent future growth. For small hairline cracks, an asphalt slurry mixture type SS-1, SS-1h shall be squeegeed over the surface and forced in the cracks. The slurry shall be maintained at a significant fluidity to be able to flow into the hairline cracks. Sealing of cracks shall be considered to be complete upon review and approval by the Engineer.

Liquid Asphalt Emulsion shall be applied prior to installation of asphalt as incidental to this item. Emulsion shall be AC-20 conforming to AASHTO M226 and shall be applied at a temperature over 100 degrees F by an emulsion truck.

The emulsion truck shall have pneumatic tires of such width and number that the load produced

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on the surface shall not exceed 650 pounds per inch of tire width, and it shall be designed, equipped, and operated so that at an even heat the emulsion may be applied uniformly on variable widths of surface at readily controlled rates from 0.05 to .20 gallons per square yard as directed by the Engineer.

The emulsion shall be applied within a pressure range of 25 to 75 pounds per square inch. Distributor equipment shall include a tachometer, pressure gauges, volume-measuring devices, and a thermometer for reading the temperature of tank contents. The distributor shall be self-powered and shall be equipped with a power unit for the pump and full circulation spray bars adjustable laterally and vertically.

At all locations where new asphalt pavement will abut existing pavement, the Contractor shall saw-cut the existing pavement neat and straight as shown on the detail drawings. All joints shall be tacked with Emulsified Asphalt, Type RS-1 before paving. The joint shall be tacked again after paving and sanded.

No diesel shall be used on castings or for cleaning of equipment. Only soap and water shall be allowed.

The Contractor shall take all reasonable measures to assure proper drainage on the final surface of the roadway. Pavement which does not drain properly due to poor workmanship shall not be accepted by the City.

At locations which are not complete at the end of the day, the Contractor shall use paper joints. In no case shall a longitudinal joint be left open to traffic at day's end.

The Contractor shall be required to provide a minimum of two vibratory mechanical rollers. One shall be a steel drum with front and rear rollers and a minimum weight of 10 tons. The other roller shall be a combination roller with four rubber front tires and a rear steel drum. The roller shall be a minimum weight of eight tons. An all rubber tire roller with a minimum weight of eight tons can be substituted for the combination roller.

The Contractor shall supply an approved Dial Type Asphalt Thermometer (Range 50 degrees F to 500 degrees F) for each paving machine in operation on the project. The thermometer shall remain the property of the Contractor upon completion of the project.

Water gate box adapters provided by the City and installed by the Contractor shall be considered incidental to this item. Water gate box adapters provided and installed by the Contractor will be paid for under Item 358.00. The Contractor shall be responsible for coordinating structure adjustment by other utilities prior to paving.

Dust Control: The Contractor shall perform dust control as directed by the Engineer and in accordance with Section 440 of the Standard Specifications. The Contractor shall prevent operations from producing dust in amounts damaging to property, cultivated vegetation, or

RECONSTRUCTION OF BLANCHARD ROAD

domestic animals, or causing a nuisance to persons living in or occupying buildings in the vicinity of the Project. The Contractor shall be responsible for any damage resulting from dust originating from its operations. Dust abatement measures shall be continued until the Contractor has completed its work. Dust abatement measures shall include but not be limited to spraying water, applying calcium chloride, and placing temporary pavement on and around trenches and on work sites.

Compensation

Hot Mix Asphalt pavement will be measured for payment as specified in Sections 420 and 460 of the Standard Specifications.

Dust control will not be measured for payment, and will be considered incidental to the hot mix asphalt items, and sidewalk items, as appropriate.

Payment for work under Items 420.00, 460.00, and 472.00 shall be at the contract unit price per ton and shall include full compensation for labor, materials including emulsified asphalt, equipment, and any other incidentals necessary for the satisfactory completion of this work as specified.

Sealing of cracks as directed by the Engineer will be measured by the foot and will be paid for at the Contract Unit Price bid under Item 464.60.

No work on abutter driveways will be paid for under Item 472 which is not shown on the plans, nor specifically directed by the Engineer.

Please note that emulsion truck and rubber tire roller are a requirement for paving. Failure to comply with this requirement will result in the City prohibiting the Contractor from paving. There shall be no additional cost to the City in this event.

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ITEM 482.30 SAWING ASPHALT PAVEMENT**FOOT**

The work under this item shall consist of establishing a neat joint in the asphalt pavement where proposed hot mix asphalt pavement interfaces with existing pavement at the limit of work. The asphalt pavement shall be cut straight using an approved power driven saw with an abrasive blade and shall be sawed dry. The saw cut shall be a minimum of 3/8" wide and extend to the depth indicated on the Drawings and details.

Saw cut edges which become broken, ragged or undermined as a result of the Contractor's operations shall be re-saw cut prior to the placement of abutting pavement for which no additional compensation will be allowed. The edges of saw cut pavements shall be sprayed or painted with a uniform thin coat of SS-S1401-C joint adhesive immediately before placement of hot mix asphalt material against the edges. Costs associated with the furnishing and applying joint adhesive shall be considered as incidental to this Item.

Compensation

Measurement for sawing asphalt pavement will be by the foot along the pavement surface.

Sawing asphalt pavement will be paid at the contract unit price per foot as described above. Said price shall include full compensation for all labor, tools, material and equipment necessary for the satisfactory completion of this work as specified.

Sawcutting associated with pavement repair at utility trenches and with curb work will not be measured separately for payment, but will be considered incidental to Item 472.00 and the appropriate curb items.

ITEM 504.00 GRANITE CURB TYPE VA4 - STRAIGHT	FOOT
ITEM 504.10 GRANITE CURB TYPE VA4 – CURVED	FOOT
ITEM 509.00 GRANITE TRANSITION CURB FOR WHEELCHAIR RAMPS - STRAIGHT	FOOT
ITEM 509.10 GRANITE TRANSITION CURB FOR WHEELCHAIR RAMPS - CURVED	FOOT
ITEM 580.00 CURB REMOVED AND RESET	FOOT

Work to be done under these items shall conform to the relevant provisions of Sections 501 and 580 of the Standard Specifications and to the following:

Granite Curbing

The Contractor shall neatly sawcut existing adjacent pavement and excavate a trench for the curb or edging that is eighteen (18) inches wide and as deep as required to allow the sub-grade to be twenty four (24) inches below the top of the finished curb/edging. The curb/edging reveal shall be as indicated on the Drawings or as directed by the Engineer.

Cement concrete shall be installed on the subgrade for curb/edging foundation and shall be six (6) inches thick and eighteen (18) inches wide. Cement concrete shall be 4000 PSI at 28 day Test, 3/4" aggregate, 5% air entrainment, and maximum 4" slump.

After the curb/edging stone is in place, cement concrete shall be placed on both sides of the curb stone. On the sidewalk/landscape side of the curb, the cement concrete shall be brought up to the elevation of the sub-base of the sidewalk or other proposed surface material as shown on the Drawings. On the street side of the curb, the cement concrete shall be brought up to the same elevation as the bottom of the adjacent hot mix asphalt binder course (in full depth construction areas), or as directed by the Engineer (in overlay areas).

At flush transverse curbs adjacent to raised intersections, cement concrete shall be placed both sides of the curb as shown on the Drawings and Details.

The joints shall be pointed with mortar conforming to Section M4.02.15 of the Standard Specifications. Joints greater than 3/4" shall have a non-shrink caulking applied as directed by the Engineer.

Any work requiring chamfering, cutting or caulking of curb shall be incidental to these items.

It is the intent of this project that maximum re-use be made of existing curbing. Where "Proposed Granite Curbing" is indicated on the Drawings, the Contractor shall construe this to mean either new material, or existing curbing within the project area which meets the requirements (including proper radius) of Section 580 of the Standard Specifications. All curbing unsuitable for continued use shall be disposed of by the Contractor as directed by the Engineer.

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Compensation

Curb items will be measured for payment as specified in Section 501 of the Standard Specifications.

Payment for work under these items shall be at the contract unit price per foot or each (as appropriate) and shall include full compensation for sawcutting, excavation, disposal, furnishing tools, equipment, labor, cement concrete foundation and backfill, hot mix asphalt, and any other incidentals necessary for the satisfactory completion of this work as specified.

ITEM 594.00 CURB REMOVED AND DISCARDED FOOT

Work to be done under this item shall conform to the relevant provisions of Sections 500 and 580 of the Standard Specifications and to the following:

Compensation

Curb Removed and discarded shall be the length actually removed and discarded, measured in accordance with Section 501 of the Standard Specifications.

Payment for work under this item shall be at the contract unit price per foot and shall include full compensation for all labor, equipment, tools, sawcutting, excavation, removal, transporting and disposal, and any other incidentals necessary for the satisfactory completion of this work as specified.

ITEM 645.148	48-INCH CHAIN LINK FENCE (PTR) VINYL COATED (PIPE POST)	FOOT
ITEM 645.172	72-INCH CHAIN LINK FENCE (PTR) VINYL COATED (PIPE POST)	FOOT
ITEM 650.048	48-INCH CHAIN LINK GATE WITH GATE POSTS	FOOT
ITEM 652.048	48-INCH CHAIN LINK FENCE END POST	EACH
ITEM 652.072	72-INCH CHAIN LINK FENCE END POST	EACH
ITEM 653.048	48-INCH CHAIN LINK FENCE CORNER OR INTERMEDIATE BRACE POST	EACH
ITEM 653.072	72-INCH CHAIN LINK FENCE CORNER OR INTERMEDIATE BRACE POST	EACH

GENERAL

The work under these items shall conform to the relevant portions of Section 644 of the Standard Specifications and the following:

All chain link fence components under these items shall be coated with polyvinyl chloride (P.V.C.). Color shall be black. P.V.C. shall be thermal fusion bonded to metal components. PVC shall be resistant to attack from prolonged exposure to dilute solutions of most common mineral acids, sear water and dilute solutions of most salts and alkali.

The Contractor shall submit manufacturer's shop drawings for all fence and gate materials, prior to beginning work under these Items.

MATERIALS

Fabric

The chain link fabric shall be Type IV. The fabric shall be 9 gage (.148") inch core wire galvanized in conformance with ASTM A641, and woven after P.V.C coating in a 2 inch square inch mesh opening. Average wall thickness of the PVC coating shall be 0.022 inches resulting in a finish (coated) wire size of 6 gauge.

Top and bottom selvages shall be knuckled. Fabric shall be fastened to intermediate posts at approximately 12" inch intervals and to top, bottom and center rails at 12" inch intervals with 9 gage (.148") inch core wire ties with P.V.C. coating. The fabric shall be securely fastened to all terminal, corner gate posts and to all backstop framework with ¼"x3/4" inch stretcher bars with heavy No. 11 gage presses steel bands spaced approximately 12" inch apart and furnished with fasteners.

The following minimum break-load for the fabric shall apply:

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#9 gage core (.148" inch) - 1,290 lbs.

Posts, Rails and Braces

Post, rails and braces shall conform to Federal Specifications RR-F-191/3C and be fabricated of Class I (round steel sections), Grade A (hot-dipped galvanized), seamless steel pipe, in accordance with ASTM A120 (Schedule 40) and P.V.C. coated by the thermal fusion process to match fabric, and be of the following sizes:

Corner & Terminal Posts

2.875" (4.64 lbs/ft) O.D

Line Posts

2.375" (3.117 lbs/ft) O.D.

Top & Bottom Rails

1.660" (1.84 lbs/ft) O.D.

All chain link fences shall be fitted with a bottom rail. Post spacing shall be maximum of 8' ft. on center. Provide internally swaged expansion couplings for rails at 30 feet on center maximum spacing. Coupling shall have a 3-inch minimum overlap at joint.

PVC thickness for all posts, rails and braces shall be 10-14 mils.

Gates

Double leaf swing gates shall conform to the requirements of Section M8.09.0 of the Standard Specifications and the following:

Gate fabric shall be of the type, mesh, gage, color and selvage as that specified above for fabric.

Gate Hardware

Hinges, latches, stops and keepers shall be hot-dipped galvanized in accordance with ASTM A153, and be P.V.C. coated to match fabric.

Hinges shall be pressed steel or malleable iron, sized to suit gate, non-lift-off type, and offset to permit 180 degree gate opening. Provide 1 pair of hinges for each leaf. Each hinge to be welded to gate support post, cleaned and field coated after installation with two coats minimum of an approved liquid P.V.C. patching compound.

Provide drop rod to hold inactive leaf. Provide gate stop pipe to engage center drop rod. Provide locking device and padlock eyes as an integral part of latch, requiring one padlock for locking both gate leaves.

Accessories

Accessories shall conform to Federal Specification RR-F-191/4C, shall be hot-dipped galvanized

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in accordance with ASTM A123 or A153 and shall be P.V.C. coated by the thermal fusion process to match fabric. In addition to ties and clips, brace bands, tension bands and bars, and truss rods (all of which are described herein before), accessories shall include the following:

Post caps shall be malleable iron suitable for use with specific posts, and PVC coated. All caps to be secured to posts with screws.

Rail and brace end or other suitable means of connection.

Rail sleeves to allow for expansion and contraction of the rails.

CONSTRUCTION METHODS

Grounding: All chain link fence and gate under these items shall be grounded. Provide ground rods meeting requirements of the Standard Specifications, at all corners or angles in fencing, at all terminal posts, and at minimum 250-foot on center if not otherwise required. Provide flexible grounding connection for gates. Abrade vinyl fence fabric coating where necessary to make mechanical grounding connections.

Fence Post Holes: Post holes shall be excavated by auguring. Posts shall be set as per Contract Details, except post hole diameter shall be 12-inches and minimum shall be 48-inches below finished grade. All posts shall be installed such that a 40-pound force applied perpendicular to the fence-line at the top shall result in a deflection at the top of no more than 2-inches.

Gate Post Holes: Gate post holes shall have a diameter 4 times greater than the outside dimension of the post, and extend minimum 6-inches below the post bottom. Post bottom shall be 48-inches below finish grade.

Testing: Each fence panel shall be constructed so that deflection of fence fabric shall be no greater than 2 inches when a force of 30 pounds is applied in the center of the panel, perpendicular to the plane of the fence fabric. Fabric shall return to original position when force is released.

COMPENSATION:

Chain link fences and gates will be measured for payment as specified in Section 644 of the Standard Specifications, and the following”

Concrete bases for fence and gate posts will not be measured or paid for separately, but will be considered incidental to the appropriate fence, gate, or post item.

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ITEM 665.00	FENCE REMOVED AND RESET	FOOT
ITEM 665.50	WOOD FENCE	FOOT
ITEM 666.48	CHAIN LINK FENCE REMOVED AND DISPOSED	FOOT

The work under these Items shall conform to the relevant provisions of Section 665 of the Standard Specifications and the following:

The work under these Items shall include remove and disposal of chain link fence, and careful removal and temporary storage of all types of fencing noted on the plans, and specified by the Engineer, to be removed and reset in order to allow for performance of the work of the project. The work will include fencing of various types. The Contractor shall separately store or otherwise inventory/label fencing by property address in order to assure that fencing from a particular property gets reset on that same property.

Fencing shall be removed in the presence of the Engineer. Where damaged is caused to fencing by the Contractor's operations, the Contractor shall be required to replace damaged components with new components of similar type and composition at no additional cost to the City. Where existing fencing is found to be unsuitable for reuse due to deterioration, as determined by the Engineer, the unsuitable components shall be disposed of by the Contractor without additional compensation and the Contractor shall provide new fencing under Item 665.50. Such replacement fencing shall match the existing fencing in type and composition including section and post components.

Reset or replacement fencing shall be set true to line and grade. Location and layout of fencing shall be approved by the Engineer prior to installations.

Compensation

Payment under these Items shall be at the Contract unit price bid per foot of removal and disposal of chain link fence, or of new Wood Fence, or Fence Removed and Reset, complete in their final locations. Payment shall also include removal of existing cement concrete foundations, and placement of new cement concrete foundations, where required.

ITEM 692.00**WALL PROTECTION****LUMP SUM**General

The work to be done under this Item consists of instituting and maintaining positive measures to protect and maintain existing retaining walls adjacent to or within the limits of work.

The Contractor shall exercise extreme caution not to disturb existing walls which are to remain. If existing-to-remain walls are disturbed, they shall be repaired or reconstructed at the Contractor's expense to thoroughly match the existing wall in color, texture, material and workmanship.

Prior to the start of construction the Contractor shall review in the field with the Engineer, the location and condition of all walls adjacent to or within the limits of work. The Contractor shall videotape all existing walls to have on record the condition of all existing walls including color, texture, material and workmanship. The Contractor shall submit the videotape to the Engineer for future reference.

Upon completion of construction, the Contractor shall review in the field with the Engineer, the location and condition of all walls adjacent to or within the limits of work to verify that the existing-to-remain walls were not disturbed. In the event that walls were disturbed, the Engineer shall verify that the Contractor reconstructed the walls to match the pre-construction condition of the walls in color, texture, material and workmanship as recorded on the pre-construction videotape.

The Contractor's attention is drawn in particular to the existing stone walls located on the "Belmont" side of Blanchard Road approximately between Stations 100+50 LT and 111+50 LT. The maintenance and protection of these walls in their current state shall be considered a priority of the Contractor.

Compensation

Payment for work under this item will be at the contract lump sum price and shall include full compensation for all labor, materials, disposal, equipment, tools, and any other incidentals necessary for the satisfactory completion of this work as specified, including but not limited to required maintaining, repairing and reconstructing of any walls.

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ITEM 701.00	4" CEMENT CONCRETE SIDEWALKS	SQUARE YARD
ITEM 701.10	6" CEMENT CONCRETE SIDEWALKS (DRIVEWAYS AND INTERSECTIONS)	SQUARE YARD
ITEM 701.20	6" CEMENT CONCRETE PEDESTRIAN RAMPS	SQUARE YARD
ITEM 701.29	CAST-IN-PLACE DETECTABLE TILE	SQUARE YARD
ITEM 701.99	CAST IRON SIDEWALK GUARD	FOOT

Work to be done under these items shall conform to the relevant provisions of Section 701 of the Standard Specifications and to the following:

MATERIALS

Concrete: Concrete for sidewalks shall conform to the Standard Specifications, M4.02.00 through M4.02.12 and be 4000 PSI at 28 day test, 3/4 inch coarse aggregate, 610 pounds cement per cubic yard, 6% air entrained (AASHTO - M154), Type A water reducing admixture (AASHTO - M194), 3 to 4 inch slump, and Type II dark-colored by adding 1-1/2 to 2 lbs. of lamp black per cubic yard at the plant.

The concrete shall contain 1 pound of 100% polypropylene microfiber per cubic yard. Fiber shall be added during batching at the plant to insure uniform distribution. The micro-fiber shall be W.R. Grace micro-fiber or equal and shall be used in accordance with the supplier's specifications.

Cast-in-Place Detectable Tile: The detectable warning strip shall be the Cast-in-Place Composite Paver Tiles by ADA Solutions, Inc. (800-372-0519) or approved equal. Existing engineered ADA and California Title 24 field tested products in service for a minimum of 2 years which are subject to compliance with requirements, may be incorporated in the work and shall meet or exceed the specified test criteria and characteristics.

Color: Brick Red. Color shall be homogenous throughout the paver tile unit.

Size: 24 in. (+/- 1") deep, cut as wide as the handicap ramp opening.

Cast Iron Sidewalk Guard: Shall be Neenah Foundry Catalog Number R4985-A, or approved equivalent product.

CONSTRUCTION METHODS

These items shall include excavation and disposal of the existing material and the fine grading and compaction of the sub-base prior to placement of concrete. If the existing material is unsuitable or more material is needed for sub-base, additional material shall be installed and paid for under Item 151.00 Gravel Borrow as directed by the Engineer. If the existing material is brick, the City reserves the right to direct the Contractor to deliver the bricks to a specified site within the City at no additional cost. In areas where sidewalks are to be constructed in present

RECONSTRUCTION OF BLANCHARD ROAD

roadway areas, the full depth of existing asphalt pavement shall be completely removed. Where new sidewalk abuts existing-to-remain sidewalk, the limit of work shall be established at the existing nearest existing contraction or expansion joint, where a neat sawcut shall be provided.

The Contractor shall exercise special care when excavating near trees. When major roots are in the way, the Contractor shall go under or between them. In no case shall the Contractor disturb the root structure of the trees without direction from the City Arborist. Exposed roots shall be covered promptly. Excavation of all tree wells shall be done entirely by hand.

Traffic signs shall be removed during the excavation. Signs to be reused shall be appropriately stored. Signs to be removed and stacked, as indicated on the Drawings or as directed by the Engineer, shall be delivered by the Contractor to the Department of Traffic, Parking and Transportation yard at 59 First Street, Cambridge. Signs to be discarded, as indicated on the Drawings or as directed by the Engineer, shall be disposed of by the Contractor.

Reinstallation of traffic signs, if location is unchanged, shall be incidental to this item (provided the existing sign post base is in conformance with City of Cambridge Dept. of Traffic, Parking and Transportation standards) and done prior to the concrete pour. New traffic sign posts, including new base, shall be installed and paid for under Item 877.00. Where a new base only is required, it shall be considered incidental to the sidewalk item. All regulatory signs shall be maintained throughout construction.

The sub-base shall be prepared at the appropriate elevation for the depth of concrete to be installed. The sub-base shall be graded to follow the proposed sidewalk elevations shown on the Drawings. At locations where no proposed grades are indicated, the sub-base shall be graded to allow for sidewalks to be sloped from the City right of way towards the street at 1/8 inch to the foot, or as directed by the Engineer.

The Contractor shall raise all water curb stop boxes to final grade and coordinate raising of other public and private utility boxes prior to pouring of concrete. The Contractor shall remove material from curb stop boxes with compressed air, after raising is complete and prior to pouring of concrete. Prior to pouring the concrete, the Contractor shall go over locations where curb boxes have been raised with the Engineer.

Proper compaction shall be obtained by means of plate-type mechanical compactors. The material shall be compacted to ninety-five percent (95%) of the maximum dry density at optimum moisture content as determined by the AASHTO Standard Method of Test T99 Method C.

Installation of Concrete: Concrete shall be installed to a depth of 6" across driveways, at street intersection corners (5' beyond the point of tangency on either side of the corner curve), and at other locations as directed by the Engineer. At all other locations, concrete shall be installed to a depth of 4". Pedestrian ramps shall be installed and paid for under Item 701.20.

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Finishing shall be as specified in Subsection 701.61B of the Standard Specifications. Curing shall be as specified in Section 476.71 of the Standard Specifications. Concrete shall be membrane-cured. The curing compound shall not discolor the concrete and shall be applied according to the manufacturer's specifications. The mixture shall be applied immediately after the finishing is complete and free water has left the concrete's surface. The Contractor shall provide the Engineer with the curing compound specification prior to its use.

Expansion joints shall be placed every 30 feet. Expansion joints shall also be placed around all appurtenances such as utility poles, hydrants, manholes, and other obstructions extending into and through the sidewalk. Expansion joints installed around utilities shall be 3/8" foam expansion joint polyethylene at a depth to match the adjacent sidewalk (4" or 6"). It is also required that an expansion joint of 1/4" thick foam at 4" or 6" deep is placed longitudinally along the granite curb between curb and the concrete and also between buildings, or retaining walls and the concrete as directed by the Engineer. Six-inch expansion joints shall be placed at all locations where six-inch concrete corner slabs or driveways meet four inch concrete walks. Expansion material protruding above the finished sidewalk shall be trimmed flush with a sharp instrument as soon as the concrete has set.

Between the expansion joints at 30 foot spacings, the sidewalk shall be divided at 5 foot intervals with score joints, made with creasing tools having a penetration depth of minimum 1/2" and at 10 foot intervals with construction joints. Joints shall be placed 90 degrees transverse with the direction of traffic and shall be straight within a tolerance of 1/4 inch of a straight edge laid along the joint. Longitudinal joints shall be installed, at the direction of the Engineer, when the sidewalk is greater than 6' wide.

Immediately after brooming concrete, using pressure-spray equipment, the Contractor shall apply a mixture of boiled linseed oil to the new concrete pavement as an anti-spalling seal. The mixture shall consist of 50% double boiled linseed oil and 50% petroleum spirits, AASHTO M-233-79. Upon approval by the Engineer, the Contractor may use other products available on the market in accordance with manufacturer's recommendations (2 applications at right angles to each other are required for complete coverage).

“Don’t Dump” Placards: The work of this Section shall also include the installation of Cast Iron or Steel “Don’t Dump” placards, where new sidewalks abut existing or proposed catch basins and inlets. The placards will be furnished by the City at no cost to the Contractor, for installation by the Contractor.

Finish Grades: At locations where the Drawings do not indicate proposed sidewalk grades, the grades shall be discussed with the Engineer prior to work, in order to address existing and proposed drainage concerns. The Contractor shall be responsible for ensuring that all new sidewalks areas are graded to drain, either to existing structures, or new structures.

Pedestrian ramps and sidewalks shall be installed in strict conformance with the layout and grades shown on the Drawings, current Americans with Disabilities Act (ADA) and

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Massachusetts Architectural Access Board (AAB) regulations; and the applicable details of the Massachusetts Highway Department (MHD) Wheelchair Ramp Standards (latest edition).

The Contractor shall establish grade elevations at all pedestrian ramp and sidewalk locations, and shall set transition lengths according to the tables which are included on the Drawings. The Contractor shall use a digital "Smart Level" to check all sub-base grades for compliance prior to installation of concrete. The Contractor shall not proceed with concrete installation on a sidewalk or ramp that is out of compliance without first contacting the Engineer.

At all pedestrian ramps and driveways, 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. At driveways, a joint shall be located between the sloping portion of the driveway (15% maximum slope), and the level area where pedestrians will cross the driveway (1.5% maximum cross slope).

The broomed finish on pedestrian ramps shall be perpendicular to the direction of the slope.

Installation of the cast-in-place detectable warning tiles shall be in accordance to the manufacturer's instructions. Detectable warning tiles shall also be placed adjacent to raised crosswalks as shown on the Drawings or as directed by the Engineer.

Cast Iron Sidewalk Guard: Shall be cast integral with the concrete sidewalk and driveway as shown on the plans and details. Expansion joints in sidewalk shall be coincident with joints in sidewalk guard sections.

COMPENSATION

Sidewalk, driveways, and pedestrian ramps will be measured for payment as specified in Section 701 of the Standard Specifications, and the following:

Payment for work under these items shall be at the applicable contract unit prices and shall include full compensation for sawcutting, excavation (including removal of existing asphalt pavement in present roadway areas), disposal of construction debris (existing sidewalk, concrete, asphalt, etc.), removal and replacement of traffic signs with conforming bases, preparation of sub-base, raising of water curb stop boxes, installation of "Don't Dump" placards, furnishing and placing cement concrete and hot mix asphalt as indicated, furnishing and installing detectable warning tiles, expansion joints, concrete sealant, and any other incidentals necessary for the satisfactory completion of this work as specified.

Payment for cast iron sidewalk guard shall be at the unit price bid per foot, which shall constitute full compensation for furnishing and installing cast iron units and all required accessories, providing thickened sidewalk edge, and all other required work as shown on the Drawings and as specified herein.

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NOTES ON EXCLUSIONS: Disposal of any excavated soil is not included for payment under this item and shall be paid for separately. Changes necessitated to private property due to changes in grade of the sidewalk are not included for payment under this item and shall be paid for separately under the appropriate items; for example: asphalt driveways, granite curb, fencing.

ITEM 706.60 CONCRETE PAVERS ON HOT MIX ASPHALT SURFACE
SQUARE YARD

The work of this Item consists of furnishing and installing a field of new pre-cast concrete pavers at the raised intersection locations shown on the Drawings and as specified herein.

Materials:

All unit pavers shall meet ASTM C 936, 8,000 pounds per square inch minimum compressive strength and 5 percent maximum water absorption rate when tested in accordance with ASTM C 140, with no individual stone testing more than 7 percent.

Materials used to manufacture the concrete pavers shall conform to the following:

1. Cement: ASTM C150, Portland Cement, Type I.
2. Aggregates: ASTM C 33 (washed, graded sand and natural aggregates, no expanded shale or lightweight aggregates).
3. Admixtures shall be added to mix to reduce efflorescence of pavers.

Provide five (5) year labor and materials warranty.

Surface sealant shall be Paver Seal - SB, a non-yellowing, non-tacky acrylic co-polymer sealant manufactured by Addiment, Inc., Atlanta, GA, 30362, or approved equal.

Concrete pavers used on raised cross intersections shall be Optiloc hydraulically precast concrete pavers, manufactured by Unilock Inc. 35 Commerce Drive, Uxbridge, MA 01569, telephone (508)278-4536)

1. Pavers size shall be 10-1/4" x 10-1/4" (L-shape)
2. Paver thickness on asphalt base shall be 3-1/8"
3. Pavers shall have a minimum compressive strength of 60 MPa.
4. Water absorption shall be 5 percent or less.

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5. Finish of pavers shall be Standard.
6. Colors shall be Rustic Red.

Method of Installation:

The final grade of the raised paver area shall be as shown on the Drawings. Granite curbing shall be placed as shown on the Drawings and Details to act as a restraining edge for the pavers. The top of the granite curb shall be flush with the adjacent roadway and paver finished grade on either side. Hot mix asphalt pavement material shall be placed which conforms to the details shown on the Drawings for Raised Crosswalks and Intersections.

Bedding Sand:

Sand shall conform to the grading requirement of ASTM C33. Mason sand or stone dust shall not be used due to the high amount of material passing the #200 sieve. The sand shall be screeded to an even thickness of 1" to 1 2" over the hot mix asphalt surface.

Pavers Installation:

The patterns shall be 90 degree herringbone patterns with a Boston Colonial Paver Border. Prior to border installation a straight line shall be established in the pavement with a wet saw, and a granite curb shall be installed with top flush to the proposed finish roadway grade, to act as a restraint for the pavers.

Once the pavers are placed in their specified patterns, they shall be compacted into the bedding sand with a plate compactor. The compactor shall have a minimum force of 5000 lb. and a frequency of 75 to 90 cycles per second.

After the pavers are compacted, sand shall be swept and vibrated into the joints until they are full.

Compensation

Concrete pavers on hot mix asphalt surface will be measured by the square yard, complete in place.

Payment for this Item will be per square yard and shall include bedding sand, concrete pavers and any other incidentals to complete the work. Casting adjustment will be paid for under Items 220.00, 358.10 and 358.20 as appropriate. Hot mix asphalt base will be paid for under Item 472.00. Granite curb for paver restraint will be paid for under Item 504.00.

RECONSTRUCTION OF BLANCHARD ROAD

ITEM 710.41	BOUND – PLAIN GRANITE - FURNISHED	EACH
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Work to be done under this item shall conform to the relevant provisions of Section 710 of the Standard Specifications and to the following:

Description

The work of this Section consists of furnishing granite bounds for installation by others. Bounds shall be of the dimensions shown in the MassHighway 1977 Construction Standard Details. The Contractor shall deliver bounds to specific locations within the Project site as directed by the Engineer, where they shall be stored and protected from damage until such time as they installed by a third party surveyor. The Contractor shall facilitate the work of the surveyor, including providing access to installation locations, but will not be required to rehandle or install the bounds once they have been delivered to the site as specified above.

After bounds are installed, the Contractor shall protect them from damage, and will be responsible to replace bounds subsequently damaged at no cost to the City.

COMPENSATION

Payment for the work of these Items will be at the Contract unit price bid per Each, which shall constitute full compensation for furnishing, delivering, and protecting bounds before and after installation by others.

ITEM 751.00	LOAM BORROW	CUBIC YARD
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Work to be done under this item shall conform to the relevant provisions of Section 751 of the Standard Specifications and to the following:

Description

The work of this Section consists of all loaming work and related items as indicated on the Drawings and/or as specified herein and includes, but is not limited to, the following:

1. Fine grading and loaming for lawn areas

RECONSTRUCTION OF BLANCHARD ROAD

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Definitions

The following related items are included herein and shall mean:

1. AOAC: Association of Official Agricultural Chemists

Samples and Submittals

At least thirty (30) days prior to intended use, the Contractor shall provide the following samples and submittals for approval in conformance with requirements of these specifications. Do not order materials until Engineer's approval of samples, certifications or test results has been obtained. Delivered materials shall closely match the approved samples.

1. Loam Borrow: The Contractor shall provide a one (1) cubic foot representative sample from each proposed source for testing, analysis, and approval. Contractor shall deliver samples to testing laboratories and shall have the testing report sent directly to the Engineer and pay all costs. Testing reports shall include the following tests and recommendations.
 - a. Mechanical gradation (sieve analysis) shall be performed and compared to the USDA Soil Classification System. A hydrometer shall be used to determine percent of clay and silt.
 - b. Percent of organics shall be determined by the loss on ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 230 degrees F, plus or minus 9 degrees.
 - c. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Soluble Salts, and acidity (pH).
 - d. Tests, as specified, for gradation, organics, soil chemistry and pH shall be performed by a public extension service or a private testing laboratory approved by the Engineer.
 - e. Soil analysis tests shall show recommendations for soil additives to correct soils deficiencies as necessary, and for fertilizing and liming applications to support successful turf growth.
 - f. All tests shall be performed in accordance with the current standards of the Association of Official Agriculture Chemists.

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2. Peat: Submit a one (1) cubic foot sample and supplier's certification of contents.
3. All additives needed to amend a specific soil in order to meet these specifications.

Examination of Conditions

A. All areas to be loamed and fine graded shall be inspected by the Contractor before starting work. Any defects shall be reported to the Engineer prior to beginning this work. The commencement of work by the Contractor shall indicate his acceptance of the areas to be loamed and fine graded, and he shall assume full responsibility for the work of this Section.

Materials

Loam

A. Loam shall be a "fine sandy loam" or a "sandy loam" determined by mechanical analysis (ASTM D-422) and based on the "USDA Classification System". It shall be of uniform composition, without admixture of subsoil. It shall be free of stones greater than one inch (1"), lumps, plants and their roots, debris and other extraneous matter as determined by the Engineer.

B. Loam shall have the following mechanical properties:

<u>Textural Class % of Total Weight</u>	<u>Average %</u>	
Sand (0.05 - 2.0 mm dia. range)	45 - 75	60
Silt (0.002-0.05 mm dia. range)	15 - 35	25
Clay (less than 0.002 mm dia. range)	5 - 20	15

C. Loam shall have an acidity range of pH 6.0 to pH 6.5 and shall contain not less than 4% nor more than 8% organic matter, as certified by required tests.

D. All loam proposed for use shall be tested for conformance to the specifications.

Soil Additives

A. Commercial fertilizer, peat, humus or other additives shall be used to counteract soil deficiencies as recommended by the soil test analysis, and as specified seeding supplements.

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B. Commercial fertilizer shall be a product complying with the State and United States fertilizer laws. Deliver to the site in the original unopened containers which shall bear the manufacturer's certificate of compliance covering analysis which shall be furnished to the Engineer. At least 50% by weight of the nitrogen content shall be derived from organic materials. Fertilizer shall contain not less than the percentages of weight of ingredients as follows or as recommended by the soil analysis:

Nitrogen	Phosphorus	Potash
10%	6%	4%

C. Humus shall be manufactured leaf compost. It shall be free from hard lumps and in a shredded or granular form. The acidity range shall be approximately 5.5 pH to 7.6 pH and the organic matter shall be not less than 65%. The minimum water absorbing ability shall be 200% by weight on an oven-dry basis.

D. Peat moss shall be composed of the partly decomposed stems and leaves of any of several species of sphagnum moss. It shall be free from wood, decomposed colloidal residue and other foreign matter. It shall have an acidity range of 3.5 pH to 5.5 pH as determined in accordance with the methods of testing of A.O.A.C., latest edition. Its water absorbing ability shall be a minimum of 1,100% by weight on an oven-dry basis.

E. Sand shall consist of hard, durable grains of quartz or other rock, clean and free from foreign matter or chemical contamination.

F. Ground limestone for adjustment of loam pH shall contain not less than eighty five percent (85%) of total carbonates and shall be ground to such fineness that forty percent (40%) will pass through 100 mesh sieve and ninety five (95%) will pass through a 20 mesh sieve. Contractor shall be aware of loam pH and the amount of lime needed to adjust pH to specification in accordance with testing lab recommendations. Ground limestone shall not be applied at a rate greater than two hundred pounds (200 lbs.)/one thousand (1,000) square feet incorporated into the soil, or fifty pounds (50 lbs.) of limestone/one thousand (1,000) square feet, surface application, per season.

G. Sulphur shall be commercial or flour sulphur, unadulterated, and shall be delivered in containers with the name of the manufacturer, material, analysis and net weight appearing on each container.

H. Superphosphate: Superphosphate shall be composed of finely ground phosphate rock as commonly used for agricultural purposes containing not less than 18% available phosphoric acid.

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Construction Methods

Establishment of Subgrade/Subsoil

A. In areas which are to receive loam borrow, all existing pavement, unsuitable materials, boulders, trash,, debris, etc. shall be removed to a minimum depth of 18-inches below final surface grade. Resultant voids shall then be backfilled with loosely compacted gravel borrow to an elevation equal to the proposed bottom of loam.

Fine Grading and Loaming

A. Contractor shall obtain Engineer's written approval of previously completed rough grading work prior to commencing loam placement work. Prior to spreading of loam, subgrades which are too compact to drain water or are too compact based upon compaction tests shall be ripped with a claw twelve inches (12") deep, pulled by a bulldozer 2'-0" on center, both directions. Contractor shall then regrade surface.

B. Immediately prior to dumping and spreading the loam, the subgrade shall be cleaned of all stones greater than two inches (2") and all debris or rubbish. Such material shall be removed from the site.

C. Loam or topsoil shall be placed and spread over approved areas to a depth sufficiently greater than four inches (4") so that after natural settlement and light rolling, a minimum four inch (4") compacted loam depth will have been provided and the completed work will conform to the lines, grades and elevations indicated. Supply additional loam, after testing and approval, as may be needed to give the specified depths and finished grades under the contract without additional cost to the City.

D. Disturbed areas outside the limit of seeding shall be spread with a minimum of four inches (4") of loam to the finished grade.

E. No subsoil or loam shall be handled in any way if it is in a wet or frozen condition.

F. Sufficient grade stakes shall be set for checking the finished grades. Stakes must be set in the bottom of swales and at the top of slopes. Grades shall be established which are accurate to one-tenth of a foot (1/10') either way. Connect contours and spot elevations with an even slope.

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G. After loam has been spread, it shall be carefully prepared by scarifying or harrowing and hand raking. Remove all large stiff clods, lumps, brush, roots, stumps, litter and other foreign matter. Remove all stones over one inch (1") in diameter from the top three inches (3") of the loam bed. Loam shall also be free of smaller stones in excessive quantities as determined by the Engineer.

H. The whole surface shall then be compacted with a roller or other suitable means to achieve a maximum dry density of 88 to 90 percent for the placed loam in accordance with compaction standards of ASTM D1557 Method D. During the compaction process, all depressions caused by settlement or rolling shall be filled with additional loam and the surface shall be regraded and rolled until presenting a smooth and even finish corresponding to the required grades.

Incorporation of Additives

A. Soil additives shall be spread and thoroughly incorporated into the layer of loam by harrowing or other methods approved by the Engineer. The following soil additives shall be incorporated:

1. Ground limestone as required by soil analysis to achieve a pH of 6.0 to 6.5, but the maximum amount applied shall be one (1) pound per square yard.
2. Fertilizer at the rate of twenty (20) lbs. minimum per one thousand (1,000) square feet, or more, as recommended by the soil analysis.
3. Superphosphate at the rate of twenty (20) lbs. per one thousand (1,000) square feet.
4. Humus or other soil amendments as required by soil analysis.

B. Following the incorporation of additives, the surface shall be re-compacted as required to meet the standards outlined above.

Compensation

Measurement and Payment for this Item will be as specified in Section 751 of the Standard Specifications. If required, removal of existing pavements and other materials from within 12-inches of final surface grade shall be measured and paid for under Item 120.10. If required, placement of gravel borrow for subsoil beneath loam will be measured and paid for under Item 151.00.

RECONSTRUCTION OF BLANCHARD ROAD

ITEM 765.01
ITEM 765.022

SEEDING – TYPE 1
SEEDING – TYPE 2

SQUARE YARD
SQUARE YARD

Work to be done under these items shall conform to the relevant provisions of Section 765 of the Standard Specifications and the following:

MATERIALS

Type 1 Seed Mix

Shall be as specified for “Grass Plots and Islands” in the Standard Specifications.

Type 2 Seed Mix

Shall be “Tall Turf Seed Mix” as manufactured by Ernst Conservation Seeds, Meadville, PA, or approved equivalent product. Composition shall be as follows:

<u>Common Name</u>	<u>% by Weight</u>	<u>Germination (min.)</u>	<u>Purity (min.)</u>
Chewings Fescue	24.0%	90%	95%
Sheep Fescue	24.0%	90%	95%
SR3100 Hard Fescue	12.0%	90%	95%
Scaldis Hard Fescue	12.0%	90%	95%
Creeping Red Fescue	12.0%	90%	95%
Dawson Red Fescue	12.0%	90%	95%
Annual Rye	4.0%	90%	90%

Tall Fescue and Annual Rye grass varieties shall be within the top 50% and 25% respectively, of varieties tested in National Turfgrass Evaluation Program, or currently recommended as low-maintenance varieties by the University of Massachusetts – Amherst.

CONSTRUCTION METHODS

All newly seeded areas shall be fenced-off using plastic construction fencing or approved equivalent.

Type 1 Seeding: Shall be performed per the Standard Specifications.

Type 2 Seeding: Seeding rate shall be 9 pounds per 1,000 square feet.

RECONSTRUCTION OF BLANCHARD ROAD

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COMPENSATION

Measurement and Payment for these Items will be as specified in Section 765 of the Standard Specifications.

ITEM 767.80	BALES OF HAY FOR EROSION CONTROL	FOOT
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Work to be done under these items shall conform to the relevant provisions of Section 767 of the Standard Specifications, and the following:

The Contractor shall execute all operations, particularly those associated with roadway and sidewalk excavation and grading, in such a manner as to minimize the amount of excavated and exposed fill or other foreign material that is washed or otherwise carried into waterways. The water quality of waterways shall not be degraded due to construction operations.

Hay Bales

Hay bales shall consist of hay from acceptable grasses and legumes, free from weeds, reeds, twigs, chaff, debris, other objectionable material or excessive amounts of seeds and grain. It shall be free from rot or mold and the moisture content shall not exceed fifteen (15) percent by weight at the time of weighing.

The hay shall be securely baled with biodegradable twine of adequate size to allow for possible rusting while in use and to permit rehandling when the bale is in a saturated condition.

Individual bales shall be of a longitudinal shape not exceeding one hundred (100) pounds when weighed.

Construction Methods

The Contractor shall prevent the unnecessary occurrence of sedimentation or siltation of waterways and private properties. In the event the sedimentation or siltation prevention measures used prove to be inadequate as determined by the City, the Contractor shall be required to adjust his operations to the extent necessary to prevent any such sedimentation or siltation from occurring.

The Contractor shall keep streams, water crossings, and waterways clear of mud, silt, debris and other objectionable materials resulting from his construction operations.

Existing natural drainage patterns and vegetative cover shall be preserved to the maximum possible extent.

RECONSTRUCTION OF BLANCHARD ROAD

The Contractor shall use temporary vegetation and mulching or paving to protect areas exposed during construction, and shall minimize the amount of bare earth exposed at any one time during construction, and also minimize the length of time bare earth is exposed.

Baled hay shall be placed to form temporary water stops, dams, diversions, dikes, berms and for other uses connected with water pollution control; bales may be left in place or disposed of by the Contractor as best suits field conditions and requirements, all as directed by the City.

On sloping terrain, hay bales may be used to trap sediment until vegetation has become established. The details of their placement shall be as approved by the City.

ITEM 775.00 STREET TREE (2 ½” - 3” CALIPER) EACH

The work of this item shall conform to the requirements of the Technical Specifications for Tree Planting (Section 910 of the Specifications) and the following:

MATERIALS

Unless otherwise indicated on the Drawings, the specific species, or combination of species, of trees to be furnished and planted by the Contractor will be selected by the City Arborist at the time of planting from the following list:

<u>Botanical Name</u>	<u>Common Name</u>
Pyrus Calleryana	“Aristocrat” Callery Pear
Amelachier canadensis	“Autumn Brilliance” Serviceberry
Syringa reticulata	“Ivory Silk” Tree Lilac
Acer gresium	Paperback Maple
Acer buergerianum	Trident Maple
Prunus ceracifera	“Thundercloud” Purpleleaf Plum
Phellodendron amurense	Amur Cork Tree
Platanus x acerifolia “Bloodgood”	London Plane “Bloodgood”

CONSTRUCTION METHODS

In sidewalk areas, tree pit sizes shall be as directed by the Engineer, and standard planting method shall be per Specification Section 910. All tree pits shall be excavated entirely by hand.

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The Contractor's particular attention is drawn to paragraph 3-2 of Specification Section 910, which requires the Contractor to provide nursery information in advance, so that the City Arborist may have the opportunity to select and tag proposed planting material.

Replacement Trees: Trees which are to be replaced per Section 910 Subsection D.3, shall be of the same size, species, variety, and quality of the originals.

COMPENSATION

Measurement and payment for the work under Item 775.00. shall be as specified in Section 910 of the project specifications (Technical Specifications for Tree Planting).

ITEM 785.00	SHRUB	EACH
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The work of this item shall conform to the requirements of Section 771 of the Standard Specification; and the Technical Specifications for Tree Planting (Section 910 of the Specifications) as appropriate.

MATERIALS

Unless otherwise indicated on the Drawings, the specific species, or combination of species, of shrubs to be furnished and planted by the Contractor will be selected by the City Arborist at the time of planting from the following list:

- Annabelle Hydrangea (24"-30")
- Privet - Amur 24-30 Inch
- Fragrant Sumac "Grow Low" (3 Gallon)
- Karl Foerster Grass (2 Gallon)
- Stella Daylily (1 Gallon)
- Russian Sage (2 Gallon)
- Sedum "Autumn Joy" (1 Gallon)
- Walkers Low Catmint (1 Gallon)
- Dropmore Catmint (1 Gallon)
- Anise Hyssop (2 Gallon)
- Little Henry Sweetspire (3 Gallon)
- Dwarf Fothergilla (3 Gallon)

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CONSTRUCTION METHODS

Locations of shrubs shall be as directed by the Engineer and the City's Landscape Architect.

The Contractor's particular attention is drawn to paragraph 3-2 of Specification Section 910, which requires the Contractor to provide nursery information in advance, so that the City Arborist may have the opportunity to select and tag proposed planting material.

ITEM 816.90 TRAFFIC SIGNAL POST – REMOVED AND DISPOSED EACH

Work to be done under this item shall conform to the relevant provisions of Section 815 Of the Standard Specifications and the following:

The work under this Item consist of furnishing all necessary labor, materials and equipment required to remove existing traffic signal bases at the locations shown on the Drawings.

The Contractor shall arrange with NSTAR for the disconnection of the base from the electrical service connection point. The existing signal head, housing, post and footing, junction boxes and wire and cable shall be removed and legally disposed of off-site. Any voids left by the removal of underground items shall be backfilled with gravel borrow and compacted as specified under Item 151.00. Conduit may be plugged and abandoned in-place, provided it does not interfere with the work of this Contract.

COMPENSATION

Removal and disposal of traffic signal post will be measured for payment by the unit Each.

Payment for work under this Item shall be at the contract unit price per each. Payment shall constitute full compensation for all labor, materials, equipment and other incidentals necessary for the satisfactory completion of the work as specified (except as noted below), including but no limited to coordination with NSTAR, removal and disposal of existing equipment, excavation and abandoning existing conduits in place.

Gravel borrow backfill shall be measured and paid for under Item 151. Surface restoration shall be paid for under the appropriate items of the Contract.

RECONSTRUCTION OF BLANCHARD ROAD

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ITEM 819.83**LOOP DETECTOR REPLACEMENT****FOOT**Description

Work under Item 819.83 shall consist of furnishing and installing traffic signal loop detectors at locations as indicated on the plans and as directed by the Engineer.

Vehicle Loop Detectors

Each channel amplifier shall be labeled with the detector number. The detector lead-in cables shall be labeled, with the street name, phase, detector, number and terminal numbers both in the controller unit and in the pull box containing the detector lead-in splice. This labeling and attachment shall be of durable materials such as brass or plastic, attached by wire or plastic ties. Adhesive attachment of the label shall not be acceptable.

Wire loop detectors shall be installed in the roadway for vehicle detection. In advance of the loop detector installation, the Contractor shall mark, on site, the loop detectors with any changes required by field conditions such as manholes. The loop detector layout shall be inspected and approved by the Engineer before the loop detectors are installed.

Loop wire shall be encased in a protected plastic tubing of PVC or polyethylene plastic, IMSA 51-5, 1/4-inch outside diameter, and the wire may have cross-linked polyethylene insulation or it may have THHN/THWN insulation.

The heat source for soldering shall be electrical, not exceeding 30W capacity.

Splicing insulator shall be an approved re-enterable body splice kit with a non-hardening sealing compound compatible with the wire insulation. (Klick-it buried wire closure kit manufactured by Communication Technology, Inc., or approved equivalent).

Splice and Connection: Splicing and connection shall be made in the pull box nearest the roadway loop sensor but not exceeding four loops per pull box. All loops included in a detector group as shown on the plans shall be spliced in a single pull box. Each lead and lead-in connector shall be stripped back and spliced using a pressure type wire connector applied with a crimping tool. Multiple loop sensors shall be identified as detailed on the plans.

Lead-in splicing shall be staggered to prevent contact with each other. Each crimped splice shall be soldered and insulated. The insulation material shall be heat-shrunked polyolefin. The shielded lead-in cable outer jacket and shield shall be stripped back sufficiently to ensure that the shield cannot come into contact with the spliced conductors. Follow the instructions of the

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manufacturer when installing the re-enterable splice kit.

NOTE WELL: The above splice shall be done on the day of the loop wire installation to prevent the entrance of any moisture into the plastic tubing.

The lead-in conductors shall be connected to the appropriate terminals in the controller cabinet, by using crimped and soldered terminal ends. The heat source for soldering shall be electrical not exceeding 30W capacity.

Testing of Loops: The test procedure shall be performed in the presence of the Engineer before and after the loop sensor is sealed in the pavement as stipulated in subsection 815.66 of the Standard Specifications. The cost of equipment, labor, and materials to perform such testing and similar re- testing following repairs, replacement, or adjustment of any detector within the project area shall be included in the price bid for the traffic control signal items.

After installation of wire loop sensors in the roadway and installation of shielded lead-in connecting the loop sensors to the controller cabinet, each loop sensor and lead-in combination shall be tested (at the controller cabinet) for proper installation. The resistance from lead to lead of the same loop shall not exceed three (3) ohms per one thousand (1000) feet as measured by a high quality meter suitable for measurements of low resistance in the range of 1 to 6 ohms.

A megohm meter test at 500 volts DC shall be made between the two leads of a loop/lead-in combination temporarily spliced together, but otherwise disconnected from all terminals, and the shield drain wire and the earth ground connection. These resistances shall be at least one hundred (100) megohms.

A megohm meter test at 500 volts DC shall be made between lead-in shield and the earth ground rod. This resistance shall be at least one hundred (100) megohms.

The meter used for these tests shall be checked for calibration each day of use by using a resistor block of $\pm 5\%$ resistors simulating loads of 1 megohm, 20 megohm and 100 megohms. The observed meter reading shall be $+10\%$ of the nominal resistor load.

Compensation:

The unit price per foot bid for Item 819.83 shall constitute full compensation for all labor, materials and equipment necessary for or incidental to the removal and disposal of existing traffic signal loop detector at the locations indicated; and furnishing and installation of new loop detector and lead-in cable as specified herein; including sawcutting, sealing, connections,

splicing, and all other work necessary to complete this item.

**ITEM 832.10 WARNING-REGULATORY AND ROUTE MARKER -
ALUMINUM PANEL (TYPE A) SQUARE FOOT**

Work to be done under this item shall conform to the relevant provisions of Section 828 of Standard Specifications and to the following:

The location, number and legend of new signs which are required shall be as shown on the Drawings or as directed by the Engineer. Signs will be mounted on posts which are furnished and paid for under Item 877.00.

The work under this Item includes all hardware, brackets, bolts, labor, etc. necessary to attach new sign panels to posts furnished under Item 877.00.

Signs

The legend, border, and background of sign panels (except as modified below) shall be Type "C", permanently applied legend, or Type "D", silk screen processed, according to the requirements of Section M9.30.0 of the Standard Specifications, Type III or Type IV.

Compensation

Signs will be measured for payment as specified in Section 828 of the Standard Specifications. Object Markers will also be measured and paid for under this Item.

Payment for work under this item shall be at the contract unit price per square foot, and shall include full compensation for all labor, materials, equipment, and other incidentals necessary for the satisfactory completion of the work as specified.

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ITEM 864.01	PAVEMENT ARROWS AND LEGENDS	SQUARE FOOT
	REFLECTIVE WHITE TAPE	
ITEM 866.04	4" REFLECTORIZED WHITE LINE - THERMO.	FOOT
ITEM 866.12	12" REFLECTORIZED WHITE LINE - THERMO.	FOOT
ITEM 866.24	24" REFLECTORIZED WHITE LINE - THERMO.	FOOT
ITEM 867.04	4" REFLECTORIZED YELLOW LINE - THERMO	FOOT
ITEM 867.08	8" REFLECTORIZED YELLOW LINE - THERMO.	FOOT

Work to be done under this item shall conform to the relevant provisions of Section 860 of the Standard Specifications and the following:

Materials

Reflective tape for pavement arrows and legends shall be 3M Stamark Series 380I, or approved equivalent product.

Construction Methods

Broken lines through intersections (vehicular and bicycle) are indicated only graphically on the Drawings. Actual pattern shall be 4-foot line and 4-foot space.

Pavement markings shall not be installed until a minimum of 15 days after final paving is completed. The Contractor shall notify the City of Cambridge Traffic Engineer at least 72 hours in advance of scheduled pavement marking installation. The exact location of pavement markings will be determined by the City's Traffic Engineer at the time of installation. The City's Traffic Engineer or representative must be present to supervise the pavement marking operations.

See Section 00850 of the Specifications for additional schedule requirements and restrictions.

Compensation

Reflectorized pavement markings will be measured and paid for as specified in Section 860 of the Standard Specifications, except the quantity of broken lines shall be 1/3 of the end-to-end length of the line.

ITEM 864.23 RAISED PAVEMENT MARKER – TWO WAY – WHITE/RED EACH
ITEM 864.24 RAISED PAVEMENT MARKER – TWO WAY – YELLOW/RED EACH
ITEM 864.25 RAISED PAVEMENT MARKER – TWO WAY – YELLOW/YELLOW EACH

Work to be done under this item shall conform to the relevant provisions of Section 860 of the Standard Specifications and the following:

MATERIALS

Each markers shall consist of an iron casting to which is attached a replaceable snowplowable marker insert for reflecting light from a single or opposite directions. Nodular Iron shall conform to ASTM A536-84 Hardened to 52-54 Rockwell “C”.

Surfaces of casting shall be free of scale, dirt, rust, oil, grease or any other contaminant which may reduce its bond to the installation adhesive.

Reflector shall feature: Polycarbonate prismatic optics, abrasion resistant lens hardcoat, and impact resistant polycarbonate body.

All aspects of reflector installation shall factory controlled to insure proper adhesion to casting.

Markers shall be as manufactured by Hallen Products, Model H960 “Low Profile” or approved equivalent product from the current Massachusetts Highway Department “Approved Products” list.

Dimensions

Overall dimensions of each marker shall be as follows: 9.3 inches long; 5.86 inches wide; 1.7inches high. The installed height of the marker shall be approximately .250 inches above road surface.

Each marker shall weigh approximately 5 pounds, and be marked with manufacturer’s name and model number of marker.

CONSTRUCTION METHODS

Markers shall be installed in strict accordance with manufacturers recommendations.

Markers shall be placed with keels parallel to centerline pavement markings, and as indicated on the Drawings. Marker placement shall be reviewed with the Engineer in the field prior to

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placement.

ITEM 877.00

TRAFFIC SIGN POST

EACH

Work to be done under this item shall consist of furnishing and installing new traffic sign posts as shown on the Drawings, as directed by the Engineer and in conformance with City of Cambridge Department of Traffic, Parking and Transportation specifications.

New Posts: New posts shall be galvanized steel flanged channel sign support systems for the mounting of traffic signs, street name signs and safety devices as manufactured by Franklin Steel or EZE-Erect or equal.

Note well: It is critical that traffic sign posts not impede accessible pedestrian access. The Contractor shall install signposts in locations shown on the Drawings, and at additional locations as directed by the Engineer, prior to installation of sidewalk. In general, sign posts located in landscaped areas shall be located 24" from the front of curb face. Sign posts located in sidewalk areas shall be located at the back of sidewalk. All sign post locations shall be verified in the field with the Engineer prior to placement.

The Contractor shall install into the ground a 3' long – 3 lbs/ft galvanized steel flange channel post base with the top of base 8" above sidewalk grade and attach using mounting system by Franklin Steel or EZE-Erect or equal safety system to a 10' long – 2 lbs/ft galvanized steel flange channel post.

Post base shall be installed into a cored 2 1/4" hole in newly placed concrete (or HMA base in brick areas) with hole around post base filled in with sand. As an alternative, concrete or HMA may be placed directly around the post base.

Care shall be taken to install sign post bases in the appropriate direction for sign attachments and proper viewing. All signs shall be installed as high as possible on post with no sign being lower than 7 feet from final sidewalk grade. Sign bases shall be protected with safety barriers prior to installation of signposts. The Contractor shall install signposts and attach signs within 24 hours after sidewalk installation.

Signs Removed and Reset: Where signs are to be removed and reset, as indicated on the Drawings or as directed by the Engineer, the work shall be considered incidental to the related sidewalk item. The Contractor shall be responsible for temporary storage of non-regulatory signs until they are ready to be reset. Regulatory signs shall remain in place at all times, either at their

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existing or new location as appropriate for the stage of construction. Temporary regulatory signs shall be utilized during any time that permanent regulatory signs need to be removed for construction and cannot be permanently reset at new location.

The Engineer will determine if the existing signs and post are in adequate condition for reinstallation. If signs or post or both are in poor condition, the Engineer will notify the Contractor to stack the signs on-site for future Cambridge Traffic Department disposal, and posts shall be disposed of by the Contractor. The Contractor will furnish and install new signs and posts, which will be paid for under the appropriate items of the Contract.

Signs Removed and Stacked: Where signs are indicated to be removed and stacked, as indicated on the Drawings or as directed by the Engineer, the Contractor shall carefully remove the existing sign from the post, dispose of the existing sign post, and deliver the sign to the Department of Traffic, Parking and Transportation yard at 59 First Street, Cambridge. This work shall be considered incidental to the related sidewalk item.

Compensation

Traffic signposts shall be measured by the unit each, complete in place.

Payment for work under these items shall be at the contract unit price per each and shall include full compensation for all labor, materials, equipment, and other incidentals necessary for the satisfactory completion of the work as specified.

ITEM 900.01	PUBLIC ART COORDINATION	LUMP SUM
ITEM 900.02	SCULPTURE FOUNDATION	FOOT

Work to be done under these items shall consist of coordinating with the City and project artist on the location and installation of a public art sculpture; furnishing and installing concrete footings and structural steel anchoring materials, to facilitate installation, by others, of a public art sculpture. The work of this Item shall conform to the relevant requirements of Section 900 of the Standard Specifications, and the following:

MATERIALS

Concrete Footing and Structural Steel Anchor Bolts:

Shall conform to the Section 900 of the Standard Specifications and the details shown on the Drawings.

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Epoxy:

Shall conform to the specifications included on the Drawings. The Contractor shall submit manufacturers information on the product to be used, for approval by the Engineer.

Crushed Bluestone Mulch

Crushed Bluestone Mulch: Shall be durable crushed bluestone, blue-grey in color, consisting of the angular fragments obtained by breaking or crushing solid or shattered natural rock and free from any foreign material. The Contractor shall furnish a 5-pound sample prior to installation, for approval by the Engineer. Crushed stone mulch shall conform to the following gradation:

<i>Square Opening Sieve</i>	<i>Percent Passing Through by Weight</i>
1/2"	100
3/8"	85 - 100
No. 4	20 - 40
No. 8	0 - 15
No. 16	0 - 5

CONSTRUCTION METHODS

The sculpture will consist of a series of Cor-Ten steel tubes attached to steel channels, which are in turn attached to a concrete footing. The approximate location, orientation, and dimensions of the required footing are shown on the Drawings. The final site selection, orientation and size will be confirmed between the City, Artist, and Contractor as part of the work of Item 900.01, and must be performed prior to any field work under Item 900.02.

Work Under Item 900.01

The Contractor shall anticipate that the work under Item 900.01 will include up to three (3) site meetings with the City and Project Artist; coordination with Artist on final dimensions and orientation of the sculpture foundation; coordination with utilities regarding precise locations and depth of facilities at the sculpture location; coordination with National Grid (Keyspan) on possible relocation of existing gas main by National Grid.

The Contractor shall also provide access to the project site as required by the Project Artist and the Artists' transportation and labor forces; and shall make adequate storage and staging areas

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available within the Project Limits.

Final site selection may result in a required relocation of a section of cement concrete sidewalk. This work, if required, shall be performed under the appropriate sidewalk items of the Contract.

Work Under Item 900.02

Item 900.02 consists of the actual construction of the sculpture foundation. The Contractor shall assume the following division of responsibilities

Responsibilities of the Project Artist

The artist will furnish the steel channels; and will furnish and install the Cor-Ten steel sculpture. The artist will be responsible for all off-site and on-site assembly of the sculpture, including transportation and rigging required.

Responsibilities of the Contractor

The Contractor shall excavate and place the concrete footing; attach the artist-supplied steel channels to the footing; backfill with bluestone mulch; and restore surface conditions at the site.

COMPENSATION

Payment for Item 900.01 will be at the contract lump sum price bid, which shall constitute full compensation for site meetings; direct coordination with the artist and the City; coordination with utility companies; and provision of access and staging/storage areas.

Payment for Item 900.02 will be at the contract unit price bid per foot, which shall constitute full compensation for all required work, including but not limited to: excavation; site protection and temporary fencing; traffic control; furnishing and placing gravel borrow, concrete foundation and crushed bluestone mulch; attachment of steel channels (furnished by others) to concrete footing; and restoration of adjacent disturbed areas.

Sidewalk work, if required, will be paid for under the appropriate sidewalk items in the Contract.

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TECHNICAL SPECIFICATIONS FOR TREE PLANTING RECONSTRUCTION OF BLANCHARD ROAD

PART 1 SCOPE OF WORK

- 1-1 The tree planting will be directed by the City Arborist. The Arborist will make any changes or instruct the Contractor if any omission, contractual or otherwise, is noticed during the planting operation.
- 1-2 All work shall be done in a safe and workman-like manner, in compliance with the rules and regulations of the Division of Industrial Safety and all other City and State agencies and authorities having jurisdiction of the types of work included in this Contract.
- 1-3 A Mass Certified Arborist or Massachusetts Certified Nursery person will carry out the planting of City of Cambridge Public Shade Trees. These persons will be at the work site for all planting operations.
- 1-4 Names of Massachusetts Certified Arborist (MCA) or Massachusetts Certified Nurserymen (MCN) will be submitted and approved by the City Arborist before any planting occurs.
- 1-5 **Definitions:** Whenever used in any of the Contract Documents, the following meanings shall be given to the terms herein defined:
 - A. The term "Contract" means the agreement executed by the Owner and the Contractor, consisting of these Contract Documents.
 - B. The term "Owner" means the City of Cambridge acting through its authorized representative, the Commissioner of Public Works, whose responsibility it shall be to coordinate review and approval by City, State and Federal departments and agencies which have jurisdiction over the various types of work to be carried out under this contract.
 - C. The term "Public Works Department (PWD)" means those persons employed by the Commissioner of Public Works for the purpose of directing or having charge of the work of this Contract or a portion thereof, limited by the particular duties entrusted to that person.
 - D. The term "Local Public Agency" means the Public Works Department.
 - E. The term "Awarding Authority" means the Public Works Department.

- F. The term "Contractor" means the person, firm or corporation entering into the Contract with the Owner to construct and install improvements embraced in this Contract.
- G. The term "Contract Documents" means and shall include the following: Invitation to Bid; Bid Requirements; Contract Forms; Bonds and Certificates; Conditions of Contract; Addenda; if any; Technical Specifications; and Drawings.
- H. The words "directed", "required", "permitted", "ordered", "designated", "prescribed", or words of like import shall mean the direction, requirement, permission, order, designation, prescription, etc. of the Owner or the Owner's representatives, and similarly, the words "approved", "acceptable", "satisfactory", or words of like import, shall mean approved by, or acceptable or satisfactory to the Owner's authorized representative, subject in each case to the final determination of the Owner unless otherwise expressly stated.
- I. The terms "City" means the City of Cambridge, Massachusetts, within which the work of this Contract is to be carried out.
- J. The term "MHD" Standard Specifications" or "Standard Specifications" refers to the latest edition of the Massachusetts Highway Department Standard Specifications for Highways and Bridges, including supplements and amendments.

- 1-6 **Description of Work:** Contractor is to furnish all labor, materials, equipment and transportation required to complete all the planting work in strict accordance with these specifications and applicable drawings. Work shall include but not be limited to:
- a. Submitting samples of materials and/or analyses for approval.
 - b. Securing necessary permits and approvals.
 - c. Excavating, removing unsuitable material and back-filling of planting area.
 - d. Furnishing specified plant materials for installation and all necessary planting operations including fertilizing, mulching, watering, staking and guying. (omit spraying)
 - e. Furnishing and installing Iron Edge along the edge of tree pits located within brick sidewalk areas. The Iron Edge shall meet the specifications contained in ITEM 706.16 BRICK WALK ON 6" HMA BASE.
 - f. Cleaning up of sites at the end of planting operations.
 - g. Maintaining, protecting, weeding, pruning damaged or broken limbs, and replacing dead plants during the guarantee period.

PART 2 PRODUCTS

2-1 Topsoil

Contractor shall provide all topsoil required to complete the planting operation. Topsoil shall be a natural, fertile, friable loam typical of cultivated topsoil of the locality, containing at least 10% and not more than 20% decayed organic matter (humus). Topsoil shall be free of sub-soil, large stones, earth clods, sticks, stumps, clay lumps, roots, or other objectionable, extraneous matter or debris. Topsoil shall not be by test either excessively acid or alkaline nor contain toxic substances. Topsoil shall not be delivered or used for planting while in a frozen or muddy condition. Name of supplier and sample to be approved by the City Arborist.

2-2 Fertilizer

Fertilizer shall be a complete, slow-release, root contact packet, 16-8-16, or equal, and a standard product complying with State and Federal Fertilizer Laws. Name of supplier and sample to be approved by the City Arborist.

2-3 Water

Water furnished by the Contractor will be free of ingredients harmful to humans and plant life. The Contractor will supply hoses and other watering equipment required for the work.

2-4 Mulch

Mulch shall consist of clean, organic plant material. The mulch must be free of dirt and materials deleterious to plant life. Name of supplier and sample to be approved by City Arborist.

2-5 Staking

Stakes will be wood, 2" x 3" in size, pointed at one end. Tree ties shall be black polyester straps. Both must be approved by the City Arborist.

2-6 Aeration/Watering Device

Aeration/watering device shall be model RWS-G Root Watering System by RainBird, Inc. or approved equivalent product. Devices shall consist of a grate retainer constructed from high-grade polymer with UV resistant thermoplastic inhibitors. The grate retainer shall fasten to a basket weave canister. The canister shall be a high grade polymer rigid mesh cylinder 34" in length. Canisters shall be fitted with a sand sock filter.

2-7 Plant Materials

- a. Plant Identification and Standards: The nomenclature used in the plant list generally conforms to that of the current edition of Standardized Plant Names, as adopted by the American Joint Committee on Horticultural Nomenclature. All plants shall conform to the varieties and sizes specified in the Plant List, and to the code of standards set forth in the current edition of

American Standard for Nursery Stock. Substitutions will not be permitted without the consent of the City Arborist.

- b. **Plant List:** The Contractor shall supply the plants necessary to complete the work as intended. Where the size of a plant on the Plant List is a variation between a minimum and maximum dimension, the sizes of the plants furnished will be equal to the average of the two dimensions. Where a single dimension is given, this dimension represents the minimum size of the plants to be furnished.
- c. **General Trees:** All plants shall be nursery-grown whether balled and burlapped or container grown. The plants shall be typical of their species and variety. Trees shall be straight, symmetrical with a crown having a persistent main leader, be growing from a single, healthy root system with no girdling roots. All plants shall be sound and healthy free from defects, disfiguring knots, sun scald, and injuries or abrasions of the bark. They shall be free of plant diseases, pests, scale and all forms of infestations, and possess a normal balance between height and spread. Pruning wounds over ¾ inch in diameter must be completely callused over.
- d. **Tree Limb Structure:** All limbs on large trees maturing over 30 feet must originate on the trunk at 7 feet above the top of root ball. Small trees maturing less than 30 feet must have limbs that start no lower than 5 feet. All trees will be selected by the City Arborist.

2-8 **Plant Root Balls:** All plants either balled and burlapped or container grown shall retain root systems as solid units. The diameter and depth of the balls of soil must be sufficient to encompass the fibrous and feeding root system necessary for the healthy development of each plant. No plant shall be accepted when the ball of earth surrounding its roots has been badly cracked or broken, either before or during the process of planting. The plants and root balls shall remain intact as a unit during all operations. All plants that cannot be planted right away must be protected and watered.

2-9 **Plant Labels:** Plant labels shall be provided by the Contractor for each tree and shall be durable, legible labels, stating the correct tree name and size, in weather resistant ink or embossed process lettering, and can be removed at end of contract.

PART 3 CONSTRUCTION METHODS

3-1 Planting Season

Planting can occur under normal, favorable weather conditions. Planting will not be permitted as determined by the City Arborist under adverse weather conditions such as when the ground is frozen or during extreme heat.

3-2 Plant Selection

The City Arborist will select and tag all specified plant material at the nursery

locations.

3-3 Plant Delivery

The Contractor will inspect and approve all trees at the nursery(ies) prior to pick up. However, this does not alter the right of the City Arborist to inspect and reject unsuitable trees delivered to the planting site.

3-4 Plant Storage

Plants shall be delivered to the Contractor's storage site and to the planting site in a well-watered and vigorous condition. All unplanted plants shall be protected at all times from sun and drying winds. Care must be taken so as not to damage bark, break branches, or cause injury to the tree.

3-5 General Planting

- a. Prior to planting, the City Arborist will supply in writing to the Contractor specified tree planting locations showing the tree selected and approved.
- b. Planting areas may need pavement removal as directed by the City Arborist. All materials excavated from the planting areas and considered detrimental to the growth of the trees, such as an existing tree or stump, sidewalk paving, rocks, sub-soil and debris, shall not be reused for fill or in the planting operation, and must be removed from the site.
- c. Any unexpected obstructions at the site that interfere with the tree planting operation will be communicated to the City Arborist to determine a solution before planting occurs.
- d. Soil of very poor quality or heavy clay encountered by the Contractor must be reported to the City Arborist for removal and amended as directed.

3-6 Tree Installation

- a. Trees shall be plumb, faced to give best appearance, and planted at the center of the planting areas.
- b. Trunk flare must be visible and free of adventitious roots.
- c. Place the tree in the planting hole so that the top of the root ball where the trunk flare is visible is 2" above the established sidewalk level.
- d. Any non-degradable materials used in wrapping the root ball must be entirely and carefully removed so as not to disturb the roots. Cut as much of the degradable burlap and rope from around the top of the ball as possible. If a wire basket is present after the root ball is securely in place, cut off as much wire as possible. Carefully cut containers and remove plant balls keeping the root ball intact. All materials cut away from the root balls must be removed from the site.
- e. Install watering/aeration loop before back-filling according to the direction and approval of the City Arborist.

3-7 Aeration/Watering Devices

Devices shall be evenly spaced and positioned against the root ball or root mass. Two units shall be provided per tree. Units shall be placed vertically with the top even with the ground surface. Areas surrounding the devices shall be backfilled with soil after placement.

3-8 Fertilizing

Insert approved slow-release plant packets, number according to the caliper of the tree with the approval of the City Arborist before back-filling.

3-9 Back-filling

- a. Carefully backfill by hand the approved topsoil in layers and water each layer thoroughly to fill all voids and allow to settle. Finish back-filling to a depth that finished grade level at settlement will be at established sidewalk level.
- b. Surround each tree with a shoulder of topsoil to form a temporary saucer, 3 inches deep and equal to the diameter of the planting hole.

3-10 Watering

At the time of planting judiciously flood plants with water. The Contractor will also include in his base bid costs for watering trees twice a week exclusive of Saturdays, Sundays and holidays for a period of 30 days from the date of planting.

3-11 Mulching

Immediately after planting operations are complete, the planting areas shall be covered with 2 inches of approved mulch. Keep mulch away from the base of the tree so that the mulch is not in contact with the trunk flare.

3-12 Staking

Place 2 or 3 wood stakes equally spaced, not higher than $\frac{1}{2}$ the height of the tree, to avoid root damage or damage to the watering/aeration loop. Line up stakes parallel to the curb line and planting area and at a reasonable distance from the trunk to prevent movement of the tree and root system.

3-13 Pruning

Prune only badly bruised, broken, or crossing limbs.

3-14 Clean Up

After completion of the work, the Contractor shall remove all debris, materials, rubbish, and excess soil from the site and dispose of them in a manner satisfactory to the City Arborist.

3-15 Backflow Prevention Devices

When hydrants are being used, the Cambridge Water System must be protected with backflow prevention devices as per Massachusetts Department of

Environmental Protection (DEP) Regulations 310 CMR 22.22 and as per the Cambridge Water Department Cross Connection Control Program. Backflow prevention device must also be used during street sweeping, sewer flushing, paving operations and hookups for any other purpose.

PART 4 MAINTENANCE, GUARANTEE AND REPLACEMENTS

4-1 Maintenance

Maintenance shall begin immediately after planting and shall continue until final inspection and acceptance. Maintenance will include: watering, re-mulching, weeding, repositioning stakes, removal of dead or broken limbs, maintaining the planting saucer, etc. Watering by the Contractor for the remainder of the guarantee period should be at least once a week or as acceptable to the City Arborist.

4-2 Guarantee

Trees will be guaranteed for a minimum period of time of one (1) year after the initial acceptance. Trees planted in spring shall be alive and in satisfactory growth on June 1 of the following year. If planted in the fall, trees shall be alive and in satisfactory growth on October 1 of the following year.

4-3 Replacements

- a. During the guarantee period, dead, unsightly or unhealthy trees should be removed promptly and replaced by the Contractor as directed by the City Arborist.
- b. Vandalized trees should be brought to the attention of the City Arborist.

PART 5 INSPECTION AND ACCEPTANCE

- 5-1** Written notices requesting all inspections must be received by City Arborist at least five days prior to anticipated inspection dates. All work in the Contract shall be found in neat, clean and safe condition.

5-2 Semi-Final Inspection

The Contractor may offer for acceptance the entire project or a completed readily defined area, if approved by the City Arborist. Semi-Final inspection will be made by the City Arborist upon completion of all work included herein.

5-3 Semi-Final Acceptance

The City Arborist will notify Contractor in writing of acceptance in whole or in part of work, exclusive of maintenance and possible replacement of plants subject to

guarantee, or of requirements for completion if deficiencies exist. Work will not be submitted for payment without the City Arborist's written acceptance.

5-4 Final Inspection and Acceptance

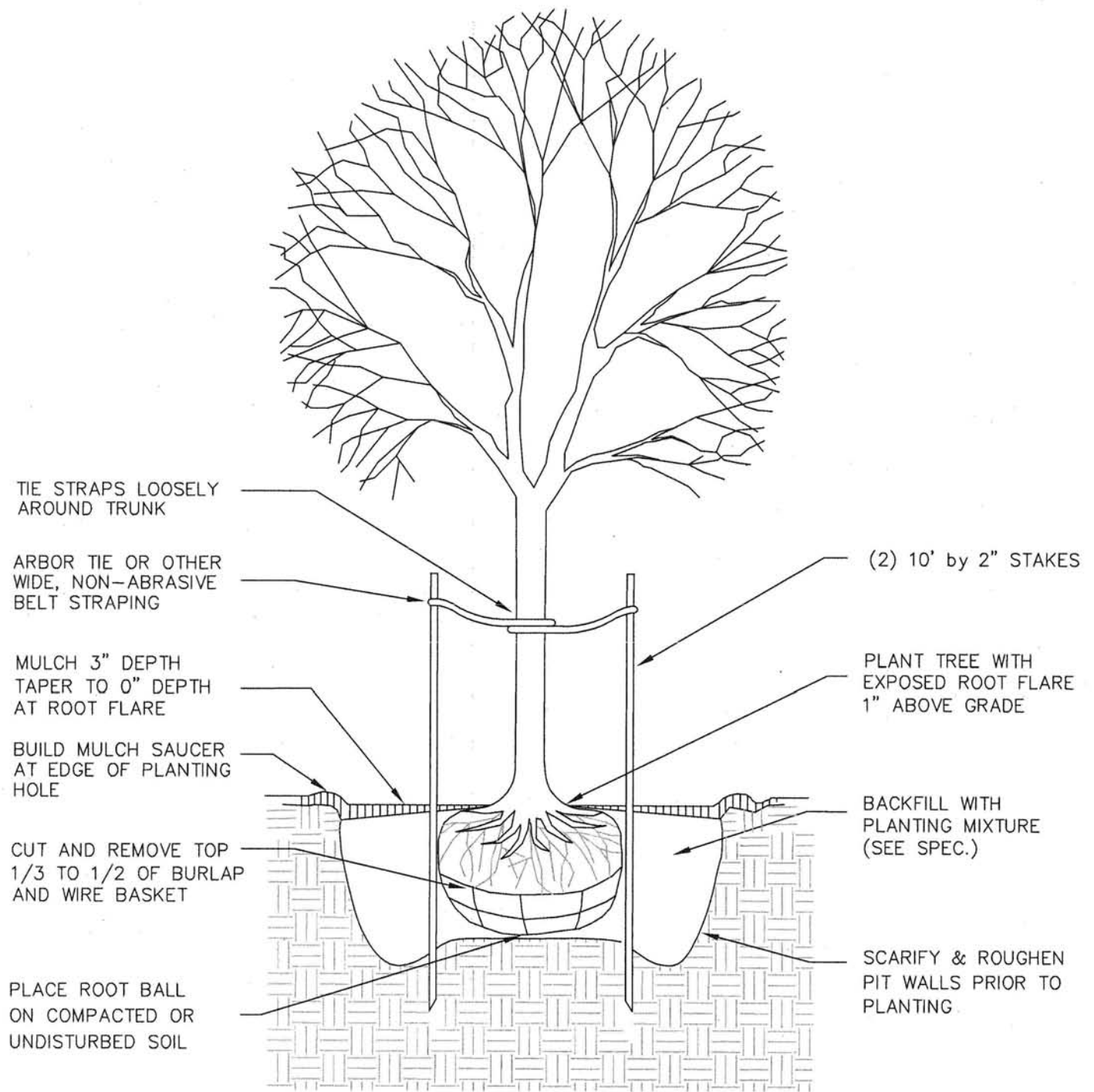
At end of maintenance and Guarantee Period, and upon written application from the Contractor, the City Arborist shall determine acceptability of completed work.

Dead, missing or unhealthy plants shall be replaced during next planting season. If a substantial number of plants are unsatisfactory, missing or dead, acceptance will not be granted until replacements are made and the Contractor's responsibility for the maintenance and guarantee will be extended.

PART 6 MEASUREMENT AND PAYMENT

- 6-1** Payment under the Contract items (see Section 00900) will be for the number of trees of the specified kind and size furnished and planted by the Contractor and accepted in accordance with these Specifications. Payment for these items will not occur until the tree is planted and accepted

The unit price per tree planted shall be full compensation for purchasing and delivering, offloading, receiving, handling and caring for all trees in the laydown area and work sites, transportation between the laydown area and work sites, furnishing and delivering prepared backfill soil, mulch, and fertilizer packets, removal of existing surface material at tree pit location, digging of pits, removal of excavated materials, planting of trees, installation of aeration/watering devices, pruning, staking, guying, wrapping, mulching, weeding, watering, cleanup, plant establishment work and care, maintenance replacement, and for all labor, equipment, tools and incidentals necessary to complete the work, and for the Contractor's and Owner's representative costs of selecting and tagging the trees, and for the one (1) year guarantee and replacement if required.



CITY OF CAMBRIDGE
DECIDUOUS TREE PLANTING

SECTION 00950
CONSTRUCTION DETAILS

FORM FOR GENERAL BID

To the Awarding Authority:

A. The undersigned proposes to furnish all labor and materials required for

RECONSTRUCTION OF BLANCHARD ROAD

CAMBRIDGE, MA

in accordance with the accompanying plans and specifications including all Labor and Materials, for the contract price specified below, subject to additions and deductions according to the terms of the specifications.

PLEASE SUBMIT YOUR BID IN DUPLICATE.

B. QUALITY REQUIREMENTS

THE CITY OF CAMBRIDGE WILL REJECT ANY BID THAT DOES NOT MEET THE QUALITY REQUIREMENTS. A "NO" RESPONSE OR A FAILURE TO RESPOND TO ANY OF THE FOLLOWING QUALITY REQUIREMENTS WILL RESULT IN A REJECTION OF YOUR BID.

THE BIDDER MAY UTILIZE SUBCONTRACTOR'S QUALIFICATIONS FOR RESPONDING TO THE QUALITY REQUIREMENTS. HOWEVER, THE BIDDER IS SPECIFICALLY ADVISED THAT ANY PERSON, FIRM OR OTHER PARTY TO WHOM IT PROPOSES TO AWARD A SUBCONTRACT UNDER THE TERMS OF THIS CONTRACT MUST BE ACCEPTABLE TO THE OWNER AND TO THE COMMONWEALTH OF MASSACHUSETTS.

THE BIDDER MUST PROVIDE REFERENCES INCLUDING TELEPHONE NUMBER AND CONTACT NAMES FROM AT LEAST THREE LOCATIONS WHERE THEY ARE CURRENTLY PROVIDING THE SAME SERVICES. REFERENCES WILL BE USED IN DETERMINING THE RESPONSIBILITY OF THE BIDDER. THE CITY RESERVES THE RIGHT OT USE ITSELF AS A REFERENCE.

- | | | |
|---|-----|----|
| 1. Bidder has worked under contract with the Commonwealth of Massachusetts or City of Cambridge within the past five (5) years to perform bituminous concrete excavation by cold-planing, full depth excavation and placement of roadway pavement meeting the 1988 MHD Standard Specifications. | YES | NO |
| 2. Bidder has paving equipment with a spreader which is a minimum of ten (10) feet wide, two (2) mechanical and rubber tire rollers weighing a minimum of ten (10) tons each and back up equipment in the event of breakdown. | YES | NO |
| 3. Bidder has an emulsion truck equipped with a tachometer pressure gauge, volume measuring devices and a thermometer for reading the temperature of tank contents. | YES | NO |
| 4. Bidder has appropriate equipment and tools and competent personnel to perform the work of this contract and will submit | YES | NO |

Bidder's Name _____

00300-17

employee qualifications if requested by the Office of the City Engineer.

- | | | |
|---|-----|----|
| 5. Bidder has a minimum of three (3) years of Municipal experience in thermoplastic pavement markings work. | YES | NO |
| 6. Bidder has performed sidewalk reconstruction and pedestrian ramps in conformance with the ADA Act. | YES | NO |
| 7. It is true that the Bidder is currently not in bankruptcy. | YES | NO |
| 8. Bidder can provide, upon request, proof of financial solvency. | YES | NO |

C. This bid includes addenda numbered _____

D. The proposed contract price for the BASE BID
is _____ DOLLARS
(\$ _____)

E. The subdivision of the proposed contract price is as follows: **(All quantities are approximate)**

(SEE FOLLOWING PAGES)

- F. The undersigned agrees if selected as General Contractor, within ten (10) working days after presentation thereof by the City, the Contractor will:
1. Execute a contract in accordance with the terms of this general bid;
 2. Furnish a performance bond and a labor and materials or payment bond;
 - a. of a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the City;
 - b. in the sum of one hundred percent of the contract price;
 - c. premiums for each are to be paid by the General Contractor.
 3. provide an Insurance certificate specifying the City of Cambridge as **Additional Insured**, complying with the Insurance requirements set forth herein in the General Terms and Conditions of the contract, Article 8.
- G. Bidder understands that the Owner reserves the right to reject any or all bids and to waive any minor informalities in the bidding prices.
- H. Amounts are to be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.
- I. The bidder hereby certifies it shall comply with the minority workforce ratios and specific action contained in the Cambridge Employment Plan, the Supplemental Equal Employment Opportunity Program and the Americans with Disabilities Act. 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 same.
- J. The bidder agrees that this bid shall be good and may not be withdrawn for a period of 90 days after the scheduled closing time for receiving bids.
- K. The bid security attached in the sum of _____ (\$ _____) is to become the property of the Owner in the event the contract and bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

The undersigned certifies that it possesses the skill, ability and integrity necessary for the faithful performance of the work; that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and who, where the provisions of section 8B of chapter 29 apply, shall have been determined to be qualified thereunder; and who obtains within 10 days of the notification of contract award the security by bond required under section 29 of chapter 149; provided that for the purposes of this section the term "security by bond" shall mean the bond of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority.

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

"I certify under the penalties of perjury that I have complied with all of the laws of the Commonwealth of Massachusetts relating to taxes, reporting of employees and contractors, and withholding and remitting child support".

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

Date _____

BY:

(Signature)

(Name of General Bidder)

(Title)

(Business Address)

(City and State)

Bidder's Name _____