CITY OF NEWTON

PURCHASING DEPARTMENT

CONTRACT FOR PUBLIC WORKS DEPARTMENT
(M.G.L. Ch. 30, Sec. 39m)

PROJECT MANUAL:

KENDRICK / NAHANTON STREET BRIDGE IMPROVEMENTS

INVITATION

FOR BID #11-88

Bid Opening Date: June 3, 2011 at 11:00 a.m.

BETA GROUP, INC.

315 Norwood Park South

Norwood, MA 02062

Christopher W. Jones, P.E., Project Manager

MAY 2011

Setti D. Warren, Mayor

CITY OF NEWTON, MASSACHUSETTS

PURCHASING DEPARTMENT
purchasing@newtonma.gov
Fax (617) 796-1227

June 3, 2011

ADDENDUM #2

INVITATION FOR BID #11-88

KENDRICK ST – NAHANTON ST BRIDGE IMPROVEMENTS PROJECT

THIS ADDENDUM IS TO: Change the Bid Opening Date and to include the Police Allowance.

BID OPENING DATE: JUNE 7, 2011 AT 11:00 A.M.

THIS ADDENDUM IS TO INCLUDE A POLICY ALLOWANCE WHICH WAS OMITTED FROM THE ORIGINAL BID DOCUMENT. THE CITY HAS ATTACHED THE PRICE SHEET WHICH STATES THE POLICE ALLOWANCE TO BE $10,000.00. THE BIDDER IS TO REPLACE THE ATTACHED PRICE SHEET FOR THE ORIGINAL BID SHEET.

All other terms and conditions of this bid remain unchanged

PLEASE ENSURE THAT YOU ACKNOWLEDGE THIS ADDENDUM ON YOUR BID FORM.

Thank you.

Rositha Durham

Rositha Durham
Chief Procurement Officer

ITEM DESCRIPTION & BID PRICE	QUANTITIES	UNIT	TOTAL COST
ITEM: **965 – MEMBRANE WATERPROOFING FOR BRIDGE DECKS** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE YARD**	**730**	**SY.**	$_____
ITEM: **966.– WATERPROOFING PROTECTIVE COURSE** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE YARD**	**10**	**SY.**	$_____
ITEM: **983.1– RIPRAP** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **TON**	**130**	**TON.**	$_____
ITEM: **983.12 – CONCRETE GROUT FILLED FABRIC BAGS** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC FEET**	**400**	**CF.**	$_____
ITEM: **999.9 – POLICE ALLOWANCE** THE SUM OF: __TEN THOUSAND _____ DOLLARS AND_____NO_____ CENTS ($_10,000.00_____) PER **LUMP SUM**	**1**	**LS.**	$ 10,000.00

TOTAL BID PRICE : $

(Total Bid Price must be entered in "PARAGRAPH C" of the BID FORM).

END OF SECTION

CITY OF NEWTON, MASSACHUSETTS

PURCHASING DEPARTMENT
purchasing@newtonma.gov
Fax (617) 796-1227

May 31, 2011

ADDENDUM #1

INVITATION FOR BID #11-88

KENDRICK ST – NAHANTON ST BRIDGE IMPROVEMENTS PROJECT

THIS ADDENDUM IS TO: **Answer the following Question:**

Q1. Must the bidder still provide the "Address of Batching Plant" and number of Miles to Batching plant requested on the bottom of Page 85 of 222 if it is deciding not to bid the cost of fuel?

A1. NO

All other terms and conditions of this bid remain unchanged

PLEASE ENSURE THAT YOU ACKNOWLEDGE THIS ADDENDUM ON YOUR BID FORM.

Thank you.

Rositha Durham

Rositha Durham
Chief Procurement Officer

CITY OF NEWTON
PURCHASING DEPARTMENT
INVITATION FOR BID #11-88

The City of Newton invites sealed bids from Contractors for:

KENDRICK / NAHANTON STREET BRIDGE IMPROVEMENTS

Pre-Bid Conference: **11:00 a.m., May 26, 2011, at Newton City Hall, Room 204**
Bids will be received until: **11:00 a.m., June 3, 2011**
at the Purchasing Department, Room 204, Newton City Hall, 1000 Commonwealth Ave., Newton, MA 02459. Immediately following the deadline for bids all bids received within the time specified will be publicly opened and read aloud.

The work under this Contract consists superstructure and substructure repairs to Bridge No. N 04-003=N-12-001, including removal of existing wearing surface, full-depth and partial-depth repairs to the concrete deck, repairs to the concrete sidewalk and safety curb, cleaning and repairing the aluminum bridge railing, replacing the bridge deck expansion joint, replacement of bridge deck waterproofing membrane and wearing surface, replacement of select bearings, retrofitting of beam cover plate termini, cleaning and painting select bearings, crack and spall repairs to the abutments and wingwalls, repairs to undermined abutment footing and riprap slope protection, pavement milling and resurfacing, signing, pavement markings and the provision of safety controls and signing for construction operations and other incidental items included in the contract documents.

Contract Documents will be available online at **www.ci.newton.ma.us/bids** or pick up at the Purchasing Department after **10:00 a.m., May 19, 2011. Bids must be submitted with one Original and one Copy.**

MassDOT has provided a list of Prequalified Construction Contractors to the City of Newton. Bidders will be verified at time of Bid Opening.

A bid deposit in an amount that is not less than five percent (5%) of the value of the bid, including all add alternates, is required. Bid deposits, payable to the City of Newton, shall be either in the form of a bid bond, or cash, or a certified check on, or a treasurer's or cashier's check issued by, a responsible bank or trust company. The City of Newton will award the contract to the lowest eligible and responsible bidder. Please Note: this bid, in accordance with the Chapter 303 Acts of 2008, contains Price Adjustments and new Prevailing Wage requirements. All bidders are required to familiarize themselves with these terms and conditions before submitting a bid.

Anticipated start date is July 5, 2011. Time for completion is **one hundred forty (140) calendar days** from the Notice to Proceed.

All bids are subject to the provisions of M.G.L. Chapter 30, Section 39M. **Wages are subject** to minimum wage rates determined by the Massachusetts Department of Labor and Industries pursuant to M.G.L. Chapter 149, Sec. 26 to 27H. The schedule of wage rates applicable to this contract is included in the bidding documents. In addtion, the prevailing wage schedule will be updated annually for all public construction projects lasting longer than one (1) year. You will be required to pay the rates set out in any updated prevailing wage schedule. Increases in prevailing wage schedules will not be the basis for change order requests. The successful bidder will be required to provide a Certificate of Insurance demonstrating current coverage of the type and amounts set forth in the Project Manual**.** The successful bidder will be required to furnish a **Labor and Materials Payment Bond in the amount of 50%** of the contract total. Wages are paid to drivers for all "**on-site"** work.

Once you've downloaded this bid from the internet website (**www.ci.newton.ma.us/bids**) I strongly suggest you email (purchasing@newtonma.gov) your company's Name, address, EMAIL, phone, fax AND the INVITATION FOR BID NUMBER and Project Title, so that we may add you to the Bidders List and you will be notified of any/all addendums.

The City of Newton will reject any and all bids when required to do so by the above referenced General Laws. In addition, the City of Newton reserves the right to waive any informalities in any or all bids, or to reject any or all bids (in whole or in part) if it be in the public interest to do so.

CITY OF NEWTON
Rositha Durham
Chief Procurement Officer
May 19, 2011

CITY OF NEWTON

DEPARTMENT OF PURCHASING

INSTRUCTIONS TO BIDDERS

ARTICLE 1 - BIDDER'S REPRESENTATION

1.1 Each General Bidder (hereinafter called the "Bidder") by making a bid (hereinafter called "bid") represents that:

1. The Bidder has read and understands the Contract Documents and the bid is made in accordance therewith.
2. The Bidder has visited the site and is familiar with the local conditions under which the Work has to be performed.

1.2 Failure to so examine the Contract Documents and site will not relieve any Bidder from any obligation under the bid as submitted.

ARTICLE 2 - REQUEST FOR INTERPRETATION

2.1 Bidders shall promptly notify the City of any ambiguity, inconsistency, or error which they may discover upon examination of the Contract Documents, the site, and local conditions.

2.2 Bidders requiring clarification or interpretation of the Contract Documents shall make a written request to the *Chief Procurement Officer*, at purchasing@newtonma.gov or via facsimile (617) 796-1227. The City will answer such requests if received Friday, May 27, 2011 at 12:00 noon.

2.3 Interpretation, correction, or change in the Contract Documents will be made by Addendum which will become part of the Contract Documents. The City will not be held accountable for any oral instruction.

2.4 Addenda will be emailed to every individual or firm on record as having taken a set of Contract Documents.

2.5 Copies of addenda will be made available for inspection at the location listed in the Invitation for Bids where Contract Documents are on file, in addition to being available online at **www.ci.newton.ma.us/bids**.

2.6 Bidders or proposers contacting ANY CITY EMPLOYEE regarding an Invitation for Bid (IFB) or a Request for Proposal (RFP), outside of the Purchasing Department, once an IFB or RFP has been released, may be disqualified from the bidding process.

2.7 Bidders downloading information off the internet web site are soley responsible for obtaining any addenda prior to the bid opening. If the bidder makes themselves known to the Purchasing Dept., at purchasing@newtonma.gov or via facsimile (617) 796-1227, they shall be placed on the bidder's list. Bidders must provide the Purchasing Dept. with their company's name, street address, city, state, zip, phone, fax, email address and **INVITATION FOR BID #11-88**.

ARTICLE 3 - MBE PARTICIPATION

3.1 Notice is hereby given that the Mayor's Affirmative Action Plan for the City of Newton, dated December 1999 is applicable to all construction contracts in excess of $10,000.00. A copy of this plan is on file at City of Newton Purchasing Department.

3.2 Notice is hereby given that the City of Newton Minority/Women Business Enterprise Plan dated December 1999 and the Supplemental Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program is applicable to all City contracts for goods and services in excess of $50,000.00. Copies of these plans are incorporated in the bidding documents.

ARTICLE 4 - PREPARATION AND SUBMISSION OF BIDS

4.1 Bids shall be submitted on the "Bid Form" as appropriate, furnished by the City.

4.2 All entries on the Bid Form shall be made by typewriter or in ink.

4.3 Where so indicated on the Bid Form, sums shall be expressed in both words and figures. Where there is a discrepancy between the bid sum expressed in words and the bid sum expressed in figures, the words shall control.

4.4 Bid Deposits shall be submitted in the amount specified in the Invitation for Bids. They shall be made payable to the City of Newton and shall be either in the form of cash, certified check, treasurer's or cashier's check issued by a responsible bank or trust company, or a bid bond issued by a surety licensed to do business in the Commonwealth of Massachusetts; and shall be conditioned upon the faithful performance by the principal of the agreements contained in the bid.

Bid deposits of the three (3) lowest responsible and eligible Bidders shall be retained until the execution and delivery of the Owner/Contractor agreement.

4.5 The Bid, including the bid deposit shall be enclosed in a sealed envelope with the following plainly marked on the outside:

* GENERAL BID FOR:
* NAME OF PROJECT AND **INVITATION NUMBER**
* BIDDER'S NAME, BUSINESS ADDRESS, AND PHONE NUMBER

4.6 Date and time for receipt of bids is set forth in the Invitation for Bids.

4.7 Timely delivery of a bid at the location designated shall be the full responsibility of the Bidder.

4.8 Bids shall be submitted with one original and one copy**.** Be advised that a new Massachusetts law has been enacted that required all employees who work on Massachusetts public works construcion sites must have no less than 10 hours of OSHA-approved safety and health training. See Chapter 306 of the Acts of 2004, which will become effective July 1, 2006.

1. This requirement will apply to any general bid or sub bid submitted on or after July 1, 2006 and to any contract awarded on or after July 1, 2006.
2. This law directs the Massachusetts Attorney General to restrain the award of construction contracts to any contractor who is in violation to this requirement and to restrain the performance of these contracts by non-complying contractors.
3. The contractor and all subcontractors on this project will be required to provide certification of compliance with this requirement. Non-compliance with this new Massachusetts Law will disquality you from bidding on public contracts.

4.9 PRICE ADJUSTMENT CLAUSES CHAPTER 90 FUNDS

It is the intention of the City to include price adjustments in the award of this Contract. These price adjustments shall be for 1) Fuel 2) Liquid Asphalt and/or for 3) Portland Cement when such commodities have been determined to be integral components of the work.

For those commodities designated to be paid as a ‘differential’ items then the special provision shall provide for a price adjustment formula for the affected items. This adjustment shall be based on the difference between the **Base Price** and the **Period Price** which shall be evaluated on a **monthly** basis, but price adjustments shall only be made if the monthly cost change exceeds **+/- 5 per cent.** Subsequently each respective price adjustment shall be made as specified under each applicable and separate payment item.

IMPORTANT NOTE: Depending on the prevailing market trends at the time of payment these price adjustments may provide for additional compensation to the Contractor, or they may otherwise result in a repayment to the City. The increase or a decrease in the value of the commodity, during the applicable payment period in which the goods and/or services were rendered, shall be the determinant factor.

The City will refer to the Massachusetts Highway Department price adjustment tables as included in this bid package to establish the base price and will be used for the actual period price.

Price Adjustment Clauses – *to apply as follows:*

- **Diesel and Gasoline –** The Base Price, and the Period Price of fuel, shall be the derived average cost of Diesel Fuel and Gasoline Fuel combined for each applicable payment period**.** Fuel adjustments shall apply to all work in the contract. The Contractor, at their own election, may either choose to bid their fuel costs separately, or he may otherwise elect to incorporate their fuel costs into separate payment items. In any event the Contractor's final bid prices shall include the fuel costs for all goods & services rendered under this contract.

- **Liquid Asphalt –**The price adjustment shall apply only to the actual virgin Liquid Asphalt content contained in the applicable Asphalt and/or Bituminous Concrete mixture.

No price adjustment will be allowed beyond the completion date of the contract unless there is an approved extension of time by the City.

ARTICLE 5 - ALTERNATES

5.1 Each Bidder shall acknowledge Alternates (if any) in Section C on the Bid Form.

5.2 In the event an Alternate does not involve a change in the amount of the base bid, the Bidder shall so indicated by writing "No Change", or "N/C" or "0" in the space provided for that Alternate.

5.3 Bidders shall enter on the Bid Form a single amount for each Alternate which shall consist of the amount for work performed by the Contractor.

5.4 The low Bidder will be determined on the basis of the sum of the base bid and the accepted alternates.

ARTICLE 6 - WITHDRAWAL OF BIDS

6.1 Any bid may be withdrawn prior to the time designated for receipt of bids on written or telegraphic request. Telegraphic withdrawal of bids must be confirmed over the Bidder's signature by written notice postmarked on or before the date and time set for receipt of bids.

6.2 Withdrawn bids may be resubmitted up to the time designated for the receipt of bids.

6.3 No bids shall be withdrawn within thirty days, Saturdays, Sundays and legal holidays excluded, after the opening of the bids.

ARTICLE 7 - CONTRACT AWARD

7.1 The City of Newton will award the contract to the lowest eligible and responsible Bidder within thirty days, Saturdays, Sundays, and legal holidays excluded after the opening of bids.

7.2 The City of Newton reserves the right to waive any informalities in or to reject any or all Bids if it be in the public interest to do so.

7.3 As used herein, the term "lowest responsible and eligible Bidder" shall mean the Bidder (1) whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work; (2) who shall certify that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (3) who, where the provisions of section eight B of chapter twenty-nine apply, shall have been determined to be qualified thereunder.

7.4 Subsequent to the award and within five (5) days, Saturday, Sundays and legal holidays excluded, after the prescribed forms are presented for signature, the successful Bidder shall execute and deliver to the City a Contract in the form included in the Contract Documents in such number of counterparts as the City may require.

7.5 In the event that the City receives low bids in identical amount from two or more responsive and responsible Bidders, the City shall select the successful Bidder by a blind selection process such as flipping a coin or drawing names from a hat. The low Bidders who are under consideration will be invited to attend and observe the selection process.

ARTICLE 8 - TAXES

8.1 The Bidder shall not include in this bid any tax imposed upon the sale or rental of tangible personal property in this Commonwealth, such as any and all building materials, supplies, services and equipment required to complete the work.

8.2 The City is exempt from payment of the Massachusetts Sales Tax, and the Bidder shall not include any sales tax on its bid. The City's exemption Number is E-046-001-404.

END OF SECTION

CITY OF NEWTON

DEPARTMENT OF PURCHASING

BID FORM #11-88

A. The undersigned proposes to supply and deliver the materials specified below in full accordance with the Contract Documents and Project Manual supplied by the City of Newton entitled:

KENDRICK / NAHANTON STREET BRIDGE IMPROVEMENTS

for the contract price specified below, subject to additions and deduction according to the terms of the specifications.

B. This bid includes addenda number(s) _____, _____, _____, _____,

C. The Contractor shall insert prices for each item in ink, in both words and figures.

_____Dollars and $_____

(*Contract price shall equal the Total of the attached Item Sheets)*

COMPANY NAME: _____

D. The undersigned has completed and submits herewith the following documents:

- ❑ Bidder's Qualifications and References Form, 2 pages
- ❑ Certificate of Non-Collusion, 1 page
- ❑ Signed Bid Form, 2 pages
- ❑ Item Sheets, 16 pages
- ❑ A five percent (5%) bid deposit.

E. The undersigned agrees that, if selected as general contractor, s/he will within five days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the City of Newton, execute a contract in accordance with the terms of this bid **and furnish a labor and materials payment bond** under the laws of the commonwealth and satisfactory to the City of Newton in the **sum not less than 50% of the contract price**, the premiums for which are to be paid by the contractor and are included in the contract price.

The undersigned hereby certifies that s/he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work and that s/he will comply fully with all laws and regulations applicable to awards made subject to section forty-four A of M.G.L. Chapter 30, s 39M.

The undersigned certifies 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; (2) 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 (“OSHA”) 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 (3) that all employees to be employed in the work subject to this bid have successfully completed a course in construction safety and health approved by the United States OSHA that is at least 10 hours in duration. The undersigned understands that any employee found on a worksite subject to this section without documentation of successful completion of 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 shall be subject to immediate removal.

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. 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 provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

The undersigned further certifies under the penalties of perjury that they have familiarized themselves with the changes to the Prevailing Wage Rates, Price Adjustment Clauses, in accordance to Chapter 303 Acts of 2008.

Date _____

_____
(Name of General Bidder)

BY: _____

_____
(Printed Name and Title of Signatory)

_____
(Business Address)

_____
(City, State Zip)

_____ / _____
(Telephone) (FAX)

_____
(E-mail address)

NOTE: If the bidder is a corporation, indicate state of incorporation under signature, and affix corporate seal; if a partnership, give full names and residential addresses of all partners; if an individual, give residential address if different from business address; and, if operating as a d/b/a give full legal identity. Attach additional pages as necessary.

END OF SECTION

CITY OF NEWTON

BIDDER'S QUALIFICATIONS AND REFERENCES FORM

All questions must be answered, and the data given must be clear and comprehensive. Please type or print legibly. If necessary, add additional sheet for starred items. This information will be utilized by the City of Newton for purposes of determining bidder responsiveness and responsibility with regard to the requirements and specifications of the Contract.

1. FIRM NAME: _____

2. WHEN ORGANIZED: _____

3. INCORPORATED? ____ YES _____ NO DATE AND STATE OF INCORPORATION: _____

* 4. LIST ALL CONTRACTS CURRENTLY ON HAND, SHOWING CONTRACT AMOUNT AND ANTICIPATED DATE OFCOMPLETION:

_____
_____
_____
_____
_____

* 5. HAVE YOU EVER FAILED TO COMPLETE A CONTRACT AWARDED TO YOU?
_____ YES _____ NO
IF YES, WHERE AND WHY?

_____
_____

* 6. HAVE YOU EVER DEFAULTED ON A CONTRACT? ____ YES _____ NO
IF YES, PROVIDE DETAILS.

_____
_____

* 7. LIST YOUR VEHICLES/EQUIPMENT AVAILABLE FOR THIS CONTRACT:

_____
_____
_____
_____
_____
_____
_____

* 8. IN THE SPACES FOLLOWING, PROVIDE INFORMATION REGARDING CONTRACTS COMPLETED BY YOUR FIRM SIMILAR IN NATURE TO THE PROJECT BEING BID. A MINIMUM OF FOUR (4) CONTRACTS SHALL BE LISTED. PUBLICLY BID CONTRACTS ARE PREFERRED, BUT NOT MANDATORY.

PROJECT NAME: _____
OWNER: _____
CITY/STATE: _____
DOLLAR AMOUNT: $ _____ DATE COMPLETED: _____
PUBLICLY BID? _____YES _____ NO

TYPE OF WORK?: _____
CONTACT PERSON: _____ TELEPHONE #: (____)_____
CONTACT PERSON'S RELATION TO PROJECT?: _____
(i.e., contract manager, purchasing agent, etc.)
_____

PROJECT NAME: _____
OWNER: _____
CITY/STATE: _____
DOLLAR AMOUNT: $ _____ DATE COMPLETED: _____
PUBLICLY BID? _____YES _____ NO
TYPE OF WORK?: _____
CONTACT PERSON: _____ TELEPHONE #: (____)_____
CONTACT PERSON'S RELATION TO PROJECT?: _____
(i.e., contract manager, purchasing agent, etc.)
_____

PROJECT NAME: _____
OWNER: _____
CITY/STATE: _____
DOLLAR AMOUNT: $ _____ DATE COMPLETED: _____
PUBLICLY BID? _____YES _____ NO
TYPE OF WORK?: _____
CONTACT PERSON: _____ TELEPHONE #: (____)_____
CONTACT PERSON'S RELATION TO PROJECT?: _____
(i.e., contract manager, purchasing agent, etc.)
_____

PROJECT NAME: _____
OWNER: _____
CITY/STATE: _____
DOLLAR AMOUNT: $ _____ DATE COMPLETED: _____
PUBLICLY BID? _____YES _____ NO
TYPE OF WORK?: _____
CONTACT PERSON: _____ TELEPHONE #: (____)_____
CONTACT PERSON'S RELATION TO PROJECT?: _____
(i.e., contract manager, purchasing agent, etc.)

9. The undersigned certifies that the information contained herein is complete and accurate and hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the City of Newton in verification of the recitals comprising this statement of Bidder's qualifications and experience.

DATE: _____ BIDDER: _____

SIGNATURE: _____

PRINTED NAME: _____ TITLE: _____

END OF SECTION

CERTIFICATE OF NON-COLLUSION

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

_____
(Signature of individual)

_____
Name of Business

CONTRACT FORMS

The forms are provided for informational purposes only. The awarded contractor will need to complete and submit the following to execute a contract for this bid.

None of the following forms are required at the time of bid submittal.

CITY - CONTRACTOR AGREEMENT

CONTRACT NO. C -

THIS AGREEMENT made this ___ day of _____ in the year Two Thousand and Eleven by and between the CITY OF NEWTON, a municipal corporation organized and existing under the laws of the Commonwealth of Massachusetts, hereinafter referred to as the CITY, acting through its Chief Procurement Officer, but without personal liability to him, and hereinafter referred to as the CONTRACTOR.

The parties hereto for the considerations hereinafter set forth agree as follows:

ARTICLE 1. **STATEMENT OF WORK.** The Contractor shall furnish all labor, materials, and equipment and perform all work required in strict accordance with the Contract Documents for the following project:

KENDRICK / NAHANTON STREET BRIDGE IMPROVEMENTS

ARTICLE 2. **TIME OF COMPLETION.** The Contractor shall commence work under this Contract on the date specified in the written notice of the City to proceed and shall fully complete all work hereunder within the time specified in the Summary of Work and Specific Work Requirements of the Project Manual. Time is of the essence with regard to this contract, **one hundred forty (140) calendar days.** Failure to complete within the time specified shall be subject to the assessment of liquidated damages in accordance with the provisions contained in the Project Manual.

ARTICLE 3. **THE CONTRACT PRICE.** The City shall pay the Contractor for the full and satisfactory performance of the Contract, in current funds a sum not to exceed:

($)

ARTICLE 4. **CONTRACT DOCUMENTS.** The Contract Documents consist of the following documents which are either attached to this Agreement or are incorporated herein by reference:

a. This CITY-CONTRACTOR Agreement;

b. The City's Invitation For Bid # 11-88 issued by the Purchasing Department;

c. The Project Manual for: **Kendrick / Nahanton Street Bridge Improvements** including the Instructions to Bidders; General Conditions; Special Conditions; MWBE/AA Requirements, Wage Rate Requirements and Wage Rate Schedule(s) including any updated prevailing wage rate schedules if applicable; The Supplementary Special Conditions; General Requirements and Project Specifications; and Drawings, if included or referenced therein;

d. Addenda Number(s)__;

e. The Bid Response of the CONTRACTOR submitted for this Project and accompanying documents and certifications;

f. Certificate(s) of Insurance and surety bond(s) submitted by the CONTRACTOR in connection with this Project;

g. Duly authorized and executed Amendments, Change Orders or Work Orders issued by the CITY after execution of this CITY-CONTRACTOR Agreement.

This CITY-CONTRACTOR Agreement, together with the other documents enumerated in this Article, constitute the entire Agreement between the CITY and the CONTRACTOR.

ARTICLE 5. **ALTERNATES.** The following Alternates have been accepted and their costs are included in the Contract Price stated in Article 3 of this Agreement:

Alternates: N/A

ARTICLE 6. **APPLICABLE STATUTES.** All applicable federal, state and local laws and regulations are incorporated herein by reference and the Contractor agrees to comply with same.

IN WITNESS WHEREOF, the parties have caused this instrument to be executed under seal the day and year first above written.

CONTRACTOR

By_____
Title_____

Date_____

Affix Corporate Seal Here

City funds in the amount of

$_____ are
available in account number
33M401A-586003

I further certify that the Mayor, or his designee, is authorized to execute contracts and approve change orders

By_____
Comptroller of Accounts

Date_____

CITY OF NEWTON

By_____
Chief Procurement Officer

Date_____

By _____
Commissioner of Public Works

Date _____

Approved as to Legal Form and Character

By_____
Associate City Solicitor

Date _____

CONTRACT & BONDS ARE APPROVED

By_____
Mayor or his designee

Date_____

CERTIFICATE OF AUTHORITY - CORPORATE

1. I hereby certify that I am the Clerk/Secretary of _____
(insert full name of Corporation)

2. corporation, and that _____
(insert the name of officer who signed the **contract and bonds**.)

3. is the duly elected _____
(insert the title of the officer in line 2)

4. of said corporation, and that on _____
(insert a date that is ***ON OR BEFORE*** the date the officer signed the **contract and bonds**.)

at a duly authorized meeting of the Board of Directors of said corporation, at which all the directors were present or waived notice, it was voted that

5. _____ the _____
(insert **name** from line 2) (insert **title** from line 3)

of this corporation be and hereby is authorized to execute contracts and bonds in the name and on behalf of said corporation, and affix its Corporate Seal thereto, and such execution of any contract of obligation in this corporation's name and on its behalf, with or without the Corporate Seal, shall be valid and binding upon this corporation; and that the above vote has not been amended or rescinded and remains in full force and effect as of the date set forth below.

6. ATTEST: _____ *AFFIX CORPORATE SEAL HERE*
(Signature of **Clerk or Secretary**)*

7. Name: _____
(Please print or type name in line 6)*

8. Date: _____
(insert a date that is ***ON OR AFTER*** the date the officer signed the **contract and bonds**.)

* The name and signature inserted in lines 6 & 7 **must** be that of the **Clerk or Secretary** of the corporation.

ATTESTATION

Pursuant to MG c. 62C, § 49A, the undersigned acting on behalf of the Contractor, certifies under the penalties of perjury that, to the best of the undersign's knowledge and belief, the Contractor is in compliance with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.*

_____
**Signature of Individual
or Corporate Contractor (Mandatory)

_____
*** Contractor's Social Security Number
(Voluntary) or Federal Identification Number

By: _____
Corporate Officer
(Mandatory, if applicable)

Date: _____

* The provision in the Attestation relating to child support applies only when the Contractor is an individual.

** Approval of a contract or other agreement will not be granted unless the applicant signs this certification clause.

*** Your social security number will be furnished to the Massachusetts Department of Revenue to determine whether you have met tax filing or tax payment obligations. Providers who fail to correct their non-filing or delinquency will not have a contract or other agreement issued, renewed, or extended. This request is made under the authority of GL c. 62C, § 49A.

CITY OF NEWTON, MASSACHUSETTS

PAYMENT BOND

Know All Men By These Presents:

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

Whereas, the said PRINCIPAL has made a contract with the Obligee, bearing the date of _____ _, 2011 for the construction of _____ in Newton, Massachusetts.
(Project Title)

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

In Witness Whereof, the PRINCIPAL and SURETY have hereto set their hands and seals this ___day of____, 2011.

PRINCIPAL	SURETY
_____	_____
BY_____	BY _____
(SEAL)	(ATTORNEY-IN-FACT) (SEAL)
_____ (Title)	
ATTEST: _____	ATTEST: _____

TOWN OF NEEDHAM
CONSERVATION COMMISSION
Public Services Administration Building
500 Dedham Avenue
Needham, MA 02492

To: Anthony Del Gaizo, Town Engineer

From: Patricia Barry, Conservation Officer P. Barry

Re: Kendrick Street Bridge Repair Project; Order of Conditions
DEP File #234-603

Date: December 17, 2010

I have enclosed both an original and a copy of the Order of Conditions for work associated with the Kendrick Street Bridge Repair Project. The original must be recorded at the Norfolk County Registry of Deeds, and proof of recording must be provided to the Conservation Department prior to the start of work.

Please read the Order carefully, and note that no work may commence until the pre-construction meeting required by special condition #8 has occurred.

If you have any questions, please contact me at (781) 455-7500x248. *Thank you.*

cc: MA Department of Environmental Protection
Philip Paradis, BETA Group, Inc. (via email)
Building Department
File

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40
& Needham Wetlands Protection Bylaw (Article 6)

Provided by MassDEP:
234-603
MassDEP File #

eDEP Transaction #

NEEDHAM
City/Town

A. General Information

1. **From:** NEEDHAM
Conservation Commission

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

3. **Applicant:**

Anthony
a. First Name

Del Gaizo
b. Last Name

Needham DPW – Engineering Division
c. Organization

470 Dedham Avenue
d. Mailing Address

Needham
e. City/Town

Massachusetts
f. State

02459
g. Zip Code

4. **Property Owner** (if different from applicant):

a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

5. **Project Location:**

Kendrick/Nahanton Street @ Town Line
a. Street Address

Needham/Newton
b. City/Town

c. Assessors Map/Plat Number

d. Parcel/Lot Number

Latitude and Longitude, if known: 42d17m50s
d. Latitude

71d12m29s
e. Longitude

A. General Information (cont.)

6. **Property recorded at the Registry of Deeds for** (attach additional information if more than one parcel):
   Norfolk
   a. County
   b. Certificate Number (if registered land)
   c. Book
   d. Page

7. **Dates:** November 18, 2010 (a. Date Notice of Intent Filed) December 2, 2010 (b. Date Public Hearing Closed) December 17, 2010 (c. Date of Issuance)

8. **Final Approved Plans** and Other Documents (attach additional plan or document references as needed):
   Kendrick Street/Nahanton Street Bridge Construction Plan
   a. Plan Title
   BETA Group, Inc.
   b. Prepared By
   Philip F. Paradis, Jr.
   c. Signed and Stamped by
   November 15, 2010
   d. Final Revision Date
   1" = 20'
   e. Scale
   Kendrick St./Nahanton St. Bridge Construction Detail
   f. Additional Plan or Document Title
   November 15, 2010
   g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

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

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

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

B. Findings (cont.)

3. ☐ Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) _____ a. linear feet

Inland Resource Area Impacts: Check all that apply below.

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☒ Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. ☐ Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. ☐ Land Under Waterbodies and Waterways	a. square feet	b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. ☒ Bordering Land Subject to Flooding	1,440 a. square feet	1,440 b. square feet	1,440 c. square feet	1,440 d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☒ Riverfront Area	4,750 a. total sq. feet	4,750 b. total sq. feet	Needham & Newton	
Sq ft within 100 ft	4,750 c. square feet	4,750 d. square feet	4,750 e. square feet	4,750 f. square feet
Sq ft between 100-200 ft	0 g. square feet	0 h. square feet	0 i. square feet	0 j. square feet

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.

4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. the work is a maintenance dredging project as provided for in the Act; or
   b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.

5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.

6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on _____ unless extended in writing by the Department.

7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.

8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

    "Massachusetts Department of Environmental Protection" [or, "MassDEP"]

    "File Number 234-603"

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

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

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. **The work associated with this Order (the "Project") <u>is not</u> subject to the Massachusetts Stormwater Standards. If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:**

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

    _____

    _____

    _____

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☒ Yes ☐ No
2. The Needham (Conservation Commission) hereby finds (check one that applies):
   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

      1. Municipal Ordinance or Bylaw — 2. Citation

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

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

      Needham (1. Municipal Ordinance or Bylaw) — Article 6 (2. Citation)
3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.
   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

Special Conditions:

See Exhibit A for Findings and Conditions adopted under the Wetlands Protection Act (M.G.L. Ch. 131 S. 40) and the Needham Wetlands Protection Bylaw (Article 6).

E. Signatures

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

12/19/2018
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

5
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

☒ by hand delivery on
12/19/2018
Date

☐ by certified mail, return receipt requested, on

Date

F. Appeals

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

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

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

G. Recording Information

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

Needham
Conservation Commission

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

To:

Needham
Conservation Commission

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

Kendrick Street Bridge — Project Location
234-603 — MassDEP File Number

Has been recorded at the Registry of Deeds of:

Norfolk — County
Book
Page

for: Property Owner

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

Book
Page

In accordance with the Order of Conditions issued on:

Date

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

Instrument Number

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

Document Number

Signature of Applicant

ORDER OF CONDITIONS
DEP FILE NO. 234-603
EXHIBIT A

Project: Kendrick Street Bridge maintenance and repair within inland bank, land under waterbodies and waterways, bordering land subject to flooding, the 200-foot Riverfront Area and the 100-foot buffer zone

Applicant: Anthony DelGaizo – Town of Needham
Department of Public Works – Engineering Division
470 Dedham Avenue
Needham, MA 02492

Owner(s): Same as Applicant

Location: Kendrick Street Bridge

Documents of Record:

- Notice of Intent and supporting documents, received November 18, 2010
- Needham General Wetlands Protection Bylaw application, received November 18, 2010
- Plan entitled "Kendrick Street/Nahanton Street Bridge Construction Plan" prepared by BETA Group, Inc. dated November 15, 2010 stamped by Philip F. Paradis Jr. P.E. No. 37845
- Plan entitled "Kendrick Street/Nahanton Street Bridge Construction Details" prepared by BETA Group, Inc. dated November 15, 2010 stamped by Philip F. Paradis Jr. P.E. No. 37845
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan Kendrick/Nahanton Street Bridge Repairs prepared by BETA Group, Inc.

FINDINGS OF FACT:
The proposed project includes the repair and maintenance of the Kendrick Street Bridge within inland bank, land under waterbodies and waterways, bordering land subject to flooding, the 200-foot Riverfront Area of the Charles River and the 100-foot buffer zone. No changes to the roadway drainage systems are proposed. Repair and maintenance of the Kendrick Street Bridge consists of rip-rap and slope repairs, roadway pavement removal, re-pavement, and deck repairs. Maintenance activities will occur within Inland Bank, Land Under Water Bodies and Waterways, Bordering Land Subject to Flooding, Riverfront Area and the 100-foot Buffer Zone. The applicant submitted a Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan to ensure that wetland resource areas will be protected during construction and sufficiently restored post construction. The Commission required erosion controls installation consisting of staked hay bales and and temporary stabilization measures on the adjacent bank slopes (i.e. jute netting).

The Commission finds that the Kendrick Street maintenance and repair project meets the requirements of 310 CMR 10.53 (3) (i) – maintenance, repair and improvement of bridges, and is therefore not subject to the performance standards set-forth in 310 CMR 10.54 Bank, 10.56 Land Under Water Bodies and Waterways, 310 CMR 10.57 Land Subject to Flooding and 10.58 Riverfront Area. In accordance with 310 CMR 10.53 (3), the Commission has determined that the proposed project serves a substantial public interest and that there are no practicable alternatives that would allow repair of the bridge with less adverse effect on the aquatic habitat to protect the interests identified in both the Act and the Bylaw. As set forth in the Bylaw regulations at Section 1.11, the Commission grants a waiver for work exceeding the performance standards for Inland Bank, Land Under Water, Bordering Land Subject to Flooding and Buffer Zone.

SPECIAL CONDITIONS:

GENERAL

1. Except where modified by the following conditions, all work shall be performed in accordance with the plans and the Notice of Intent referenced above.

2. The Needham Conservation Commission reserves the right to enter upon the premises to inspect the work for compliance with the Order of Conditions.

3. The Contractor and/or Applicant may be fined for any applicable non-compliance with the conditions contained herein. This may include a non-criminal penalty of up to $200.00 per day, per violation issued under the Needham Wetlands Protection Bylaw.

4. If any change is intended to be made in the work permitted hereunder, the Applicant shall submit a written request to the Commission with plans that reflect the proposed changes. The Commission shall review said request and plans, and may require the applicant to submit a request for amendment to the Order of Conditions. No changes shall be made prior to said written request to the Commission and approval thereof. Failure to comply with this condition shall be deemed a violation of the Order and may result in the issuance of non-criminal penalties of up to $200 per day.

5. If any change is made, altered or revised without prior approval of the Commission, or if erosion, siltation or other adverse impact to the Resource occurs, the Commission may impose additional conditions as necessary to protect the interests of the Wetlands Protection Act and the Town Wetlands Bylaw.

PRE-CONSTRUCTION

6. A copy of the approved plans, the Notice of Intent, and this Order of Conditions must be provided to the Contractor prior to the commencement of work.

7. The Owner must provide the Commission with the name, address, e-mail and telephone/fax number of the person responsible for construction supervision and compliance with this Order.

8. Prior to commencing any activity within wetland resource areas and/or the buffer zone, the applicant and contractor(s) shall meet with the Conservation Commission or their Agent at the project site to review this Order of Conditions. At (or prior to) this meeting the applicant shall submit evidence that this Order has been filed at the Registry of Deeds.

9. Before beginning any work on site or installing erosion controls, the Applicant must notify the Conservation Commission (in writing or by phone) that the erosion control line has been staked or marked on site, and arrange for a site meeting. At that meeting, the erosion control plan will be reviewed and adjustments made as the Commission and/or their Agent may find necessary.

10. Before any demolition, excavation, or construction work begins, a staked haybale barrier shall be installed in a 4-inch deep trench (toed-in and backfilled) in the location shown on the reference plan. Any soil excavated from the trench shall be deposited on the upgradient side of the siltation barrier.

11. The Conservation Commission shall be informed in writing when installation of the siltation controls is complete, and shall inspect these controls within 3 business days of written notification. No work may proceed until the Conservation Commission or their Agent has inspected and approved the installation of the siltation barriers.

12. The applicant shall notify the Conservation Office at least 2 business days before site preparation and construction work begins (781-455-7589).

CONSTRUCTION

13. No work, disturbance or alteration – **with the exception of activities approved on the reference plan** – shall occur on the Resource Area side of the erosion controls, which shall serve as the limit of work. No heavy equipment may operate beyond the limit of work at any time.

14. The Applicant shall remove all silt caught by the siltation barrier periodically. In no event shall the silt be allowed to collect to a height greater than six inches.

15. The erosion control line must be regularly inspected by the Applicant and continually maintained in good condition until all up-gradient areas have been permanently stabilized with vegetation and all construction is completed. No erosion controls may be removed without the approval of the Commission or their Agent.

16. At no time shall silt or sediment be allowed to enter the resource area. The Commission must be notified within 24 hours if any silt or sediment enters the resource area.

17. No fueling or maintenance of vehicles shall be allowed within the buffer zone.

18. Any stockpiled soil or similar material must be enclosed within a line of staked haybales to prevent erosion or siltation into the Resource Area or undisturbed buffer zone.

19. No construction materials, debris, leaves, or other materials shall be deposited within the Resource Area or downgradient of the limit of work.

20. In the event that earthwork ceases for more than 30 days, all exposed soils must be stabilized with a temporary vegetative cover, straw mulch, or other method of erosion control accepted by the Massachusetts Department of Environmental Protection.

21. Following the completion of construction and grading, all exposed soils within the buffer zone must be stabilized with a permanent vegetative cover. Bark mulch or wood mulch will not be considered to provide a permanent stabilization on slopes with a gradient steeper than 3:1.

POST-CONSTRUCTION

22. Certificate of Compliance Requests shall be submitted in writing on WPA Form 8A must be submitted to the Commission at the time a Certificate of Compliance is requested. The request shall be accompanied by a certificate signed by a Registered Surveyor or Professional Engineer stating that all work has been completed strictly in accordance with the Order of Conditions. If such work has not been so completed, this Certificate must describe any deviations from the plans as approved by the Commission.

23. It shall be presumed that any work or alteration, which includes, but is not limited to, building, grading, clearing, dumping debris or other materials or in any way disturbing the areas protected by the Act and By-law that is inconsistent with, or not specifically authorized by, this Order of Conditions shall require the filing of a new Notice of Intent, and the issuance of an Order of Conditions from the Conservation Commission. This condition shall survive the issuance of a Certificate of Compliance.

CITY OF NEWTON, MASSACHUSETTS
Department of Planning and Development

Telephone
(617)-796-1120
Telefax
(617) 796-1086
TDD/TTY
(617) 796-1089

Setti D. Warren
Mayor

January 4, 2011

Louis Taverna, City Engineer
Department of Public Works
1000 Commonwealth Avenue
Newton, MA 2459

RE: Order of Conditions for repair to Nahanton-Kendrick Street Bridge on the Newton/Needham border - DEP NE #239-620

Dear Mr. Taverna;

Enclosed please find an Order of Conditions issued pursuant to the Wetlands Protection Act, General Laws, Chapter 131, Section 40 and pursuant to the Newton Floodplain/Watershed Protection Ordinance, Section 22-22, for the above-referenced project.

Following the 10-day appeal period that begins with the date of issue shown on page 2 (and 11) of the Order, you must arrange to have the original Order recorded at the Middlesex Registry of Deeds. The Order is not valid until and unless it is properly recorded. No work on the project may begin until:

1) the Conservation Commission and Inspectional Services Department receive from you the tear-off form, properly filled out at the Registry of Deeds in Cambridge, which provides proof to the Commission that the Order was recorded as required (General Condition 9 of the Order),
2) the DEP sign has been erected (General Condition 10), and
3) you have given the Commission 48 hr notice to inspect the installation of erosion & sediment control measures and received approval to proceed

Upon completion of the project, you must submit a "Request for a Certificate of Compliance" to the Conservation Commission stating that the work has been satisfactorily completed. In accordance with the Wetlands Protection Act Regulations (310 CMR 10.05(9)(d)), your request for a Certificate of Compliance must be presented in the form noted in Condition #26. Your Certificate of Compliance must be recorded and proof of recording sent to the Conservation Commission as required by the Wetlands Protection Act Regulations (310 CMR 10.05(9)(F)).

Very truly yours,
FOR THE COMMISSION

Anne Phelps
Sr. Environmental Planner

Enclosure

CC: Wetlands Division, DEP - NERO, 205B Lowell St., Wilmington, MA 01887
Frank Nichols, Special Projects Engineer - DPW
John Lojek, Commissioner of Inspectional Services
Thomas McKinney, General Manager, Boston Marriott Newton Hotel, 2345 Commonwealth Avenue Newton, MA 02466
Marc Bacon, CR/TPG Newton Hotel, LLC, 1149 Reservoir Ave., Cranston, RI 02920
Chris Novak, VHB 101 Walnut St., P.O. Box 9151, Watertown, MA 02471

Conservation Commission
1000 Commonwealth Avenue, Newton, Massachusetts 02459
Email: aphelps@newtonma.gov
www.ci.newton.ma.us

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

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

Provided by MassDEP:
239-620
MassDEP File #
eDEP Transaction #
City/Town

A. General Information

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

1. From: Newton
Conservation Commission

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

3. To: Applicant:

Lou
a. First Name

Taverna
b. Last Name

City of Newton, Engineering Dept.
c. Organization

1000 Commonwealth Avenue
d. Mailing Address

Newton
e. City/Town

MA
f. State

g. Zip Code

4. Property Owner (if different from applicant):

SAME
a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

5. Project Location:

Nahanton St. Bridge: junction w/Kendrick St.

Newton/Needham line
b. City/Town

c. Assessors Map/Plat Number

d. Parcel/Lot Number

Latitude and Longitude, if known: d m s d. Latitude d m s e. Longitude

wpaform5.doc • rev. 12/23/09

A. General Information (cont.)

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

a. County
b. Certificate Number (if registered land)
c. Book
d. Page

7. Dates: 11-22-2010 a. Date Notice of Intent Filed; 12-16-2010 b. Date Public Hearing Closed; 1-4-2011 c. Date of Issuance

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

Repair/Retrofit Kendrick St./Nahanton St. Bridge Construction Plan
a. Plan Title

BETA Group Inc.
b. Prepared By

Phillip F. Paradis, Jr., P.E.
c. Signed and Stamped by

November 18, 2010
d. Final Revision Date

1"=20'
e. Scale

f. Additional Plan or Document Title
g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

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

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

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

Approved subject to:

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

B. Findings (cont.)

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

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

3. ☒ Buffer Zone Impacts: Shortest distance between limit of project disturbance and Bank or Bordering Vegetated Wetland boundary (if available) — 0 a. linear feet

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☒ Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. ☐ Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. ☐ Land Under Waterbodies and Waterways	a. square feet	b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. ☒ Bordering Land Subject to Flooding	1440 a. square feet	1440 b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet

B. Findings (cont.)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
9. ☒ Riverfront Area	4,750 a. total sq. feet	4,750 b. total sq. feet		
Sq ft within 100 ft	4750 c. square feet	4750 d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

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

10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	cu yd c. nourishment	cu yd d. nourishment
14. ☐ Coastal Dunes	a. square feet	b. square feet	cu yd c. nourishment	cu yd d. nourishment
15. ☐ Coastal Banks	a. linear feet	b. linear feet		
16. ☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17. ☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. ☐ Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. ☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or Inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. ☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		

B. Findings (cont.)

22. ☐ Restoration/Enhancement:

a. square feet of BVW | b. square feet of salt marsh

23. ☐ Stream Crossing(s):

a. number of new stream crossings | b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. the work is a maintenance dredging project as provided for in the Act; or
   b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on 1-4-2016 unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

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

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

    "Massachusetts Department of Environmental Protection" [or, "MassDEP"]

    "File Number 239-620 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #12 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

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

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

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

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

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

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;
iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;
v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

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

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following: *i.*) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and *ii.*) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

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

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

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

Order of Conditions/B – Findings – Final Approved Plans:

Plan entitled, "Repair/Retrofit Kendrick St./Nahanton St. Bridge Construction Plan," prepared by BETA Group, Inc., stamped by Phillip F. Paradis, Jr., P.E., dated November 18, 2010.

The referenced plans are on file with the Conservation Commission, Inspectional Services, Engineering and Public Works Departments.

Order of Conditions/B – Findings - Newton Standard Conditions

20. Prior to the commencement of work on the project site, appropriate erosion controls shall be erected between the wetland resource area and the construction area in order to protect the wetland resource area and confine refuse and other materials within the construction area. The Conservation Commission Office shall be given 48 hr notice of the start of work, by calling 617-796-1120, and that the erosion controls have been erected and are ready for inspection. Work may not begin until the erosion control have been inspected and approved.

21. All soils must be contained on the site during the period of construction until stabilization can occur. City streets shall be kept clean and catch basins in the immediate area shall be protected from eroding soils. Containment and protection measures shall include, but are not limited to, a row of staked hay bales across the street frontage of the property except for a driveway opening; a paved driveway or a driveway consisting of crushed stone or other material which will catch loose soils and prevent their deposition on the city streets; wheel washing stations; weighted hay bales surrounding catch basins; catch basins fitted with silt bags or catch basin grates wrapped with filter fabric and cleaned on a regular basis; and any other measures deemed necessary to keep the city streets and catch basins clean.

22. The foregoing conditions notwithstanding, the Applicant shall see that throughout the construction period, all measures necessary to prevent any damage to the wetland resource area are taken and should any damage occur during the course of the work on the premises, the Applicant shall be responsible for and bear the full cost of restoration of the wetland to the satisfaction of the Conservation Commission and the Engineering Department.

23. During the construction period and prior to issuance of a Certificate of Compliance, members and agents of the Conservation Commission shall have the right to inspect the Applicant's project work to evaluate compliance with the herein cited PLANS and with these conditions.

24. This document and the approved plans shall be included in all construction contracts and subcontracts for the proposed work and shall supersede any conflicting contract requirements. It shall be kept on file at the job site at all times during construction.

25.N/A. All roof drainage shall be directed into an infiltration facility sized and designed to accommodate such drainage. The City Engineer shall review and approve the proposed design **prior to the commencement of construction**.

26. Any excess spoil material which is to remain on Applicant's premises and all areas of disturbed soil shall be left stabilized with mulch, grass or other plantings and protected against erosion and sedimentation. All materials not to remain on Applicant's premises shall be removed from said premises and disposed in a legal manner.

27. Upon completion of this project, the Applicant shall submit the following to the Newton Conservation Commission to receive a Certificate of Compliance in accordance with Condition #11:

a. A letter from the Applicant requesting a Certificate of Compliance and referencing the DEP File number.

b. A written statement from a Professional Engineer registered in Massachusetts certifying that the work has been completed in substantial compliance with this Order of Conditions and the approved plans referenced herein (or approved revisions). If the completed work differs from that in the approved plans and conditions, the report must specify how the project differs.

c. An as-built topographic plan signed and stamped by a professional land surveyor registered in Massachusetts to complete the public record. This plan will include as-built elevations of all drainage structures constructed within 100 feet of any wetland, distances to all structures and elevations within 100 feet of wetlands.

d. A letter from a qualified wetland scientist certifying compliance with state regulations is also required for all wetland replication or restoration areas. Wetland replication areas shall be in-kind replication, i.e., forested to forested or shrub to shrub or meadow to meadow, etc., and be built to function in the same way that the filled area functioned. Replication areas shall be monitored through two growing seasons to achieve the standards required.

28. Prior to the commencement of construction, applicant shall have in hand all other City permits, including, but not limited to, Building, Street Opening, Sidewalk Crossing and Utility Connection permits. Should the approved plans change as a result of the issuance of other permits, the Commission shall be notified and a new plan presented for review prior to commencement of construction.

29. The storage of materials and sediment in the floodplain is prohibited. All dumpsters, piles of lumber, pipe and other materials shall take place outside of the floodplain. All stockpiled soils shall be located outside of the floodplain and appropriate erosion controls must be applied to ensure that sediments do not erode or blow into the wetland resource area.

Newton Special Conditions:

30. Applicant's contractor shall designate a person to be in charge of erosion and sediment control (E&SC supervisor), and shall furnish the contact information for this person, including emergency contact information, to the Commission prior to the start of any work.

31. No haybales shall be used for erosion and sediment control in the riverfront area because of the common presence of weed seeds, but shall be replaced by alternatives appropriately scaled and installed (such as compost-filled tubes, or the like) according to manufacturers' recommendations/specifications. All erosion and sediment control measures shall be inspected and approved by the Environmental Planner prior to the start of work for which the erosion and sediment control is installed.

32. The approved Plan does not show any stockpiling in the riverfront area. Any stockpiling of soils and/or material in the riverfront area shall require prior approval by the Environmental Planner and erosion and sediment control measures shall be installed and approved prior to any stockpiling.

33. No hazardous materials shall be stored in the riverfront area.

34. Any spills of hazardous materials shall be reported to the conservation commission immediately, and no later than 24 hrs following the spill. Contact information will be provided for notification of Anne Phelps, Sr. Environmental Planner and for Norman Richardson, Conservation Commission member in case of any emergency spill.

35. A more-detailed plan for rip-rap and slope repairs shall be submitted prior to the start of work. Cutting of vegetation shall be kept to a minimum and no cutting of vegetation shall be conducted without prior approval of Environmental Planner.

36. Construction Plan has note "riprap outside the 2:1 slope may be relocated to fill in other areas lacking the required stone." The commission urges the contractor to make maximum use of this strategy so as to not increase the fill in flood zone.

37. The "eroded slope repair" shown on the construction plan appears to be mislabeled. The slope is currently well covered with vegetation and does not appear to be eroding. The slope may have eroded previously because it was not properly stabilized after the original work or the last repair, or this area is proposed for use to access footings or rip-rap under the bridge. In the latter case, the slope will need to be re-stabilized. A detailed plan shall be submitted for this for approval by the Environmental Planner -- the notation "loam and seed" is not sufficiently detailed. If gravel has been deposited, it must first be removed. Jute netting, anchored to the slope, is strongly recommended, since the area is so steep.

38. The designated erosion and sediment control supervisor shall hold a pre-construction site meeting with the project engineer and the Environmental Planner to discuss staging of work.

39. Specific details & drawings and/or "cut sheets" of both the "protective shield" and "containment system" shall be submitted to the Commission or Environmental Planner for review and approval prior to the start of any work on the deck.

40. Following installation of the containment field, a site visit with the respective engineers from BETA Group, City of Newton Engineering, and the chosen contractor present shall be held with the Environmental Planner to review the performance specifications of the containment field and answer any questions of the Planner.

41. An agent of the Commission, either the Environmental Planner or other designee, shall be on site for the first day of operation of the containment field to observe the operation of the structure under working conditions and observe that nothing is leaking.

42. No COC shall be issued until and unless the Commission is satisfied with the containment of all hazardous waste and/or other debris and construction materials. Any deficiencies in containment shall be rectified according to the direction of the Commission, by the City of Newton Engineering Department and/or by its contractor.

CONDITIONS WHICH WILL NOT EXPIRE WITH THE ISSUANCE OF A CERTIFICATE OF COMPLIANCE, BUT WILL CONTINUE IN PERPETUITY:

The use of herbicides and other pesticides is prohibited. Fertilizers shall be limited to the use of slow-release organic fertilizers only. This condition is being imposed to improve water quality in the Charles River.

The Operations and Maintenance Plan for the site drainage system is appended hereto. Once the appropriate maintenance schedule for the drainage structures is established, this plan may be amended for frequency of cleaning. All other provisions shall remain in effect as is.

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In order to protect wildlife and/or vernal pool species, artificial lighting shall be designed to prevent lighting of the wetlands. Any outdoor lights within 200 feet of the wetland shall be directed so as not to radiate light towards those areas. Any such lights shall be limited to no more than 1,800 lumens per fixture and the fixture shall not illuminate any part of the wetland more than .2 footcandles. Exterior lights shall not be mounted higher than 25 feet above the ground.

* * * * *

Inspectional Services: ***Prior to the issuance of a Building Permit,*** please be sure the applicant has complied with Conditions # 9, 17, 20, 21, 28, _____.

conditions\Nahanton-Kendrick St. Bridge repair sp cond

9-E

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

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

Provided by MassDEP:
239-620
MassDEP File #

eDEP Transaction #

City/Town

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☒ Yes ☐ No
2. The Newton Conservation Commission hereby finds (check one that applies):
   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

      1. Municipal Ordinance or Bylaw — 2. Citation

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

   b. ☒ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:
      Watershed/Floodplain Ordinance — Sec. 22-22
      1. Municipal Ordinance or Bylaw — 2. Citation
3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.
   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):
   SEE ATTACHED.

E. Signatures

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

12-1
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

7
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

☐ by hand delivery on

Date

☐ by certified mail, return receipt requested, on

Date

F. Appeals

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

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

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

CITY OF NEWTON

GENERAL CONDITIONS OF THE CONTRACT

FOR PUBLIC WORKS CONSTRUCTION

ARTICLE 1

(DELETED)

ARTICLE 2

Definitions

The word "Commissioner" shall mean the official duly authorized to act for the City of Newton in the execution of the work of this contract, acting directly or through properly authorized agents.

The word "Engineer," or "City Engineer," shall mean the City Engineer of the City of Newton, acting directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

The word "Contractor" shall mean the party or parties contracting to perform the work covered by this contract or his, or their, legal representatives, successors or assigns.

The word "Plan" shall mean plans referred to and included in the Project Manual for this contract. The word "City" shall mean the City of Newton.

ARTICLE 3
Plans, Drawings, Profiles

1. The work shall be done in accordance with plans referred to in Article 1 and such further working and detail plans, drawings and profiles as may be furnished from time to time by the Engineer. All said plans, general and detail, are to be deemed a part of this contract, and the said plans, specifications and contract are to be considered together, so that any work mentioned in the contract, though not shown on the plans, and any work shown on the plans though not mentioned in the contract, is to be executed by the Contractor as a part of this contract. Figured dimensions are to prevail over scale. All things which in the opinion of the Engineer may fairly be inferred from the contract, plans and specifications, are to be executed by the Contractor as a part of the contract; and the Engineer shall be sole judge as to whether detail plans, drawings and profiles conform to the general plans and the contract.

Discrepancy in Plans

2. The Contractor shall carefully examine all said plans, profiles, drawings, specifications and orders; all figures, dimensions, lines, marks and scales thereof, and all directions of the Commissioner and the Engineer relating to the work, and conform to those in relation to which there is no doubt or discrepancy, but at once submit all cases of doubt or discrepancy to the Engineer for adjustment. Anything done on any part of the work for which special information or drawing should be procured, unless done in accordance with such information or drawing, or anything done in relation to which there is doubt or discrepancy, except in accordance with the adjustment thereof, or done in violation of law or public authority, is to be redone if the Commissioner shall so direct.

ARTICLE 4
Inspection

1. The Contractor in carrying on the contract shall conform to all determinations and directions of the Engineer relating to the proper interpretation of the plans, specifications, profiles or drawings, the fitness of persons employed on the work or the number thereof, or the suitableness, amount, quality, and value of anything done or any materials used, and the Contractor shall permit the Commissioner and the Engineer and persons designated by them to enter upon the work and

inspect the same at all times and in all places, and shall provide safe and convenient facilities for making such entry and inspection.

ARTICLE 5
Change in Plans and Work

1. The City, acting through the Commissioner and upon his written order only, from time to time given to the Contractor or his foreman, may change, increase or take away any part of the work, or change the specifications, plans, drawings, form or materials thereof. Any deduction or addition thereto is to be allowed, or paid for at a price to be determined, within not more than 15 days of the completion of the change, by the City Engineer acting in the same capacity as an architect in a building contract as between owner and contractor. Any demand for addition or deduction must be made in writing to the City Engineer within seven (7) days of the time change was ordered.

ARTICLE 6
Time and Manner of Doing the work - Beginning and Completion

1. The Contractor shall begin work upon receipt of written Notice to Proceed. Once begun the work shall be carried out in a continuous and uninterrupted fashion with sufficient workforce and resources to assure completion by the date for completion established by the Contract Documents.

2. The Contractor shall carry on the work in accordance with the requirements of law and of all other public authorities, and to the satisfaction of the Commissioner; he shall give all notices, take out all permits, pay all charges and fees, give personal supervision to the work and keep thereon a competent foreman and sufficient employees, skilled in the several parts which are given them to do.

Maintenance of Travel

3. The Contractor shall conduct his work so as to interfere as little as possible with public travel, and shall give property owners proper means of access to their property where existing access has been cut off by the work. The Contractor shall keep the streets open for through travel except where, in the opinion of the Commissioner, it is necessary to close the street. The continuous length of the street occupied for the work shall be kept as short as possible, and no part of the work shall be unnecessarily delayed. Wherever the Commissioner shall direct, trenches shall be bridged by the Contractor in a proper and secure manner so as not to interrupt travel. Free access shall be maintained at all times to all water gates, gas gates, and fire hydrants.

Abandonment of Work by Contractor

4. In the event the City Engineer certifies to the Commissioner that the work is not being so carried forward or if the Contractor at any time is not carrying on the work to the satisfaction of the Commissioner, or is not observing any of the provisions of the contract, or has abandoned the work, or become insolvent or assigned his property, the City, acting by the Commissioner and at his discretion, may, with or without notice to the Contractor, or advertising for doing the work, and by contract, day labor or otherwise, do any part of the work which the Contractor has failed to do or replace any part not done to the satisfaction of the Commissioner, or take possession of the work and complete the same, and in doing so may use any implements, machinery or materials on or about the work which are the property of the Contractor, charging the Contractor any excess cost for completing the work, which excess cost the Contractor agrees to pay.

ARTICLE 6A
Liquidated Damages

1. In case the work embraced in the contract shall not have been completed by the date stipulated therein, the Contractor shall pay to the City of Newton as liquidated damages a designated sum per calendar day for the entire period of overrun in accordance with the following Schedule of Deductions, and in addition, the Contractor shall pay without reimbursement the entire cost of all traffic officers, railroad flagmen, inspectors, or other personnel the City Engineer and/or the Chief Engineer of the railroad determines to be necessary during the period of overrun of time.

SCHEDULE OF DEDUCTIONS

Daily Charge

Per Calendar Day
$1,200.00

2. Whatever sum of money may become due and payable to the City of Newton by the Contractor under this Article may be retained out of money belonging to the Contractor in the hands and possession of the City of Newton. It is agreed that this Article shall be construed and treated by the parties to the contract not as imposing a penalty upon said Contractor for failing fully to complete said work as agreed on or before the time specified in the proposal, but as liquidated damages to compensate said City of Newton for all additional costs incurred by it because of the failure of the Contractor fully to complete said work on or before the date of completion specified in the proposal.

ARTICLE 6B

Delays and Extensions of Time

1. If the Contractor is delayed at any time in the progress of the work by an act or neglect of the City, or by changes in the work ordered by the City, or by unseasonably inclement weather, or by other causes deemed by the City Engineer to be beyond the Contractor's control, and which the City Engineer determines may justify delay, then the time for completion may be extended for such reasonable time as the City Engineer may determine.

2. No such extension of time will be allowed unless the Contractor submits a written request for an extension to the City Engineer no later than 10 calendar days of the start of the occurrence or event giving rise thereto. Each such request must describe the occurrence or event and specify the manner and extent that such occurrence or event is causing or has caused a delay in the work. The City Engineer shall promptly investigate each request and make his written determination to the Commissioner and the Contractor within 10 days after receipt of the request. In his determination the City Engineer may either grant, deny, or modify the length of the requested extension.

3. If the City Engineer's determination so warrants, the Commissioner shall authorize a written Change Order to the Contract extending the time for completion. No extension of time shall be deemed as granted until said Change Order has been duly executed by the parties.

4. Change Orders which may be executed by the City and the Contractor in connection with additions, extra labor and/or extra materials shall not be considered as allowing extensions of the time for completion unless the change order expressly specifies that additional time is allowed in connection with the work under the change order. Once a Change Order has been executed by the parties, any request by the Contractor for an extension of time based solely on the fact that additions, extra labor and/or extra materials are required by the Change Order will be denied by the City Engineer.

5. Permitting the Contractor to continue and finish the work or any part of it after the times fixed for its completion, or after the date to which the time for completion may have been extended, shall in no way operate as a waiver on the part of the City of Newton of any of its rights under the contract. The Contractor remains liable for damages caused other than by delay.

ARTICLE 7
Lines and Grades

1. The Contractor shall retain a Registered Land Surveyor who shall furnish such boards and stakes and cause to be placed thereon, such lines, marks and directions relating to the work as the Commissioner or City Engineer shall from time to time direct.

ARTICLE 8
Public Service Pipes and Conduits

1. The Contractor shall maintain such pipes or conduits of public service corporations or of the City as are across or within the lines of the work until such time as said public service corporations or the City assume the maintenance or removal of said pipes or conduits. The Commissioner will notify such public service corporations to that effect on the existence of such obstructions to the work being brought to his notice by the Contractor. The City will relocate either temporarily or permanently all water mains and water service pipes, or hydrants, and drains or sewers which may interfere with the work contemplated in this contract. (This clause is not to be construed as applying to such pipes as may be readily supported and protected during the progress of the work.) The cost of shutting off and turning on water in water mains during blasting shall be assumed by the City.

Protection of Existing Structures

2. All existing gas pipes, water pipes, sewers, drains, conduits, or other structures which are uncovered by the excavation shall be carefully supported and protected from injury by the Contractor, and, in case of injury, they shall be restored by him, without compensation therefor, to as good condition as that in which they were found, and shall be kept in repair until 6 months after the completion of the work. The Contractor shall provide suitable temporary channels for water at all water courses. Wherever the work passes under or adjacent to street railway tracks, the Contractor shall make all necessary arrangements with the railway company for doing any work which may affect the property of the company or interfere with the operating of the railway, and he shall be liable for any damage that may be caused by any act, omission or neglect on his part, and shall pay all expenses of every kind incidental to this work.

Changing the Location of Existing Structures

3. Whenever it becomes necessary to change the location of any water or gas pipes, sewers, drains, conduits or other structures not otherwise provided for in these specifications, the Contractor shall do the whole or such portions of the work of making such changes as the Commissioner may require, and shall receive in payment therefor the reasonable cost of the work done as determined by the Commissioner plus 15 per cent of such cost. In estimating such cost, no allowance shall be made to the Contractor for the use of tools not especially provided for this work, for general superintendence, or for any overhead expenses except liability insurance.

ARTICLE 9
Co-operation with Other Contractors

1. The Contractor shall conduct the work in such manner as not to interfere with other work being done by the City, by contract or otherwise, and if deemed necessary by the Commissioner, the work under this contract shall conform to the progress of said other work; shall co-operate with other contractors or employees who may be doing work for the City, and with public service corporations affected by the work, in arranging for storage places, connections, bracings, temporary support for structures, repairs, etc.

ARTICLE 10
Subcontracts

1. The Contractor, in any contract with a Subcontractor, shall provide that the Subcontractor shall be subject to all specifications, terms, provisions, conditions, requirements and liabilities set forth in this contract so far as such specifications, terms, provisions, conditions, requirements and liabilities are applicable to the work to be done under such Subcontract, and shall also provide that such Subcontract shall be terminated by the Contractor whenever the Commissioner shall certify to him in writing that in his opinion the work of the Subcontractor is unnecessarily or unreasonably delayed or that the Subcontractor has violated any of the provisions of this contract. The Contractor shall at once terminate such subcontract if the Commissioner, after certifying as aforesaid, shall in writing direct the Contractor to make such termination.

2. Subcontracts shall be made in writing and the Contractor shall furnish the Commissioner with a copy of his subcontracts on demand.

3. Pursuant to the provisions of M.G.L. Ch. 30, Sec. 39F (1), the following provisions are included in the General Conditions:

(a) Forthwith after the general contractor receives payment on account of a periodic estimate, the general contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by that sub-contractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(b) Not later than the sixty-fifth day after each subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the subcontract less amounts retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the

subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring the payment and also less any amount claimed due from the subcontractor by the general contractor.

(c) Each payment made by the awarding authority to the general contractor pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials furnished by a subcontractor shall be made to the general contractor for the account of the subcontractor; and the awarding authority shall take reasonable steps to compel the general contractor to make each such payment to each such subcontractor. If the awarding authority has received a demand for direct payment from a subcontractor for any amount which has already been included in a payment to the general contractor or which is to be included in a payment to the general contractor for payment to the subcontractor as provided in subparagraphs (a) and (b), the awarding authority shall act upon the demand as provided in this section.

(d) If, within seventy days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority, the demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered to or sent by certified mail to the general contractor at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of the completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth day after which the subcontractor has substantially completed the subcontract work. Within ten days after the subcontractor has delivered or so mailed the demand to the awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the awarding authority and a copy shall be delivered to or sent by certified mail to the subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor and of the amount due for each claim made by the general contractor against the subcontractor.

(e) Within fifteen days after receipt of the demand by the awarding authority, but in no event prior to the seventieth day after substantial completion of the subcontract work, the awarding authority shall make direct payment to the subcontractor of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount (i) retained by the awarding authority as the estimated cost of completing the incomplete or unsatisfactory items of work (ii) specified in any court proceedings barring such payment, or, (iii) if the reply shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The awarding authority shall make further direct payments to the subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this subparagraph.

(f) The awarding authority shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (e) in an interest-bearing joint account in the names of the general contractor and the subcontractor in a bank in Massachusetts selected by the awarding authority or agreed upon by the general contractor and the subcontractor and shall notify the general contractor and the subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the general contractor and the subcontractor or as determined by decree of a court of competent jurisdiction.

(g) All direct payments and all deductions from demands for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to subparagraph (f) shall be made out of amounts payable to the general contractor at the time of receipt of a demand for direct payment from a subcontractor and out of amounts which later become payable to the general contractor and in the order of receipt of such demands from subcontractors. All direct payments shall discharge the obligation of the awarding authority to the general contractor to the extent of such payment.

(h) The awarding authority shall deduct from payments to a general contractor amounts which, together with deposits in interest-bearing accounts pursuant to subparagraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from subcontractors. All such amounts shall be earmarked for such direct payments, and the subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the general contractor.

ARTICLE 11
Compensation for Work

1. Subject to any provisions in Paragraph 7, the price named in the proposal and accepted by the City shall be paid by the City and received by the Contractor as full compensation for furnishing materials and for use of tools, forms, machinery and other implements, and for labor in moving materials and executing all the work contemplated in this contract, also for loss or damage arising from delay however occasioned, or out of the nature of the work aforesaid or from the action of the

elements, from floods, or from any unforeseen obstructions or difficulties which may be encountered in the prosecution of the same and for all risks of every description connected with the work and for well and faithfully completing the work in the proper manner and according to the plans and specifications and requirements of the Commissioner under them.

2. During the first week of each calendar month, the City Engineer shall cause all work done by the Contractor during the previous month to be measured and shall estimate the value thereof and, on or before the 10th of each month issue a certificate to the Commissioner of the measurements and the amount due the Contractor according to the terms of his contract.

3. The City shall pay the Contractor on approval of the Commissioner monthly on or before the 18th of each month for all work done during the preceding month according to the aforementioned certificate of the City Engineer, less 5 per cent of the amount of such work and less any amounts due the City by the Contractor.

4. Within ten days after the completion of the work as determined by the Commissioner, the City Engineer shall issue to the Commissioner a final certificate of the total amount of work done and the money due the Contractor therefor, crediting thereon the amounts of the previous payments. In making the final certificate, the City Engineer shall not be bound by any preceding certificate or estimate of the amount of work done or materials furnished.

Final Payment--Claims Against Contractor

5. At the expiration of 65 days after the completion of the work as determined by the Commissioner, the City shall, unless claims are made or notice of liability against the City is given, pay the Contractor, on the approval of the Commissioner, the percentages retained and the balance due the Contractor according to the aforementioned final certificate of the City Engineer less any indebtedness of the Contractor to the City. If a claim or claims are made, or notice of liability given, such amounts due the Contractor may be paid upon satisfaction of such claims or upon furnishing of indemnity to said City against all loss, cost, damage or expense by reason of such claims. In the event of no known claims or liens the City may, at its option, pay within 35 days.

6. The City, on making any payment after the completion of the work, shall be released from all claim or liability to the Contractor for anything done or used, or for any loss or injury sustained in carrying on the contract, or for any act, omission, neglect or mistake of the City or any person relating to or affecting the contract, except for the balance of any sum retained as aforesaid.

Extra Work

7. The Contractor shall be paid for any additions, or deductions as provided in Article 5, paragraph 1, and for extra labor done by, and for extra materials furnished by him in compliance with the written order only of the Commissioner, calling for work not similar in character to that covered by the items given in the proposal, and for which no price is set in the said written order, the direct (not including consequential) cost to the Contractor, as determined to be reasonable by the Commissioner, plus fifteen per cent of said costs as so determined in regard to labor only. For teams or trucks so furnished, no payment shall be made to the Contractor beyond the current local rate as determined by the Commissioner in each case. The direct cost of labor may include the cost of mechanics and laborers furnished and a reasonable proportion of the time of the foreman and timekeeper, but it shall in no case include any charge for the use of tools, for establishment charges or for time spent by the Contractor. The actual cost of insurance on extra pay rolls and of materials furnished for extra work, shall be paid without any addition. The labor and materials so ordered shall constitute a part of the work to be done under the contract; and all and singular the provisions of the contract shall apply to said labor and materials as if the same were specified therein. The Contractor shall have no claim for the above mentioned extra labor and materials unless he furnishes the details and bills therefor within one week after doing any such labor or furnishing any such materials.

8. No claim of the Contractor against the City under this contract shall be deemed valid unless such claim is presented to the Commissioner within ten days from the time when the Contractor first knows of, or has opportunity to know of, the acts and circumstances on which such claim is based.

9. A payment or payments to the Contractor, in cases where these provisions or any of them, are not complied with, shall not be construed as a waiver of said provisions or any part thereof.

Contract Made Subject to Appropriations

10. This contract is made subject to appropriation heretofore made and shall not be altered unless the Contractor, the sureties on the bond, if any, the officer making the contract and the Mayor shall in writing agree thereto.

ARTICLE 12
Responsibility for Work--Contractor's Responsibility

1. The Contractor has made his proposal from his own examinations and estimates, and shall not hold the City, its agents, or employees, responsible for or bound by, any schedule, estimate, sounding, boring, or any plan of any part of the work; shall, if any error in any plan, drawing, specification or direction relating to anything to be done under the contract come to his knowledge, report it at once to the Commissioner; shall not, except as the Commissioner shall authorize in writing, assign or sublet any part of the contract except for the supply of materials and plant, or of anything to be done thereunder; shall, subject to the provisions of the contract take all responsibility of, and bear all losses resulting to him in carrying on the contract, and shall assume the defense of, and hold the City, its agents and employees harmless from all suits and claims against them, or any of them, arising from the use of any invention, patent or patent right, material, labor or implement, by or from any act or omission or neglect of the Contractor, his Subcontractor, his agents or employees, in carrying on the contract, or for any liability of any nature arising under the contract. The Contractor shall be solely responsible and liable for, and shall fully protect and indemnify the City against all claims for damages to persons or property occasioned by or resulting from blasting or other methods or processes in the work of construction, whether such damages be attributable to negligence of the Contractor, his employees or his Subcontractor or otherwise.

ARTICLE 13
LIGHTS--GUARDS

1. The Contractor shall assume all responsibilities of the work and take all proper precautions to protect persons and property from injury and unnecessary interference; leave a reasonably unobstructed way along public and private places for pedestrians, teams, and vehicles, and for access to hydrants; provide proper walks over or around any obstruction made in a public or private place in carrying on the contract, and maintain from the beginning of twilight through the whole of every night, on or near the obstruction sufficient lights and guards to protect travelers from injury thereby, and if, after one notification from the Commissioner that said lights and guards are not sufficient, the Contractor has not placed additional lights and guards to the satisfaction of the Commissioner, the Commissioner shall have the right to take charge of that part of the work at the expense of the Contractor. While the work is suspended he shall keep all roadways and sidewalks in proper condition, and when the work is completed put the place and vicinity in proper condition and so leave them.

The Contractor shall provide proper means of access to property where the existing access is cut off by the Contractor and replace or put in good condition every conduit, catch-basin, tree, wall, fence, or other thing injured by the Contractor in carrying on the contract, unless the same has been permanently done away with, on approval of the Commissioner, as being necessary to the proper carrying on of the contract.

ARTICLE 14
Guaranty

1. Any settlement or other defect, or the failure of any part of the structure or the work due to defective materials or workmanship, that occurs within one year after the work is completed, is to be immediately repaired by the Contractor. In the event of any such settlement, defect, or failure causing liability to the City for damage to persons or property, the Contractor does by this clause agree to hold the City harmless and to assume the defense of any claims therefor.

2. Responsibility under this guaranty for the adequacy of the work does not relieve the Contractor of his obligation to comply with the terms of the contract and to conform to all the requirements of the plans and specifications, nor does it give him the right to deviate in any way from the details of design of the structure or the work.

ARTICLE 15
Defective Work and Materials

1. The inspection of the work shall not relieve the Contractor of any of his obligations to fulfill his contract as herein described, and defective work shall be made good and unsuitable materials may be rejected, notwithstanding that such work and materials have been previously overlooked by the Engineer and accepted or estimated for payment. If the work or

materials, or any part thereof shall be found defective at any time before the final acceptance of the whole work, the Contractor shall forthwith make good such defect in a manner satisfactory to the Engineer, and if any material brought upon the ground for use in the work or selected for the same, shall be condemned by the Engineer as unsuitable or not in conformity with the specifications, the Contractor shall forthwith remove such materials from the vicinity of the work. Nothing in this contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been attached or affixed to the work or the soil, but all materials shall, upon being so attached or affixed, become the property of the City of Newton.

ARTICLE 16
Employment of Labor

1. The Contractor shall give preference in employment, first to citizens of Massachusetts, second, to other citizens of the United States; and shall allow all employees on said work to lodge, board and trade where they choose, and shall not obstruct any other person in doing work for the City; and shall conform to all labor laws of the Commonwealth; and no laborer or teamster, workman or mechanic working within this Commonwealth in the employ of the Contractor or Subcontractor or other person doing or contracting to do the whole or a part of the work contemplated by the Contractor shall be requested to, or required to, or work more than eight hours in any one calendar day. This contract is subject to all the laws of the Commonwealth, and ordinances of the City and if any clause thereof does not conform to such laws and ordinances, such clause shall be void and such laws and ordinances operated in lieu thereof.

ARTICLE 17
Laws and Regulations--Contractor to Comply with Law

1. The Contractor shall keep fully informed of all existing or future acts of the legislature, and of all municipal ordinances, prohibitions, rules and regulations in any manner affecting the conduct of the work, and of all orders or decrees of any body or tribunal having any jurisdiction or authority over the materials, times, places and actions of those employed in the work embraced in the contract. The Contractor shall at all times observe and comply with all existing and future acts, ordinances, prohibitions, rules, regulations, orders and decrees; and shall protect and indemnify the city and its employees against any and all claims arising from or based on any violation of such acts, ordinances, prohibitions, rules, regulations, orders or decrees, and against all violations of law by the Contractor or his agents or employees.

END OF SECTION

CITY OF NEWTON
MINORITY/ WOMEN BUSINESS ENTERPRISE PLAN
DECEMBER 1, 1999
JANUARY 21, 2010 revised

STATEMENT OF POLICY:

Whereas it is the policy of the government of the United States of America, the Commonwealth of Massachusetts and the City of Newton that no person shall be discriminated against in any manner whatsoever on the grounds of race, religion, color, sex, handicap or national origin; and

Whereas, it is the policy of the government of the United States of America that no person shall, on the grounds of race, color, sex or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program of activity funded entirely or in pail by the City, the State or Federal government; and

Whereas, it is the policy of the government of the United States of America to encourage that Minority/Women Business Enterprises shall have the maximum practicable opportunity to participate in Federal and State assisted projects; and all City funded contracts; and

Whereas, it is the policy of the City of Newton to encourage that minority/women business enterprises shall have the maximum practicable opportunity to participate in all City funded contracts; and

Whereas, the City of Newton, as a recipient of Federal and State funds subscribes to the above policies and will fully comply With Federal, State and local laws and directives governing non-discrimination, equal opportunity and affirmative action in all municipal activities; and

Whereas, to further enunciate the equal opportunity policy of the City of Newton's Minority/Women Business Program, the following responsibilities are specified

> This MINORITY/ WOMEN Business Enterprise Plan sets forth the administrative standards for the further implementation of the City of Newton's policy of the utilization of minority contractors and subcontractors.
>
> The City of Newton strongly affirms that it will not discriminate in any contractual procedures against any persons because of race, color, religion, age, disability, sex or national origin. This policy shall be administered with a positive supportive attitude.
>
> It is the responsibility of the City of Newton to take affirmative steps to implement this policy to insure equality of opportunity in conducting the Program including notifying those persons and businesses doing business with the City, that contracts for goods, services and construction, shall be made Without reference or regard to race, color, sex, age, handicap, religion or national origin.

Setti D. Warren Mayor

CITY OF NEWTON
MINORITY/ WOMEN BUSINESS ENTERPRISE PLAN
JANUARY 21, 2010

I. **DEFINITIONS:**

A. **Minority Person**- the term includes a person who is of Black Hispanic, Asian, American Indian or Cape Verdean origin.

B. Minority Business Enterprise (MBE) -- the term shall mean a business a) that is certified by SOMWBA; orb) I provides evidence satisfactory to the *City's* Affirmative Action Officer that it is a business owned or controlled by one or more of the following:

- an individual who is a minority person,
- a partnership or joint venture controlled by minority persons in which at least 51 % of the ownership interest is held by minority persons or,
- a corporation or other entity controlled by minority persons and in which at least 51 % of the stock is owned by one or more minority persons.

C. **Contract Compliance Officer** - the Chief Procurement Officer or his/her designee responsible for the implementation of Newton's Minority/Women Enterprise Plan ("MWBE Plan") and activities.

D. **MCAD** - Massachusetts Commission Against Discrimination.

E. SOMWBA -- State Office of Minority/Women Business Assistance,

F. **City** - The City of Newton.

G. **Women Business Enterprise** (WBE) - the term shall mean a business a) that is certified by SOMWBA; or b) provides evidence satisfactory to the City's Affirmative Action Officer that it is a business owned or controlled by one or more of the following:

- an individual who is a woman.
- a partnership or joint venture controlled by women in which at least 51% of the ownership interest is held by women, or
- a corporation or other entity controlled by women and in which at least 51% of the stock is owned by one or more women.

H. **MWBE —** Minority or Women Business Enterprise

II. **GOALS**:

Newton's Minority/Women Enterprise Plan ("MWBE Plan") shall be guided by the goals presented below to promote minority/women opportunities within the City.

These goals comprise the framework for those activities to be implemented as part of the MWBE Plan:

To take affirmative action in expanding opportunities for minority and women owned firms in obtaining contracts within the City of Newton.

To assure that all contractors, regardless of race color, religion, creed, national origin, sex, age, ancestry or handicap, shall have equal opportunity to City contracting activities.

To award, of the total annual City contract dollars expended, 10 percent to MBE and 5 percent to WBE for construction; for goods and services, 5 percent WBE and 5 percent MBE.

III. SOLICITATION ACTIVITIES:

To notify MWBEs of upcoming contracts for construction, professional services and supplies, funded in whole or in part with Federal, State, and City funds, the following activities will be undertaken. In addition on a regular basis, the City of Newton will distribute to its listing of MWBEs and SOMWBA, a summary of upcoming contract opportunities which are subject to the City's MWBE Plan.

A. Construction Contracts

All construction contracts with an estimated value over $50,000 will be formally advertised within local, regional, minority and special interest publications at least 14 days prior to the bid opening date.

For all such construction contracts a "Notice of Solicitation" of a project going out to bid will be distributed to appropriate SOMWBA or City certified firms at least 14 days prior to the bid opening date.

B. Contracts for Professional Services

The City of Newton will send notification of its advertised Request for Proposals to appropriate! SOMWBA or City certified firms Responding MWBE firms will be considered for contract award within the bounds of generally accepted management practice or with the applicable procurement law relating to securing the lowest cost and best services available.

C. Procurement of Supplies

The City of Newton will (where feasible) utilize MWBEs for the procurement of supplies in accordance with City purchasing procedures. These efforts will be documented and reported to MCAD, and the Mayor's office on a quarterly basis.

IV. CONSTRUCTION ACTIVITIES:

A. Goals

The City of Newton bid documents and contracts with an estimated value over $50,000 will contain the City's goal of 10% for MBE and 5% for 'WBE utilization for subcontracts,

B. Pre-Bid Conference

To affirmatively further the opportunities available to prospective bidders, the City will hold a pre-bid conference 5-7 days prior to the bid opening date for all City construction contracts and subcontracts with an estimated value over $50,000.

The pre-bid conference will provide an opportunity for contractors to: review and clarify the technical requirements of the projects, review the City's MWBE Plan; and review Equal Opportunity requirements. The *City* will advertise this conference and extend invitations to interested contractors as part of the notice of solicitation.

C. Bid Submission

All bids for City of Newton contracts with -an estimated value over $50,000 shall include a certification of intent to be completed by the bidder swing his/her intent to comply with the *City's* MWBE Plan. Failure to include this certification shall be an informality which may be waived if such certification is received prior to the award of the contract.

D. Contract Execution

Upon notification of award of the contract, the bidder shall provide a written plan detailing how it will comply with the MWBE Plan

E. Monitoring

Throughout the duration of the contract, the *City* of Newton through its Contract Compliance Officer, will monitor the progress and activities of all contractors and subcontractors as they attempt to comply with the MWBE Plan.

F. Enforcement

In the case of clear neglect to make a good faith effort to comply with this MWBE Plan, the City of Newton reserves the right to designate contractor, after a hearing, as ineligible for future City bid awards.

V. CONTRACT COMPLIANCE OFFICER/DUTIES AND RESPONSIBILITIES:

The Contract Compliance Officer, as liaison between minority firms and the City of Newton will have the overall responsibility for the implementation of Newton's MWBE Plan. This responsibility includes the development, management, dissemination of information; the provision of technical assistance to minority firms including clarification of procedures to be implemented; maintenance of relevant documentation; completion of reporting requirements; and performance of monitoring and evaluation activities; and maintenance and updating of listings of minority/women business.

The Contract Compliance Officer has oversight of all City procurements for construction, professional services and supplies and shall coordinate the implementation of the MWBE Plan with other *City* departments.

THE CITY OF NEWTON. MASSACHUSETTS
SUPPLEMENTAL EQUAL EMPLOYMENT OPPORTUNITY
ANTI-DISCRIMINATION AND AFFIRMATIVE ACTION PROGRAM

I. The requirements hereinafter set forth apply to construction contracts which involve an expenditure by the City of $50,000 or more.

II. For purposes of this contract "minority" refers to Asian Americans, Black, Hispanics American Indians and Cape Verdeans. The City refers to the- City of Newton

III. During the performance of this contract the Contractor and all of (his) Subcontractors (hereinafter collectively referred to as the Contractor) , for himself, his assignees, and successors in interest, agree as follows:

In connection with the performance of work under this contract, the Contractor shall not discriminate against any employee or applicant for employment because of race, color, religious creed, national origin, age or sex. The aforesaid provision shall include, but not be limited to, the following: layoff; termination; rates of pay or other forms of compensation; conditions or privileges of employment; and the selection of apprenticeship. The Contractor shall post hereafter in conspicuous places, available for employees and applicants for employment, notices to be provided by the City setting forth the provisions of the Fair Employment Practices Law of the Commonwealth (MGL Chapter 151 B) . (See Attachment A)

2. In connection with the performance of work under this contract, the Contractor shall undertake in good faith, affirmative action measures designed to eliminate any discriminatory barriers in the terms and conditions of employment on the grounds of race, color, religious creed, national origin, age or sex, and to eliminate and remedy any effects of such discrimination -in the past. Such affirmative action shall. entail positive and aggressive measures to ensure equal employment: opportunity in the areas of hiring, upgrading, demotion or transfer, recruitment, 'Layoff or termination, rate of compensation, and in-service or apprenticeship training programs. This affirmative action shall. include all action required to guarantee equal employment opportunity for all persons, regardless of race, color, religious creed, national origin, age or sex. A 'purpose of- this provision is to ensure to the fullest extent possible an adequate supply of skilled tradesmen for this and future City public construction projects

1. As part of this obligation of remedial action under the foregoing section, the contractor shall maintain on this project a not less than 5 percent ratio of minority employee man hours to total man hours in each job category, including, but not limited to, bricklayers, carpenters, cement masons, electricians, ironworkers, operating engineers, and those "classes of work" enumerated in Section 44C of Chapter 149 of the Massachusetts General Laws.

2. In the hiring of minority journeymen, apprentices, trainees and advanced trainees, the Contractor shall rely on referrals, from the Contractor's affirmative action program approved by the City, traditional referral methods utilized by the construction industry, and referrals from agencies, not more than three in number at any one Lime, designated by the Liaison Committee or the City.

1. At the discretion of the City, there maybe established for the life of this contract a body to be known as the Liaison Committee, The Liaison Committee shall be composed of the Compliance Officer and one representative each from the Departments administering this project, hereinafter called the administering Departments, and such other representatives as may be designated by the City.

2. The Contractor (or, his/her agent, if any, designated by him/her as the onsite equal employment opportunity officer) shall recognize the Liaison Committee as the affirmative action body, and shall establish a continuing working relationship with the Liaison Committee on all matters related to minority recruitment, referral, employment and training.

3. The Contractor shall prepare manning tables on a quarterly basis.* These shall be broken down into projections, by week, for workers required in each trade. Copies shall be furnished one week in advance of the initiation of work and quarterly thereafter to the City and to the Liaison Committee.

4. Records of employment referral orders, prepared by the Contractor, shall be made available to the *City* and to the Liaison Committee on request.

5. The contractor shall prepare weekly reports in a form approved by the City of hours worked in each trade by each employee, identified as minority or non-minority. Copies of these reports shall be provided at the end of each week to the City and to the Liaison Committee.

* If job is less than three months, prepare for length of job.

VI. If the Contractor shall use any sub contractor on any work performed under this contract, he/she shall take affirmative action to negotiate with qualified minority subcontractors. This affirmative action shall cover both pre-bid and post-bid periods. It shall include notification to the State Office of: Minority *Business Assistance* or As designee, while bids are in preparation, of all products, work or services for which the Contractor intends to negotiate bids.

VII. In the employment of journeyman, apprentices, trainees, and advanced trainees, the Contractor shall give preference to citizens of the Commonwealth who have served in the armed forces of the United States in time of war and have been honorably discharged there from or released from active duty therein, and who are qualified to perform the work to which the employment relates, and, secondly to citizens of the Commonwealth generally, and, if such cannot be obtained in sufficient numbers, then to citizens of the United States

VIII. A designee of the City and a designee of the Liaison Committee shall each have the right of access no the Construction site,

IX. **Compliance with Requirements**

The Contractor shall comply with the provisions of Chapter 151 B of the Massachusetts General Laws, which are herein incorporated by reference and made as amended by Executive Order 227, and of Chapter 151B as amended, of the Massachusetts General Laws, both *of which* are herein incorporated by reference and made a part of this contract.

X. **Non-Discrimination**

The Contractor, in the performance of all work after award, and prior to completion of the contract work, will not discriminate on the grounds of race, color, religious creed,

national origin, age or sex in employment practices, in the selection or retention of sub-contractors, or in the procurement of materials and rentals of equipment.

XI. **Solicitations for sub-Contracts and for the Procurement of Materials and Equipment**

In all solicitations either by competitive bidding or negotiation made by the Contractor either for work to be performed under a subcontract or for the procurement of materials or equipment, each potential subcontractor or supplier shall be notified in writing by the Contractor of the Contractor's obligations under his contract relative to non-discrimination and affirmative action.

XII. **Bidders Certification Requirement**

1. The following certification statement will be inserted in the bid document just above the bidder's signature.

"The bidder hereby certifies he shall comply with tile minority manpower ratio and specific action steps contained in the City of Newton, Massachusetts Supplemental Equal Employment-- Opportunity Anti-Discrimination and Affirmative Action Program. The Contractor receiving the award of the contract shall be required to obtain from each of its subcontractors and submit to the contracting or, administering agency prior to the performance of any work under said contract a certification by said subcontractor, regardless of tier, that it will comply with the minority manpower ratio and specific affirmative action steps contained in the City of Newton Massachusetts Supplemental Equal Employment Opportunity Anti -Discrimination and Affirmative Action Program.

XIII. **Contractor's Certification**

A Contractor's' certification form must be signed by all successful low bidders prior to award by the City. A Contractor shall not be eligible for award of a contract unless the contractor has executed and submitted the Contractor's Certification, which shall be deemed a part of the resulting contract. (See Attachment B)

XIV. **Subcontractor's Certification**

Prior to the award of any subcontract, regardless of tier, the prospective subcontractor must execute and submit: to the Prime Contractor a subcontractor's certification setting forth the subcontractor's compliance with this program, which shall be deemed a part of the resulting subcontract. (See Attachment C)

XV. **Compliance - Information, Reports and Sanctions**

1. The Contractor will provide all information and reports required by the administering department or, the City on instruction issued by either of them and will permit access to its facilities and any books, records, accounts and other sources of information which

may be determined by the City to affect the employment of personnel. This provision shall apply only to information pertinent to the City's supplementary affirmative action contract requirements. Where information required is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the administering department or the City as appropriate and shall set forth what efforts he/she has made to obtain the information.

2. Whenever the administering department, the City, or the Liaison Committee believes the General Contractor or any Subcontractor may not-, be operating in compliance with the terms of this Section, the City directly, or through its designated agent, shall conduct: an appropriate invest ig at ion, and may confer with the parties, to determine if such Contractor is operating in compliance with the terms of this Section. If the City or its agent finds the General Contractor or any Subcontractor not in compliance, it shall make a preliminary report on non-compliance, and notify such Contractor in writing of such steps as will in the judgment of the City or its agent bring such Contractor into compliance. In the event, that such Contractor fails or refuses to fully perform such steps, the City shall make a final report of non-compliance, and recommend to the administering department the imposition of one or more of the sanctions listed below. If, however, the City believes the General Contractor or any Subcontractor has taken or is taking every possible measure to achieve compliance, it shall not make a final report of non-compliance, within fourteen days at the receipt of the recommendations of the City, the administering department shall move to impose one or more of the following sanctions, as it may deem appropriate to attain full and effective enforcement:

(a) The recovery by the administering department from the General Contractor of 1/100 of!! of the contract award price or $1000 whichever sum is greater, in the nature of liquidated damages or
if a Subcontractor is in non-compliance, the recovery by the administering department from the General Contractor, to be assessed by the General Contractor as a back charge against the Subcontractor, of 1/10 of 1% of the sub-contract price, or $400 whichever sum is greater, in the nature of liquidated damages, for each week that such party fails or refuses to comply

(b) The suspension of *any* payment of part thereof due under the contract until such time as the General Contractor or any Subcontractor is able to demonstrate his compliance with the terms of the contract;

(c) The termination, or cancellation, of the contract, in whole or in part, unless the General Contractor or any Subcontractor is able to demonstrate within a specified time his/her compliance
with the terms of the City's affirmative action construction contract requirements; OR,

(d) The denial to the General Contractor or any Subcontractor of the right to participate in any future contracts awarded by the administering department for a

(e) Period of up to three years.

3. If at any time after the imposition of one or more of the above sanctions (unless the contract. has been terminated), a Contractor is able to demonstrate that he/she is in compliance with this section, he/she may request the City to suspend the sanctions conditionally pending a final determination by the City as to whether the Contractor is in

compliance. Upon final determination of the City, the administrating department, based upon the recommendation of the City, shall either lift the sanctions or continue them.

4. Sanctions enumerated under Section XV shall not: be imposed by the City except after the General Contractor or Subcontractor has had an opportunity for full and fair hearing with City. The non-compliance investigation shall be initiated without prior notice to the contractor. Any sanctions to be imposed shall be, set forth fully and completely in writing, and may then be appealed to t-he City in writing by the Contractor.

.XIV. **Severability**

The provisions of this section are severable, and if any of these provisions shall be held unconstitutional by any court of competent jurisdiction, the decision of such court. shall not, affect or impair any of the remaining provisions.

FAIR EMPLOYMENT LAW

The Fair Employment Law declares that it is illegal to discriminate on the basis of race, color, religious creed, national origin, sex, sexual orientation, age, ancestry or disability

IT IS UNLAWFUL:

- to print or circulate any advertisement or use any application form which directly or indirectly specifies any limitation on the basis of race, color, religious creed, national origin, sex, sexual orientation, age, ancestry or disability.
- to discharge or refuse to hire arty individual on file basis of their race, color, religious creed, national origin, sex, sexual orientation, age, ancestry, or disability.
- to discriminate against any individual in matters relating to compensation, terms, conditions, or privileges of employment because of their race, color, religious creed, national origin, sex, sexual orientation, age, ancestry or disability.
- to require a woman to leave her job at some arbitrary stage in her pregnancy or to refuse to let her return to work until a specified time set by the employer.
- to grant a female employee at least eight weeks leave for purposes of childbirth or to treat her absence differently than any other absence due to disability.
- to require an employee to remain at work during any day or part thereof that s/he observes as a religious holiday provided that the employee gives a ten-day notice and the absence does not cause undue hardship to the employer.
- to discharge or refuse to hire any person because of their failure to furnish information concerning admission to a center for the treatment of mentally ill persons.
- to discriminate against a job applicant for failure to furnish information, written or oral, concerning.- A) an arrest, detention or disposition regarding a violation of law in which no conviction resulted; B) a first conviction for any of the following misdemeanors: driving under the influence, simple assault, speeding, minor traffic violations, disturbance of the peace; or C) conviction for a misdemeanor where the date of the conviction or end of period of incarceration, if any, occurred more than five years prior to the employment application, and the applicant has not been convicted of any offense within the five years immediately before the date of application.

RETALIATION

It is illegal to retaliate against any person because s/he has opposed any practices forbidden under this Chapter or because s/he has filed a complaint, testified, or assisted in any proceeding before the Commission. It is also illegal to aid, abet, incite, compel or coerce the doings of any of the acts forbidden under this Chapter or to attempt to do so.

SEXUAL HARASSMENT

151B:1,18 The term "sexual harassment" shall mean sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature when (a) submission to or rejection of such advances, requests or conduct is made either explicitly or implicitly a term or condition of employment, or as a basis for employment decisions: (h) such advances,, requests or conduct have the purpose or effect of unreasonably interfering with an individual's work performance by creating an intimidating, hostile, humiliating or sexually offensive work environment.

COMPLAINTS

All complaints must be filed in writing. Information on the filing of complaints can be obtained by contacting the MASSACHUSETTS COMMISSION AGAINST DISCRIMINATION at the following locations:

Boston office:
One Ashburton Place
Room 601
Boston, MA 02108
(617) 727-3990

Springfield office:
436 Dwight Street
Suite 315
Springfield, MA 01103
(4 13) 739-2145

Attachment B

CITY OF NEWTON

Contractors Certification

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

CONTRACTOR'S CERTIFICATION

_____Certifies that:
Contractor's Name

it tends to use the following listed construction trades in the work under the contract

_____ and

2. will comply with the minority manpower ration and specific affirmative action steps contained herein; and

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

_____
(Signature of authorized representative of Contractor)

Any contract for the provision of goods or services to the City of Newton or any of its departments is subject to the ordinance creating the Human Rights Commission, as it may be amended from Time to Time. Any complaints within the purview shall be forwarded immediately to the contracting agency, and a copy shall be sent to the Human Rights Commission; any complaints received by the contracting agency shall be forwarded to the contractor, and a copy shall be sent to the Human Rights Commission.

Attachment C

CITY OF NEWTON

Subcontractors Certification

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

SUBCONTRACTOR`S CERTIFICATION

_____Certifies that:
Contractor's Name

it tends to use the following listed construction trades in the work under the contract

_____ and

will comply with the minority manpower ration and specific affirmative action steps contained herein; and

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

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

_____
(Signature of authorized representative of Contractor)

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

Any contract for the provision of goods or services to the City of Newton or any of its departments is subject to the ordinance creating the Human Rights Commission, as it may be amended from Time to Time. Any complaints within the purview shall be forwarded immediately to the contracting agency, and a copy shall be sent to the Human Rights Commission; any complaints received by the contracting agency shall be forwarded to the contractor, and a copy shall be sent to the Human Rights Commission.

END OF SECTION

CITY OF NEWTON

WAGE RATE REQUIREMENTS

1. GENERAL

A. This section summarizes the requirements for the payment of wages to laborers and mechanics employed under the Contract.

B. Other duties and requirements of law which may not be specified in this section apply and are inherently a part of the Contract.

2. WAGE RATES

A. The rate per hour to be paid to mechanics, apprentices, teamsters, chauffeurs, and laborers employed on the Work shall not be less than the rate of wages in the attached "Minimum Wage Rates" as determined by the Commissioner of Labor and Industries. The schedule of prevailing wage rates will be updated annually for all public construction projects lasting longer than one (1) year. The contractor shall pay the prevailing wage rate set out in the applicable prevailing wage rate schedule. Increases in prevailing wage rates shall not be the basis for a change order.

B. Keep posted on the site a legible copy of said schedule. Keep on file the wage rates and classifications of labor employed on this Work in order that they may be available for inspection by the Owner, Administrator, or the Architect.

C. Apprentices employed pursuant to this determination of wage rates must be registered and approved by the State Apprenticeship Council wherever rates for journeymen or apprentices are not listed.

D. Pay reserve police officers employed on the Work the prevailing rate of wages paid to regular police officers as required by M.G.L. c149, Sec. 34B, as amended. Such police officers shall be covered by Workmen's Compensation Insurance and Employers Liability Insurance by the Contractor.

E. The Contractor and all subcontractors shall, on a weekly basis throughout the term of the contract, provide to the City of Newton certified payroll affidavits verifying compliance with M.G.L. c.149, Sec. 27, 27A and 27B.

F. The Contractor and all subcontractors shall provide a Statement of Compliance within 15 days of the completion of its portion of the work. This statement shall be submitted to the Owner on the form found elsewhere in this section.

G. The Contractor shall maintain accurate and complete records, including payroll records, during the Contract term and for three years thereafter.

END OF SECTION

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

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lt. Governor

JOANNE F. GOLDSTEIN
Secretary

HEATHER E. ROWE
Director

Prevailing Wage Rates

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

Awarding Authority: City of Newton

Contract Number: 11-88 **City/Town:** NEWTON

Description of Work: Kendrick St - Nahanton St Bridge Improvements Project

Job Location: Kendrick St and Nahanton St

Classification	Effective Dates and Total Rates					
Construction						
(2 AXLE) DRIVER - EQUIPMENT	12/01/2010	$45.370	06/01/2011	$45.770	08/01/2011	$46.120
	12/01/2011	$46.780	06/01/2012	$47.080	08/01/2012	$47.430
	12/01/2012	$48.460				
(3 AXLE) DRIVER - EQUIPMENT	12/01/2010	$45.440	06/01/2011	$45.840	08/01/2011	$46.190
	12/01/2011	$46.850	06/01/2012	$47.150	08/01/2012	$47.500
	12/01/2012	$48.530				
(4 & 5 AXLE) DRIVER - EQUIPMENT	12/01/2010	$45.560	06/01/2011	$45.960	08/01/2011	$46.310
	12/01/2011	$46.970	06/01/2012	$47.270	08/01/2012	$47.620
	12/01/2012	$48.650				
ADS/SUBMERSIBLE PILOT	08/01/2010	$103.680	08/01/2011	$107.800		
AIR TRACK OPERATOR	12/01/2010	$49.850	06/01/2011	$50.850	12/01/2011	$52.100
ASBESTOS REMOVER - PIPE / MECH. EQUIPT.	12/01/2009	$40.250				
ASPHALT RAKER	12/01/2010	$49.350	06/01/2011	$50.350	12/01/2011	$51.600
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE	12/01/2010	$60.980				
BACKHOE/FRONT-END LOADER	12/01/2010	$60.980				
BARCO-TYPE JUMPING TAMPER	12/01/2010	$49.350	06/01/2011	$50.350	12/01/2011	$51.600
BLOCK PAVER, RAMMER / CURB SETTER	12/01/2010	$49.850	06/01/2011	$50.850	12/01/2011	$52.100
BOILER MAKER	01/01/2010	$55.850				

APPRENTICE: BOILERMAKER - Local 29

Ratio	Step	1	2	3	4	5	6	7	8
1:5	%	65.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00

Apprentice wages shall be no less than the following:

Step 1$42.66/2$42.66/3$44.54/4$46.43/5$48.31/6$50.20/7$52.08/8$53.97

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)	03/01/2011	$70.900	08/01/2011	$73.000	02/01/2012	$73.990

APPRENTICE: BRICK/PLASTER/CEMENT MASON - Local 3 Newton

Ratio	Step	1	2	3	4	5
1:5	%	50.00	60.00	70.00	80.00	90.00

Apprentice wages shall be no less than the following:

Step 1$48.30/2$52.82/3$57.34/4$61.86/5$66.38

BULLDOZER/GRADER/SCRAPER	12/01/2010	$60.630				
CAISSON & UNDERPINNING BOTTOM MAN	12/01/2010	$50.250	06/01/2011	$51.250	12/01/2011	$52.500
CAISSON & UNDERPINNING LABORER	12/01/2010	$49.100	06/01/2011	$50.100	12/01/2011	$51.350
CAISSON & UNDERPINNING TOP MAN	12/01/2010	$49.100	06/01/2011	$50.100	12/01/2011	$51.350
CARBIDE CORE DRILL OPERATOR	12/01/2010	$49.350	06/01/2011	$50.350	12/01/2011	$51.600
CARPENTER	03/01/2011	$56.230	09/01/2011	$57.360	03/01/2012	$58.480

This wage schedule must be posted at the work site in accordance with M.G.L. ch. 149, sec. 27
Failure of the employer to pay "prevailing wage rates," which are the minimum wage rates listed above, on public works projects is a violation of M.G.L. ch. 149, sec. 27. Employees not receiving such rates should report the violation to the Office of Fair Labor and Business Practices, 100 Cambridge Street, Boston, MA 02108; Tel: 617-727-3465.

Issue Date: 05/10/2011 **Wage Request Number:** 20110510-070 **Page 1 of 10**

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

DEVAL L. PATRICK
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Secretary

HEATHER E. ROWE
Director

Prevailing Wage Rates

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

Awarding Authority: City of Newton

Contract Number: 11-88 **City/Town:** NEWTON

Description of Work: Kendrick St - Nahanton St Bridge Improvements Project

Job Location: Kendrick St and Nahanton St

Classification	Effective Dates and Total Rates					
APPRENTICE: CARPENTER - Zone 2 Eastern MA						
Ratio / Step: 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8						
1:5 / % / 50.00 / 60.00 / 70.00 / 75.00 / 80.00 / 80.00 / 90.00 / 90.00						
Apprentice wages shall be no less than the following:						
Step 1$26.27/2$29.47/3$41.91/4$43.51/5$46.68/6$46.68/7$51.46/8$50.87						
CEMENT MASONRY/PLASTERING	02/01/2011	$69.070	08/01/2011	$70.770	02/01/2012	$71.540
CHAIN SAW OPERATOR	12/01/2010	$49.350	06/01/2011	$50.350	12/01/2011	$51.600
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES	12/01/2010	$61.980				
COMPRESSOR OPERATOR	12/01/2010	$49.690				
DELEADER (BRIDGE)	01/01/2011	$64.410	07/01/2011	$65.410	01/01/2012	$66.410
	07/01/2012	$67.410	01/01/2013	$68.410		
APPRENTICE: PAINTER Local 35 - BRIDGES/TANKS						
Ratio / Step: 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8						
1:1 / % / 50.00 / 55.00 / 60.00 / 65.00 / 70.00 / 75.00 / 80.00 / 90.00						
Apprentice wages shall be no less than the following: Steps are 750 hrs.						
Step 1$29.31/2$36.86/3$39.01/4$41.16/5$51.51/6$53.66/7$55.81/8$60.11						
DEMO: ADZEMAN	12/01/2010	$49.100	06/01/2011	$50.100	12/01/2011	$51.350
DEMO: BACKHOE/LOADER/HAMMER OPERATOR	12/01/2010	$50.100	06/01/2011	$51.100	12/01/2011	$52.350
APPRENTICE: LABORER Demo Backhoe/Loader/Hammer Operator						
Ratio / Step: 1 / 2 / 3 / 4						
1:5 / % / 60.00 / 70.00 / 80.00 / 90.00						
Apprentice wages shall be no less than the following:						
Step 1$37.48/2$40.64/3$43.79/4$46.95						
DEMO: BURNERS	12/01/2010	$49.850	06/01/2011	$50.850	12/01/2011	$52.100
APPRENTICE: LABORER Demo Burners						
Ratio / Step: 1 / 2 / 3 / 4						
1:5 / % / 60.00 / 70.00 / 80.00 / 90.00						
Apprentice Wages shall be no less than the following:						
Step 1$37.33/2$40.46/3$43.59/4$46.72						
DEMO: CONCRETE CUTTER/SAWYER	12/01/2010	$50.100	06/01/2011	$51.100	12/01/2011	$52.350
DEMO: JACKHAMMER OPERATOR	12/01/2010	$49.850	06/01/2011	$50.850	12/01/2011	$52.100
DEMO: WRECKING LABORER	12/01/2010	$49.100	06/01/2011	$50.100	12/01/2011	$51.350
APPRENTICE: LABORER Demo Wrecking Laborer						
Ratio / Step: 1 / 2 / 3 / 4						
1:5 / % / 60.00 / 70.00 / 80.00 / 90.00						
Apprentice wages shall be no less than the following:						
Step 1$36.88/2$39.94/3$42.99/4$46.05						
DIRECTIONAL DRILL MACHINE OPERATOR	12/01/2010	$60.630				
DIVER	08/01/2010	$77.520	08/01/2011	$80.270		

This wage schedule must be posted at the work site in accordance with M.G.L. ch. 149, sec. 27
Failure of the employer to pay "prevailing wage rates," which are the minimum wage rates listed above, on public works projects is a violation of M.G.L. ch. 149, sec. 27. Employees not receiving such rates should report the violation to the Office of Fair Labor and Business Practices, 100 Cambridge Street, Boston, MA 02108; Tel: 617-727-3465.

Issue Date: 05/10/2011 **Wage Request Number:** 20110510-070 **Page 2 of 10**

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
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Prevailing Wage Rates

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

Awarding Authority: City of Newton

Contract Number: 11-88 **City/Town:** NEWTON

Description of Work: Kendrick St - Nahanton St Bridge Improvements Project

Job Location: Kendrick St and Nahanton St

Classification	Effective Dates and Total Rates					
DIVER TENDER	08/01/2010	$62.570	08/01/2011	$65.320		
DIVER TENDER (EFFLUENT)	08/01/2010	$81.250	08/01/2011	$85.380		
DIVER/SLURRY (EFFLUENT)	08/01/2010	$103.680	08/01/2011	$107.800		
ELECTRICIAN	03/01/2011	$68.290				

APPRENTICE: ELECTRICIAN - Local 103

Ratio	Step	1	2	3	4	5	6	7	8	9	10
2:3***	%	40.00	40.00	45.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00

Apprentice wages shall be no less than the following Steps: App Prior 1/1/03; 30/35/40/45/50/55/65/70/75/80

1$37.38/2$37.38/3$44.81/4$44.81/5$46.95/6$49.08/7$51.22/8$53.35/9$55.49/10$57.62

ELEVATOR CONSTRUCTOR	01/01/2011	$66.690	01/01/2012	$68.190	

APPRENTICE: ELEVATOR CONSTRUCTOR - Local 4

Ratio	Step	1	2	3	4	5
1:1	%	50.00	55.00	65.00	70.00	80.00

Apprentice rates shall be no less than the following: Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Step 1$34.26/2$43.76/3$48.86/4$51.41/5$56.50

ELEVATOR CONSTRUCTOR HELPER	01/01/2011	$52.830	01/01/2012	$54.330		
FENCE & GUARD RAIL ERECTOR	12/01/2010	$49.350	06/01/2011	$50.350	12/01/2011	$51.600
FIELD ENG. - INST. PERSON (BLDG, SITE, HVY CONST)	05/01/2011	$59.380				
FIELD ENG. - ROD PERSON (BLDG, SITE, HVY CONST)	05/01/2011	$42.930				
FIELD ENG.-CHIEF OF PARTY (BLDG, SITE, HVY CONST)	05/01/2011	$60.770				
FIRE ALARM INSTALLER	03/01/2011	$68.290				
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING	03/01/2011	$56.300				
FIREMAN (ASST. ENGINEER)	12/01/2010	$54.840				
FLAGGER & SIGNALER	12/01/2010	$38.050	06/01/2011	$39.050	12/01/2011	$39.050
FLOORCOVERER	03/01/2011	$61.110	09/01/2011	$62.360	03/01/2012	$63.610

APPRENTICE: FLOORCOVERER - Local 2168 Zone I

Ratio	Step	1	2	3	4	5	6	7	8
1:1	%	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00

Apprentice rates shall be no less than the following: Steps are 750 hrs.

Step 1$28.38/2$30.17/3$41.41/4$43.20/5$46.78/6$48.57/7$52.15/8$53.95

FORK LIFT/CHERRY PICKER	12/01/2010	$60.980				
GENERATOR/LIGHTING PLANT/HEATERS	12/01/2010	$49.690				
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)	01/01/2011	$53.910	07/01/2011	$54.910	01/01/2012	$55.910
	07/01/2012	$56.910	01/01/2013	$57.910		

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Issue Date: 05/10/2011 **Wage Request Number:** 20110510-070 **Page 3 of 10**

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

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lt. Governor

JOANNE F. GOLDSTEIN
Secretary

HEATHER E. ROWE
Director

Prevailing Wage Rates

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

Awarding Authority: City of Newton

Contract Number: 11-88 **City/Town:** NEWTON

Description of Work: Kendrick St - Nahanton St Bridge Improvements Project

Job Location: Kendrick St and Nahanton St

Classification	Effective Dates and Total Rates					
APPRENTICE: GLAZIER - Local 35 Zone 2						
Ratio / Step: 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8						
1:1 / % / 50.00 / 55.00 / 60.00 / 65.00 / 70.00 / 75.00 / 80.00 / 90.00						
Apprentice wages shall be no less than the following: Steps are 750 hrs.						
Step 1$24.06/2$31.08/3$32.71/4$34.33/5$44.16/6$45.78/7$47.41/8$50.66						
HOISTING ENGINEER/CRANES/GRADALLS	12/01/2010	$60.980				
APPRENTICE: HOIST/PORT. ENG.- Local 4						
Ratio / Step: 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8						
1:6 / % / 55.00 / 60.00 / 65.00 / 70.00 / 75.00 / 80.00 / 85.00 / 90.00						
Apprentice wages shall be no less than the following:						
Step 1$31.33/2$45.47/3$47.41/4$49.35/5$51.29/6$53.22/7$55.16/8$57.10						
HVAC (DUCTWORK)	02/01/2011	$65.170	08/01/2011	$66.420	02/01/2012	$67.670
	08/01/2012	$68.920	02/01/2013	$70.170		
HVAC (ELECTRICAL CONTROLS)	03/01/2011	$68.290				
HVAC (TESTING AND BALANCING - AIR)	02/01/2011	$65.170	08/01/2011	$66.420	02/01/2012	$67.670
	08/01/2012	$68.920	02/01/2013	$70.170		
HVAC (TESTING AND BALANCING -WATER)	09/01/2010	$68.730				
HVAC MECHANIC	09/01/2010	$68.730				
HYDRAULIC DRILLS	12/01/2010	$49.850	06/01/2011	$50.850	12/01/2011	$52.100
INSULATOR (PIPES & TANKS)	09/01/2010	$61.660				
APPRENTICE: ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston						
Ratio / Step: 1 / 2 / 3 / 4						
1:4 / % / 50.00 / 60.00 / 70.00 / 80.00						
Apprentice wages shall be no less than the following: Steps are 1 year						
Step 1$37.34/2$42.20/3$47.07/4$51.93						
IRONWORKER/WELDER	03/16/2010	$60.940				
APPRENTICE: IRONWORKER - Local 7 Boston						
Ratio / Step: 1 / 2 / 3 / 4 / 5 / 6						
** / % / 60.00 / 70.00 / 75.00 / 80.00 / 85.00 / 90.00						
Apprentice wages shall be no less than the following: ** Structural 1:6; Ornamental 1:4						
Step 1$46.82/2$50.35/3$52.12/4$53.88/5$55.65/6$57.41						
JACKHAMMER & PAVING BREAKER OPERATOR	12/01/2010	$49.350	06/01/2011	$50.350	12/01/2011	$51.600
LABORER	12/01/2010	$49.100	06/01/2011	$50.100	12/01/2011	$51.350
APPRENTICE: LABORER - Zone 1						
Ratio / Step: 1 / 2 / 3 / 4						
1:5 / % / 60.00 / 70.00 / 80.00 / 90.00						
Apprentice wages shall be no less than the following:						
Step 1$36.88/2$39.94/3$42.99/4$46.05						
LABORER: CARPENTER TENDER	12/01/2010	$49.100	06/01/2011	$50.100	12/01/2011	$51.350

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Issue Date: 05/10/2011 **Wage Request Number:** 20110510-070 **Page 4 of 10**

THE COMMONWEALTH OF MASSACHUSETTS
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DEVAL L. PATRICK
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Lt Governor

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HEATHER E. ROWE
Director

Prevailing Wage Rates

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

Awarding Authority: City of Newton

Contract Number: 11-88 **City/Town:** NEWTON

Description of Work: Kendrick St - Nahanton St Bridge Improvements Project

Job Location: Kendrick St and Nahanton St

Classification	Effective Dates and Total Rates					
LABORER: CEMENT FINISHER TENDER	12/01/2010	$49.100	06/01/2011	$50.100	12/01/2011	$51.350
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER	12/01/2010	$49.100	06/01/2011	$50.100	12/01/2011	$51.350
LABORER: MASON TENDER	12/01/2010	$49.350	06/01/2011	$50.350	12/01/2011	$51.600
LABORER: MULTI-TRADE TENDER	12/01/2010	$49.100	06/01/2011	$50.100	12/01/2011	$51.350
LABORER: TREE REMOVER	12/01/2010	$49.100	06/01/2011	$50.100	12/01/2011	$51.350

This classification applies to the wholesale removal
of standing trees including all associated trimming of branches and limbs, and applies to the removal of branches at locations not on or around utility lines.

LASER BEAM OPERATOR	12/01/2010	$49.350	06/01/2011	$50.350	12/01/2011	$51.600
MARBLE & TILE FINISHERS	03/01/2011	$59.270	08/01/2011	$60.950	02/01/2012	$61.740

APPRENTICE: MARBLE & TILE FINISHER - Local 3 Marble & Tile

Ratio	Step	1	2	3	4	5
1:3	%	50.00	60.00	70.00	80.00	90.00

Apprentice wages shall be no less than the following: Steps are 800 hrs.

Step 1$41.98/2$45.43/3$48.89/4$52.35/5$55.81

MARBLE MASONS,TILELAYERS & TERRAZZO MECH	03/01/2011	$70.940	08/01/2011	$73.040	02/01/2012	$74.030

APPRENTICE: MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile

Ratio	Step	1	2	3	4	5
1:3	%	50.00	60.00	70.00	80.00	90.00

Apprentice wages shall be no less than the following:

Step 1$48.32/2$52.84/3$57.37/4$61.89/5$66.42

MECH. SWEEPER OPERATOR (NON-CONSTRUCTION)	07/01/2010	$29.590	07/01/2011	$30.290
MECH. SWEEPER OPERATOR (ON CONST. SITES)	12/01/2010	$60.630		
MECHANICS MAINTENANCE	12/01/2010	$60.630		
MILLWRIGHT (Zone 1)	04/01/2011	$57.850		

APPRENTICE: MILLWRIGHT - Local 1121 Zone 1

Ratio	Step	1	2	3	4	5	6	7	8
1:5	%	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00

Apprentice wages shall be no less than the following:

Step 1$37.10/2$38.77/3$42.04/4$43.72/5$46.19/6$47.87/7$50.35/8$50.02

MORTAR MIXER	12/01/2010	$49.350	06/01/2011	$50.350	12/01/2011	$51.600
OILER (OTHER THAN TRUCK CRANES,GRADALLS)	12/01/2010	$43.170				
OILER (TRUCK CRANES, GRADALLS)	12/01/2010	$46.330				
OTHER POWER DRIVEN EQUIPMENT - CLASS II	12/01/2010	$60.630				
PAINTER (BRIDGES/TANKS)	01/01/2011	$64.410	07/01/2011	$65.410	01/01/2012	$66.410
	07/01/2012	$67.410	01/01/2013	$68.410		

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Issue Date: 05/10/2011 **Wage Request Number:** 20110510-070 **Page 5 of 10**

THE COMMONWEALTH OF MASSACHUSETTS
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Prevailing Wage Rates

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

Awarding Authority: City of Newton

Contract Number: 11-88 **City/Town:** NEWTON

Description of Work: Kendrick St - Nahanton St Bridge Improvements Project

Job Location: Kendrick St and Nahanton St

Classification **Effective Dates and Total Rates**

APPRENTICE: PAINTER Local 35 - BRIDGES/TANKS

Ratio	Step	1	2	3	4	5	6	7	8
1:1	%	50.00	55.00	60.00	65.00	70.00	75.00	80.00	90.00

Apprentice wages shall be no less than the following: Steps are 750 hrs.

Step 1$29.31/2$36.86/3$39.01/4$41.16/5$51.51/6$53.66/7$55.81/8$60.11

PAINTER (SPRAY OR SANDBLAST, NEW) * 01/01/2011 $55.310 07/01/2011 $56.310 01/01/2012 $57.310
07/01/2012 $58.310 01/01/2013 $59.310

* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.

APPRENTICE: PAINTER Local 35 Zone 2 - Spray/Sandblast - New

Ratio	Step	1	2	3	4	5	6	7	8
1:1	%	50.00	55.00	60.00	65.00	70.00	75.00	80.00	90.00

Apprentice wages shall be no less than the following:

Step 1$24.76/2$31.85/3$33.55/4$35.24/5$45.14/6$46.83/7$48.53/8$51.92

PAINTER (SPRAY OR SANDBLAST, REPAINT) 01/01/2011 $53.370 07/01/2011 $54.370 01/01/2012 $55.370
07/01/2012 $56.370 01/01/2013 $57.370

APPRENTICE: PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint

Ratio	Step	1	2	3	4	5	6	7	8
1:1	%	50.00	55.00	60.00	65.00	70.00	75.00	80.00	90.00

Apprentice wages shall be no less than the following:

Step 1$23.79/2$30.78/3$32.38/4$33.98/5$43.78/6$45.38/7$46.98/8$50.17

PAINTER (TRAFFIC MARKINGS) 12/01/2010 $49.100 06/01/2011 $50.100 12/01/2011 $51.350

PAINTER / TAPER (BRUSH, NEW) * 01/01/2011 $53.910 07/01/2011 $54.910 01/01/2012 $55.910
07/01/2012 $56.910 01/01/2013 $57.910

* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.

APPRENTICE: PAINTER - Local 35 Zone 2 - BRUSH NEW

Ratio	Step	1	2	3	4	5	6	7	8
1:1	%	50.00	55.00	60.00	65.00	70.00	75.00	80.00	90.00

Apprentice wages shall be no less than the following: Steps are 750 hrs.

Step 1$24.06/2$31.08/3$32.71/4$34.33/5$44.16/6$45.78/7$47.41/8$50.66

PAINTER / TAPER (BRUSH, REPAINT) 01/01/2011 $51.970 07/01/2011 $52.970 01/01/2012 $53.970
07/01/2012 $54.970 01/01/2013 $55.970

APPRENTICE: PAINTER Local 35 Zone 2 - BRUSH REPAINT

Ratio	Step	1	2	3	4	5	6	7	8
1:1	%	50.00	55.00	60.00	65.00	70.00	75.00	80.00	90.00

Apprentice wages shall be no less than the following: Steps are 750 hrs.

Step 1$23.09/2$30.01/3$31.54/4$33.07/5$42.80/6$44.33/7$45.86/8$48.91

PANEL & PICKUP TRUCKS DRIVER 12/01/2010 $45.200 06/01/2011 $45.600 08/01/2011 $45.950
12/01/2011 $46.610 06/01/2012 $46.910 08/01/2012 $47.260
12/01/2012 $48.290

PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) 08/01/2010 $62.570 08/01/2011 $65.320

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THE COMMONWEALTH OF MASSACHUSETTS
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Prevailing Wage Rates

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

Awarding Authority: City of Newton

Contract Number: 11-88

City/Town: NEWTON

Description of Work: Kendrick St - Nahanton St Bridge Improvements Project

Job Location: Kendrick St and Nahanton St

Classification	Effective Dates and Total Rates					
PILE DRIVER	08/01/2010	$62.570	08/01/2011	$65.320		

APPRENTICE: PILE DRIVER - Local 56 Zone 1

Ratio	Step	1	2	3	4	5	6	7	8
1:3	%	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00

Apprentice wages shall be no less than the following:

Step 1$47.62/2$49.49/3$51.36/4$53.23/5$55.10/6$56.96/7$58.83/8$60.70

PIPEFITTER & STEAMFITTER	09/01/2010	$68.730				

APPRENTICE: PIPEFITTER - Local 537

Ratio	Step	1	2	3	4	5
**	%	40.00	45.00	60.00	70.00	80.00

Apprentice Rates-Step1$33.44/2$43.38/3$50.29/4$54.90/5$59.51 ** 1:3; 3:15; 1:10 thereafter / Steps are 1 yr.

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

PIPELAYER	12/01/2010	$49.350	06/01/2011	$50.350	12/01/2011	$51.600
PLUMBERS & GASFITTERS	03/01/2011	$67.500	09/01/2011	$68.250	03/01/2012	$69.050
	09/01/2012	$70.300	03/01/2013	$71.550		

APPRENTICE: PLUMBER - Local 12

Ratio	Step	1	2	3	4	5
**	%	35.00	40.00	55.00	65.00	75.00

Apprentice wages shall be no less than the following: ** 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr

Step 1$30.01/2$32.89/3$41.54/4$47.31/ 4w/lic$50.20 /5$53.09/ 5w/lic$55.98

PNEUMATIC CONTROLS (TEMP.)	09/01/2010	$68.730				
PNEUMATIC DRILL/TOOL OPERATOR	12/01/2010	$49.350	06/01/2011	$50.350	12/01/2011	$51.600
POWDERMAN & BLASTER	12/01/2010	$50.100	06/01/2011	$51.100	12/01/2011	$52.350
POWER SHOVEL/DERRICK/TRENCHING MACHINE	12/01/2010	$60.980				
PUMP OPERATOR (CONCRETE)	12/01/2010	$60.980				
PUMP OPERATOR (DEWATERING, OTHER)	12/01/2010	$49.690				
READY-MIX CONCRETE DRIVER	05/01/2011	$41.690				
RECLAIMERS	12/01/2010	$60.630				
RESIDENTIAL WOOD FRAME CARPENTER **	04/01/2009	$35.620				

** The Residential Wood Frame Carpenter classification applies only to the construction of new, wood frame residences that do not exceed four stories including the basement.

As of 9/1/09 Carpentry work on wood-frame residential WEATHERIZATION projects shall be paid the RESIDENTIAL WOOD FRAME CARPENTER rate.

APPRENTICE: CARPENTER (Residential Wood Frame) - Zone 2

Ratio	Step	1	2	3	4	5	6	7	8
1:5	%	60.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00

Apprentice wages shall be no less than the following:

Step 1$20.13/2$26.04/3$27.23/4$28.43/5$29.63/6$30.83/7$32.03/8$33.22

RIDE-ON MOTORIZED BUGGY OPERATOR	12/01/2010	$49.350	06/01/2011	$50.350	12/01/2011	$51.600
ROLLER/SPREADER/MULCHING MACHINE	12/01/2010	$60.630				

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Prevailing Wage Rates

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

Awarding Authority: City of Newton

Contract Number: 11-88

City/Town: NEWTON

Description of Work: Kendrick St - Nahanton St Bridge Improvements Project

Job Location: Kendrick St and Nahanton St

Classification	Effective Dates and Total Rates					
ROOFER (Inc.Roofer Waterproofing &Roofer Damproofg)	02/01/2011	$54.860	08/01/2011	$55.860	02/01/2012	$56.860
	08/01/2012	$57.860	02/01/2013	$58.860		

APPRENTICE: ROOFER - Local 33

Ratio	Step	1	2	3	4	5
**	%	50.00	60.00	65.00	75.00	85.00

** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1

Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.

Apprentice rates no less than: Step 1$30.41/2$40.64/3$42.41/4$45.97/5$49.53

ROOFER SLATE / TILE / PRECAST CONCRETE	02/01/2011	$55.110	08/01/2011	$56.110	02/01/2012	$57.110
	08/01/2012	$58.110	02/01/2013	$59.110		

APPRENTICE: ROOFER (Slate/Tile/Precast Concrete) - Local 33

Ratio	Step	1	2	3	4	5
**	%	50.00	60.00	65.00	75.00	85.00

Apprentices wages shall be paid no less than the following:

Step 1$30.54/2$40.79/3$42.58/4$46.16/5$49.74

SHEETMETAL WORKER	02/01/2011	$65.170	08/01/2011	$66.420	02/01/2012	$67.670
	08/01/2012	$68.920	02/01/2013	$70.170		

APPRENTICE: SHEET METAL WORKER - Local 17-A

Ratio	Step	1	2	3	4	5	6	7
1:4	%	40.00	45.00	50.00	60.00	65.00	75.00	85.00

Steps 1-3 are 1 year; Steps 4-7 are 6 mos.

Apprentice wages shall be no less than the following:

Step 1$28.86/2$34.49/3$37.38/4$42.38/5$45.01/6$50.27/7$55.03

SIGN ERECTOR	06/01/2009	$37.780

APPRENTICE: SIGN ERECTOR - Local 35 Zone 2

Ratio	Step	1	2	3	4	5	6	7	8	9
1:1	%	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00

Steps are 4 mos.

Apprentice wages shall be no less than the following:

Step 1$19.48/2$23.12/3$24.36/4$25.60/5$30.34/6$31.58/7$32.82/8$34.06/9$35.30

SPECIALIZED EARTH MOVING EQUIP < 35 TONS	12/01/2010	$45.660	06/01/2011	$46.060	08/01/2011	$46.410
	12/01/2011	$47.070	06/01/2012	$47.370	08/01/2012	$47.720
	12/01/2012	$48.750				
SPECIALIZED EARTH MOVING EQUIP > 35 TONS	12/01/2010	$45.950	06/01/2011	$46.350	08/01/2011	$46.700
	12/01/2011	$47.360	06/01/2012	$47.660	08/01/2012	$48.010
	12/01/2012	$49.040				
SPRINKLER FITTER	01/01/2011	$70.550	09/01/2011	$71.350	01/01/2012	$71.500
	03/01/2012	$72.250	09/01/2012	$73.250	01/01/2013	$73.400
	03/01/2013	$74.400				

This wage schedule must be posted at the work site in accordance with M.G.L. ch. 149, sec. 27
Failure of the employer to pay "prevailing wage rates," which are the minimum wage rates listed above, on public works projects is a violation of M.G.L. ch. 149, sec. 27. Employees not receiving such rates should report the violation to the Office of Fair Labor and Business Practices, 100 Cambridge Street, Boston, MA 02108; Tel: 617-727-3465.

Issue Date: 05/10/2011 **Wage Request Number:** 20110510-070 **Page 8 of 10**

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

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lt. Governor

JOANNE F. GOLDSTEIN
Secretary

HEATHER E. ROWE
Director

Prevailing Wage Rates

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

Awarding Authority: City of Newton

Contract Number: 11-88 **City/Town:** NEWTON

Description of Work: Kendrick St - Nahanton St Bridge Improvements Project

Job Location: Kendrick St and Nahanton St

Classification	Effective Dates and Total Rates					
APPRENTICE: SPRINKLER FITTER - Local 550						
Ratio / Step	1	2	3	4	5	6
1:1 / %	40.00	45.00	50.00	55.00	60.00	65.00
Apprentice wages shall be no less than the following steps:						
1$36.20/2$38.75/3$41.30/4$43.85/5$46.40/6$48.95/7$51.50/8$54.05/9$56.60/10$59.15						
STEAM BOILER OPERATOR	12/01/2010	$60.630				
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN	12/01/2010	$60.630				
TELECOMMUNICATION TECHNICIAN	03/01/2011	$56.300				
APPRENTICE: TELECOMMUNICATION TECHNICIAN - Local 103						
Ratio / Step	1	2	3	4	5	6
1:1 / %	40.00	45.00	50.00	55.00	60.00	65.00
Apprentice wages shall be no less than the following:						
Step 1$37.09/2$38.69/3$40.30/4$41.89/5$43.49/6$45.10/7$48.30/8$49.90						
TERRAZZO FINISHERS	03/01/2011	$69.840	08/01/2011	$71.940	02/01/2012	$72.930
APPRENTICE: TERRAZZO FINISHER - Local 3 Marble & Tile						
Ratio / Step	1	2	3	4	5	
1:3 / %	50.00	60.00	70.00	80.00	90.00	
Apprentice wages shall be no less than the following:					Steps are 800 hrs.	
Step 1$47.77/2$52.18/3$56.60/4$61.01/5$65.43						
TEST BORING DRILLER	12/01/2010	$50.500	06/01/2011	$51.500	12/01/2011	$52.750
TEST BORING DRILLER HELPER	12/01/2010	$49.220	06/01/2011	$50.220	12/01/2011	$51.470
TEST BORING LABORER	12/01/2010	$49.100	06/01/2011	$50.100	12/01/2011	$51.350
TRACTORS/PORTABLE STEAM GENERATORS	12/01/2010	$60.630				
TRAILERS FOR EARTH MOVING EQUIPMENT	12/01/2010	$46.240	06/01/2011	$46.640	08/01/2011	$46.990
	12/01/2011	$47.650	06/01/2012	$47.950	08/01/2012	$48.300
	12/01/2012	$49.490				
TUNNEL WORK - COMPRESSED AIR	12/01/2010	$61.680	06/01/2011	$62.930	12/01/2011	$64.180
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE)	12/01/2010	$63.680	06/01/2011	$64.930	12/01/2011	$66.180
TUNNEL WORK - FREE AIR	12/01/2010	$53.750	06/01/2011	$55.000	12/01/2011	$56.250
TUNNEL WORK - FREE AIR (HAZ. WASTE)	12/01/2010	$55.750	06/01/2011	$57.000	12/01/2011	$58.250
VAC-HAUL	12/01/2010	$45.660	06/01/2011	$46.060	08/01/2011	$46.410
	12/01/2011	$47.070	06/01/2012	$47.370	08/01/2012	$47.720
	12/01/2012	$48.750				
WAGON DRILL OPERATOR	12/01/2010	$49.350	06/01/2011	$50.350	12/01/2011	$51.600
WASTE WATER PUMP OPERATOR	12/01/2010	$60.980				
WATER METER INSTALLER	03/01/2011	$67.500	09/01/2011	$68.250	03/01/2012	$69.050
	09/01/2012	$70.300	03/01/2013	$71.550		
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone)	08/30/2010	$34.050	08/29/2011	$35.310		

This wage schedule must be posted at the work site in accordance with M.G.L. ch. 149, sec. 27
Failure of the employer to pay "prevailing wage rates," which are the minimum wage rates listed above, on public works projects is a violation of M.G.L. ch. 149, sec. 27. Employees not receiving such rates should report the violation to the Office of Fair Labor and Business Practices, 100 Cambridge Street, Boston, MA 02108; Tel: 617-727-3465.

Issue Date: 05/10/2011 **Wage Request Number:** 20110510-070 **Page 9 of 10**

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

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Prevailing Wage Rates

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

Awarding Authority: City of Newton

Contract Number: 11-88 **City/Town:** NEWTON

Description of Work: Kendrick St - Nahanton St Bridge Improvements Project

Job Location: Kendrick St and Nahanton St

Classification	Effective Dates and Total Rates					
CABLEMAN (Underground Ducts & Cables)	08/30/2010	$44.320	08/29/2011	$46.110		
DRIVER / GROUNDMAN CDL	08/30/2010	$39.360	08/29/2011	$40.830		
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs)	08/30/2010	$31.890	08/29/2011	$33.050		
EQUIPMENT OPERATOR (Class A CDL)	08/30/2010	$48.320	08/29/2011	$50.110		
EQUIPMENT OPERATOR (Class B CDL)	08/30/2010	$41.760	08/29/2011	$43.340		
GROUNDMAN	08/30/2010	$31.390	08/29/2011	$32.550		
GROUNDMAN -Inexperienced (<2000 Hrs.)	08/30/2010	$26.840	08/29/2011	$27.790		
JOURNEYMAN LINEMAN	08/30/2010	$57.510	08/29/2011	$59.620		
APPRENTICE: LINEMAN (Outside Electrical) - East Local 104						
Ratio Step 1 2 3 4 5 6 7						
1:2 % 60.00 65.00 70.00 75.00 80.00 85.00 90.00						
Apprentice wages shall be no less than the following:						
Step 1$34.59/2$36.99/3$39.65/4$42.30/5$44.95/6$47.61/7$50.76						
TELEDATA CABLE SPLICER	07/19/2010	$32.510	07/18/2011	$32.900	07/16/2012	$33.300
TELEDATA LINEMAN/EQUIPMENT OPERATOR	07/19/2010	$30.960	07/18/2011	$31.330	07/16/2012	$31.700
TELEDATA WIREMAN/INSTALLER/TECHNICIAN	07/19/2010	$30.960	07/18/2011	$31.330	07/16/2012	$31.700
TREE TRIMMER	02/01/2009	$19.010				
This classification applies only to the trimming of branches on and around utility lines.						
TREE TRIMMER GROUNDMAN	02/01/2009	$17.060				
This classification applies only to the trimming of branches on and around utility lines.						

Additional Apprentice Information:

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

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

All steps are six months (1000 hours) unless otherwise specified.

* Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof.
** Multiple ratios are listed in the comment field.
*** The job site ratio of 2 apprentices (APP) for every 3 journeymen (JM) is allowed as follows:
1 JM: 1 APP; 2-3 JM: 2 APP; 4-6 JM: 4 APP; 7-9 JM: 6 APP; 10-12 JM: 8 APP; 13-15 JM: 10 APP; etc.
**** The job site ratio of 2 apprentices (APP) for every 3 journeymen (JM) is allowed as follows:

This wage schedule must be posted at the work site in accordance with M.G.L. ch. 149, sec. 27
Failure of the employer to pay "prevailing wage rates," which are the minimum wage rates listed above, on public works projects is a violation of M.G.L. ch. 149, sec. 27. Employees not receiving such rates should report the violation to the Office of Fair Labor and Business Practices, 100 Cambridge Street, Boston, MA 02108; Tel: 617-727-3465.

Issue Date: 05/10/2011 **Wage Request Number:** 20110510-070 **Page 10 of 10**

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF LABOR
DIVISION OF OCCUPATIONAL SAFETY
PREVAILING WAGE PROGRAM
www.mass.gov/dos/pw

NOTICE: TO AWARDING AUTHORITIES AND CONTRACTORS

ISSUED: SEPTEMBER 1, 2006

DRIVERS WHO HAUL BITUMINOUS CONCRETE (ASPHALT)

The Massachusetts Supreme Judicial Court recently affirmed that drivers who haul bituminous concrete to public construction projects are not covered by the Prevailing Wage Law while off-site, including time spent over-the-road and picking-up materials. These drivers are covered by the Prevailing Wage Law only while on-site at the public construction project.

In Teamsters Joint Council No. 10 v. Department of Labor, et al., 447 Mass. 100 (2006), the SJC upheld a 2001 administrative decision limiting the applicability of prevailing wage rates to the time bituminous drivers spend at the public construction site. This most recent decision of the SJC followed a 1989 ruling that had upheld an earlier Department of Labor (and Industries') policy that had deemed this category of drivers to be "teamsters" under the Law and, therefore, entitled to prevailing wage rates. See Construction Industries of Massachusetts v. Commissioner of Labor and Industries, 406 Mass. 162 (1989). However, the earlier court case had left open the question of whether this entitled these bituminous drivers to prevailing wage rates for their over-the-road time as well as their on-site time. This most recent decision has now answered that question.

All of the requirements of the Prevailing Wage Law, including certified weekly payroll requirements, apply to bituminous drivers for all time spent at the public construction site.

DRIVERS WHO HAUL READY-MIX CONCRETE (CEMENT)

Drivers who haul ready-mix concrete to public construction projects are not covered by the Prevailing Wage Law while off-site, including time spent over-the-road and picking-up materials. These drivers are covered by the Prevailing Wage Law while on-site at the public construction project. This applicability determination was established by a 2001 administrative decision of the Department of Labor's Division of Occupational Safety.

All of the requirements of the Prevailing Wage Law, including certified weekly payroll requirements, apply to ready-mix drivers for all time spent at the public construction site.

Please feel free to contact the Division of Occupational Safety at 617-626-6953 if you have any questions. Questions about enforcement of the Prevailing Wage Law may be directed to the Attorney General's Fair Labor and Business Practices Division at 617-727-3465

19 Staniford Street •• 2nd Floor •• Boston, Massachusetts 02114 •• Tel: 617-626-6953 •• Fax: 617-626-6944
Printed on Recycled Paper

The Massachusetts Prevailing Wage Law
M.G.L. ch. 149, §§ 26 – 27

NOTICE TO AWARDING AUTHORITIES

- 'The enclosed wage schedule applies only to the specific project listed at the top and will be updated for any public construction project lasting longer than one (1) year.
- 'You should request an updated wage schedule from the Division of Occupational Safety if you have not opened bids or selected a contractor within 90 days of the date of issuance of the enclosed wage schedule.
- 'The wage schedule shall be incorporated in any advertisement or call for bids for the project for which it has been issued.
- 'Once a contractor has been selected by the awarding authority, the wage schedule shall be made a part of the contract for that project.

NOTICE TO CONTRACTORS

- The enclosed wage schedule, and any updated schedule, must be posted in a conspicuous place at the work site during the life of the project.
- The wages listed on the enclosed wage schedule must be paid to employees on public works projects regardless of whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
- The enclosed wage schedule applies to all phases of the project including the final clean-up. Contractors whose only role is to perform final clean-up must pay their employees according to this wage schedule.
- All apprentices must be registered with the Massachusetts Division of Apprentice Training in order to be paid at the reduced apprentice rates. If a worker is not registered with the Division of Apprentice Training, they must be paid the “total rate” listed on the wage schedule regardless of experience or skill level. For further information, please call (617) 727-3486 or write to the Division of Apprentice Training, 399 Washington Street, 4th Floor, Boston, MA 02108

WEEKLY PAYROLL RECORDS REPORT
& STATEMENT OF COMPLIANCE

In accordance with Massachusetts General Law c149, §27B, a true and accurate record must be kept of all persons employed on the public works project for which the enclosed rates have been provided. A Payroll Form has been printed on the reverse of this page and includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the contract.

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

In addition, each such contractor, subcontractor or public body shall furnish to the Department of Labor & Workforce Development/Division of Occupational Safety within fifteen days after completion of its portion of the work a statement, executed by the contractor, subcontractor or public body who supervises the payment of wages, in the following form:

STATEMENT OF COMPLIANCE

_____, 2011

I,_____,_____
(Name of signatory party) (Title)
do hereby state:
That I pay or supervise the payment of the persons employed by
_____ on the _____
(Contractor, subcontractor or public body) (Building or project)
and that all mechanics and apprentices, teamsters, chauffeurs and laborers employed on said project have been paid in accordance with wages determined under the provisions of sections twenty-six and twenty-seven of chapter one hundred and forty nine of the General Laws.

Signature _____

Title _____

DIVISION OF OCCUPATIONAL SAFETY, 399 WASHINGTON STREET, 5TH FL., BOSTON, MA. 02108

WEEKLY PAYROLL REPORT FORM

Company Name:

Project Name:

Awarding Auth.:

Work Week Ending:

Prime Contractor

Subcontractor
List Prime Contractor:

Employer Signature:

Print Name & Title:

Employee Name & Address	Work Classification	Hours Worked							(A) Tot. Hrs.	(B) Hourly Base Wage	Employer Contributions			(F) [B+C+D+E] Hourly Total Wage (prev. wage)	(G) [A*F] Weekly Total Amount
											(C) Health & Welfare	(D) Pension	(E) Supp. Unemp		
		S	M	T	W	T	F	S							

NOTE: Every contractor and subcontractor is required to submit a copy of their weekly payroll records to the awarding authority.

CITY OF NEWTON

SUMMARY OF WORK AND SPECIFIC REQUIREMENTS OF THE CONTRACT

FOR PUBLIC WORKS CONSTRUCTION

A. SUMMARY OF WORK

1. **The work under this Contract consists superstructure and substructure repairs to Bridge No. N 04-003=N-12-001, including removal of existing wearing surface, full-depth and partial-depth repairs to the concrete deck, repairs to the concrete sidewalk and safety curb, cleaning and repairing the aluminum bridge railing, replacing the bridge deck expansion joint, replacement of bridge deck waterproofing membrane and wearing surface, replacement of select bearings, retrofitting of beam cover plate termini, cleaning and painting select bearings, crack and spall repairs to the abutments and wingwalls, repairs to undermined abutment footing and riprap slope protection, pavement milling and resurfacing, signing, pavement markings and the provision of safety controls and signing for construction operations and other incidental items included in the contract documents.**

2. All other work described in the Project Manual and/or shown on the Plan(s) unless specifically indicated as not to be done.

B. In addition the work under the contract includes:

1. Work outside the Project Site as called for in the Project Manual and/or Plan(s) and as required for the performance of the work.

2. The restoration of any items damaged or destroyed by encroaching upon areas outside the Project Site.

3. All labor, materials, tools, and equipment necessary to do all the work required for the completion of each item as specified, which shall limited not only to the exact intent mentioned, but shall include incidental work necessary or customarily performed for the completion of that item.

4. All items not specifically mentioned or noted in the Project Manual and/or Plan(s), but which are obviously necessary to make a complete working installation.

C. The Proposed Contract Price shall be complete costs, including overhead, profit, insurance, transportation, and all other costs connected with, or incidental to the work described.

II. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

A. Upon notification the Contractor shall commence the work specified in the Project Manual as directed by the City. The work shall proceed in a continuous uninterrupted fashion with adequately staffed crews, in a satisfactory manner, which will assure that the work is completed in a timely manner to the satisfaction of the City.

B. The time for substantial completion pursuant to **Article 2** of the **Contract** shall:

NOTICE: * TIME IS OF THE ESSENCE *

Within five (5) business days of the Notice Of Award the Contractor shall submit to the Purchasing Department:

- **A signed contract.**
- **A Certificate of Insurance (naming the City as an additional insured)**
- **A Labor and Materials Payment Bond and a Performance bond each in the amount of 50% of the contract total.**

Anticipated start date is July 5, 2011. Time for completion is one hundred forty (140) calendar days from the Notice To Proceed. The successful bidder must be able to accommodate the City of Newton in the scheduling of this work.

Time is of the essence for the completion of this contract. If the Contractor fails to achieve substantial or final completion of the Work within the time required by the contract, and unless an extension of time is granted, the Contractor shall pay to the City as liquidated damages, the applicable amount specified in **Article 7** of the **General Conditions** for each day of delay. If different completion dates are specified in the Contract for separate parts or stages of the work, the amount of liquidated damages shall be assessed on those parts or stages which are delayed. To the extent that the Contractor's delay or nonperformance is excused under another section in this Contract, liquidated damages shall not be due the City. The Contractor remains liable for damages caused other than by delay.

III. INSURANCE REQUIREMENTS

A. The Contractor shall carry and maintain until acceptance of the work such Workmen's Compensation, Automobile Liability, Public Liability, Contingent Public Liability, Property Damage and Contingent Property Damage Insurance, each including blasting coverage, as shall protect him and any sub-contractor performing work covered by this contract from all claims and liability for damages for personal injury, including accidental death, and for property damage which may arise from operations under this contract, whether such operations be by himself or by any sub-contractor or by any one directly or indirectly employed by either of them.

B. The City shall be named as an additional insured on such policy.

C. The amounts of such insurance shall be as follows:

1. Workmen's Compensation Insurance as required by Massachusetts General Law.

2. Automobile Liability Insurance on all vehicles owned or hired for a.) Bodily Injury in an amount not less than $500,000.00 for each occurrence, and not less than $1,000,000.00 aggregate; b.) Property Damage in an amount not less than $250,000.00 each occurrence, and not less than $500,000.00 aggregate.

3. Public Liability Insurance and Contingent Public Liability Insurance in an amount not less than $500,000.00 for injuries, including accidental death to any one person, and subject to the same limit for each person, in an amount not less than $1,000,000.00 on account of one accident.

4. Property Damage Insurance and Contingent Property Damage Insurance in an amount not less than $250,000.00 on account of one accident, and in an amount of not less than $500,000.00 on account of all accidents.

5. General Liability Insurance shall include Contractual Liability Insurance.

D. Before any work is started, the successful bidder shall be required to file with the Chief Procurement Officer certificates of insurance coverage as detailed above, with policy numbers and dates of expiration.

E. The Contractor shall indemnify, hold harmless and defend the City and its departments, officers, employees, servants, and agents from and against all actions, causes of actions, claims, demands, damages, costs, loss of services, expenses and compensation, including attorney's fees and interest arising out of or resulting directly or indirectly from the services rendered pursuant to this Contract, provided that any such action, cause of action, claim, demand, damage, cost, loss of service, expense, compensation (1) in any way grows out of bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, which (2) is caused in whole or in part by any act or omission of the Contractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is cased in part by a party indemnified hereunder.

END OF SECTION

The Contractor shall insert prices for each item in ink, in both words and figures, and is to show a total bid price. In the event a discrepancy between the written words and figures, the written words shall govern. In the event an error in the bidders total bid price, the corrected total bid obtained by the summation of the products of the unit prices multiplied by the respective quantities shall stand as the bidder's total bid price.

The estimated quantities shown here are based solely upon a reasonable assessment of the project parameters, thus the Contractor is advised that the actual quantities may vary substantially as field conditions, scheduling, monetary constraints (due to cost adjustments) and/or funding amounts may ultimately necessitate.

NOTICE: In accordance with MGL Chapter 303 of the Acts of 2008 this bid contains price adjustments for (1) Fuel (combination of Gasoline & Diesel) and (2) Liquid Asphalt. It is the bidder's responsibility to familiarize themselves with these price adjustment programs prior to entering a bid.

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **0.303FC - FUEL COSTS*** • * Bidder's may elect **NOT** to bid the cost of fuel(s) by inserting the term **N/A** *(i.e. Not Applicable)* in all (4) entry lines of this Item 0.303FC. This is **a mandatory requirement** to verify the Contractor has waived their option to bid the cost of fuel(s) separately and has instead elected to factor their delivery & discharge & installation fuel costs into the separate bid price of **Item 1.5.** • **Contractor's choosing to bid this line item must NOT include the cost of fuel in Line Item 1.5.** **0.303FC** = total combined number of gallons of Fuel (Diesel & Gasoline) to supply, deliver & install One Ton of Bituminous Concrete: (IN WORDS)_____ Gallons Per Ton (IN FIGURES)_____ Gallons Per Ton (_____**Gallons per Ton**) **x** ($ 3.43 **/Gallon**) **x** ***^ Base Price^*** ***of diesel and gasoline= (BPF)*** ***Per Mass Highway*** For a bid to be considered responsive the Contractor **MUST** supply the following information: Address of Batching Plant: _____ _____ The One –Way shortest distance listed by Mapquest (www.mapquest.com) from the batching plant to Newton City Hall, 1000 Commonwealth Ave., Newton Centre, MA 02459 _____ Miles *The City of Newton reserves the right to validate this information before and after awarding the bid.*	**190**	**TONS**	Note: This factored value is for the **Comparison of Bids Only**. (See Spec. Prov.) $_____

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **0.303LA- DIFFERENTIAL FOR LIQUID ASPHALT** (Informational Note: For the purpose of this program One (1) Ton of Type I-1 Bituminous Concrete shall contain six-hundreths (**.** 06) Ton of Liquid Asphalt) The **Base Price** for Liquid Asphalt is: $ 530.00 PER **Ton of Liquid Asphalt** ***^Base Price of Liquid Asphalt (BPLA)^*** ***Per Mass Highway***	**N/A**	**N/A**	The Base Price (BPLA) shown here shall be used to determine the monthly price differential (See Spec. Prov.) $ N/A
ITEM: **106.151 - BLEEDER (BRIDGE DECK) PVC EXTENSION** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**18**	**EA.**	$_____
ITEM: **106.281 – GRAFFITI REMOVAL** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE FEET**	**2000**	**S.F.**	$_____
ITEM: **106.282 – CLEAN ALUMINUM BRIDGE RAIL** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LUMP SUM**	**1**	**LS**	$_____

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **106.302 - CLEAN AND PAINT STRUCTURAL STEEL** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE FEET**	**200**	**S.F.**	$_____
ITEM: **106.303 – CLEAN AND PAINT BEARING ASSEMBLIES** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**4**	**EA.**	$_____
ITEM: **106.5 – ELASTOMERIC JOINT SEALER** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**200**	**FT.**	$_____
ITEM: **107.49 – BRIDGE EXPANSION JOINT REMOVED & REPLACED** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LUMP SUM**	**1**	**LS.**	$_____
ITEM: **107.65– ALUMINUM PICKETS REMOVED & REPLACED** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**11**	**EA.**	$_____

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **107.851 - SEALING HORIZONTAL CRACKS MORE THAN 0.12″** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**200**	**FT.**	$_____
ITEM: **107.852– SEALING HORIZONTAL CRACKS LESS THAN 0.12″** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**400**	**FT.**	$_____
ITEM: **107.853– SEALING OVERHEAD AND VERTICAL CRACKS MORE THAN 0.16″** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**20**	**FT.**	$_____
ITEM: **107.854– SEALING OVERHEAD AND VERTICAL CRACKS LESS THAN 0.16″** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**50**	**FT.**	$_____
ITEM: **107.98– UTILITY SUPPORT REMOVED AND REPLACED** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**2**	**EA.**	$_____

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **107.99 - UTILITY SUPPORT RESET** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**9**	**EA.**	$_____
ITEM: **108.67– JACKING SUPERSTRUCTURE** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LUMP SUM**	**1**	**LS.**	$_____
ITEM: **120.1 – UNCLASSIFIED EXCAVATION** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC YARD**	**20**	**CY.**	$_____
ITEM: **127.12– REINFORCED CONCRETE EXCAVATION FOR SUBSTRUCTURE REPAIRS** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC YARD**	**3**	**CY.**	$_____
ITEM: **127.401– REINFORCED CONCRETE DECK EXCAVATION (FULL DEPTH)** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC YARD**	**30**	**CY.**	$_____

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **127.41 - REINFORCED CONCRETE DECK EXCAVATION (PARTIAL DEPTH)** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC YARD**	**40**	**CY.**	$_____
ITEM: **129– PAVEMENT MILLING** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE YARD**	**600**	**SY.**	$_____
ITEM: **129.2 – OLD PAVEMENT EXCAVATION** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE YARD**	**720**	**SY.**	$_____
ITEM: **150– ORDINARY BORROW** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC YARD**	**10**	**CY.**	$_____
ITEM: **151– GRAVEL BORROW** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC YARD**	**20**	**CY.**	$_____

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **187.3 - REMOVAL & DISPOSAL OF DRAINAGE STRUCTURE SEDIMENTS** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC YARD**	**7**	**CY.**	$_____
ITEM: **220– DRAINAGE STRUCTURE ADJUSTED** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**2**	**EA.**	$_____
ITEM: **222.2 – FRAME & GRATE (OR COVER) MUNICIPAL STANDARD** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**1**	**EA.**	$_____
ITEM: **223– FRAME & GRATE (OR COVER) REMOVED & RESET** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**2**	**EA.**	$_____
ITEM: **223.2– FRAME & GRATE (OR COVER) REMOVED & DISCARDED** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**1**	**EA.**	$_____

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **225.6 - INLET SEDIMENT CONTROL DEVICE** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**4**	**EA.**	$_____
ITEM: **440– CALCIUM CHLORIDE FOR ROADWAY DUST CONTROL** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **POUNDS**	**90**	**LB.**	$_____
ITEM: **443 – WATER FOR ROADWAY DUST CONTROL** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **GALLON**	**4**	**GAL.**	$_____
ITEM: **450.90– CONTRACTOR QUALITY CONTROL** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **TON**	**70**	**TON.**	$_____
ITEM: **452– ASPHALT EMULSION FOR TACK COAT** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **GALLON**	**100**	**GAL.**	$_____

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **453 – HMA JOINT SEALANT** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**700**	**FT.**	$_____
ITEM: **455.23– SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5)** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **TON**	**70**	**TON.**	$_____
ITEM: **445.60 – SUPERPAVE BRIDGE SURFACE COURSE 9.5 (SSC-B-9.5)** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **TON**	**45**	**TON.**	$_____
ITEM: **455.71– SUPERPAVE BRIDGE PROTECTIVE COURSE 12.5 (SPC-B-12.5)** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **TON**	**65**	**TON.**	$_____
ITEM: **472– HOT MIX ASPHALT FOR MISCELLANEOUS WORK** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **TON**	**10**	**TON.**	$_____

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **482.3 – SAWING ASPHALT PAVEMENT** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**80**	**FT.**	$_____
ITEM: **482.31– SAWING & SEALING JOINTS IN ASPHALT PAVEMENT AT BRIDGES** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**40**	**FT.**	$_____
ITEM: **657 – TEMPORARY FENCE** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**1900**	**FT.**	$_____
ITEM: **742 – ENGINEERS FIELD OFFICE AND EQUIPMENT (TYPE C)** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **MONTH**	**7**	**MO.**	$_____
ITEM: **748 – MOBILIZATION** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LUMP SUM**	**1**	**LS.**	$_____

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **751 – LOAM BORROW** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC YARD**	**5**	**CY.**	$_____
ITEM: **765– SEEDING** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE YARD**	**30**	**SY.**	$_____
ITEM: **767.81 – EROSION CONTROL BARRIER** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**120**	**FT.**	$_____
ITEM: **852 – SAFETY SIGNING FOR CONSTRUCTION OPERATIONS** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE FEET**	**500**	**SF.**	$_____
ITEM: **853.1 – PORTABLE BREAKAWAY BARRICADE TYPE III** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**4**	**EA.**	$_____

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **853.2 – TEMPORARY CONCRETE BARRIER** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**900**	**FT.**	$_____
ITEM: **853.21– TEMPORARY CONCRETE BARRIER REMOVED & RESET** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**1100**	**FT.**	$_____
ITEM: **853.41 – TEMP. IMP. ATTENUATOR FOR SHLDR INCAPABLE OF REDIRECTION** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**1**	**EA.**	$_____
ITEM: **853.411 – TEMP. IMP. ATTENUATOR FOR SHLDR INCAPABLE OF REDIRECTION R&R** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**1**	**EA.**	$_____
ITEM: **853.44 – TEMP. IMP. ATTENUATOR FOR MEDIAN CAPABLE OF REDIRECTION** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**2**	**EA.**	$_____

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **854.014 – TEMPORARY PAVEMENT MARKINGS 4″ (PAINTED)** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**5000**	**FT.**	$_____
ITEM: **854.034– TEMPORARY PAVEMENT MARKINGS 4″ (REMOVABLE TAPE)** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**5000**	**FT.**	$_____
ITEM: **854.1 – PAVEMENT MARKINGS REMOVAL – PANT** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**5000**	**FT.**	$_____
ITEM: **856 – SPECIAL LIGHTING UNIT (FLASHING ARROW)** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **UNIT DAY**	**210**	**UD.**	$_____
ITEM: **856.12 – PORTABLE CHANGEABLE MESSAGE SIGN** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **UNIT DAY**	**420**	**UD.**	$_____

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **859– REFLECTORIZED DRUM** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **DRUM DAY**	**9000**	**DD.**	$_____
ITEM: **867.04– 4″ REFLECTORIZED YELLOW LINE (THERMOPLASTIC)** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**1400**	**FT.**	$_____
ITEM: **905 – 4000 PSI, ⅜″, 660 CEMENT CONCRETE** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC YARD**	**70**	**CY.**	$_____
ITEM: **908.01 – CEMENT FOR POINTING** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **FEET**	**100**	**FT.**	$_____
ITEM: **908.10 – CONCRETE PENETRANT** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE FEET**	**1300**	**SF.**	$_____

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **909.2– CEMENTITIOUS MORTAR FOR PATCHING** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE FEET**	**200**	**SF.**	$_____
ITEM: **910.1– STEEL REINFORCEMENT FOR STRUCTURES – EPOXY COATED** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **POUND**	**1000**	**LB.**	$_____
ITEM: **921.2 – LAMINATED ELASTOMERIC BEARING W/ ANCHOR BOLTS (51-100)** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**7**	**EA.**	$_____
ITEM: **921.4 – LAMINATED ELASTOMERIC BEARING W/ ANCHOR BOLTS (151-200)** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**2**	**EA.**	$_____
ITEM: **960.2 – STEEL BEAM COVER PLATE REPAIR** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**28**	**EA.**	$_____

ITEM DESCRIPTION & BID PRICE	ESTIMATED QUANTITIES	UNIT	TOTAL COST
ITEM: **965 – MEMBRANE WATERPROOFING FOR BRIDGE DECKS** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE YARD**	**730**	**SY.**	$_____
ITEM: **966.– WATERPROOFING PROTECTIVE COURSE** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE YARD**	**10**	**SY.**	$_____
ITEM: **983.1– RIPRAP** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **TON**	**130**	**TON.**	$_____
ITEM: **983.12 – CONCRETE GROUT FILLED FABRIC BAGS** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC FEET**	**400**	**CF.**	$_____
ITEM: **999.9 – POLICE ALLOWANCE** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LUMP SUM**	**1**	**LS.**	$_____

TOTAL BID PRICE : $

(Total Bid Price must be entered in "PARAGRAPH C" of the BID FORM).

END OF SECTION

SECTION 0. 303

ITEM: **0.303FC - FUEL COSTS***

Description

*** The Contractor may elect NOT to bid the cost of fuels separately by inserting the term N/A** *(i.e. Not Applicable)* **in all (4) entry lines of Item 0.303FC on Item Sheet 3. This is a mandatory requirement to verify that the Contractor has formally waived their option to bid the cost of fuel(s) separately and has instead elected to factor the round-trip supply, delivery & installation fuel costs into the bid price of Item 1.5.**

(a) Under this item the Contractor shall be paid for all the fuel(s) consumed in the performance of this contract.

(b) The intent of this program is to maintain a reasonable and continuous parity with the regional fluctuations that may occur in the cost of petroleum based fuel products. It is important to note that due to the numerous types of; fuel, equipment, vehicles, programs, and efficiency factors related to each of these operational elements and therefore unique to the Contractor's own enterprises, that any fuel adjustments made under this item are intended only to defray and offset extraordinary market trends in petroleum based fuel products.

(c) **IMPORTANT NOTE: An adjustment to the cost of fuels may result in an increase of payment if the fuel market has trended upward, or it may otherwise result in a decrease of payment if the fuel market has trended downward.**

(d) The City of Newton reserves the right, before awarding the Contract, to request from the Contractor a tabulated accounting of the means and methods upon which the number of gallons bid by the Contractor was derived. The intent of this evaluation is to preserve the fairness of this program by preventing bidders from placing an imbalanced bid that may ultimately cause excessive financial impact to either party. These tabulations will include, but shall not be limited to, an accounting of all **transport and installation** equipment and their associated manufacturers fuel consumption rates which the Contractor/supplier intends to use to complete the work under this contract. In the event the City of Newton, subsequent to performing an analysis, determines that the Contractor's bid, with regard to the consumption of fuel per round trip for the **supply, delivery and installation of the bituminous concrete, is excessive for the type transport equipment** traditionally deployed for this type of work then t**he City of Newton reserves the right to waive any informalities in any or all bids, or to reject any or all bids, if it be in the public interest to do so.**

(e) The Contractor shall also incorporate into their bid the amounts of fuel required for any work performed by their subcontractors or by their vendors.

Method of Administration

(f) In accordance with Chapter 303 Acts of 2008, the City of Newton shall use the most current 'new' pricing of Diesel and Gasoline fuel as thay are indicated on the Mass Highway web site at the time of advertisement.

http://www.mhd.state.ma.us/default.asp?pgid=content/fuelPrices&sid=about#para24

The **average** of these two values (Diesel & Gasoline) shall serve as the value basis for determining the **Base Price** of Fuel (BPF) at the time of the advertisement. Subsequently, during the course of the contract, the **Period Price** of Fuel (PPF) shall be determined in the same manner, but at the end of each calendar month, and if the **averaged** Period Price (PPF) has either increased or decreased by more than five percentage points (5%) relative to the **averaged** Base Price of Fuel (BPF), then the cost of fuel(s) for the applicable calendar month shall be paid for at the adjusted rate, otherwise the cost of fuel(s) for the applicable calendar month shall be paid for at the initial Base Price of Fuels.

The Contractor is advised to verify these value standards and citations prior to placing their bid.

Method of Administration

(g) When a cost adjustment is applied it shall be inclusive of the five (5%) variation.

(h) Payments for fuel shall be calculated at the end of **each calendar month** and they shall be based upon the acceptable **number of tons of bituminous concrete supplied, delivered and installed** within that particular (applicable) calendar month in which the work was performed, **inclusive of the tack coat application**. **(Program Note: In the event a continuous paving operation spans several days but the delivery & discharge of the bituminous concrete is performed in two separate months, then two separate fuel payments shall be made).**

(i) Immediately upon delivery of any bituminous concrete product, the Contractor shall furnish the Engineer with a computer generated invoice that has been issued directly by the bituminous concrete batching plant. The invoice shall clearly show the **tare weight, type of bituminous concrete and the date of delivery** for each load of bituminous concrete which is ultimately delivered and discharged. The plant issued tare/weight slips are to bear the name of the Contractor and Vendor and shall **be surrendered to the DPW Agent-In-Charge immediately upon the delivery of the material. The City will have no obligation to pay for any errant invoice slips which are forwarded after the delivery vehicle has exited the project site.**

(j) **No upward fuel adjustment will be made for any delivery and/or installation related activity which takes place beyond the completion date of the contract** unless the Contractor's work has been delayed due to no fault of their own (i.e. Preparation work that must be performed by others before the Contractor can complete their own tasks in the contractually allotted time.) Any such delay must be brought to the attention of the DPW Agent-In-Charge in a timely manner at which time the Agent shall investigate, verify, and document the extenuating circumstances and inform the Contractor of their decision.

Method of Payment

(k) Payment formula:

BPF = The Base Price of Fuel on the bid release date (Averaged cost of Diesel & Gasoline in $/Gallon)
PPF = The Period Price of Fuel for the applicable calendar month (Averaged cost of Diesel & Gasoline in $/Gallon)
G = Gallons of fuel bid by the Contractor to Supply, Deliver & Install One (1) Ton of Bit. Conc. W/tack coat (Gallons Bid for All Services)
T = The total number of Tons of Type I-1 Bit. Conc. Supplied, Delivered & Installed in the applicable calendar month

If the (PPF) does not exceed +/- 5% relative to the (BPF) then: (BPF) x G x T = Fuel Payment ($)

If the (PPF) does exceed +/- 5% relative to the (BPF) then: (PPF) x G x T = Fuel Payment ($)

Basis of Payment

*** The Contractor may elect NOT to bid the cost of fuels separately by inserting the term N/A** *(i.e. Not Applicable)* **in all (4) entry lines of Item 0.303FC on Item Sheet 3. This is a mandatory requirement to verify that the Contractor has formally waived their option to bid the cost of fuel(s) separately and has instead elected to factor the round-trip supply, delivery & installation fuel costs into the bid price of Item 1.5.**

Basis of Payment (Continued)

(l) **The round trip cost of fuel(s) consumed for the delivery, and discharge and installation of one ton of bituminous concrete** shall be paid for under **Item 0.303FC.** The cost of fuel used to complete the work under this contract shall be made in accordance with the applicable Period Price for Diesel & Gasoline fuels as posted for each calendar month in which the work was performed**, inclusive of tack coat**, and as specified herein.

(m) The Contractor shall be responsible for disbursing fuel cost payments to their subcontractors and/or to their vendors.

(n) No payment shall be made for any fuel(s) consumed to remedy and/or to replace any deficient material supplied by the Contractor, subcontractors and/or their vendors.

SECTION 0. 303

ITEM 0.303LA - DIFFERENTIAL FOR LIQUID ASPHALT

Description

(a) Under this item a differential value shall be calculated and applied to the payment on a monthly basis. The differential value shall be based upon the amount of Liquid Asphalt contained in the total tare weight of bituminous concrete supplied, delivered and installed in each respective calendar month.

(b) **Item 0. 303LA** is to provide a structured means, whereby the cost of the Liquid Asphalt **contained in Type I-1 bituminous concrete** is evaluated each calendar month, and under certain market conditions this value is adjusted **either upward or downwards** to maintain a reasonable and continuous parity with the regional fluctuations that may occur in the price of this commodity.

(c) **IMPORTANT NOTE: An adjustment to the cost of the Liquid Asphalt component may result in an increase of payment if the market has trended upward, or it may otherwise result in a decrease of payment if the market for Liquid Asphalt has trended downward. Further, these adjustments do not compensate the Contractor for the entire cost of the bituminous concrete products consumed in the execution of this contract but only for the monthly differential value(s) which may occur with regard to the Liquid Asphalt component**.

Method of Administration

(d) In accordance with Chapter 303 Acts of 2008 the City of Newton shall use the most current 'new' pricing for **Liquid Asphalt** as indicated on the Mass Highway web site at the time of advertisement.

http://www.mhd.state.ma.us/default.asp?pgid=content/fuelPrices&sid=about#para24

The value at the time of advertisement shall serve as the Base Price of Liquid Asphalt (BPLA). Subsequently, and during the course of the contract, the Period Price of the Liquid Asphalt (PPLA) component shall be determined in the same manner and at the end of each respective calendar month, and if the Period Price (PPLA) has either increased or decreased by more than five percentage points (5%) relative to the Base Price (BPLA) index, then the differential cost of the Liquid Asphalt component shall be paid for at the adjusted rate, otherwise no adjustment shall be made.

The Contractor is advised to verify these value standards and citations prior to placing their bid.

(e) The differential value for the Liquid Asphalt component shall be calculated at the end of each calendar month and it shall be based upon the number of acceptable tons of bituminous concrete supplied, delivered and installed within that particular calendar month. This value shall be derived by applying a fixed factor to the tonnage of Liquid Asphalt that is contained in a single ton of Type I-1 bituminous concrete top mix. **(Program Note: In the event a continuous delivery & paving operation spans several days but is performed in two separate months, then two separate Liquid Asphalt calculations shall be made.)**

(f) When a cost differential is applied it shall be inclusive of the five (5%) variation.

(g) Immediately upon delivery of any bituminous concrete product, the Contractor shall furnish the Engineer with a computer generated invoice that has been issued directly by the bituminous concrete batching plant. The invoice shall clearly show the **tare weight, type of bituminous concrete and the date of delivery** for each load of bituminous concrete which is ultimately delivered and discharged. The plant issued tare/weight slips are to bear the name of the vendor and shall **be surrendered to the DPW Agent-In-Charge immediately upon the delivery of the material. The City will have no obligation to pay for any errant slips which are forwarded after the delivery vehicle has exited the project site.**

Method of Administration (Continued)

(h) **No upward Liquid Asphalt component adjustment will be made for any delivery and discharge which takes place beyond the completion date of the contract** unless the Contractor's work has been delayed due to no fault of their own (i.e. Preparation work that must be performed by others before the Contractor can complete their own tasks in the contractually allotted time.) Any such delay must be brought to the attention of the DPW Agent-In-Charge in a timely manner at which time the Agent shall investigate, verify, and document the extenuating circumstances and inform the Contractor of their decision.

Method of Payment

(i) Payment formula:

BPLA = The Base Price Liquid Asphalt Cost Index on the bid release date ($/Ton of Liquid Asphalt)
PPLA = The Period Price for One Ton of Liquid Asphalt for the applicable calendar month in which it was delivered ($/Ton of Liquid Asphalt)
TBC = Total tare Tons of bituminous concrete delivered & discharged in the applicable calendar month (Tons)
. 06 = Tons of Liquid Asphalt contained in One (1) Ton Type I-1 bituminous concrete
(120 lbs. Liquid Asphalt/Ton Bit. Conc. = .06 Tons Liquid Asphalt/Ton Bit. Conc.)

If the (PPLA) does not exceed +/- 5% relative to the (BPLA) then: No differential adjustment.

If the (PPLA) exceeds +/- 5% relative to the (BPLA) then:

(PPLA - BPLA) x TBC x . 06 = Differential Value for Current Pay Period ($)

Basis of Payment

(j) Under **Item 0.303LA** the differential value for **Liquid Asphalt contained in One (1) Ton of Type I-1 bituminous concrete** used to complete the work under this contract shall be made in accordance with the Period Price index values for Liquid Asphalt posted for each calendar month in which the work was performed and relative to the Base Price as specified herein. Subsequently these values shall be factored in accordance with the above-noted formula (Par. i).

(k) **The differential value for Liquid Asphalt shall be based upon a fixed mean value of six-hundredths (. 06)Ton Liquid Asphalt contained in One (1) Ton of Type I-1 bituminous Concrete, with said value differential being factored only on the number of Tons of Bituminous Concrete actually used, verified and/or accepted by the Engineer.**

(l) No adjustment shall be made for any material which is rejected or is deemed to be of an inferior quality. Nor shall any adjustment be made for Liquid Asphalt contained in any **bituminous concrete** material which is used to remedy any deficient work which was initially performed by the Contractor and/or vendor under this contract, and which is proven to be deficient and/or of inferior quality during and/or subsequent to discharge.

(m) The Contractor shall be responsible for disbursing the Liquid Asphalt cost adjustments to their subcontractors and/or to their vendors.

SCOPE OF WORK

The work under this Contract consists superstructure and substructure repairs to Bridge No. N-04-003=N-12-001, including removal of existing wearing surface, full-depth and partial-depth repairs to the concrete deck, repairs to the concrete sidewalk and safety curb, cleaning and repairing the aluminum bridge railing, replacing the bridge deck expansion joint, replacement of bridge deck waterproofing membrane and wearing surface, replacement of select bearings, retrofitting of beam cover plate termini, cleaning and painting select bearings, crack and spall repairs to the abutments and wingwalls, repairs to undermined abutment footing and riprap slope protection, pavement milling and resurfacing, signing, pavement markings and the provision of safety controls and signing for construction operations and other incidental items included in the contract documents.

All work done under this contract shall be in conformance with the MassDOT *Standard Specifications for Highways and Bridges* dated 1988 and the *English Supplemental Specifications* dated February 25, 2010; the *Standard Special Provisions* dated August 27, 2010, the *2010 Construction Standard Details*; the *2003 Manual on Uniform Traffic Control Devices* with latest Massachusetts amendments; the *1990 Standard Drawings for Signs and Supports*; the *1968 Standard Drawings for Traffic Signals and Highway Lighting*; the latest edition of *American Standard for Nursery Stock*; the Plans and these Special Provisions.

References within the Standard Specifications to the Massachusetts Department of Transportation, Massachusetts Highway Department, or the Engineer shall for the purposes of this Contract be construed to mean the City of Newton or its representative.

DISPOSAL OF EXCAVATION MATERIAL

Surplus materials obtained from any type of excavation, and not needed for further use as determined by the Engineer shall become the property of the Contractor and shall be disposed of by him/her outside the location subject to the regulations and requirements of local authorities governing the disposal of such materials, at no additional compensation.

DISPOSAL OF SURPLUS MATERIALS

All existing and other materials not required or needed for use on the project, and not required to be removed and stacked, shall become the property of the Contractor and shall be removed from the site during the construction period and legally disposed. No separate payment will be made for this work, but all costs in connection there with shall be included in the prices bid for the various contract items.

ENGINEERING DIRECTIVES

Contractors can access MassDOT, Highway Division Engineering Directives at:
http://www.mhd.state.us/default.asp?pgid=content/engineering02&sid=about

EXISTING BRIDGE PLANS

The existing bridge plans are available for review at the office of the Bridge Design Section, Room No. 6430, Massachusetts Department of Transportation, 10 Park Plaza, Boston, MA 02116. It is the Contractor's

responsibility to field verify all the existing information that he deems necessary for completing the scope of work.

GENERAL REQUIREMENTS FOR WORK INVOLVING PAINTED STEEL
(1/21/2009)

Demolition and work involving painted steel shall conform to the requirement of Section 961 of the Standard Specifications

WORK INVOLVING PAINTED STEEL.

Hazardous materials shall be removed in the immediate area of any intended welding, heating, saw cutting or burning of steel. Hazardous material removal is required to allow the demolition of structural steel, railings, drainage systems, utility supports, steel lamp posts, etc.

The contractor shall assume that the coatings on the steel contain lead, unless otherwise determined by testing. The contractor shall certify in writing to the Engineer the results of all testing, and shall also certify that any lead coated steel removed from the project was not reused or buried, but was sent to a scrap metal recycling facility.

Implement and maintain programs and procedures, which comply with the requirements of this specification and all applicable standards and regulations. Comply with all applicable regulations even if the regulation is not specifically referenced herein. If a state or local regulation is more restrictive than the regulation of this specification, follow the more restrictive requirements.

This requirement is intended only for the demolition and preparation prior to repair and does not include provisions for recoating of steel.

Cutting or Burning of Steel

All surfaces to be welded, heated, saw cut or burned shall be cleaned so as to remove all contaminants and/or hazardous materials, which could be discharged to the environment as a function of the subsequent operations.

Lead paint shall be removed in its entirety in an area prescribed by a 15 cm (6 inches) minimum offset from the required work. The paint removal operation may be dry abrasive blasting, wet abrasive blasting or chemical stripping.

Proper level of containment shall be used when performing this work in accordance with Section 961.67 “Containment”. Full containment is not required during chemical stripping operation however; the Contractor shall install proper shielding and/or tarpaulins under the chemical stripping operations in order to catch all debris generated during this procedure. A cleaned area must be inspected and approved before the demolition operations are started.
During cleaning operations the Contractor shall be required to furnish and erect temporary floodlights illuminating the steel surface at a minimum of 30-foot candles. This lighting shall be used in areas where there is insufficient lighting for proper cleaning operations and inspection. The Contractor shall supply electrical power.

The Contractor shall provide support for interim and final inspection of the bridge during cleaning operations. This support shall include the necessary traffic controls and safe access to the work.

Mechanical Disassembly of Steel

All surfaces to be mechanically disassembled by shear cutting or removing bolts or rivets shall not require deleading. When shear cutting or removing bolts or rivets, the Contractor shall not use any method that will cause dust and/or particles to be emitted and/or dispersed into the environment to an extent that would expose the workers above the Action Levels of 30ug/cm.

For purposes of limiting the lead dust, the Contractor shall dampen the lead paint work areas.

The contractor shall install a proper shielding and/or tarpaulins under all lead-paint-coated surfaces to be shear cut or bolts or rivets ordered removed in order to catch any loose lead paint chips, dust or particles.

Environmental

All applicable portions of Sections 961.65 "Worker Protection" and 961.66 "Environmental Protection and Monitoring" shall be followed when performing this work. During chemical stripping a hand washing facility maybe used in lieu of a decontamination/changing facility.

Hazardous material shall be collected during the disassembly and disposed of as outlined in Section 961.68 "Handling of Hazardous Waste and Reporting Release Programs". Submittals shall be according to Section 961.69 "Submittals".

INTERPRETATION OF BASIC ESTIMATE OF QUANTITIES

Attention is directed to the provisions of Subsection 2.02 and to the fact that the basic estimate of quantities of work to be done hereunder is based on data and dimensions available on existing bridge plans. No field measurements using survey were made. The Contractor must satisfy himself by his own investigation and research regarding all conditions affecting the work, the amount of work to be done, the labor, materials and equipment needed, and make his bid on sole reliance thereon.

PAINTING (STRUCTURAL) CERTIFICATION

All Contractors or Subcontractors performing lead based paint removal, containment and collection, surface preparation, or coating of structural steel must be pre-qualified by MassDOT in the Painting (Structural) category. The application form for Contractor Pre-qualification can be downloaded from:

http://www.mhd.state.ma.us/default.asp?pgid=content/prequal02&sid=about

PERSONAL PROTECTIVE SAFETY EQUIPMENT FOR CONTRACTOR PERSONNEL

The Contractor is responsible to ensure that all personnel, including all subcontractors, working on the project are issued and are wearing all necessary personal protective safety equipment while working within the project limits. This equipment shall include, as a minimum, a hardhat and a safety vest, regardless of the type of work being performed. Other safety equipment shall be added as required to perform the work in which they are

engaged and in accordance with all local, state and federal requirements in effect. Safety equipment shall be provided at no additional cost to the Massachusetts Department of Transportation.

PROMPT PAYMENT AND RELEASE OF RETAINAGE TO SUBCONTRACTORS

The Contractor agrees to pay each subcontractor, used during this contract, no later than 10 business days from the receipt of each payment the prime contractor receives from the City of Newton for all the accepted subcontract work. Failure to comply with this requirement may result in the withholding of payment to the prime contractor until such time as all payment due under this provision has been received by the subcontractor(s) and/or referral to the Prequalification Committee for action which may affect the contractor's prequalification status.

The Contractor further agrees to make payment in full, including retainage, to each subcontractor not later than 10 business days after the subcontractor satisfactorily has completed all of the work required under its subcontract.

PROTECTION OF UNDERGROUND FACILITIES

The Contractor's attention is directed to the necessity of making his own investigation in order to assure that no damage to existing structures, drainage lines, traffic signal conduits, etcetera, will occur.

The Contractor shall notify Massachusetts DIG SAFE and procure a Dig Safe Number for each location prior to disturbing existing ground in any way. The telephone number of the Dig Safe Call Center is 1-888-344-7233.

SAWCUTS

Sawcuts shall be made in the existing pavement at areas of new or reset curb, limits of full depth pavement construction and as directed by the Engineer. Payment for this work shall be included in the unit price under the applicable items.

SUBSECTION 4.04 CHANGED CONDITIONS.

This Subsection is revised by deleting the two sequential paragraphs near the end that begin "The Contractor shall be stopped…" and "Any unit item price determined …" (1/6/2006).

SUBSECTION 4.06 INCREASED OR DECREASED CONTRACT QUANTITIES
Replace this Subsection with the following: (Revised – 3/23/ 2007)

The quantities contained in the Contract are set forth as a basis for the comparison of bids only and may not necessarily reflect the actual quantity of work to be performed. The Department reserves the right to increase, decrease or eliminate the quantity of any particular item of work.

Where the actual quantity of a pay item varies more than 25 percent above or below the estimated quantity stated in the Contract, an equitable adjustment in the Contract Price for that pay item shall be negotiated upon demand of either party regardless of the cause of the variation in quantity. No allowances will be made for loss of anticipated overhead costs or profits suffered or claimed by the Contractor resulting directly or

indirectly from such increased, decreased or eliminated quantities or from unbalanced allocation among the contract items from any other cause. It is the intention of this provision to preserve the bid basis while limiting the Contractor's risk exposure to 25% of each bid quantity.

In the case of an overrun, the contractor will be compensated at the Contract Unit Price for a quantity up to 125% of the Contract quantity. The adjusted unit price shall only be applied to that quantity above 125% of the contract quantity.

Neither party shall be required to demonstrate any change in the cost to perform the work based solely on the overrun. The original Contract unit bid price shall have no bearing on determining the adjusted unit price for an overrun. The adjusted unit price shall be based on the estimated cost of performing the added work over 125% of the bid quantity. In the event that an adjusted unit price cannot be agreed upon within 60 days after being requested by either party, a unit price will be established that is deemed to be fair and equitable by the Engineer, whether higher or lower than the unit price bid. Payment will be made at that rate until agreement is reached or until the Contractor chooses to exercise his rights under Section 7.16.

To assist the Engineer in the determination of an equitable adjustment for an overrun, the Contractor shall prepare a submission in the following manner and accept as full payment for work or materials an amount for an equitable adjustment in the Contract Price equal to the following:

(1) The actual cost or a reasonable cost estimate for direct labor, material (less value of salvage, if any) and use of equipment, plus 10 percent of this total for overhead;
(2) Plus actual cost or a reasonable cost estimate of Worker's Compensation and Liability Insurance, Health, Welfare and Pension Benefits, Social Security deductions and Employment Security Benefits;
(3) Plus 10 percent of the total of (1) and (2) for profit and other unallocated costs;
(4) Plus the estimated proportionate cost of surety bonds.

No allowance shall be made for general superintendence and the use of small tools and manual equipment.

For work performed by a Subcontractor, the Contractor shall accept as full payment therefore an amount equal to the actual cost or the reasonable cost estimate to the Contractor of such work as determined by the Engineer, plus 10 percent of such cost. The Subcontractor is bound by the same criteria for the determination of an equitable adjustment as the Contractor.

In the case of an underrun, the unit price for the actual quantity installed, if less than 75% of the bid quantity, shall only be adjusted to account for increased unit costs that result solely from the decreased quantity. The adjusted unit price shall be the bid price plus the demonstrated unit change in the cost of performing the work due solely to the decreased quantity.

The Contractor shall prepare a submission demonstrating actual increased unit costs for review and evaluation by the Engineer. No allowance will be made for loss of anticipated overhead costs or profits suffered or claimed by the Contractor resulting directly or indirectly from such decreased or eliminated quantities.

The Contractor is required to furnish itemized statements of cost and give the Department access to supporting records.

APPROVED EQUIVALENT
(Supplementing Subsection 5.03 and Section 6.00)

For any materials named or described in these specifications, an approved equivalent to that named or described in the said specifications may be furnished.

CONSTRUCTION (STAKES) STAKINGS
(Supplementing Subsection 5.07)

The Contractor shall be responsible for establishment of proposed alignment, profile, and cross-section control throughout the project areas and all related work shown on the plans. All survey work will be in accordance with MassHighway standards and done by a licensed surveyor registered in Massachusetts.

All necessary survey work shall be done with no specific compensation. The cost shall be included in the various bid prices.

DRAINAGE
(Supplementing Subsection 7.13)

It shall be the Contractor's responsibility to maintain proper drainage at all times in the areas under construction until the final system is put into use.

If the roadway is to be left at base course over the winter months, only catch basins at low points and those structures identified by the Engineer shall be adjusted to base course grade. Further adjustment of these structures to final grade shall be paid for under Item 220.

The castings of all structures, which are required to be set or reset under this project shall not be set complete in place to the final grade until after the bituminous concrete binder course has been completed and top course is scheduled to be completed with 2 weeks.

Before placement of top course material begins, utility structures shall be adjusted to final grade. Utility structures shall be exposed above binder grade for not more than two (2) weeks before placement of top course material will be required.

All new pipes and structures within the limits of this contract shall be left in a clean and operable condition at the completion of the work.

If necessary crushed stone foundation required for drainage structures and pipe shall be included in the appropriate drainage items without any additional compensation.
All the above work shall be included under the relevant drainage item without additional compensation therefore. Any adjustments made to new drainage structures will be included under the contract unit price for the respective structures.

NOTICE TO OWNERS OF UTILITIES
(Supplementing Subsection 7.13)

Written notice shall be given by the Contractor to all public service corporations or municipal and State officials owning or having charge of publicly or privately owned utilities of his intention to commence

operations affecting such utilities at least one week in advance of the commencement of such operations. The Contractor shall, at the same time, file a copy of such notice with the Engineer.

Following are the names and phone numbers of the utilities and agencies presumed to be affected, but the completeness of the list is not guaranteed:

DPW – **Newton** Engineering Department 1000 Commonwealth Ave Newton Centre, MA 02459	Lou Taverna (617) 796-1011
DPW – **Needham** Town Engineer 470 Dedham Ave Needham, MA 02492	Anthony Del Gaizo (781) 455-7538
Newton Water & Sewer Department 60 Elliot St Newton Highlands, MA 02461	Fred Russell (617) 796-1640
Needham Water & Sewer Department 470 Dedham Ave Needham, MA 02492	Vincent Roy (781) 455-7547
Newton Fire Department 1164 Centre St Newton Centre, MA 02459	Chief Joe LaCroix (617) 796-2210
Newton Fire Department – Fire Alarm 1164 Centre St Newton Centre, MA 02459	Jeff Knight (617) 796-2220
Needham Fire Department 88 Chestnut St Needham, MA 02492	Chief Paul Buckley (781) 455-7580
Needham Fire Department – Fire Alarm 88 Chestnut St Needham, MA 02492	Ray Bigelow (781) 455-7579
Newton Police Department 1321 Washington St Newton, MA 02465	Chief Mathew Cummings (617) 796-2100
Needham Police Department 99 School St Needham, MA 02492	Chief Thomas Leary (781) 455-7570
Nstar Electric One NSTAR Way Westwood, MA 02090	Steven Owens (781) 441-8709

National Grid Gas **(Newton)** 40 Sylvan Rd Waltham, MA 02451	Dennis Peri (781) 907-2836
Nstar Gas **(Needham)** One NSTAR Way Westwood, MA 02090	Steven Owens (781) 441-8709
Verizon 1166 Shawmut Ave New Bedford, MA 02746	Karen Nunes (508) 991-3522
MWRA Water 2 Griffin Way Chelsea, MA 02150	Ralph Francesconi (617) 305-5827
MWRA Sewer 2 Griffin Way Chelsea, MA 02150	Kevin McKenna (617) 305-5956
MBTA 10 Park Plaza - Room 6720 Boston, MA 02166	Frank Depaola (617) 222-3118
RCN 173 Bedford St Lexington, MA 02040	Margot Jones (781) 652-8951
Comcast 676 Island Pond Rd Manchester, NH 03109	Jean MacLaren (603) 695-1461
Nstar Communications One NSTAR Way Westwood, MA 02090	Andrew Balta (781) 441-3492
AT&T / TCG, c/o Siena Engineering **(Newton)** 50 Mall Rd – Suite 203 Burlington, MA 01803	David Edgar (781) 221-8400
MCI Metro Access **(Newton)** PO Box 600 Charlton, MA 01507	Stephen Parretti (508) 248-1305
Above Net Communications **(Newton)** 4 Powderhouse Rd Medfield, MA 02052	Neil Bresnahan (781) 760-3034
Veroxity Technology Partners, LLC **(Needham)** 6 Technology Park Dr	Jeff Harington (617) 848-3043

Westford, MA 01886

The following links should be used to verify the contacts:

Utilities are shown at website http://www.mhd.state.ma.us/WebApps/utilities. Select District 6 on top of the webpage, select Newton or Needham, then locate the utility.

Town officials are shown at website http://www.mass.gov under the "For Government" tab, select "City/town official directory" under "online Services" heading. Enter Newton or Needham on the left of the webpage and locate the official contact.

DESIGNER
BETA Group, Inc.
Chris Jones, Project Manager
(781) 255-1982

WORK SCHEDULE
(Supplementing Subsection 8.02)

Work on this project is restricted to a normal eight-hour day, five-day week with the Prime Contractor and all Subcontractors working on the same shift.

No work shall be done on this contract on Saturdays, Sundays, or Holidays. Work will not be allowed the day before or the day after a weekend which involves a Holiday without prior approval by the Engineer.

PROVISIONS FOR TRAVEL AND PROSECUTION OF WORK
(Supplementing Subsection 8.03)

Before starting any work under this Contract, the Contractor shall submit a Schedule of Operation as provided in Section 8.02. This work schedule shall include a plan of his construction procedures, detours, and the safety measures he will use during the prosecution of the work as set forth in Section 850 of the Standard Specifications for Highways and Bridges.

The Contractor may be required to temporarily suspend operations when such are considered by the Engineer to be a hazard to traffic. Particular care shall be taken to establish and maintain methods and procedures which will not create unnecessary or unusual hazards to public safety. Signs having messages that are irrelevant to normal traffic conditions will be removed or properly covered at the end of each work period. Signs are to be kept clean at all times, and legends shall be distinctive and unmarred.

The Contractor shall provide, place and erect all necessary barricades and warning signs and maintain adequate lights and illumination therefore. He shall be held responsible for all damage to the work due to any failure of signs and barricades needed to protect the work from traffic, pedestrians, or other causes.

The Contractor shall provide for the removal of all material spilled from his trucks on existing pavement over which it is hauled, or otherwise deposited thereon whenever, in the judgment of the Engineer, the accumulation is sufficient to cause the formation of mud or dust, or interfere with drainage or create a traffic hazard.

In case of damage to utilities, the Contractor shall promptly notify the Owner and shall, if requested, furnish manpower under the owner's direction in getting access to the utility. Pipes or other structures damaged by the operation of the Contractor may be repaired by the owner, either the municipality or the utility company. The cost of such repairs shall be borne by the Contractor without compensation. The Contractor shall determine the exact location of all existing utilities before commencing work. He agrees to be fully responsible for any and all damages which might be occasioned by his failure to exactly locate and preserve any and all underground utilities.

SAFETY CONTROLS FOR CONSTRUCTION OPERATIONS
(Supplementing Subsections 850.21 and 850.61))

Safety controls for construction operations shall be done in accordance with the relevant provisions of Section 850 of the Standard Specifications, the Manual on Uniform Traffic Control Devices, the Traffic Management Plan, and the following:

The providing of safety controls for construction operations shall be considered incidental to this contract and the costs for safety controls shall be included in the unit bid price for those contract items requiring such controls.

Positioning, adjusting and re-positioning of all devices such as traffic cones, high level warning devices, etc., not otherwise classified and paid for under other items in this contract, is considered incidental and no separate payment will be made.

ASPHALT BINDER

In order to allow an efficient transition from viscosity graded Asphalt Cement (AC) specifications to performance graded Superpave Binder (PG) specifications (non-modified binder), AC graded products shall be replaced with PG binder as follows:

Projects requiring AC-20 will be constructed using PG 64-28
Projects requiring AC-5 will be constructed using PG 52-34

The Contractor shall follow existing mix design requirements and produce the hot-mix using the required grade of PG binder.

The binder supplier shall provide the City with PG test results and a certification of the PG binder grade when PG binder is substituted for AC grade asphalt. This testing and certification shall be based on the existing lot numbering system.

The binder supplier shall not mix AC and PG binders in the same tank, unless tested and re-certified to meet the specified grade.

Performance-Graded asphalt shall not have a higher temperature grade than specified without prior approval.

CLEARING AND GRUBBING

No tree shall be removed prior to approval of the City of Newton or Town of Needham, as appropriate. The removal of all trees shall be coordinated with the City/Town prior to removal.

The clearing and grubbing work shall be considered incidental to the Contract. No separate payment shall be made for clearing and grubbing or the removal of trees.

TRAFFIC MANAGEMENT PLAN

Construction Staging and Scheduling

The Contractor shall follow the requirements of the Traffic Management Plan unless otherwise directed by the Engineer. The proposed work on this bridge is to be completed in three stages with the bridge open to one lane of traffic in each direction at all the times during the construction. The existing sidewalk will be open or relocated during construction. The Traffic Management Plan and Typical Details show the suggested construction staging with pertinent traffic controls. The Contractor may submit an alternate traffic management plan, in writing, for approval by the Engineer.

The Contractor shall prepare and submit to the Engineer a proposed work schedule that complies with the Plans and Specifications. No work shall start until the Engineer's approval of the schedule is received.

The following are the stages to be followed in the prosecution of this contract. Typical traffic control layouts are shown on the Plans. No work on any stage may begin unless all requirements of the previous stages have been met. It should be noted that any costs of delays incurred by these procedures shall be deemed to be included in the contract prices bid and no additional payment shall be made therefore.

General Construction Stages

1. Implement Traffic Safety Controls and Safety Signing for Construction Operations per the Traffic Management Plan.
2. Implement Erosion Control Barriers as shown on the plans.
3. Remove wearing surface on the **southern** portion of Bridge N-04-003=N-12-001. Implement temporary sidewalk or maintain existing sidewalk during this stage.
4. Perform Deck repair per Scope of Work and plans for **southern** portion of Bridge N-04-003=N-12-001. Implement temporary sidewalk or maintain existing sidewalk during this stage.
5. Remove wearing surface on the **middle** portion of Bridge N-04-003=N-12-001.
6. Perform Deck repair per Scope of Work and plans for **middle** portion of Bridge N-04-003=N-12-001.
7. Remove wearing surface on the **northern** portion of Bridge N-04-003=N-12-001.
8. Perform Deck repair per Scope of Work and plans for **northern** portion of Bridge N-04-003=N-12-001.
9. Repair eroded roadway slopes and riprap slopes as shown on the plans.
10. Mill existing roadway pavement on bridge approaches to the extents shown on the plans.
11. Place top course for the entire length and width of the project.
12. Install Pavement Markings.
13. Remove Erosion Control Barriers.
14. Remove Traffic Safety Controls and Safety Signing for Construction Operations.

ITEM 106.151 BLEEDER (BRIDGE DECK) PVC EXTENSION EACH

The work to be done under this Item consists of extending existing PVC deck drains to outlet below the bottom of the steel beams, and repairing corrosion on galvanized stay-in-place forms in the area around the base of the existing drains as shown on the plans and as directed by the Engineer. Work under this Item shall also include replacing the existing galvanized screen covering the opening to the drain inlets on top of the concrete bridge deck.

Extensions shall be schedule 40 PVC, and shall be connected via coupling to the existing drains. Couplings shall be elbowed to enable the extensions to be placed close enough to the steel beams to allow a clamped connection. Extensions shall be extended 12 inches below the bottom flange of the steel beams. Extensions shall be clamped to the bottom flanges of the steel beams via non-welded conduit clamps.

Corrosion of the galvanized stay-in-place deck forms around the base of the existing drains shall be removed. The corroded areas shall be cleaned and painted with galvanizing repair paint.

Bleeder (Bridge Deck) PVC Extension will be measured per each drain extension installed, complete in place, and accepted by the Engineer.

Payment under this Item shall be made at the contract unit price per each, which price shall include full compensation for all labor, materials and equipment necessary to perform the work described above.

ITEM 106.281 GRAFFITI REMOVAL SQUARE FOOT

The work under this Item shall conform to the relevant provisions of the Standard Specifications and the following.

The work under this Item consists of removing graffiti from the surfaces of the concrete piers, steel beams, and riprap slope protection at the bridge.

Removal of graffiti from the surfaces of the concrete abutments and wingwalls shall be performed under Item 908.10.

The Contractor shall submit for approval his proposed equipment, staging, and procedures for performing the work.

Graffiti shall be removed using vacuum-shrouded power washing, blasting, or power-tool equipment that has the appropriate attachments for the surface being cleaned to ensure that no water, dust, or abrasive escapes during operation. This equipment should be capable of cleaning all the graffiti off the surface at a rate acceptable to the engineer while producing no detectable dust. The equipment should operate in a manner such that all dust or water/abrasive/dust mix generated is simultaneously drawn away from the contact surface into attached vacuum hoses leading to a vacuum that utilizes HEPA filters. The vacuum and its hoses should be sufficiently rated for the volume of debris and/or abrasive/debris generated.

If a blast media is used, it shall be a soluble large crystal sodium bicarbonate.

Staging to access graffiti will not be allowed in the river. Staging shall be suspended from the superstructure, mounted to the piers, or shall be performed using an under-bridge aerial lift vehicle.

The graffiti removal procedure shall not damage the underlying concrete surface, or the paint coatings of the steel beams.

Graffiti Removal will be measured per square foot of graffiti removed, and accepted by the Engineer.

Payment under this Item shall be made at the contract unit price per square foot, which price shall include full compensation for all labor, materials and equipment necessary to perform the work described above.

ITEM 106.282 CLEAN ALUMINUM BRIDGE RAIL LUMP SUM

The work under this Item shall conform to the relevant provisions of the Standard Specifications and the following.

The work under this Item consists of cleaning the aluminum bridge railing.

Cleaning operations shall not be performed until the final stage of construction, after all bridge deck repair work including joint replacement, concrete repairs, and final paving have been performed.

The Contractor shall submit for approval his proposed equipment and procedures for performing the work.

All surface contaminants including, but not limited to, dirt, oils, and oxidation shall be removed from the surface of the aluminum railing system.

It is the intent of this Item to clean as much of the railing system as possible without staging operations on the back side of the railing. Therefore, all front (street-facing) surfaces of the railing shall be cleaned, and as much as possible of the back (rear-facing) surfaces that can be accessed from the front of the railing shall be cleaned.

The aluminum bridge rail shall be cleaned by power washing or blasting with a sodium bicarbonate media.

Cleaning operations shall not damage the underlying aluminum surfaces.

Cleaning operations shall be fully contained such that cleaning media or contaminants do not escape into the river or stormwater drainage system.

Payment under this Item shall be made at the contract lump sum price, which price shall include full compensation for all labor, materials and equipment necessary to perform the work described above.

ITEM 106.302 CLEAN AND PAINT STRUCTURAL STEEL SQUARE FOOT
ITEM 106.303 CLEAN AND PAINT BEARING ASSEMBLIES EACH

The work under this Item shall conform to Section 961 of the Standard Specifications and the following.

The working consists of cleaning (full removal) and painting of the east ends of the existing steel beams (2′-6″ from the ends of the beams) and the exterior bearing assemblies at the west abutment and west pier as shown on the plans and as directed by the Engineer.

Clean and Paint Structural Steel will be measured per square foot of steel beam cleaned and painted, complete in place, and accepted by the Engineer.

Clean and Paint Bearing Assemblies will be measured per each bearing assembly cleaned and painted, complete in place, and accepted by the Engineer.

Payment under these Items shall be made at the contract unit prices per respective unit of measurement, which price shall include full compensation for all labor, materials and equipment necessary to perform the work.

Payment for cleaning and painting of steel as part of the cover plate repairs, utility support replacement and resetting, and new bearing installations will not be paid for under these Items, but will be included under payment of those respective Items.

ITEM 106.5 ELASTOMERIC JOINT SEALER FOOT

The work under this Item shall conform to the relevant provisions of the Standard Specifications and the following.

Sealant around the perimeter of the bridge railing post base plates shall be removed and replaced with elastomeric sealant as shown on the plans and as directed by the Engineer.

Sealant shall conform to ASTM C920 and shall be selected from the MassDOT Qualified Construction Materials List.

Existing sealant shall be completely removed and the surface shall be prepared in accordance with the recommendations of the sealant manufacturer.

Sealant shall be applied in accordance with manufacturer's recommendations.

Elastomeric Joint Sealer will be measured per foot of joint sealer installed, complete in place, and accepted by the Engineer.

Payment under this Item shall be made at the contract unit price per foot, which price shall include full compensation for all labor, materials and equipment necessary to perform the work described above.

ITEM 107.49 BRIDGE EXPANSION JOINT REMOVED AND REPLACED LUMP SUM

The work under this Item shall conform to the relevant provisions of the Standard Specifications and the following.

The work under this Item shall include the removal and replacement of the existing neoprene compression seal expansion joint in the bridge deck at the east abutment and replacing with a new neoprene strip seal joint in the roadway, and a new ADA-compliant compression seal joint in the sidewalk and safety curb. The work shall include all sawcutting, demolition, joint components, concrete, granite curb, metalwork and all other incidentals required to remove and replace the joints.

The existing armored joint, concrete sidewalk and safety curb, and granite curb shall be partially demolished as shown on the plans and/or as directed by the Engineer.

Demolition procedures shall be in accordance with the relevant provisions of Section 112 of the Standard Specifications and the Special Provisions for Items 127.12–127.4; however, payment shall be included under this Item.

The Strip Seal Bridge Joint System shall be in accordance with Section 972 of the Standard Specifications.

NEOPRENE COMPRESSION SEAL

Manufacturer: Shall have a minimum ten (10) years experience specializing in the design and manufacture of expansion control systems.

Products: Expansion control systems shall be installed with manufacturer's blockout repair and infill materials.

Application: The specified expansion control system(s) shall be installed by the manufacturer's factory trained installer.

The expansion joint system shall be a complete system designed by the manufacturer to withstand structural movement and harsh environmental conditions. The system shall consist of a preformed neoprene profile, installed using the same dimensions as the joint gap at mid-range temperature, bonded with a two-component epoxy adhesive, and pressurized during the adhesive cure time. In addition, it shall be designed for application on the specified type of surface indicated on the project drawings.

Components and Materials

A. Profile - Polychloroprene (neoprene) elastomer, preformed by extrusion and vulcanized into its definitive shape, which is supplied in a configuration and dimensions matching the proposed application.

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The profile shall have the following properties:

PROPERTY	**ASTM METHOD**	**REQUIREMENT**
Tensile Strength, min	D-412	2000 psi (13.8 MPa)
Elongation at Break, min	D-412	250%
Hardness, Shore A	D-2240	65 +/- 5
Oven Aging, 70hrs at 212ºF Tensile Strength, max loss Elongation at Break, max loss Change in Hardness	D-573	 20% 20% 0 - 10 points
Oil Swell, 70hrs at 212ºF Weight Change, max	D-471	45%
Ozone Resistance, 70hrs at 104ºF	D-1149	No Cracks
Low Temperature Stiffing, 7 days at 14F Change in Hardness	D-2240	0 – 15 points

B. Adhesive - Two-component, thixotropic, epoxy-based adhesive, which is mixed at the job site. The adhesive shall have the following properties:

PROPERTY	ASTM METHOD	REQUIREMENT
Tensile Strength	D-638	4,000 psi (27 MPa)
Axial Compression	D 638	8,000 psi (55 MPa)
Pot Life at 68ºF (20ºC)	N/A	40 minutes
Flash Point	N/A	> 200ºF (93ºC)
Initial Cure at 68ºF (20ºC)	N/A	24 hours
Full Cure at 68ºF (20ºC)	N/A	7 days

Note: If the ambient air temperature is between 40ºF and 60ºF, an alternate cold weather epoxy shall be utilized

C. Pressurization is done through a valve with cap system. The profile is pressurized during installation and curing time of adhesive to assure complete bonding throughout gap/profile surfaces. Air pressure will bleed itself with time or air valve can be released at any time after 24 hours of installation.

EXECUTION

Ambient temperature shall not be lower than 4□C (40□F) during installation. Note that gap size will change with cold and hot temperature extremes. Gap measurement should optimally be carried out at the mid-point of the average temperature range for the area of installation.

The environment should be free of dust, oil, grease, wax, moisture, and frost. The gap wall surfaces must be thoroughly cleaned.

No installation may be performed in rainy weather, or when rain is expected within one hour before installation. All surfaces must be completely dry prior to applying adhesive.

All foreign materials must be totally removed from the gap. The heads must first be cleaned out by disc grinding or sandblasting and then vacuumed or blown with dry, oil free, compressed air before the two component epoxy adhesive is mixed and applied.

Expansion joint system is to be installed in strict accordance with the manufacturer's instructions manufacturer approved installers or under the supervision of manufacturer representatives

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Non durable and unsound concrete at the joint gap edge must be removed and the concrete must be totally repaired per the joint manufacturer. All cracks shall be repaired.

The profile shall be cut to the correct length of the appropriate gap for installation, without pulling or exerting excess tension.

Seal both ends of the profile (air tight) and install air valve. Inflate profile to assure there are no leaks in the profile. Deflate before installation.

Clean and abrade sides of profile per the manufacturer's instruction.

Mix adhesive according to manufacturer's directions only after all preparation of gap and profile are complete.

Apply adhesive to the inner gap walls in an even manner. In the same even fashion, apply adhesive to outer rigid sidewalls of profile.

Profile should be gradually inserted into the gap, without stress or compression. The installer should maintain the profile at the depth desired, by hand or by any convenient means. Clean away excess adhesive.

Pressurization should be done through the air valve with a heavy pump. Pressurization should be applied slowly so as not to cause the joint to squeeze adhesive out of the flanges on the sides of the joint.

Clean all excess adhesive around the edges and top of the joint with a trowel or scraping tool.

Allow epoxy adhesive to cure (usually 24 hours) and remove valve to bleed off air pressure.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Payment for Bridge Expansion Joint Removed and Replaced shall be made at the contract lump sum bid price, which price shall include full compensation for all labor, materials and equipment necessary to perform the work.

ITEM 107.65 ALUMINUM PICKETS REMOVED AND REPLACED EACH

The work under this Item shall conform to the relevant provisions of the Standard Specifications and the following.

Broken aluminum bridge railing pickets shall be replaced as shown on the plans and as directed by the Engineer.

Broken pickets shall be removed and become the property of the Contractor.

Pickets shall be replaced to match the dimensions and finish of the existing pickets. Some disassembly of the picket frame may be required in order to allow replacement of the pickets.

Tubular pickets shall conform to ASTM B221 Allow 6063-T5.

Rivets shall conform to ASTM B316 Alloy 6061-T6.

Aluminum Pickets Removed and Replaced will be measured per each picket replaced, complete in place and accepted by the Engineer.

Payment under this Item shall be made at the contract unit price per each, which price shall include full compensation for all labor, materials and equipment necessary to perform the work.

ITEM 107.851	**SEALING HORIZONTAL CRACKS MORE THAN 0.12 INCHES**	**FOOT**
ITEM 107.852	**SEALING HORIZONTAL CRACKS LESS THAN 0.12 INCHES**	**FOOT**
ITEM 107.853	**SEALING OVERHEAD AND VERTICAL CRACKS MORE THAN 0.16 INCHES**	**FOOT**
ITEM 107.854	**SEALING OVERHEAD AND VERTICAL CRACKS LESS THAN 0.16 INCHES**	**FOOT**

The work to be done under this Item consists of repairing cracks in sound concrete.

Not included under this Item are the repairs to cracks that pass through areas of unsound concrete to be removed under Items 127.12, 127.401, and 127.41. The Engineer will designate these areas.

Cement concrete crack sealing requirements defined herein are for the repair and sealing of cast-in-place cement concrete to prevent water infiltration to the steel reinforcement bars. The width of cracks shall be determined by the Engineer using a width indicating comparator card made of clear plastic with lines of specified width on the cards. The crack width comparator cards shall be held on concrete surfaces to allow the widths of any concrete cracks to be determined by direct visual comparison of the crack width with the widths of the lines marked on the card surface.

Crack sealing materials shall be applied by skilled applicators under a supervisor with proven successful experience in applications with similar scope of work. Crack sealing materials shall be applied when the concrete and the ambient air temperatures are above 40°F. If a heated enclosure is used to accomplish this, the heating units shall be properly vented to the outside of the enclosure to prevent products of combustion from exhausting within the enclosure.

Before containers of sealing materials are opened, the labels shall be checked and the label information shall be documented. If multi-component systems are used, mixing shall be completed prior to application. Manufacturer's instructions shall be followed. An initial crack sealing demonstration application shall be satisfactorily made in the presence of the Engineer before the application is continued.

Before sealing, the concrete must be clean, sound, and free of contaminants and surface moisture Any curing compounds, sealers, oils, greases, coatings, or other impregnations shall be removed by abrasive blast cleaning. Once any concrete surface contaminants are removed, the concrete shall be swept clean and blown off using oil-free compressed air immediately prior to applying the sealer.

Methacrylate crack sealing shall be performed in accordance with the manufacturer's instructions within the allowable ambient temperature range. The cracks shall be v-notched to a minimum depth of ½" and shall be cleaned with oil-free compressed air. The notch shall then be inspected to confirm that the crack was intercepted. If the crack was not intercepted, the notch shall be expanded to intercept the crack and shall then be re-cleaned with oil-free compressed air. Methacrylate shall then be poured into the crack. The crack shall then be observed for seepage of methacrylate and shall be refilled as necessary to ensure the crack is completely filled. If large quantities of methacrylate are used and the crack is not getting filled, the crack should be filled with pre-bagged dried silica sand filler and the crack shall then be re-filled with methacrylate. Methacrylate crack sealer shall consist of a high molecular weight low viscosity methacrylate monomer that when catalyzed will produce a crack-healer/penetrating-sealer that is a rapid-curing, modified-methacrylate resin. The methacrylate material shall, as a minimum, provide the following as applied properties:

Property	Value	Test

Viscosity	< 25 cps	ASTM D2393-86
Bond Strength	> 1500 psi	ASTM C882
Tensile Elongation	> 3%	ASTM D638

Epoxy injection crack sealing shall be performed in accordance with the manufacturer's instructions within the allowable ambient temperature range. Epoxy-Resin for Cement Concrete Crack Injection shall conform to AASHTO M235, Type IV, Grade I. The cracks shall be cleaned with oil - free compressed air. Surface mounted injection ports shall then be installed over the centers of the cracks. The spacing of these ports shall be contingent upon the material and the injection equipment chosen. Socket porting shall be allowed provided that a hollow drill bit and vacuum system is used to prevent debris from entering the cracks. Surface ports shall be mounted with rapid setting epoxy material. The crack widths shall be noted during port installation. After the ports are installed, the crack surfaces shall be sealed with high modulus, 100% solids, moisture tolerant epoxy paste adhesive. This material shall be capped with fine sand before it is cured. After the capping material has cured, the cracks shall be injected with an epoxy resin compound. he injection pressure used to seal the cracks shall be based upon a number of factors including crack width, crack depth, and the epoxy material used. Injection shall be accomplished using a metered system. The system shall be equipped with a pressure gauge accurate for the pressures anticipated for this work. Injection shall start at the widest point of the crack and shall continue until the narrowest portions of the crack have been filled. Injection shall continue until refusal. If epoxy is observed at adjacent ports, the adjacent port shall be capped and injection shall continue until refusal occurs. Once refusal occurs, injection shall continue at the next wet port until refusal is reached.

Silane Crack Sealer shall consist of a clear, breathable, high-performance, 100 percent solids by weight of Silane sealer material used for protecting new and existing concrete surfaces. It must penetrate deeply, sealing out water, chloride ions, and acids, and prevent damage from freeze/thaw cycles. Silane Crack Sealer material shall, as a minimum, provide the following as applied properties:

Property	Value	Test
Water Weight Gain at 250 ft^2/gal	88 percent reduction	NCHRP 244 Series II-Cube test
Absorbed Chloride at 250 ft^2/gal	89 percent reduction	NCHRP 244 Series II-Cube test
Absorbed Chloride at 250 ft^2/gal	94 percent reduction	NCHRP 244 Series IV - Northern Climate

The type of Cement Concrete crack sealing required shall be determined as a function of the surface type and maximum crack width as follows:

Bridge decks and other non-overhead surfaces sloped less than or equal to 15%:

- Cracks less than 0.06" wide shall be ignored;
- Cracks greater than or equal to 0.06" wide and less than 0.12" wide shall be sealed with an approved methacrylate;
- Cracks greater than or equal to 0.12" wide shall be sealed using either epoxy injection or methacrylate with a sand filler.

Overhead surfaces, vertical surfaces, and non-overhead surfaces sloped greater than 15%:

- Cracks less than 0.06" wide shall be ignored;
- Cracks greater than or equal to 0.06" wide and less than 0.16" wide shall be sealed with an approved silane sealer;
- Cracks greater than or equal to 0.16" wide shall be sealed using epoxy injection.

The Contractor shall arrange with the materials manufacturer or distributor to have the services of a competent field representative at the work site prior to any mixing of components to instruct the work crews in the proper mixing and application procedures. The field representative shall remain at the job site after

work commences and continue to instruct until the Engineer is satisfied that the crew has mastered the technique of installing the system successfully. The representative shall make periodic visits to the project as the work progresses and shall confer on each visit with the Contractor and the Engineer.

The manufacturer's field representative must be fully qualified to perform the work and shall be subject to the approval by the Engineer. The Contractor shall be completely responsible for the expense of the services of the required field representative.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Sealing of Cracks will be measured by the foot of crack repaired and approved by the Engineer under the appropriate Item. Payment for work done under these Items will be made at the Contract unit price per foot, which price shall include full compensation for all labor, materials and equipment necessary to perform the work described above.

ITEM 107.98 UTILITY SUPPORT REMOVED AND REPLACED EACH
ITEM 107.99 UTILITY SUPPORT RESET EACH

The work under this Item shall conform to Sections 112, 960, and 961 of the Standard Specifications and the following.

Existing W4×13 utility supports that have deteriorated shall be removed and replaced as shown on the plans and as directed by the Engineer.

Existing W4×13 utility supports that are not fully connected to their connection plates because of missing bolts shall be reconnected to those beams as shown on the plans and as directed by the Engineer.

Structural steel shall conform to AASHTO M270 Grade 36. Bolts shall conform to ASTM A325.

New steel and connection bolts shall be painted to match the color of the existing steel paint.

Utility Support Removed and Replaced will be measured per each W4×13 support bracket removed and replaced, complete in place and accepted by the Engineer.

Utility Support Reset will be measured per each existing W4×13 support bracket reconnected, complete in place and accepted by the Engineer

Payment under these Items shall be made at the contract unit price per each, which price shall include full compensation for all labor, materials and equipment necessary to perform the work.

ITEM 108.67 JACKING SUPERSTRUCTURE LUMP SUM

The work under this Item shall conform to the relevant provisions of the Standard Specifications and the following.

Work under this Item shall consist of jacking and temporary shoring to relieve the substructure of dead and live loads during bearing assembly replacement. This work shall also include all materials, equipment, labor and temporary shoring design necessary to complete the work.

MATERIALS

Materials and equipment used to perform the work shall be capable of supporting the beams' full dead and live load. All materials used shall conform to the applicable provisions of the Standard Specifications

CONSTRUCTION METHODS.

The Contractor shall submit a design for the temporary jacking and shoring program. The design and computations of all temporary jacking and shoring shall be prepared and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts. The design and computations, including drawings, shall be submitted to the Engineer for review and approval.

The beams must be jacked and shored from the existing abutment or pier. Modifications of the existing ground around the substructures to support the jacking and shoring operations will not be permitted.

Care must be taken to minimize disturbance to the existing site. All equipment, shoring and cribbing systems shall be removed upon completion of the work. The area shall be restored to its original condition to the satisfaction of the Engineer and at no additional cost to the Owner.

The Engineer may order additional or stronger shoring at any time when, in his opinion, sufficient and proper supports have not been provided. The Engineer may also order additional temporary shoring when, in his opinion, field conditions make it necessary to properly protect the work under construction or any existing installation affected by the construction. It is expressly understood and agreed that the fact that the Engineer orders or fails to order such shoring or bracing shall not relieve the Contractor of sole and exclusive responsibility for any damage whatsoever to adjacent structures and installations, either above or below ground, that may be caused by the installation or removal of the shoring, failure or yielding of the shoring, or other factors related to said shoring.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Payment for Jacking Superstructure will be made at the contract lump sum bid price, which price and payment shall constitute full compensation for all labor and materials as indicated on the shop and working drawings, including the cost of designing the temporary jacking and shoring systems, steel, hardware, erecting and maintaining the temporary supports, and their subsequent removal, furnishing all equipment, tools and incidentals necessary to complete the work.

ITEM 120.1 UNCLASSIFIED EXCAVATION CUBIC YARD

The work to be done under this Item shall consist of removing and disposing in accordance with the relevant provisions of Section 120, all the materials obstructing the execution of required work, as shown on the Plans and as directed, except for those materials for which payment is made inclusive with work specified to be performed under other items of this Contract.

Also included shall be the removal and disposal of substandard or damaged edging, concrete foundation, rock, guardrail, drain pipe, water pipe and all other materials not classified and paid for under other items as determined by the Engineer.

Edges of excavations made in existing pavements shall be squared by sawcutting with power-driven tools to provide a neat, clean edge for joining new pavement. Ragged, uneven edges shall not be acceptable. Pavement areas which have been broken or undermined shall be edged neatly with minimum disturbance to remaining pavement. Payment for sawcutting at limits of work shall be made under Item 482.5. All other sawcutting shall be incidental to the item to which it pertains.

When working next to existing retaining walls, wing walls, the Contractor shall exercise extreme caution not to disturb the existing wall. If the existing wall is disturbed, it shall be reconstructed at the Contractor's expense to thoroughly match the existing wall in color, texture, material, and workmanship.

ITEM 127.12	**REINFORCED CONCRETE EXCAVATION FOR SUBSTRUCTURE REPAIRS**	**CUBIC YARD**
ITEM 127.401	**REINFORCED CONCRETE DECK EXCAVATION (FULL DEPTH)**	**CUBIC YARD**
ITEM 127.41	**REINFORCED CONCRETE DECK EXCAVATION (PARTIAL DEPTH)**	**CUBIC YARD**

The work under these Items includes the removal of deteriorated and/or spalled concrete, as may be required, for repairs of the reinforced concrete bridge deck, sidewalk, safety curb, substructures, and as directed by the Engineer.

GENERAL

Existing deteriorated concrete shall be removed to the limits of sound concrete as directed by the Engineer.

The Contractor shall not damage any existing reinforcing steel in areas where deteriorated or spalled concrete is being removed.

The Contractor will not be paid for the removal of any concrete beyond the limits described under these Items and approved by the Engineer.

All materials resulting from the concrete demolition shall become the property of the Contractor who shall properly dispose of all such materials at approved locations. Debris from construction must be carefully contained within the work zones and prevented from falling into the water below. Contractor shall be responsible for dust control during the demolition operations.

CONSTRUCTION METHODS

A. Inspection of the Concrete Surfaces: The Contractor will perform his own investigations and will "evaluate" and mark out the surfaces of the concrete to determine the areas for repairs. Methods for evaluation shall include nondestructive methods such as visual observations and acoustic impact method using a hammer or chain drag (for horizontal surfaces only). The Contractor is referenced to ACI Report 201.1R-92 "Guide for Making a Condition Survey of Concrete in Surface" and ACI Report 364.1R-94 "Guide for Evaluation of Concrete Structures Prior to Rehabilitation" in regards to evaluation methods. Before any existing concrete is removed, the Contractor will provide the Engineer clear access to the areas designated for repair. During this time, the Engineer will perform an inspection of the areas and will approve and/or designate the areas where concrete removal and repair will be required.

The Contractor will not be allowed to do any further repair work until all necessary inspection operations have been performed, unless given permission by the Engineer.

The Contractor will include any costs related to this inspection in the general cost of the work.

B. Removal of Deteriorated Concrete: All deteriorated concrete designated for removal under these Items shall be removed within the limits approved by the Engineer. The lateral limits of each area to be repaired will be delineated by the Contractor and suitably marked and subsequently approved by the Engineer. Where several areas are to be repaired are very close together, the Engineer may combine these individual repairs into a larger area. The outlines of each such area shall first be cut to a depth of ½ inch with an approved power-saw capable of making straight cuts. In the event that reinforcing steel is encountered within the outer ½ inch depth during sawing operations, the depth of sawcut shall immediately be adjusted to a shallower depth so as not to damage the steel bars. If so directed by the Engineer, sawcutting shall again be carried down to the ½ inch depth at other locations of repair provided reinforcing steel is not again encountered. Where over-breakage occurs resulting in a featheredge, the featheredge shall be squared up to a vertical edge in an approved manner. Where sawing is impractical, the area shall be outlined by chisel or other approved means.

The removal of deteriorated concrete shall be accomplished by pneumatic or power hammers approved by the Engineer. For concrete removal, the weight of pneumatic or power hammers shall not exceed 35 pounds. Pneumatic or power hammers heavier than the nominal fifteen (15) pound class shall not be used for removing concrete from below any reinforcing bar. Fillets at inside corners of intersecting limit lines shall be carefully removed. After completion of concrete removal, the sides of the patch shall be vertical down to the bottom of the patch.

During the prosecution of work under these Items for the removal of disintegrated concrete, the Engineer may reject the use of any method or equipment that causes undue vibration or possible damage to the structure or any part thereof.

Any stay-in-place forms damaged or otherwise rendered unusable shall be repaired or replaced, at the discretion of the Engineer, by the Contractor AT HIS OWN EXPENSE.

The minimum depth of concrete removal shall not be less than the specified minimum thickness of repair material. Minimum depth of all cement concrete areas to be excavated in the bridge deck and sidewalk shall be one (1) inch below the bottom of the top layer of longitudinal reinforcing steel. If removal of deteriorated concrete results in full or partial exposure of reinforcing steel, but less than 1” clearance exists between the sound concrete and the inside surface of exposed reinforcing steel, enough sound concrete as is necessary to achieve this 1” minimum clearance shall be removed. The removal of this sound concrete shall also be included for payment under these Items.

Before removing concrete, the Contractor shall take all measures to protect pedestrian and vehicular traffic from his construction operations. No debris, tools or incidental equipment of any kind will be permitted to fall into areas where vehicular or pedestrian traffic exists. Any material that accidentally falls into such areas shall be removed immediately. All debris shall be promptly removed and satisfactorily disposed of by the Contractor.

Where the existing reinforcing steel is damaged or deteriorated it shall be supplemented with new reinforcing steel of the same size. Pneumatic tools shall not be placed in direct contact with reinforcing steel. Any sound reinforcing steel damaged during the concrete removal operations shall be repaired or replaced by the Contractor at his expense as directed by the Engineer. New steel shall

be attached beside existing steel with a minimum splice length as indicated on the Plans, or as directed by the Engineer. The concrete shall be removed to a minimum depth of 1 inch below the new steel.

Any reinforcing steel which is to remain and has been loosened or dislodged, shall be realigned and retied by the Contractor, and shall be considered incidental to this Item of work.

C. Surface Preparation: Areas to be repaired must be clean, sound, and free of contaminants. All loose and deteriorated concrete shall be removed by mechanical means. Mechanically prepare the concrete substrate to obtain a surface profile of +/- 0.25 inches with a new exposed aggregate surface. Area to be patched shall not be less 1½ inches for repairs using 4000 PSI, 3/8", 660 Cement Concrete.

All reinforcing bars and concrete surfaces exposed shall be cleaned by grit blasting. No grease, dust, rust, or laitance will be allowed to remain. Where active corrosion has occurred that would inhibit bonding, abrasion blast steel to white metal finish. The Contractor shall take all precautions necessary so as not to damage that portion of the concrete that is to remain.

After removals and edge conditioning are complete, remove bond inhibiting materials (dirt, grease, loosely bonded aggregate) by abrasion blasting and by the use of compressed air. Check the concrete surfaces after cleaning to insure that surface is free from additional loose aggregate or that additional delaminations are not present.

METHOD OF MEASUREMENT

Reinforced Concrete Excavation will be measured for payment by the number of cubic yards of material excavated, as determined by field measurements conducted by the Contractor and verified by the Engineer, under the appropriate Item. Reinforced concrete excavation required for work on the sidewalk and safety curb shall be measured for payment under Reinforced Concrete Deck Excavation (Partial Depth).

BASIS OF PAYMENT

Payment for work under these Items shall be made at the contract bid price per cubic yard and shall constitute full payment for excavation, saw cutting, abrasion blasting, removal, and satisfactory off-site disposal of all excavated materials, and the furnishing of all tools, labor, equipment transportation and all incidental work required to properly execute the work in accordance with these specifications and to the complete satisfaction of the Engineer.

ITEM 129. PAVEMENT MILLING SQUARE YARD

The work to be done under this Item consists of milling the hot mix asphalt wearing surface on the bridge approaches as shown on the plans and disposing in accordance with relevant provisions of Section 120 and the following.

All hand or other work necessary to clear pavement, concrete collars and other material from around structures shall be considered part of the work of this section.

Payment for work under this item shall be at the contract unit price per square yard, which price shall include full compensation for all labor, materials, equipment, and incidentals necessary to mill pavement, dispose of millings outside the project limits in accordance with all federal, state and local regulations, clean and prepare the pavement surface for paving to the satisfaction of the Engineer.

ITEM 129.2 OLD PAVEMENT EXCAVATION SQUARE YARD

Work under this Item consists of satisfactory removal and disposal of the hot mix asphalt wearing surface and the old membrane waterproofing on the bridge deck, or as directed by the Engineer. Incidental to this Item shall be the partial removal of the waterproofing protective course at the ends of the bridge deck

The contract unit price per square yard shall include the cost of furnishing all labor and equipment necessary to complete the removal and satisfactory disposal of the bituminous wearing surfaces and membrane waterproofing. All saw cutting of the existing pavement shall be considered incidental to this Item.

ITEM 187.3 REMOVAL AND DISPOSAL OF DRAINAGE STRUCTURE SEDIMENTS CUBIC YARD

The work to be done under Item 187.3 shall include removing the accumulated dirt, refuse, and other debris, as directed by the Engineer, as necessary for the Contractor to perform relevant items of work under this Contract, from designated drainage structures, including the gutter mouth of curb inlets, and disposing of materials removed. The cast iron hood shall be removed from all catch basins so equipped, prior to cleaning.

Hydraulic lift trucks should be used during drainage structure and pipe cleaning operations so that the material can be decanted at the site. After material from several drainage structures along the same system is loaded onto the truck, the truck should be elevated so any free flowing liquid may drain back into the drainage structure. Material must arrive at the disposal facility sufficiently dry to pass the Paint Filter Liquids Test (or no liquid drips from it when a handful is taken and squeezed).

All material removed from the drainage structures shall be properly handled and disposed of by the Contractor, and this must be done in accordance with all DEP regulations, policies, and guidance. The responsibility for the proper handling and disposal of this material shall be solely the Contractor's.

Material removed from drainage structures and pipes shall be transported immediately to the place of disposal in machines or trucks that will not spill the material along the roadway. Any material falling on the roadway shall be removed at the Contractor's own expense.

Drainage structure cleanings are classified as a solid waste by the Massachusetts Department of Environmental Protection (DEP) and may be disposed of at any landfill that is permitted by DEP to accept solid waste. Materials containing free-flowing liquids are prohibited from being accepted at landfills. The DEP encourages the beneficial reuse of this material whenever possible; however, use not in accordance with DEP determination, or disposal or use as fill in an unapproved location is not acceptable.

It is anticipated that most, if not all, of the material will be landfilled, therefore the Contractor should be aware that many landfills may require testing and analysis of the material prior to accepting it for disposal at the facility.

The Contractor should be aware that in the event that the test results indicate a hazardous waste that can not be landfilled, the Contractor shall be responsible for all costs associated with adhering to special regulations regarding disposal of hazardous waste. The Contractor should take this into consideration in preparing the bid.

Material removed and that is to be transported to an approved facility, will be measured in the hydraulic lift truck, after DECANTING.

Excavated material will be paid for at the contract unit price per cubic yard for Item 187.3 which price shall include the cost of removal, delivery and disposal at an approved landfill, disposal facility or recycling facility, the costs for approvals, permits, testing, transportation, and other incidental expenses, by a qualified individual as described above

ITEM 220. DRAINAGE STRUCTURE ADJUSTED EACH

The work to be done under the above Item shall conform to the relevant provisions of Section 220 and the following:

All dirt and debris caused by the Contractor shall be cleaned by the Contractor at his own expense.

If any frame and grate on a drainage structure to be adjusted is found to be damaged at no fault to the Contractor, it shall be replaced with a new frame and grate. New frame and grates shall be paid for under Item 222.2.

Drainage structures to be adjusted shall be paid for at the contract unit bid price per each, which price shall include all labor, tools, materials, pavement sawcuts, concrete collar and setting/resetting the drainage frame and grate to line and grade in accordance with Item 222.2 and necessary incidental expenses.

ITEM 222.2 FRAME AND GRATE (OR COVER) MUNICIPAL STANDARD EACH

ITEM 223. FRAME AND GRATE (OR COVER) REMOVED AND RESET EACH

ITEM 223.2 FRAME AND GRATE (OR COVER) REMOVED AND DISCARDED EACH

The work of these items shall conform to the relevant provisions of Section 200 of the Standard Specifications and the following:

Frames and grates shall be of good quality, strong, tough, even grained cast iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind which render them unfit for the service for which they are intended. Grates, covers, and frame seats shall be machined to a true surface. Castings shall be thoroughly cleaned and subject to hammer inspection.

Casting frames shall be set in a full mortar bed with bricks, a maximum of 8 inches thick.

The concrete collars shall be placed up to a height that is equal to the top of the existing hot mix asphalt base course, thereby allowing for the placement of Hot Mix Asphalt finished course above the collar.

Nonsalvageable frames and grates from existing drainage structures to be adjusted shall become the property of the Contractor and shall be disposed of off the site.

Compensation for this work shall be at the contract unit price bid for each item and shall include all labor, tools, material and necessary incidental expenses.

ITEM 225.6	**INLET SEDIMENT CONTROL DEVICE**	**EACH**

Work under this Item shall conform to the relevant provisions of the Standard Specifications and the details shown on the Plans.

Compensation shall be at the contract unit price bid per each, and shall include the fabric, all labor, tools, materials, and any necessary incidental items, to provide complete in place installation, inspections, maintenance, and silt removal and disposal throughout the duration of construction as directed by the Engineer. Said compensation shall also include the final removal and disposal of the fabric and silt upon the completion of construction.

ITEM 450.9	**CONTRACTOR QUALITY CONTROL**	**TON**
ITEM 452.	**ASPHALT EMULSION FOR TACK COAT**	**GALLON**
ITEM 453.	**HMA JOINT SEALANT**	**FOOT**
ITEM 455.23	**SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5)**	**TON**
ITEM 455.61	**SUPERPAVE BRIDGE SURFACE COURSE 12.5 (SSC-B-12.5)**	**TON**
ITEM 455.71	**SUPERPAVE BRIDGE PROTECTIVE COURSE 12.5 (SPC-B-12.5)**	**TON**

SECTION 450
HOT MIX ASPHALT PAVEMENT

Section 450 - Hot Mix Asphalt Pavement entirely replaces the following Sections and Subsections of the Standard Specifications for Highways and Bridges:

> **Section 420 - Class I Bituminous Concrete Base Course Type I-1**
> **Section 460 - Class I Bituminous Concrete Pavement Type I-1**
> **Subsection M3.01.0 - Asphalt Cement**
> **Subsection M3.11.06 - Bituminous Materials**
> **Subsection M3.11.08 - Inspection**
> **Subsection M3.11.09 - Composition and Compaction Acceptance Tests**

The Contractor shall adhere to all of the requirements herein of Section 450, Hot Mix Asphalt Pavement. All QC Inspection Report Forms and Test Report Forms must be submitted to the Department by the Contractor and all material produced and placed must conform to the Quality Limits specified in Subsection 450.77. Contractor QC data and Department Acceptance data for each Lot falling under HMA Lot Category A (Large Lot) or Category B (Small Lot) will be evaluated using Quality Level Analysis and must meet the minimum Percent Within Limits specified in Subsection 450.77.

NOTE: The Pay Adjustment provisions included in Subsection 450.92 will be applied to items under this contract.

DESCRIPTION

450.20 General.

This work shall consist of producing and placing Hot Mix Asphalt (HMA) pavement. HMA mixtures shall be composed of the following: Mineral aggregate, mineral filler (if required), Performance Graded Asphalt Binder (PGAB), and as permitted, reclaimed materials (limited to Reclaimed Asphalt Pavement (RAP), Reclaimed Asphalt Shingles (RAS), and Processed Glass Aggregate (PGA)). The HMA pavement shall be constructed in courses as shown on the plans and as directed on the prepared or existing base in accordance with these specifications and in close conformity with the lines, grades, compacted thickness and typical cross section as shown on the plans. Unless specified otherwise, each HMA pavement course placed shall be comprised of one of the mixture types listed in Table 450.1.

Table 450.1 - HMA Pavement Courses & Mixture Types

Pavement Course	Mixture Type	Mix Designation
Friction Course	• Open-Graded Friction Course	OGFC
Surface Course	• Dense Binder • Modified Top • Standard Top	SC - DB SC - MT SC - ST
Intermediate Course	• Binder • Dense Binder	IC - B IC - DB
Base Course	• Binder • Black Base	BC - B BC - BB
Leveling Course	• Leveling Mix	LC - LM
Bridge Surface Course	• Modified Top	BSC - MT
Bridge Protective Course	• Dense Binder - Antistrip	BPC - DBA

450.30 Quality Assurance.

A. Quality Assurance Responsibilities.

This is a Quality Assurance Specification wherein the Contractor is responsible for controlling the quality of materials and workmanship and the Department is responsible for accepting the completed work based on the measured quality. Quality Assurance is simply defined as “making sure the Quality of a product is what it should be”.

The core elements of Quality Assurance include: Contractor Quality Control (QC), Department Acceptance, Department Independent Assurance (IA), Dispute Resolution, Qualified Laboratories, and Qualified Personnel. Although Quality Assurance utilizes test results to control production and determine acceptance of the HMA, inspection remains as an important element in controlling the process and accepting the product.

The Contractor is responsible for providing an appropriate Quality Control system to ensure that all materials and workmanship meet the required quality levels for each specified Quality Characteristic. The Contractor will perform all required Quality Control inspection, sampling, and testing in accordance with these specifications and the Contractor’s Quality Control Plan.

The Department will monitor the adequacy of the Contractor’s QC activities and will perform Acceptance inspection, sampling, and testing. The Department’s Acceptance information will be utilized in the acceptance determination for each Lot of material produced and placed.

Independent Assurance is the responsibility of the Department’s Central Materials Laboratory. The function of IA testing is to periodically provide an unbiased and independent evaluation of the sampling and testing procedures used in the acceptance decision. Contractor QC and Department Acceptance testing equipment will be evaluated by IA personnel using one or more of the following: calibration checks, split sample comparison, or proficiency samples (homogeneous samples distributed and tested by two or more laboratories). QC and Acceptance testing personnel are evaluated by observation and split samples or proficiency samples.

B. Hot Mix Asphalt Lots & Sublots.

The quality of each HMA pavement course of the same mixture type produced and placed will be inspected, tested, and evaluated on the basis of Lots and Sublots. A Lot is defined as "an isolated quantity of material from a single source which is assumed to be produced or placed by the same controlled process".

In general, a Lot of HMA shall consist of the total quantity of material having the same Job Mix Formula (JMF), produced and placed for the same pavement course at a uniform plan thickness, under the same conditions within a single construction season. The Lot size and corresponding unit of measure is a function of the individual Quality Characteristic evaluated. Lot sizes for Quality Characteristics subject to Department Acceptance are as shown in Table 450.2.

Changes in the target values, material sources, or JMF for an HMA mixture type will constitute a change in Lot, requiring the establishment of a new Lot. All Lots will be properly identified for accurate evaluation and reporting of HMA quality.

Table 450.2 - HMA Lot Sizes

Quality Characteristic	Lot Size & Unit of Measure
PG Asphalt Binder Grading	Total Tons of HMA from all JMFs using the same PGAB Grade (from same PGAB Supplier), produced by a single plant and placed within same construction season.
PG Asphalt Binder Content	Total Tons of HMA with same JMF for same individual pavement course, produced by a single plant and placed within same construction season.
Volumetrics - Air Voids	
In-place Density	
Thickness	
Ride Quality (IRI)	Total length (miles) of individual wheel paths (in all travel lanes and ramps) of in-place HMA with same JMF for same individual pavement course, produced by a single plant and placed within same construction season, and which is located within the same posted speed limit range as defined in Table 450.19
Wheel Path Deviations	

Each HMA Lot will be divided into Sublots of uniform size. The size of each HMA Sublot shall be as listed in Table 450.10 and Table 450.17. If the HMA quantity at the end of a Lot is equal to or greater than one half of a full Sublot, then such quantity shall be identified and evaluated as a separate Sublot. If the HMA quantity at the end of a Lot is less than one half of a full Sublot, then such quantity shall be combined with the previous full Sublot quantity and shall be identified and evaluated as the final Sublot.

C. HMA Quality Assurance Requirements.

These Specifications establish three categories under which Hot Mix Asphalt Lots will be produced, placed, evaluated and accepted. Table 450.3 below defines each of the Lot categories and outlines the required Quality Assurance activities of the Contractor and the Department. The division of the categories is based on the estimated quantities for individual Hot Mix Asphalt Lots. For contracts containing multiple Hot Mix Asphalt items, it is possible to have work performed under more than one HMA Lot category.

Table 450.3 - HMA Lot Categories & Quality Assurance Requirements

Quality Assurance Requirements	Category A (Large Lot)	Category B (Small Lot)	Category C (Minor Lot)

Total Quantity for individual Lot of HMA:	≥ 6000 tons (5500 Mg)	≥ 1500 tons (1375 Mg), but < 6000 tons (5500 Mg)	< 1500 tons (1375 Mg)
QC Plan Required:	YES	YES	See Note 1
Contractor QC Inspection Required:	YES (Subsection 450.64)	YES (Subsection 450.64)	YES (Subsection 450.64)
Contractor QC Testing Required:	YES (Subsection 450.65)	YES (Subsection 450.65)	YES (Subsection 450.65)
Control Strip Required:	YES	NO	NO
Control Charts Required:	YES	NO	NO
Quality Level Analysis Required:	YES	YES	NO
MHD Acceptance Inspection & Testing Performed:	Minimum 25% of Sublots (Subsection 450.74)	Minimum 50% of Sublots), But Minimum 3 Sublots (Subsection 450.74)	100% of Sublots (Subsection 450.74)
QC Test Results included in MHD Acceptance Determination:	YES (If Validated)	YES (If Validated)	NO
Pay Adjustment Applied:	YES (Subsection 450.92)	YES (Subsection 450.92)	NO

Note 1: If all HMA Lots fall under Category C then a QC Plan is not required. However, if any Lots on the project fall under Category A or Category B, then any Category C Lots must be addressed in the QC Plan.

MATERIALS

450.40 General.

Materials shall meet the requirements in the following Subsections of Division III, Materials and as otherwise specified herein:

Asphalt Emulsion	M3.03.0
Hot Poured Joint Sealer	M3.05.0
Asphalt Anti-Stripping Additive	M3.10.0
Job-Mix Formula	M3.11.03
Mineral Aggregate	M3.11.04
Mineral Filler	M3.11.05
Plant Requirements	M3.11.07

450.42 Hot Mix Asphalt Mix Design.

The Contractor shall be responsible for development of all HMA job-mix formulas. The aggregate gradation structure and target PG Asphalt Binder content of each job-mix formula for HMA base courses, HMA intermediate courses, and HMA surface courses shall conform to the master ranges in M3.11.03 – Table A. The aggregate gradation structure and target PG Asphalt Binder content for Open-Graded Friction Course (OGFC) shall conform to the master ranges in M3.11.03 – Table B.

All job-mix formulas for HMA intermediate courses and surface courses shall be supported by volumetric mix designs using the Marshall method. Marshall mix design method, procedures and criteria shall be based on Asphalt Institute MS-2 and AASHTO T245. Marshall volumetric mix designs shall be based on 75-blow hammer compaction. Volumetric mix designs are not required for HMA leveling course mixtures, base course mixtures and OGFC.

All HMA job-mix formulas will be submitted to the Department for final approval. Two or more job-mix formulas per HMA mixture type may be approved for a particular plant, however, only HMA conforming to one job-mix formula is permitted to be produced and placed on any given day.

450.44 Reclaimed Asphalt Pavement (RAP).

Reclaimed Asphalt Pavement (RAP) shall consist of the material obtained from the highways or streets by crushing, milling or planing existing HMA pavements. This material shall be transported to the HMA production facility yard and processed through an appropriate crusher so that the resulting material will contain no particles larger than the maximum aggregate size of the HMA mixture in which it will be used. The material shall be stockpiled on a free draining base and kept separate from the virgin aggregates. The material contained in the RAP stockpiles shall have a reasonably uniform gradation from fine to coarse and shall be protected from accumulation of excessive moisture and shall not be contaminated by foreign materials.

The use of RAP will be permitted at the option of the Contractor and provided that the end product is in conformance with the approved job-mix formula. The proportion of RAP to virgin aggregate for base course mixtures and intermediate course mixtures shall be limited to a maximum of 40% for drum mix plants and 20% for modified batch plants. The maximum amount of RAP for surface course mixtures shall be 10%. No RAP will be allowed in OGFC mixtures.

450.46 Reclaimed Asphalt Shingles (RAS).

Reclaimed Asphalt Shingles (RAS) may be used in HMA leveling courses, HMA base courses, and HMA intermediate courses at a maximum rate of 5% by mass. When RAS is used in HMA mixtures containing RAP or other reclaimed materials, the RAS will be considered as part of the overall allowable mass of reclaimed materials in the mixture, as defined in M3.11.03. HMA mixtures containing RAS shall be designed, produced, and placed in accordance with the requirements contained in Section M3.

450.48 Performance Graded Asphalt Binder.

A. Standard Asphalt Binder Grade.

The Asphalt Binder shall be a Performance Graded Asphalt Binder (PGAB) which meets the specification requirements of AASHTO Standard M320. PGAB shall be provided by an Approved Supplier (AS) in accordance with the Approved Supplier Certification (ASC) system outlined in AASHTO R26, "Standard Practice For Certifying Suppliers of Performance Graded Asphalt Binders".

The standard PGAB grade for Massachusetts has been determined based upon the expected minimum and maximum pavement in-service temperature using the ***LTPPBind software*** with a High Reliability (96-98%). Unless indicated otherwise on the Plans or in the Special Provisions, the standard PGAB Grade of PG64-28 shall be used.

B. Asphalt Binder Modifiers for Reclaimed Materials.

For any HMA containing reclaimed materials, an asphalt binder modifier shall be added to the mixture to restore the asphalt binder properties of the reclaimed materials to a level that is consistent with the specified virgin PGAB. If greater than 25% RAP is used in an HMA mixture, the PGAB modifier grade shall be in accordance with Table 450.4. The type and amount of asphalt binder modifier to be used shall be included as part of the job-mix formula. Only Performance Graded Asphalt Binders will be used as modifiers and shall meet the requirements of AASHTO M 320. However, the resulting final PGAB grade shall be in accordance with Table 450.4 (or the specified PGAB grade per the contract). For HMA Category A Lots and Category B Lots incorporating greater than 25% RAP in the job-mix formula, the Contractor shall perform, as part of the mix design, full binder testing per AASHTO M 320 on samples of asphalt binder recovered from the RAP (by Abson recovery) blended in the appropriate proportion with samples of the virgin PGAB. For HMA Category A Lots containing greater than 25% RAP, the Contractor shall also perform full binder testing (on asphalt binder recovered from the RAP blended with the virgin PGAB) for the Control Strip and for Quality Control during HMA production and placement as specified in Subsection 450.65F.

Table 450.4 - PGAB Grades for HMA Mixtures Containing RAP

Amount of RAP in Mixture	PGAB Modifier Grade	Resulting PGAB Grade
≤ 25% RAP by Weight of Mixture	None	64-28
> 25% to 40% RAP by Weight of Mixture	52-34	64-28 ± 2ºC

CONSTRUCTION PROCEDURES

450.50 General.

Prior to the start of any work activity addressed in Subsections 450.53 thru 450.59 below, a Construction Quality Meeting shall be held to review the Contractor's Quality Control system. The Contractor shall present

and discuss with the Engineer in sufficient detail the specific Quality Control information and activities contained in each section of their QC Plan as outlined in Subsection 450.61 below. The meeting is intended to ensure that the Contractor has an adequate Quality Control system in place and that the Contractor's personnel are fully knowledgeable of the roles and activities for which they are responsible to achieve the specified level of quality. Contractor personnel required to attend the Construction Quality Meeting include; the Project QC Manager, all other QC personnel (production facility and field operations), all Superintendents, and the Foremen for field operations. The Contractor shall provide a copy of the approved QC Plan for each Contractor and Department attendee of the meeting.

450.51 Control of Grade and Cross-Section.

The Contractor will provide a longitudinal and transverse reference system, with a maximum spacing of 100 ft (30 meters), for the purpose of locating and documenting sampling and testing locations and related uses. It is the Contractor's responsibility to clearly mark this reference system in the field. Work related to this reference system is incidental and will be included as part of the Contractor's Quality Control system. The Department shall provide information tying in the Contractor's reference system to the State Mile Marker System.

The Contractor shall furnish, set and maintain all line and grade stakes necessary to guide the automated grade control equipment. Where required these control stakes shall be maintained by the Contractor and used throughout the operations, from the grading of the subbase material up to and including the final course of the pavement.

Under normal conditions, where more than one course of HMA is to be constructed, the use of the string line for grade control may be eliminated or discontinued after the construction of the initial course of HMA. For resurfacing projects, where only one course of HMA is to be constructed, the use of the string line for grade control may be eliminated. The use of approved automation may then be substituted for the string line where lines and grades are found to be satisfactory by the Engineer.

450.52 Weather Limitations.

HMA shall only be placed on dry, unfrozen surfaces and only when the temperature requirements contained in Table 450.5 below are met.

The Contractor may continue HMA placement when overtaken by sudden rain, but only with material which is in transit from the HMA production facility at the time, and then only when the temperature of the HMA mixture is within the temperature limits specified and when the existing surface on the roadway is free of standing moisture.

The construction of HMA pavement shall terminate November 15 and shall not be resumed prior to April 1 except as determined and directed in writing by the Engineer depending upon the necessity and emergency of attendant conditions, weather conditions, and location of the project. Only in extreme cases will the placement of surface courses be permitted between November 15 and April 1. Regardless of any temperature requirements, OGFC mixtures shall not be placed after October 31 or before May 1 without the written permission of the Engineer.

Table 450.5 - Temperature Limitations for HMA Placement

HMA Pavement Course	**Lift Thickness** Inches (mm)	**Minimum Air Temperature** °F (°C)	**Minimum Surface Temperature** °F (°C)
Friction Course	1 (25)	55 (13)	60 (16)
Surface Course	< 13/4 (45)	50 (10)	55 (13)

Surface Course	≥ 13/4 (45)	40 (4)*	45 (7)
Intermediate Course	All	40 (4)*	45 (7)
Base Course	All	40 (4)*	45 (7)
Leveling Course	As Specified	50 (10)	55 (13)

*When the air temperature falls below 50° F (10° C), extra precautions shall be taken in drying the aggregates, controlling the temperatures of the materials, and in placing and compacting the mixtures.

The Contractor shall supply the Engineer with an approved dial type thermometer with a temperature range of -50° to 500° F (10° to 260° C) and an infrared pistol thermometer for each paving machine in operation on the project. The infrared pistol thermometer shall be Fahrenheit or Celsius selectable and conform to the following requirements:

- Portable and battery operated
- LCD Display to nearest 1° F (1° C)
- Temperature operating range of 0° to 750° F (–18° to 400° C)
- Accuracy of ± 2%
- Repeatability of +/- 5° F (± 3° C)
- Emissivity preset at 0.95

The thermometers will remain the property of the Contractor upon completion of the project.

450.53 Preparation of Underlying Surface.

HMA mixtures shall be placed only upon properly prepared surfaces that are clean from foreign materials. The underlying surface shall be prepared in accordance with the requirements below, prior to the placement of HMA pavement courses.

A. Subbase or Reclaimed Base.

Prior to the placement of HMA base course mixtures, the Contractor shall inspect the prepared subbase or reclaimed base material to ensure that it is in conformance with the required grade, cross-section, and in-place density. Subbase or reclaimed base material that is not in accordance with the plans or specifications shall be reworked or replaced to meet the applicable requirements of Sections 401, 402, or 403 before the start of HMA placement. The subbase or reclaimed base shall not be frozen or have standing water when placing HMA.

B. Milling Existing HMA Pavement.

When specified on the plans, existing HMA pavement courses shall be milled and removed from the project by the Contractor. Milling shall be performed in conformity with the limits, line, grade, and typical cross-section shown on the plans and in accordance with Section 130, Milling Existing HMA Pavement. All Quality Control activities for milling shall be addressed in the Contractor's HMA QC Plan.

C. Patching Existing Pavement Courses.

Areas of existing HMA pavement courses that are significantly distressed or unsound shall be removed and replaced with patches using new Hot Mix Asphalt. The location and limits of patching will be as identified in the plans or as marked by the Engineer.

Each existing pavement course determined to be unsound shall be removed to the full depth of the pavement course within a rectangular area. For each patch location equal to or greater than 50 square feet

(4.6 square meters) in area (and having a minimum dimension of 4 feet (1.2 meters)) where the existing pavement courses are removed down to subbase, the subbase shall be compacted by mechanical means to not less than 95% of the maximum dry density of the subbase material as determined by AASHTO T 99 method C at optimum moisture content. Each edge of the patch area shall be sawcut or otherwise neatly cut by mechanical means to provide a clean and sound vertical face. The vertical face of each edge shall be thoroughly coated with a hot poured rubberized asphalt sealant meeting the requirements of ASTM D3405 immediately prior to placing the HMA patching mixture.

Delaminated areas of existing pavement courses resulting from pavement milling shall be cut back neatly by mechanical means to the limits of any unsound material. After removing all unsound material, the underlying pavement surface within the patch limits shall receive a thorough tack coat at a rate of application of 1/10 gal/s.y. (0.40 liters/square meter) immediately prior to placing the HMA patching mixture.

HMA patching mixture shall be the same mixture type as the existing pavement course being patched or as specified on the plans or as directed by the Engineer. The lift thickness of the patching mixture shall not exceed four times the nominal maximum aggregate size of the mixture. The patching mixture will be placed by hand or by mechanical means and shall match the thickness, grade, and cross-slope of the surrounding pavement. The HMA patching mixture shall be compacted using a steel wheel roller. For patch areas not large enough to permit use of a roller, compaction shall be accomplished using a mechanical tamper capable of achieving the required in-place density. The Contractor shall test the in-place density of each patched area using a calibrated density gauge and record the test data for each patched area on NETTCP Test Report Forms. The in-place density of the HMA patching mixture shall be not less than 90% of the maximum theoretical density of the mixture as determined by AASHTO T 209.

D. Leveling Courses.

HMA Leveling Courses shall only be used when specified in the Plans or Special Provisions. The HMA mixture used for a Leveling Course shall be as specified in the Plans or Special Provisions and shall conform to the relevant Materials requirements of Section 450.

E. Preparation of Curbs, Edging, and Utilities.

All curbs or edging shall be installed or reset to the line and grade established on the plans. The surface elevation of all catch basin frames and grates, manholes, utility valve boxes, or other utility structures located in the pavement shall uniformly match the grade and cross-slope of the final pavement riding surface. Adjustment of all curbs, edging, and utilities shall be completed prior to the placement of the HMA surface course. When OGFC is specified to be placed over the HMA surface course, all curbs, edging, and utilities shall be adjusted prior to placement of the surface course mixture. Hand placement of HMA along curbs and edging or around utilities after placement and compaction of the surface course shall not be permitted.

F. Sweeping Underlying Surface.

The Contractor shall provide a mechanical sweeper equipped with a water tank, spray assembly to control dust, a pick-up broom, a dual gutter broom, and a dirt hopper. The sweeper shall be capable of removing millings and loose debris from the underlying surface.

All milled pavement surfaces shall be thoroughly swept in accordance with Section 130, prior to opening a milled area to traffic, to remove all remaining millings and dust. All other existing pavement surfaces shall be swept immediately prior to application of the tack coat. Any new HMA pavement course that has been open to traffic, or that was placed 30 days prior to placement of the subsequent pavement course, shall also be swept immediately prior to application of the tack coat.

G. Tack Coat.

A tack coat of asphalt emulsion, grade RS-1 shall be uniformly applied to existing or new pavement surfaces prior to placing pavement courses as specified below. The existing surface shall be swept clean of

all foreign matter and loose material using a mechanical sweeper and shall be dry before the tack coat is applied.

(1) Tack Distributor System.

A pressure distributor shall be used to apply the tack coat. The tack distributor system shall be equipped with the following to control and monitor the application:

(a) System for heating the asphalt emulsion uniformly to specified temperature.
(b) Thermometer for measuring the asphalt emulsion temperature.
(c) Adjustable full circulation spray bar.
(d) Positive controls including tachometer, pressure gauge, and volume measuring device.

(2) Tack Application Requirements.

When an HMA pavement course is placed on an existing pavement surface, a tack coat shall be applied at the rate of 1/20 gal/s.y. (0.20 liters/square meter). All existing surfaces subjected to milling shall receive a tack coat at the rate of 1/10 gal/s.y. (0.40 liters/square meter).

Any new HMA pavement course that has been open to traffic, or that was placed 30 days prior to placement of the subsequent pavement course, shall receive a tack coat at an application rate of 1/20 gal/s.y. (0.20 liters/square meter).

When the surface of a new HMA pavement course is in a condition which in the Engineer's judgment is unsatisfactory for the direct placement of the subsequent pavement course, a tack coat shall be applied at the applicable rate specified above for the particular pavement surface condition.

In addition to the requirements above, all vertical surfaces of curbs, edging, utilities, and drainage structures shall receive a thorough tack coat application immediately prior to placing each HMA pavement course.

(3) Tack Inspection.

The asphalt emulsion temperature and application rate shall be periodically measured and properly recorded by the Contractor on NETTCP Inspection Report Forms. If the temperature or application rate is determined to not be in conformance with the specification requirements above, the Contractor shall make appropriate adjustments to the tack application operations.

450.54 Hot Mix Asphalt Transportation and Delivery.

A. Haul Unit Equipment.

The trucks used to transport HMA to the field placement site shall have tight, clean, smooth metal beds. When necessary to maintain the required HMA temperature, trucks shall be equipped with insulated beds. The truck beds shall be evenly and lightly coated with an approved release agent to prevent HMA mixture adherence. Release agents may consist of soapy water or commercial oil emulsions (also known as soluble oils) in the proportions recommended by the manufacturer. Truck beds shall be kept free of kerosene, gasoline, fuel oil, solvents, or other materials that could adversely affect the HMA mixture. Excess lubricant shall not be allowed to accumulate in low spots in the body. The Contractor shall employ sufficient procedures and QC inspection to ensure that all truck beds are free of contaminants, residual HMA, or excess release agent.

B. HMA Protection During Transport.

The HMA shall be transported from the plant to the field placement site in trucks previously cleaned of all foreign materials. During transportation of the HMA from the plant to the placement equipment at the site, each load shall be fully covered at all times, without exception, with canvas or other suitable material of sufficient size and thickness, which is tightly secured to furnish complete protection. The HMA shall not be transported such a distance that segregation of the mixture takes place or that a crust is formed on the surface, bottom or sides of the HMA.

C. Coordination and Inspection of HMA Delivery.

The dispatching of trucks from the plant shall be continuously coordinated to ensure that all HMA mixture planned to be delivered to the field placement site may be placed and compacted before the end of the scheduled work day. During paving operations, the Contractor shall provide for ongoing two-way radio or cellular phone communication between the field placement site and the HMA plant.

The target temperature and allowable range of the HMA when delivered at the field placement site will be established in the Contractor's Quality Control Plan. The Contractor shall measure the temperature of the HMA, either from the trucks prior to discharge or from the paver hopper, using a metal stemmed dial type thermometer at the minimum frequency indicated in the approved QC Plan. All QC temperature measurement results of the delivered HMA mixture shall be recorded on NETTCP Inspection Report Forms. The Contractor shall also visually inspect the delivered HMA for crusting or material (physical) segregation. The Contractor shall reject any loads of HMA with material which is crusted, segregated, or which is not within the delivery temperature range established in the Contractor's Quality Control Plan.

450.55 Hot Mix Asphalt Placement.

A. Material Transfer Vehicles

For projects on all controlled access highways with HMA Category A Lots, a Material Transfer Vehicle (MTV) will be required. The MTV shall be used to place each pavement course, with the exception of leveling courses, on the mainline of the traveled way including all travel lanes, auxiliary lanes, and collector/distributor (C/D) lanes.

(1) MTV Equipment Requirements.

The MTV shall be self-propelled and capable of remixing and transferring the HMA mixture to the paver so that the HMA mat behind the paver has a uniform homogeneous temperature and appearance. The MTV shall be equipped with the following:

(a) A truck unloading system, capable of 600 tons per hour (550 Mg per hour), which shall receive HMA from the trucks and independently deliver the mixture from the trucks to the paver.

(b) A paver hopper insert with a minimum capacity of 14 tons (12.7 Mg) shall be installed in the hopper of conventional paving equipment. The paver hopper insert shall be marked to identify the point at which the insert is 50% full.

(c) An internal storage bin with a minimum capacity of 25 tons (22.7 Mg) of mixture and a remixing system in the bottom of the storage bin to continuously blend the mixture as it discharges to a conveyor system; or a dual pugmill system located in the paver hopper insert with two full length longitudinally mounted counter-rotating screw augers to continuously blend and feed the mixture through the paver to the screed.

(2) MTV Operations.

The Contractor shall ensure that the MTV is loaded continuously to keep the paver moving. The volume of HMA in the paver hopper insert shall remain above the 25% capacity mark during all paving operations. In the event the MTV malfunctions during HMA placement operations, the Contractor shall continue placement of material until such time there is sufficient HMA placed to maintain traffic in a safe manner. The Contractor may continue placement of HMA until any additional mixture in transit has been placed. Paving Operations may resume only after the MTV has been repaired and is fully operational.

(3) Bridge Loading Restrictions.

The MTV shall be subject to all bridge load restrictions. The Contractor shall verify the sufficiency of the current bridge ratings with the Engineer. In the event that the MTV exceeds the maximum allowable bridge load, the MTV shall be empty when crossing the bridge and shall be moved across without any other Contractor vehicles or equipment being on the bridge. The MTV shall be moved across

the bridge in a travel lane and shall not be moved across the bridge on the shoulder. The MTV shall be moved at a speed no greater than five miles per hour (8 kph) without any acceleration or deceleration.

B. Pavers.

Each HMA pavement course shall be placed with one or more pavers at the specified grade, cross-slope, and lift thicknesses.

(1) Paver Equipment Requirements.

Each paver shall be a self-contained, power propelled unit and shall produce a finished surface of smooth and uniform texture without segregating, tearing, shoving or gouging the HMA. The pavers shall be equipped with the following:

(a) A receiving hopper having sufficient capacity to ensure a uniform and continuous placement operation.

(b) Automatic feed controls, which are properly adjusted to maintain a uniform depth of material ahead of the screed.

(c) Automatic screed controls with sensors capable of sensing the transverse slope of the screed, and providing the automatic signals that operate the screed to maintain grade and transverse slope.

(d) An adjustable vibratory screed with full-width screw augers and heated for the full width of the screed.

(e) Capable of spreading and finishing HMA pavement courses in widths at least 12 inches (300mm) more than the width of one travel lane.

(f) Capable of being operated at forward speeds to satisfactorily place the HMA.

(2) Paver Operations.

The Contractor shall ensure that the paver is loaded continuously to keep the placement operation moving. The volume of HMA in the paver receiving hopper shall remain above the paver tunnel during all paving operations. Proper practices shall be utilized to ensure that HMA is not dumped or spilled onto the prepared underlying surface in front of the paver by trucks unloading into the receiving hopper.

C. HMA Placement Inspection.

The HMA shall be free of identifiable material (physical) segregation or temperature related segregation. The HMA placed shall be a homogeneous mixture that is of uniform temperature. The Contractor shall inspect the HMA in the paver receiving hopper for material (physical) segregation. The Contractor will also inspect the uncompacted HMA mat behind the paver for longitudinal streaks, end-of-load segregation or other irregularities.

The Contractor shall also measure the temperature differential in the uncompacted mat behind the paver. Each HMA pavement course behind the paver shall be divided into longitudinal Sublots of 500 feet (150 meters). The mat temperature differential of the uncompacted HMA shall be measured at a minimum of one location in each Sublot along a straight transverse line behind the paver at a minimum frequency of once per Sublot. The transverse line for mat temperature measurement shall be established at a distance within 10 feet (3 meters) behind the paver screed. Temperature measurements shall be obtained by the Contractor using an infrared pistol thermometer at two (2) foot intervals along the transverse line across the width of the mat and recorded on NETTCP Inspection Report Forms. The difference between the highest and lowest temperature measurement shall not exceed 20°F (10°C).

If the maximum mat temperature differential is exceeded, or if material segregation or irregularities in the HMA mat behind the paver are noted, the Contractor shall review the production, transportation, and placement operations and take corrective action. The Contractor shall make every effort to prevent or correct any irregularities in the HMA, such as changing pavers or using different and additional equipment. The Contractor's Quality Control Plan shall fully outline procedures for inspecting the HMA mat

during placement, identifying and troubleshooting material segregation or temperature related segregation, and implementing corrective action.

450.56 Hot Mix Asphalt Compaction.

A. Compaction Equipment Requirements.

The Contractor shall employ compaction equipment as outlined in the approved Quality Control Plan. Equipment used for compaction of HMA Base Courses, Intermediate Courses and Surface Courses may include steel wheeled rollers, vibratory rollers, or pneumatic-tired (rubber tired) rollers as determined appropriate by the Contractor for the particular mixture type being placed. The number and type of rollers used for breakdown, intermediate, and finish rolling shall be sufficient to achieve the target in-place density and specified course thickness.

B. Compaction Operations.

The rollers shall not crush the aggregate in the HMA mixture and shall be capable of reversing without shoving or tearing the mixture. The Contractor shall outline in the Quality Control Plan the proposed rolling sequence for each HMA pavement course to be placed. For HMA Category A Lots, the initial rolling pattern for each pavement course will be confirmed or adjusted during placement of the Control Strip in accordance with the requirements of Subsection 450.66B. As Lot placement progresses during the construction season, the rolling pattern shall be adjusted as necessary to achieve the specified HMA in-place density.

C. Compaction of Open-Graded Friction Course.

Vibratory rollers or rubber tire rollers will not be permitted on Open Graded Friction Course (OGFC) mixtures. Initial rolling of OGFC should be accomplished with the breakdown roller within a short distance of the paver. Any subsequent rolling shall be accomplished without over-rolling the mixture. Breakdown and intermediate rolling of OGFC shall be completed before the material has cooled to 195°F (90°C).

D. Inspection & Testing of Compacted HMA.

The compacted HMA pavement course shall be free of material (physical) segregation and shall meet the requirements for in-place density, thickness, and ride quality specified in Subsection 450.65F. The Contractor shall inspect each Sublot of HMA throughout the compaction operation and shall further inspect the in-place HMA after Sublot completion and identify any areas of visible material (physical) segregation. The Contractor shall reject any in-place Sublot of HMA which is determined to be segregated through procedures established in the Quality Control Plan. The Contractor will also test each Sublot for in-place density, thickness, and ride quality as specified in Subsection 450.65F.

450.57 Hot Mix Asphalt Joints.

The Contractor shall plan the sequence of HMA placement to minimize transverse and longitudinal joints in each pavement course. Paving operations should employ long pulls or tandem pavers, whenever practicable, to reduce the number and length of joints.

A. Transverse Joints.

Where the start or end of a new HMA pavement course meets existing HMA pavement, the existing pavement shall be sawcut to form a transverse butt joint for the full depth of all new pavement courses. The sawcut shall follow a straight line and provide a clean and sound vertical face. Material at any intermediate transverse joint resulting from suspension of placement of a new HMA pavement course shall also be sawcut and removed to provide a clean vertical face before continuing placement of the pavement course.

When traffic is to be carried over any transverse joint before completion of an HMA pavement course, the Contractor shall provide a temporary tapered joint with a maximum 12:1 slope. The HMA mixture forming the taper shall be placed on heavy wrapping paper or other suitable material to serve as a bond breaker. The temporary tapered joint shall be sawcut to reveal the full depth of the pavement course and form a transverse butt joint with a clean vertical face. The temporary tapered joint material shall be completely removed before resuming placement of the HMA pavement course.

Prior to the start of HMA placement at each transverse joint, the vertical joint face shall be thoroughly coated with a hot poured rubberized asphalt sealant meeting the requirements of ASTM D3405, with a minimum of 15% ground reclaimed tire rubber. The asphalt sealant temperature and application rate for each pavement course shall be established in the Contractor's Quality Control Plan. No reheating of the joint face shall be permitted. Equipment used to apply the hot poured rubberized asphalt sealant shall be capable of maintaining the sealant at the established temperature and application rate sufficient to uniformly coat the vertical joint face without runoff or accumulation of the asphalt sealant.

B. Longitudinal Joints.

All longitudinal joints in HMA surface courses shall be located on the roadway centerline or on a lane line or edge line of the traveled way. The longitudinal joints in each pavement course below the surface course shall be successively offset from the joint in the surface course by no more than 12 inches (300 mm) and no less than six inches (150 mm).

(1) Vertical Joints.

When an HMA pavement course is placed using single paver pulls, the Contractor shall employ suitable equipment to confine the longitudinal edge of the HMA mixture to establish an edge that is near vertical. For all HMA surface course mixtures placed, when the Contractor's placement operations do not provide a confined and near vertical edge, the longitudinal edge of the surface course shall be sawcut full depth and removed to provide a clean vertical face before placement of the adjacent course of HMA.

All longitudinal joint edges of HMA surface courses, regardless of whether the joint edge is required to be sawcut, shall be treated prior to placing the adjacent pull of HMA. The vertical joint shall be coated with a hot poured rubberized asphalt sealant meeting the requirements of ASTM D3405, with a minimum of 15% ground reclaimed tire rubber. The asphalt sealant shall be applied at a sufficient temperature and application rate sufficient to uniformly coat the vertical joint face without runoff or accumulation of the sealant. The asphalt sealant temperature and application rate shall be established in the Contractor's Quality Control Plan. No reheating of the joint shall be permitted.

When placing an HMA surface course with pavers in tandem, the use of the hot poured rubberized asphalt sealant will be omitted, provided the temperature of the mixture at the longitudinal joint does not fall below 200°F (95°C) prior to the placement of the adjacent mat.

When the longitudinal edge of any HMA pavement course is placed against an adjoining edge such as existing pavement, curb, gutter, drainage or utility structure, or any metal surface, a tack coat shall be uniformly applied to the entire vertical joint surface in accordance with Subsection 450.53 prior to placement of the HMA.

(2) Wedge Joints.

The Contractor may use a longitudinal wedge joint when placing HMA pavement courses at a thickness of 1.75 inches (45 mm) or greater.

When a wedge joint is proposed for use, the joint detail shall be included in the Contractor's QC Plan. The wedge joint shall include a notched vertical edge with a minimum depth of 0.5 inches (12.5 mm). The sloped surface of the wedge joint shall not exceed a 6:1 slope. The Contractor shall use a commercially manufactured wedge joint attachment to the paver, or other attachment approved by the Engineer, to form the wedge joint.

Hot poured rubberized asphalt sealant shall not be applied to wedge joints. A tack coat shall be applied to the entire surface of the wedge joint in accordance with Subsection 450.53 prior to placement of the adjacent pull of HMA.

C. Inspection & Testing of HMA Joints.

The hot poured rubberized asphalt sealant temperature and application rate shall be measured and properly recorded by the Contractor on NETTCP Inspection Report Forms a minimum of once per transverse joint and once per 1,000 feet (300 meters) of longitudinal joint. If the temperature or application rate is determined to not be in conformance with the requirements established in the Contractor's Quality Control Plan, the Contractor shall make appropriate adjustments to the asphalt sealant application operations.

The placement and compaction of HMA at each transverse joint or longitudinal joint shall provide a tight bond between the existing pavement and the new pavement course. The Contractor shall visually inspect each transverse joint and longitudinal joint throughout the placement and compaction operations and shall further inspect the joints after Sublot completion and identify any bumps, depressions, openings, or other visible defects. The Contractor shall reject any in-place Sublot of HMA which is determined to have defective joints through procedures established in the Quality Control Plan.

All finished joint surfaces shall be smooth and true to the required grade and cross-slope without deviations exceeding 0.25 inches (6 mm), both transversely and parallel to the joint, when measured with a 10 foot (3 meter) standard straightedge. The in-place density of the completed HMA pavement course, within 1 foot (300 mm) of either side of the finished joint, shall be not less than 90% of the maximum theoretical density of the mixture as determined by AASHTO T 209. The Contractor will measure the surface smoothness and test the in-place density of each transverse joint and longitudinal joint of each Sublot of HMA as specified in Subsection 450.65F. All joint inspection and testing data shall be recorded on NETTCP Inspection Report Forms and Test Report Forms.

450.58 HMA Pavement on Bridges.

A. Bridge Course Mixture Requirements.

HMA pavement courses for bridge decks shall consist of a bridge protective course, placed first, followed by a bridge surface course. Unless specified otherwise on the plans, the bridge protective course mixture shall consist of Dense Binder treated with an approved antistripping compound as specified under M3.10.0.

The bridge protective course and bridge surface course shall be placed only after all curbing and edging, when included in the work, are in place. The bridge protective course shall be placed within 24 hours after the membrane waterproofing has been placed, unless an exception is granted by the Engineer. No vehicular traffic shall be permitted over any bare membrane waterproofing except as provided for under Subsection 965.62. Equipment used for placement and compaction of the bridge protective course and bridge surface course shall be sufficient to place the HMA mixture at the required grade, cross-slope, thickness, and in-place density without damaging the underlying membrane waterproofing.

B. Inspection & Testing of Bridge Course Mixtures.

The Contractor shall inspect and test each Sublot of bridge protective course HMA mixture and bridge surface course HMA mixture in accordance with the requirements for mixture temperature, mat temperature, segregation, and joint quality as specified in Subsections 450.54 through 450.57. QC sampling and testing of each Sublot shall be performed for all HMA loose mix Quality Characteristics specified in Subsection 450.65F. HMA cores shall not be obtained; however, the in-place density of the bridge protective course and bridge surface course shall be randomly tested using a calibrated density gauge and the test data recorded on NETTCP Test Report Forms. The in-place density of the bridge protective course and

bridge surface course shall be not less than 90% of the maximum theoretical density of the mixture as determined by AASHTO T 209. When the HMA bridge surface course is placed in conjunction with mainline pavement, QC testing for ride quality shall be performed as specified in Subsection 450.65F(11).

450.59 Opening to Traffic.

No vehicular traffic or loads shall be permitted on the newly completed HMA pavement until adequate stability has been attained and the material has cooled sufficiently to a temperature of 140° F (60° C) or less as indicated by a surface type thermometer. The Contractor shall clearly outline, in the Quality Control Plan, the specific criteria related to opening new pavement to traffic. HMA cores shall be obtained by the Contractor for all Sublots placed each day in accordance with the approved Quality Control Plan prior to opening to traffic. At the discretion of the Engineer, based on climactic or other conditions, obtaining of cores may be delayed for a period up to, but not to exceed, 48 hours.

CONTRACTOR QUALITY CONTROL

450.60 General.

The Contractor shall provide a Quality Control (QC) system, as outlined in their Quality Control Plan, adequate to ensure that all materials and workmanship meet the required quality levels for each specified Quality Characteristic. The Contractor shall provide qualified QC personnel and QC laboratory facilities and perform Quality Control inspection, sampling, testing, data analysis, corrective action (when necessary), and documentation as outlined further below.

450.61 Contractor Quality Control Plan.

For projects with HMA Category A Lots (Large Lot) or Category B Lots (Small Lot), the Contractor shall provide and maintain a detailed Quality Control Plan, hereinafter referred to as the "QC Plan". If all HMA Lots fall under Lot Category C (Minor Lot) then a QC Plan is not required. However, if any Lots on the project fall under Lot Category A or Category B, then any Category C Lots must be addressed in the QC Plan. The QC Plan should sufficiently document the QC processes of all Contractor parties (i.e. Prime Contractor, Subcontractors, Producers) performing work required under Section 450. The QC Plan is not intended to be a generic document, but rather must be project specific.

A. QC Plan Submittal Requirements.

At the pre-construction conference, the Contractor shall be prepared to discuss the Quality Control Plan. Information to be discussed shall include the proposed QC Plan submittal date, QC organization, and sources of materials. The Contractor shall submit seven (7) copies of the QC Plan to the Engineer for approval not less than forty-five (45) days prior to the start of any work activities related to HMA pavement construction (including preparation of underlying surface) addressed in Subsections 450.53 thru 450.59. The Contractor shall not start work on the subject work items without an approved QC Plan.

B. QC Plan Format and Contents.

The QC Plan shall be structured to follow the format and section headings outlined below and as outlined in further detail in the New England Transportation Technician Certification Program (NETTCP) "Model QC Plan" for HMA. In the event of discrepancies between the section headings below and the NETTCP Model QC Plan, the current version of the Model QC Plan shall take precedence. The pages of the QC Plan shall be sequentially numbered. The QC Plan shall address, in sufficient detail, the specific information requested under each section and subsection contained in the NETTCP Model QC Plan.

C. QC Plan Approval and Modifications.

Approval of the QC Plan will be based on the inclusion of the required information. Revisions to the QC Plan may be required prior to approval for any part of the QC Plan that is determined by the Department to be insufficient. Approval of the QC Plan does not imply any warranty by the Engineer that the QC Plan will result in completed work that complies with the specifications. It remains the responsibility of the Contractor to demonstrate such compliance. The Contractor may modify the QC Plan as work progresses when circumstances necessitate changes in Quality Control personnel, laboratories, or procedures. In such case, the Contractor shall submit an amended QC Plan to the Department for approval a minimum of three calendar days prior to the proposed changes being implemented.

Quality Control Plan Outline

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450.62 Quality Control Personnel Requirements.

The Contractor's Quality Control organization shall, at a minimum, consist of the personnel outlined below that meet the described minimum qualifications. Every effort should be made to maintain consistency in the Quality Control organization, however substitution of qualified personnel shall be allowed. When circumstances necessitate substitution of QC personnel not originally listed in the approved QC Plan, the Contractor shall submit an amended QC Plan for approval in accordance with Subsection 450.61C.

A. Quality Control Manager.

The Contractor's Quality Control system and QC Plan shall be administered by a qualified Quality Control Manager (QC Manager). The QC Manager must be a full-time employee of the Contractor or a Quality Control consultant engaged by the Contractor. The QC Manager shall have full authority to institute any and all actions necessary for the successful implementation of the QC Plan. The QC Manager (or their assistant in the QC Manager's absence) shall be available to communicate with the Engineer at all times.

Principal responsibilities of the QC Manager shall include preparation and submittal of the Contractor's QC Plan, managing the activities of all QC personnel, communicating on quality issues within the Contractor's organization, and ensuring that all requirements outlined in the approved QC Plan are met.

For all projects with HMA Category A Lots (Large Lot), the QC Manager shall be certified by the NETTCP as a Quality Assurance Technologist. For projects having only HMA Category B Lots or Category C Lots, the Contractor may submit alternate qualifications for the QC Manager acceptable to the Department.

B. Production Facility Quality Control Technician(s).

All Contractor Quality control sampling, testing, and inspection conducted at the HMA production facility shall be performed by qualified Production Facility Quality Control Technicians (Plant QCTs). The Contractor shall provide a sufficient number of Plant QCTs to adequately implement the minimum Quality Control requirements contained in Section 450 and as outlined in the approved QC Plan. A minimum of one (1) qualified Plant QCT shall be present at each production facility location. HMA will not be accepted by the Department unless the Plant QCT is physically present at the plant during production and correctly performs the required Quality Control inspection, testing and documentation.

All Plant QCTs shall be certified as a HMA Plant Technician by the NETTCP.

C. Laboratory Quality Control Technician(s).

Any QC testing that is performed at off site laboratories (i.e. other than at the production facility or field site) shall be performed by qualified Laboratory Quality Control Technicians (Laboratory QCTs). The Contractor shall provide a sufficient number of Laboratory QCTs to adequately implement the minimum Quality Control requirements contained in Section 450 and as outlined in the approved QC Plan.

All Laboratory QCTs shall be certified as a HMA Plant Technician by the NETTCP.

D. Field Quality Control Technician(s).

All Contractor Quality Control sampling, testing, and inspection conducted at the HMA field placement site shall be performed by qualified Field Quality Control Technicians (Field QCTs). The Contractor shall provide a sufficient number of Field QCTs to adequately implement the minimum Quality Control requirements contained in Section 450 and as outlined in the approved QC Plan. A minimum of one (1) qualified Field QCT will be present at each field placement site. HMA will not be accepted by the Department unless the Field QCTs is physically present at the site during pre-placement and placement operations and correctly performs the required Quality Control inspection, testing and documentation.

All Field QCTs shall be certified as a HMA Paving Inspector as certified by the NETTCP.

450.63 Quality Control Laboratory Facility Requirements.

All Contractor Quality Control testing shall be performed in laboratories qualified through the NETTCP Laboratory Qualification Program (LQP) or accredited through the AASHTO Accreditation Program (AAP). Laboratory facilities shall be kept clean and all equipment shall be maintained in proper working condition. The QC Manager shall have overall responsibility for ensuring that all laboratories utilized for Quality Control are in compliance with the requirements of the NETTCP LQP. This includes providing required AASHTO, ASTM, and NETTCP reference materials and ensuring that all required equipment and tools are properly functioning and calibrated.

The Engineer shall be permitted unrestricted access to inspect and review the Contractor's laboratory facility. The Engineer will advise the Contractor in writing of any noted deficiencies concerning the laboratory facility, equipment, supplies, or testing personnel and procedures. Deficiencies shall be grounds for the Engineer to order an immediate stop to incorporating materials into the work until deficiencies are corrected. The Engineer shall be permitted to utilize the Contractor's laboratory to conduct Acceptance testing.

450.64 Quality Control Inspection.

The Contractor shall perform Quality Control inspection of all work items addressed under Section 450. Inspection activities during HMA production and placement may be performed by qualified Production personnel (e.g. Skilled Laborers, Foremen, Superintendents). However, the Contractor's QC personnel shall have overall responsibility for QC inspection. The Contractor shall not rely on the results of Department Acceptance inspection for Quality Control purposes. The Engineer shall be provided the opportunity to monitor and witness all QC inspection.

Quality Control inspection activities must address the following four primary components:

- Equipment
- Materials
- Environmental Conditions
- Workmanship

The minimum frequency of Quality Control inspection activity shall be in accordance with the requirements below and as outlined in the approved QC Plan. The results and findings of QC inspection shall be documented on NETTCP Inspection Report Forms (IRFs).

A. QC Inspection for Preparation of Underlying Surface.

The Contractor's personnel will perform Quality Control inspection during preparation of the underlying surface in accordance with the requirements of Subsection 450.53. The minimum items to be inspected shall be as outlined in Table 450.6 and Table 450.7. The Contractor shall identify in the QC Plan the specific inspection activities necessary to ensure the quality of the work, including any additional inspection activities not specifically listed in Table 450.6 and Table 450.7.

Table 450.6 - Minimum QC Inspection of HMA Patching Operations

Inspection Component	Items Inspected	Minimum Inspection Frequency	Point of Inspection	Inspection Method
Equipment	As specified in QC Plan	Per QC Plan	Per QC Plan	Per QC Plan
Materials	Aggregates & PG Binder (Correct Type)	Per QC Plan	HMA Production Facility	Visual Check + Manufacturer COC

	Rubberized Asphalt Sealant (Correct Type)	Per QC Plan	Per QC Plan	Check Manufacturer COC
	Temperature of HMA Mix	4 per Day(1)	From Haul Vehicle at Patching Site	Check Measurement
Environmental Conditions	Underlying Surface Soundness & Moisture	Per QC Plan	Underlying Surface	Visual Check
	Temperature of Air & Underlying Surface	1 per Day(2)	At Patching Site	Check Measurement
Workmanship	Sawcut Limit Vertical Face	Per QC Plan	Sawcut Limits	Visual Check
	Rubberized Asphalt Sealant Application Rate	Per QC Plan	Sawcut Limits	Check Measurement
	HMA Lift Thickness	Per QC Plan	HMA Lift	Check Measurement
	Cross-Slope & Profile	Per QC Plan	Compacted HMA	Check Measurement

(1) The initial temperature measurements will be taken from haul vehicles on the first or second load.
(2) As a minimum, the temperature measurements of the air and underlying surface shall be obtained prior to starting the HMA patching placement.

Table 450.7 - Minimum QC Inspection of Tack Coat Operations

Inspection Component	Items Inspected	Minimum Inspection Frequency	Point of Inspection	Inspection Method
Equipment	As specified in QC Plan	Per QC Plan	Per QC Plan	Per QC Plan
Materials	Asphalt Emulsion (Correct Type)	Per QC Plan	Per QC Plan	Check Manufacturer COC
	Asphalt Emulsion Temperature	(See Note 1)	From Tack Distributor System	Check Measurement
Environmental Conditions	Underlying Surface Cleanliness & Moisture	Per QC Plan	Underlying Surface	Visual Check
	Temperature of Air & Underlying Surface	1 per Day(2)	At Paving Site	Check Measurement
Workmanship	Asphalt Emulsion Application Rate	(See Note 1)	From Tack Distributor System	Check Measurement

(1) The Asphalt Emulsion Temperature and Application Rate shall be checked as follows:

- After application of the first 1,000 lane-feet (300 lane-meters) per HMA pavement course.
- After application of the next 1,500 lane-feet (450 lane-meters) per HMA pavement course.
- After application of the next 2,500 lane-feet (750 lane-meters) per HMA pavement course.
- Thereafter, a minimum of once per 5,000 lane-feet (1500 lane-meters) each day.

(2) As a minimum, the temperature measurements of the air and underlying surface shall be obtained prior to starting the tack coat placement.

B. QC Inspection for Production & Placement of HMA Lots.

The Contractor's QC personnel will perform Quality Control inspection at both the HMA production facility and at the site of HMA field placement to ensure that the production and placement processes are

providing work conforming to the contract requirements. The minimum items to be inspected for each HMA Lot shall be in accordance with the requirements of Subsection 450.54 thru Subsection 450.59 and as outlined in Table 450.8. The Contractor shall identify in the QC Plan the specific inspection activities necessary to ensure the quality of the work, including any additional inspection activities not specifically listed in Table 450.8.

Table 450.8 - Minimum QC Inspection for Production & Placement of HMA Lots

Inspection Component	Items Inspected	Minimum Inspection Frequency	Point of Inspection	Inspection Method
Equipment	As specified in QC Plan	Per QC Plan	Per QC Plan	Per QC Plan
Materials	Aggregates & PG Binder (Correct Type)	Per QC Plan	HMA Production Facility	Visual Check + Manufacturer COC
	Rubberized Asphalt Sealant (Correct Type)	Per QC Plan	Per QC Plan	Check Manufacturer COC
	Temperature of HMA Mix at Plant	4 per Day(1)	From Haul Vehicle at Plant	Check Measurement
	Temperature of Delivered HMA Mix	4 per Day(1)	From Haul Vehicle or Paver Hopper	Check Measurement
Environmental Conditions	Underlying Surface Soundness & Moisture	Per QC Plan	Underlying Surface	Visual Check
	Temperature of Air & Underlying Surface	1 per Day(2)	At Paving Site	Check Measurement
Workmanship	Joint Location & Alignment	Per QC Plan	Per QC Plan	Visual Check
	Sawcut Joint Vertical Face	Per QC Plan	Joint Vertical Face	Visual Check
	Rubberized Asphalt Sealant Application Rate	Once per 1,000 ft (300 meters) per joint	Joint Vertical Face	Check Measurement
	Temperature Differential in HMA Mat	Once per 500 feet (150 meters) per pavement course	HMA Mat Behind Paver	Per Subsection 450.55C
	Physical Segregation	Per QC Plan	HMA Mat Behind Paver & Compacted HMA	Visual Check
	HMA Lift Thickness	Per QC Plan	HMA Lift	Check Measurement
	Cross-Slope	Per QC Plan	Compacted HMA	Check Measurement
	Joint Tightness	Per QC Plan	Compacted HMA	Visual Check
	Joint Surface Deviations	Once per 500 feet (150 meters) per joint	At Finished Joint	10 foot (3 meter) standard straightedge

(1) The initial temperature measurements will be taken from the first or second load.

(2) As a minimum, the temperature measurements of the air and underlying surface shall be obtained prior to starting the HMA patching placement.

450.65 Quality Control Sampling and Testing Requirements.

The Contractor's QC personnel will perform Quality Control sampling and testing at both the HMA production facility and at the site of HMA field placement to ensure that the production and placement processes are providing work conforming to the contract requirements. The Engineer will not sample or test for Quality Control or assist in controlling the Contractor's operations. All QC sampling and testing shall be in accordance with the AASHTO, ASTM, NETTCP, or Department procedures specified in Table 450.9 and Table 450.10. The Contractor shall furnish approved containers for all material samples. The Engineer shall be provided the opportunity to monitor and witness all QC sampling and testing.

A. Random Sampling.

The Contractor's Quality Control system shall utilize stratified random sampling of each Lot produced and placed to assure that all material within the Lot has an equal probability of being selected for testing. The Contractor's qualified QC personnel shall obtain random QC samples at the minimum frequencies specified in Table 450.9 and Table 450.10. In all cases, application of the specified QC sampling frequencies shall result in a minimum one random sample per Sublot.

Random sample locations shall be determined using the random number tables and procedures contained in ASTM D 3665 or an electronic random number generator, as presented by the NETTCP. The determination of all random sample locations shall be documented on NETTCP Standard Test Report Form D3665. The Contractor will provide the Engineer with the random QC sampling locations selected and documented for each Sublot prior to production and placement of the relevant Sublots.

B. Selective Sampling.

The Contractor's Quality Control system will also utilize selective sampling (i.e. non-random samples) as needed to provide supplemental information to assist in maintaining all production and placement processes in control. The Contractor's qualified QC personnel shall obtain selective QC samples from any Sublot as determined necessary and in accordance with the guidelines established in the approved QC Plan.

C. QC Sample Identification System.

The Contractor shall establish a reliable system for the identification of all QC samples obtained. All PG Asphalt Binder samples, HMA loose mixture samples, and core samples shall be correctly labeled with the following minimum information:

(a) Contract No.
(b) Date Sampled.
(c) Mixture Type.
(d) Lot & Sublot No.
(e) Sample No.
(f) Sample Type (i.e. Random or Selective).
(g) Sample Location (e.g. Station & Offset).

All QC sampling data for Ride Quality and Wheel Path Deviations will be identified by the Contractor as directed by the Engineer. The Contractor's system and procedures for identification of QC samples shall be outlined in the approved QC Plan.

D. Retention of Split Samples.

The Contractor's qualified QC personnel shall obtain all material samples (PGAB samples, HMA loose mix samples, and cores) for QC testing. The Contractor will retain split samples from each PGAB sample and HMA loose mix sample and provide a split sample to the Engineer if requested. The Contractor shall retain the original core samples after testing to serve as "split samples" and protect them from damage. All split samples shall be properly labeled and stored for a period of (30) days, or until tested. These split samples (PGAB samples, HMA loose mix samples, and cores) will be utilized if necessary, in the Dispute Resolution process. If mutually agreed upon by the Contractor and the Department, the retained split samples may be discarded prior to the required thirty (30) days.

E. Quality Control Testing of Prepared Underlying Surface.

The Contractor's QC personnel will perform Quality Control testing during preparation of the underlying surface. All QC testing shall be in accordance with the AASHTO, ASTM, NETTCP, or Department procedures specified in Table 450.9. The Engineer shall be provided the opportunity to monitor and witness all QC testing.

Table 450.9 - Minimum QC Sampling & Testing of Prepared Underlying Surface

Quality Characteristic	Test Method(s)	Sublot Size	Minimum Test Frequency	Point of Sampling	Sampling Method
HMA Patching Mixture: PG Asphalt Binder Content	AASHTO T164 or AASHTO T308	150 tons (140 Mg)	1 per Sublot	From Haul Vehicle at Plant	Random AASHTO T168
HMA Patching Mixture: Combined Agg. Gradation	AASHTO T30	150 tons (140 Mg)	1 per Sublot	From Haul Vehicle at Plant	Random AASHTO T168
HMA Patching Mixture: Maximum Theo. Specific Gravity	AASHTO T209	150 tons (140 Mg)	1 per Sublot	From Haul Vehicle at Plant	Random AASHTO T168
HMA Patching Mixture: In-place Density	ASTM D2950 or AASHTO TP68	100 sq. feet. (10 sq. meter) per each Patch Area	1 per Sublot	From Compacted HMA Patch	Random ASTM D2950, AASHTO TP68

F. Quality Control Testing of HMA Lots.

The Contractor's QC personnel will perform Quality Control testing at both the HMA production facility and at the site of HMA field placement to ensure that the production and placement processes are providing work conforming to the contract requirements. The Engineer shall be provided the opportunity to monitor and witness all QC testing of HMA. All QC testing of HMA Lots shall be in accordance with the AASHTO, ASTM, NETTCP, or Department test methods specified in Table 450.10 and the procedures outlined below.

Table 450.10 - Minimum Quality Control Sampling & Testing of HMA Lots

Quality Characteristic	Test Method(s)	Sublot Size	Minimum Test Frequency	Point of Sampling	Sampling Method
PG Asphalt Binder Grading	AASHTO M320	Per Supplier QC Plan or 24,000 tons (22,000 Mg) of HMA per Subsection 450.65F(1)	See Subsection 450.65F(1)	See Subsection 450.65F(1)	Random AASHTO T40
Aggregate Gradation	AASHTO T27	Per QC Plan	Per QC Plan	At HMA Plant Per QC Plan	Random AASHTO T2
PG Asphalt Binder Content	AASHTO T164 or AASHTO T308	600 tons (550 Mg)	1 per Sublot(1)	From Haul Vehicle at Plant	Random AASHTO T168
Combined Aggregate Gradation	AASHTO T30	600 tons (550 Mg)	1 per Sublot(1)	From Haul Vehicle at Plant	Random AASHTO T168
Maximum Theo. Specific Gravity	AASHTO T209	600 tons (550 Mg)	1 per Sublot(1)	From Haul Vehicle at Plant	Random AASHTO T168
Bulk Specific Gravity	AASHTO T166 (SSD Method)	600 tons (550 Mg)	1 per Sublot(1)	From Haul Vehicle at Plant	Random AASHTO T168
Volumetrics: Air Voids, VMA, VFA	AASHTO T245	600 tons (550 Mg)	1 per Sublot(1)	From Haul Vehicle at Plant	Random AASHTO T168
In-place HMA Mat Density (Density Gauge)	ASTM D2950 or AASHTO TP68	150 tons (140 Mg)	1 per Sublot(1)	From Compacted HMA Course	Selective & Random ASTM D2950, AASHTO TP68
In-place HMA Mat Density (Cores)	AASHTO T230 AASHTO T166 AASHTO T269	600 tons (550 Mg)	1 per Sublot(1)	From Compacted HMA Course	Random AASHTO T269
Thickness	AASHTO T269	600 tons (550 Mg)	1 per Sublot(1)	From Compacted HMA	Random AASHTO T269
Transverse Joint Density	ASTM D2950 or AASHTO TP68	Each Joint	1 per Sublot(1) Random	At Finished Joint	ASTM D2950, AASHTO TP68
Longitudinal Joint Density	ASTM D2950 or AASHTO TP68	500 feet (150 meters) per Joint	1 per Sublot(1)	At Finished Joint	Random ASTM D2950, AASHTO TP68
Ride Quality (IRI)	AASHTO PP52 Per Subsection 450.65F(11)	0.1 miles (160 meters) per each Wheel Path	3 Runs per Sublot	Each Pavement Course Per Subsection 450.65F(11)	Random Per Subsection 450.65F(11)
Wheel Path Deviations	10 foot (3 meter) standard straightedge	500 feet (150 meters) per each Wheel Path	1 per Sublot(1)	Each Pavement Course Per Subsection 450.65F(12)	Random Per QC Plan

(1) In the event that the total daily HMA production is less than one Sublot, a minimum of one random QC sample shall be obtained for the day's production.

(1) PG Asphalt Binder Grading.

QC testing of PG Asphalt Binder shall be performed by the PGAB Supplier in accordance with AASHTO R26 and the Supplier's approved PGAB Quality Control Plan. The Contractor shall submit to the Engineer a Supplier's Certificate of Compliance (COC) along with copies of the certified AASHTO M320 test results for each Supplier Lot of PGAB from which the HMA Producer's PGAB was obtained.

If the Contractor modifies the PGAB at the HMA production facility through blending or introduction of an asphalt binder modifier, the Contractor (i.e. HMA Producer) shall assume responsibility as the PGAB Supplier per AASHTO R26. In such case, the Contractor shall obtain and test a minimum of one random sample of the modified PGAB for each 24,000 ton (22,000 Mg) HMA Sublot, as defined in Table 450.10, to determine conformance with AASHTO M320. A minimum of two 1-quart (1 Liter) containers of PGAB shall be obtained for each PGAB sample in accordance with AASHTO T40. All QC samples shall be split prior to testing and the un-tested portion of the sample shall be retained for a minimum of 30 days.

For HMA Category A Lots incorporating greater than 25% RAP or greater in the job-mix formula, the Contractor shall perform full asphalt binder grade testing on a minimum of one random sample from the Control Strip and from each Sublot as specified in Table 450.10 during HMA Lot production. The QC testing shall be performed on samples of asphalt binder recovered from the RAP (by Abson recovery) blended in the appropriate proportion with samples of the virgin PGAB to determine conformance with AASHTO M320. The PG Asphalt Binder Grade testing results shall be within ± 2ºC of the specified PGAB grade for the HMA pavement course mixture.

(2) Aggregate Gradation.

The virgin aggregates utilized in each HMA Lot shall be tested for Gradation in accordance with AASHTO T27. The Sublot size and minimum frequency of QC testing for Aggregate Gradation shall be as specified in the Contractor's approved QC Plan. Aggregate samples shall be obtained at the HMA plant from aggregate bins or stockpiles in accordance with AASHTO T2.

(3) PG Asphalt Binder Content.

Each HMA Lot produced and placed shall be tested for PG Asphalt Binder Content in accordance with either AASHTO T164 or T308. When AASHTO T164 is used, the test results shall be reported prior to ash correction. The Sublot size and minimum frequency of QC testing for PG Asphalt Binder Content shall be as specified in Table 450.10. Each material sample for PG Asphalt Binder Content shall be obtained at the HMA plant from a randomly selected quadrant from the haul vehicle in accordance with ASTM D3665 and AASHTO T168.

(4) Combined Aggregate Gradation.

Each HMA Lot produced and placed shall be tested for Combined Aggregate Gradation in accordance with AASHTO T30. The Sublot size and minimum frequency of QC testing for Combined Aggregate Gradation shall be as specified in Table 450.10. Each material sample for Combined Aggregate Gradation shall be obtained at the HMA plant from a randomly selected quadrant from the haul vehicle in accordance with ASTM D3665 and AASHTO T168.

The QC test results of Combined Aggregate Gradation must be plotted on Control Charts with Action Limits. Recommended Action Limits are provided in Table 450.11, however, the Action Limits to be used for each HMA Lot shall be as specified in the Contractor's approved QC Plan. If the QC test results for an individual Sublot fall outside of the established Action Limits, the Contractor shall evaluate the HMA production process and determine any adjustments necessary to bring the Combined Aggregate Gradation back within the Action Limits. If the subsequent Sublot test result falls outside of the Action Limits, the Contractor shall suspend Lot production until it can be demonstrated that the HMA mixture can be produced within the Action Limits. The Contractor's QC personnel shall document all action(s) taken to bring the HMA production process into control.

Table 450.11 - Recommended Action limits for Combined Aggregate Gradation

Sieve Size	Action Limit
Passing No. 4 Sieve (4.75mm) and larger sieve sizes	JMF Target +/-6 percent
Passing No. 8 sieves (2.36mm)	JMF Target +/-5 percent
Passing No. 16 (1.18mm) to No. 50 (300m) sieves (inclusive)	JMF Target +/-3 percent
Passing No. 100(150m) sieve	JMF Target +/-2 percent
Passing No. 200(75m) sieve	JMF Target +/-1 percent

(5) Maximum Theoretical Specific Gravity.

Each HMA Lot produced and placed shall be tested for Maximum Theoretical Specific Gravity in accordance with AASHTO T209. The Sublot size and minimum frequency of QC testing for Maximum Theoretical Specific Gravity shall be as specified in Table 450.11. Each material sample for Maximum Theoretical Specific Gravity shall be obtained at the HMA plant from a randomly selected quadrant from the haul vehicle in accordance with ASTM D3665 and AASHTO T168.

(6) Bulk Specific Gravity.

Each HMA Lot produced and placed shall be tested for Bulk Specific Gravity in accordance with AASHTO T166 (SSD Method). The Sublot size and minimum frequency of QC testing for Bulk Specific Gravity shall be as specified in Table 450.10. Each material sample for Bulk Specific Gravity shall be obtained at the HMA plant from a randomly selected quadrant from the haul vehicle in accordance with ASTM D3665 and AASHTO T168.

(7) Volumetrics (Air Voids, VMA, VFA).

Each HMA Lot produced and placed shall be tested for Volumetrics (Air Voids, VMA, VFA) in accordance with AASHTO T245. The requirement for Volumetric testing of laboratory compacted specimens applies to HMA mixtures for all pavement courses, with the exception of Open Graded Friction Courses and Base Courses. The Sublot size and minimum frequency of QC testing for Volumetrics shall be as specified in Table 450.10. Each material sample for Volumetrics shall be obtained at the HMA plant from a randomly selected quadrant from the haul vehicle in accordance with ASTM D3665 and AASHTO T168.

(8) In-place HMA Mat Density.

Each HMA Lot produced and placed shall be tested for In-place Density using a density gauge or cores as specified below. The requirement for In-Place Density testing applies to all pavement courses, with the exception of Open Graded Friction Courses and Leveling Courses.

The Sublot size and minimum frequency of random QC testing for In-place Density by either density gauge or core shall be as specified in Table 450.10.

(a) ***Testing In-Place Density by Density Gauge.*** Initial QC testing of In-Place Density during compaction of HMA pavement courses shall be performed selectively (or randomly when determined appropriate by QC personnel) using a density gauge in accordance with ASTM D2950 or AASHTO TP 68. QC testing of In-Place Density for all HMA bridge protective courses and bridge surface courses shall be performed randomly using a density gauge. Each random sampling and testing location for HMA bridge courses shall be established by determining a randomly selected tonnage and corresponding approximate longitudinal distance within the Sublot, along with a randomly selected offset distance in accordance with ASTM D3665. Additional selective QC sampling and testing within each Sublot of compacted HMA bridge protective courses or bridge surface courses shall be as determined necessary by the Contractor's QC personnel and as specified in the Contractor's approved QC Plan.

(b) ***Testing In-Place Density by Cores.*** Final QC testing of In-Place Density of all applicable HMA pavement courses shall be performed using 6-inch (150 mm) diameter cores in accordance with AASHTO T230, T166, and T269. Cores shall not be obtained from bridge protective surface courses. In-Place Density shall be determined from each core by comparing the Bulk Specific Gravity of the core to the average Maximum Theoretical Specific Gravity for all HMA mixture Sublots produced for the pavement course on the same day's production. Each core location shall be established by determining a randomly selected tonnage and corresponding approximate longitudinal distance within the Sublot, along with a randomly selected offset distance in accordance with ASTM D3665. If the randomly determined sampling location coincides with one of the following conditions, the sampling location shall be relocated immediately beyond the boundary distance as indicated below for the specific condition:

1. Within 1 foot (300mm) from an edge of pavement course to be left unconfined upon project completion
2. Within 1 foot (300mm) of any longitudinal joint or transverse joint.
3. Within 3 feet (1 meter) of any drainage structure.

Core samples shall be obtained in accordance with AASHTO T230 prior to opening the pavement course to traffic. At the discretion of the Engineer, based on climactic or other conditions, obtaining of cores may be delayed for a period up to, but not to exceed, 48 hours. All cores shall be protected against damage and tested within 24 hours after they have been obtained. The Contractor shall fill all core holes, whether from QC sampling or Department Acceptance sampling, with fresh HMA mixture from the same Lot. The filled core holes shall be thoroughly compacted as outlined in the Contractor's approved QC Plan.

(9) Thickness.

Each HMA pavement course specified to be placed at a compacted thickness of 1 inch (25mm) or greater shall be tested for Thickness using cores, with the exception of the following courses:

1. Open Graded Friction Course.
2. Bridge Surface Course.
3. Bridge Protective Course.
4. Leveling Course.
5. In the absence of a Leveling Course, the first pavement course placed over existing pavement.

The aforementioned pavement courses are exempt only from determination of Thickness using cores and the corresponding statistical evaluation of Lot quality. The Contractor is still responsible for ensuring the minimum required thickness of these pavement courses using an appropriate sampling and testing protocol as outlined in the Contractor's approved QC Plan.

All sampling and testing for Thickness of the applicable pavement courses using cores shall be in accordance with AASHTO T269. The Sublot size and minimum frequency of random QC testing for Thickness shall be as specified in Table 450.10.

(10) Joint Density.

Each transverse joint and longitudinal joint formed during placement of a pavement course shall be tested for Joint Density using a density gauge in accordance with ASTM D2950. The requirement for Joint Density testing applies to all pavement courses, with the exception of Open Graded Friction Courses and Leveling Courses. The Sublot size and minimum frequency of random QC testing for Joint Density shall be as specified in Table 450.10.

Each random sampling and testing location shall be established by determining a randomly selected distance along the joint, along with a randomly selected offset distance within 1 foot (300 mm) of either side of the finished joint, in accordance with ASTM D3665. Additional selective QC sampling and testing of Joint Density within each Sublot of compacted HMA pavement courses or bridge protective surface courses shall be as determined necessary by the Field QCT and as specified in the Contractor's approved QC Plan

(11) Ride Quality.

The finished surface of the pavement shall be uniform in appearance, free from irregularities in contour and texture and shall present a smooth riding surface. Ride Quality testing shall be performed for Quality Control on a periodic basis during construction of the HMA pavement courses specified below. QC testing shall be performed for HMA Category A Lots, at a minimum, within 24 hours after each 8 lane-miles (13 lane-kilometers) of an individual pavement course have been placed. QC testing of HMA Category B Lots shall be performed, at a minimum, every other paving day. In addition, the Contractor shall perform QC testing of the entire final pavement course placed upon completion.

(a) ***Pavement Courses Subject to Testing.*** For projects having a posted speed equal to or greater than 40 mph with HMA Lots falling under Lot Category A (Large Lots) or Category B (Small Lots), QC testing shall be performed with an inertial profiler to determine the Ride Quality of the following pavement courses:

- Friction Course (OGFC)
- Surface Course
- Intermediate Course (lift immediately beneath Surface Course only)
- Leveling Course (when placed immediately beneath Surface Course)

At a minimum, the finished surface of these pavement courses will be tested for all mainline travel lanes, auxiliary lanes, ramps, and side road travel lanes. The Contractor may also elect to perform Ride Quality testing of the pavement courses beneath the courses indicated above in order to provide adequate Quality Control. The following pavement courses and surfaces are specifically excluded from Ride Quality testing:

1. Bridge surface courses (including 15 feet (5 meters) before the approach joint and 15 feet (5 meters) after the departure joint), unless placed with the mainline surface course as part of a continuous paving operation.
2. Mainline pavement courses less than one half mile (800 meters) in total length (excluding bridge lengths).
3. Side road pavement courses less than one Sublot (0.1 mile (160 meters)) in total length.
4. Single resurfacing pavement courses placed in one lift at a total plan (compacted) thickness less than 1.75 inches (45 millimeters).
5. Pavement courses on horizontal curves having a centerline radius of curvature of 500 feet (150 meters) or less, including the length of pavement within the super-elevation transition of such curves.
6. Pavement courses for shoulders.
7. Manholes and catch basins.

(b) ***Inertial Profiler Equipment Requirements.*** All inertial profilers used for Contractor

QC testing shall conform to the equipment specifications contained in AASHTO PP50 and ASTM E950. The inertial profiler shall be equipped with a system of transducers (height sensor, accelerometer, distance sensor) to measure the longitudinal pavement profile. An automated triggering system shall be provided that detects a reference mark to start, stop, and event mark the data collection process. The profiler equipment shall include an onboard computer system capable of storing all profile measurement data, calculating the real time International Roughness Index (IRI) per ASTM E1926 (independent of speed), and displaying profile plots.

(c) Certification and Correlation of Inertial Profilers. All inertial profilers used for Contractor QC testing must be certified for precision and accuracy in accordance with the requirements of AASHTO PP51. In addition, all Contractor QC profilers must be correlated against the Department's reference profiling device in accordance with the Department's correlation procedures. The certification and correlation of all profilers shall be conducted at the Profiler Correlation Center in New Bedford, MA established by the University of Massachusetts at Dartmouth. The certification and initial correlation of the Contractor's inertial profiler shall be completed prior to the start of Ride Quality testing on the project. After the initial correlation is successfully completed, the same inertial profiler can be used on any Department project without re-correlation for the remainder of the construction season. Equipment that does not pass the Department's correlation procedure shall not be used. The Contractor's use of inertial profiler equipment that has not been successfully correlated is sufficient grounds for withholding payment for QC testing of Ride Quality. The Contractor's inertial profiler equipment may be required to undergo re-correlation at any time during the construction season if significant variations are found within the Contractor's QC test data or between the QC test data and the Department's Acceptance test data.

(d) Ride Quality Testing Procedures. Ride Quality testing shall be performed in accordance with the procedures outlined in AASHTO PP52, as clarified or amended herein.

The Ride Quality will be measured for each wheel path [a wheel path is defined as 3 feet (1 meter) from and parallel to each longitudinal edge of the lane to be measured]. Each wheel path will be divided into 0.1 mile (160 meters) Sublots starting at the project limits in the direction of traffic. Partial Sublots may result at either end of the project or as a result of interruptions of the continuous pavement surface (i.e. bridge approaches, railroad crossing, cessation of daily paving operations, etc.).

Just prior to testing, the Contractor shall sweep the pavement and remove all foreign objects or materials on the pavement course surface. Testing will begin 15 feet (5 meters) after the transverse approach joint and end 15 feet (5 meters) before the transverse departure joint. A minimum of three and up to a maximum of five test runs will be performed on each wheel path. The final test result for each Sublot will be the average of the three best test runs.

(e) Data Format and Reporting Requirements. All Ride Quality QC testing data shall be collected and saved in electronic format in an ASCII data file. A copy of the raw data file shall be provided to the Engineer on site immediately following testing of completed Sublots. A longitudinal profile shall be determined for all Sublots tested and an average IRI value shall be determined and reported for each Sublot (i.e. each 0.1 mile (160 meters) segment of each wheel path). The Contractor shall summarize the results for all Sublots, by corresponding Ride Quality Lot, in an electronic spreadsheet file (MS Excel) consistent with the format of the Department's QA Spreadsheets. The summary spreadsheet of QC testing data shall be submitted to the Department, electronically and in hardcopy, within two days after the testing is completed.

(f) Ride Quality Monitoring & Corrective Action. The Contractor shall evaluate and monitor the test data for each pavement course requiring Ride Quality testing for conformance with the applicable Quality Limits specified in Table 450.19. If the running Quality Level for all Sublots placed and tested falls below the Suspension Quality Level (70 PWL), the Contractor shall suspend further placement of the corresponding pavement course and evaluate the Sublots placed for appropriate corrective action. If the running Mean IRI of all Sublots placed and tested for the pavement course immediately below the final course is greater than the Action Limits specified in Table 450.12, corrective action will be required prior to placement of the final pavement course.

When Ride Quality correction is required, the Contractor shall use one or more of the following corrective methods:

1. Removal and replacement of the entire pavement course.
2. Partial depth removal of the pavement course by milling and placement of new pavement course(s) of the same mixture type.
3. Overlaying (not patching) with the specified pavement course.
4. Diamond grinding or use of other surface profiling devices.

The corrective method(s) chosen by the Contractor shall be subject to the approval of the Department and shall be performed at the Contractor's expense. The Contractor shall retest any Sublots where corrections are made and provide the Department with a copy of the raw data file, the profile plot, and the IRI summary spreadsheet data for the corrected Sublots.

Table 450.12 - Action Limits for Pavement Course Below Final Pavement Course

Posted Speed Limit(1)	**Target IRI**	**Maximum Mean IRI of All Sublots Tested**
Greater than or equal to 55 mph (90 km/hr)	75 in/mile (1.18 m/km)	≤ 100 in/mile (1.58 m/km)
40 mph (65 km/hr) to 55 mph (90 km/hr)	105 in/mile (1.66 m/km)	≤ 125 in/mile (1.97 m/km)
Less than 40 mph (65km/hr)	Not subject to Ride Quality testing	N/A

(1) Note that projects with posted speed limits that fall into more than one of the Posted Speed Limit ranges above will be divided into multiple Lots and evaluated separately.

(12) Wheel Path Deviations.

Each wheel path [a wheel path is defined as 3 feet (1 meter) from and parallel to each longitudinal edge of a travel lane] of each HMA Lot produced and placed shall be tested for Wheel Path Deviations (high points or low points). Testing shall be performed using a 10-foot (3 meter) standard straightedge in the longitudinal direction on each wheel path. The requirement for Wheel Path Deviation testing applies to all pavement courses (including bridge protective courses and bridge surface courses). At a minimum, the finished surface of each required pavement course will be tested for all mainline travel lanes, auxiliary lanes, ramps, and side road travel lanes. The Sublot size and minimum frequency of QC testing for Wheel Path Deviations shall be as specified in Table 450.10. Each random sampling and testing location shall be established by determining a randomly selected distance along the wheel path in accordance with ASTM D3665. Additional selective QC sampling and testing for Wheel Path Deviations within each Sublot of compacted HMA pavement courses shall be as determined necessary by the Field QCT and as specified in the Contractor's approved QC Plan.

The variation from the edge of the 10-foot (3 meter) straightedge to the top of the wheel path surface between any two wheel path contact points shall not exceed 0.25 inches (6 mm). The Contractor shall correct any location in a pavement course wheel path not meeting this requirement. The corrective method(s) proposed by the Contractor shall be subject to the approval of the Department and shall be performed at the Contractor's expense. The Contractor shall retest any Sublots where corrections are made and provide the Department with a copy of the testing data for the corrected Sublots.

450.66 HMA Mix Design Verification and Control Strip Requirements.

For all pavement courses with HMA Lots falling under Lot Category A (Large Lots), the HMA mix design Verification and Control Strip procedures outlined below shall apply.

A. Laboratory Verification of HMA Mix Design.

The Contractor shall develop a HMA Laboratory Trial Mix Formula (LTMF) for each pavement course mixture type, which is proposed as the Job Mix Formula, utilizing Marshall volumetric mix design criteria (75-blow hammer compaction) in accordance with Subsection 450.42. The LTMF must be submitted to the Engineer, a minimum of 15 working days prior to the start of HMA production, with supporting documentation and samples of constituent materials in adequate amount to verify the LTMF selected for production (proposed JMF). If the Engineer is unable to verify the Contractor's LTMF, then the Engineer will work with the Contractor to resolve the verification issue(s). The Contractor shall not proceed to HMA production for the Control Strip as outlined below until the LTMF is verified by the Department.

B. HMA Control Strip.

The Contractor shall produce and place a Control Strip Lot for all HMA pavement courses, with the exception of Leveling Courses, on the first day of HMA production. The Control Strip will be used to verify that the HMA can be produced per the LTMF, to establish compaction patterns, and to verify that the equipment and processes for lay-down and compaction are capable of providing the HMA pavement course in conformance with quality requirements outlined below. The Control Strip Lot shall consist of a minimum of 600 tons (550 Mg) of HMA, but not more than one day's production. The total Control Strip quantity shall be divided into three (3) equal Sublots. If the Control Strip quantity is equal to or greater than 1800 tons (1650 Mg), each full Sublot shall be 600 tons (550 Mg). The Contractor and the Department will both perform inspection, sampling, and testing on the Control Strip and evaluate the corresponding data as outlined below.

(1) Control Strip Inspection.

The Contractor's QC personnel shall perform inspection of each Control Strip Sublot at both the HMA production facility and at the site of HMA field placement. The specific items to be inspected for the Control Strip shall include the four primary inspection components (Equipment, Materials, Environmental Conditions, Workmanship) in accordance with the requirements of Table 450.8 and as specified in the Contractor's approved QC Plan. The Department will also inspect each Control Strip Sublot for the inspection components of Materials and Workmanship.

(2) Control Strip Sampling and Testing.

The Contractor and the Department shall independently sample and test the Control Strip Lot for the Quality Characteristics identified in Table 450.13. The Contractor shall sample and test each 600 ton (550 Mg) Sublot produced and placed. The Department will sample and test only three 600 ton (550 Mg) Sublots, randomly selected from the Control Strip Lot, when more than three Sublots are placed. Each Contractor QC sample and each Agency Acceptance sample shall be randomly obtained from each Sublot in accordance with ASTM D3665 and the prescribed sampling protocols for each Quality Characteristic as outlined in Subsection 450.65F. Split samples shall be retained for each Sublot by both the Contractor and the Department in accordance with Subsection 450.65D.

(3) Evaluation of Control Strip Inspection Data.

The Contractor and the Department shall each evaluate their respective Control Strip inspection data against the requirements for Materials and Workmanship specified in Subsection 450.53 thru Subsection 450.58.

(4) Evaluation of Control Strip Sampling and Testing Data.

The Contractor and the Department shall each evaluate their respective individual Sublot test results against the Control Strip Verification Limits in Table 450.13. The Contractor and the Department shall also evaluate the Control Strip Lot Quality Level (PWL) using the Specification Limits in Table 450.19 for those Quality Characteristics subject to Quality Level Analysis. The Contractor's QC test data shall be combined with the Agency's Acceptance test data to determine the Lot Quality Level, provided that the QC data is Validated against the Acceptance data in accordance with Subsection 450.77. The Control Strip Lot Quality Level must be 90 PWL or greater.

Table 450.13 - Control Strip Verification Limits

Quality Characteristic	Control Strip Target	Limits on Individual Sublot Test Value	
		Lower Limit	Upper Limit
PG Asphalt Binder Grading	AASHTO M320	AASHTO M320	AASHTO M320
PG Asphalt Binder Content (P_b)	Per LTMF	Target - 0.4 %	Target + 0.4 %
Combined Gradation: Passing 4.75mm and Larger Sieves	Per LTMF	Target - 6 %	Target + 6 %
Combined Gradation: Passing 2.36mm Sieve	Per LTMF	Target - 5 %	Target + 5 %
Combined Gradation: Passing 1.18mm to 300µm Sieve	Per LTMF	Target - 3 %	Target + 3 %
Combined Gradation: Passing 150µm Sieve	Per LTMF	Target - 2 %	Target + 2 %
Combined Gradation: Passing 75µm Sieve	Per LTMF	Target - 1 %	Target + 1 %
Volumetrics: Air Voids (V_a)	4 %	Target - 1.4 %	Target + 1.4 %
In-Place HMA Mat Density	95 % of G_{mm}	92.5 % of G_{mm}	97.5 % of G_{mm}
Thickness*: (All Courses 1 inch (25mm) or greater)	Per Plans	-20 % of Target Thickness	+20 % of Target Thickness
Ride Quality*: Greater than or equal to 55 mph (90 km/hr)	75 in/mile (1.18 m/km)	N/A	100 in/mile (1.58 m/km)
Ride Quality*: 40mph (65 km/hr) to 55 mph (90 km/hr)	100 in/mile (1.58 m/km)	N/A	125 in/mile (1.97 m/km)
Wheel Path Deviations	0 inches	Target - 0.25 in. (6 mm)	Target + 0.25 in. (6 mm)

*To be evaluated for applicable pavement courses subject to testing per Subsection 450.65F.

(5) Verification of Control Strip Lot and LTMF.

If the evaluation of all Control Strip inspection data and testing data indicates that the individual Sublots are in conformance with the requirements outlined above and the overall Lot Quality is equal to or greater than 90 PWL, the Control Strip Lot and LTMF shall be declared Verified. In such event, the LTMF shall become the Job Mix Formula (JMF) for the Lot and the Contractor may proceed with production and placement of the first HMA Lot. The Verified Control Strip Lot shall receive full payment at the contract unit price for the HMA pavement course item.

If the evaluation of either the Control Strip inspection data or testing data indicates that the individual Sublots are not in conformance with the requirements outlined above, or if the overall Lot Quality is less than 90 PWL, the Control Strip Lot and LTMF shall be declared Not Verified. In such event, the Contractor shall reassess the LTMF, the production process, and the placement process to determine the apparent cause(s) of nonconformance. The Contractor shall prepare a plan of corrective action for the nonconforming Control Strip Lot. The corrective method(s) proposed by the Contractor shall be subject to the approval of the Department and shall be performed at the Contractor's expense. Once appropriate adjustments to the LTMF, or to the production or placement process, have been determined by the Contractor, a new Control Strip Lot shall be produced and placed and evaluated in accordance with the procedures outlined in paragraphs (1) thru (5) above. The Contractor shall not proceed with production and placement of the first HMA Lot until the new Control Strip Lot has been Verified.

450.67 Quality Control Documentation and Data Evaluation.

A. QC Inspection Documentation & Evaluation.

The Contractor shall document all QC inspection activity for each HMA Lot Category (Category A, B, or C) produced and placed. All inspection results shall be recorded within 24 hours of inspection on current NETTCP standard Inspection Report Forms (IRFs). The QC Manager shall evaluate inspection results in a timely manner to confirm that production and placement processes are in control. The Contractor shall submit hard copies of all IRFs to the Engineer at the completion of each Lot.

B. QC Sampling and Testing Documentation & Data Analysis.

The Contractor shall document all QC sampling and testing data for each HMA Lot Category (Category A, B, or C) produced and placed. All sampling and testing data shall be recorded within 24 hours of sampling and testing on current NETTCP standard Test Report Forms (TRFs). The QC Manager shall evaluate sampling and testing results in a timely manner, as further outlined below, to confirm that production and placement processes are in control. All QC testing data shall be entered into the Department's MS-Excel QA Data Spreadsheets via the internet (mhdqa.com) within two (2) days after completion of testing. The Contractor shall submit hard copies of all TRFs to the Engineer at the completion of each Lot.

(1) Control Charts.

For each HMA Category A Lot produced and placed, the Contractor shall use Control Charts as part of the QC system to assist in identifying assignable causes affecting the HMA production and placement processes. Control Charts shall be prepared for the Quality Characteristics subject to QC sampling and testing listed in Table 450.10. As a minimum, the Contractor shall plot all QC test results of each Lot on Control Charts for individual Sublot measurements or test values (Run Charts). It is also recommended practice for the Contractor to use Control Charts that plot Subgroups of data (e.g. X-Bar Charts, R Charts). The Contractor shall submit examples of the Control Charts to be used in the QC Plan. As a minimum, the Control Charts shall identify the Contract number, the Payment Item number, the Lot number, the Quality Characteristic, the Control Chart Target, the Upper and Lower Control Chart Limits, and Sublot or Subgroup numbers.

All Control Charts should be updated within 24 hours after the corresponding testing is completed and documented. Quality Control personnel should use the Control Chart data to monitor and adjust the production and placement processes or suspend operations as determined necessary. Control Charts for Quality Characteristics related to HMA production should be maintained at the HMA production facility. Control Charts for Quality Characteristics related to HMA field placement should be maintained at the project field site. Current Control Charts shall be posted in an accessible location. The Engineer shall be provided access to all Control Charts as part of the Department's monitoring of Contractor QC activity.

(2) Evaluation of Individual Sublot QC Test Results.

The Contractor shall evaluate the individual QC test results for each HMA Lot Category (Category A, B, or C) produced and placed. Each random QC test result shall be evaluated against the applicable Quality Limits within 24 hours of testing. For HMA Category A Lots and Category B Lots, each Sublot test value shall be within the Engineering Limits specified in Table 450.19. For HMA Category C Lots, each Sublot test value shall be within the Specifications Limits indicated in Table 450.19.

If the evaluation of the QC testing data indicates that an individual Sublot is not in conformance with the applicable Quality Limits for the particular HMA Lot Category, the Contractor shall isolate the Sublot and perform selective sampling followed by additional random sampling of the Sublot to quantify the actual quality of the Sublot.

(3) Evaluation of Lot Quality Level.

For HMA Category A Lots and Category B Lots, the Contractor shall use all random QC test results to continuously evaluate the running quality level and determine the percent within limits (PWL) for each Lot during production and placement. The PWL shall be determined through Quality Level Analysis (QLA) for each of the applicable Quality Characteristics listed in Table 450.19 using the corresponding Specification Limits therein. The Contractor shall perform a running QLA using random QC data only at a minimum after each 5 Sublots have been tested and shall plot the cumulative PWL after each 5 Sublot interval. The Engineer shall be provided access to all records documenting the running QLA for each Lot as part of the Department's monitoring of Contractor QC activity.

If the running QLA shows the PWL falling below the Acceptable Quality Level (AQL) of 90 PWL, the Contractor shall initiate appropriate adjustments to the production or placement process or initiate corrective action in accordance with procedures outlined in the approved QC Plan. If the PWL falls below the Suspension Quality Level (SQL) of 70 PWL, the Contractor shall suspend production and placement of the Lot. The Contractor shall prepare a plan of corrective action for any nonconforming Lot, as further outlined below. If significant adjustment to the JMF or the production or placement process is required, a new Lot will be established. After resuming production and placement, the PWL for the Lot must be back at or above the AQL of 90 PWL.

450.68 Corrective Action.

As part of the Contractor's Quality Control system, the Contractor shall implement corrective action for any part of a Lot that is determined by inspection or testing to not be in conformance with the quality requirements specified in Section 450. If the results of QC inspection identify nonconforming material or workmanship within one or more Sublots, or if the evaluation of the QC testing data indicates that any Sublot is not in conformance with the applicable Quality Limits for the particular HMA Lot Category, the Contractor shall isolate the Sublot(s) and perform additional inspection or testing to further assess the quality of the Sublot. Selective inspection or testing should be used to determine the limits of nonconformance, followed by random inspection or testing to quantify the actual quality of the nonconforming area.

Based on the results of additional inspection or testing, the Contractor shall prepare a plan of corrective action for the nonconforming Sublot(s). The Corrective action plan shall be submitted to and approved by the Engineer prior to initiating corrective action. All corrective action shall be performed at the Contractor's expense.

450.69 Quality Control Records System.

A. Quality Control Daily Diary.

The QC Manager should maintain a Quality Control Daily Diary (QC Daily Diary) to document all major activities or actions related to the Contractor's QC system. The QC Daily Diary serves as a summary record of key actions taken by QC personnel each day. Recommended Information which should be recorded in the QC Daily Diary includes:

- The day's weather or environmental conditions.
- A summary of production or placement activities completed.
- Any non-conforming material or workmanship identified.
- Any corrective actions recommended or taken by QC personnel.
- Discussions held with other Contractor personnel or Department personnel.
- Visitors to the production facility or field placement operation.

B. Quality Control Record Books.

The Contractor shall maintain one or more ringed binders referred to as "Quality Control Record Books" (QC Record Books) to store all required QC documents. Separate QC Record Books shall be kept at each HMA production facility and at the project field site. Either a separate QC Record Book shall be established for each HMA pavement course or the data for each pavement course may be included in a single QC Record Book provided the data is separated according to pavement course. QC data for each pavement course shall be organized into separate sections by Quality Characteristic and by Lot number.

QC documents to be stored in the QC Record Book(s) include:

- A signed copy of the current approved QC Plan.
- The original signed copies of all completed Inspection Report Forms.
- The original signed copies of all completed Random Sampling location forms.
- The original signed copies of all completed Test Report Forms.

- A current copy or printout of all Control Charts.
- A current copy or printout of all running QLA performed.
- Current summaries of all individual QC test results to date (by Lot & Sublot).
- Summary sheets of material quantities produced or placed (by Lot & Sublot).

Each required record shall be inserted into the corresponding QC Record Book within 24 hours after the document has been completed. All QC Record Books shall be maintained in a suitable location. The Engineer shall be provided access to all QC Record Books as part of the Department's monitoring of Contractor QC activity.

C. Quality Control Records Retention.

All Contractor QC records identified above shall be retained for a minimum of seven (7) years. The records shall be protected from damage or alteration. When requested by any State or Federal Agency for audit or similar purposes, the Contractor shall provide complete access to all QC records.

DEPARTMENT ACCEPTANCE

450.70 General.

The Department is responsible for performing all Acceptance activities and making the final acceptance determination for each HMA Lot produced and placed. The Department's Acceptance system will include monitoring the Contractor's QC activity, performing Acceptance inspection, sampling & testing, and determining the Quality and corresponding payment for each Lot. These activities will be performed for each HMA Lot Category (Lot Category A, B, and C) as outlined further below.

450.71 Acceptance System Approach.

A. Acceptance of Category A Lots.

The Engineer's acceptance determination for each HMA Category A Lot will be based on an evaluation of the Department's Acceptance inspection information and Acceptance testing data. The Engineer will perform Acceptance sampling and testing on a minimum of 25% of the Sublots produced and placed. Contractor QC test data will be included in the Department's acceptance determination for each Category A Lot provided the following requirements are met:

- Split Sample Correlation testing requirements are satisfied.
- The Contractor provides adequate Quality Control per the approved QC Plan.
- All QC test results included are from random samples.
- The QC test results are Validated against the Department's Acceptance test results.

B. Acceptance of Category B Lots.

The Engineer's acceptance determination for each HMA Category B Lot will also be based on an evaluation of the Department's Acceptance inspection information and Acceptance testing data. The Engineer will perform Acceptance sampling and testing on a minimum of 50% of the Sublots produced and placed, but not less than three (3) Sublots. Contractor QC test data will be included in the Department's acceptance determination for each Category B Lot provided the requirements outlined in paragraph A above are satisfied.

C. Acceptance of Category C Lots.

For all HMA Category C Lots, the Engineer's acceptance determination will be based only on the Department's Acceptance inspection information and Acceptance testing data. The Engineer will perform Acceptance sampling and testing on 100% of the Sublots produced and placed. Contractor QC test data will not be included in the Department's acceptance determination for Category C Lots.

450.72 Department Monitoring of Contractor Quality Control.

For projects with HMA Category A Lots or Category B Lots, the Department will monitor the Contractor's Quality Control system to confirm that QC activities are being performed for each Lot in reasonable compliance with the approved QC Plan. Department monitoring of the Contractor's QC system is not intended to evaluate the Quality of the Work. The Engineer will not perform the QC responsibilities of the Contractor or provide constant direction to the Contractor on how to perform Quality Control. The Engineer's monitoring of QC activity will include the following:

- Periodic visual observation of QC inspection, sampling, and testing.
- Reviewing QC documentation and records.
- Providing feedback based on monitoring findings.

The Engineer will document all findings (positive or negative) from any monitoring of the Contractor's QC system on standard Monitoring Report Forms (MRFs). Copies of all MRFs will be provided to the Contractor on a timely basis. When deficiencies in the Contractor's QC system are identified and documented by the Engineer, the Contractor shall take immediate action to address the deficiencies. If the Contractor fails to take appropriate action, the Contractor shall suspend production and placement of the corresponding Lot(s). The Department will withhold payment for the Contractor Quality Control Payment Item (Item No. 450.70) until the Contractor implements satisfactory corrective measures.

450.73 Acceptance Inspection.

The Engineer will perform Acceptance inspection of all work items addressed under Section 450 to ensure that all materials and completed work are in conformance with the contract requirements. Acceptance inspection is intended to visually assess the quality of each HMA Lot produced and placed and will address only the inspection components of Materials and Workmanship in support of the Department's final acceptance determination.

All Acceptance inspection activity by the Department will be performed independent of the Contractor's QC inspection at both the HMA production facility and at the site of HMA field placement. The Engineer will document the results and findings of Acceptance inspection on NETTCP Inspection Report Forms (IRFs). The Engineer will furnish a copy of all Department Acceptance inspection results to the Contractor within five (5) days following the inspection.

A. Acceptance Inspection of Prepared Underlying Surface.

The Department will perform Acceptance inspection of the prepared underlying surface prior to placement of HMA. The items to be inspected and minimum frequency of inspection will be in accordance with the requirements outlined in Table 450.14 and Table 450.15.

Table 450.14 - Department Acceptance Inspection of HMA Patching

Inspection Component	Items Inspected	Minimum Inspection Frequency	Point of Inspection	Inspection Method
Materials	Mixture Type + PG Binder Grade (Correct Type)	1 per Day	HMA Production Facility	Visual Check + Manufacturer COC
	Rubberized Asphalt Sealant (Correct Type)	1 per Day	At Paving Site	Check Manufacturer COC
Workmanship	Sawcut Limit Vertical Face	25% of Patched Areas	Sawcut Limits	Visual Check
	Rubberized Asphalt Sealant Application Rate	25% of Patched Areas	Sawcut Limits	Visual Check + Check Measurement

	Cross-Slope & Profile	25% of Patched Areas	Compacted HMA	Check Measurement

Table 450.15 - Department Acceptance Inspection of Tack Coat

Inspection Component	Items Inspected	Minimum Inspection Frequency	Point of Inspection	Inspection Method
Materials	Asphalt Emulsion (Correct Type)	1 per Day	At Paving Site	Check Manufacturer COC
Workmanship	Asphalt Emulsion Application Rate	Once per 5,000 lane-ft (1,500 lane-m)	Tacked Surface + Tack Distributor System	Visual Check + Check Measurement

B. Acceptance Inspection of HMA Lots.

The Department will perform Acceptance inspection at both the HMA production facility and at the site of HMA field placement. For purposes of Acceptance inspection, the total quantity of each HMA pavement course produced and placed during the same construction season will constitute a Lot. Each in-place HMA Lot will be divided into 500 lane-feet (150 lane-meters) Sublots. The items to be inspected and minimum frequency of inspection will be in accordance with the requirements outlined in Table 450.16.

Table 450.16 - Department Acceptance Inspection of HMA Lots

Inspection Component	Items Inspected	Minimum Inspection Frequency	Point of Inspection	Inspection Method
Materials	HMA Mixture Type, Aggregates & PG Binder (Correct Type)	1 per Day	HMA Production Facility	Visual Check + Manufacturer COC
	Rubberized Asphalt Sealant (Correct Type)	1 per Day	At Paving Site	Check Manufacturer COC
Workmanship	Joint Location & Alignment	50% of Sublots, Once per Joint	At Finished Joint	Visual Check
	Sawcut Joint Vertical Face	50% of Sublots, Once per Joint	Joint Vertical Face	Visual Check
	Rubberized Asphalt Sealant Application Rate	50% of Sublots, Once per Joint	Joint Vertical Face	Visual Check + Check Measurement
	Physical Segregation	50% of Sublots, Once per Lane	Compacted HMA	Visual Check
	Cross-Slope	50% of Sublots, Once per Lane	Compacted HMA	Check Measurement
	Joint Tightness	50% of Sublots, Once per Joint	Compacted HMA	Visual Check
	Joint Surface Deviations	50% of Sublots, Once per Joint	At Finished Joint	10 foot (3 meter) standard straightedge

450.74 Acceptance Sampling & Testing.

A. Random Sampling.

The Department will utilize stratified random sampling to determine the overall quality of each HMA Lot produced and placed. Random Acceptance sample locations will be determined by the Engineer in accordance with ASTM D 3665 or by electronic random number generator, as presented by the NETTCP. All random Acceptance sample locations will be documented on NETTCP Standard Test Report Form D3665.

The Contractor shall furnish the Engineer with approved containers for all Acceptance samples. The Engineer will obtain all random Acceptance samples independent of the Contractor's QC samples at the frequencies outlined below.

(1) Sampling HMA Category A Lots. The Engineer will obtain Acceptance samples from a minimum of 25% of all Sublots in each HMA Category A Lot for all Quality Characteristics specified in Table 450.17, other than PG Asphalt Binder Grading and Ride Quality. Acceptance samples For PG Asphalt Binder Grading and Ride Quality will be obtained from each Sublot as defined in Table 450.17.

(2) Sampling HMA Category B Lots.

The Engineer will obtain Acceptance samples from a minimum of 50% of all Sublots, but not less than three (3) Sublots, in each HMA Category B Lot for all Quality Characteristics specified in Table 450.17, other than PG Asphalt Binder Grading and Ride Quality. Acceptance samples For PG Asphalt Binder Grading and Ride Quality will be obtained from each Sublot as defined in Table 450.17.

(3) Sampling HMA Category C Lots.

The Engineer will obtain Acceptance samples from 100% of all Sublots in each HMA Category C Lot for all Quality Characteristics specified in Table 450.17, other than Ride Quality. Acceptance sampling and testing for Ride Quality will not be performed on Category C Lots.

B. Selective Sampling.

The Department will utilize selective sampling (i.e. non-random samples) as needed to provide supplemental information to assist in quantifying the quality of apparent nonconforming material. When the results of acceptance inspection or random sampling and testing identify material which is not in conformance with the applicable Quality Limits for the particular HMA Lot Category, the Engineer will isolate the corresponding Sublot(s) and perform selective sampling to further assess the quality of the Sublot. Selective inspection or testing will be used to determine the limits of nonconformance, followed by random inspection or testing to quantify the actual quality of the nonconforming area. The test results of selective Acceptance samples will not be combined with random Acceptance sample data in the determination of Lot acceptance using Quality Level Analysis as outlined in Subsection 450.78.

C. Contractor Assistance in Obtaining Acceptance Samples.

The Engineer will obtain all material samples for Acceptance testing by the Department. When requested by the Department, the Contractor shall assist the Engineer in obtaining Acceptance samples in accordance with the following requirements:

- The Acceptance sample location and time will be randomly selected by the Engineer and provided to the Contractor immediately prior to sampling.
- The Contractor's qualified QC personnel will only provide the physical labor to assist the Engineer in obtaining the Acceptance sample.
- The Engineer will be present to direct and monitor the taking of the sample.
- The Engineer will take immediate possession of the Acceptance sample.

Contractor assistance may be requested in obtaining Acceptance samples for PG Asphalt Binder Grading and for In-Place Density and Thickness (HMA cores). The Contractor shall provide adequate traffic control for the Department to obtain cores, regardless of whether the Contractor assists the Engineer in obtaining the Acceptance core samples.

D. Acceptance Sample Identification System.

The Department will use a standard system for the identification of all Acceptance samples. All PG Asphalt Binder samples, HMA loose mixture samples, and core samples will be labeled by the Engineer with the minimum information indicated under Subsection 450.65C. Acceptance sampling data for Ride Quality and Wheel Path Deviations will be identified by the Engineer in accordance with the Department's Standard Operating Procedures (SOPs).

E. Retention of Split Samples.

Qualified Department personnel will obtain all material samples (PGAB samples, HMA loose mix samples, and cores) for Acceptance testing. The Department will retain split samples from each PGAB sample and HMA loose mix sample and provide a split sample to the Contractor if requested. The Department will retain the original core samples after testing to serve as "split samples" and protect them from damage. All split samples will be stored for a period of (30) days, or until tested. These split samples will be utilized if necessary, in the Dispute Resolution process. If mutually agreed upon by the Department and the Contractor, the retained split samples may be discarded prior to the required thirty (30) days.

F.Acceptance Testing of HMA Lots.

The Department will perform Acceptance testing using the random samples obtained in accordance with Subsection 450.74A from the HMA production facility and at the site of HMA field placement. The specific Quality Characteristics subject to Department Acceptance testing are identified in Table 450.17. All Acceptance testing of HMA Lots will be performed by the Engineer in accordance with the AASHTO, ASTM, NETTCP, or Department test methods specified in Table 450.17 and the procedures outlined below. The Engineer will furnish a copy of all Department Acceptance test results/data to the Contractor within five (5) days following completion of testing.

(1) PG Asphalt Binder Grading.

The Department will review the Supplier's Certificate of Compliance (COC) and corresponding certified AASHTO M320 test results submitted by the Contractor for each Supplier Lot of PGAB from which the HMA Producer's PGAB was obtained. The Engineer will also obtain and test a minimum of one random Acceptance sample of PGAB for each 12,000 ton (11,000 Mg) HMA Sublot, as defined in Table 450.17, to determine conformance with AASHTO M320. A minimum of two 1-quart (1-Liter) containers of PGAB will be obtained for each Acceptance sample from the HMA Producer's tanks in accordance with AASHTO T40. All PGAB Acceptance samples will be split prior to testing and the un-tested portion of the sample will be retained for a minimum of 30 days.

(2) PG Asphalt Binder Content.

The Engineer will test each HMA Lot produced and placed for PG Asphalt Binder Content in accordance with either AASHTO T164 or T308. When AASHTO T164 is used, the test results will be reported prior to ash correction. The Sublot size and minimum frequency of Acceptance testing for PG Asphalt Binder Content will be as specified in Table 450.17. Each material sample for PG Asphalt Binder Content will be obtained at the HMA plant from a randomly selected quadrant from the haul vehicle in accordance with ASTM D3665 and AASHTO T168.

Table 450.17 - Department Acceptance Sampling and Testing of HMA Lots

Quality Characteristic	Test Method(s)	Sublot Size	Minimum Test Frequency	Point of Sampling	Sampling Method
PG Asphalt Binder Grading	AASHTO M320	12,000 tons (11,000 Mg) of HMA using same PG Grade	1 per Sublot	From Tank Valve at HMA Plant	Random AASHTO T40
PG Asphalt Binder Content	AASHTO T164 or AASHTO T308	600 tons (550 Mg)	1 per Sublot sampled per Subsection 450.74A(1)	From Haul Vehicle at HMA Plant	Random AASHTO T168
Volumetrics: Air Voids	AASHTO T245	600 tons (550 Mg)	1 per Sublot sampled per Subsection 450.74A(1)	From Haul Vehicle at HMA Plant	Random AASHTO T168
In-place HMA Mat Density (Cores)	AASHTO T269 AASHTO T230 AASHTO T209 AASHTO T166	600 tons (550 Mg)	1 per Sublot sampled per Subsection 450.74A(1)	From Compacted HMA Course	Random AASHTO T269
In-place HMA Mat Density (Bridge Courses)	ASTM D2950 or AASHTO TP68	150 tons (140 Mg)	1 per Sublot sampled per Subsection 450.74A	From Compacted HMA Course	Random ASTM D2950 or AASHTO TP68
Thickness	AASHTO T269	600 tons (550 Mg)	1 per Sublot sampled per Subsection 450.74A(1)	From Compacted HMA Course	Random AASHTO T269
Ride Quality (IRI)	AASHTO PP52 per Subsection 450.65F(11)	0.1 miles (160 meters) per each Wheel Path	1 Per Sublot	Each Pavement Course per Subsection 450.65F(11)	Random per Subsection 450.65F(11)
Wheel Path Deviations	10 foot (3 meter) standard straightedge	0.1 miles (160 meters) per each Wheel Path	1 per Sublot sampled per Subsection 450.74A(1)	Each Pavement Course per Subsection 450.65F(12)	Random per Subsection 450.65F(12)

(1) In the event that the total daily HMA production is less than one Sublot but greater than 150 tons (140 Mg), a minimum of one random Acceptance sample shall be obtained for the day's production.

(3) Volumetrics (Air Voids).

The Engineer will test each HMA Lot produced and placed for Volumetrics (Air Voids) in accordance with AASHTO T245. The requirement for Volumetric testing of laboratory compacted specimens applies to HMA mixtures for all pavement courses, with the exception of Open Graded Friction Courses and Base Courses. The Sublot size and minimum frequency of Acceptance testing for Volumetrics will be as specified in Table 450.17. Each material sample for Volumetrics will be obtained at the HMA plant from a randomly selected quadrant from the haul vehicle in accordance with ASTM D3665 and AASHTO T168.

(4) In-Place HMA Mat Density.

The Engineer will test each HMA Lot produced and placed for In-place HMA Mat Density. The requirement for In-Place Density testing applies to all pavement courses, with the exception of Open Graded Friction Courses and Leveling Courses, as outlined below.

(a) Testing In-Place Density by Cores. Acceptance testing of HMA pavement courses (other than bridge courses) for In-place Density will be performed using cores in accordance with the procedures outlined in Subsection 450.65F(8)(b). The Sublot size and minimum frequency of Acceptance testing for In-place Density of HMA pavement courses by core will be as specified in Table 450.17.

(b) Testing In-Place Density by Density Gauge. Acceptance testing of all HMA Bridge Protective Courses and Bridge Surface Courses for In-place Density will be performed using a density gauge in accordance with the procedures outlined in Subsection 450.65F(8)(a). The Sublot size and minimum frequency of Acceptance testing for In-place Density of HMA bridge courses by density gauge will be as specified in Table 450.17.

(5) Thickness.

Each HMA pavement course specified to be placed at a compacted thickness of 1 inch (25mm) or greater, with the exception of the HMA pavement courses identified in Subsection 450.65F(9), will be tested by the Engineer for Thickness using cores. Acceptance sampling and testing for Thickness of the applicable pavement courses shall be in accordance with AASHTO T269. The Sublot size and minimum frequency of Acceptance testing for Thickness will be as specified in Table 450.17.

(6) Ride Quality.

Department Acceptance testing for Ride Quality will be required for all projects having a posted speed equal to or greater than 40 mph (65 km/hr) with HMA Lots falling under Lot Category A or Category B. The Engineer will perform Ride Quality testing on the final HMA pavement course placed (either Surface Course or OGFC, when specified) for all mainline travel lanes, auxiliary lanes, ramps, and side road travel lanes using an inertial profiler in accordance with the procedures outlined in Subsection 450.65F(11). Pavement courses and surfaces that are specifically excluded from Acceptance testing for Ride Quality are as specified in Subsection 450.65F(11)(a). The Sublot size and minimum frequency of Acceptance testing for Ride Quality will be as specified in Table 450.17.

The inertial profiler equipment used to perform Acceptance testing will be certified and correlated by the Department in accordance with the requirements and procedures outlined in Subsection 450.65F(11). The Department Acceptance data and Contractor QC data will be correlated and normalized using statistical procedures. The normalization of data will be based on the measurement difference/bias from the Department Reference Profiling Device determined during the device correlation conducted at the Profiling Center by UMass Dartmouth. The Department will provide software and procedures to perform the data normalization. The normalized Acceptance Ride Quality data and QC Ride Quality data will be used to determine the quality level (PWL) and corresponding pay for each Lot.

(7) Wheel Path Deviations.

Each HMA Lot produced and placed will be tested by the Engineer for Wheel Path Deviations (high points or low points) using a 10 foot (3 meter) standard straightedge in accordance with the procedures outlined in Subsection 450.65F(12). Acceptance testing for Wheel Path Deviations applies to

all pavement courses (including bridge protective courses and bridge surface courses). The finished surface of each required pavement course will be tested for all mainline travel lanes, auxiliary lanes, ramps, and side road travel lanes. The Sublot size and minimum frequency of Acceptance testing for Wheel Path Deviations will be as specified in Table 450.17.

450.75 Split Sample Correlation.

Split Sample Correlation is an important part of the Department acceptance system for HMA Category A Lots and Category B Lots. Split Sample Correlation shall be performed when Validated Contractor QC test data is to be included in the acceptance determination. The purpose of Split Sample Correlation testing is to identify and eliminate any discrepancies in testing procedures or equipment that could result in significant differences between the Contractor's QC testing results and the Engineer's Acceptance testing results.

Either prior to or on the first day of production and placement of any HMA Category A Lot or Category B Lot, the Contractor and the Department will conduct Split Sample Correlation. The Engineer or the Contractor may also request that Split Sample Correlation be performed at any time during HMA Lot production and placement. Department IA personnel may also test a split of the Correlation samples.

Split Sample Correlation will be performed on split material samples for those Quality Characteristics identified in Table 450.18. Correlation samples for HMA mixture testing shall be either laboratory prepared specimens or plant produced HMA specimens. Samples for HMA Category A Lots may be obtained from the Control Strip Lot. Correlation testing of the Contractor's QC ride quality testing equipment and the Department's Acceptance ride quality testing equipment will be performed in accordance with Subsection 450.65F(11)(c).

Table 450.18 Split Sample Correlation Allowable Differences

Quality Characteristic	Allowable Difference Between Contractor and Department Split Samples
Maximum Theoretical Specific Gravity (Gmm)	+/- 0.020
Bulk Specific Gravity (Gmb)	+/- 0.030
PG Asphalt Binder Content	+/- 0.4%
Volumetrics - Air Voids	+/- 1.4%
In-Place HMA Mat Density	+/- 1.4%
Thickness	+/- 10 %
Ride Quality (IRI)	Per Subsection 450.65F(11)(c)

If the Contractor's Split Sample Correlation results differ from the Department's results by more than the allowable differences specified in Table 450.18, then the Contractor and the Department shall determine and resolve the reasons for the differences prior to the start or continuation of HMA Lot production and placement.

450.76 Lot Acceptance Determination Based on Inspection Results.

The Department's Acceptance Inspection results will be used in the final acceptance determination for all HMA Lots (Lot Category A, B, and C). Prior to final acceptance of each HMA Lot produced and placed, the Department will periodically evaluate all Acceptance inspection information for the prepared underlying surface and the Lot. The materials and product workmanship for the completed Work will be evaluated for conformance with the plans and the requirements specified in Subsections 450.53 thru 450.58.

When the Acceptance information identifies deficiencies in either material quality or product workmanship for any underlying surface location or HMA Sublot(s), the location or Sublot(s) will be

isolated and further evaluated by the Engineer through additional Acceptance inspection (or sampling and testing, if relevant or possible). Depending upon the findings of the additional Acceptance inspection activity, the Engineer will determine the disposition of the nonconforming Work in accordance with Division I, Subsection 5.03, Conformity with Plans and Specifications.

After each HMA Lot (and corresponding prepared underlying surface) is complete, including any corrective action, the Engineer will evaluate all Acceptance inspection information for the Work. The Department will accept the subject Work if the Engineer's evaluation of all inspection information for the completed Lot (and underlying surface) indicates that the corresponding materials and product workmanship meet the specified requirements (provided the evaluation of all Acceptance testing data for the subject Work per Subsection 450.77 also finds the Work to be acceptable).

450.77 Lot Acceptance Determination Based on Testing Data.

A. Evaluation of Lot Category A Testing Data.

Prior to final acceptance of each HMA Category A Lot produced and placed, the Engineer will periodically evaluate all available Department Acceptance testing data for the Lot.

The Contractor's random QC testing data for each Lot will be included with the Department's random Acceptance testing data in the acceptance determination, provided that the QC data has been Validated in accordance with paragraph (1) below. The Department's Acceptance data and all Validated Contractor QC data will be evaluated using the Quality Limits specified in Table 450.19 and as further outlined below.

(1) Validation of Contractor QC Test Results.

Validation is defined as the mathematical comparison of two independently obtained sets of data to determine whether it can be assumed they came from the same Population. The Validation of each HMA Lot will be performed through a statistical comparison of the Engineer's random Acceptance testing data and the Contractor's random QC testing data for the Lot.

The statistical comparison of testing data will be made using the test result Variances (***F-test***) and the test result Means (***t-test***) at a significance level of 0.01 and in accordance with the procedures contained in Appendix F of the *AASHTO Implementation Manual For Quality Assurance* (February 1996). The Validation worksheet in the Department's MS-Excel QA Data Spreadsheets will be used to perform the Validation of each Lot.

If the Validation results indicate that the Contractor's QC test results and the Department's Acceptance test results can be assumed to be from the same Population, then the Contractor's QC test results will be included with the Department's Acceptance test results in the final acceptance determination for each Lot.

If the Validation results indicate that the Contractor's QC test results and the Department's Acceptance test results cannot be assumed to be from the same Population, then the Department will endeavor to determine the reason for the difference between the two data sets. If a reason for the difference cannot be determined, then only the Department's Acceptance test results will be used in the final acceptance determination for each Lot.

(2) Conformance with Engineering Limits.

The Engineer will evaluate all Department Acceptance testing data and Validated Contractor QC testing data for each Category A Lot to determine conformance with the Engineering Limits in Table 450.19. Each Sublot test value for the Acceptance Quality Characteristics identified in Table 450.19 shall be within the Engineering Limits.

If a Sublot test result is outside of the Engineering Limits, the Engineer will further assess the Sublot quality to determine whether the material in the Sublot can remain in place. The Engineer will isolate the Sublot and perform selective sampling followed by additional random sampling (if possible) within the Sublot to quantify the actual quality of the Sublot. The Engineer will determine the disposition of the Sublot in accordance with Division I, Subsection 5.03, Conformity with Plans and Specifications.

If the Engineer's assessment determines that the material quality is sufficient to permit the Sublot to remain in place without corrective action, all random testing data for the Sublot (including the original out of Engineering Limit test result) will be included in the Quality Level Analysis for the Lot in accordance with paragraph (3) below.

When a nonconforming Sublot is corrected or replaced, the Engineer will perform Acceptance testing of the Sublot and evaluate the test results for conformance with the Engineering Limits. The Acceptance test data for the corrected Sublot will replace the original Acceptance test result and will be include in the Quality Level Analysis for the Lot in accordance with paragraph (3) below. Once the above requirements have been met, the Department will accept all completed Sublots, provided that the overall Lot quality is above the Acceptance Limit as further outlined below.

(3) Analysis of Lot Quality Level.

For each HMA Category A Lot, the Engineer will determine the Lot Quality Level, for the applicable Quality Characteristics in Table 450.19, using the Quality Level Analysis (QLA) procedures outlined in Subsection 450.78. The QLA procedure will evaluate all Department Acceptance testing data and Validated Contractor QC testing data using the Specification Limits in Table 450.19. The Department's MS-Excel QA Data Spreadsheets will be used to perform the QLA for each Lot.

All random test results that are within the Engineering Limits will be included in the Quality Level Analysis. Individual Sublot test results that are beyond the Engineering Limits, but for which the corresponding Sublot is permitted to remain in place per paragraph (2) above, will also be included in the Quality Level Analysis.

The QLA procedure will determine the Percent Within Limits (PWL) for each Lot. The Acceptance Limit for each completed Lot is 60 PWL. Each Lot must achieve a final Quality Level of at least 60 PWL in order to be accepted by the Department.

If the final computed Lot Quality Level is at 90 PWL, the Contractor will receive full payment at the unit bid price for the Lot. If the Lot Quality Level is greater than 90 PWL, the Contractor will receive an incentive pay adjustment for the Lot in accordance with Subsection 450.92. If the Lot Quality Level is less than 90 PWL but greater than or equal to 60 PWL, the Contractor will receive a disincentive pay adjustment for the Lot. If the final computed Lot Quality Level is below 60 PWL, the Lot will be rejected.

(4) Final Lot Acceptance Determination.

After each HMA Category A Lot is complete, including any corrective action, the Engineer will perform a final evaluation of all Department Acceptance data and Validated Contractor QC data for the Lot. The Department will accept the subject Lot if the Engineer's evaluation of all testing data for the Lot is in conformance with the applicable Quality Limits as outlined in paragraph (2) and paragraph (3) above.

Table 450.19 - Quality Limits for Acceptance of HMA Lots

Quality Characteristic	Target	Specification Limits		Engineering Limits		Acceptance Limit
		LSL	USL	LEL	UEL	
PG Asphalt Binder Grading	Per Binder Grade specified	N/A	N/A	Per AASHTO M320	Per AASHTO M320	N/A
PG Asphalt Binder Content	Per JMF	Target - 0.3 %	Target + 0.3 %	Target - 0.4 %	Target + 0.4 %	60 PWL
Volumetrics: Air Voids	4 %	2.7 %	5.3 %	2 %	6 %	60 PWL
In-Place HMA Mat Density (Cores)	95 % of G_{mm}	92.5 % of G_{mm}	97.5 % of G_{mm}	92 % of G_{mm}	98 % of G_{mm}	60 PWL
In-Place HMA Mat Density (Bridge Courses)	95 % of G_{mm}	N/A	N/A	90 % of G_{mm}	N/A	N/A
Thickness: (All Courses 1 inch (25mm) or greater)	Per Plans	-20 % of Target Thickness	+20 % of Target Thickness	-30 % of Target Thickness	+30 % of Target Thickness	60 PWL
Ride Quality: Greater than or equal to 55 mph (90 km/hr)	65 in/mile (1.03 m/km)	N/A	90 in/mile (1.42 m/km)	N/A	100 in/mile (1.58 m/km)	60 PWL
Ride Quality: 40mph (65 km/hr) to 55 mph (90 km/hr)	80 in/mile (1.26 m/km)	N/A	115 in/mile (1.82 m/km)	N/A	135 in/mile (2.13 m/km)	60 PWL
Ride Quality: Less than 40 mph (65 km/hr)	Not subject to ride testing					
Wheel Path Deviations	0 inches	N/A	N/A	Target - 0.25 in. (6 mm)	Target + 0.25 in. (6 mm)	N/A

B. Evaluation of Lot Category B Testing Data.

Prior to final acceptance of each HMA Category B Lot produced and placed, the Engineer will periodically evaluate all available Department Acceptance testing data for the Lot.

The Contractor's random QC testing data for each Lot will be included with the Department's random Acceptance testing data in the acceptance determination, provided that the QC data has been Validated. The Department's Acceptance data and all Validated Contractor QC data will be evaluated for conformance with Engineering Limits and for Lot Quality Level in accordance with the requirements of Subsection 450.77A above using the applicable Quality Limits specified in Table 450.19.

After each HMA Category B Lot is complete, including any corrective action, the Engineer will perform a final evaluation of all Department Acceptance data and Validated Contractor QC data for the Lot. The Department will accept the subject Lot if the Engineer's evaluation of all testing data for the Lot is in conformance with the applicable Quality Limits.

C. Evaluation of Lot Category C Testing Data.

For each HMA Category C Lot produced and placed, the Engineer will evaluate all Department Acceptance testing data for the Lot entered into the Department's MS-Excel QA Data Spreadsheets after all HMA Sublots are complete in-place. The Contractor's random QC testing data for each Lot will not be included with the Department's random Acceptance testing data in the acceptance determination. The individual Sublot test results for each HMA Category C Lot will be evaluated against the Specification Limits contained in Table 450.19 (Note: the Engineering Limits are not applied since the inherent variability for Minor Lot quantities is expected to be within the Specification Limits). Work under HMA Lot Category C will not be subject to an evaluation of Lot Quality Level using QLA procedures.

If a Sublot test result is outside of the Specification Limits, the Engineer will further assess the Sublot quality in accordance with the requirements of Subsection 450.77A(2). The Engineer will determine the disposition of the Sublot in accordance with Division I, Subsection 5.03, Conformity with Plans and Specifications.

After each HMA Category C Lot is complete, including any corrective action, the Engineer will perform a final evaluation of all Department Acceptance data. The Department will accept the subject Lot if the Engineer's evaluation of the testing data for each Sublot is in conformance with the Specification Limits.

450.78 Quality Level Analysis Procedures.

For each Quality Characteristic subject to analysis of Lot Quality Level, the Quality Level Analysis (QLA) - Standard Deviation Method will be used to determine the percentage of the Lot that is within the Specification Limits. The number of significant figures retained in each step of the QLA calculations and the rounding of all reported values will be as established in the Department's MS Excel QA Data Spreadsheets. The estimated percentage of Work that is within the Specification Limits for a given Lot will be determined as follows:

A. Step 1 – Determine Lot Mean.

The Mean (X) will be determined for each Lot using all random Department Acceptance sample test values and all random Contractor QC sample test values (provided they have been Validated). The Mean is calculated using the following equation:

$$X = \Sigma x / n$$

Where: $\sum$ = summation of
x = individual test value of each material sample n = total number of material samples tested

B. Step 2 – Determine Lot Standard Deviation.

The Standard Deviation (s) will be determined for each Lot using all random Department Acceptance sample test values and all random Contractor QC sample test values (provided they have been Validated). The Standard Deviation is calculated using the following equation:

$$s = \sqrt{\frac{n\sum(x^2) - (\sum x)^2}{n(n-1)}}$$

Where: $\Sigma(x^2)$ = summation of the squares of individual test values
$(\Sigma x)^2$ = summation of the individual test values squared

C. Step 3 – Determine Upper Quality Index for Lot.

The Upper Quality Index (QU) will be determined for each Lot using the Lot Mean and Lot Standard Deviation calculated in Step 1 and Step 2 above. The Upper Quality Index is calculated using the following equation:

$$Q_u = (USL - X) / s$$

Where: USL = Upper Specification Limit from Table 450.19
X = The Lot Mean
s = The Lot Standard Deviation

D. Step 4 – Determine Lower Quality Index for Lot.

The Lower Quality Index (QL) will be determined for each Lot using the Lot Mean and Lot Standard Deviation calculated in Step 1 and Step 2 above. The Upper Quality Index is calculated using the following equation:

$$Q_L = (X - LSL) / s$$

Where: LSL = Lower Specification Limit from Table 450.19
X = The Lot Mean
s = The Lot Standard Deviation

E. Step 5 – Determine Percentage of Lot Below Upper Specification Limit.

The estimated percentage of the Lot falling below the Upper Specification Limit (PU) will be determined using Table 450.20. The PU value is determined from the table by entering the column for the number of material samples (n) representing the Lot and locating the row that corresponds to the Q_u value determined in Step 3 above. If no USL is specified in Table 450.20, the PU value is equal to 100.

F. Step 6 – Determine Percentage of Lot Above Lower Specification Limit.

The estimated percentage of the Lot falling above the Lower Specification Limit (PL) will be determined using Table 450.20. The PL value is determined from the table by entering the column for the number of material samples (n) representing the Lot and locating the row that corresponds to the QL value determined in Step 4 above. If no LSL is specified in Table 450.20, the PL value is equal to 100.

G. Step 7 – Determine Estimated Percent Within Limits for Lot.

The Lot Quality Level will be determined by estimating the Percent Within Limits (PWL). The PWL is determined using the PU value from Step 5 and the PL value from Step 6 above. The Percent Within Limits is calculated using the following equation:

$$PWL = (P_U + P_L) - 100$$

Table 450.20 - Values for Estimating Percent of Lot Within Specification Limits

P_U Or P_L (%)*	Upper Quality Index (Q_U) or Lower Quality Index (Q_L)														
	n = 3	n = 4	n = 5	N = 6	n = 7	n = 8	n = 9	n = 10 to n = 11	n = 12 to n = 14	n = 15 to n = 18	n = 19 to n = 25	n = 26 to n = 37	n = 38 to n = 69	n = 70 to n = 200	n = 201 to n = ∞
100	1.16	1.50	1.79	2.03	2.23	2.39	2.53	2.65	2.83	3.03	3.20	3.38	3.54	3.70	3.83
99		1.47	1.67	1.80	1.89	1.95	2.00	2.04	2.09	2.14	2.18	2.22	2.26	2.29	2.31
98	1.15	1.44	1.60	1.70	1.76	1.81	1.84	1.86	1.91	1.93	1.96	1.99	2.01	2.03	2.05
97		1.41	1.54	1.62	1.67	1.70	1.72	1.74	1.77	1.79	1.81	1.83	1.85	1.86	1.87
96	1.14	1.38	1.49	1.55	1.59	1.61	1.63	1.65	1.67	1.68	1.70	1.71	1.73	1.74	1.75
95		1.35	1.44	1.49	1.52	1.54	1.55	1.56	1.58	1.59	1.61	1.62	1.63	1.63	1.64
94	1.13	1.32	1.39	1.43	1.46	1.47	1.48	1.49	1.50	1.51	1.52	1.53	1.54	1.55	1.55
93		1.29	1.35	1.38	1.40	1.41	1.42	1.43	1.44	1.44	1.45	1.46	1.46	1.47	1.47
92	1.12	1.26	1.31	1.33	1.35	1.36	1.36	1.37	1.37	1.38	1.39	1.39	1.40	1.40	1.40
91	1.11	1.23	1.27	1.29	1.30	1.30	1.31	1.31	1.32	1.32	1.33	1.33	1.33	1.34	1.34
90	1.10	1.20	1.23	1.24	1.25	1.25	1.26	1.26	1.26	1.27	1.27	1.27	1.28	1.28	1.28
89	1.09	1.17	1.19	1.20	1.20	1.21	1.21	1.21	1.21	1.22	1.22	1.22	1.22	1.22	1.23
88	1.07	1.14	1.15	1.16	1.16	1.16	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17
87	1.06	1.11	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.13	1.13
86	1.04	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
85	1.03	1.05	1.05	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
84	1.01	1.02	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99
83	1.00	0.99	0.98	0.97	0.97	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.95	0.95	0.95
82	0.97	0.96	0.95	0.94	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
81	0.96	0.93	0.91	0.90	0.90	0.89	0.89	0.89	0.89	0.88	0.88	0.88	0.88	0.88	0.88
80	0.93	0.90	0.88	0.87	0.86	0.86	0.86	0.85	0.85	0.85	0.85	0.84	0.84	0.84	0.84
79	0.91	0.87	0.85	0.84	0.83	0.82	0.82	0.82	0.82	0.81	0.81	0.81	0.81	0.81	0.81
78	0.89	0.84	0.82	0.80	0.80	0.79	0.79	0.79	0.78	0.78	0.78	0.78	0.77	0.77	0.77
77	0.87	0.81	0.78	0.77	0.76	0.76	0.76	0.75	0.75	0.75	0.75	0.74	0.74	0.74	0.74
76	0.84	0.78	0.75	0.74	0.73	0.73	0.72	0.72	0.72	0.71	0.71	0.71	0.71	0.71	0.71
75	0.82	0.75	0.72	0.71	0.70	0.70	0.69	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.67
74	0.79	0.72	0.69	0.68	0.67	0.66	0.66	0.66	0.66	0.65	0.65	0.65	0.65	0.64	0.64
73	0.76	0.69	0.66	0.65	0.64	0.63	0.63	0.63	0.62	0.62	0.62	0.62	0.62	0.61	0.61
72	0.74	0.66	0.63	0.62	0.61	0.60	0.60	0.60	0.59	0.59	0.59	0.59	0.59	0.58	0.58
71	0.71	0.63	0.60	0.59	0.58	0.57	0.57	0.57	0.57	0.56	0.56	0.56	0.56	0.55	0.55
70	0.68	0.60	0.57	0.56	0.55	0.55	0.54	0.54	0.54	0.53	0.53	0.53	0.53	0.53	0.52
69	0.65	0.57	0.54	0.53	0.52	0.52	0.51	0.51	0.51	0.50	0.50	0.50	0.50	0.50	0.50
68	0.62	0.54	0.51	0.50	0.49	0.49	0.48	0.48	0.48	0.48	0.47	0.47	0.47	0.47	0.47
67	0.59	0.51	0.47	0.47	0.46	0.46	0.46	0.45	0.45	0.45	0.45	0.44	0.44	0.44	0.44
66	0.56	0.48	0.45	0.44	0.44	0.43	0.43	0.43	0.42	0.42	0.42	0.42	0.41	0.41	0.41
65	0.52	0.45	0.43	0.41	0.41	0.40	0.40	0.40	0.40	0.39	0.39	0.39	0.39	0.39	0.39
64	0.49	0.42	0.40	0.39	0.38	0.38	0.37	0.37	0.37	0.37	0.36	0.36	0.36	0.36	0.36
63	0.46	0.39	0.37	0.36	0.35	0.35	0.35	0.34	0.34	0.34	0.34	0.34	0.33	0.33	0.33
62	0.43	0.36	0.34	0.33	0.32	0.32	0.32	0.32	0.31	0.31	0.31	0.31	0.31	0.31	0.31
61	0.39	0.33	0.31	0.30	0.30	0.29	0.29	0.29	0.29	0.29	0.28	0.28	0.28	0.28	0.28
60	0.36	0.30	0.28	0.27	0.27	0.27	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.25	0.25
59	0.32	0.27	0.25	0.25	0.24	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23	0.23
58	0.29	0.24	0.23	0.22	0.21	0.21	0.21	0.21	0.21	0.21	0.20	0.20	0.20	0.20	0.20
57	0.25	0.21	0.20	0.19	0.19	0.19	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
56	0.22	0.18	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15
55	0.18	0.15	0.14	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
54	0.14	0.12	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
53	0.11	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
52	0.07	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
51	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: For negative values of Q_U or Q_L, P_U or P_L is equal to 100 minus the table value for P_U or P_L.

If the value of Q_U or Q_L does not correspond exactly to a value in the table, use the next higher value. *Percent Within limits for positive values of Q_U or Q_L

DISPUTE RESOLUTION

450.80 Disputable items

The Contractor or the Department may dispute any of the test values that are utilized in the acceptance determination for a given Lot. The specific Quality Characteristics which may be disputed are as listed in Table 450.21 below.

450.81 Basis for Dispute

Differences from one individual Contractor QC test value to another (or from one individual Department Acceptance test value to another) within a Lot are expected due to inherent variability. Differences are also expected between the QC test values and the Acceptance values for a given Lot as a result of inherent variability. An individual QC test value cannot be directly compared to an individual Acceptance test value since the samples are randomly obtained independent of one another. However, if one or more of the Contractor's random QC test values for a Lot significantly differs from the Department's Acceptance test values for the same Lot, either party may dispute the validity of an individual test value.

450.82 Dispute Resolution Samples

Samples used for Dispute Resolution testing shall be the split samples required to be retained for thirty (30) days by the Contractor and the Department in accordance with Subsection 450.65D and Subsection 450.74E. Original cores are to be retained and shall be protected from damage. If In-place density or thickness is disputed, then the original core, unless damaged, will be used in the Dispute Resolution process. If the original disputed core is damaged, then a new core shall be obtained from within a 2-foot (600mm) radius of the location of the original core by the party whose data is being disputed in the presence of the other party. If ride quality smoothness test data is disputed, then the disputed Sublot(s) shall be resampled/retested by the party whose data is being disputed in the presence of the other party.

450.83 Dispute Resolution Steps

The Contractor may dispute the Department's Acceptance results and the Department may dispute the Contractor's Quality Control results by requesting that the dispute resolution split sample be tested. Such a request, either from the Contractor or the Department, must be made in writing within five days after the original sample was obtained. The following shall be provided in the written request:

- Sample reference number, including Lot and Sublot
- The specific Quality Characteristic and test result(s) being disputed
- The complete NETTCP test report form containing the disputed results

A. Step 1 – Split Sample Correlation.

Immediately prior to conducting testing for Dispute Resolution, the Contractor's QC testing personnel, the Department's Acceptance testing personnel (from the District), and a Department Independent Assurance (IA) technician will conduct Split Sample Correlation testing as detailed in Subsection 450.75. Split Sample Correlation testing will be conducted on a separate material sample obtained independent from the original sample and the Dispute Resolution sample. The purpose of the Split Sample Correlation testing is to determine if testing procedures or equipment utilized by the Contractor or the Department might be the cause of the disputed result(s).

B. Step 2 – Dispute Resolution Sample Testing.

If a Department Acceptance test value is being disputed, the Department's Acceptance testing personnel (from the District) will test the Dispute Resolution split sample. If a Contractor QC test value is being disputed, the Contractor's QC testing personnel will test the Dispute Resolution split sample. In either case, testing of the Dispute Resolution split sample shall be performed by the same Contractor QC testing personnel and Department Acceptance testing personnel that performed the split sample correlation in step 1 above. Testing of the Dispute Resolution split sample shall be performed in the presence of both the Contractor and the Department.

C. Step 3 – Additional Dispute Resolution Testing.

If either the Contractor or the Department believes that the results of the Dispute Resolution split sample testing in Step 2 above do not conclusively resolve the dispute, additional sampling and testing within the disputed Sublot may be requested. In such case, an independent AASHTO accredited laboratory will be utilized to obtain and test three (3) random samples from the disputed Sublot. The Mean of the three test results will be used as the Dispute Resolution test value.

450.84 Final Disposition.

If the difference between the original test value and the Dispute Resolution test value (as determined under either Step 2 or Step 3 above) is within the maximum test difference values listed in Table 450.21, then the original test value will be used in the acceptance determination for the Lot. If the difference between the original test value and the Dispute Resolution test value exceeds the maximum difference values in Table 450.21, then the Dispute Resolution test value will be used in the acceptance determination. In such case, the record of the original test value will be retained (with notation of the outcome of Dispute Resolution); however, it will not be used in calculating the Lot quality level.

Table 450.21 – Dispute Resolution Maximum Test Difference Values

Quality Characteristic	Maximum Test Difference
Maximum Specific Gravity (G_{mm})	+/- 0.020
Bulk Specific Gravity (G_{mm})	+/- 0.030
PG Asphalt Binder Content	+/- 0.4
Volumetrics - Air Voids	+/- 1.4
In-place HMA Mat Density	+/- 1.4
Thickness	+/- 10% of original value
Ride Quality (IRI)	+/- 10% of original value

COMPENSATION

450.90 Method of Measurement.

A. Patching.

HMA for Patching will be measured for payment by the ton (Megagram) and shall be the actual quantity complete, in place and accepted by the Engineer.

B. Tack Coat.

Asphalt Emulsion for Tack Coat, as required by the plans or these specifications, will be measured by the gallon (liter).

C. Joint Sealer.

HMA Joint Sealant used for sealing all longitudinal joints and transverse joints in HMA pavement courses will be measured by the linear foot (linear meter).

D. Hot Mix Asphalt.

Hot Mix Asphalt pavement course mixtures will be measured by the ton (Megagram) and shall be the actual pavement course quantity complete, in place and accepted by the Engineer. The quantity shall be determined only by weight slips that have been properly countersigned by the Engineer at the time of delivery.

E. Contractor Quality Control.

The Contractor's Quality Control system as specified in Subsection 450.60 through Subsection 450.69 will be measured by the ton (Megagram) and shall be represented by the actual quantity of HMA for Patching and all HMA pavement courses complete, in place and accepted by the Engineer.

450.91 Basis of Payment.

A. Patching.

HMA for Patching will be paid for at the contract unit price per ton (Megagram) of the HMA mixture type specified under Pay Item 451. Payment shall include all sawcutting, removal of existing distressed or unsound pavement, applying hot poured rubberized asphalt sealant to vertical faces, and transportation, delivery, placement, and compaction of HMA for Patching in accordance with Subsection 450.53C.

B. Tack Coat.

Asphalt Emulsion for Tack Coat will be paid for at the contract unit price per gallon (liter) of applied tack coat under Pay Item 452. Payment shall include sweeping existing surfaces and applying the tack coat to all required surfaces at the specified rate in accordance with Subsection 450.53F.

C. Joint Sealer.

HMA Joint Sealant will be paid for at the contract unit price per linear foot (linear meter) of joint sealed under Pay Item 453. Payment shall include application of the joint sealer to all longitudinal joints and transverse joints in HMA pavement courses as required and in accordance with Subsection 450.57.

D. Hot Mix Asphalt.

Each Hot Mix Asphalt pavement course will be paid for at the contract unit price per ton (Megagram) of in-place mixture under the HMA Pay Items specified (Pay Items 450.10 through 450.70). Payment shall include sweeping the underlying surface, transportation, delivery, placement (including providing a MTV when required), and compaction of each HMA pavement course in accordance with Subsection 450.54 through Subsection 450.58.

All sawcutting required for transverse joints or longitudinal joints in accordance with Subsection 450.57 shall also be included in the contract unit price for each HMA pavement course.

E. Contractor Quality Control.

The Contractor's Quality Control system will be paid for at the contract unit price per ton (Megagram) under Pay Item 450.90. Payment will be full compensation for all QC activities required under Subsection 450.50 through Subsection 450.69 including; the Construction Quality Meeting, providing the field reference system, preparing and maintaining the approved Quality Control Plan, preparing all HMA mixture designs, performing QC sampling, testing and inspection (including the Control Strip when required), evaluating all QC data, and maintaining proper QC records. No separate payment will be made for any assistance provided by the Contractor to the Engineer in obtaining Department Acceptance samples. Failure of the Contractor to perform adequate Quality Control in accordance with the specifications and the Contractor’s approved QC Plan will be justification for withholding payment.

450.92 Pay Adjustment (PA).

Payment for each HMA Category A Lot and Category B Lot will be determined based on the final Lot Quality Level (PWL) computed in accordance with the QLA procedures contained in Subsection 450.78. Pay adjustments will be determined for each of the Acceptance Quality Characteristics identified in Table 450.22. The relative pay adjustment weight assigned to each of the HMA Quality Characteristics is indicated in Table 450.22.

Table 450.22 - Pay Adjustment Weight Assigned to HMA Quality Characteristics

HMA Quality Characteristics	Pay Adjustment Weight
PG Asphalt Binder Content	10 percent
Volumetrics - Air Voids	25 percent
In-Place HMA Mat Density	25 percent
Thickness	10 percent
Ride Quality (IRI)	30 percent

A. Lot Pay Factor.

A Pay Factor (PF) will be determined for each HMA Lot using the Quality Level (PWL) computed for the Lot and the equation below:

$$PayFactor(PF) = [55 + 0.5(Quality\ Level)] / 100$$

The Lot Pay Factor will be used to determine the pay adjustment for each Quality Characteristic as further outlined below.

B. Pay Adjustment for PG Asphalt Binder Content.

Pay adjustment for PG Asphalt Binder Content shall be applied to Pay Item 999.490 at the completion of the HMA Lot. The total Lot pay adjustment for PG Asphalt Binder Content will be determined as follows:

$$PA_{PGAB} = \sum(PF_i - 1)\ (Q_i)\ (P_i)\ (0.10)$$

Where: PA_{PGAB} = Pay adjustment in dollars for PG Asphalt Binder Content.
PF_i = Pay factor based on Quality Level (PWL) of PG Asphalt Binder Content for individual Lot (i).
Q_i = Quantity represented by individual Lot (i) in tons (Mg).
P_i = Contract unit price per ton (Mg) for individual Lot (i).
0.10 = Weight given to PG Asphalt Binder Content pay adjustment

C. Pay Adjustment for Volumetrics (Air Voids).

Pay adjustment for Volumetrics (Air Voids) shall be applied to Pay Item 999.491 at the completion of the HMA Lot. The total Lot pay adjustment for Volumetrics (Air Voids) will be determined as follows:

$$PA_{Air\ Voids} = \sum(PF_i - 1)\ (Q_i)\ (P_i)\ (0.25)$$

Where: $PA_{Air\ Voids}$ = Pay adjustment in dollars for Volumetrics (Air Voids).
PF_i = Pay factor based on Quality Level (PWL) of Volumetrics (Air Voids) for individual Lot (i).
Q_i = Quantity represented by individual Lot (i) in tons (Mg).
P_i = Contract unit price per ton (Mg) for individual Lot (i).
0.25 = Weight given to Volumetrics (Air Voids) pay adjustment

D. Pay Adjustment for In-Place HMA Mat Density.

Pay adjustment for In-Place HMA Mat Density shall be applied to Pay Item 999.492 at the completion of the HMA Lot. The total Lot pay adjustment for In-Place HMA Mat Density will be determined as follows:

$$PA_{In\text{-}Place\ Density} = \sum(PF_i - 1)\ (Q_i)\ (P_i)\ (0.25)$$

Where: $PA_{In\text{-}Place\ Density}$ = Pay adjustment in dollars for In-Place HMA Mat Density.

PF_i = Pay factor based on Quality Level (PWL) of In-Place HMA Mat Density for individual Lot (i).

Q_i = Quantity represented by individual Lot (i) in tons (Mg).

P_i = Contract unit price per ton (Mg) for individual Lot (i).

0.25 = Weight given to In-Place HMA Mat Density pay adjustment

E. Pay Adjustment for Thickness.

Pay adjustment for Thickness shall be applied to Pay Item 999.493 at the completion of the HMA Lot. The total Lot pay adjustment for Thickness will be determined as follows:

$$PA_{Thickness} = \sum(PF_i - 1)\ (Q_i)(P_i)\ (0.10)$$

Where: $PA_{Thickness}$ = Pay adjustment in dollars for Thickness.

PF_i = Pay factor based on Quality Level (PWL) of Thickness for individual Lot (i).

Q_i = Quantity represented by individual Lot (i) in tons (Mg).

P_i = Contract unit price per ton (Mg) for individual Lot (i).

0.10= Weight given to Thickness pay adjustment.

F. Pay Adjustment for Ride Quality.

Pay adjustment for Ride Quality shall be applied to Pay Item 999.494 at the completion of all HMA Lots. Although Ride Quality Acceptance testing will be performed only on the final pavement course, the pay adjustment will be applied to the total quantity of all HMA pavement courses placed. Since each wheel path of the final pavement course represents a Lot for Ride Quality, the quantity for each Lot shall be computed by dividing the total quantity of all pavement courses placed by the number of wheel paths for all lanes tested in the final pavement course. The total Lot pay adjustment for Ride Quality will be determined as follows:

$$PA_{Ride\ Quality} = \sum(PF_i - 1)\ (\sum(Q_{pc})(P_{pc}))/N_{wp}\ (0.30))$$

Where: $PA_{Ride\ Quality}$ = Pay adjustment in dollars for Ride Quality.

PF_i = Pay factor based on Quality Level (PWL) of Ride Quality for individual Lot (i).

Q_{pc} = Quantity represented by individual pavement course (pc) in tons (Mg).

P_{pc} = Contract unit price per ton (Mg) for individual pavement course (pc).

N_{wp} = Total number of wheel paths for all lanes tested.

0.30 = Weight given to Ride Quality pay adjustment.

450.93	Payment Items	Payment Unit
450.10	HMA Friction Course – OGFC	Ton (Megagram)
450.20	HMA Surface Course – Dense Binder HMA	Ton (Megagram)
450.21	Surface Course – Modified Top HMA	Ton (Megagram)
450.22	Surface Course – Standard Top HMA	Ton (Megagram)
450.30	Intermediate Course – Dense Binder HMA	Ton (Megagram)
450.31	Intermediate Course – Binder	Ton (Megagram)
450.40	HMA Base Course – Binder	Ton (Megagram)
450.41	HMA Base Course – Black Base HMA	Ton (Megagram)
450.50	Leveling Course – Leveling Mix	Ton (Megagram)
450.60	HMA Bridge Surface Course – Modified Top HMA	Ton (Megagram)
450.70	Bridge Protective Course – Dense Binder	Ton (Megagram)
450.90	Contractor Quality Control	Ton (Megagram)
451	HMA for Patching	Ton (Megagram)
452	Asphalt Emulsion for Tack Coat	Gallon (Liter)
453	HMA Joint Sealant	Linear Foot (Meter)
999.490	HMA Pay Adjustment – PG Asphalt Binder Content HMA [1]	Dollar
999.491	Pay Adjustment – Volumetrics (Air Voids) [1] HMA Pay	Dollar
999.492	Adjustment – In-place Mat Density [1] HMA Pay	Dollar
999.493	Adjustment – Thickness [1]	Dollar
999.494	HMA Pay Adjustment – Ride Quality [1]	Dollar

[1] Not a bid item

SECTION 455
SUPERPAVE HOT MIX ASPHALT PAVEMENT

Section 455 - SUPERPAVE Hot Mix Asphalt Pavement amends Section 450 - Hot Mix Asphalt Pavement. The provisions herein replace the Subsections of Section 450 as indicated.

NOTE: The Pay Adjustment provisions included in Subsection 450.92 will be applied to items under this contract.

DESCRIPTION

Delete Subsection 450.20 - General and replace with the following: **455.20**

General.

This work shall consist of producing and placing Hot Mix Asphalt (HMA) pavement. All HMA mixtures shall meet the requirements of the SUPERPAVE volumetric design system. The HMA pavement shall be constructed in courses on the prepared or existing base in accordance with these specifications and in conformance with the lines, grades, compacted thickness and typical cross section as shown on the plans. Each SUPERPAVE HMA pavement course placed shall be comprised of one of the mixture types listed in Table 455.1.

Table 455.1 - SUPERPAVE HMA Pavement Courses & Mixture Types

Pavement Course	Mixture Type	Mixture Designation
Friction Course	• Open-Graded Friction Course - Polymer Modified	OGFC – P
Surface Course	SUPERPAVE Surface Course - 4.75 SUPERPAVE Surface Course - 9.5 SUPERPAVE Surface Course - 12.5 SUPERPAVE Surface Course - 19.0	SSC - 4.75 SSC - 9.5 SSC - 12.5 SSC - 19.0
Intermediate Course	SUPERPAVE Intermediate Course - 12.5 SUPERPAVE Intermediate Course - 19.0	SIC-12.5 SIC - 19.0
Base Course	SUPERPAVE Base Course - 25.0 SUPERPAVE Base Course - 37.5	SBC-25.0 SBC - 37.5
Leveling Course	SUPERPAVE Leveling Course - 4.75 SUPERPAVE Leveling Course - 9.5	SLC-4.75 SLC - 9.5
Bridge Surface Course	SUPERPAVE Bridge Surface Course - 9.5 SUPERPAVE Bridge Surface Course - 12.5	SSC-B-9.5 SSC-B - 12.5
Bridge Protective Course	SUPERPAVE Bridge Protective Course - 9.5 SUPERPAVE Bridge Protective Course - 12.5	SPC-B-9.5 SPC-B - 12.5

When a SUPERPAVE Surface Course - 19.0 (SSC - 19.0) is specified in the contract, the Laboratory Trial Mix Formula (LTMF) aggregate gradation shall provide a fine-graded HMA mixture as defined in Subsection 455.42F.

MATERIALS

Delete Subsection 450.40 - General and replace with the following: **455.40**
General.

SUPERPAVE HMA mixtures shall be composed of the following: Mineral aggregate, mineral filler (if required), Performance Graded Asphalt Binder (PGAB), and as permitted, reclaimed materials (limited to Reclaimed Asphalt Pavement (RAP), Reclaimed Asphalt Shingles (RAS), and Processed Glass Aggregate (PGA)). Materials shall meet the requirements in the following Subsections of Division III, Materials and as otherwise specified herein:

Asphalt Emulsion	M3.03.0
Hot Poured Joint Sealer	M3.05.0
Asphalt Anti-Stripping Additive	M3.10.0
Mineral Aggregate	M3.11.04
Mineral Filler	M3.11.05
Plant Requirements	M3.11.07

Delete Subsection 450.42 - Hot Mix Asphalt Mix Design and replace with the following: **455.42**
SUPERPAVE Hot Mix Asphalt Mixture Design.

The Contractor shall be responsible for development of all SUPERPAVE HMA mixture designs. All HMA surface courses, intermediate courses, base courses, leveling courses, bridge surface courses, and bridge protective courses shall be supported by volumetric mixture designs using the SUPERPAVE mixture design system. All SUPERPAVE HMA mixture designs shall be developed in accordance with the following AASHTO standards, as modified herein:

AASHTO M 323 AASHTO R
35 AASHTO T 312

Volumetric mixture designs are not required for OGFC. The aggregate gradation structure and target PG Asphalt Binder content for Open-Graded Friction Course - Polymer Modified (OGFC-P) shall conform to the master ranges in M3.11.03 – Table B.

A. Development of Laboratory Trial Mix Formula (LTMF).

The Contractor shall develop and submit for Department approval, a minimum of forty-five (45) days prior to the start of SUPERPAVE HMA pavement construction, a Laboratory Trial Mix Formula (LTMF) as the proposed Job Mix Formula (JMF) for each SUPERPAVE mixture type to be used on the project. Two or more JMFs per HMA mixture type may be approved for a particular plant, however, only HMA conforming to one JMF is permitted to be produced and placed on any given day.

The following is a general outline of the steps for developing an LTMF and an approved JMF:

1. Estimate Percentage of RAP to be utilized and select PG Asphalt Binder as required by the specifications (Subsection 455.42C.);
2. Evaluate aggregates (and reclaimed materials) for conformance with Consensus Properties

(Subsection 455.42D.) and Source Properties (Subsection 455.42E.);

3. Develop trial aggregate blends and estimate PG Asphalt Binder content in accordance with AASHTO R 35. Compact each of the blends. Based on volumetric analysis, select the best trial blend that meets the requirements of M 323 (Subsections 455.42F and 455.42G.);
4. Determine volumetric properties of LTMF and select PG Asphalt Binder content (Subsection 455.42H.);
5. Evaluate Moisture Sensitivity of the mixture (Subsection 455.42I.);
6. LTMF to be verified in the laboratory by the Department (Subsection 455.43);
7. Through production of a Control Strip Lot, verify that LTMF can be produced through the plant. (Subsection 450.66B.). Verification of the LTMF results in an approved JMF;
8. Repeat process for all mixtures to be utilized.

B. Estimated Design Traffic.

The estimated traffic level to be used for SUPERPAVE HMA mixture designs for this contract, expressed in Equivalent Single Axle Loads (ESALs) for the design travel lane over a 20-year period is ___0.1__Million 18-kip (80-kn) ESALs.

C. Performance Graded Asphalt Binder.

The Asphalt Binder used for all HMA mixtures under this contract shall comply with the requirements of Subsection 450.48. The PGAB Grade selected for this Contract is **PG64-28**.

D. Aggregate Consensus Properties.

Aggregates utilized in SUPERPAVE HMA mixtures, including RAP if used in the mixture, shall be tested for conformance with the following Consensus Property requirements:

- Determining the Percentage of Fractured Particles in Coarse Aggregate (ASTM D 5821)
- Uncompacted Void Content of Fine Aggregate (AASHTO T 304 - Method A)
- Flat or Elongated Particles (ASTM D 4791)
- Clay Content/Sand Equivalent Test (AASHTO T 176)

The Consensus Property test results shall be submitted with the LTMF for each SUPERPAVE HMA mixture. The Contractor shall provide aggregate samples a minimum of forty-five (45) days prior to production for each LTMF to the Department for LTMF verification prior to SUPERPAVE HMA production. The required minimum or maximum criteria for each of the Consensus Property tests for the total aggregate blend are specified below in Table 455.2 below.

Table 455.2 - Aggregate Consensus Property Requirements

Traffic Level	Design ESALs 18-kip (80-kn))	Coarse Aggregate Angularity (1) (2) ASTM D5821 (Percent Minimum)		Fine Aggregate Angularity (1) AASHTO T 304 - Method A (Percent Minimum)		Flat or Elongated Particles (2) ASTM D4791 (Percent Maximum)	Sand Equivalent AASHTO T 176 (Percent Minimum)
----	(million)	(Depth from final surface) ≤ 4 in (100 mm)	(Depth from final surface) > 4 in (100 mm)	(Depth from final surface) ≤ 4 in (100 mm)	(Depth from final surface) > 4 in (100 mm)	> # 4 (4.75 mm)	----
1	< 0.3	55/--	--/--	--	--	--	40
2	0.3 to < 3.0	75/--	50/--	40	40	10	40
3	3 to < 10	85/80	60/--	45	40	10	45
4	10 to < 30.0	95/90	80/75	45	40	10	45
5	>_ 30.0	100/100	100/100	45	45	10	50
	Design ESALS are the anticipated project traffic level expected on the design lane, projected over a 20 year period, regardless of the actual expected design life of the roadway.	Criteria presented as minimum values. 95/90 denotes that a minimum of 95% of the coarse aggregate, by mass, shall have one fractured face and that a minimum of 90% shall have two fractured faces.		Criteria presented as minimum percent air voids in loosely compacted fine aggregate passing the #8 (2.36 mm) sieve.		Criteria presented as maximum percent by mass of flat or elongated particles of materials retained on the #4 (4.75 mm) sieve, determined at 5:1 ratio.	Criteria presented as minimum values for fine aggregate passing the #4 (4.75 mm) sieve.

Notes:

(1) If less than 25% of a given layer is within 4 inches (100 mm) of the anticipated top surface, the layer may be considered to be below 4 inches (100 mm) for mixture design purposes.

(2) This criterion does not apply to #4 (4.75 mm) nominal maximum size mixtures.

E. Aggregate Source Properties.

The coarse mineral aggregate utilized in SUPERPAVE HMA mixtures shall be clean, crushed rock consisting of the angular fragments obtained by breaking and crushing shattered natural rock. It shall be free from dirt or other objectionable materials. The coarse aggregate, including RAP if used in the mixture, shall be tested for conformance with the following Source Property requirements:

- Toughness as Determined by: Los Angeles Abrasion (AASHTO T 96)
- Soundness as Determined by: Soundness (AASHTO T 104)
  - Deleterious Materials as Determined by: Clay Lumps & Friable Particles (AASHTO T 112)
  - Specific Gravity (AASHTO T 8)

Testing for each of the Source Properties shall be performed for each SUPERPAVE HMA mixture design developed for the project. The Source Property test results shall be submitted with the LTMF for each SUPERPAVE HMA mixture. The Contractor shall provide samples of each aggregate material from each stock pile, a minimum of forty-five (45) days prior to production for each LTMF to the Department for LTMF verification prior to SUPERPAVE HMA production. The requirements for each of the Source Properties are as indicated in Table 455.3 below.

Table 455.3 - Aggregate Source Property Requirements

Source Property Test	Limit
Toughness (AASHTO T 96)	Maximum Loss < 30 %
Soundness (AASHTO T 104)	Maximum Loss < 10 %
Deleterious Materials (AASHTO T 112)	Maximum Permissible < 0.5 %

F. SUPERPAVE Aggregate Gradation and Specific Gravity Requirements.

The combined aggregate blend for each SUPERPAVE HMA mixture shall conform to the Gradation Control Point requirements specified in Table 455.6 below. The results of the selected optimum Design Aggregate Structure shall be plotted on a 0.45 Power Chart and included with the LTMF.

The combined aggregate gradation shall be classified as coarse-graded when it passes below the Primary Control Sieve (PCS) control point as defined in Table 455.4. All other gradations shall be classified as fine graded.

The specific gravity of each coarse and fine aggregate component shall be determined in accordance with AASHTO T 85 and T 84 respectively, and the specific gravity of the mineral filler shall be determined in accordance with AASHTO T 100. The individual aggregate specific gravities shall be included with the LTMF. The Contractor shall provide samples of each aggregate material a minimum of forty-five (45) days prior to production for each LTMF to the Department for verification of the selected optimum Design Aggregate Structure and specific gravity of each stock pile.

Table 455.4 - Gradation Classification

PCS Control Point for Mixture Nominal Maximum Aggregate Size
% Passing

Nominal Maximum Aggregate Size (mm)	1-1/2" (37.5 mm)	1" (25.0 mm)	3/4" (19.0 mm)	1/2" (12.5 mm)	3/8" (9.5 mm)
Primary Control Sieve (mm)	3/8" (9.5 mm)	#4 (4.75 mm)	#4 (4.75 mm)	#8 (2.36 mm)	#8 (2.36 mm
PCS Control point (% Passing)		47	40	47	39

G. Gyratory Compaction Criteria.

Each SUPERPAVE HMA mixture shall be designed and controlled during production using an approved Gyratory Compactor which meets the requirements of AASHTO T 312. Compaction shall be in accordance with the requirements of AASHTO T 312. The density of each SUPERPAVE HMA mixture shall be evaluated at the initial number of gyrations $_{(Ninitial)}$, the design number of gyrations $_{(Ndesign)}$, and the maximum number of gyrations $_{(Nmax)}$. The gyratory-compacted specimens for each LTMF shall meet the density requirements specified in Table 455.5 below.

H. Volumetric Design Requirements.

Each SUPERPAVE HMA mixture shall be designed in accordance with the volumetric mixture design specifications contained in AASHTO M 323 and procedures contained in AASHTO R 35, as modified herein. Each HMA mixture LTMF shall be tested for conformance with the following volumetric properties:

- Air Voids at $_{Ndesign}$ (V_a)
- Voids in the Mineral Aggregate at $_{Ndesign}$ (VMA)
- Voids Filled with Asphalt at $_{Ndesign}$ (VFA)
- Fines to Effective Asphalt Ratio (P0.075 / Pbe)

The volumetric property test results shall be submitted with the LTMF for each SUPERPAVE HMA mixture. The required minimum or maximum criteria for each of the volumetric property tests are specified in Table 455.6 below.

Table 455.5 - SUPERPAVE HMA Design Requirements

Traffic Level	Design ESALs	Number of Gyrations by Superpave Gyratory Compactor			Percent Density of Gmm from HMA Specimen			Voids Filled with Asphalt (VFA)* Based on Nominal Maximum Aggregate Size					
	(million)	Nini	Ndes	Nmax	Nini	Ndes	Nmax	#4 (4.75 mm)	3/8" (9.5 mm)	1/2" (12.5 mm)	3/4" (19.0 mm)	1" (25.0 mm)	1-1/2" (37.5 mm)
1	< 0.3	6	50	75	≤ 91.5	96.0	≤ 98.0	70 – 80	70 – 80	70 – 80	70 – 80	67 – 80	64 – 80
2	0.3 to < 3.0	7	75	115	≤ 90.5	96.0	≤ 98.0	65 – 78	65 – 78	65 – 78	65 – 78	65 – 78	64 – 78
3	3.0 to < 10	8	100	160	≤ 89.0	96.0	≤ 98.0	75 – 78	73 – 76	65 – 75	65 – 75	65 – 75	64 – 75
4	10 to < 30.0	8	100	160	≤ 89.0	96.0	≤ 98.0	75 – 78	73 – 76	65 – 75	65 – 75	65 – 75	64 – 75
5	≥ 30.0	9	125	205	≤ 89.0	96.0	≤ 98.0	75 – 78	73 – 76	65 – 75	65 – 75	65 – 75	64 – 75

*The VFA values contained in Table 455.5 have been modified from AASHTO M 323 to ensure adequate PG Asphalt Binder content in each SUPERPAVE HMA mixture.

Table 455.6 - Gradation and Volumetric Requirements

	SUPERPAVE HMA Mixture Nominal Maximum Aggregate Size												LTMF Verification Limits
Sieve	#4 (4.75 mm)		3/8" ((9.5 mm)		1/2" (12.5 mm)		3/4" (19.0 mm)		1" (25.0 mm)		1-1/2" (37.5 mm)		
	CONTROL POINTS		CONTROL POINTS		CONTROL POINTS		CONTROL POINTS (5)		CONTROL POINTS		CONTROL POINTS		Target ±
Inches	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	
2	-	-	-	-	-	-	-	-	-	-	100	-	**6.0**
1.5	-	-	-	-	-	-	-	-	100	-	90	100	**6.0**
1	-	-	-	-	-	-	100	-	90	100	-	90	**6.0**
3/4	-	-	-	-	100	-	90	100	-	90	-	-	**6.0**
1/2	100	-	100	-	90	100	-	90	-	-	-	-	**6.0**
3/8	95	100	90	100	-	90	-	-	-	-	-	-	**6.0**
#4	90	100	-	90	-	-	-	-	-	-	-	-	**6.0**
#8	-	-	35	67	31	58	26	49	19	45	15	41	**5.0**
#16	30	60	-	-	-	-	-	-	-	-	-	-	**3.0**
#30	-	-	-	-	-	-	-	-	-	-	-	-	**3.0**
#50	-	-	-	-	-	-	-	-	-	-	-	-	**3.0**
#100	-	-	-	-	-	-	-	-	-	-	-	-	**2.0**
#200	6	12	2	10	2	10	2	8	1	7	0	6	**1.0**
PB	-		-	-	-	-	-	-	-	-	-	-	**0.3**
VMA (3)	17.0		16.0		15.0		14.0		13.0		12.0		1.0
Va (%)	4.0		4.0		4.0		4.0		4.0		4.0		1.0
VFA	Per Table 455.5 ± 5 off LTMF		Per Table 455.5 ± 5 off LTMF		Per Table 455.5 ± 5 off LTMF		Per Table 455.5 ± 5 off LTMF		Per Table 455.5 ± 5 off LTMF		Per Table 455.5 ± 5 off LTMF		
Gse	LTMF value		LTMF value		LTMF value		LTMF value		LTMF value		LTMF value		0.02
Gmm	LTMF value		LTMF value		LTMF value		LTMF value		LTMF value		LTMF value		0.02
Dust/Pbe(2)	0.9 – 2.0		0.6 - 1.2		0.6 - 1.2		0.6 - 1.2		0.6 - 1.2		0.6 - 1.2		
Mixture Temp	265 - 325F(1)		265 - 325F (1)		265 - 325F (1)		265 - 325F (1)		265 - 325F (1)		265 - 325F (1)		
PCS (4)			Sieve #8	47	Sieve #8	39	Sieve #4	47	Sieve #4	40	Sieve 3/8"	47	

(1) Based on the final design PG Asphalt Binder certification. (2) Dust is considered to be the percent of material passing the #200 (75 µm) sieve. The calculated effective asphalt content (Pbe) shall be used for this calculation. (3) Voids in Mineral Aggregates shall be computed as specified by AASHTO R 35. (4) If the aggregate gradation passes beneath the PCS Control Point specified in Table 455.4, the dust-to-binder ratio range may be increased from 0.6-1.2 to 0.8-1.6 at the Engineer's discretion. (5) When used as a Surface Course under OGFC the Min % for the #8 (2.36 mm) Sieve should be 40.

I. Evaluation of Moisture Sensitivity.

Each SUPERPAVE HMA mixture shall be tested by the Contractor for Moisture Sensitivity in accordance with the requirements of AASHTO T 283. The compacted specimens for each LTMF shall exhibit a minimum tensile strength ratio of 80% as determined by AASHTO T 283. A minimum tensile strength ratio of 80% is required. The use of approved anti-stripping agents (either liquid or mineral) can be used to meet this requirement. If an anti-strip agent is required, it shall be included in the Contractor's cost.

The Moisture Sensitivity test results shall be submitted with the LTMF for each SUPERPAVE HMA mixture. The Department will perform testing of the Moisture Sensitivity prior to SUPERPAVE HMA production as part of the verification of each LTMF.

Delete Subsection 450.66A. - Laboratory Verification of HMA Mix Design and replace with the following:

455.43 Verification of Laboratory Trial Mix Formula (LTMF)

The Contractor shall submit a LTMF with supporting documentation, a minimum of forty-five (45) days prior to production, to the Engineer with samples of blended aggregate material and PG Asphalt Binder. An adequate amount of the blended aggregate material and PG Asphalt Binder shall be supplied in order to verify the LTMF selected for production (proposed JMF).

If the Engineer is unable to verify the Contractor's LTMF in accordance with the LTMF Verification Limits in Table 455.7, then the Engineer will work with the Contractor to resolve the verification issue(s). **The Contractor shall not proceed with production and placement of the Control Strip (Section 450.66B.) until the LTMF is verified by the Engineer.**

Table 455.7 - SUPERPAVE HMA LTMF Verification Limits

Properties	LTMF Verification Limit
Asphalt Binder Content (P_b)	Target ± 0.3 percent
Gradation Passing #4 (4.75 mm) and Larger Sieves	Target ± 6.0 percent
Gradation Passing #8 (2.36 mm) Sieve	Target ± 5.0 percent
Gradation Passing #16 (1.18 mm) to #50 (0.30 mm) Sieve	Target ± 3.0 percent
Gradation Passing #100 (0.15 mm) Sieve	Target ± 2.0 percent
Gradation Passing #200 (75 µm) Sieve	Target ± 1.0 percent
Max. Theo. Specific Gravity (G_{mm})	Target ± 0.02
Air Voids (V_a)	Target ± 1.0 percent
Voids in Mineral Aggregate (VMA)	Target ± 1.0 percent
Voids Filled With Asphalt (VFA)	Target ± 5.0 percent
Bulk Specific Gravity (G_{mb})	Target ± 0.022

CONSTRUCTION PROCEDURES

Delete Subsection 450.53F. - Tack Coat and replace with the following:

G. Tack Coat.

A tack coat of asphalt emulsion, grade RS-1 shall be uniformly applied to existing or new pavement surfaces prior to placing pavement courses as specified below. The existing surface shall be swept clean of all foreign matter and loose material using a mechanical sweeper and shall be dry before the tack coat is applied.

(1) Tack Distributor System.

A pressure distributor shall be used to apply the tack coat. The tack distributor system shall be equipped with the following to control and monitor the application:

(a) System for heating the asphalt emulsion uniformly to specified temperature.
(b) Thermometer for measuring the asphalt emulsion temperature.
(c) Adjustable full circulation spray bar.
(d) Positive controls including tachometer, pressure gauge, and volume measuring device.

(2) Tack Application Requirements.

The tack coat material shall be applied by a pressure distributor. All nozzles on the distributor shall be open and functioning. All nozzles shall be turned at the same angle to the spray bar. Proper nozzle angle shall be as determined by the manufacturer of the distributor spray bar. The spray bar shall be adjusted so that it is at the proper height above the pavement surface to provide a double overlap spray for a uniform coverage of the pavement surface. A double lap application requires that the nozzle spray patterns overlap one another such that every portion of the pavement receives spray from exactly two nozzles.

When an HMA pavement course is placed on an existing tight smooth pavement surface, a tack coat shall be applied at the rate of 1/20 gal/s.y. (0.20 liters/square meter). All existing surfaces subjected to milling shall receive a tack coat at the rate of 1/15 gal/s.y. (0.28 liters/square meter). Tack coat shall be applied to cover approximately 90% of the pavement surface.

Any new HMA pavement course that has been open to traffic, or that was placed 30 days prior to placement of the subsequent pavement course, shall receive a tack coat at an application rate of 1/20 gal/s.y. (0.20 liters/square meter).

When the surface of a new HMA pavement course is in a condition which in the Engineer's judgment is unsatisfactory for the direct placement of the subsequent pavement course, a tack coat shall be applied at the applicable rate specified above for the particular pavement surface condition.

In addition to the requirements above, all vertical surfaces of curbs, edging, utilities, and drainage structures shall receive a thorough tack coat application immediately prior to placing each HMA pavement course.

(3) Tack Inspection.

The asphalt emulsion temperature and application rate shall be periodically measured and properly recorded by the Contractor on NETTCP Inspection Report Forms. If the temperature or application rate is determined to not be in conformance with the specification requirements above, the Contractor shall make appropriate adjustments to the tack application operations.

COMPENSATION

The Pay Adjustment provisions included in Subsection 450.92 - Pay Adjustment shall be applied to items under this contract.

Delete Subsection 450.91D. - Hot Mix Asphalt and replace with the following:

D. Hot Mix Asphalt.

Each Hot Mix Asphalt pavement course will be paid for at the contract unit price per ton (Megagram) of in-place mixture under the HMA Pay Items specified in Subsection 455.93. Payment shall include sweeping the underlying surface, transportation, delivery, placement including providing a Material Transfer Vehicle (MTV), and compaction of each HMA pavement course in accordance with Subsection 450.54 through Subsection 450.58.

All sawcutting required for transverse joints or longitudinal joints in accordance with Subsection 450.57 shall also be included in the contract unit price for each HMA pavement course.

Delete Subsection 450.93 - Payment Items and replace with the following:

455.93	Payment Items	Payment Unit
450.10	Open Graded Friction Course - Polymer Modified (OGFC - P)	Ton (Megagram)
455.21	SUPERPAVE Surface Course - 4.75 (SSC - 4.75)	Ton (Megagram)
455.22	SUPERPAVE Surface Course - 9.5 (SSC - 9.5)	Ton (Megagram)
455.23	SUPERPAVE Surface Course - 12.5 (SSC - 12.5)	Ton (Megagram)
455.24	SUPERPAVE Surface Course - 19.0 (SSC - 19.0)	Ton (Megagram)
455.31	SUPERPAVE Intermediate Course - 12.5 (SIC - 12.5)	Ton (Megagram)
455.32	SUPERPAVE Intermediate Course - 19.0 (SIC - 19.0)	Ton (Megagram)
455.41	SUPERPAVE Base Course - 25.0 (SBC - 25.0)	Ton (Megagram)
455.42	SUPERPAVE Base Course - 37.5 (SBC - 37.5)	Ton (Megagram)
455.51	SUPERPAVE Leveling Course - 4.75 (SLC - 4.75)	Ton (Megagram)
455.52	SUPERPAVE Leveling Course - 9.5 (SLC - 9,5)	Ton (Megagram)
455.60	SUPERPAVE Bridge Surface Course - 9.5 (SSC-B - 9.5)	Ton (Megagram)
455.61	SUPERPAVE Bridge Surface Course - 12.5 (SSC-B - 12.5)	Ton (Megagram)
455.70	SUPERPAVE Bridge Protective Course - 9.5 (SPC-B - 9.5)	Ton (Megagram)
455.71	SUPERPAVE Bridge Protective Course - 12.5 (SPC-B - 12.5)	Ton (Megagram)
450.90	Contractor Quality Control	Ton (Megagram)
451	HMA for Patching	Ton (Megagram)
452	Asphalt Emulsion for Tack Coat	Gallon (Liter)
453	HMA Joint Sealant	Linear Foot (Meter)

999.490	HMA Pay Adjustment – PG Asphalt Binder Content [1]	Dollar
999.491	HMA Pay Adjustment – Volumetrics (Air Voids) [1]	Dollar
999.492	HMA Pay Adjustment – In-place Mat Density [1]	Dollar
999.493	HMA Pay Adjustment – Thickness [1]	Dollar
999.494	HMA Pay Adjustment – Ride Quality [1]	Dollar

1 Not a bid item

ITEM 482.3 SAWING ASPHALT PAVEMENT FOOT

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

The work shall include the saw cutting of existing pavements at project limits for roadway and sidewalk construction.

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

All edges of excavations made in existing pavements shall be squared by sawcutting with power-driven tools to provide a neat, clean edge for joining new pavement. Ragged, uneven edges shall not be accepted. Areas which have been broken or undermined shall be edged neatly with a minimum disturbance to remaining pavement.

Saw-cut surfaces shall be sprayed or painted with a uniform thin coat of RS-1 asphalt emulsion immediately before placement of hot mix asphalt material against the surface.

Sawing pavements will be measured for payment by the foot. Sawing pavements will be paid for at the contract unit price per foot, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

ITEM 482.31 SAWING & SEALING JOINTS IN ASPHALT PAVEMENT AT BRIDGES FOOT

Work under this Item consists of sawcutting, cleaning and sealing transverse joints in the finished bituminous concrete pavement. The joints shall be constructed at the approach joints on the bridges, and also where necessary as determined by the Engineer. The intent of this work is to establish a weakened plane joint to control reflective cracking in the newly installed bituminous concrete pavement.

MATERIAL

Joint seal material shall be an asphalt rubber compound of the hot poured type conforming to Subsection M3.05.4, & ASTM D3405 with minimum 15% ground reclaimed tire rubber.

PREPARATION

Locate and reference the location of each existing joint prior to the placement of any bituminous concrete.

Do not perform saw cutting until the bituminous course has thoroughly cooled. Perform saw cutting within seven (7) days after placement of the wearing course. Perform this work in all finished overlay areas prior to discontinuing of work due to seasonal pavement limitations.

ACCURATELY LOCATING JOINT

The most critical step in sawing and sealing the overlay is the process of locating the joints in the existing pavement. The Contractor shall be responsible for the accuracy of the procedure used for locating the joints. Experience has shown that as little as one (1) inch deviation from the joint location can cause the joint to reflect through the overlay rather than at the sawed joint. Therefore, extreme care must be taken in referencing the location of the existing joints before they are covered with a bituminous overlay.

Where applicable, the transverse saw cut joints shall normally extend into the asphalt shoulder, unless otherwise specified by the Engineer. Transverse joints that are offset at the joint by more than one (1) inch, measured between the centers of the joint cavities, shall require separate saw cuts terminating at the longitudinal joints.

SAW CUTTING OF TRANSVERSE JOINTS

The bituminous concrete shall have aged sufficiently to allow a clean cut to be made and to withstand the eroding effects of the saw or other cutting devices.

The saw cut portion of the joint shall be made with an approved power driven saw. The blade shall be of such size and configuration that the desired dimensions of the saw cut can be made with one pass. The saw cut shall be made with an abrasive blade and sawn dry or with a diamond blade and sawn wet. If wet sawing is used, immediately flush the joint reservoir with water.

Wet sawed joints shall be thoroughly cleaned with a water blast to remove any sawing slurry, dirt, or deleterious matter adhering to the joint walls or remaining in the joint cavity. The joints shall be blown with air to provide dry joint surfaces prior to sealing. A Hot-Air-Lance shall be used for this operation. Dry sawed joints shall be thoroughly cleaned with a stream of air sufficient to remove any dirt, dust, and deleterious matter adhering to the joint walls or remaining in the cavity.

The Contractor shall saw cut joints to the appropriate dimensions based on the existing pavement slab length and new overlay depth. When the total depth of the overlay exceeds 4½”, including scratch or leveling courses, he/she shall make a 1/8” wide saw cut to a minimum depth of 2½” or 1/3 of the total overlay thickness, whichever is greater. Then saw a poured sealer reservoir into the wearing course over the saw cut joint having a width of 3/8” and a depth of ½”.

The Contractor shall conduct his operations so that saw cutting of joints, cleaning and sealing are continuous operations.

Traffic shall not be allowed to knead together or damage the sawed joints.

Sawed joints shall be filled and cured prior to opening of traffic.

Sawed joints not sealed before traffic is allowed on the overlay shall be re-sawn when sawing and sealing operations resume at no additional costs to the Department.

SEALING

After cleaning, and just prior to sealing, bond breaker tape shall be placed in the bottom of the saw cut joint. The bond breaker tape shall consist of regular masking tape or a suitable bond breaker tape designed for use with hot poured sealants.

The width of the tape map is equal to, but not more than 3/16” narrower than, the width of the saw cut joint.

EQUIPMENT

Equipment used in the performance of the work required by this section of the specification shall be approved by the Engineer and maintained in satisfactory working condition at all times.

CONSTRUCTION DETAILS

1. Material: sealant material shall be heated in a kettle or melter constructed as a double boiler, with a space between the inner and outer shells filled with oil or other heat transfer medium. The equipment shall include positive temperature controls, automatic and continuous mechanical agitation, recirculation pumps and thermometers for continuous reading of temperature of both the sealing compound and the heat transfer medium. The melter shall be equipped with a thermostat to maintain the sealing compound within a range of the temperatures specified by the manufacturer.

2. Air Compressors: shall be portable and capable of furnishing no less than 180 cubic feet of air per minute at no less than 130 psi pressure at the nozzle (if the velocity of this unit is not sufficient to thoroughly clean the joint, as determined by the Engineer, a Hot-Air-Lance must be used.) The compressor shall be equipped with traps that will maintain the compressed air free of oil and water.

3. The joints seal shall be applied with a mobile carriage and a rubber or metal shoe and have a flow control valve which allows all cracks to be filled to refusal, so as to eliminate all voids or entrapped air, and not to leave unnecessary surplus crack sealer on the pavement surface. Pour pots or similar devices shall not be used to fill sawed joints.

   The hot seal shall completely fill the joint such that after cooling, the level of the sealer will not be greater than 1/8” below the finished pavement surface.

   Any depression in the seal greater than 3/16” shall be brought up to the specified limit by the further addition of hot sealant. Overfilling of the joints will not be allowed and spillage of the sealer shall be avoided.

   Sand shall not be spread on the sealed joints to allow early opening to traffic. Sealer shall be tack free prior to opening to traffic.

4. Boiler Slag Aggregate: black beauty should be used at locations deemed necessary by the Engineer (e.g. intersections of high volume traffic).

JOINT SEALING

No sealing materials shall be applied in wet joints or where frost, snow or ice is present or when ambient temperature is below 120° F. Any given quantity of material shall never be heated at the pouring temperature for more than six (6) hours and shall never be reheated more than once.

All joints determined by the Engineer to be dried or rejuvenated shall be heated, prior to application of sealer, with a Hot-Air-Lance, which operates at 2000° F at 2000 feet/sec velocity. The lance shall have no exit flame, which can burn the asphalt.

WORKMANSHIP

Care shall be taken in the sealing of the joints so that the final appearance will present a neat fine line. Overfilling of joints will not be allowed and spillage of the sealer shall be avoided.

All workmanship shall be of the highest quality, and excess or spilled sealer shall be removed from the pavement by approved methods and discarded. Any workmanship determined to be below the high standards of the particular craft involved will not be accepted, and will be corrected and/or replaced as directed by the Engineer in charge, at no additional cost to the Department.

PERFORMANCE

The contractor/subcontractor must furnish satisfactory evidence that he/she has the ability and experience to perform this class of work and that he/she has sufficient capital and equipment to enable him/her to prosecute the work successfully and complete it within the time specified in the contract.

METHOD OF MEASUREMENT

The actual number of linear feet of joint properly sawed and sealed in the bituminous concrete surface in place and accepted will be the measure of this work for payment.

BASIS OF PAYMENT

Payment will be made at the Contract Unit Price per Foot for this Item complete in place, which shall include the cost of all materials, equipment, tools and labor, including any survey work, and all incidentals necessary to complete the work as specified.

ITEM 657. TEMPORARY FENCE LINEAR FOOT

The work under this Item shall include furnishing, installing, maintaining, removing, resetting and final removal of 6.0 ft. chain-link fence in the location(s) indicated on the Plans and/or as directed by the Engineer. The fence shall be used to close off the construction area from adjacent private properties whose use may conflict with the construction activities, and to protect pedestrians from construction activities.

Fencing shall conform to the relevant provisions of Section 644 of the Standard Specifications.

The Contractor will be responsible for providing the Engineer with an acceptable method for the installation of the Temporary Fence that will provide for the pedestrian and worker safety and security for which it is intended.

All posts, including end, corner and intermediate brace posts, and all gates and gateposts, shall be included in the per linear foot cost. The fencing height shall be 6.0 ft. minimum. Materials need not be new, but shall be in good condition, shall not be deteriorated, nor in a condition which in any way may jeopardize the safety and security purposes intended. All fencing shall meet the approval of the Engineer. The Contractor shall be responsible for maintenance of the Temporary Fence and shall be responsible and cognizant that the work area remains secure and is inaccessible to the general public at all times. It may be necessary to remove sections of Temporary Fence at times during construction. Any removing and resetting of Temporary Fence by the Contractor to facilitate his/her construction operations shall be done at no additional cost to the Department. Fence fabric shall be placed on the top face of the post away from the work area. A top tension wire, rather than a pipe top rail, shall be used. The top edge of the fabric shall be finished with a "knuckled" salvage. The Temporary Fence shall not be removed until construction is completed, or until requested by the Engineer.

Compensation for this Item will be at the Contract Unit Price bid per Linear Foot, and shall include all tools, equipment, materials and labor costs for a complete installation as described herein with 20% of the bid price for this Item held until the fence is removed. The cost of removal and proper disposal of the Temporary Fence shall be considered incidental.

The Contractor shall replace and/or restore sections of fence damaged due to the construction, and/or accidents, vandalism or in any other manner for the duration of the project.

ITEM 742. ENGINEER'S FIELD OFFICE AND EQUIPMENT (TYPE C) MONTH

Work under this Item shall conform to the relevant provisions of Section 740 and the following:

Superseding Subsection 740.43 of the Standard Specifications, a paper copier WILL be required.

A computer system and a digital camera meeting the requirements set forth below and including installation, maintenance, power, paper and other supplies shall be provided at the Resident Engineer's Office.

The computer system shall consist of the following:

Computer:..... Small form factor (Approx: 4" x 12" x 14", H x W x D), with speakers
CPU:..... 2.8 GHz Pentium 4 CPU with 800 MHz front side bus or better
RAM: ..... 1 Gb of 400 MHz PC-3200 DDR (Dual Channel) or better
Video:..... 128 MB memory or better; DVI capability to supplied LCD monitor
Hard disk:..... 500GB, 7200RPM or better
Monitor: ..... 19" 1280x1024 LCD, TFT, Height adjustable stand, DVI
DVD-RW/CD-RW: DVD-RW 20X speed or better, 10 DVD-R disks
Modem: ..... 56K/V.90 internal or external modem
Mouse:..... Optical mouse with scroll (USB or PS/2) or equivalent
Keyboard:..... Standard 104-key
Printer:..... HP 1200 laserjet printer
OS: ..... Windows XP Professional
Web Browser:..... Microsoft Internet Explorer 6.0
Office: ..... MS Office Professional
CAD: ..... Auto CAD Light
Connectivity:..... 8 high-speed USB 2.0 ports

A digital camera shall be supplied from Olympus, Nikon, Canon or approved equal with at least 8.1 Megapixel and 5X Optical Zoom. The memory/storage shall be a 2GB micro SD card. A USB 2.0 micro SD card reader shall also be provided for easy transfer of the card's contents onto the computer. Additional accessories include a USB Connect and 2 sets of batteries, a battery recharger, carrying case, computer software if necessary and an AC adapter.
All computers must have an Internet access account. DSL (digital subscriber line) is preferred where available. If DSL is not available, a cable internet service provider will be acceptable. Only high speed internet access will be provided. Dial-up Internet access is acceptable; if no other service is available. (America Online is not acceptable service.)

The Engineer's Field Office and the equipment included therein, including the computer system and camera shall remain the property of the Contractor at the completion of the project.

ITEM 767.82 EROSION CONTROL BARRIER FOOT

Work under this Item shall conform to the relevant provisions of Section 767 and the following:

Erosion Control Barriers shall be constructed as shown on the plans. Note the different barrier requirements for work on each riverbank.

Erosion Control Barriers will be measured for payment by the foot. Erosion Control Barriers will be paid for at the contract unit price per foot, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

ITEM 856.12 PORTABLE CHANGEABLE MESSAGE SIGN UNIT DAY

The work under this Item shall consist of the furnishing and installing Portable Changeable Message Signs as shown on the Plans, as directed by the Engineer, and the following:

The work to be performed under this Item shall conform to the relevant provisions of Section 850 of the Standard Specifications.

Seven (7) days prior to the commencement of construction, the Contractor shall place a Portable Changeable Message Sign on each side of the bridge approach to inform the traveling motorists of the upcoming bridge construction.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Measurement and payment for this Item shall be in accordance with Subsections 850.80 and 850.81.

ITEM 905. 4000 PSI, 3/8", 660 LB CEMENT CONCRETE CUBIC YARD

The work to be performed under this Item shall conform to the relevant provisions of Section 901 of the Specifications and the following:

4000 PSI, 3/8", 660 LB Cement Concrete shall be used to patch deteriorated areas of concrete in the piers, or as otherwise directed by the Engineer. The Contractor shall remove existing concrete under either Item 127.1,

Reinforced Concrete Excavation; Item 127.401, Reinforced Concrete Deck Excavation (Full Depth); or Item 124.41, Reinforced Concrete Deck Excavation (Partial Depth) to the limits directed by the Engineer. After the existing concrete has been removed, the surface has been prepared, at the direction of the Engineer, epoxy bonding compound shall be applied to existing surfaces to be patched, 4000 PSI, 3/8", 660 LB Cement Concrete shall then be placed in the areas requiring patching. Should epoxy bonding compound not be used, the surface, after proper preparation will be pre-wetted to a saturated surface dry (SSD) condition.

Surface preparation shall conform to the requirements shown on the plans and herein described, and all costs in connection with such surface preparation shall be considered incidental. Areas to be patched shall not be less than 2 inches in depth for repairs using 4000 PSI, 3/8", 660 LB Cement Concrete.

The Contractor shall have the approval of the Engineer certifying that existing concrete has been removed to the required limits and that adequate surface preparation has been achieved before any concrete is placed.

All edges shall be sawcut to a minimum of 1/2" deep as part of the concrete removal work. If directed by the Engineer, epoxy bonding compound shall be applied to the reinforcing steel and concrete, immediately prior to placing the concrete. The bonding compound shall be applied to this clean surface by spray or by brushing, using brushes of a size and/or design that will reach through the reinforcing steel to the underlying concrete surface. The manner of mixing, the rate of application, and the allowable open or contact time, before placing the concrete, shall be in accordance with the recommendations of the bonding compound manufacturer. If the concrete is not placed against the bonding compound within the allowable open time the Contractor shall follow the manufacturer's recommendations. Epoxy bonding compound is a multi-component, 100% solids, moisture insensitive, epoxy-resin system that shall be used as a bonding adhesive to bond fresh plastic concrete to sound, hardened concrete. Epoxy bonding compound shall be applied in accordance with manufacturer's recommendations and shall conform to the requirements of the Supplemental Specifications, Subsection M.4.05.5. Products to be used for epoxy bonding compound shall be approved by the Engineer before the Contractor begins his operations.

The surface of the old concrete shall be thoroughly cleaned by abrasive blasting to remove all loose particles, dust and other films. Surface preparation for bonding new concrete to existing concrete shall include thoroughly cleaning, roughening and pre-wet the surface with clean water to saturated surface dry (SSD).

All patches shall be formed such that new concrete will be flush with the surrounding existing surface when the concrete has cured.

All reinforcing steel, encountered in the structure, shall be thoroughly cleaned and painted with a zinc-rich epoxy primer conforming to Material Spec. No. M7.02.61 before it is covered with new concrete. Any steel, damaged or otherwise made unsatisfactory by the contractors operations shall be replaced at the contractor's expense.

4000 PSI, 3/8", 660 LB Cement Concrete shall be mixed and placed in accordance with the relevant provisions of Item 905. The concrete shall be pumped or hand shoveled into the repair. Vibrators shall be of an approved design and shall be internal mechanical vibrators of a size suitable to the work at hand. The amount of vibrating to be done will be subject to the direction of the Engineer, who will be guided by the quality of the results obtained.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Measurement of 4000 PSI, 3/8", 660 LB Cement Concrete will be per cubic yard of patch area, complete in place and accepted by the Engineer.

The work described under this Item shall be paid for at the contract unit price per cubic yard. Such payment shall be considered full compensation for all labor, materials and equipment necessary to carry out the work.

ITEM 908.01 CEMENT FOR POINTING FOOT

Work under this Item includes the cleaning out of defective mortar joints between sections of the granite curbing on the bridge.

MATERIALS

The cement mortar shall meet the requirements of Subsection M4.02.15.

CONSTRUCTION METHODS

All defective stone masonry joints, as determined by the Engineer, shall be chipped out to a minimum depth of two inches by means of hand or pneumatic tools. The joint shall be thoroughly cleaned of all loose mortar, dust, dirt, and vegetation with high pressure air and water blast and flushed clean.

All cleaned joints shall be inspected and approved by the Engineer prior to the application of cement mortar. The mortar shall be driven to the back of the excavated joint and cut flush with the masonry face. Only enough mortar shall be mixed that can be effectively used to repoint the prepared joints and voids.

Pointing shall not be done in freezing weather nor when the stone contains frost.

METHOD OF MEASUREMENT AND BASIS FOR PAYMENT

Cement for Pointing will be measured per foot of joint pointed, complete in place and accepted by the Engineer.

The work under this Item will be paid for at the contract unit price per foot of cement for pointing installed, which price shall include full compensation for all labor, materials, forms and equipment necessary to complete the work.

ITEM 908.10 CONCRETE PENETRANT SQUARE FOOT

Work under this Item shall conform to the relevant provisions of Section 901 of the Standard Specifications and the following.

Work under this Item shall include surface preparation and the application of concrete penetrant to the exposed surfaces (stems, beam seats, backwalls) of the bridge abutments and wingwalls.

Concrete penetrant shall be a silane sealer suitable for application to existing in-service concrete services, conforming to Section M9.15.0 of the Standard Specifications, and listed on the MassDOT Qualified Construction Materials List.

Concrete surfaces shall be prepared by sandblasting in accordance with manufacturer's recommendations. Preparation shall include removal of all graffiti from the concrete surfaces. Structural steel and bearing surfaces shall be protected during sandblasting operations.

Concrete penetrant shall be applied in accordance with manufacturer's recommendations.

METHOD OF MEASUREMENT AND BASIS FOR PAYMENT

Concrete Penetrant will be measured per square foot of concrete surface area treated, complete in place and accepted by the Engineer.

The work under this Item will be paid for at the contract unit price per square foot installed, which price shall include full compensation for all labor, materials, and equipment necessary to complete the work.

ITEM 909.2 CEMENTITIOUS MORTAR FOR PATCHING SQUARE FOOT

The work under this Item consists of furnishing and placing a polymer-modified, cementitious, 2-component, fast-setting, trowel grade patching mortar to patch vertical, horizontal and overhead surfaces on the existing substructure in areas of spalled concrete and/or as directed by the Engineer.

This Item does not include the repair of any horizontal or vertical patch which exceeds 1½ inches in depth. The repairs to those patches shall be made with 4000 PSI, 3/8", 660 Cement Concrete as specified under Item 905.

The procedure to be used to repair deteriorated or spalled concrete shall be as defined on the Plans and as follows.

The Contractor shall remove all deteriorated or spalled concrete, as directed in Item 127.12, in areas determined by the Contractor and verified by the Engineer. All costs to remove the deteriorated and spalled concrete shall be covered in Item 127.12.

The Contractor shall have the approval of the Engineer certifying that all spalled and deteriorated concrete has been removed prior to patching the deteriorated areas.

Concrete at the edges of all areas to be patched using Cementitious Mortar for Patching shall be removed to a minimum depth of 1/2 inch prior to the application of the mortar.

A. Material

1. The polymer modified cementitious system shall consist of a system from the Department Qualified Products List for the specific application.

   Surface Preparation
   Areas to be patched must be clean and sound. All loose and disintegrated concrete shall be removed by means of abrasive blasting, or an equivalent method, to a depth where sound concrete is exposed. Minimum patch depth at edges of patch shall be ½ inch. Abrasive blast existing concrete to remove all contaminants prior to applying mortar. Chipping methods to be approved in advance by the Engineer.

B. Mixing

Mix manually or mechanically. The mortar shall be prepared in accordance with the manufacturer's instructions.

C. Application and Finishing

Application and finishing shall be as per the manufacturer's literature.

D. Curing

Use of fine mist spray of water, wet burlap, or non-solvent approved curing compound if ambient conditions might cause premature surface drying, i.e., high temperature, low humidity, strong winds. If necessary, protect newly applied mortar from rain. To prevent freezing, cover with insulating material.

E. Manufacturer's Field Representative

1. The Contractor shall arrange with the materials manufacturer or distributor to have the services of a competent field representative at the work site prior to any mixing of components to instruct the work crews in the proper mixing and application procedures. The field representative shall remain at the job site after work commences and continue to instruct until the representative and the Contractor, Inspector and/or Engineer are satisfied that the crew has mastered the technique of installing the system successfully. The representative shall make periodic visits to the project as the work progresses and shall confer on each visit with the Contractor, Inspector and/or Engineer.

2. The manufacturer's field representative must be fully qualified to perform the work and shall be subject to the approval of the Engineer.

3. The Contractor shall be completely responsible for the expense of the services of the required field representative and the bid contract price shall be full compensation for all costs in connection therewith.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Measurement of cementitious mortar for patching will be per square foot of patch area, complete in place and accepted by the Engineer.

Payment under this Item shall be made at the contract unit price per square foot of cementitious mortar installed, which price shall include full compensation for all labor, materials and equipment necessary to perform the work described above.

ITEM 921.2	**LAMINATED ELASTOMERIC BEARING W/ ANCHOR BOLTS (51–100)**	**EACH**
ITEM 921.4	**LAMINATED ELASTOMERIC BEARING W/ ANCHOR BOLTS (151–200)**	**EACH**

Work to be done under these Items shall conform to the relevant provisions of the Standard Specifications and the following.

Work under these Items consists of removing existing steel bearing assemblies and furnishing and installing new elastomeric bearing assemblies at the existing beams as shown on the plans and/or as directed by the Engineer.

Elastomeric bearing pads shall conform to Section M9.14.5 of the Standard Specifications.

Prior to replacement of the bearing assemblies, all dead and live loads shall be relieved of the bearings in accordance with Item 108.67 Jacking Superstructure.

Existing bearings shall be removed in accordance with the plans and/or as directed by the Engineer.

Welds along the girder flanges at the abutments, or the cover plate edges at the piers shall be ground smooth to achieve a profile suitable for installation of the new bearing assembly.

Prior to installation of the new bearings, the beam seat shall be prepared in accordance with the bearing manufacturer's requirements.

At the abutment assemblies, the existing anchor bolts to remain shall be thoroughly cleaned of all corrosion.

The grout to be used for the anchor bolts at the piers shall be a non-shrink cementitous mortar, or other standard materials from the MassDOT Qualified Construction Materials List.

The Contractor shall arrange with the materials manufacturer to have the services of a competent field representative at the work site prior to any coring operations to instruct the work crews in proper anchor bolt installation procedures.

Cored dowel holes shall be diamond core drilled in accordance with the recommendations of the grout manufacturer. The inner surfaces of the diamond core drilled holes shall be scored to develop sufficient keying action. The method of scoring shall be subject to approval by the Engineer.

The coring operation shall be performed without damage to any existing reinforcing bars or any portion of the structure that is to remain in place. Any damage to any existing portion of the structure that is to remain in place shall be repaired to a condition equal to or better than that existing prior to the beginning of the grouting operations and at the Contractor's expense.

The Contractor shall strictly follow the recommendations of the manufacturer for mixing and placing the grout material. The holes shall be blown clear of any debris and shall have the approval of the Engineer prior to the placement of any grout material. Any excessive grout around the hole after placement of the anchor bolt shall be struck off smooth while the grout is still fresh.

Steel components of bearing assemblies shall be hot dip galvanized and painted in accordance with Section 960 of the Standard Specifications. Paint color shall match that of the existing steel paint.

Laminated Elastomeric Bearing will be measured per each bearing installed, complete in place and accepted by the Engineer according to they type of bearing installed.

The work under these Items will be paid for at the contract unit price per each, which price shall include full compensation for all labor, materials, and equipment necessary to complete the work.

ITEM 960.2 STEEL BEAM COVER PLATE REPAIR EACH

Work to be done under this Item shall conform to the provisions of Section 960 of the Standard Specifications and the following.

Work under this Item shall consist of furnishing and installing new bolted splice plates at the ends of existing flange cover plates as shown on the plans or as directed by the Engineer.

New structural steel shall be painted in accordance with Section 960 of the Standard Specifications.

Preparation of existing steel, including painting, shall be in accordance with Section 961 of the Standard Specifications.

Staging to access repair areas will not be allowed in the river. Staging shall be suspended from the superstructure, or shall be performed using an under-bridge aerial lift vehicle.

Steel Beam Cover Plate Repair will be measured per cover plate repair assembly installed, complete in place and accepted by the Engineer.

The work under this Item will be paid for at the contract unit price per each, which price shall include full compensation for all labor, materials, and equipment necessary to complete the work.

ITEM 983.12 CONCRETE GROUT FILLED FABRIC BAGS CUBIC FOOT

Work to be done under this Item shall conform to the relevant provisions of the Standard Specifications and the following.

This work shall consist of furnishing and installing custom fitted fabric tubes or bags and pumping concrete grout into these fabric tubes or bags at the specified locations and in accordance with the lines, grades, design and dimensions shown on the contract drawings and as specified herein, and as directed by the Engineer.

MATERIALS

Fabric Forms: The fabric forms shall be composed of synthetic yarns formed into a woven fabric. Yarns used in the manufacture of the fabric shall be composed of at least 85% by weight of polyamide. Forms shall be woven with a minimum of 50% textured yarns (by weight) to improve adhesion to fine aggregate concrete and to improve filtration. They shall be formed into a network such that the yarns retain dimensional stability relative to each other, including selvages. Each layer of fabric shall conform to the physical, mechanical and hydraulic requirements shown below. The fabric forms shall be free of defects or flaws which significantly affect their physical, mechanical, or hydraulic properties.

Fabric form material shall consist of two layers of woven fabric sewn together. When filled with fine aggregate concrete they shall form a concrete armor unit with finished average unit dimensions as shown on the plans or as directed by the Engineer.

Specification property requirements – fabric forms[1, 2]:

Property	Test Method	Units	Values
Physical:			
Composed of Yarns -Machine -Cross			Polyamide (Nylon) Polyamide (Nylon)
Mass Per Unit Area (double-layer)	ASTM D 5261	g/m^2	470
Thickness	ASTM D 5199	mm	0.7
Mill Width		m	1.93
Mechanical:			
Wide-Width Strip Tensile Strength -Machine -Cross	ASTM D 4595	 kN/m kN/m	 33.2 24.5
Elongation at Break -Machine -Cross	ASTM D 4595	% %	20 30
Trapezoidal Tear Strength -Machine -Cross	ASTM D 4533	N N	800 510
Hydraulic:			
Apparent Opening Size (AOS)	ASTM D 4751	mm	0.250
Flow Rate	ASTM D 4491	$l/min/m^2$	2035

Notes:

1. Conformance of fabric forms to specification property requirements shall be based on ASTM D 4759, "Practice for Determining the Special Performance of Geotextiles."

2. All numerical values represent minimum average roll values (i.e., average of test results from any sample roll in a lot shall meet or exceed the minimum values). Lots shall be sampled according to ASTM D 43254, "Practice for Sampling of Geosynthetics for Testing."

Mill width of fabric rolls shall be a minimum of 6 ft. Each selvage edge of the fabric shall be reinforced for a width of 2 in. by adding a minimum of 15 warp yarns to the selvage construction. Mill width rolls shall be cut to the length required, and two layers of fabric shall be joined, top layer to bottom layer, by means of sewing thread to form the required unit dimensions.

Self-sealing filling valves, suitable for use with fine aggregate concrete, shall be installed at predetermined locations. A minimum of two valves shall be provided for bags more than 20 ft long.

All Seams sewn in the factory shall be not less than 15.7 kN/m when tested in accordance with ASTM D 4884. All sewn seams shall be made using a Type 401 double lock stitch or two rows of single-lock stitch. All double-lock stitches shall be sewn simultaneously and be parallel to each other, spaced between ¼ in to ¾ in apart. Each row of stitching shall consist of 4 to 7 stitches per inch. Thread used for seaming shall exhibit ultraviolet, chemical and biological durability.

The Contractor shall submit, to the Engineer, a manufacturer's certification that the supplied fabric forms meet the criteria of these Specifications, as measured in full accordance with the test methods and the standards referenced herein. The certifications shall include the following information about each fabric form delivered:

Manufacturer's name and current address;
Full product name;
Style and product code number;
Form number(s);
Polymer types; and

Manufacturer's certification statement.

Concrete grout shall consist of a mixture of Portland cement, fine aggregate (sand) and water, so proportioned and mixed as to provide a pump able grout. Pozzolan, grout fluidifier or pumping aid conforming to this Specification may be used at the option of the Contractor. The mix shall exhibit a compressive strength of 3,500 psi at 28 days. The Contractor shall submit in writing to the Engineer a mix design showing the mix proportions and results of two test breaks, performed by an independent testing lab.

CONSTRUCTION DETAILS

Prior to commencing work, the Contractor shall submit a construction procedure and equipment list to the Engineer for their approval. No work shall begin until this approval is received.

The grout filled bags shall be placed where shown on the plans or where ordered by the Engineer.

The Contractor shall conduct the grout filling operation in a manner that will prevent the possibility of discharge of grout or cement into the water. Grout injection shall be performed in a manner that will avoid rupture of the fabric forms or the formation of cold joints. A cold joint is defined as one in which the pumping of the fine aggregate concrete into a given form is discontinued or interrupted for an interval of forty-five or more minutes.

The grout filling operation shall be conducted in a manner to ensure that the undermined sections of footing are completely filled.

METHOD OF MEASUREMENT

Concrete Grout Filled Fabric Backs will be measured as the number of cubic feet of concrete grout actually placed into production and used to fill the fabric bags, complete in place, and approved by the Engineer.

BASIS OF PAYMENT

The work under this Item will be paid for at the contract unit price per cubic foot, which price shall include full compensation for all labor, materials, and equipment necessary to complete the work.

Payment will be made for the cubic feet of grout introduced into the pumping system even though some of it will be used for delivery purposes and not necessarily incorporated in the work. Stoppages attributed to the Contractor shall be the Contractor's responsibility and the cost of the material required to refill the discharge system shall be borne by the Contractor.

ITEM 999.9 POLICE ALLOWANCE LUMP SUM

Work under this Item shall consist of furnishing traffic control services required to regulate, control and protect vehicular and pedestrian traffic on existing roadways and pathways which will be affected by the Contractor's operations. Where vehicular and pedestrian traffic is maintained, the work shall be conducted and guarded so that there will be at all times a safe passageway.

The Contractor shall provide such police officers, as may be deemed necessary by the Engineer, for the direction and control of vehicular and pedestrian traffic. Such officers shall wear regulation policemen's

uniforms. Only City of Newton Police shall be employed on roadways under control of the City of Newton. Only Town of Needham Police shall be employed on roadways under control of the Town of Needham.

City of Newton Police and Town of Needham Police, employed by the Contractor on a temporary basis, are considered to be employees for payment purposes only. The Contractor shall issue W-2 "Statements of Earnings and Taxes Withheld" to such employees and must submit copies thereof to the Massachusetts Department of Revenue in the usual manner prescribed by law. With respect to orders, control, and direction, City of Newton Police and Town of Needham Police shall be under the jurisdiction of their respective City/Town Chief of Police.

METHOD OF MEASUREMENT

The Contractor shall include in his bid a lump sum allowance of $10,000 for furnishing of Police Allowance. The Contractor must submit certified copies of itemized Bills of Services rendered for review and approval by the Engineer. This lump sum allowance will be adjusted to the actual paid for, authorized, and approved services.

BASIS OF PAYMENT

The service to be paid for under Police Allowance shall be the actual amount paid by the Contractor to provide satisfactory services as stipulated above. Any allowance for overhead shall be considered to have been included for payment in the prices stipulated in the numbered items of the Proposal.

END OF SECTION

APPENDIX

Smith & Wessel Associates, Inc. Document

Nahanton Street Bridge – at Kendrick & Nahanton Street, Needham/Newton Line
Lead Base Paint XRF Testing Report, 2 pages

SMITH & WESSEL ASSOCIATES, INC.
HAZARDOUS BUILDING MATERIALS AND AIR QUALITY SPECIALISTS

May 18, 2010

Mr. Chris Jones
Beta Group, Inc.
315 Norwood Park South
Norwood, Massachusetts 02062

Ref: Nahanton Street Bridge – At Kendrick & Nahanton Street, Needham/Newton line
Lead Based Paint XRF Testing

Dear Mr. Jones:

On May 17, 2010, Smith & Wessel Associates, Inc. (SWA) licensed Lead Inspector, Ted Sherry, performed a limited assessment for lead-based paint (LBP) at the Nahanton Street Bridge located at Kendrick and Nahanton Streets on the Needham/Newton line. The bridge crosses over the Charles River and is slated for renovations.

Testing for LBP was conducted using a portable X-Ray fluorescence analyzer (XRFA), a state-of-the-art testing instrument that allows us to test multiple surfaces quickly and accurately. Using this instrumentation avoids destructive sampling techniques, such as sodium sulfide testing. The XRFA uses a radioactive source to excite the electrons of lead atoms (if present) in paint. As the lead atom electrons return to their normal state, they emit x-rays that are measured by the XRFA. These data are then processed and the results converted to milligrams of lead per square centimeter (mg/cm^2) of sampled surface area.

The United States Department of Housing and Urban Development (HUD) has established a standard for lead-based paint, as tested using an XRF analyzer, of 1.0 mg/cm^2. Although this standard only applies to housing funded by the federal government, it is a useful reference concentration for assessing hazards associated with lead in paint in other settings. Thus, when paint contains greater than 1.0 mg/cm^2, special care should be taken when conducting activities that impact these paints. When conducting abrasive blasting, torch burning, or similar activities that generate significant dust or fume, hazards can be caused even at concentrations below the HUD standard. Contractors must comply with all requirements of the OSHA Lead Standard when impacting materials coated with lead paint.

SWA conducted limited testing of representative bridge components that are expected to be impacted by the renovations. SWA utilized the XRF to test structural steel, cross

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supports, corrugated under section and the handrail system. XRF results detailed in Table below indicate that of those components tested, none are coated with lead paint.

Summary of Surfaces Tested for LBP				
Location	**Substrate**	**Color**	**Component's**	**Result mg/cm^2**
Nahanton Street Bridge	Metal	Green	Structural steel beams	<0.1
	Metal	Green	Structural steel cross supports	<0.1
	Metal	Silver	Corrugated under side	<0.1
	Metal	Silver	Handrail system	<0.1

Conclusions and Recommendations

1. SWA's XRF results indicate that no lead was detected in those painted components tested. SWA did observe a placard on the bridge indicating that it was constructed in 1988. Except for use in some industrial settings, LBP was banned in 1978. However, because our inspection was limited in scope and not all surfaces could be assessed, there may be components associated with the bridge that will require further testing to determine for lead concentrations. In particular, the underside of the bridge that spans the Charles River was not full accessible.

Please do not hesitate to call should you have any further questions or concerns.

Respectfully submitted,
Smith & Wessel Associates Inc.

Ted Sherry
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Smith & Wessel Associates