

CITY OF SALEM



**Kimberley Driscoll, Mayor
Kathleen Winn, Deputy Director,
Department of Planning and Community Development**

PROJECT MANUAL BID AND CONTRACT DOCUMENTS

**Project Title: Winter Island Trail
Prepared By: Kyle Zick Landscape Architecture, Inc.
Preparation Date: 02/05/16**

City of Salem



Invitation for Bids

R-47

Winter Island Trail

February 10, 2016

BIDS DUE:

Wednesday, February 24, 2016, 2:00 PM

*Late bids will be rejected

Whitney C. Haskell
Purchasing Agent
93 Washington Street, 2nd Floor
Salem, MA 01970
whaskell@salem.com
(978) 619-5695

**WINTER ISLAND TRAIL
R-47
COVER SHEET**

PLEASE PRINT OR TYPE:

Name of Bidder:	Contact Individual:			
Address:				
#	Street	City/Town	State	Zip Code
Phone:	Alternate Phone:			
Email Address:	Social Security/Federal Tax Identification Number:			
Authorized Signature: _____				

**WINTER ISLAND TRAIL
R-47
BIDDER'S CHECKLIST**

Submissions:

Please Check:

- Completed Cover Sheet
- Bidder's Checklist (this sheet)
- Bid Form
- Signed Certificate of Non-Collusion
- Signed Tax Compliance Certification
- Certificate as to Corporate Bidder
- Reference Form
- 5% Bid Deposit
- Prevailing Wage Certification
- Debarment Certification
- Labor Harmony and OSHA Certification
- List of Similar Project/References
- Acknowledgement of Addenda: _____ (*if applicable*)
(#s)

**WINTER ISLAND TRAIL
R-47
BID FORM**

BASE BID

General – Demolition / Site Preparation

Construction fencing, erosion control, building material & gravel removal, stockpiling, vegetation clearing

\$ _____ (figures)	_____ DOLLARS AND _____ CENTS. (written)
-----------------------	---

Earthwork
Cut & Fill

\$ _____ (figures)	_____ DOLLARS AND _____ CENTS. (written)
-----------------------	---

Site Improvement

Signage, new granite benches, resetting boulders, bollards

\$ _____ (figures)	_____ DOLLARS AND _____ CENTS. (written)
-----------------------	---

Trail Construction

Asphalt path with chip seal surface

\$ _____ (figures)	_____ DOLLARS AND _____ CENTS. (written)
-----------------------	---

Stonedust path

\$ _____ (figures)	_____ DOLLARS AND _____ CENTS. (written)
-----------------------	---

Pavers near Harbormaster Office

\$ _____ (figures)	_____ DOLLARS AND _____ CENTS. (written)
-----------------------	---

Planting

Topsoil & lawn seeding

\$ _____ (figures)	_____ DOLLARS AND _____ CENTS. (written)
-----------------------	---

Bank Stabilization

Coir log and bayberry planting

\$ _____ (figures)	_____ DOLLARS AND _____ CENTS. (written)
-----------------------	---

TOTAL BASE BID

\$ _____ (figures)	_____ DOLLARS AND _____ CENTS. (written)
-----------------------	---

ADD ALTERNATE #1 – Stormwater Detention Area

TOTAL ADD ALTERNATE

Clear lawn, cut, seed, line with boulders

\$ _____ (figures)	_____ DOLLARS AND _____ CENTS. (written)
-----------------------	---

ADD ALTERNATE #2 – Native Planting at Entrance & Along Maple Allée

TOTAL ADD ALTERNATE

Trees at entrance + three (3) maples along allée

\$ _____ (figures)	_____ DOLLARS AND _____ CENTS. (written)
-----------------------	---

ADD ALTERNATE #3 – Asphalt & Painted Crosswalk Trail Segment – Earthwork, Paving, Painting, Topsoil & Seeding

TOTAL ADD ALTERNATE

\$ _____ (figures)	_____ DOLLARS AND _____ CENTS. (written)
-----------------------	---

ADD ALTERNATE #4 – Stormwater Bioinfiltration System

TOTAL ADD ALTERNATE

\$ _____ (figures)	_____ DOLLARS AND _____ CENTS. (written)
-----------------------	---

VEGETATION CLEARING & GRUBBING UNIT PRICE: Please provide a unit price for clearing & grubbing 1000 square feet of vegetation (vines, shrubs, and small to medium-sized trees).

\$ _____ (figures)	_____ DOLLARS AND _____ CENTS. (written)
-----------------------	---

THIRTY (30) CUBIC YARD DUMPSTER UNIT PRICE: Please provide a unit price for filling a thirty cubic yard dumpster with wood, brush, concrete, steel, and trash.

\$ _____ (figures)	_____ DOLLARS AND _____ CENTS. (written)
-----------------------	---

*In the event of a discrepancy, the written amount will control.

Signature of Authorized Representative

Name (printed)

Date

**WINTER ISLAND TRAIL
R-47
REQUIRED CERTIFICATIONS**

1. NON-COLLUSION

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

(Signature of authorized individual submitting proposal)

(Printed Name)

(Name of Bidder (if different than name))

(Federal Tax Identification or Social Security Number)

(Date)

2. TAX COMPLIANCE

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

(Signature of authorized individual submitting proposal)

(Printed Name)

(Name of Bidder (if different than name))

(Federal Tax Identification or Social Security Number)

(Date)

3. CORPORATE AUTHORITY (if applicable)

I, _____ certify that I am the _____ of the corporation named as Bidder in the Bid included herein, that _____, who signed said Bid on behalf of the Bidder was then _____ of said corporation, that I know his signature, that his signature thereon is genuine and that said Bid was duly signed, sealed and executed for and in behalf of said corporation by authority of its governing body.

(Corporate Seal)

(Secretary-Clerk)

(Signature of authorized individual submitting proposal)

(Printed Name)

(Name of Bidder (if different than name))

(Federal Tax Identification or Social Security Number)

(Date)

4. PREVAILING WAGES

The undersigned bidder or quoter hereby certifies, under the pains and penalties of perjury, that the foregoing bid or quote is based upon the payment to laborers employed on the project of wages in an amount no less than the applicable prevailing wage rates established for the project by the Massachusetts Department of Labor and Workforce Development. The undersigned bidder or quoter agrees to indemnify the awarding authority for, from and against any loss, expenses, damages, action or claims, including any expense incurred in connection with any delay or stoppage of the project work, arising out of or as a result of (1) the failure of the said bid or quote to be based upon the payment of the said applicable prevailing wage rates, or (2) the failure of the bidder or quoter, if selected as the Contractor, to pay laborers employed on the project the said applicable prevailing wages.

(Signature of authorized individual submitting proposal)

(Printed Name)

(Name of Bidder (if different than name))

(Federal Tax Identification or Social Security Number)

(Date)

5. DEBARRMENT

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.

(Signature of authorized individual submitting proposal)

(Printed Name)

(Name of Bidder (if different than name))

(Federal Tax Identification or Social Security Number)

(Date)

6. LABOR HARMONY AND OSHA TRAINING

The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards made subject to section 44A.

(Signature of authorized individual submitting proposal)

(Printed Name)

(Name of Bidder (if different than name))

(Federal Tax Identification or Social Security Number)

(Date)

REFERENCE FORM *(Attach additional sheets as necessary.)*

(1) Reference Name (Contact Person):		City/Town/Company:	
Address:			
Phone:	Fax:	Email:	
Dates of Services Provided: ____ / ____ / ____ to ____ / ____ / ____			
Description of Services Provided:			

(2) Reference Name (Contact Person):		City/Town/Company:	
Address:			
Phone:	Fax:	Email:	
Dates of Services Provided: ____ / ____ / ____ to ____ / ____ / ____			
Description of Services Provided:			

(3) Reference Name (Contact Person):		City/Town/Company:	
Address:			
Phone:	Fax:	Email:	
Dates of Services Provided: ____ / ____ / ____ to ____ / ____ / ____			
Description of Services Provided:			

PART 1. GENERAL INFORMATION

1.1 PROCUREMENT DESCRIPTION

The proposed Winter Island Trail is to be a scenic, multi-use and accessible trail bordering Cat Cove along the west side of Winter Island Park in Salem, MA. The 1/3 mile trail will be 5' wide and will include stormwater management improvements with native plantings and amenities such as viewing spots with seating and interpretive signage.

The estimated value is \$240,000.00.

1.2 APPLICABLE LAW

This procurement will be conducted pursuant to Massachusetts General Laws Chapter 30, Section 39M.

1.3 APPROVAL

Any contract that may result from the procurement shall be subject to the approval of the Mayor of the City of Salem.

1.4 INCORPORATION BY REFERENCE

All requirements, specifications, terms and conditions described in this Invitation for Bids shall be incorporated by reference into any contract that may result.

1.5 TIME FOR AWARD

Any contract that may result from the procurement shall be awarded within thirty (30) days after the bid opening. The Contractor must agree to hold its bid prices firm for that period.

1.6 RIGHT TO CANCEL/REJECT

The City reserves the right to cancel this Invitation for Bids or reject in whole or in part any and all bids if the City determines that cancellation or rejection serves the best interests of the City.

1.7 TAXATION

Purchases made by the City are exempt from the payment of Federal excise tax and the payment of Commonwealth of Massachusetts sales tax and any such taxes must not be included in the bid pricing.

Copies of the City's tax exempt paperwork shall be available upon request of the selected contractor.

1.8 OBTAINING THE INVITATION FOR BIDS

The Invitation for Bids shall be available beginning, Wednesday, February 10, 2016 by 10:00 AM.

The Invitation for Bids and related documents shall be available for free download from the City's Purchasing Department website at http://salem.com/Pages/SalemMA_Purchasing/index under the link titled "IFBs, RFPs, RFQs."

Hardcopies of the Invitation for Bids and related documents may be obtained at the Office of the Purchasing Agent, 93 Washington Street, 2nd Floor, Salem, Massachusetts 01970, between the hours of 8:00 AM-4:00 PM on Monday-Wednesday, 8:00-7:00 PM on Thursday, and 8:00 AM-12:00 PM on Friday.

PART 2. INSTRUCTIONS FOR BIDDERS

2.1 REQUIREMENTS AND SUBMISSIONS

Below please find a description of the requirements and submissions that must be included as part of a bid. Bids must be sealed and marked as noted.

2.1.1 BID FORM

Every bid must include a completed 'Bid Form'. See attached. All material, equipment and labor is F.O.B. City of Salem.

2.1.2 NON-COLLUSION

Every bid must include a certification of good faith, certifying that the bid was made in good faith and without collusion or fraud. See 'Non-Collusion Form' attached.

2.1.3 TAX COMPLIANCE

Every bid must include a written certification that the bidder has complied with all state laws relating to taxes, reporting of employees and contractors, and child support. See 'Tax Compliance Form' attached.

2.1.4 CORPORATE BIDDER

If the bid is being submitted by a corporation, the bid must include a certification that the individual submitting the bid has been authorized to bind the corporation. See 'Certificate of Corporate Authority' attached.

2.1.5 REFERENCE FORM

Every bid must be accompanied by at least three (3) professional references.

2.1.6 BID DEPOSIT

Each bid must be accompanied by a deposit equal to five percent (5%) of the amount of the bid. The bid deposit may be in the form of a certified treasurer's or cashier's check payable to the City of Salem from a responsible bank or trust company; cash; or a bid bond.

2.1.7 PAYMENT BOND

The selected contractor shall be required to furnish a Payment Bond in the amount of fifty percent (50%) of the contract price, within ten days of the date of notification of the contract award.

2.1.8 PREVAILING WAGE

Wages for this project are subject to the prevailing wage rates as set by the Department of Labor Standards. A copy of the prevailing wage rates for this project is included in the Invitation for Bids, along with a Payroll Record Form and Statement of Compliance. In the event that the option to renew is exercised, an updated prevailing wage rate sheet will be sent to the Contractor along with the contract amendment letter.

Certified Weekly Payroll documents shall be sent to the Office of the Purchasing Agent, 93 Washington Street, 2nd Floor, Salem, MA 01970. Payroll records must be sent three (3) business days after the close of the previous work week. See ‘Certification Regarding Payment of Prevailing Wage Rates’ attached.

2.1.9 DEBARMENT

Every bid must include a certification regarding the contractor’s debarment status. A debarred contractor is not eligible for the award of public contracts during the period of its debarment. See ‘Certification Regarding Debarment’ attached.

2.1.10 LABOR HARMONY AND OSHA CERTIFICATION

Every bid must include a certification regarding labor harmony training approved by the U.S. Occupational Safety and Health Administration completed by all employees to be employed at the worksite. See ‘Labor Harmony and OSHA Certification’ attached.

2.2 BID DELIVERY

Below please find a description of the manner in which sealed bids must be submitted.

2.2.1 DUE DATE AND TIME

Bids shall be received by the Office of the Purchasing Agent on or before **2:00 PM on Wednesday, February 24, 2016.**

Any bid received after that time shall be rejected as non-responsive.

2.2.2 ADDRESS

Sealed bids shall be delivered to the Office of the Purchasing Agent, 93 Washington Street, 2nd Floor, Salem Massachusetts 01970.

2.2.3 HOURS OF OPERATION

Bids must be delivered during the normal hours of operation of the City of Salem:

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

2.2.4 COPIES

Bidders must submit one (1) original and one (1) copy of the bid.

2.2.5 LABELING

The outside of the envelope containing the sealed bid must be labeled with 1) the bid number 2) the bid opening date and time and 3) the name of the bidder.

2.3 SIGNATURES

A bid must be signed as follows: 1) if the bidder is an individual, by her/him personally; 2) if the bidder is a partnership, by the name of the partnership, followed by the signature of each general partner; and 3) if the bidder is a corporation, by the authorized officer, whose signature must be attested to by the clerk/secretary of the corporation, and with the corporate seal affixed.

2.4 QUESTIONS, CHANGES, MODIFICATIONS AND WITHDRAWALS

2.4.1 QUESTIONS/REQUESTS FOR CLARIFICATION

Questions concerning this Invitation for Bids must be submitted in writing to: Whitney Haskell at whaskell@salem.com at least five (5) days prior to the bid opening date. Written responses will be mailed to all bidders on record as having picked up the Invitation for Bids.

2.4.2 CHANGES

If any changes are made to this Invitation for Bids, addenda will be issued. Addenda will be posted in the Office of the Purchasing Agent, on the website and e-mailed to all bidders on record as having picked up the Invitation for Bids.

2.4.3 MODIFICATIONS AND WITHDRAWALS

A bidder may correct, modify, or withdraw a bid by written notice received by the City of Salem prior to the time and date set for bid opening.

Modifications must be submitted in a sealed envelope clearly labeled "Modification No. ___" to the address listed in part one of this section. Each modification must be numbered in sequence, and must reference the Invitation for Bids.

After the bid opening a bidder may not change any provision of the bid in a manner prejudicial to the interests of the City or fair competition. Minor informalities will be waived or the bidder will be allowed to correct them. If a mistake and the intended bid are clearly evident on the face of the bid document, the mistake will be corrected to reflect the intended correct bid, and the bidder will be notified in writing; the bidder may not withdraw the bid. A bidder may withdraw a bid if a mistake is clearly evident on the face of the bid document, but the intended correct bid is not similarly evident.

2.5 UNFORESEEN OFFICE CLOSURES

If, at the time of the scheduled bid opening, 93 Washington Street, 2nd Floor, Salem, MA 01970, is closed due to uncontrolled events such as fire, snow, ice, wind, or building evacuation, the bid opening will be postponed until 2:00 PM on the next normal business day. Bids will be accepted until that date and time.

2.6 BID OPENING PROCEDURE

At the time and place fixed for opening of bids, the City will cause to be opened and publicly read aloud every bid received within the time set for receiving bids, irrespective of any irregularities therein. Bidders and other persons properly interested may be present, in person or by representative.

PART 3. SPECIFICATIONS

3.1 SPECIFICATIONS

SECTION 01 33 23: SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.2 GENERAL SUBMITTAL PROCEDURES

- A. Submittals shall be sent to the Owner's Representative via email in PDF format. Hard/paper copies are not desired. Physical samples shall be delivered to the Owner's Representative in person or from a shipping company.
- B. The Owner's Representative has 7 days to review the submittals and return them to the Contractor, also in PDF format.
- C. Transmittal: Include a transmittal with each submittal identifying the item clearly.

PART 2 - PRODUCTS-not used

PART 3 - EXECUTION-not used

**END OF SECTION 01 33 23
SUBMITTALS**

SECTION 01 35 23: SAFETY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. The work of this section consists of establishing an effective accident prevention program and providing a safe environment for all personnel and visitors.

1.2 QUALITY ASSURANCE

- A. Comply with contract clauses, Federal, state, and local safety and health requirements, the most stringent shall apply. Equipment or tools not meeting OSHA requirements will not be allowed on the project sites. Failure to comply with the requirements of this section and related sections may result in suspension of work.
- B. Qualifications of Employees:
 - 1. All employees must be physically qualified and able to perform their assigned duties in a safe manner.
 - 2. Do not allow employees to perform work whose ability or alertness is impaired because of prescription or illegal drug use, fatigue, illness, intoxication, or other conditions that may expose themselves or others to injury.
 - 3. Operators of vehicles, mobile equipment, hoisting equipment, and hazardous plant equipment shall be able to understand signs, signals, and operating instructions, and be fully capable of operating such equipment. Provide operating instructions for all equipment. Newly hired operators shall be individually tested by an experienced operator or supervisor to determine if they are capable of safely operating equipment.

PART 2 - PRODUCTS

2.1 ACCIDENT PREVENTION PLAN

- A. The Plan shall be written to comply with OSHA and project requirements.

2.2 FIRST AID FACILITIES

- A. Provide adequate facilities for the number of employees and the hazards associated with the types of ongoing construction work at the site.

2.3 PERSONNEL PROTECTIVE EQUIPMENT

- A. Meet requirements of applicable ANSI standards.

PART 3 - EXECUTION

3.1 EMERGENCY INSTRUCTIONS

- A. Post telephone numbers and reporting instructions for ambulance, physician, hospital, fire department, and police in conspicuous locations at the work site.

3.2 FIRE AND LIFE SAFETY

- A. Comply with the requirements of NFPA 241 (Standard for Safeguarding Construction, Alteration, and Demolition Operations).
- B. Store hazardous materials in accordance with manufacturer's and OSHA recommendations. Maintain readily available, on site, MSDS for each chemical.
 - 1. Maintain a spill emergency response kit.

3.3 PROTECTIVE EQUIPMENT

- A. Inspect personal protective equipment daily and maintain in a serviceable condition. Clean, sanitize, and repair personal items, as appropriate, before issuing them to another individual.
- B. Inspect and maintain other protective equipment and devices before use and on a periodic basis to ensure safe operation.

3.4 HARD HATS AND PROTECTIVE EQUIPMENT AREAS

- A. A hard hat area shall be designated by the Contractor. The hard hat area shall be posted by the Contractor in a manner satisfactory to the Owner's Representative.
- B. It is the Contractor's responsibility to require all those working on or visiting the site to wear hard hats and other necessary personal protective equipment at all times.

**END OF SECTION 01 35 23
SAFETY REQUIREMENTS**

SECTION 01 50 00: TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.2 USE CHARGES

- A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum as required.
- B. Water Service: Water from existing water system is available for use with metering and with payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service: Electric power from existing system is available for use with metering and with payment of use charges. Provide connections and extensions of services as required for construction operations.

1.3 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Temporary materials may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.
- B. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.76-mm-) thick, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts.
- C. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete or galvanized steel bases for supporting posts.
- D. Safety Barrier Fence: Orange plastic fence, minimum height, 4 feet
- E. Barrier Tape: Yellow tape Imprinted with "CAUTION: CONSTRUCTION AREA", manufactured by Reef Industries, Inc., Houston, Texas, or approved equal.

2.2 TEMPORARY FACILITIES

- A. Sufficiently lighted and ventilated toilet facilities in weatherproof, sight proof, handicap accessible, sturdy enclosures with privacy locks.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance and as directed by the Owner's Representative.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
- B. Potable water is not available on site. Furnish cool, potable water for construction personnel in locations convenient to work stations.
- C. Sanitary Facilities: Provide temporary toilets, and wash facilities for use by construction personnel.
 - 1. Place in approved locations secluded from public observation and convenient to work stations. Relocate as work progress requires.
 - 2. Maintain and clean toilet facilities at least weekly.
 - 3. Completely remove sanitary facilities on completion of work.
- D. Electric Power Service: Use of existing electric power service will be permitted.
 - 1. When temporary connections are removed, restore existing utility services to their original condition.
- E. Telephone Service: No telephone service is available on site for Contractor's use. Make arrangements with Telephone Company and pay all costs.

3.3 SUPPORT FACILITIES INSTALLATION

- A. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
 - 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.

- B. Project Identification and Temporary Signs: City will provide Contractor with temporary identification sign to be installed by the Contractor.
 - 1. Provide temporary, directional signs for construction personnel and visitors.
 - 2. Maintain and touchup signs so they are legible at all times.
- C. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- B. Storm water Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of storm water from heavy rains.
- C. Site Enclosure Fence:
 - 1. Extent of Fence: Portion determined sufficient to restrict access to site and accommodate construction operations.
- D. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
- E. Barricades, Warning Signs, and Lights: Comply with requirements of MUTCD, part IV, 2003 edition and authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- F. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
 - 1. Responsible Person: A capable and qualified person shall be placed in charge of fire protection. The responsibilities shall include locating and maintaining fire protective equipment and establishing and maintaining safe torch cutting and welding procedures.
 - 2. Smoking: Smoking within buildings or temporary storage sheds is prohibited.
 - 3. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of NPS and authorities having jurisdiction. Check with park; many require "burn permits" for welding
 - 4. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 - 5. Hazard Control: Take all necessary precautions to prevent fire during construction.
 - 6. Spark Arresters: Equip all gasoline or diesel powered equipment used during periods of potential fire hazards or in potential forest and grass fire locations with spark arresters approved by the USDA Forest Service.
 - 7. Vehicles and Equipment: Provide one extinguisher on each vehicle or piece of equipment.
 - 8. Service and Refueling Areas: Locate areas a minimum of 50 feet from buildings. Shut down equipment before refueling.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

WINTER ISLAND TRAIL

- B. Maintenance: Maintain facilities in good operating condition until removal.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

END OF SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

SECTION 01 77 00: CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 1. Substantial Completion and Final Inspection.
 2. Warranties.
 3. Final cleaning.

1.2 SUBSTANTIAL COMPLETION AND FINAL INSPECTION

- A. When project, or designated portion of project, is substantially complete, request in writing a final inspection. Upon receipt of written request that project is substantially complete, the Owner's Representative will proceed with inspection within 3 days of receipt of request or will advise the Contractor of items that prevent the project from being designated as substantially complete.
- B. If, following final inspection, the work is determined to be substantially complete, Owner's Representative will prepare a Punch List to be corrected before final acceptance and issue a Letter of Substantial Completion. Contractor shall complete the work described on the Punch List within 7 calendar days, as weather permits. If the Contractor fails to complete the work within this time frame, the Owner's Representative may either replace or correct the work with an appropriate reduction in the contract price or charge for re-inspection costs in accordance with the Inspection of Construction clause of the contract.
- C. If, following final inspection, the work is not determined to be substantially complete; Owner's Representative will notify Contractor in writing. After completing work, Contractor shall request a new final inspection. All re-inspection costs may be charged against the Contractor in accordance with the Inspection of Construction clause of the contract.

1.3 FINAL ACCEPTANCE OF THE WORK

- A. Prior to requesting inspection for verification of completion of all outstanding items.
- B. After all deficiencies have been corrected, a Letter of Final Acceptance will be issued.

1.4 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Owner's Representative for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

PART 2 - PRODUCTS: NOT USED

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers for final cleaning. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove labels that are not permanent.
 - f. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - g. Leave Project clean and ready for occupancy.

END OF SECTION 01 77 00
CLOSEOUT PROCEDURES

SECTION 31 10 01: SITE PREPARATION

PART 1-GENERAL

1.1 RELATED DOCUMENTS

- A. The General Documents, as listed on the Table of Contents, and applicable parts of Division 1, GENERAL REQUIREMENTS, shall be included in and made a part of this Section.
- B. Examine all Contract Documents and all other Sections of the Specifications for requirements therein affecting the work of this trade.

1.2 SUMMARY

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to prepare the site, complete, as indicated on the Contract Documents, as specified, and as follows:
 - 1. Protection of existing structures and utilities
 - 2. Salvage, stockpile on site, and reuse materials
 - 3. Salvage materials and stockpile off site
 - 4. Removal and disposal of materials
 - 5. Erosion Control (filter tube)

1.3 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. SECTION, EARTH MOVING; Excavation and backfill.

1.4 PROTECTION

- A. Do not interfere with use of adjacent buildings or facilities. Maintain free and safe passage to and from adjacent buildings and facilities or both and between them and the public way.
- B. Cease operations and notify Owner immediately if safety of adjacent structures, workers, or the general public appears to be endangered. Take precautions to properly support structures and protect workers and general public. Do not resume operations until safety is restored.
- C. Prevent movement, settlement or collapse of adjacent services, sidewalks, driveways and trees. Assume liability for such movement, settlement, or collapse. Promptly repair damage at no cost to the Owner.

1.5 ARCHEOLOGICAL PROTECTION

- A. Much of the project area is an archeologically sensitive area. If Contractor discovers potential archeological resources, Contractor shall contact the City and relocate work to non-sensitive areas until directed further.

PART 2-PRODUCTS

2.1 EROSION CONTROL

- A. FILTER TUBE
 - a. Filter tube shall consist of biodegradable mesh tube filled with wood chips or compost. Filter tube shall be 12 inch diameter. Stakes shall be hardwood. Tubes shall be manufactured by Filtrexx, Silt Sock, or an approved equal.

PART 3-EXECUTION

3.1 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. Existing structures and utilities shall be suitably protected from damage, including but not limited to existing pavements and curbs, site walls, lighting, fencing, manholes, and utility lines.
- B. Provide and install erosion and sedimentation control at all existing catch basins, manholes and all other utility structures as identified on the drawings.

3.2 SALVAGE, STOCKPILE ON SITE, AND REUSE MATERIALS

- A. Materials indicated on the Contract Documents or designated by the Owner's Representative in the field to be salvaged shall be carefully removed, protected from damage, and put in temporary storage as follows:
 - 1. Salvaged material shall be stockpiled on-site in an area designated by the Owner's Representative.
 - 2. Salvaged material shall include but are not limited to the following:
 - a. Boulders
 - b. Granite blocks
 - c. Utility poles / pole sections
 - d. Benches

All construction staging and materials storage shall be limited to the construction work area.

3.3 REMOVAL AND DISPOSAL OF MATERIALS

- A. Materials indicated on the Contract Documents or designated by the Owner's Representative in the field to be removed shall be dismantled, removed, and legally disposed of off-site as indicated on the Contract Documents and as specified, performed and paid for in this SECTION, SITE PREPARATION. Removals include but are not limited to the following:
 - 1. Trees
 - 2. Shrubs
 - 3. Invasive plant species
 - 4. Gravel
 - 5. Utility poles
 - 6. Barbed wire
 - 7. Steel edging
- B. Material resulting from the site preparation work and not scheduled to be salvaged and which is unsuitable for reuse on the project, shall become the property of the Contractor and shall be legally disposed of off-site.
- C. Debris, rubbish, and other material shall be disposed of promptly and shall not be left until final cleanup of site.
- D. Existing site structures indicated on the Contract Documents to be removed, shall be completely dismantled and removed from the site.
- E. Areas formerly occupied by structures shall be regraded to conform with surrounding topography following demolition.

3.4 EROSION CONTROL

- A. Erosion control shall be constructed and installed as indicated on the Contract Documents, prior to start of clearing and grubbing operations or any earthwork operations.

3.5 MAINTENANCE AND REMOVAL OF EROSION CONTROL DEVICES

A. Erosion Control Devices

1. Sediment behind the erosion control device shall be checked twice each month and after each heavy rain. Silt shall be removed if greater than 6 in. (150 mm) deep.
2. Condition of erosion control device shall be checked twice each month or more frequently as required. Damaged and/or deteriorated items shall be replaced. Erosion control devices shall be maintained in place and in effective condition.

B. Removal of Erosion Control Devices: Erosion control devices shall be maintained until all disturbed earth has been paved or vegetated, at which time they shall be removed.

1. Erosion protection material shall be kept securely anchored and in place until acceptance of stabilized, erosion and sediment controlled slope.
2. All temporary erosion control devices and accessories shall be completely removed at completion of project and legally disposed of off site at no additional cost to the Owner.
3. After erosion control devices are removed, areas disturbed by these devices shall be regraded and seeded and all adjacent areas repaired to a condition equal with the adjacent lawns or plantings.

END OF SECTION 31 10 01
SITE PREPARATION

SECTION 31 11 00: SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to prepare the site, complete, as indicated on the Contract Documents, as specified, and as follows:
 - 1. Clearing and grubbing of existing vegetation

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 CLEARING

- A. Trees, shrubs, stumps, brush, grasses, turf, herbaceous plants, downed timber, rubbish, organic matter, miscellaneous vegetation or extraneous debris not indicated on the Contract Documents or designated in the field by the Owner's Representative to remain shall be cleared.
- B. Clearing shall include the felling, cutting, and satisfactory disposal of all trees, stumps and vegetative debris produced through the clearing operations.
- C. Fell trees in such a way as to not injure trees to be saved. Excavation or grading within the branch spread of trees to be saved shall be performed only under the direction of the Owner's Representative unless otherwise directed.
- D. Clearing includes felling of individual trees and removal of areas of other vegetation.
- E. Cut all stumps flush with finished grade unless within footprint of proposed trail, in which case stump shall be removed.

3.3 PROTECTION OF EXISTING TREES AND VEGETATION

- A. The Contractor shall make every effort not to damage existing plant materials to remain. The Contractor is required to install protection as necessary to assure undamaged plant material and adjacent conditions.
- B. Vehicles shall not be parked within the dripline or where damage may result to trees to be saved. Construction materials shall not be stored beneath trees to be saved.
- C. Repair/replace vegetation that is damaged at no additional cost to Owner. Employ certified arborist to repair damaged trees.

**-END OF SECTION 31 11 00-
SITE CLEARING**

SECTION 31 20 00: EARTH MOVING

PART 1-GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. The work of this Section consists of providing labor, equipment, materials, incidental work, and construction methods necessary to complete the EARTH MOVING, as indicated in the Contract Documents and as specified.
- A. Provide all labor, equipment, materials, incidental work, and construction methods necessary to complete the EARTH MOVING which includes, but is not necessarily limited to the following:
 - 1. Unclassified excavation.
 - 2. Fill materials, fill and compaction.
 - 3. Drainage and dewatering as necessary to perform work in the dry.
 - 4. Rough grading.
 - 5. Removal of surplus or unsuitable materials.
 - 6. Dust control.
 - 7. Excavation, filling and grading around trees to remain.
 - 8. Frost protection.
 - 9. Preparation of subgrade for footings, foundations, slabs, pavements, and landscaping

1.3 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Section, SITE PREPARATION; Site preparation including clearing and grubbing.
 - 2. Section, ASPHALT PAVING; Correction of subgrades.
 - 3. Section, CRUSHED SHELL SURFACING; Correction of subgrades.
 - 4. Section, PLANTING SOILS; Placing and preparing topsoil for lawns, finish grading of planting soils.

1.4 REFERENCES

- A. The following standards shall apply to the work of this Section.
 - 1. Associated General Contractors of America, Inc. (AGC):

Manual	Manual of Accident Prevention in Construction
--------	---
 - 2. American Society for Testing and Materials (ASTM):

D 422	Particle - Size Analysis of Soils
D698-00a	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³ (600 kN-m/m ³))
D 1556	Density of Soil In-Place by the Sand Cone Method
D 1557	Test Method for Laboratory Compaction Characteristics of Soil Using Modified Method Effort

sieves or testing procedures as would be required for off-site borrow materials for which the on-site materials are proposed to replace.

2. One optimum moisture-maximum density curve for each soil material.
3. Report of actual unconfined compressive strength and/or results of bearing tests of each stratum tested.

1.6 QUALITY CONTROL TESTING REQUIREMENTS

- A. Contractor shall select and the Owner shall approve a qualified independent geotechnical engineering testing agency to perform on-site observation and testing during the following phases of the construction operations. Independent geotechnical engineering testing agency shall be paid directly by the Contractor.
 1. Classify proposed on-site and borrow soils to verify that soils comply with specified requirements and to perform required field and laboratory testing.
 2. Observation during excavation and replacement of existing fill under paved areas.
 3. Observation of compaction of excavation subgrade and paved area subgrade.
 4. Observation during placement and compaction of fills.
 5. Laboratory testing and analysis of fill and bedding materials specified, as required by the Owner's Representative.
 6. Observe construction and perform water content, gradation, and compaction tests at a frequency and at locations determined by the testing laboratory and approved by the Owner. The results of these tests will be submitted to the Owner's Representative, copy to the Contractor, on a timely basis so that the Contractor can take such action as is required to remedy indicated deficiencies. During the course of construction, the testing laboratory will advise the Owner's Representative in writing with copy to Contractor if, at any time, in his opinion, the work is not in substantial conformity with the Contract Documents.
 7. Observation of fills following interruptions by rains or other inclement weather.
 8. Payments for these services will be paid for the Owner on an hourly basis and will be paid only after careful review of submitted invoices and test results.
- B. Contractor shall perform field in-place density tests according to ASTM D 1556, ASTM D 2167, or ASTM D 2937, as applicable. Testing laboratory shall submit test results directly to the Owner's Representative for review and acceptance.
 1. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.
 2. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gauges at beginning of work, on each different type of material encountered, and at intervals as directed by the Owner's Representative.
 3. Footing Subgrade: At footing subgrade, perform at least one test of each soil stratum to verify design bearing capacities. Subsequent verification and approval of other footing subgrade may be based on a visual comparison of each subgrade with related tested strata when acceptable to the Owner's Representative.
 4. Paved Areas: At subgrade and at each compacted fill and backfill layer, perform at least one field in-place density test for every 2,000 sq. ft. or less of paved area, but in no case fewer than three tests as directed by the Owner's Representative.

- 5. Fills and Embankments: For each 500 cubic yards or fraction thereof per shift, perform at least one field in-place density test as directed by the Owner's Representative.
- C. When subgrade, fills or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, recompact and retest until required density is obtained.
- D. Testing of soils shall be in accordance with the following:

<u>Property</u>	<u>ASTM Test Method</u>
Particle - Size Analysis	D 422
Liquid Limit	D 4318
Plasticity Index	D 4318
- E. The testing laboratory's presence does not include supervision or direction of the actual work by the Contractor, his employees or agents. Neither the presence of the testing laboratory, nor any observations and testing performed by the testing laboratory shall excuse the Contractor from defects discovered in his work.
- F. The Owner reserves the right to modify or waive testing laboratory services.

1.7 QUALITY ASSURANCE

- A. Codes and Standards: Perform EARTH MOVING complying with requirements of authorities having jurisdiction.
- B. Comply with applicable requirements of NFPA 495.
- C. Pre-installation Conference: Conduct conference at Project site.
 - 1. Before commencing EARTH MOVING, meet with representatives of the governing authorities, Owner, Owner's Representative, consultants, geotechnical engineer, independent testing agency, and other concerned entities. Review EARTH MOVING procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least three working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.
- D. Compliance: Comply with local safety regulations and with provisions of "Accident Prevention in Construction" published by the Associated General Contractors of America, Inc.

1.8 EXAMINATION OF EXISTING CONDITIONS

- A. The Contractor shall become thoroughly familiar with the existing conditions of the site, consult records and drawings of adjacent structures and of existing utilities and their connections, and note all conditions which may influence the work of this Section, EARTH MOVING.
 - 1. Existing Utilities: Do not interrupt existing utilities serving facilities occupied by the Owner or others except when permitted in writing by the Owner's Representative and then only after acceptable temporary utility services have been provided.
 - 2. Provide a minimum 48-hours' notice to the Owner's Representative and receive written notice to proceed before interrupting any utility.
 - 3. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shutoff services if lines are active.
- B. By submitting a bid, the Contractor affirms that he has carefully examined the site and all conditions affecting work under this Section, EARTH MOVING. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.
- C. The Contractor may, at his own expense, conduct additional subsurface testing as required for his own information.

1.9 INFORMATION NOT GUARANTEED

- A. Information in the Contract Documents relating to subsurface conditions, natural phenomena, and existing utilities and structures is from the best sources presently available. Such information is furnished only for the information and convenience of the Contractor, and the accuracy or completeness of this information is not guaranteed.
- B. Plans, surveys, measurements, and dimensions under which the work is to be performed are believed to be correct, but the Contractor shall examine them for himself during the bidding period. Compensation for unforeseen subsurface conditions shall be in accordance with the general provisions of contract, including:
 - 1. General and Supplementary Conditions and Division 1 Specification Sections

1.10 PERMITS, CODES, AND SAFETY REQUIREMENTS

- A. Comply with all rules, regulations, laws and ordinances of the City and State, and all other authorities having jurisdiction over the project site. All labor, materials, equipment and services necessary to make the work comply with such requirements shall be provided by the Contractor without additional cost to the Owner.
- B. Comply with the provisions of the Manual for Accident Prevention in Construction of the Associated General Contractors of America, Inc., and the requirements of the Occupational Safety and Health Administration, United States Department of Labor.
- C. The Contractor shall procure and pay for all permits and licenses required for the complete work specified herein and shown on the Drawings.
- D. The Contractor shall not close or obstruct any street, sidewalk, or passageway without written permission from authorities having jurisdiction. The Contractor shall so conduct his operations as to interfere as little as possible with the use ordinarily made of roads, driveways, or other facilities near enough to the work to be affected thereby.
- E. The Contractor shall secure a DIG-SAFE permit number for the project to certify notification of gas, electrical and telephone utilities. All other affected utilities shall be contacted by the Contractor who shall secure notification receipts in accordance with requirements of Massachusetts law. The phone number is 1-888-DIG-SAFE. Contractors shall notify "Dig-Safe" of contemplated excavation, demolition or explosive work in public or private ways, and utility company right-of-way or easement. This notification shall be made at least 72 hours prior to the work, but not more than sixty days before the contemplated work. Such notice shall set forth the name of the street or the route number of said way and an accurate description of the location and nature of the proposed work. The Owner's Representative requires that the notification be sent to "Dig-Safe" by certified mail, with copies to the Owner. The Architect requires a copy of the signed receipt of the delivery. "Dig-Safe" is required to respond to the notice within 72 hours from the time said notice is received by designating at the locus the location of pipes, mains, wires and conduits. Contractor shall not commence work until "Dig-Safe" has responded as noted above. The work shall then be performed in such a manner, and with reasonable precaution taken to avoid damage to utilities under the surface in said areas of the work.
- F. Contractor shall contact all utility companies whose utilities might be affected by the Work of this Section, EARTH MOVING, and notify these utility companies of contemplated excavation, demotion or explosive work in public or private ways, and utility right-of-way easement. This notification shall be made at least 72 hours prior to the work, but not more than sixty days before the contemplated work. Such notice shall set forth the name of the street or the route number of said way and an accurate description of the location and nature of the proposed work. Contractor shall secure notification receipts for submission to the Owner's Representative prior to the start of the contemplated work. Contractor shall not commence work until all utility companies have responded and provided the necessary receipts. The work shall then be performed in such a manner, and with reasonable precaution taken to avoid damage to utilities under the surface in said areas of the work.

1.11 LAYOUT AND GRADES

- A. Benchmarks: The Contractor shall maintain and/or reestablish benchmarks and survey monuments necessary for the work of these Contract Documents and as shown in the Contract Documents or found to exist on the site to provide a base reference for the construction. Replace any which may become destroyed or disturbed. The Contractor shall employ and pay all costs for a registered Civil Engineer or Surveyor who is licensed within the jurisdiction of the project site to lay out all lines and grades in accordance with the Drawings, and as necessary or required for the construction. The selection of the registered Civil Engineer or Surveyor shall be subject to the Owner's Representative's approval.

1.12 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. Observe all rules and regulations governing the respective utilities in executing work under this Section, EARTH MOVING. The work shall be executed in such manner as to prevent any damage to adjacent property and any other property and existing improvements such as, but not limited to: streets, curbs, paving, utility lines and structures, monuments, bench marks and other public and private property. Protect existing structures and foundations from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by EARTH MOVING operations.
- B. In case of any damage or injury caused in the performance of the work, the Contractor shall, at his own expense, make good such damage or injury to the satisfaction of, and without cost to the Owner. Existing roads, sidewalks, and curbs damaged during the project work shall be repaired or replaced to their original condition at the completion of operations. The Contractor shall replace, at his own cost, existing bench marks, monuments, and other reference points which are disturbed or destroyed.
- C. Buried structures, utility lines, and the like, including those which project less than 18 in. (457 mm) above grade, which are subject to damage from construction equipment shall be clearly marked to indicate the hazard. Markers shall indicate limits of danger areas, by means which will be clearly visible to operators of trucks and other construction equipment, and shall be maintained at all times until completion of Project.
- D. Locate and mark underground utilities to remain in service before beginning the work. Protect all existing utilities to remain during operations. Do not interrupt existing utilities except when authorized in writing by authorities having jurisdiction.
- E. When an active utility line is exposed during construction its location and elevation shall be plotted on the Record Drawing by the Contractor and both the Owner's Representative and the Utility Owner notified in writing.
- F. Provide barricades, fences, lights, signs, and all other safety devices required for the protection of the public.

1.13 DEFINITIONS

- A. Base Course: The layer placed between the subbase course and surface pavement in a paving system.
- B. Borrow: Soil material obtained off-site when sufficient approved soil material is not available from excavations.
- C. Drainage Fill: Course of washed granular material supporting slab-on-grade placed to cut off upward capillary flow of pore water.
- D. Embankment: Any area on the site where the Contractor is required to raise grades to proposed subgrade elevations. Embankments are placed in layers to a predetermined elevation and cross section.
- E. Excavation: The removal of material encountered to subgrade elevations and the reuse of the material on site as Backfill, Fill or Ordinary Borrow material as it conforms to these specifications or disposal of materials removed.
- F. Finish Grade: Final grade elevations indicated on the Drawings. Spot elevations shall govern over proposed contours. Where not otherwise indicated, project site areas shall be given uniform slope between points for which finished grades are indicated or between such points and existing

established grades. Spot elevations shall govern over proposed contours. No ponding of surfaces shall be allowed due to lack of improper pitches across surfaces that will not allow proper drainage to occur.

- G. Rock: A sound and solid mass, layer, or ledge of mineral matter in place of such hardness and texture that it:
 - 1. Mechanical Definition of Rock: Cannot be effectively loosened or broken down by ripping in a single pass with a late model tractor-mounted hydraulic ripper equipped with one digging point of standard manufacturer's design adequately sized for use with and propelled by a crawler type tractor rated between 210- and 240-net flywheel horsepower, operating in low gear, or
 - 2. Manual Definition of Rock: In areas where the use of the ripper described above is impracticable, rock defined as sound material of such hardness and texture that it cannot be loosened or broken by a 6 lb. (2.7 kg) drifting pick. The drifting pick shall have a handle not less than 34 in. (0.86 m) in length.
- H. Rough grade: The top surface of subbase or base courses such as gravel, crushed stone, ordinary fill, and the like, ready to receive the final surface material application. Unless stated otherwise, all rough grades shall represent compacted material depths, as specified herein.
- I. Soil: All earth materials, organic or inorganic, which have resulted from natural processes such as weathering, decay, and chemical action of in situ rock or the deposition of unconsolidated material in which more than 35 percent by weight will pass a No. 200 sieve.
- J. Surplus Materials: On-site materials not used during the course of construction.
- K. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.
- L. Structural Backfill: The designated material as indicated in the Contract Documents to attain the proposed grades abutting or adjacent to site structures.
- M. Subbase Course: The layer placed between the subgrade and base course in a paving system or the layer placed between the subgrade and surface of a pavement or walk.
- N. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase course, drainage fill, or topsoil materials.
- O. Topsoil: The upper layer of the soil profile which is supporting the growth of vegetation as evidenced by the existence therein of numerous roots and other organic matter.
- P. Unauthorized excavation: Removing materials beyond indicated subgrade elevations or dimensions without direction by the Owner's Representative. Unauthorized excavation, as well as remedial work directed by the Owner's Representative, shall be at the Contractor's expense.
- Q. Unclassified excavation: Removal of materials encountered when establishing required grade elevations to the depths and extents shown on the Contract Documents. Unclassified excavation includes removal and disposal of pavements and other obstructions visible on ground surface, underground structures and utilities indicated to be demolished and removed, material of any classification indicated in data on subsurface conditions.
- Q. Unsuitable Material: Material that is classified as "unsuitable" shall be material having at least one of the following properties:
 - 1. Material with a maximum unit dry weight per cubic foot less than 90 lb. (40.9 kg) as determined by ASTM D 1557.
 - 2. Material containing visible organic matter, topsoil, organic silt, peat, construction debris, frozen material, roots, and stumps.
 - 3. Material which has a Liquid Limit greater than 55 when tested in accordance with ASTM D 4318.

4. Material designated in the field by the Owner's Representative or the testing laboratory.

- R. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within building lines.
- S. Utility Trench Backfill: The area bounded by the proposed finished subgrade and the cover material over the respective pipe or conduit. This material shall conform with applicable requirements for embankment or structural backfill depending on the area or zone into which the utility is installed.

1.14 COORDINATION

- A. Prior to start of EARTH MOVING the Contractor shall arrange an on-site meeting with the Owner's Representative for the purpose of establishing Contractor's schedule of operations and scheduling inspection procedures and requirements.
- B. As construction proceeds, the Contractor shall be responsible for notifying the Owner's Representative prior to start of EARTH MOVING operations requiring inspection and/or testing.

In the event that the Contractor does not notify the Owner's Representative prior to the start of EARTH MOVING operations and inspections and tests are not made or performed by the Owner's testing agents, the Owner's Representative may require the Contractor to remove all EARTH MOVING performed without the necessary inspections and replaced under the required supervision, review, inspections or tests at no additional cost to the Owner.

- C. The Contractor shall be responsible for obtaining test samples of soil materials proposed to be used and transporting them to the site sufficiently in advance of time planned for use of these materials for testing of materials to be completed. Use of these proposed materials by the Contractor prior to testing and approval or rejection, shall be at the Contractor's risk.

1.15 ARCHEOLOGICAL PROTECTION

- A. Much of the project area is an archeologically sensitive area. If Contractor discovers potential archeological resources, Contractor shall contact the City and relocate work to non-sensitive areas until directed further.

PART 2 PRODUCTS

2.1 AGGREGATE MATERIALS

- A. General: Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations. Gradation requirements shall be determined by AASHTO T11 and T27.
 1. Borrow material shall from on-site or off-site sources shall contain salt levels less than 1.0 milliohms/cm as measured by electrical conductivity (EC2) of a 1:2 soil-water suspension (Test minus sieve #4 material.). Borrow material with levels of salt in excess of this level will be considered unsuitable material and shall be removed from the site by the Contractor at no additional cost to the Owner.
 2. Borrow material from on-site and off-site sources shall contain levels of heavy metals or PCB less than the following levels:

Toxic Elements Maximum Concentration (mg/kg dry weight)

Arsenic	30
Boron	300
Cadmium	14
Chromium	1000
Copper	1000
Lead	300
Mercury	10
Molybdenum	10
Nickel	200

WINTER ISLAND TRAIL

Selenium	36
Zinc	2500
PCBs	1

Borrow material with levels of heavy metals and PCBs in excess of these levels will be considered unsuitable material and shall be removed by the Contractor from the site and disposed of legally at no additional cost to the Owner.

3. Satisfactory Soil Materials: ASTM D 2487 soil classification groups GW, GP, SW, and SP; free of rock or gravel larger than 2 in. (50 mm) in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter.
 4. Unsatisfactory Soil Materials: ASTM D 2487 soil classification groups GC, GM, SC, SM, ML, MH, CL, CH, OL, OH, and PT.
- B. Backfill and Fill Materials: Satisfactory soil materials as described above. On-site material for use in compacted backfill shall be natural, inorganic, granular soil, taken from areas of excavation after stripping of topsoil and removal of unsatisfactory soil materials as described above.
1. Use only backfill materials meeting the requirements of satisfactory soil materials that are free from rocks greater than 4in. (200 mm) in diameter or length, that have largest dimension no greater than $\frac{3}{4}$ lift thickness, or are no greater than $\frac{1}{2}$ ft.³ in volume. Do not use any foreign matter, such as construction debris, trash, wood, roots, leaves, sod, organic matter, or soft clay and silt. Sound pieces of building stone, masonry, and concrete from on-site sources subject to the same size limitations as stone, may be employed in backfill. Individual pieces shall be mixed into general backfill material, leaving no voids between pieces. Backfill shall be clean, non-organic material, of non-swelling character, capable of being readily compacted to form a solid, stable embankment. Pieces of bituminous pavement shall be excluded from the backfill unless their use is expressly permitted by the Owner's Representative, in which case they shall be broken up as directed. Materials containing ice or frozen lumps shall not be employed.
 2. Backfill and fill materials for use under lawns and planted areas shall be free draining materials that drain at a rate greater than or equal to one inch per hour after compaction to the specified levels.
 3. Suitable Excavated Material:
 - a. Free from clods, silt lumps or balls of clay.
 - b. Free from stones or rock fragments over 50 pounds.
 - c. Free from organics, peat, etc.
 4. Frozen Material:
 - a. Do not backfill with or on frozen materials.
 - b. Remove, or otherwise treat as necessary, previously placed material that has frozen prior to placing backfill.
 5. Wet Material:
 - a. Do not mechanically or hand compact material that is, in the opinion of the Engineer, too wet.
 - b. Do not continue backfilling until the previously placed and new materials have dried sufficiently to permit proper compaction.
- C. Ordinary borrow shall conform to ASTM D2487 soil classification groups GW, GP, SW, and SP, and be well graded, natural inorganic soil, meeting the following requirements:
1. It shall be free of organic or other weak or compressible materials, of frozen materials, and of stones larger than 4 inches (250 mm) maximum dimension.
 2. It shall be of such nature and character that it can be placed to form embankments and compacted to the specified densities in a reasonable length of time.
 3. It shall be free from highly plastic clays, from all materials subject to decay, decomposition, or dissolution and from cinders or other materials which will corrode piping or other metal.

- 4. It shall have a maximum dry density of not less than 100 lbs. Per cubic foot.
- 5. Material from excavation on the site may be used as ordinary fill if it meets the above requirements and is approved by the Owner's Representative.

#50 (300 um)	8-24
#200 (75 um)	3-10

D. Processed Gravel shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings, and deleterious materials. Gradation shall conform to the following:

<u>Sieve No.</u>	<u>% Passing by Weight</u>
3" (75 mm)	100
1 1/2" (37.5mm)	70-100
3/4" (19 mm)	50-85
#4 (4.75um)	30- 60
#200 (75 um)	0 –10

2.2 USES OF MATERIALS

A. Uses of Fill Materials: Fill materials listed above shall be utilized as follows and as otherwise indicated on the Drawings, specified or directed.

- 1. Processed Gravel:
 - a. Subbase for path.
 - b. As shown on the Contract Documents.
- 2. Ordinary Borrow:
 - a. General site fills.
 - b. As shown on the Contract Documents.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by EARTH MOVING operations.
- B. Protect subgrade and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

3.2 GRADES AND ELEVATIONS

- A. The Contract Documents indicate, in general, alignments, grade elevations and invert elevations. Establish the lines and grades in conformity with the Drawings. The Owner's Representative, however, may make such adjustments in the field in grades and alignments as are found necessary in order to avoid interference with any special conditions encountered.
- B. Spot elevations shall govern over proposed contours. Where not otherwise indicated, project site areas shall be given uniform slopes between points for which finished grades are indicated or between such points and existing established grades.
- C. Establish and maintain suitable stakes over all areas to be graded as directed, specified or required. Maintain sufficient reference points at all times during construction to properly perform the contract installation.

3.3 UNCLASSIFIED EXCAVATION

- A. The work of excavation shall be conducted at such locations, at such rates of progress and in such a manner as will ensure the continued progress of the work, with a minimum inconvenience to the general public.
- B. All material encountered during excavation shall be unclassified excavation and shall include the removal of boulders up to 3 cubic yards, earth, rock, concrete, covered pavements, abandoned utilities, abandoned foundations and all miscellaneous materials encountered as required for excavation. Boulders and rock over 3 cubic yards shall be covered under "Rock Excavation" in this Section, EARTH MOVING. The sequence of all excavation operations shall be such as to ensure the most efficient reuse of acceptable excavated borrow materials for particular improvement application. Acceptable materials shall be used or stockpiled for later use in backfill and subgrade preparation.
- C. Excavate all materials to the elevations, dimensions and form as shown in the Contract Documents and as specified for the construction of drainage structures, utilities, lawn and site improvements necessary for the completion of the utilities and site work. Excavate to elevations indicated or required within a tolerance of plus or minus 0.10 foot and as will allow footings to rest on firm, undisturbed earth or rock, free of loose materials, and as will permit rough grades to be at indicated or specified depths. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, installing services and other construction, and for inspections.
 - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
- D. Unauthorized Excavation: Fill unauthorized excavation under foundations or wall footings by extending indicated bottom elevation of concrete foundation or footing to excavation bottom, without altering required top elevation.
 - 1. Any excavation which has been carried, through error, beyond specified depths or dimensions, shall be backfilled by the Contractor at his own expense with compacted gravel borrow, with concrete, or with other material as directed by the Owner's Representative.
- E. Hand Excavation: In general, machine excavation will be permitted with the exception of work in the vicinity of trees to remain, existing utilities and excavation of pipe bells which will be hand work. Excavate to 6 inches below the bottom of pipe or as shown on Drawings. Excavation to final grade shall be made in such a manner as to maintain the undisturbed bearing character of the soil exposed at the excavation level.
- F. Inspection: After completion of the excavation and prior to commencement of foundation footings, pavements and concrete slab construction, the excavation will be inspected by the Owner's Representative to ensure that foundation elevations have been reached.

3.4 STOCKPILING

- A. Stockpiling: No excavation shall be deposited or stockpiled at any time so as to endanger portions of the new or an existing structure, either by direct pressure or indirectly by overloading banks contiguous to the operation. Stockpile soil materials away from edge of excavations. Material, if stockpiled, shall be stored so as not to interfere with the established sequence of the construction. If there is not sufficient area available for stockpiling within the limits of the project, the Contractor will be required to furnish his own area for stockpiling, and for moving the material back and forth from the storage area, at no additional cost to the Owner. No excavation shall be deposited within existing tree protection zones. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water away from existing drainage structures, ponds, basins, or wetland areas. Cover stockpiles to prevent wind-blown dust. The Contractor shall provide and install all erosion control specified under SITE PREPARATION.
- B. Throughout the course of the work the Contractor shall provide and maintain all erosion control systems for stockpiled materials.

3.5 EXCAVATION, FILLING AND GRADING AROUND TREES

- A. Excavate within drip line of trees only where indicated or directed. Notify Owner's Representative prior to any excavation.
- B. Maintain existing grade within drip line of trees, unless otherwise indicated.
- C. Place no fill within the drip line of existing trees unless otherwise shown on the Drawings.

3.6 FILLING, BACKFILLING AND COMPACTION

- A. Placing Fills and Compacting:
 - 1. Preparation: All areas to be filled or backfilled shall be free of vegetation, topsoil, wet materials, unsatisfactory soil materials, obstructions, deleterious materials, construction debris, refuse, compressible or decayable materials and standing water from ground surface prior to placing fills. Do not place fill when fill materials or material below it are frozen. No fill materials containing ice or frozen lumps shall be used.
 - a. Plow, furrow, till or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing surface.
 - 2. Remove all concrete formwork, temporary shoring, bracing, and sheeting prior to inspection by Owner's Representative. If approved in writing by the Owner's Representative, leave concrete formwork, temporary shoring, bracing, or sheeting in place.
 - 3. The Contractor shall notify the Owner's Representative when excavation is ready for formal inspection. Filling and backfilling shall not be started until conditions have been approved by the Owner's Representative.
 - 4. At the completion of excavation and before placing any fills, proof-roll compact subgrades to the same compaction levels required for placed fills as required hereinafter. Compaction procedure shall be approved by the Owner's Representative.
 - a. Notify Owner's Representative when excavations have reached required subgrade.
 - b. When test results determines that unforeseen unsatisfactory soil is present, stop excavation work immediately and contact the Owner's Representative to determine whether or not to continue excavation work and replace the unsatisfactory soil material with compacted backfill or fill material as directed by the Owner's Representative..
 - 5. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for changes in Work.
 - 6. Reconstruct subgrade damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Owner's Representative.
 - 7. Subgrade compaction shall be tested by the testing laboratory before proceeding further.
 - 8. All fill is to be placed "in-the-dry", to which end dewatering may be required. Spreading and drying of each layer may also be required. Dewatering, as necessary, shall be a part of the work of this Section, EARTH MOVING, and shall be done at no additional cost to the Owner
 - 9. Conversely, if the testing laboratory determines that the fill is too dry for proper compaction, water shall be added to provide the specified optimum moisture content, as necessary for proper compaction.
 - 10. Compaction of each lift shall be as specified herein and as determined by ASTM Test, Designation D1556. Fill shall be placed in successive horizontal lifts no thicker than 6 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers. Compact fill to the required density as specified in this Section, EARTH MOVING. Maximum dry density shall be determined

in accordance with ASTM D1557, Method D. The following percentages of minimum to maximum dry densities shall be achieved for fill materials or prepared subgrades.

Under structures, footings, paved surfaces, drainage piping, utilities and other improvements:

	<u>Minimum</u>	<u>Maximum</u>
a. All fills	95%	98%
b. Top twelve inches of subgrades in cut	95%	98%
c. Fills within lawn and planting areas to within eighteen inches of finished subgrade	85%	90%

Maximum dry density for topsoils and loam shall be determined in accordance with ASTM D698. The following percentages of minimum to maximum dry densities shall be achieved for fill materials or prepared subgrades.

In lawn and plant beds:

	<u>Minimum</u>	<u>Maximum</u>
d. Fills within lawn and planting areas in top eighteen inches of finished grade	80%	85%

11. Place backfill and fill materials evenly on all sides of structures to required elevations. Place backfill and fill uniformly along the full length of each structure.
12. In the case of lawn and planting areas, compaction requirements for subgrades and fills shall be considered minimums and maximums within the density percentages called for, and any over-compaction of subgrades or fills which would be detrimental to lawn or planting objectives shall be corrected by loosening subgrades or fills through tilling or other means and re-compacting to specified compaction limits.
13. The Contractor shall notify the Owner's Representative 3 days in advance when the rough grades are established and ready for formal inspection. No loam shall be placed on rough grades before inspection by the Owner's Representative.

3.7 AGGREGATE BASE COURSE FOR PAVEMENTS

- A. Aggregate subbase and base courses for paving and the spreading, grading, and compaction methods employed shall conform to standard requirements for usual base course of this type for first class road work, and the following:
 1. MassDOT Specifications Section 100
- B. Compaction of aggregate base courses shall be to 95 percent of maximum density as determined by ASTM D 1557, Method D. Stone greater than 2 inches (64 mm) shall be excluded from course.
- C. Width of base courses shall be greater than or equal to the width of pavement surface, if continuous lateral support is provided during rolling, and shall extend a distance of at least twice the base thickness beyond edge of the course above, if not so supported.
- D. Aggregate material shall be applied in lifts less than or equal to 6 inches (150 mm) thick, compacted measure. Each lift shall be separately compacted to specified density.
 1. Material shall be placed adjacent to wall, manhole, catch basin, and other structures only after they have been set to required grade and level.

2. Rolling shall begin at sides and progress to center of crowned areas, and shall begin on low side and progress toward high side of sloped areas. Rolling shall continue until material does not creep or wave ahead of roller wheels.
 3. Surface irregularities which exceed 1/2 inches (12 mm) measured by means of a 10 feet (3 m) long straightedge shall be replaced and properly compacted.
- E. Subgrade, subbase course and base course shall be kept clean and uncontaminated. Less select materials shall not be permitted to become mixed with gravel or dense graded crushed stone. Materials spilled outside pavement lines shall be removed and area repaired.
- F. Portions of subgrade or of construction above which become contaminated, softened, or dislodged by passing of traffic, or otherwise damaged, shall be cleaned, replaced, and otherwise repaired to conform to the requirements of this specification before proceeding with next operation.

3.8 ROUGH GRADING

- A. Rough grading shall include the shaping, trimming, rolling, and refinishing of all surfaces of the subbase and base courses, shoulders, and earth slopes in preparation for final, finish grading of pavements, loams and site improvements as shown on the Drawings. The rough grading of shoulders and sloped areas may be done by machine methods. All ruts shall be eliminated. Traffic of men and equipment across soil subgrade areas shall be prohibited following excavation to the required lines and grades.
1. Shape subbase and base courses to required crown elevations and cross-slope grades.
 2. When thickness of compacted subbase or base course is 6 inches or less, place materials in a single layer.
 3. When thickness of compacted subbase or base course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.
- B. If, during the progress of the Work, any pipe, drain or other construction is damaged due to operations under this Contract, the Contractor shall repair all damage at no additional cost to the Owner and restore damaged areas to their original conditions.
- C. Do all other cutting, filling and grading to the lines and grades indicated on the Drawings. Grade evenly to within the dimensions required for grades shown in the Contract Documents and as specified herein. No stones larger than 3 inches in largest dimension shall be placed in upper 6 inches of the subgrade. Fill shall be left in a compacted state at the end of the workday and sloped to drain.
- D. Slope grades to direct water away from buildings and to prevent ponding. Rough grade to required elevations within the following tolerances:
1. Lawn or Unpaved Areas: Plus or minus 0.10 foot.
 2. Paved Areas: Plus or minus 0.05 foot.
- E. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders at least 12 inches wide of acceptable soil materials and compact simultaneously with each subbase course and base course layer.
- F. The Contractor shall bring all areas to grades as shown in the Contract Documents and in the details. The Owner's Representative, however, may make such adjustments in grades and alignments as are found necessary to avoid special conditions encountered.
- G. No rubbish of any description shall be allowed to enter fill material. Such material shall be removed from the site.
- H. Wherever streets, lawns, or sidewalks or other items contained within or outside the Limit of Contract lines have been excavated in fulfilling the work required under this Contract, the Contractor shall

furnish and install all materials necessary to bring finish surfaces level with the existing adjacent surfaces. All work shall be installed to match the existing conditions in accordance with the governing authority. Notify the proper authorities prior to restoring surfaces outside the Contract Limit Lines.

- I. Placed fill materials that become disturbed shall be regraded and re-compacted. Fill materials that become contaminated shall be removed and replaced, as directed by the Owner's Representative.
- J. Contractor shall clean the subgrade of all stones greater than 2 inches and all debris and rubbish. Such material shall be removed from the site, not raked to the edges and buried. Notify the Owner's Representative that the subsoil has been cleaned and request his/her attendance on site to review and approve subgrade conditions prior to spreading additional specified material over the subgrade.

3.9 REMOVAL OF SURPLUS AND UNSUITABLE MATERIALS

- A. Surplus excavated or surplus off-site borrow materials not required to complete site construction and unsuitable excavated materials shall, unless directed otherwise by the Owner's Representative, become the property of the Contractor who shall remove such materials from the site and legally dispose of it at no additional cost to the Owner.

3.10 DRAINAGE AND DEWATERING

- A. The Contractor shall control the grading in areas under construction on the site so that the surface of the ground will properly slope to prevent accumulation of water in excavated areas and adjacent properties. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrade, and from flooding Project site and surrounding area. The Contractor shall grade and ditch the site as necessary to direct surface runoff away from open excavations and subgrade surfaces. Positive drainage (minimum 1.0 percent slope) shall be maintained at all times.
- B. Protect subgrade and foundation soils from softening and damage by rain or water accumulation.
- C. Should surface, rain or ground water be encountered during the operations, the Contractor shall furnish and operate pumps or other equipment, and provide all necessary piping to keep all excavation clear of water at all times and shall be responsible for any damage to work or adjacent properties from such water. All piping exposed above surface for this use shall be properly covered to allow foot traffic and vehicles to pass without obstruction.
- D. Water from trenches and excavations shall be disposed of in such a manner as will not cause injury to public health nor to public or private property, nor to existing work, nor to the work completed or in progress, nor to the surface of roads, walks, and streets, nor cause any interference with the use of the same by the public. Methods of disposal of pumped effluent shall not cause erosion or siltation.
 - 1. The Contractor shall provide and install all erosion control specified under SITE PREPARATION.
- E. There shall be sufficient pumping equipment, in good working order, available at all times to remove water.
- F. Presence of ground water in soil will not constitute a condition for which an increase in the Contract price may be made. Do not place concrete fill, lay piping or install appurtenance under any circumstances in excavation containing free water.
- G. Under no circumstances place fills, pour concrete, or install piping and appurtenances in excavations containing free water.
- H. Where, in the opinion of the Owner's Representative, pumping of excavations is not effective in maintaining a dry firm subgrade, provide other dewatering methods acceptable to the Owner's Representative.

3.11 FROST PROTECTION

- A. Do not excavate to full indicated depth when freezing temperatures may be expected, unless footings or slabs can be poured immediately after the excavation has been completed. Protect the excavation from frost if placing of concrete is delayed.

WINTER ISLAND TRAIL

- B. Completed foundations that have not been backfilled shall be protected from freezing by temporary additional earth cover, insulating blankets, heaters, or other methods acceptable to the Owner's Representative.
- C. Frozen material shall not be placed as fill or backfill.
- D. No work shall be installed on frozen ground.
- E. Should protection fail, remove frozen materials and replace with concrete or gravel borrow as directed by the Owner's Representative at not additional cost to the Owner.

3.12 DUST CONTROL

- A. During the construction period, the Contractor shall take special measures including, but not limited to, wetting down to control dust on site, in order to prevent annoyance/and or damage to adjacent property, whether public or private. Calcium chloride or any other chemical material may not be used on subgrades of areas to be seeded or planted.
- B. The Contractor shall take all necessary measures to keep streets, over which equipment and service for project travel, clean and free from dirt, dust, mud and debris resulting from construction operations. The actions taken shall meet the requirements of all authorities having jurisdiction.

3.13 CLEANUP

- A. At the end of all excavation, filling and grading operations and before acceptance of the work, the Contractor shall remove all debris, rubbish, garbage, trash, and discarded material, from the site. He shall dispose of them in a manner satisfactory to the Owner's Representative. The premises shall be left clean, presentable, and satisfactory.

**END OF SECTION 31 20 00
EARTH MOVING**

SECTION 32 12 16: ASPHALT PAVING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to furnish and install the bituminous concrete pavement, permits, traffic control and police detail, as indicated on the Contract Documents and as specified herein.

1.03 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. SECTION, SITE PREPARATION
 - 2. SECTION, EARTH MOVING; Excavation and backfill and establishment of subgrade elevations.

1.04 REFERENCES

- A. The following standards shall apply to the work of this Section.
 - 1. American Association of State Highway and Transportation Officials (AASHTO):
 - M 20 Penetration Graded Asphalt Cement
 - M 82 Cut-Back Asphalt (Medium Curing Type)
 - M 140 Emulsified Asphalt
 - 2. American Society for Testing and Materials (ASTM):
 - D 1557 Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using 10-pounds (4.54-kg) Rammer and 18-in. (475-mm) Drop
 - 3. Massachusetts Department of Transportation (MassDOT):
 - Specifications Standard Specifications for Highways and Bridges
 - 4. Federal Specifications (Fed. Spec.):
 - SS-S-1401 Sealing Compound, Hot Applied, for Concrete and Asphalt Pavements

1.05 SAMPLES AND SUBMITTALS

- A. At least 30 days prior to intended use, the Contractor shall provide job mix formula for all bituminous concrete specified in this Section, listing quantities and pertinent ingredient properties for review and approval by the Owner's Representative. Do not order materials until Owner's Representative's approval of mix formula has been obtained. Delivered materials shall closely match the approved samples.

1.06 QUALITY ASSURANCE

- A. Unless otherwise specified, work and materials for construction of the bituminous concrete pavement shall conform to the applicable portions of the following:
 - 1. MassDOT Specifications Sections 400.
- B. Paving work, base course installation, top coarse installation and the like, shall be done only after excavation and construction work which might damage them has been completed. Damage caused during construction shall be repaired before acceptance.
- C. Pavement subbase shall not be placed on a muddy or frozen subgrade. Pavement courses shall not be placed on frozen or contaminated base course or binder course.
- D. Existing pavement under state or local jurisdiction shall, if damaged during the course of this project, be repaired or replaced as specified, performed and paid for under this section of the Specification. Materials and construction shall match local or state paving standards and cross sections, which ever is most stringent.

1.07 TESTING AND INSPECTION

- A. The Owner reserves the right to retain an independent testing laboratory to perform inspection and testing of paving and associated work in accordance with Division 1 Section, QUALITY CONTROL.

PART 2 PRODUCTS

2.01 BASE COURSE

- A. Material for base course shall be specified, provided, installed and paid for under the work of the SECTION, EARTH MOVING, of this Specification.

2.02 SUBBASE COURSE

- A. Material for subbase course shall be specified, provided, installed and paid for under the work of the SECTION, EARTH MOVING, of this Specification.

2.03 BITUMINOUS CONCRETE

- A. Bituminous concrete shall be a standard plant-mixed, hot-laid paving material for road work, consisting of clean, crushed rock aggregate, mineral filler, and asphalt conforming to the following:
 - 1. MassDOT Specifications Section M03.
- B. Bituminous Concrete Mixtures: Bituminous concrete for roadway and parking lot pavements and patching shall be Class I, Type I-1, furnished in accordance with MassDOT Specifications Section M03, except as modified herein.
 - 1. Bituminous concrete pavement for roadways and parking lots and other areas shown on the Contract Documents shall consist of 2 courses of bituminous concrete with a minimum finished pavement depth after rolling equal to the following:
 - a. Total Compacted Pavement Thickness shall be as indicated on the Contract Documents.
 - b. Binder course shall consist of one lift of Binder Course bituminous concrete to thickness as shown on the Contract Documents.
 - c. Finished top course shall consist of one lift of Top Course bituminous concrete to thickness as shown on the Contract Documents.
 - 2. Bituminous concrete patch shall consist of the following:

- a. Top Course and Binder Course bituminous concrete in depths to match existing roadways.
- 3. Bituminous concrete berm shall be in accordance with MassDOT Specifications Section 470 and M03.
- 4. Bituminous concrete material shall conform to MassDOT Specifications Paragraph M03, except as amended herein.

2.04 BITUMINOUS MATERIALS

- A. Bituminous crack sealer shall be a hot-applied bituminous sealer conforming to Fed. Spec. SS-S-1401.
- B. Tack coat shall consist of asphalt emulsion, Type RS-1 or RS-2 conforming to MassDOT Specifications.
- C. Prime coat shall be Asphalt Primer conforming to MassDOT Specifications, M03 Asphalt Primer, and in accordance with the requirements of AASHTO M116.

2.05 FINISH AGGREGATE FOR CHIP AND SEAL PAVEMENT

- A. Finish Aggregate. Crushed stone aggregate shall consist of processed natural stone. Aggregate shall be stone of inert, durable, fractured face, uniform quality meeting the following sieve gradation analysis by weight:

<u>Sieve</u>	<u>Percent</u>
1/2	100
3/8	0-5

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

PART 3 EXECUTION

3.01 GRADING

- A. Areas to be paved shall be compacted and brought approximately to subgrade elevation as specified, performed and paid for under the work of SECTION, EARTH MOVING, before work of this section is performed. Final fine grading, filling, and compaction of subgrade to receive paving, as required to form a firm, uniform, accurate, and unyielding subgrade at required elevations and to required lines, shall be specified, performed and paid for under the SECTION, EARTH MOVING, of this Specification.
- B. Existing subgrade material that will not readily compact as required shall be removed and replaced with satisfactory materials. Additional materials needed to bring subgrade to required line and grade and to replace unsuitable material removed shall be material specified, delivered, installed and paid for under the SECTION, EARTH MOVING, of this Specification.
- C. Subgrade of areas to be paved shall be recompacted as required to bring top 8 inches (200 mm) of material immediately below gravel base course to a compaction of at least 95 percent of maximum density, as determined by ASTM D 1557, Method D. Subgrade compaction shall extend for a distance of at least 12 inches (300 mm) beyond pavement edge.
- D. Excavation required in pavement subgrade shall be completed before fine grading and final compaction of subgrade are performed. Where excavation must be performed in completed subgrade or subbase subsequent backfill and compaction shall be performed as directed by the Owner's Representative as specified, performed and paid for under the work of the SECTION, EARTH MOVING, of this Specification. Completed subgrade after filling such areas shall be uniformly and properly graded.

- E. Areas being graded or compacted shall be kept shaped and drained during construction. Ruts greater than or equal to 2 inches (50 mm) deep in subgrade, shall be graded out, reshaped as required, and recompact before placing pavement.
- F. Materials shall not be stored or stockpiled on subgrade.
- G. Disposal of debris and other material excavated and/or stripped as specified, performed and paid for under the work of this section, and material unsuitable for or in excess of requirements for completing work of this section, shall conform to the following:
 - 1. Material shall be legally disposed of off-site.
 - 1. Material shall be disposed of in waste disposal area indicated on the Contract Documents.
- H. Prepared subgrade will be inspected by the Owner's Representative. Subgrade will be approved by the Owner's Representative before installation of paving base course. Disturbance to subgrade caused by inspection procedures shall be repaired as specified, performed and paid for under SECTION, EARTH MOVING, of this Specification.

3.02 AGGREGATE BASE COURSE

- A. Aggregate base course for bituminous paving shall be provided, installed and paid for under the SECTION, EARTH MOVING, of this Specification.

3.03 BITUMINOUS PAVING

- A. Bituminous paving mixture, equipment, methods of mixing and placing, and precautions to be observed as to weather, condition of base, and related requirements shall conform to the following:
 - 1. Road and Parking: MassDOT Specifications Section 400 - Class I Bituminous Concrete Pavement for roadway and parking areas.
 - 2. Berm: MassDOT Specifications Section 470 Class I Bituminous Concrete Berms.
- B. Bituminous binder and wearing surface courses shall each be applied individually, in single lifts of full thickness indicated on the Contract Documents.
- C. No mix shall be placed on wet or damp surfaces. No mix shall be placed when ambient temperatures are 40°F (4.5°C) and falling.
- D. The temperature of bituminous concrete mixture when delivered to the site shall conform to MassDOT Specifications Section 400
- E. The Owner's Representative may require the Contractor to remove and replace at this own expense any defective mix not conforming to the specified job mix formula.
 - 1. If, at any time before the final acceptance of the work, any soft, imperfect places or spots shall develop in the surface, all such places shall be removed and replaced with new materials and then compacted until the edges at which the new work connects with the old become invisible.
- F. Adjacent paving and curb work shall be protected from stain and damage during entire operation. Damaged and stained areas including curbs shall be replaced or repaired to equal their original condition.
- J. Deliveries shall be timed to permit spreading and rolling all material during daylight hours, unless artificial light, satisfactory to Owner's Representative, is provided. Loads which have been wet by rain or otherwise will not be accepted. Hauling over freshly laid or rolled material will not be permitted.
- K. Spreading and Finishing:

WINTER ISLAND TRAIL

1. The equipment for spreading and finishing shall be mechanical, self-powered pavers, capable of spreading and finishing the mixture true to lines, grade, width and crown by means of fully automated controls for both longitudinal and transverse slope.
 2. If, during construction, it is found that the spreading and finishing equipment in use leaves tracks or indented areas, or produces other permanent blemishes in the pavement, which are not satisfactorily corrected by the scheduled operations, the use of such equipment shall be discontinued and other satisfactory spreading and finishing equipment shall be provided by the Contractor.
 3. The mixtures shall be placed and compacted only at such times as to permit the proper inspection and checking by the Owner's Representative.
 4. The mixtures shall be placed only upon approved surfaces that are clean from foreign materials and dry; and when weather conditions are suitable.
 5. The contact surfaces of curbing, manholes, catch basins or other appurtenant structures in pavement shall be painted thoroughly with a thin uniform coating of bitumen (MassDOT Specifications RS-1) just before any mixture is placed against them. This requirement shall be included as work incidental to paving operations.
 6. Machine Spreading: All mixtures shall be deposited in an approved mechanical spreader and immediately spread thereby, and then struck off in a uniform layer to the full width required and of such depth that each course, when compacted, shall have the required thickness and shall conform to the grade and cross section contour specified.
 7. Hand Spreading: Spreading by hand methods will be permitted only for particular locations in the work which because of irregularity, inaccessibility or other unavoidable obstacles do not allow mechanical spreading and finishing.
- L. Placing and rolling of mixture shall be as nearly continuous as possible. Rolling shall begin as soon after placing as mixture will bear the operation without undue displacement. Delays in rolling freshly spread mixture will not be permitted. Rolling shall proceed longitudinally, starting at edge of newly placed material and proceeding toward previously rolled areas. Rolling overlap on successive strips shall be greater than or equal to 1/2 width of roller rear wheel. Alternate trips of roller shall be of slightly different lengths. Corrections required in surface shall be made by removing or adding materials before rolling is completed. Skin patching of areas where rolling has been completed will not be permitted. Course shall be subjected to diagonal rolling, crossing lines of the first rolling while mixture is hot and in compactable condition. Displacement of mixture or other fault shall be corrected at once by use of rakes and application of fresh mixture or removal of mixture, as required. Rolling of each course shall be continued until roller marks are eliminated. Roller shall pass over unprotected edge of course only when paving is to be discontinued for sufficient time to permit mixture to become cold.
- M. In places not accessible to roller, mixture shall be compacted with hand tampers. Hand tampers shall weigh at least 50 pounds (22.7 kg) and shall have a tamping face less than or equal to 100 square inches (64,500 square millimeters). Mechanical tampers capable of equal compaction will be acceptable in areas in which they can be employed effectively.
- N. Compaction:
1. After the paving mixture has been properly spread, compaction shall be obtained by the use of power rollers of approved design and weight per inch (millimeter) of roller. The rollers shall be steel wheeled supplemented with pneumatic-tired rollers where required.
 2. Along curbs, structures and all places not accessible with a roller, the mixture shall be thoroughly compacted with mechanical tamping devices. The surface of the mixture after compaction shall be smooth and true to the established line and grade.
 3. The densities of the completed pavement shall be not less than 95 percent of the density obtained from laboratory compaction of a mixture composed of the same materials in like proportions.

- O. Portions of pavement courses which become mixed with foreign material or are in any way defective shall be removed, replaced with fresh mixture, and compacted to density of surrounding areas. Bituminous material spilled outside lines of finished pavement shall be immediately and completely removed. Such material shall not be employed in the work.
- P. Joints shall present same texture, density, and smoothness as other sections of the course. Continuous bond shall be obtained between portions of existing and new pavements and between successive placements of new pavement. New material at joints shall be thick enough to allow for compaction when rolling. Compaction of pavement, base, and subgrade at joints shall be such that there is no yielding of new pavement relative to existing pavement when subjected to traffic.
- Q. Contact surfaces of previously constructed pavement (if greater than or equal to two days since binder placed), manholes, and similar structures shall be thoroughly cleaned and painted with a thin uniform coating of bitumen immediately before fresh mixture is placed. Tack coat shall be applied at rate which will leave bituminous residue of 5 to 7 gallons/100 yd.² after evaporation of vehicle. Base surface shall be dry and clean when tack coat is applied. Bituminous paving material shall not be placed until vehicle has completely evaporated from tack coat. Adjoining new paving shall be placed before tack coat has dried or dusted over.
- R. Earth or other approved material shall be placed along pavement edges in such quantity as will compact to thickness of course being constructed, allowing at least 12 inches (150 mm) of shoulder width to be rolled and compacted simultaneously with rolling and compacting surface. Pavement edge shall be trimmed neatly to line before placing earth or other approved material along edge.
- S. Variations in pitch of finished surface shall be less than or equal to the following tolerances when tested with a 10 foot (3 m) straightedge, applied both parallel to and at right angles to centerline of paved area.
 - 1. For roadway and parking pavement surface course - 1/4 inch (6 mm) in 10 feet (3 m).
 - 3. At joint with existing pavement, and at other locations where an essentially flush transition is required, pavement elevation tolerance shall not exceed 0.01 feet (3 mm).
 - 4. At other areas pavement elevation tolerance shall not exceed \pm 0.05 feet (15 mm).
 - 5. Irregularities exceeding these amounts or which retain water on surface shall be corrected by removing defective work and replacing with new material as specified, performed and paid for under this section.
- T. No vehicular traffic of any kind shall be allowed to pass over the newly finished surface until it has had time to set. Seventy-two hours will be considered sufficient time for the pavement to set in most cases, but this period may be extended by the Owner's Representative as required by weather or other reasons. Under all circumstances, damage to the pavement caused by the Contractor's or public vehicles driving over the pavement before the pavement has fully cured shall be repaired as specified, performed and paid for under this section, at no additional cost to the Owner.

3.04 AGGREGATE SURFACE TREATMENT

- A. It is the intent of this Specification to apply a crushed stone product to the previously installed bituminous concrete pavement as shown on the Contract Documents and as specified in this SECTION, ASPHALT PAVING. Installation of binder and top courses shall be as specified herein.
- B. The contractor shall install sufficient binder and wearing course to ensure that when the chip and seal layers are applied the top surfaces of the pavement are flush with adjacent curbs and conform to the requirements for lines and grades to the Contract Documents.
- C. The following specifications describe an application of a single coat of crushed stone over a spray-applied layer of bitumen. The Contractor shall apply no less than two coats of bitumen and aggregate. The first layer of bitumen shall be applied directly to the rolled top course, crushed stone shall be rolled into place as specified herein, After the first layer of crushed stone has been rolled, a second layer of bitumen shall be applied over the freshly applied stone to a depth sufficient to fully adhere to the final layer of stone which shall be promptly placed over the second layer of bitumen.

- D. The bitumen shall be applied uniformly at the specified rate with a pressure distributor. Distributors shall be in good mechanical condition, with an accurate tachometer, and capable of spraying satisfactorily for a width of not less than 15 feet at a pressure of between 40 and 60 pounds per square inch. The distributor shall be equipped with a system for heating evenly the entire volume of the bitumen under efficient and positive control at all times.
- E. Distributors shall also be equipped with satisfactory thermometers for measuring the temperature of the material to be applied and shall have either a stream of air-kerosene system for the clearing of the lines and pumps. Evidence of fluxing with kerosene or emulsification by steam will be sufficient cause for rejection of the delivery.
- F. Deliveries of bitumen will be refused when the above conditions are not fulfilled.
- G. A hose attachment on the distributor shall be used to apply bitumen wherever necessary to touch up any areas missed or inaccessible to the distributor.
- H. No bituminous work shall be done during rainy weather or when weather conditions such as temperature or otherwise are, in the Landscape Architect's judgment, unfavorable for obtaining satisfactory results.
- I. Bituminous Cement Distribution. The liquid bituminous cement shall be applied uniformly under pressure by hose from a spray wand remote from the distributor truck at the temperature specified by the manufacturer and at a rate sufficient to provide coverage of 1/2 the average stone size. If a job delay occurs, the heater in the distributor should be turned off, and restarted sufficiently before start of spreading to reheat material to at least the minimum application temperature prior to resumption of spreading. No spread of bituminous cement shall be in excess of an area or distance that cannot be immediately covered with aggregate
- J. Prevention of Overspray. During application of bituminous cement coating, adequate provision shall be made to absolutely prevent overspray of adjacent pavement structures, vehicles, plant materials, or personal property. All adjacent vertical or horizontal surfaces of finish materials such as granite curbing, coping, and steps and concrete coping and sidewalks shall be masked prior to bituminous cement spraying as approved by the Owner/ Landscape Architect. Upon the occurrence of areas of excessive bitumen, blotting shall be instituted immediately with aggregate material of approximately half the size of the aggregate finish. The blotting material shall be on hand at the start of bitumen distribution.
- K. Aggregate Distribution:
 - 1. Preparation. The application of aggregate shall follow as close as possible behind application of the hot bituminous cement which shall not be spread further in advance of the aggregate spread than can be immediately covered. Construction equipment or other vehicles shall not drive on uncured pavement. Aggregate may be preheated before application but to a temperature not to exceed 300 degrees F.
 - 2. Transporting and Spreading. The dry aggregate shall be transported across the previously finished work to the work area by wheel barrow or ATV, dumped, and spread uniformly by hand with flat spreading rakes at a rate of spread between 30 and 40 pounds per square yard. Chip and seal gravel shall completely cover the bituminous material, allowing workers and equipment, including rollers, to deliver, spread and compact the material without coming in contact with liquid bitumen, and rendering the bituminous material completely hidden (invisible). Any deficient areas shall be immediately covered with additional aggregate.
 - 3. Rolling. Rolling shall commence immediately following spread of aggregate using pneumatic-tire rollers for primary rolling. Small steel drum rollers of self propelled and hand operated types shall be used to roll along edges and in difficult to-reach areas. There shall be at least three complete passes by the rollers to embed the aggregate particles firmly into the bituminous cement coating and bituminous concrete base course. Size of roller shall be commensurate with the scale and intricacy of the work area but shall not be so heavy as to cause crushing of stone. Water ballast in machines shall be adjusted accordingly to prevent crushing.
 - 4. Construction Joints. Joints shall be reasonably true to line. The overlap in application of the bituminous cement shall be the minimum to assure complete coverage. Where any construction

WINTER ISLAND TRAIL

joint occurs, there shall be no gaps, depressions, ridges, overlap or detectable seams. When it is necessary to terminate a spread of aggregate, stop the bitumen/aggregate application over heavy paper or polyethylene sheet. Upon resuming application, remove the paper or sheet leaving neat, sharp edge to the work, and lay fresh paper or sheet back over the previously finished work at this edge. Initiate bitumen/aggregate application over this paper or sheet, leaving the lateral joint between the two runs without gap, overlap, ridging, or detectable seaming. Any lateral joints shall be similarly executed.

5. Removal of Excess Aggregate. After a period of at least several days of curing and setting time, as determined sufficient by the Landscape Architect, all loose aggregate shall be swept up, collected, and removed from the project site in a manner approved by the Landscape Architect that will not displace more than a well distributed 5% of the embedded aggregate nor damage the bituminous concrete below.
6. Setting of Aggregate Surfacing Material. No vehicular traffic of any kind shall be allowed to pass over the newly finished surface until it has had time to set. 24 hours will be considered sufficient time for the pavement to set in most cases, but this period may be extended by the Landscape Architect as required by the weather or other reasons.

-END OF SECTION 31 12 16-
ASPHALT PAVING

SECTION 32 14 13
PRECAST CONCRETE UNIT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to furnish and install the concrete unit pavers as indicated on the Contract Documents and as specified, including but not limited to the following:

- 1. Concrete Unit Pavers

1.3 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Section, EARTH MOVING; Establishment of subgrade elevation.

1.4 REFERENCES

- A. The following standards shall apply to the work of this Section.
 - 1. American Society for Testing and Materials (ASTM):
 - C 33 Specification for Concrete Aggregates
 - C 136 Test Method for Sieve Analysis of Fine and Coarse Aggregates
 - C 936 Specification for Solid Concrete Interlocking Paving Units

1.5 SUBMITTALS

- A. Manufacturer's Product Data: Manufacturer's product data shall be submitted for the following items:
 - 1. Test results of structural properties of pavers
 - 2. Physical sample of each type demonstrating the color, finish and texture of paver.
- B. Test Report:
 - 1. Test report of precast concrete paver shall be submitted.

2. Testing shall be done by an independent testing laboratory. Test procedures shall conform to ASTM C 936 methods, where applicable.
3. Test report shall indicate, as a minimum, the following:
 - a. Compressive strength, pounds per square inch.
 - b. Absorption, 5 hr. submersion in cold water.
 - c. Absorption, 24 hr. submersion in cold water.
 - d. Maximum saturation coefficient.
 - e. Initial rate of absorption (suction).
 - f. Abrasion index.
 - g. Freeze-thaw.

1.6 QUALITY ASSURANCE

- A. Paver setters shall have a minimum of 5 years experience in the setting of masonry work of the type for this project.

1.7 SAMPLE PANEL

- A. Construct a sample panel of concrete pavers on the specified base before start of any finished paving. Sample panel shall exhibit pavers, and required jointing. Unless otherwise indicated, size of panel shall be 6 feet (1.83 m) x 6 feet (1.83 m) minimum.
- B. Owner's Representative will inspect and accept sample panel. If the original sample is not acceptable, construct additional panels at no cost to the Owner until an acceptable panel is constructed. The acceptable panel shall become the standard for the entire job, and shall remain undisturbed until completion of all granite paving. Remove panel from the site upon completion of paving.

1.8 LAYOUT

- A. The paver layout indicated on the Contract Documents is approximate. The final configuration of the paving will be determined in the field by the Owner's Representative. Do no paving until said determination is made.

1.9 DELIVERY, HANDLING, AND STORAGE

- A. Pavers shall be carefully packed and banded by the supplier for shipment. Following shipping, pavers shall be stored on wood skids or pallets, covered with non-staining, waterproof membrane and protected from the weather. Skids shall be placed and stacked in such a manner as to evenly distribute the weight of the materials and to prevent breakage, cracking, and damage to granite pieces. Materials shall be stored in such a manner as to allow air to circulate around the material. Pavers shall not be permitted to be in direct contact with the ground any time during storage.

1.10 PROTECTION OF FINISHED SURFACES

- A. Finished surfaces adjacent to the paving work shall be adequately protected from soiling, staining, and other damage.

PART 2 - PRODUCTS

2.1 CONCRETE UNIT PAVERS

- A. General: Concrete pavers shall conform to ASTM C936-82, Standard Specifications for Solid Concrete Interlocking Paving Units. The minimum compressive strength shall not be less than 7,200 pounds per square inch (50 MPa) with the average compressive strength not less than 8,000 pounds per square inch (55 MPa) Maximum absorption shall be 5 percent or less at 50 cycles of freeze-thaw testing per section ASTM C67. Submit paver tests for freeze thaw and abrasion resistance to be approved by the Owner's Representative. Color pigments shall be UV stabilized. Exposed faces shall have a sandblasted finish. Pavers for rooftop, at-grade and for curb shall be manufactured by one manufacturer. Pavers shall be manufactured by Unilock or an approved equal.
- B. Stone subbase shall be as specified in EARTH MOVING.

PART 3 - EXECUTION

3.1 SETTING-GENERAL

- A. Pavers with chips, cracks, stains, or other defects that might be visible in the finished work shall not be used.
- B. Pavers shall be set true to the required lines and grades in the pattern detailed on the Contract Documents. Pavers shall be neatly cut and fitted at all perimeters and closures to fit neatly and closely, with joints uniform in thickness. Pavers shall be cut with a water-cooled, cut-off wheel masonry saw using a diamond carbide blade.
- C. Concrete pavers shall be set over aggregate setting bed. Setting bed shall be protected from damage prior to setting pavers.
- D. Concrete pavers with chips, cracks, stains, or other structural or aesthetic defects shall not be used.
- E. Only competent workmen under adequate supervision shall perform the work of setting concrete pavers. Set pavers in accordance with manufacturer's recommendations. Concrete pavers shall be set true to the required lines and grades in the pattern detailed on the Contract Documents.
- F. Pavers shall be carefully placed by hand, set true to the required lines and grades in the pattern shown on the Contract Documents. Accurate alignment shall be maintained. The Owner's Representative will approve the start of paving layouts.
- G. Pavers shall be neatly cut and fitted at all perimeters and closures to fit neatly and closely. Pavers shall be tightly butted meeting side of adjacent paver. Joints between pavers shall be uniform and filled with recommended aggregate material. Surface edge of one paver shall be level with the next adjacent pavers so that no voids, rocking motions, or tripping hazards are encountered. There shall be no deviation from a true grade greater than 1/4 inch (6.35 mm) in 10 feet (3.1 m). All finish paved areas shall slope to drain at a minimum of 1/8 inch (3.2 mm) in 1 foot (0.3 m).
- H. All cutting and patching required to complete the work shall be done (including the filling and closing of all openings) with water-cooled radial cut-off type masonry saws with diamond-tipped blade for a sharp, straight edge. Cut edges shall be plumb and straight. Scoring and breaking will not be acceptable.

3.2 ADJUST AND CLEAN

- A. Remove and replace pavers that have been broken, chipped, stained, or otherwise damaged. Remove and replace units which are misaligned or not to grade or do not match

adjoining work. Provide new matching units, install as specified and fill joints to eliminate evidence of replacement. Repair defective and unsatisfactory joints as required to provide a neat, uniform appearance.

- B. After completion of setting, surfaces shall be carefully cleaned, removing all dirt, cutting dust, filler, and stains using the approved masonry cleaner. Follow the manufacturer's directions for use. Apply masonry cleaner within the time frame noted in the manufacturer's literature.
 - 1. Test suitability of masonry cleaner on a test area for approval by the Owner's Representative. All test area to dry for the appropriate time period as described by Manufacturer's product literature.
 - 2. Protect all adjacent architecture, pavement, lawns and planting from damage by masonry cleaner. Employ waterproof tarps and other appropriate barriers to prevent damage to adjacent materials.
 - 3. After cleaning, rinse thoroughly with clean water per manufacturer's written directions.

End of Section

SECTION 32 15 00: STONE DUST SURFACING

PART 1–GENERAL

1.1 GENERAL PROVISIONS

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

1.2 SUMMARY

- A. The work of this Section consists of providing labor, equipment, materials, incidental work, and construction methods necessary to furnish and install the stone dust surfacing, including aggregate base and edging, as indicated on the Drawings and as specified.

1.3 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Division Section, EARTH MOVING; Excavation and backfill and establishment of subgrade elevations.

1.4 SUBMITTALS

- A. Submit for Owner's Representative's approval a 1 pound sample of stone dust material demonstrating material gradation and color for review and acceptance.
- B. Samples: The following manufacturer's literature for steel edging.

PART 2–PRODUCTS

- 2.1 Material for processed gravel base shall be specified, provided, installed and paid for under the work of the SECTION, EARTH MOVING, of this Specification.
- 2.2 Stone dust shall be decomposed granite or trap rock meeting the following requirements:
 - 1. Stonedust blend shall be 4 parts unwashed AASHTO #10, 4 parts AASHTO #8 and 1 part minus #200 fines blended uniformly
 - 2. Stone dust shall be gray in color with color relatively uniform and shall be subject to the approval of the Owner's Representative.

PART 3– EXECUTION

3.1 STONE DUST SURFACING

- A. Processed gravel base shall be placed on the compacted base course per the Earth Moving section.
- B. Stone dust surfacing shall be placed only after excavation and construction work that might injure the surfacing have been completed. Damage to edging, stone dust surfacing, adjacent grades or materials occurring during construction shall be repaired by the Contractor before acceptance at no additional cost to the Owner.

WINTER ISLAND TRAIL

- C. Stone dust surfacing shall be constructed on the compacted base course.
- D. Stone dust shall be spread evenly over the base in 4 inch maximum lifts and compacted to 95 percent of maximum density as determined by ASTM D 1557.
- E. Water shall be added to stone dust surface as required to achieve a dense, hard packed surface conforming to the finish grades indicated.
- F. Variations in smoothness of finished stone dust surface shall be less than or equal to 1/4 inch when tested with a 10-foot straightedge, applied both parallel to and at right angles to centerline of stone dust surface areas. Irregularities exceeding these amounts or which retain water on surface shall be corrected by removing defective work and replacing with new material conforming to this specification.

END OF SECTION 32 15 00
STONE DUST SURFACING

SECTION 32 30 00: SITE IMPROVEMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to furnish and install designated Site Improvements and related items as indicated on the Contract Documents, as specified in this Section, and includes, but is not limited to, the following:
 - 1. Granite benches
 - 2. Granite blocks for sign bases

1.3 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Section: Earth Moving
 - 2. Section: Planting Soils
 - 3. Section: Seeding

1.4 REFERENCES-Not Used

1.5 SUBMITTALS

- A. Photos of proposed granite blocks for benches, and sign bases (multiple angles with tape measure visible for scale)
- B. Granite block selection:
 - 1. Landscape architect shall select granite blocks from supplier for use on the project.
 - 2. Contractor to arrange an appointment at stone supplier at least 30 days in advance of stone placement.

1.6 DELIVERY, HANDLING, AND STORAGE

- A. Stone shall be carefully handled to prevent chipping, breakage, soiling, or other damage. Pinch or wrecking bars shall not be used without protecting edges of stone with wood or other rigid materials. Stone units shall be lifted with wide-belt type slings wherever possible; wire rope or ropes containing tar or other substances which might cause staining or damage to stone finish shall not be used.
- B. Stone damaged in any manner will be rejected and shall be replaced with new materials at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 GRANITE - GENERAL

- A. Granite is not intended to be newly fabricated for this project. Granite shall be salvaged granite blocks that are rectangular in shape, clean and free from mortar, paint, barnacles or other debris. Each face of the stone block shall not deviate from a uniform plane by more than one inch (depression or projection). Top surface of block shall not hold water. Granite shall be of the sizes and dimensions indicated on the Contract Documents. All faces shall be at right angles to the plane of the top. Gray shall be gray in color.

2.2 INTERPRETIVE SIGN BASES

- A. Sign base and bracket shall be powder coated aluminum.
- B. Anchor bolts shall be stainless steel
- C. Sign based shall be manufactured by Vacker Sign or an approved equal.

PART 3 – EXECUTION

3.1 GRANITE SETTING

- A. Set granite on crushed gravel.
- B. Relationship to finished grade shall be per the approval of the Landscape Architect.
- C. Backfill per Section EARTH MOVING.
- D. Clean soil and other fill materials from stone blocks.

**-END OF SECTION 32 30 00-
SITE IMPROVEMENTS**

SECTION 32 30 10: MODULAR WETLAND

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to furnish and install designated Modular Wetland and related items as indicated on the Contract Documents, as specified in this Section, and includes, but is not limited to, the following:
 - 1. Modular wetland

1.3 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Section: Earth Moving
 - 2. Section: Planting Soils
 - 3. Section: Planting

1.4 REFERENCES-Not Used

1.5 SUBMITTALS

- A. Shop drawing of modular wetland unit
- B. Manufacturer's literature of modular wetland unit including concrete vault, piping, manhole covers, growing media.

PART 2 - PRODUCTS

2.1 PRE-ENGINEERED MODULAR SUBSURFACE FLOW WETLAND SYSTEM

- A. Basis of design: Modular Wetland Systems manufactured by BioClean Environmental Services. The specification information below is based on this basis of design. Other manufacturers may be submitted that are equal in their function, treatment capacity, and ability to support vegetation. Manufacturer of pre-engineered modular wetland shall have been in business manufacturing pre-engineered stormwater treatment devices for a minimum of 10 years.
- B. Precast concrete vault: 5,000 psi, 28 day concrete. Vault to include steel reinforcement per ASTM A 615, Grade 60. Vault to have H2O loading capacity.
- C. Filter netting: 100% polyester with a number 16 sieve size and strength tested to ASTM D 3787.
- D. Drainage cells: injection molded plastic, 2" thick and allows waters to flow in 4 directions.
- E. Pre-treatment Chamber Filter Cartridges: loading rate not to exceed 3 gallons per minute per square foot surface area.
- F. Pre-treatment drain down system: previous floor that allows water to drain into the underdrain pipe.
- G. Biofiltration chamber media: ceramic material produced by expanding and vitrifying select material in a rotary kiln. Media to meet ASTM C330, ASTM C331 and AASHTO M195. Aggregates shall have a minimum 24 hour water absorption of 10.% mass. Media shall not contain an organic materials. Retention

- time in median shall be a minimum of 3 minutes.
- H. Plant support media: 3" thick moisture retention cell that is inert and contains no chemicals or fertilizers, and is not made of organic material, and has an internal void percentage of 80%.
 - I. Discharge chamber: shall house a flow control orifice plate that restricts flows greater than designed treatment flow rate. Contains a drain down filter.
 - J. Pipe: high density polyethylene
 - K. Manholes: ductile iron

PART 3 – EXECUTION

3.1 MODULAR WETLAND SETTING

- A. Excavate and backfill per Section EARTH MOVING.
- B. Function: The modular wetland shall have no moving internal components and functions based on gravity flow. The unit shall include a pretreatment chamber, a biofiltration chamber and a discharge chamber. The unit shall remove and retain debris, sediments, TSS, dissolved and particulate metals and nutrients including nitrogen and phosphorous species, bacteria, BOD, oxygen demanding substances, organic compounds and hydrocarbons entering the filter during frequent storm events and continuous dry weather flows.
- C. Install per manufacturer's recommendations.
- D. Excavation and backfilling per Section EARTH MOVING.
- E. Inspection: After installation, the contractor shall demonstrate that the unit has been properly installed.
- F. Maintenance: Contractor shall maintain the unit for 1 year following final acceptance. Maintenance to include removing debris, trash, organics and sediments and disposal of said materials.
- G. Warranty: The manufacturer shall guarantee the unit against manufacturing defects for 5 years from date of delivery.

**-END OF SECTION 32 30 10-
MODULAR WETLAND**

SECTION 32 32 00: PLANTING SOILS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to supply and place planting soils as indicated on the Contract Documents and as specified. Supplying and placement of planting soils shall include, but not be limited to:
 - 1. Sampling and testing of loam borrow.
 - 2. Modifying, screening, placing, spreading and grading of loam borrow.
 - 3. Providing all other sampling, testing, supplying, placing, spreading and grading of planting soils as required by this Section.

1.3 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Section, EARTHWORK.
 - 2. Section 32 92 19, SEEDING.
 - 3. Section 32 90 00, PLANTING.

1.4 REFERENCES

- 1. American Society for Testing and Materials (ASTM):
 - D 75 Practice for Sampling Aggregates
 - D 422 Test Method for Particle-Size Analysis of Soils
 - D698-00a Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³)
 - D1557 Moisture-Density Relations of Soils and Soil-Aggregate Mixtures using 10-lb Rammer and 18-in. Drop
- 3. A.O.A.C.: Association of Official Agricultural Chemists.

1.5 SUBMITTALS

- A. At least 30 days prior to ordering materials, the Contractor shall submit to the Owner's Representative representative samples, certifications, manufacturer's product data and certified test results for materials as specified below for approval in conformance with the requirements of Section, SUBMITTALS, of this Specification. No materials shall be ordered or delivered until the required submittals have been reviewed and approved by the Owner's Representative. Delivered materials shall closely match the approved samples. Approval shall not constitute final acceptance. The

Owner's Representative reserves the right to reject, on or after delivery, any material that does not meet these Specifications.

1. Loam Borrow: The Contractor shall provide a one cubic foot representative sample for testing. All stockpile sampling shall be per ASTM D 75 and Appendixes for securing samples from stockpiles.

Testing will be at the Contractor's expense. Contractor shall deliver all samples to testing laboratories via overnight courier and shall have the testing report sent directly to the Owner's Representative. Perform all tests for gradation, organic content, soil chemistry and pH by UMASS Soil and Plant Tissue Laboratory, West Experiment Station, North Pleasant Street, University of Massachusetts, Amherst, MA 01003, (413) 545-2311.

Testing reports shall be dated within 30 days of submission to the Owner's Representative. Testing reports beyond 30 days old will be rejected and new testing reports mandated.

Testing reports shall include the following tests and recommendations. Contractor shall deliver samples to testing laboratories and shall have the testing report sent directly to the Owner's Representative from the Soil and plant Tissue Laboratory. Testing reports shall include the following tests and recommendations.

- a. Mechanical gradation (sieve analysis) shall be performed and compared to the USDA Soil Classification System. Sieve analysis shall be by combined hydrometer and wet sieving using sodium hexametaphosphate as a dispersant in compliance with ASTM D 422 after destruction of organic matter by H₂O₂. To facilitate review and approval of sieve analysis, provide a computer generated gradation curve from UMASS Soil & Plant Tissue Laboratory.
 - b. Percent of organics shall be determined by the loss on ignition of oven-dried samples. Test samples minus #10 material shall be oven-dried to a constant weight at a temperature of 450 degrees Fahrenheit (752 degrees Centigrade).
 - c. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Magnesium, extractable Aluminum, Lead, Zinc, Cadmium, Copper, Soluble Salts, and pH and buffer pH. A Conductivity Meter shall be used to measure Soluble Salts in 1:2 soil/water (v/v). Except where otherwise noted, nutrient tests shall be for available nutrients.
 - d. Soil analysis tests shall show recommendations for soil additives to correct soils deficiencies as necessary, and for additives necessary to accomplish lawn and planting work as specified.
3. Limestone: Submit supplier's certification that the limestone being supplied conforms to these Specifications.
 4. All additives needed to amend a specific soil in order to meet these specifications.

1.6 EXAMINATION OF CONDITIONS

- A. All areas of the existing site where topsoil is to be sampled for testing shall be inspected by the Contractor before starting work and any issues that might inhibit or prevent the sampling operation shall be reported to the Owner's Representative prior to beginning this work.
- B. The Contractor and any sub-Contractor responsible for the execution of the Work of this Section, PLANTING SOILS, shall review and confirm in writing that the subsoil elevations have been brought to the proper subgrade elevations prior to proceeding with the spreading of the loam borrow.

PART 2 - PRODUCTS

2.1 LOAM

- A. Loam borrow shall be one of the following loamy sands and sandy loams; “loamy sand”, “loamy fine sand”, “loamy very fine sand”, or “coarse sandy loam”: determined by mechanical analysis (ASTM D 422) and based on the "USDA Classification System" and as defined in this Section. It shall be of uniform composition, without admixture of subsoil. It shall be free of stones greater than 0.75 inches (19 mm) lumps, plants and their roots, debris and other extraneous matter as determined by the Owner's Representative.

Planting soil for lawn areas shall have the following grain size distribution for material passing the #10 (2.0 mm) sieve:

<u>Millimeter</u>	<u>Percent Passing by Weight</u>	
	<u>Maximum</u>	<u>Minimum</u>
2	-----	100
1	100	82
0.5	87	65
0.25	72	49
0.10	45	30
0.05	32	22
0.002	5	2

- 1. Maximum size shall be one and one quarter inches largest dimension. The maximum retained on the #10 sieve shall be 25% by weight of the total sample.
- 2. The ratio of the particle size for 80% passing (D80) to the particle size for 30% passing (D30) shall be 6.0 or less. (D80/D30 < 6.0).
- 3. In addition to the foregoing, all loam borrow to be used for loaming and seeding shall be mechanically screened processed loam borrow that passes a 3/4 inch by 6 inch (19 mm by 150 mm) screen size.
- 4. On-site loam borrow may be re-used if screened per item 3 above. Re-use of on-site topsoil is acceptable for areas to be seeded, but not for the rain garden.

- B. Organic content and pH for specific planting use shall be as follows:

- 1. Areas planted with turf grasses per the Section 32 92 19, SEEDING, of this Specification:
 - a. pH: 6.0 through 7.0
 - b. Organic Content 4.0 - 6.0 percent as determined by the loss on ignition of oven-dried samples passing #10 sieve (Muffle furnace temperature: 450 +/- 10 degrees C for 8 hours)
- 2. Loam borrow shall be pH adjusted for particular planting applications and shall be adjusted prior to delivery to the Project sites as recommended by UMASS Soil & Plant Tissue Laboratory test results.
 - a. When pH of loam borrow is equal to or greater than 7 use aluminum sulfate to adjust pH downward to required levels.

- b. When pH of loam borrow is less than 7 use either sulfur or ferrous sulfate to adjust pH downward to required levels.
 - c. When pH of loam borrow must be raised to the required levels use limestone.
 - d. Regardless of amendment Contractor chooses to use, Contractor, not the Owner, shall be responsible for obtaining specified pH by seeding and/or planting time.
- C. All loam borrow proposed for use shall be tested for conformance to the specifications. Soil additives shall be used to counteract soil deficiencies as recommended by the soils analysis and as supplements for lawn construction as specified herein.
- D. The Owner's Representative reserves the right to reject on or after delivery to the project site any material which does not, in his opinion, meet these specifications.

2.2 BIOSWALE FILTER MIX

- A. Bioswale filter mix shall be composed as follows:
- | Component | Percentage Passing by Weight |
|-----------|------------------------------|
| Topsoil | 20-30% |
| Sand | 40% |
| Compost | 30-40% |
- B. Topsoil shall be sandy loam, loamy sand or loam as defined by the USDA Classification System.
- C. Sand shall be gravelly sand that meets ASTM D 422 and the following gradation:

<u>Inch</u>	Percent Passing by Weight	
	<u>Maximum</u>	<u>Minimum</u>
2	-----	100
0.75	100	70
0.25	80	50
#40	40	15
#200	3	0

- D. Compost shall be leaf compost. Biosolids are not allowed for the compost component.
- E. pH shall be 5.5 to 6.5

PART 3 - EXECUTION

3.1 FILLING AND COMPACTION

- A. Subsoil or ordinary borrow shall have been excavated and filled as required by the Contract Documents and specified and paid for under the Section, EARTH MOVING, of this Specification. Do not damage the work previously installed. Maintain all required angles of repose of materials adjacent to the loam as shown on the Contract Documents. Do not over excavate compacted subgrades of adjacent pavement or structures during loaming operations.
- B. Confirm that the subgrade is at the proper elevation and that no further earthwork is required to bring the subgrade to proper elevations. Subgrade elevations shall slope parallel to the finished grade and or toward the subsurface drain lines as shown on the Contract Documents.

- C. Clear the subgrade of all construction debris, trash, rubble and any foreign material. In the event that fuels, oils, concrete washout or other material harmful to plants have been spilled into the subgrade material, excavate the soil sufficiently to remove the harmful material. Such construction debris, trash, rubble and foreign material shall be removed from the site and disposed of in a legal manner. Fill any over excavation with approved fill and compact to the required subgrade compaction levels.
- D. Do not proceed with the installation of loam borrow until all utility work in the area has been installed.
- E. Protect adjacent walls, walks and utilities from damage or staining by the loam borrow. Use 0.5-inch (13 mm) plywood and or plastic sheeting as directed to cover existing concrete, metal and masonry work and other items as directed during the progress of the work. Clean up all trash and any soil or dirt spilled on any paved surface at the end of each working day.

3.2 FINE GRADING

- A. Place loam in two lifts. Place the first lift to a depth of 2 inches and harrow or till the loam into the underlying subsoil to a depth of 2 inches, creating a blended interface of loam and subsoil approximately 4 inches deep. Spread the second lift of loam to a minimum depth of 4 inches or greater as shown on the Contract Documents.
- B. No loam borrow shall be handled, planted, or seeded in any way if it is in a wet or frozen condition. A moist loam borrow is desirable.
- C. Soil additives shall be spread and thoroughly incorporated into the layer of loam borrow by harrowing or other methods reviewed by the Owner's Representative. The following soil additives shall be incorporated:
 - 1. Ground limestone or acidulant as required by soil analysis to achieve the required pH.
 - 2. Fertilizer at the rate and of analysis recommended by the soil analysis
 - 3. Other soil amendments as required by soil analysis.
- D. Sufficient grade stakes shall be set for checking the finished grades. Stakes must be set in the bottom of swales and at the top of slopes. Deviation from indicated elevations that are greater than one-tenth of a foot shall not be permitted. Connect contours and spot elevations with an even slope. Finish grades shall be smooth and continuous with no abrupt changes at the top or bottom of slopes.
- E. During the compaction process, all depressions caused by settlement or rolling shall be filled with additional loam borrow and the surface shall be regraded and rolled until presenting a smooth and even finish corresponding to the required grades.
- F. The Contractor shall install loam borrow in successive horizontal lifts no thicker than 6 inches (150 mm). The Contractor shall install the soil at a higher level to anticipate any reduction of loam borrow volume due to compaction, settling, erosion, decomposition, and other similar processes during the warranty period. The Owner's Representative will ensure that the full depths of loam borrow for lawn are obtained by digging holes in the loam borrow at the same frequency as for compaction testing.
 - 1. Compact loam to the required density as specified herein.
 - 2. Maximum dry density for topsoils and loam shall be determined in accordance with ASTM D698. The following percentages of minimum to maximum dry densities shall be achieved for fill materials or prepared subgrades.

In lawn and plant beds:

<u>Minimum</u>	<u>Maximum</u>
----------------	----------------

- a. Fills within seeding and planting areas in top eighteen inches

of finished grade

80%

85%

3. The surface area of each lift shall be scarified by raking prior to placing the next lift.
- G. Select equipment and otherwise phase the installation of the loam borrow to ensure that wheeled equipment does not travel over subsoil, placed fills or ordinary borrow or already installed soil.
- H. Disturbed areas outside the limit of lawn work shall be graded smooth and spread with a minimum of 6 inches (150 mm) of loam borrow to the finished grade.

3.3 ACCEPTANCE

- A. Confirm that the final grade of the loam borrow is at the proper finish grade elevations. Adjust grade as required to meet the contours and spot elevations noted on the Plans. Request the presence of the Owner's Representative to inspect final grade. Do not proceed with the remaining work of this Contract until the Owner's Representative has given his/her written approval of the final grade.

-END OF SECTION 32 32 00-

PLANTING SOILS

SECTION 32 33 00: SEEDING

PART 1-GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to perform all lawn installation and fine grading work and related items as indicated on the Contract Documents and/or as specified in this Section and includes, but is not necessarily limited to, the following:

1. Seeding
2. Maintenance and protection

1.3 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 1. Section 32 32 00, PLANTING SOILS

1.4 REFERENCES

- A. Not Applicable.

1.5 SUBMITTALS

- A. At least 30 days prior to intended use, the Contractor shall provide the following samples and submittals for approval in conformance with the requirements of Section, SUBMITTALS. Do not order materials until Owner's Representative's approval of samples, certifications or test results has been obtained. Delivered materials shall closely match the approved samples. Acceptance shall not constitute final acceptance. The Owner's Representative reserves the right to reject on or after delivery any material that does not meet these Specifications.
 1. Material Sampling and Testing of Loam Borrow from Off-Site Sources shall be specified, performed and paid for under Section 32 32 00, PLANTING SOILS, of this Specification.
 2. Seed: Submit a manufacturer's Certificate of Compliance to the Specifications with each shipment of each type of seed. These certificates shall include the guaranteed percentages of purity, weed content and germination of the seed, and also the net weight and date of shipment. No seed may be sown until the Contractor has submitted the certificates.
 3. Hydroseeding: Prior to the start of hydroseeding, submit a certified statement for approval as to the number of pounds of materials to be used per 100 gallons of water.
 4. Wood Cellulose Fiber Mulch: Submit 4 copies of manufacturer's literature and one material sample.
 5. Limestone: Submit supplier's certification that the limestone being supplied conforms to these Specifications.
 6. All additives needed to amend a specific soil in order to meet these specifications.

7. Erosion control matting: Submit 4 copies of manufacturer's literature and one material sample.

1.6 EXAMINATION OF CONDITIONS

- A. All areas to be improved shall be inspected by the Contractor before starting work and any defects such as incorrect grading, or drainage problems shall be reported to the Owner's Representative prior to beginning this work. The commencement of work by the Contractor shall indicate his acceptance of the areas to be improved, and he shall assume full responsibility for the work of this Section, SEEDING.
- B. The Contractor shall be solely responsible for judging the full extent of work requirements involved.

1.7 QUALITY ASSURANCE

- A. Qualification of Landscape Contractor: The work of this Section, SEEDING, shall be performed by a landscape contracting firm which has successfully installed work of a similar quality, schedule requirement, and construction detailing with a minimum of five years experience. Proof of this experience shall be submitted per SUBMITTALS paragraph of this Section, SEEDING.

PART 2 - PRODUCTS

2.1 LOAM

- A. Loam borrow shall be specified, provided, installed and paid for under the work of the Section 32 91 13, PLANTING SOILS, of this Specification.

2.2 SOIL ADDITIVES

- A. Soil additives shall be specified, and provided under Section 32 32 00, PLANTING SOILS

2.3 SEED

- A. Seed mixture shall be fresh, clean, new crop seed. Grass shall be of the previous year's crop and in no case shall the weed seed content exceed 0.25% by weight. The seed shall be furnished and delivered in the proportion specified below in new, clean, sealed and properly labeled containers. All seed shall comply with State and Federal seed laws. Submit manufacturer's Certificates of Compliance. Seed that has become wet, moldy or otherwise damaged shall not be acceptable. Chewings fescue, hard fescue, tall fescue and rygrass shall contain *Acromonium* endophytes. Seed containing endophyte must be kept cool and dry at all times; do not stockpile in the sun.

1. Seed Mixture #1 Composition

Chewings Fescue	30%
Creeping Red Fescue	30%
Rough Bluegrass	20%
Annual Ryegrass	20%

- a. Seeding rate for Seed Mix #1 shall be 4 pounds per 1,250 square feet.

2.4 FERTILIZERS

- A. Do not apply fertilizer on this site due to the proximity to coast and wet ditches.

2.5 LIMESTONE

- A. Ground limestone for adjustment of loam borrow pH shall contain not less than 85 percent of total carbonates and shall be ground to such fineness that 40 percent will pass through 100 mesh sieve and 95 percent will pass through a 20 mesh sieve. Contractor shall be aware of loam borrow pH and the amount of lime needed to adjust pH to specification in accordance with testing lab

recommendations.

2.6 WOOD CELLULOSE FIBER MULCH

- A. Mulch to cover hydroseeded areas with slopes less than 3 to one shall be fiber processed from whole wood chips and clean recycled newsprint in a 1:1 proportion manufactured specifically for standard hydraulic mulching equipment. Fiber shall not be produced from recycled material such as sawdust, paper, or cardboard.
- B. Moisture content shall not exceed 10 percent, plus or minus 3 percent as defined by the pulp and paper industry standards. Fiber shall have a water holding capacity of not less than 900 grams water per 100 grams fiber.
- C. The mulch shall be of such character that the fiber will be dispersed into a uniform slurry when mixed with water. It shall be nontoxic to plant life or animal life.
- D. The mulch shall contain a non-petroleum based organic tackifier and a green dye to allow for easy visual metering during application but shall be non-injurious to plant growth.

2.7 HERBICIDES, CHEMICALS AND INSECTICIDES

- A. No herbicides, chemicals or insecticides shall be used within 100' of the wetland resource areas.

2.8 WATER

- A. Water from existing water system is available for use with metering and with payment of use charges. Provide connections and extensions of services as required for construction operations.

PART 3-EXECUTION

3.1 FILLING AND COMPACTION

- A. Filling and compaction of loam shall be specified, performed and paid for under the work of the Section 32 32 00, PLANTING SOILS, of this Specification.

3.2 FINE GRADING

- A. Fine grading shall be specified, performed and paid for under the work of the Section 32 32 00, PLANTING SOILS, of this Specification.

3.3 SEEDING

- A. Contractor shall obtain Owner's Representative's written approval of fine grading and bed preparation before doing any seeding.
- B. Limit of grading and earthwork shall be limit of seeding unless otherwise indicated on the Contract Documents. All areas disturbed outside the limit of seeding shall be prepared and seeded as specified herein at no additional cost.
- C. The season for seeding shall be from April 1 to June 1 and from August 15 to October 30. The actual planting of seed shall be done, however, only during periods within this season which are normal for such work as determined by weather conditions and by accepted practice in this locality. To prevent loss of soil via water and wind erosion and to prevent the flow of sediment, fertilizer, and pesticides onto roadways, sidewalks, and into catch basins, seed loam areas within 5 Days of spreading the loam.
- D. Seed only when the bed is in a friable condition, not muddy or hard.
- E. Seeding shall be by Hydroseeding Method specified as follows:

WINTER ISLAND TRAIL

1. Prior to the start of work, furnish a certified statement as to the number of pounds of materials to be used per 100 gallons of water. This statement shall also specify the number of square feet of hydroseeding that can be covered with the quantity of solution in the hydroseeder.
2. Hydroseed with wood cellulose fiber mulch at a rate of 46 pounds per 1,000 square feet or 2000 pounds per acre.
3. For the hydroseeding process, a mobile tank with a capacity of at least 500 gallons shall be filled with water and the mixture noted above in the specified proportions. The resulting slurry shall be thoroughly mixed by means of positive agitation in the tank. Apply the slurry by a centrifugal pump using the hose application techniques from the mobile tank. Only hose application shall be permitted. At no time shall the mobile tank or tank truck be allowed onto the prepared hydroseed beds. The hose shall be equipped with a nozzle of a proper design to ensure even distribution of the hydroseeding slurry over the area to be hydroseeded and shall be operated by a person thoroughly familiar with this type of seeding operation.
4. Contractor shall obtain Owner's Representative's written approval of fine grading and bed preparation before doing any hydroseeding.
5. Limit of grading and earthwork shall be limit of hydroseeding unless otherwise indicated on the Contract Documents. All areas disturbed outside the limit of hydroseeding shall be hydroseeded.
6. Seed only when the bed is in a friable condition, not muddy or hard. Construction methods shall conform to hydraulic method requirements specified in the Standard Specification.
7. Hydroseeding shall be a two-step process.
 - a. Step one shall consist of spreading 100 percent of the required seed uniformly over the prepared loam bed so that the seed comes into direct contact with the soil. To mark the progress of the hydroseeding operation the Contractor may add 10 percent of the wood cellulose fiber mulch to the slurry.
 - b. Step two shall consist of a separate application of wood cellulose fiber mulch immediately following the first step of hydroseeding noted above. Apply the wood cellulose fiber mulch at a rate of 2,000 pounds per acre.

3.5 LAWN MAINTENANCE

- A. Maintenance shall begin immediately after any area is seeded and shall continue for a 60 day active growing period for seeded areas or until Final Acceptance, whichever is longer; following the completion of all lawn construction work, and until final acceptance of the project. [* In the event that seeding operations are completed too late in the Fall for adequate germination and growth of grass, then maintenance shall continue into the following Spring for the minimum 60 Day period. In addition, install blankets or netting to prevent loam degradation and movement over the winter. Submit product literature and samples to the Owner's Representative for review. Blankets and netting shall be placed in a timely manner at no additional cost to the Owner.
- B. Maintenance shall include reseeding, mowing, watering, weeding, and resetting and straightening of protective barriers.
- C. During the maintenance period, any decline in the condition of seeded areas shall require immediate action to identify potential problems and to undertake corrective measures.
- D. Watering shall be done in a manner that will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment.
 1. The Contractor shall provide all labor and arrange for all watering necessary to establish an acceptable lawn. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary to maintain moist soil to a depth of at least 2 inches for seeded areas.

2. Watering shall be done in a manner that will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment. The Contractor shall furnish sufficient watering equipment to apply water to the required soil depths each 8-hour period.
- E. Protection
1. Lawn areas shall be protected by a 3-foot high barrier constructed of 2 inch by 2 inch hardwood stakes or iron pipes set 18 inches in the ground at 10 foot intervals and connected by No. 10 wire. Flags of white cloth shall be secured to the wire at center points between stakes.
 2. Barriers must be raised immediately after lawn construction and shall be maintained until Acceptance.
- F. After the grass in seeded areas has germinated, reseed all areas and parts of areas that fail to show a uniform stand of grass. Reseed such areas and parts of areas repeatedly until all areas are covered with a satisfactory growth of grass with no less than 20 grass shoots per square inch and 2880 grass shoots per square foot. Reseeding together with necessary grading, and trimming shall be done at the Contractor's expense.
- G. Mowing and Edging:
1. The Contractor shall keep lawn areas mowed until Acceptance of the contract by cutting to a height of 2 inches when growth reaches 3 inches or as directed by the Owner's Representative.

3.6 APPLYING LIMESTONE

- A. The Contractor shall return to the site at the beginning of the next seeding season and spread limestone across all lawn areas installed under this Contract. The work of liming the fields shall be as specified under Section 32 32 00, PLANTING SOILS, of this Specification, and performed and paid for under this Section, SEEDING. Limestone shall be spread at rates determined by the soil tests specified, performed and paid for under Section 31 32 00, PLANTING SOILS.

3.7 ACCEPTANCE OF SEED

- A. Following the minimum required maintenance periods for construction, the Contractor shall request the Owner's Representative in writing for a formal inspection of the completed work. Request for inspection shall be received by the Owner's Representative at least 10 Days before anticipated date of inspection.
- B. Acceptance Requirements
1. At the end of the maintenance period, seeded areas shall show complete germination of specified grass species such that:
 - a. No weeds present.
 - b. No bare spots greater than 12 inches in diameter over greater than 10% of overall seeded area.
- C. At least 90 percent of the grass and forbs established shall be permanent grass and forb species. If seeded areas are deficient, the Contractor's responsibility for maintenance of all seeded areas shall be extended until deficiencies are corrected. Seeded areas to be corrected shall be prepared and reseeded in accordance with the requirements of this Section.
- D. Owner's Representative's inspection shall determine whether maintenance shall continue in any part.

3.8 CLEAN UP

- A. Absolutely no debris may be left on the site. Excavated material shall be removed as directed. Repair any damage to site or structures to restore them to their original condition, as directed by the Owner's Representative, at no cost to the Owner.

**END OF SECTION 32 33 00
SEEDING**

SECTION 32 90 00: PLANTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to perform all planting work and related items as indicated on the Contract Documents and as specified in this Section and includes, but is not limited to, the following:
 - 1. Planting trees and shrubs
 - 2. Staking, guying, and anchoring trees.
 - 3. Planting maintenance.
 - 4. One year guarantee period for all plants.
 - 5. Providing and placing backfill mix.

1.3 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
 - 1 Section 32 91 13, PLANTING SOILS
 - 2. Section 32 92 19, SEEDING.

1.4 REFERENCES

- A. The following standards shall apply to the work of this Section.
 - 1. Hortus III, 1976, L. H. Bailey Hortorium.
 - 2. Tree and Shrub Transplanting Manual, E.B. Himelick, 1991, International Society of Arboriculture.
 - 3. American National Standards Institute (ANSI):
 - Z60.1 American Standard for Nursery Stock, latest edition, published by American Nursery & Landscape Association, (ANLA).

1.5 SUBMITTALS

- A. At least 90 days prior to the first day of the planting season described in this Section, PLANTING, submit to the Owner's Representative proof of certification of Foreman or Crew Leader as Massachusetts Certified Landscape Professional or Massachusetts Certified Horticulturist in accordance with QUALITY ASSURANCE paragraph of this Section.
- B. Submit proof of landscape contractor's experience to the Owner's Representative in accordance with QUALITY ASSURANCE paragraph of this Section, PLANTING.
- C. At least 30 days prior to ordering materials, the Contractor shall submit to the Owner's Representative representative samples, certifications, manufacturer's product data and certified test results for

materials as specified below. No materials shall be ordered or delivered until the required submittals have been reviewed and approved by the Owner's Representative. Delivered materials shall closely match the approved samples. Approval shall not constitute final acceptance. The Owner's Representative reserves the right to reject, on or after delivery, any material which does not meet these Specifications.

D. Material Sampling and Testing:

1. Material Sampling and Testing of Loam Borrow from Off-Site Sources shall be specified, under the work of the Section 32 91 13, PLANTING SOILS.
2. Planting Mulch: Submit a one cubic foot (28 liter) sample.
3. Antidesiccant: Submit manufacturer's product data.
4. Peat: Submit a one cubic foot (28 liter) sample and manufacturer's certification of contents.
5. Mycorrhizal Fungal Inoculant:
 - a. Submit manufacturer's product data certifying that inoculant being supplied conforms to these Specifications.
 - b. Submit the purchasing receipt showing the total quantity purchased for the Project prior to installation.
 - c. Submit empty packets of fungal spore inoculant to the Owner's Representative for verification of use.
6. Tree Staking System: Submit manufacturer's product data of system.
7. Soil Additives: Submit manufacturer's product data for all soil additives needed to amend a specific soil in order to meet the requirements of this Section, PLANTING.

1.6 EXAMINATION OF CONDITIONS

- A. All areas to be planted shall be inspected by the Contractor before starting work and any defects such as incorrect grading or inadequate drainage shall be reported to the Owner's Representative prior to beginning this work.
- B. The Contractor shall be solely responsible for judging the full extent of work requirements involved, including but not limited to the potential need for storing and maintaining plants temporarily and/or rehandling plants prior to final installation.
- C. All plants are the full responsibility of the Contractor between the time of digging at the nursery and final acceptance.

1.7 QUALITY ASSURANCE

- A. Qualification of Landscape Contractor: The work of this Section, PLANTING, shall be performed by a landscape contracting firm which has successfully installed work of a similar quality, schedule requirement, and construction detailing with a minimum of five years experience. Proof of this experience shall be submitted per SUBMITTALS paragraph of this Section, PLANTING.
- B. Qualification of Foreman or Crew Leader: All work of unloading, stockpiling, storing, transporting on-site, planting, staking and guying, fertilizing, and maintenance of trees, shrubs, vines, groundcover, and perennials shall be supervised by a foreman or crew leader who is a certified landscape professional or a certified horticulturist.
 1. Landscape professional shall be a Massachusetts Certified Landscape Professional certified by the Associated Landscape Contractors of Massachusetts.
 2. Horticulturist shall be a Massachusetts Certified Horticulturist as certified by the Massachusetts Nursery and Landscape Association.

3. Certification shall be current. Proof of certification shall be submitted per SUBMITTALS paragraph of this Section, PLANTING.
- C. The ratio of laborers to certified landscape professionals or certified horticulturist shall not exceed twelve to one. Certified Landscape Professional or Certified Horticulturist shall be on the project site throughout the day to day performance of the work described in this Section, PLANTING.
- D. Qualification of Arborist: All work of pruning shall be performed by an arborist certified by the Massachusetts Arborist Association or the International Society of Arboriculture.

PART 2 - PRODUCTS

2.1 LOAM BORROW

- A. Loam borrow for planting shall be specified, provided, installed and paid for under the work of the Section 32 91 13, PLANTING SOILS, of this Specification.

2.2 SOIL ADDITIVES

- A. Soil additives shall be specified, provided, installed and paid for under Section 32 91 13, PLANTING SOILS, of this Specification.

2.3 GRADES AND STANDARDS OF PLANTS

- A. The Contractor shall furnish all plants shown on the Contract Documents, as specified, and in quantities listed on the PLANT LIST. No substitutions will be permitted, without written approval by the Owner's Representative. All plants shall be nursery grown unless specifically authorized to be collected as noted on the PLANT LIST.
- B. All plants shall be typical of their species or variety and shall have a normal habit of growth and be legibly tagged with the proper name. Only plant stock grown within Hardiness Zones 1 through 6b, as established by the USDA Plant Hardiness Zone Map, latest edition, will be accepted.
- C. Plants shall be in accordance with ASNS Standards of the American Nursery & Landscape Association except as noted in this Section, PLANTING. Botanical plant names shall be in accordance with plant designations included in Hortus III.
- D. If, at any time during the performance of the Contract, any plant shows signs of graft incompatibility, as determined by the Owner's Representative, then the tree or shrub and all other similarly grafted plants of the same Genus/Species/Variety shall be rejected and removed from the site. Visual symptoms of graft incompatibility as cause for rejection include:
 1. Development of over-growths by rootstock or scion resulting in the development of shoulders or inverted shoulders.
 2. Suckering of the rootstock combined with poor growth or dieback of scion.
 3. Any mechanical weakness between scion and rootstock.
 4. Any marked difference in bark pattern and structure between scion and rootstock.
- E. All deciduous trees shall meet the following standards:
 1. Trees shall have a single, straight trunk, well formed, and sturdy. No part of the trunk shall be conspicuously crooked as compared with normal trees of the same variety.
 2. Trees with multiple leaders shall conform to all standards noted in this Section, PLANTING for single leader trees and shall be accepted only as noted on the PLANT LIST.

WINTER ISLAND TRAIL

3. All pruning wounds shall show vigorous bark on all edges at the time of harvest. Trees shall be free from all signs of pest and disease damage. The trunk shall be free from sun scald, frost cracks, and wounds resulting from abrasions, fire, animal damage, or other causes.
 4. Pruning scars within the crown of any tree shall be clean cut and shall leave no protrusion beyond the branch collar.
 5. All trees shall have healthy, vigorous leaves or needles of normal size, color, shape, and texture for the particular species and variety.
 6. Deciduous shade trees and deciduous flowering trees shall have fall color typical for their species and variety.
 7. Unless otherwise indicated on the PLANT LIST, the height and spread of deciduous shade trees shall be the minimum requirements.
 8. Take caliper measurements for deciduous trees 6 inches (150 mm) above ground level up to and including 4 inches (100 mm) caliper size and 12 inches (300 mm) above ground for larger sizes.
 9. No deciduous tree shall be pruned after the Owner's Representative has tagged the plant in the nursery except as directed by the Owner's Representative.
 10. Branching of all deciduous trees shall be best quality representatives of the species, cultivar or variety with lateral branching around the entire trunk to form a symmetrical tree for 80 percent to 100 percent of the tree's outer perimeter. All branches on deciduous trees shall meet the trunk at angles no less than 30 degrees and no greater than 90 degrees from the vertical.
- F. Evergreen trees shall meet the following standards:
1. The height of the evergreen trees (measured from the trunk flare at the natural ground line of the tree to the midpoint of the terminal leader) shall be not less than the minimum size designated on the PLANT LIST.
 2. No trees with double-leaders or twin-heads will be permitted.
 3. Evergreen trees shall be of specified height with spread in proportion to height, as designated in ASNS Standards, and shall be well-branched to the ground.
 4. All pruning wounds shall show vigorous bark on all edges at the time of harvest.
 5. Terminal and top whorl buds of all evergreen trees shall be in healthy and whole condition at the time of harvest.
 6. No evergreen tree shall be pruned after the Owner's Representative has tagged the tree in the nursery except as directed by the Owner's Representative.
 7. All trees shall have healthy, vigorous leaves or needles of normal size, color, shape, and texture for the particular species and variety.
- G. All shrubs shall meet the following standards:
1. All shrubs shall be healthy and vigorous plants which are very well shaped, heavily branched, densely foliated, and true to form for the variety.
 2. Canes or Trunk(s) and Branches:
 - a. Well formed and sturdy.
 - b. Branching shall be uniformly distributed close to the ground.
 - c. Scars shall be free of rot and not exceed 1/4 the diameter of the wood beneath in greatest dimension unless completely healed (except pruning scars).
 - d. Pruning scars shall be clean cut and shall leave little or no protrusion from the trunk or branch.

- e. Graft unions shall be completely healed.
 - f. No suckers or water sprouts.
 - g. Contain no dead wood.
 - h. Free of cracks, splits, or cambium peeling.
3. No shrub with pest or mechanical damage will be accepted.
4. Shrubs shall show no signs of frost or winter damage to the foliage. Foliage shall not be in a state of drought stress. Leaves or needles shall show no signs of wilt or desiccation due to weather stress at any season of the year.

2.4 ROOT SYSTEMS FOR ALL PLANTS

- A. Each plant shall have an extensive, symmetrically balanced fibrous root system. Any root ball which shows signs of asymmetry, girdling, injury, or damage to the root system shall be rejected.
- B. Curling or spiraling of the roots along the walls of rigid containers will not be accepted. Curling, spiraling or girdling roots within balled and burlapped material will not be accepted.
- C. All parts of the fibrous root system of all plants shall be moist and fresh with a white color when washed of soil. When the plant is removed from the container, the visible root mass shall be healthy with white root tips. The root systems of all plants shall be free of disease, insect pests, eggs, or larvae.
- D. All trees, and all shrubs which are not grown in containers must be moved with the root systems as solid units with balls of earth firmly wrapped with untreated 8 ounce natural, biodegradable fabric burlap, firmly laced with stout, natural biodegradable cord or twine. The base of the tree trunks shall be wrapped with a protective burlap layer, surrounded by a cardboard trunk protector, and loosely tied with twine.
- E. The diameter and depth of the balls of earth must encompass the fibrous and root feeding system necessary for the healthy recovery of the plant. Minimum root ball diameters and depths shall be in accordance with ASNS standards.
- F. No plants shall be loose in the container.
- G. Container grown plants which have roots growing out of the container will be rejected.

2.5 MYCORRHIZAL FUNGAL INOCULANT

- A. Mycorrhizal fungal inoculant shall be live spores packaged in plastic packets. At a minimum each packet of inoculant shall contain the following:
 - 1. Live spores of VA Endomycorrhizal fungi: Vesicular-Arbuscular mycorrhizae fungi, minimum of 8 species.
 - 2. Live spores of Ectomycorrhizal fungi: including *Pisolithus tinctorius*.
- B. Mycorrhizal fungal inoculant shall be manufactured by Plant Health Care Incorporated, 440 William Pitt Way, Pittsburgh, PA 15238, telephone: (800) 421-9051; Horticultural Alliance, 2946 Louise Street, Sarasota, FL 34237, (800) 628-6373; BioPlex Organics, 2213 Huber Drive, Manheim, PA 17545 (800) 441-3573, or approved equal.

2.6 PLANTING SOIL MIX

- A. Planting soil mix shall be an approved loam borrow specified, provided, installed and paid for under the Section 32 91 13, PLANTING SOILS, of this Specification and that has been pH adjusted according to particular planting applications and improved through the addition of organic matter as directed below. Planting loam shall conform to the following pH levels:
 - 1. Planting soil mix for general planting of non-acid loving plants shall have a true pH value of 6.0 to 6.5. Planting soil mix shall be amended by the Contractor at his own expense to the proper pH

range by mixing with dolomitic limestone as specified, provided, installed and paid for under the Section 32 91 13, PLANTING SOILS, of this Specification.

2. The amount of either sulfur or limestone required to adjust the planting soil mix to the proper pH range shall be approved by the Owner's Representative on the basis of soil tests as specified, provided, installed and paid for under the Section 32 91 13, PLANTING SOILS, of this Specification.
3. In those areas indicated on the Contract Documents, augment planting soil mix with 10 percent gypsum. Thoroughly premix gypsum into planting soil mix prior to commencing the planting operations. Gypsum shall be specified, provided, installed and paid for under the Section 32 91 13, PLANTING SOILS, of this Specification.

2.7 STAKING, GUYING, AND ANCHORING MATERIALS

- A. Stakes for supporting trees shall be of sound wood of uniform shape and size, reasonably free of knots, insects and fungi and capable of standing in the ground at least two years. Unless noted otherwise, stakes shall be 10 feet (3.0 meters) long of 2 inch by 4 inch (50 mm by 100 mm) nominal size. Stakes shall be pointed at one end and stained dark green, or other color selected by the Owner's Representative. Provide a minimum of three stakes per tree.
- B. Elastic Webbing, Belting or Tape:
 1. Guying system shall be elastic webbing, belting or tape which establishes contact with the trunk of the tree with a broad, smooth surface. Guying system shall not abrade or girdle tree. Submit guying system to the Owner's Representative for review and approval.

2.8 MULCH

- A. Bark Mulch: Mulch shall be high quality, double-ground, premium bark mulch of 70 percent hemlock bark with the balance spruce and pine bark. Mulch shall have been aged for a minimum of six months and not longer than two years. Bark mulch shall be shredded to a uniform size; free of dirt, debris and foreign matter; with pieces no thicker than 1/4 in (6 mm). Mulch must be free of stringy material or chunks over 3 inches (75 mm) in size and shall not contain, in the judgment of the Owner's Representative, an excess of fine particles. Submit sample for the Owner's Representative's approval.
- B. Rain Garden Mulch: Crushed shells shall be mix of oyster, clam, and other shells. Crushed shells mixture shall 100% pass through a 1" sieve.

2.9 WRAPPING MATERIAL

- A. Wrapping material shall be first quality, 4 inch (100 mm) wide heavy waterproof crepe paper manufactured for this purpose. Tape for securing wrapping material shall be a durable, weatherproof tape of same color as wrapping material.

2.10 WATER

- A. The Contractor shall be responsible to furnish his own supply of water to the site at no extra cost. If possible, the Owner shall furnish the Contractor upon request with an adequate source and supply of water at no charge. However, if the Owner's water supply is not available or not functioning, the Contractor shall be responsible to furnish adequate supplies at his own cost. All work injured or damaged due to the lack of water, or the use of too much water, shall be the Contractor's responsibility to correct. Water shall be free from impurities injurious to vegetation.

2.11 ANTIDESICCANTS

- A. Antidesiccants shall be emulsions or other materials which will provide a protective film over plant surfaces permeable enough to permit transpiration and specifically manufactured for that purpose. Manufacturer of antidesiccant shall be subject to the Owner's Representative's approval and shall be used only after approval by the Owner's Representative. Antidesiccant shall be delivered in

containers of the manufacturer and shall be mixed and applied according to the manufacturer's instructions.

2.12 COIR LOG

- A. Coir log shall be 100% coir batting and a reinforced jute mesh exterior. Stakes shall be hardwood.

PART 3-EXECUTION

3.1 PLANTING

- A. Furnishing and planting of plant material shall include, but shall not be limited to, the digging of planting pits and plant beds, amendment of loam as required to produce planting soil mix, provision of soil additives required to adjust for pH requirements of specific plants, furnishing the plants as specified as well as the labor of planting, fertilizing, and maintenance.
- B. Prior to spreading of loam, subgrades shall have been tested to determine if they are too compact to drain water as specified, performed and paid for under the work of Section 32 91 13, PLANTING SOILS, of this Specification.
- C. The Contractor shall locate plant material sources and ensure that plants are shipped in timely fashion for installation.
- D. Contractor shall locate all existing underground utilities that are within 10 feet (3 meters) of the proposed planting pits and notify the Owner's Representative of any conflicts prior to digging plant pits.
- E. Seasons for Planting:
 - 1. Spring: Deciduous materials - March 21 through May 1; Evergreen materials - April 15 through June 1.
- F. Plant Material Inspection:
 - 1. At least one month prior to the expected planting date, the Contractor shall request that the Owner's Representative provide a representative to select and tag stock to be planted under this Section, PLANTING. The Contractor shall pay for the transportation, subsistence and overnight accommodations, if necessary, for the Owner's Representative's representative during the period of time required to select and tag the plant material.
 - 2. The Contractor shall be responsible to certify the availability of quality plants in specified sizes from his/her sources of supply prior to requesting that the Owner's Representative make plant source inspections. In the event that plants at the inspection location are found to be unavailable or of insufficient size, the Contractor shall be liable to reimburse the Owner for all costs of the Owner's Representative's hourly services which are incurred during unproductive inspection trips.
 - 3. Unless specifically designated otherwise, a representative of the Contractor shall accompany the Owner's Representative on all plant material selection field trips.
 - 4. All trees for the project shall be individually tagged for approval with the Owner's Representative's seals, and no trees shall be accepted for delivery to the site without such seals. Representative samples only of shrubs and ground cover plants may be tagged or marked for approval as an "Approved Typical Sample" and shipped to the site. Any shrub or groundcover plant that arrives at the construction site that does not meet the Approved Typical Sample will be rejected by the Owner's Representative.
 - 5. Plants to be inspected shall be in locations and conditions that allow direct and un-obscured inspection by the Owner's Representative. Container grown or balled and burlapped shrubs shall be pulled from holding blocks by the nurseryman for scrutiny by the Owner's Representative at no additional cost to the Owner. Harvested trees held in storage shall not have branches tied up. Harvested trees shall not have trunks obscured by burlap, cardboard trunk protection, or other devices that would otherwise obscure inspection. In the event that branches are tied up, trunks

are obscured by burlap or cardboard trunk protection, or root flares hidden by burlap and twine and the Owner's Representative cannot inspect root flares, trunks or branching habit, the Contractor shall bear all responsibility and costs associated with tree rejection at a later date during the course of the Contract.

6. Inspection and approval of plants at the source shall not impair the right of subsequent inspection and rejection upon delivery to the site, or during the progress of the work if the Owner's Representative finds that plants do not meet the requirements of the PLANT LIST or this Contract, have declined noticeably due to handling abuse, lack of maintenance, or other causes. Cost of replacements, as required, shall be borne by the Contractor.
- G. Placement of Loam for planting soil shall be specified, performed and paid for under the work of Section 32 91 13, PLANTING SOILS, of this Specification. Obtain Owner's Representatives written approval of work of rough grading and finish grading prior to starting the work of planting.
- H. Planting:
1. Notify the Owner's Representative three working days prior to the proposed arrival of plant material on the site. If not planted within 24 hours of delivery to the site, all plants shall be maintained in an on-site nursery. Container grown shrubs stored on site shall be shaded from direct sunlight at all times and shall not be stored directly on paved surfaces. All plants delivered to the site and not planted within 24 hours of delivery shall have their root balls covered with mulch and shall be watered on a daily basis such that root balls are kept moist throughout.
 2. Locations for all plants and outlines for planting areas shall be staked on the ground by the Contractor for approval by the Owner's Representative before any plant pits or plant beds are dug. Notify the Owner's Representative no less than 3 days prior to desired date of inspection of staking to schedule site visit.
 3. Circular plant pits shall not be required provided that the minimum dimension between the edge of the pit and the face of the rootball is not less than required by this Section, PLANTING.
 4. All plant pits dug with a machine shall have the sides of the holes scraped with hand shovels to prevent glazing or compaction of the sides of the hole. Remove and stockpile excavated loam for reuse as backfill for plant pit. All subsoil excavated from the bottoms of planting pits shall be removed from the site.
 4. All plant pits shall be hand dug. Remove and stockpile excavated loam for reuse as backfill for plant pit. All subsoil excavated from the bottoms of planting pits shall be removed from the site.
 5. Plant pits shall be dug to the dimensions shown on the Contract Documents.
 - a. Plant pits for trees shall be a minimum three times greater in diameter than the diameter of the root ball. Place root ball directly on subgrade. Slope sides of tree pits at a 45 degree angle.
 - b. Individual plant pits for shrubs shall be three times greater in diameter than the diameter of the root ball. Place root ball directly on subgrade. Slope sides of tree pits at a 45 degree angle.
 - c. Plant beds for shrub massing shall be one large and continuous excavated bed. Extend bed no less than 3 feet beyond limits of shrub root balls on perimeter of bed.
 - d. Plant pits for trees and shrubs shall be dug to the depth of the rootball to be planted.
 - e. Remove all soil from around the root flare of the stem of the plant and from the top of the rootball to determine the true depth of the rootball. All plants that have been planted and have root flares that are buried will be rejected.
 6. All plant roots and earth balls must be damp and thoroughly protected from sun and wind from the beginning of the digging operation, during transportation, and at the site until the final planting.
 7. Remove container plants from containers prior to planting.

8. Trees and shrubs shall be placed in the center of plant pits, plumb, with the crown of their roots exposed and located above the surrounding finish grade.
9. Prior to completion of planting installations, remove rope and cut wire baskets from the top 1/3 of the root balls. Pull burlap away from the trunk or stem of the plant and cut burlap from the top 1/3 of the root balls.
10. Contractor shall 'butterfly' the root system for all container grown perennials immediately prior to planting them. Butterflying shall consist of vertically cutting the containerized root ball with a spade through the bottom half of the rootball followed by gently pulling the rootball open at the cut while placing it into the planting hole. The butterflied root system shall be placed over a small ridge of soil in the planting pit in order to assure as much soil to root ball contact as possible and to keep the halves apart.
11. Planting soil shall be backfilled with approved planting soil to the full depth of the planting pit or bed. Eliminate air pockets and compact the soil by flooding the tree pit or plant bed within 2 hours of planting installation. After water has drained from the planting pit or bed and planting backfill has dried enough additional planting soil shall be spread in pit or bed to bring the finished surface of the planting pit or bed to grades shown on the Contract Documents. A saucer shall be formed around each plant at a depth of 3 inches (75 mm) for trees and for shrubs.
12. Fertilizer shall be spread over the plant saucer or plant bed between the saucer and the edge of the rootball. Till the fertilizer into the soil to a depth of four inches prior to the placement of the planting mulch. Fertilizer shall be provided, spread and paid for under the Section 32 91 13, PLANTING SOILS, of this Specification. Do not mulch until placement of the fertilizer has been verified by the Owner's Representative. Fertilizer application rates shall be as determined by soil testing, analysis, and testing laboratory recommendations specified, performed and paid for under the Section 32 91 13, PLANTING SOILS, of this Specification.
13. All plants shall be inoculated with mycorrhizal fungi. Inoculant shall be added after the plants have been placed in their holes. Open the required number of packets for each plant and thoroughly mix the inoculant powder into the upper 10 inches (250 mm) of backfill soil.
 - a. Mycorrhizal fungal inoculant shall be added to the plant pits according to plant size.
 - b. The application rates for mycorrhizal fungal packets shall be in accordance with the manufacturer's recommendations.
 - c. Submit the purchasing receipt showing the total quantity purchased for the project prior to installation. Submit empty packets of fungal spore inoculant to the Owner's Representative for verification of use. Owner's Representative will excavate tree pits to determine presence of mycorrhizal fungal inoculant.
- I. All plants shall be watered immediately following planting as necessary to thoroughly moisten rootball and plant pit loam and thereafter shall be inspected frequently for watering needs and watered, as required, to provide adequate moisture in the planting pit. The Contractor shall inspect tree pits 24 hours after initial watering to confirm that they are draining properly. If surface water or excessively saturated plant pit soils exist, the Contractor shall immediately notify the Owner's Representative. The Owner's Representative will recommend remedial measures based upon site conditions.
- J. Keeping Trees Plumb:
 1. Contractor shall keep trees plumb and upright at all times. To this end the Contractor shall either;
 - a. Stake, guy, or anchor all trees; or
 - b. Monitor plants on a regular basis and, if a tree is moved out of plumb, then straighten the tree to a vertical, upright condition.
 2. If Contractor chooses to keep trees plumb and upright by resetting trees that move out of vertical alignment, then the work of this item shall include:

- a. Tree inspections on a weekly basis and after storms or abnormally windy days to determine if the trees have shifted out of vertical alignment and require resetting.
 - b. Reset trees that have moved out of plumb by carefully excavating the soil from the base of the rootball facing away from the direction of tilt and easing the tree upright into a vertical, plump position. Upon righting the tree, firmly press the soil around the base of the rootball to reset the tree.
 - c. The Contractor shall retain the right to stake, guy, or anchor the tree into place in accordance with the requirements of this Section, PLANTING.
 - d. Mulch and water the tree in accordance with the requirements of this Section, PLANTING, immediately after the work of resetting.
- K. Mulch material shall be placed over entire saucer areas of individual trees and shrubs and over the entire area of planting beds to a depth of 3 inches (75 mm) after settlement, not later than one week after planting. Do not apply mulch prior to the first watering of plant materials. Do not apply mulch prior to placement of surface applied fertilizer and verification of placement by the Owner's Representative.
- L. The trunks of all deciduous trees over 1-1/2 inches (40 mm) in diameter shall be wrapped by the Contractor immediately after the inspection of the trees by the Owner's Representative. Wrapping shall extend from the ground line to the height of the second branches or to the height directed. The specified wrapping shall be wound spirally, starting from the base and overlapping 1-1/2 inches (40 mm) in order to shed water. Wrapping shall be securely taped to prevent loosening and unraveling. If trees are planted in springtime, do not apply any tree wrapping. If deciduous trees are planted in the autumn, wrap the trees and then remove wrapping the following spring.
- 1. Trees delivered to the site wrapped for protection shall be unwrapped at the site for inspection of the trunk by the Contractor and Owner's Representative.
- M. Pruning:
- 1. As directed by the Owner's Representative, each plant shall be pruned in accordance with the workmanship requirements of "Pruning Standards" for Class I, fine pruning, to preserve the natural character of the plant.
 - 2. Tree pruning, as required, shall be undertaken to the full height of affected trees.
 - 3. All dead wood or suckers and all broken or badly bruised branches shall be removed. Never cut a leader.
- N. Antidesiccant shall be applied to all evergreen and broadleaf evergreen plants in December and again in February, according to manufacturer's application recommendations and as directed by the Owner's Representative.
- O. If planting is done after lawn preparation or installation, proper protection of lawn areas shall be provided. Any damage resulting from planting operations shall be repaired immediately at no cost to the Owner. Repair work shall be as specified and installed under the work of Section 32 92 19, SEEDING, of this Specification and paid for under this Section, PLANTING.
- P. Absolutely no debris may be left on the site. Repair any damage to site as directed by the Owner's Representative, at no additional cost.

3.2 MAINTENANCE

- A. Maintenance shall begin immediately after each plant is planted and shall continue for a minimum 30-day Monitoring Period and until Final Acceptance.
- B. Maintenance shall consist of keeping the plants in a healthy growing condition and shall include but is not limited to watering, weeding, cultivating, pruning, re-mulching, tightening and repairing of guys, straightening of trees to a plumb position, removal of dead material, resetting plants to proper grades or upright position, and maintaining the planting saucer.

WINTER ISLAND TRAIL

1. Plants shall be inspected for watering needs at least twice each week and watered to promote plant growth and vitality. The following watering rates assume that the soil is free draining. If the on site conditions do not ensure a free draining soil, then notify the Owner's Representative in writing of this condition. Watering rates for trees, shrubs, ground cover, vines and perennials in free draining soils are presented here as guidelines to ensure that the top six inches of plant bed soil remains moist at all times. Actual watering rates may vary depending upon soil conditions. Guideline rates shall be as follows:

<u>Type of Plant/Size</u>	<u>Weekly Watering Rate</u>
Deciduous Trees:	
1 - 1-1/2 in. (25 - 40 mm) caliper	40 gallons (150 liters)
1-1/2 - 2 in. (40 - 50 mm) caliper	54 gallons (200 liters)
2 - 2-1/2 in. (50 - 60 mm) caliper	61 gallons (230 liters)
2-1/2 - 3 in. (60 - 80 mm) caliper	70 gallons (260 liters)
3 - 3-1/2 in. (80 - 90 mm) caliper	80 gallons (300 liters)
Shrubs	
Up to 2 ft. (0.6 meter) height	10 gallons (35 liters)
2 - 4 ft. (0.6 - 1.25 meter) height	20 gallons (75 liters)
4 - 6 ft. (1.25 - 1.80 meter) height	30 gallons (115 liters)

- a. Water shall be applied by 1 inch (25 m) diameter hose with an attached metering gauge.
 2. For trees in lawn or mulched beds, apply water to the ground surface directly under the canopy. Water shall be applied at a sufficiently slow rate to prevent run off from the soil surface but great enough to equal 0.2 inches of water per square foot (55 mm of water per square meter) of canopy area per hour for 5 hours per week.
 3. Stakes shall be kept plumb and neat in appearance. Guys, wires and anchoring cables shall be tightened and repaired weekly.
 4. Planting beds and individual plant pits shall be kept free of weeds, and mulch shall be replaced as required to maintain the specified layer of mulch. Beds and individual pits shall be neat in appearance and maintained to the designed layout.
 5. Plants that die during the maintenance period shall be removed and replaced by the Contractor within one week of notification and replaced during that growing season, unless directed otherwise by the Owner's Representative.
 6. Spraying of insecticides or herbicides shall be done by State-licensed professionals. Spraying for insects, pests and diseases shall conform to the National Arborist Association Standards under the section entitled "Standards for Pesticide Application Operations", as currently adopted and as approved by the Owner's Representative. All insecticides, pesticides, and herbicides shall be EPA-approved and shall conform to the requirements MCRG: Massachusetts Control Recommendation Guide for Insect, Disease, and Weed Pests of Shade Trees and Woody Ornamentals, latest edition, University of Massachusetts, Amherst, College of Food and Natural Resources.
 7. Work of pruning, fertilizing, spraying, and similar activities shall be undertaken only by Certified Arborists and licensed chemical applicators, as pertinent to the work being performed.
- C. During the maintenance period, any decline in the condition of plantings shall require the Contractor to take immediate action to identify potential problems and undertake corrective measures. If required, the Contractor shall engage professional arborists and/or horticulturalists to inspect plant materials and to identify problems and recommend corrective procedures. The Owner's Representative shall be immediately advised of such actions. Inspection and recommendation reports shall be submitted to the Owner's Representative.

3.3 ACCEPTANCE

- A. Upon completion of all planting work, the Contractor shall request in writing that the Owner's Representative formally inspect the planting work.
- B. If plant materials and workmanship are acceptable, the Owner's Representative will issue a written Certificate of Conditional Acceptance to the Contractor.
- C. Following the issuance of the Certificate of Conditional Acceptance to the Contractor, the Contractor shall maintain the plants for a minimum 30 day Monitoring Period. At the end of the Monitoring Period, the plant material will be inspected by the Owner's Representative to determine whether or not all planting work has been performed to the requirements of this Section, PLANTING.
- D. Acceptance Standards at end of the Monitoring Period: If plant material is reviewed when it is in full leaf, leaves shall be plump with water with a shape indicative of the species and shall be free of insect, pest and disease damage. Twigs shall have living cambium for their full length. Twigs and branches shall have a full bud set for their full length, including terminal buds. Trunks and branches shall be free of frost cracks; sun scald; damage due to insects, pests, and disease; structural defects; and damage resulting from machinery or tools. Plant material inspected and reviewed when the plants are not in full leaf shall have twigs, branches and trunks meeting the above requirements. All plants regardless of the season of review shall have a minimum of 75 percent healthy, balanced branching structure with a healthy terminal leader(s) with viable terminal bud(s).
- E. If any number of plants do not meet these Acceptance Standards at the time of inspection, or if in the Owner's Representative's opinion, workmanship is unacceptable, written notice will be given by the Owner's Representative to the Contractor in the form of a punch list, which itemizes necessary planting replacements and/or other deficiencies to be remedied. The Contractor's responsibility for maintenance of all plants shall be extended until replacements are made or other deficiencies are corrected. All plants that do not meet these Acceptance Standards shall be removed from the project within seven days of receipt of the punch list. Replacements shall conform in all respects to the Specifications for new plants and shall be planted in the same manner
- F. Following the correction of all Punch List deficiencies, the Contractor shall request in writing that the Owner's Representative formally inspect the planting work. If plant materials and workmanship are acceptable, the Owner's Representative will issue a written Certificate of Final Acceptance to the Contractor.

3.4 GUARANTEE

- A. The date of the Certificate of Final Acceptance shall establish the commencement of the required one-year guarantee and establishment period for planting work.
- B. At the end of the guarantee and establishment period, a final inspection will be held to determine whether any plant material replacements are required. Each plant shall be plumb, shall have a character that is natural for its species as determined by the Owner's Representative, and shall conform to the Acceptance Standards described in this Section, PLANTING. Plants found to be unacceptable shall be removed promptly from the site and replaced according to this Section, PLANTING. A final inspection will be made after the replacement plants have lived through one year.
- C. At the end of the one-year guarantee and establishment period, remove all tree stakes, guys, or anchors installed on trees during the course of the work of this contract.
- D. All replacements shall be plants of the same kind and size specified in the PLANT LIST. The cost shall be borne by the Contractor, except for possible replacements due to vandalism or neglect on the part of others.

**END OF SECTION 32 90 00
PLANTING**

PART 4. EVALUATION AND SELECTION

4.2 RULE FOR AWARD

Any contract that results from the procurement shall be awarded to the lowest responsible and eligible bidder, offering the lowest price on the "Bid Form."

PART 5. TERMS AND CONDITIONS

5.1 TERM OF CONTRACT

The performance period for any contract that results from this Invitation for Bids shall commence on or around March 1, 2016 to June 1, 2016.

5.2 ASSIGNMENTS AND SUBCONTRACTING

The selected vendor shall not assign, sell, subcontract or otherwise transfer any interest in this contract without the prior written consent of the City. The successful bidder shall be fully responsible to the City for the acts and omissions of his subcontractor, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

5.4 INSURANCE REQUIREMENTS

General- The Vendor shall before commencing performance of the Contract be responsible for providing and maintaining insurance coverage in force for the life of the Contract of the kind and in adequate amounts to secure all of the obligations under the Contract and with insurance companies licensed to write insurance in the Commonwealth of Massachusetts. All such insurance carried shall not be less than the kinds and amounts designated herein, and the Vendor agrees that the stipulation herein of the kinds and limits of coverage shall in no way limit the liability of the Vendor to any such kinds and amounts of insurance coverage. All policies issued shall indemnify and save harmless the City of Salem, its agents and employees from any and all claims for damages to persons or property as may rise out of the performance of this Contract.

Vendor's Comprehensive General Public Liability and Property Damage Liability Insurance - The Vendor shall carry Comprehensive General Liability Insurance providing for a limit of not less than Five Hundred Thousand Dollars (\$500,000.00) for all damages arising out of bodily injury to or death of one person, and subject to that limit for each person, a total limit of not less than One Million Dollars (\$1,000,000.00) for all damages arising out of bodily injuries or death of two or more persons in any one accident; and Vendor's Comprehensive Property Damage Liability Insurance providing for a limit of not less than Five Hundred Thousand Dollars (\$500,000.00) for all damages arising out of injury to or destruction of property in any one accident, and subject to that limit per accident, a total (or aggregate) limit or not less than One Million Dollars (\$1,000,000.00) for all damages arising out of injury to or destruction of property during the policy period.

Comprehensive Automotive and Property Damage Insurance - The Vendor shall carry Automobile Insurance covering all owned vehicles, hired vehicles or non-owned vehicles under the control of the Vendor while performing work under the Contract in the amount of not less than Five Hundred Thousand Dollars (\$500,000.00) for all damages arising out of bodily injuries to or death of one person and subject to that limit for each person, a total of not less than One Million Dollars (\$1,000,000.00) for all damages arising out of bodily injuries to or death of two or more persons in any one accident; and Property Damage coverage in the amount of not less than Five Hundred Thousand Dollars (\$500,000.00) for all damages to or destruction of property.

The Vendor must carry Workman's Compensation Insurance in the amounts prescribed under Massachusetts State Law and meet all other City and State Laws and Regulations.

No cancellation(s) of such insurance, whether by the insurer or by the insured party shall be valid unless written notice thereof is given by the parties proposing cancellation to the other party and to

the City of Salem at least fifteen (15) days prior to the intended effective date thereof, which date shall be expressed in said notice, which shall be sent by registered mail, return receipt requested. These provisions shall apply to the legal representative(s), trustee in bankruptcy, receiver, assignee, trustee, and successor(s) in interest of the Vendor.

All insurance coverage shall be at the sole expense of the Vendor and shall be placed with such company as may be acceptable to the City of Salem and shall constitute a material part of the contract documents.

Failure to provide written proof to City and continue in force such insurance as aforesaid shall be deemed a material breach of the contract, and may constitute sufficient grounds for immediate termination of the same.

5.5 CHANGE ORDERS AND ADJUSTMENTS

Any request for a change order or adjustment must be submitted in writing and contain, an explanation of the need for the change order, a statement of work including a cost breakdown of each addition, and a statement that the change order is in the best interest of the awarding authority. The City is not obligated to pay for change orders that are not approved in writing, by the original contract signatories. Three (3) copies of the change order shall be required.

5.6 INDEMNIFICATION

Unless otherwise provided by law, the Vendor will indemnify and hold harmless the City against any and all liability, loss, damages, costs or expenses for personal injury or damage to real or tangible personal property which the City may sustain, incur or be required to pay, arising out of or in connection with the performance of the Contract by reason of any negligent action/inaction or willful misconduct by the Contractor, its agents, servants or employees.

5.7 FEDERAL AND STATE LAW

The selected contractor shall comply with all applicable Federal, State and Local laws and ordinances.

5.8 STATEMENT OF WORK

Except as otherwise specifically stated in the bid and contract documents the selected contractor shall secure, at its own expense, all necessary permits and licenses and comply with all city and state codes and regulations. The selected contractor shall provide and pay for all materials, equipment, labor, tools, temporary construction of every nature, charges, levies, fees, or other expenses incurred and all other services and facilities of every nature whatsoever for his performance of the Contract within the specified time, and required for this project. The selected contractor must provide all materials and equipment free of any lien, claim or encumbrance.

5.9 SAMPLE CONTRACT

See 'Sample Contract' attached.

SAMPLE CONTRACT

CONTRACT NO. X-XX
SCCS Kitchen Plumbing
CITY OF SALEM
CONTRACT FOR SERVICES
Over \$10,000

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

ARTICLE I. DEFINITION.

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

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

ARTICLE II. AMOUNT AND DURATION.

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

ARTICLE III. PERFORMANCE.

The Contractor agrees to provide all goods and/or services set forth in Invitation for Bids, Documents, Scope of Services, and the CONTRACTOR’s bid _____ and/or as outlined in ATTACHMENT A - SCOPE OF SERVICES.

ARTICLE IV. TERMINATION.

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

For Cause. If the CONTRACTOR is determined by the CITY to be in default of any term or condition of CONTRACT, the CITY may terminate this contract on thirty (30) days notice by providing notice to the CONTRACTOR, which shall be in writing and shall be deemed delivered and received when given in person to the CONTRACTOR, or when received by fax, express mail, certified mail return receipt requested, regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the CONTRACTOR. If the CITY is determined by the CONTRACTOR to be in default of any term or condition of this CONTRACT the CONTRACTOR may terminate this contract on thirty (30) days notice by providing notice to the CITY, which shall be in writing and shall be deemed delivered and received when given in person to the CITY, or when received by fax, express mail, certified mail return receipt requested, regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the CITY.

Default. The following shall constitute events of default under this CONTRACT: a) any material misrepresentation made by the CONTRACTOR to the CITY, b) any failure to perform any of its obligations under this CONTRACT including, but not limited to the following: (i) failure to commence performance of this CONTRACT at the time specified in this CONTRACT due to a reason or circumstance within the CONTRACTOR’S reasonable control, (ii) failure to perform this CONTRACT with sufficient personnel and equipment or with sufficient material to ensure the completion of this CONTRACT within the specified time due to a reason or circumstance within the CONTRACTOR’S reasonable control, (iii) failure to performance this CONTRACT in a manner reasonably satisfactory

to the CITY, (iv) failure to promptly re-perform with reasonable time the services that were rejected by the CITY as unsatisfactory, or erroneous, (v) discontinuance of the services for reasons not beyond the CONTRACTOR'S reasonable control, (vi) failure to comply with a material term of this CONTRACT, including, but not limited to, the provision of insurance and nondiscrimination, and (vii) any other acts specifically and expressly stated in this CONTRACT as constituting a basis for termination of this CONTRACT, and (viii) failure to comply with any and all requirements of state law, and/or regulations, and City ordinances, and/or regulations.

ARTICLE V. REMEDIES OF THE CITY.

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

ARTICLE VI. REMEDIES OF THE CONTRACTOR.

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

ARTICLE VII. ASSIGNABILITY.

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

ARTICLE VIII. INDEMNIFICATION.

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

ARTICLE IX. WORKER'S COMPENSATION AND OTHER INSURANCE.

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

Failure to provide and continue in force such insurance during the period of this contract shall be deemed a material breach of this contract, shall operate as an immediate termination thereof, and CONTRACTOR shall indemnify the CITY for all losses, claims, and actions resulting from the failure to provide the insurance required by this Article. Prior to commencement of any work and until completion of its work under this CONTRACT shall maintain the following insurance coverage, at its cost, from insurance acceptable to the CITY, giving evidence of such coverage to the CITY prior to execution of this CONTRACT, a copy of such insurance coverage to be attached herewith:

General - The Vendor shall before commencing performance of the Contract be responsible for providing and maintaining insurance coverage in force for the life of the Contract of the kind and in adequate amounts to secure all of the obligations under the Contract and with insurance companies licensed to write insurance in the Commonwealth of Massachusetts. All such insurance carried shall not be less than the kinds and amounts designated herein, and the Vendor agrees that the stipulation herein of the kinds and limits of coverage shall in no way limit the liability of the Vendor to any such kinds and amounts of insurance coverage. All policies issued shall indemnify and save harmless the City of Salem, its agents and employees from any and all claims for damages to persons or property as may rise out of the performance of this Contract.

Vendor's Comprehensive General Public Liability and Property Damage Liability Insurance - The Vendor shall carry Comprehensive General Liability Insurance providing for a limit of not less than Five Hundred Thousand Dollars (\$500,000.00) for all damages arising out of bodily injury to or death of one person, and subject to that limit for each person, a total limit of not less than One Million Dollars (\$1,000,000.00) for all damages arising out of bodily injuries or death of two or more persons in any one accident; and Vendor's Comprehensive Property Damage Liability Insurance providing for a limit of not less than Five Hundred Thousand Dollars (\$500,000.00) for all damages arising out of injury to or destruction of property in any one accident, and subject to that limit per accident, a total (or aggregate) limit or not less than One Million Dollars (\$1,000,000.00) for all damages arising out of injury to or destruction of property during the policy period.

Comprehensive Automotive and Property Damage Insurance - The Vendor shall carry Automobile Insurance covering all owned vehicles, hired vehicles or non-owned vehicles under the control of the Vendor while performing work under the Contract in the amount of not less than Five Hundred Thousand Dollars (\$500,000.00) for all damages arising out of bodily injuries to or death of one person and subject to that limit for each person, a total of not less than One Million Dollars (\$1,000,000.00) for all damages arising out of bodily injuries to or death of two or more persons in any one accident; and Property Damage coverage in the amount of not less than Five Hundred Thousand Dollars (\$500,000.00) for all damages to or destruction of property.

The Vendor must carry Workman's Compensation Insurance in the amounts prescribed under Massachusetts State Law and meet all other City and State Laws and Regulations.

No cancellation(s) of such insurance, whether by the insurer or by the insured party shall be valid unless written notice thereof is given by the parties proposing cancellation to the other party and to the City of Salem at least fifteen (15) days prior to the intended effective date thereof, which date shall be expressed in said notice, which shall be sent by registered mail, return receipt requested. These provisions shall apply to the legal representative(s), trustee in bankruptcy, receiver, assignee, trustee, and successor(s) in interest of the Vendor.

All insurance coverage shall be at the sole expense of the Vendor and shall be placed with such company as may be acceptable to the City of Salem and shall constitute a material part of the contract documents.

Failure to provide written proof to City and continue in force such insurance as aforesaid shall be deemed a material breach of the contract, and may constitute sufficient grounds for immediate termination of the same.

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

ARTICLE X. CORPORATE CONTRACTOR.

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

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

ARTICLE XI. SUBJECT TO APPROPRIATION.

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

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

ARTICLE XII. DOCUMENTS, MATERIALS, ETC.

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

Any materials produced in whole or in part under this CONTRACT shall not be subject to copyright, except by the CITY, in the United States or any other country. The CITY shall have unrestricted authority to, without payment of any royalty, commission, or additional fee of any type or nature, publicly disclose, reproduce, distribute and otherwise use, and authorize other to use, in whole or in part, any reports, data or other materials prepared under this CONTRACT.

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

ARTICLE XIII. AUDIT, INSPECTION, RECORD KEEPING.

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

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

ARTICLE XIV. WEEKLY PAYROLL RECORDS REPORT.

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

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

ARTICLE XV. CONFLICT OF INTEREST.

CITY. No officer, member or employee of the CITY and no members of its governing body who exercise any function or responsibility in review or approval of the undertaking or carrying out of this CONTRACT shall participate in any decision relating to the CONTRACT which affects his/her personal interests or the interest of any corporation, partnership, or association in which he/she has a direct or indirect pecuniary interest. None of the services to be provided by the CONTRACTOR shall be used for any partisan political activity or further the election or defeat of any candidate for political office in the CITY. Compliance with this section shall be material to the CONTRACT.

CONTRACTOR. CONTRACTOR agrees that his/her/its agents, servants, and employees have neither presently nor during the period of this CONTRACT any interest direct or indirect which would impair, detract, or conflict in any manner or degree with the performance of services required under this CONTRACT. The CONTRACTOR, his/her/its agents, servants or employees further stipulates that in the performance of this CONTRACT, no person having any such interest shall be employed. Conflicts of Interest include but are not limited to (a) immediate family relationships with officials of the CITY, (b) instances where the CONTRACTOR, his/her/it agents, servants or employees during the period of this CONTRACT was connected as an officer, employee or member of the governing body of the CITY, and (c) instances where the CONTRACTOR has an interest in any CITY department, its agents, servants or employees or parcels of land within the CITY. Compliance with this section shall be material to the CONTRACT.

ARTICLE XVI. PAYMENT.

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

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

ARTICLE XVII. CONFLICT.

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

ARTICLE XVIII. WAIVER AND AMENDMENT.

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

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

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

ARTICLE XIX. CERTIFICATION.

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

TAXES. PURSUANT to M.G.L. c. 62C, s. 49A, the CONTRACTOR has filed all state tax returns and complied with all laws of the Commonwealth relating to taxes.

DEBARMENT. The CONTRACTOR is not currently debarred or suspended by the Commonwealth of Massachusetts, or any of its entities or subdivisions.

AMERICANS WITH DISABILITIES ACT. The CONTRACTOR is aware of the recently enacted Americans with Disabilities Act which prohibits discrimination based upon disability and shall meet any relevant standards, and/or conditions set out in the bid/proposal documents, bid/proposal specifications, and/or ATTACHMENT A - SCOPE OF SERVICES.

ARTICLE XX. FORUM AND CHOICE OF LAW

This CONTRACT and any performance herein shall be governed by and be construed in accordance with the laws of Commonwealth. Any and all proceedings or actions relating to subject matter herein shall be brought and maintained in the courts of the Commonwealth or the federal district court sitting in the Commonwealth, which shall have exclusive jurisdiction thereof. This paragraph shall not be construed to limit any other legal rights of the parties.

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

THE CITY:

THE CONTRACTOR:

Kimberley Driscoll,
Mayor

Authorized Signature

Print Name

Whitney Haskell,
Purchasing Agent

Approved as to form:

Elizabeth Rennard, Esq.,
City Solicitor

Approved as Contract Manager:

I certify that funds have been encumbered
in the amount of : \$

Sarah Stanton,
Finance Director

Print Title

Company

Status (Corporate/Non- Corporate)

Taxpayer Identification Number

Date

ATTACHMENT A

SCOPE OF SERVICES

INSTRUCTIONS FOR DEPARTMENT AND CONTRACTOR: Please attach for reference purposes a copy of all bid/proposal documents, including but not limited to (i) invitations/instructions for bidders (ii) invitation/instructions for proposers, (iii) general and specific conditions, and please provide a detailed description of all types of goods and/or services that will be provided pursuant to this CONTRACT, not otherwise provided in any bid/proposal instructions, specifications, conditions or other documents.

ATTACHMENT B

ADDITIONAL CONTRACT TERMS AND CONDITIONS

INSTRUCTIONS FOR DEPARTMENTS: *Please specify any additions or modifications to the terms and conditions (not to conflict with the public procurement laws or City ordinances or regulations):*

ATTACHMENT C

CERTIFICATE OF CORPORATE AUTHORITY

If the Contractor is a corporation, complete the following certification:

At a duly authorized meeting of the Board of Directors of the _____ (Name of the Corporation) held on _____ (Date), at which all the Directors were present or waived notice, it was voted that, _____ (Name), _____ (Officer) of this company, is authorized to execute Contracts and bonds in the name and behalf of said company, and affix its corporate seal thereto, and such execution of any Contract or obligation in this company's name on its behalf by such _____ (Officer) of the company, shall be valid and binding upon this company.

I hereby certify that I am the Clerk of the _____ (Name of the Corporation), that _____ (Name) is the duly elected _____ (Officer) of said company, and that the above vote has not been amended or rescinded and remains in full force and effect as of the date of the Contract.

A true copy,

Attest: _____
(Clerk)

Place of Business: _____

Corporate Seal:

PREVAILING WAGE RATES



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

Prevailing Wage Rates

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

RONALD L. WALKER, II
Secretary

WILLIAM D MCKINNEY
Director

CHARLES D. BAKER
Governor

KARYN E. POLITO
Lt. Governor

Awarding Authority: City of Salem
Contract Number: R-47 **City/Town:** SALEM
Description of Work: Construction of a scenic, multi-use trail at Winter Island Park
Job Location: Winter Island, Salem, MA 01970

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2015	\$31.65	\$10.41	\$10.08	\$0.00	\$52.14
	06/01/2016	\$32.15	\$10.41	\$10.08	\$0.00	\$52.64
	08/01/2016	\$32.15	\$10.91	\$10.08	\$0.00	\$53.14
	12/01/2016	\$32.15	\$10.91	\$10.89	\$0.00	\$53.95
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2015	\$31.72	\$10.41	\$10.08	\$0.00	\$52.21
	06/01/2016	\$32.22	\$10.41	\$10.08	\$0.00	\$52.71
	08/01/2016	\$32.22	\$10.91	\$10.08	\$0.00	\$53.21
	12/01/2016	\$32.22	\$10.91	\$10.89	\$0.00	\$54.02
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2015	\$31.84	\$10.41	\$10.08	\$0.00	\$52.33
	06/01/2016	\$32.34	\$10.41	\$10.08	\$0.00	\$52.83
	08/01/2016	\$32.34	\$10.91	\$10.08	\$0.00	\$53.33
	12/01/2016	\$32.34	\$10.91	\$10.89	\$0.00	\$54.14
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2015	\$88.29	\$9.80	\$19.23	\$0.00	\$117.32
AIR TRACK OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2015	\$31.90	\$7.45	\$12.65	\$0.00	\$52.00
	06/01/2016	\$32.40	\$7.45	\$12.65	\$0.00	\$52.50
	12/01/2016	\$33.15	\$7.45	\$12.65	\$0.00	\$53.25
For apprentice rates see "Apprentice- LABORER"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	12/01/2015	\$34.38	\$10.40	\$5.95	\$0.00	\$50.73
ASPHALT RAKER <i>LABORERS - ZONE 2</i>	12/01/2015	\$31.40	\$7.45	\$12.65	\$0.00	\$51.50
	06/01/2016	\$31.90	\$7.45	\$12.65	\$0.00	\$52.00
	12/01/2016	\$32.65	\$7.45	\$12.65	\$0.00	\$52.75
For apprentice rates see "Apprentice- LABORER"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.73	\$10.00	\$14.90	\$0.00	\$68.63
	06/01/2016	\$44.48	\$10.00	\$14.90	\$0.00	\$69.38
	12/01/2016	\$45.73	\$10.00	\$14.90	\$0.00	\$70.63
	06/01/2017	\$46.73	\$10.00	\$14.90	\$0.00	\$71.63
	12/01/2017	\$47.73	\$10.00	\$14.90	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.73	\$10.00	\$14.90	\$0.00	\$68.63
	06/01/2016	\$44.48	\$10.00	\$14.90	\$0.00	\$69.38
	12/01/2016	\$45.73	\$10.00	\$14.90	\$0.00	\$70.63
	06/01/2017	\$46.73	\$10.00	\$14.90	\$0.00	\$71.63
	12/01/2017	\$47.73	\$10.00	\$14.90	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 2</i>	12/01/2015	\$31.40	\$7.45	\$12.65	\$0.00	\$51.50
	06/01/2016	\$31.90	\$7.45	\$12.65	\$0.00	\$52.00
	12/01/2016	\$32.65	\$7.45	\$12.65	\$0.00	\$52.75
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 2</i>	12/01/2015	\$31.90	\$7.45	\$12.65	\$0.00	\$52.00
	06/01/2016	\$32.40	\$7.45	\$12.65	\$0.00	\$52.50
	12/01/2016	\$33.15	\$7.45	\$12.65	\$0.00	\$53.25
For apprentice rates see "Apprentice- LABORER"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2016	\$41.62	\$6.97	\$16.21	\$0.00	\$64.80
	01/01/2017	\$42.92	\$6.97	\$16.21	\$0.00	\$66.10

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - BOILERMAKER - Local 29

Effective Date - 01/01/2016

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

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$27.90	\$6.97	\$10.54	\$0.00	\$45.41
2	65	\$27.90	\$6.97	\$10.54	\$0.00	\$45.41
3	70	\$30.04	\$6.97	\$11.35	\$0.00	\$48.36
4	75	\$32.19	\$6.97	\$12.16	\$0.00	\$51.32
5	80	\$34.34	\$6.97	\$12.97	\$0.00	\$54.28
6	85	\$36.48	\$6.97	\$13.78	\$0.00	\$57.23
7	90	\$38.63	\$6.97	\$14.59	\$0.00	\$60.19
8	95	\$40.77	\$6.97	\$15.40	\$0.00	\$63.14

Notes:

Apprentice to Journeyworker Ratio:1:5

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)	02/01/2016	\$49.86	\$10.18	\$19.14	\$0.00	\$79.18
BRICKLAYERS LOCAL 3 (LYNN)	08/01/2016	\$50.76	\$10.18	\$19.22	\$0.00	\$80.16
	02/01/2017	\$51.33	\$10.18	\$19.22	\$0.00	\$80.73

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

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

Effective Date - 02/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.93	\$10.18	\$19.14	\$0.00	\$54.25
2	60	\$29.92	\$10.18	\$19.14	\$0.00	\$59.24
3	70	\$34.90	\$10.18	\$19.14	\$0.00	\$64.22
4	80	\$39.89	\$10.18	\$19.14	\$0.00	\$69.21
5	90	\$44.87	\$10.18	\$19.14	\$0.00	\$74.19

Effective Date - 08/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.38	\$10.18	\$19.22	\$0.00	\$54.78
2	60	\$30.46	\$10.18	\$19.22	\$0.00	\$59.86
3	70	\$35.53	\$10.18	\$19.22	\$0.00	\$64.93
4	80	\$40.61	\$10.18	\$19.22	\$0.00	\$70.01
5	90	\$45.68	\$10.18	\$19.22	\$0.00	\$75.08

Notes:

Apprentice to Journeyworker Ratio:1:5

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

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - CARPENTER - Zone 2 Eastern MA

Effective Date - 03/01/2015

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

Notes:

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING BRICKLAYERS LOCAL 3 (LYNN)	01/01/2016	\$46.44	\$10.90	\$18.71	\$1.30	\$77.35
---	------------	---------	---------	---------	--------	---------

Apprentice - CEMENT MASONRY/PLASTERING - Eastern Mass (Lynn)

Effective Date - 01/01/2016

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

Notes:

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

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR LABORERS - ZONE 2	12/01/2015	\$31.40	\$7.45	\$12.65	\$0.00	\$51.50
	06/01/2016	\$31.90	\$7.45	\$12.65	\$0.00	\$52.00
	12/01/2016	\$32.65	\$7.45	\$12.65	\$0.00	\$52.75

For apprentice rates see "Apprentice- LABORER"

CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES OPERATING ENGINEERS LOCAL 4	12/01/2015	\$44.73	\$10.00	\$14.90	\$0.00	\$69.63
	06/01/2016	\$45.48	\$10.00	\$14.90	\$0.00	\$70.38
	12/01/2016	\$46.73	\$10.00	\$14.90	\$0.00	\$71.63
	06/01/2017	\$47.73	\$10.00	\$14.90	\$0.00	\$72.63
	12/01/2017	\$48.73	\$10.00	\$14.90	\$0.00	\$73.63

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$30.13	\$10.00	\$14.90	\$0.00	\$55.03
	06/01/2016	\$30.65	\$10.00	\$14.90	\$0.00	\$55.55
	12/01/2016	\$31.52	\$10.00	\$14.90	\$0.00	\$56.42
	06/01/2017	\$32.21	\$10.00	\$14.90	\$0.00	\$57.11
	12/01/2017	\$32.90	\$10.00	\$14.90	\$0.00	\$57.80

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

DELEADER (BRIDGE) <i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2016	\$49.51	\$7.85	\$16.10	\$0.00	\$73.46
	07/01/2016	\$50.46	\$7.85	\$16.10	\$0.00	\$74.41
	01/01/2017	\$51.41	\$7.85	\$16.10	\$0.00	\$75.36

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2016

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

Effective Date - 07/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.23	\$7.85	\$0.00	\$0.00	\$33.08
2	55	\$27.75	\$7.85	\$3.66	\$0.00	\$39.26
3	60	\$30.28	\$7.85	\$3.99	\$0.00	\$42.12
4	65	\$32.80	\$7.85	\$4.32	\$0.00	\$44.97
5	70	\$35.32	\$7.85	\$14.11	\$0.00	\$57.28
6	75	\$37.85	\$7.85	\$14.44	\$0.00	\$60.14
7	80	\$40.37	\$7.85	\$14.77	\$0.00	\$62.99
8	90	\$45.41	\$7.85	\$15.44	\$0.00	\$68.70

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN <i>LABORERS - ZONE 2</i>	12/01/2015	\$35.50	\$7.45	\$13.55	\$0.00	\$56.50
---	------------	---------	--------	---------	--------	---------

For apprentice rates see "Apprentice- LABORER"

DEMO: BACKHOE/LOADER/HAMMER OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2015	\$36.50	\$7.45	\$13.55	\$0.00	\$57.50
--	------------	---------	--------	---------	--------	---------

For apprentice rates see "Apprentice- LABORER"

DEMO: BURNERS <i>LABORERS - ZONE 2</i>	12/01/2015	\$36.25	\$7.45	\$13.55	\$0.00	\$57.25
---	------------	---------	--------	---------	--------	---------

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: CONCRETE CUTTER/SAWYER <i>LABORERS - ZONE 2</i>	12/01/2015	\$36.50	\$7.45	\$13.55	\$0.00	\$57.50
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2015	\$36.25	\$7.45	\$13.55	\$0.00	\$57.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER <i>LABORERS - ZONE 2</i>	12/01/2015	\$35.50	\$7.45	\$13.55	\$0.00	\$56.50
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
	12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2015	\$58.86	\$9.80	\$19.23	\$0.00	\$87.89
DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2015	\$42.04	\$9.80	\$19.23	\$0.00	\$71.07
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2015	\$63.06	\$9.80	\$19.23	\$0.00	\$92.09
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2015	\$88.23	\$9.80	\$19.23	\$0.00	\$117.26
DRAWBRIDGE OPERATOR (Construction) <i>ELECTRICIANS LOCAL 103</i>	09/01/2015	\$45.67	\$13.00	\$15.89	\$0.00	\$74.56
	03/01/2016	\$46.17	\$13.00	\$16.39	\$0.00	\$75.56
For apprentice rates see "Apprentice- ELECTRICIAN"						
ELECTRICIAN <i>ELECTRICIANS LOCAL 103</i>	09/01/2015	\$45.67	\$13.00	\$15.89	\$0.00	\$74.56
	03/01/2016	\$46.17	\$13.00	\$16.39	\$0.00	\$75.56

Apprentice - ELECTRICIAN - Local 103

Effective Date - 09/01/2015

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

Effective Date - 03/01/2016

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

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

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR	01/01/2016	\$54.53	\$14.43	\$14.96	\$0.00	\$83.92
ELEVATOR CONSTRUCTORS LOCAL 4	01/01/2017	\$55.86	\$15.28	\$15.71	\$0.00	\$86.85

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ELEVATOR CONSTRUCTOR - Local 4

Effective Date - 01/01/2016

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

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.93	\$15.28	\$0.00	\$0.00	\$43.21
2	55	\$30.72	\$15.28	\$15.71	\$0.00	\$61.71
3	65	\$36.31	\$15.28	\$15.71	\$0.00	\$67.30
4	70	\$39.10	\$15.28	\$15.71	\$0.00	\$70.09
5	80	\$44.69	\$15.28	\$15.71	\$0.00	\$75.68

Notes:

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

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER <i>ELEVATOR CONSTRUCTORS LOCAL 4</i>	01/01/2016	\$38.17	\$14.43	\$14.96	\$0.00	\$67.56
	01/01/2017	\$39.10	\$15.28	\$15.71	\$0.00	\$70.09

For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"

FENCE & GUARD RAIL ERECTOR <i>LABORERS - ZONE 2</i>	12/01/2015	\$31.40	\$7.45	\$12.65	\$0.00	\$51.50
	06/01/2016	\$31.90	\$7.45	\$12.65	\$0.00	\$52.00
	12/01/2016	\$32.65	\$7.45	\$12.65	\$0.00	\$52.75

For apprentice rates see "Apprentice- LABORER"

FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2015	\$40.49	\$10.00	\$14.55	\$0.00	\$65.04
	05/01/2016	\$41.38	\$10.00	\$14.55	\$0.00	\$65.93
	11/01/2016	\$41.97	\$10.00	\$14.55	\$0.00	\$66.52
	05/01/2017	\$42.85	\$10.00	\$14.55	\$0.00	\$67.40
	11/01/2017	\$43.58	\$10.00	\$14.55	\$0.00	\$68.13
	05/01/2018	\$44.29	\$10.00	\$14.55	\$0.00	\$68.84

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2015	\$41.93	\$10.00	\$14.55	\$0.00	\$66.48
	05/01/2016	\$42.82	\$10.00	\$14.55	\$0.00	\$67.37
	11/01/2016	\$43.42	\$10.00	\$14.55	\$0.00	\$67.97
	05/01/2017	\$44.31	\$10.00	\$14.55	\$0.00	\$68.86
	11/01/2017	\$45.04	\$10.00	\$14.55	\$0.00	\$69.59
	05/01/2018	\$45.76	\$10.00	\$14.55	\$0.00	\$70.31

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2015	\$21.71	\$10.00	\$14.55	\$0.00	\$46.26
	05/01/2016	\$22.23	\$10.00	\$14.55	\$0.00	\$46.78
	11/01/2016	\$22.58	\$10.00	\$14.55	\$0.00	\$47.13
	05/01/2017	\$23.11	\$10.00	\$14.55	\$0.00	\$47.66
	11/01/2017	\$23.53	\$10.00	\$14.55	\$0.00	\$48.08
	05/01/2018	\$23.96	\$10.00	\$14.55	\$0.00	\$48.51
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 103</i>	09/01/2015	\$45.67	\$13.00	\$15.89	\$0.00	\$74.56
	03/01/2016	\$46.17	\$13.00	\$16.39	\$0.00	\$75.56
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS LOCAL 103</i>	09/01/2015	\$34.25	\$13.00	\$14.06	\$0.00	\$61.31
	03/01/2016	\$34.63	\$13.00	\$14.55	\$0.00	\$62.18
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$36.34	\$10.00	\$14.90	\$0.00	\$61.24
	06/01/2016	\$36.96	\$10.00	\$14.90	\$0.00	\$61.86
	12/01/2016	\$38.00	\$10.00	\$14.90	\$0.00	\$62.90
	06/01/2017	\$38.84	\$10.00	\$14.90	\$0.00	\$63.74
	12/01/2017	\$39.67	\$10.00	\$14.90	\$0.00	\$64.57
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER <i>LABORERS - ZONE 2</i>	12/01/2015	\$20.50	\$7.45	\$12.65	\$0.00	\$40.60
	06/01/2016	\$20.50	\$7.45	\$12.65	\$0.00	\$40.60
	12/01/2016	\$20.50	\$7.45	\$12.65	\$0.00	\$40.60
For apprentice rates see "Apprentice- LABORER"						
FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE 1</i>	09/01/2015	\$41.59	\$9.80	\$17.53	\$0.00	\$68.92

Apprentice - FLOORCOVERER - Local 2168 Zone 1

Effective Date - 09/01/2015

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

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

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

Apprentice - GLAZIER - Local 35 Zone 2

Effective Date - 01/01/2016

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

Effective Date - 07/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.98	\$7.85	\$0.00	\$0.00	\$27.83
2	55	\$21.98	\$7.85	\$3.66	\$0.00	\$33.49
3	60	\$23.98	\$7.85	\$3.99	\$0.00	\$35.82
4	65	\$25.97	\$7.85	\$4.32	\$0.00	\$38.14
5	70	\$27.97	\$7.85	\$14.11	\$0.00	\$49.93
6	75	\$29.97	\$7.85	\$14.44	\$0.00	\$52.26
7	80	\$31.97	\$7.85	\$14.77	\$0.00	\$54.59
8	90	\$35.96	\$7.85	\$15.44	\$0.00	\$59.25

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

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

Apprentice - OPERATING ENGINEERS - Local 4

Effective Date - 12/01/2015

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

Effective Date - 06/01/2016

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

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2016	\$43.31	\$10.70	\$21.95	\$2.28	\$78.24
	08/01/2016	\$44.46	\$10.70	\$21.95	\$2.28	\$79.39
	02/01/2017	\$45.56	\$10.70	\$21.95	\$2.28	\$80.49
	08/01/2017	\$46.66	\$10.70	\$21.95	\$2.28	\$81.59
	02/01/2018	\$47.81	\$10.70	\$21.95	\$2.28	\$82.74

For apprentice rates see "Apprentice- SHEET METAL WORKER"

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

For apprentice rates see "Apprentice- ELECTRICIAN"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2016	\$43.31	\$10.70	\$21.95	\$2.28	\$78.24
	08/01/2016	\$44.46	\$10.70	\$21.95	\$2.28	\$79.39
	02/01/2017	\$45.56	\$10.70	\$21.95	\$2.28	\$80.49
	08/01/2017	\$46.66	\$10.70	\$21.95	\$2.28	\$81.59
	02/01/2018	\$47.81	\$10.70	\$21.95	\$2.28	\$82.74
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) <i>PIPEFITTERS LOCAL 537 (Local 138)</i>	09/01/2015	\$47.36	\$9.70	\$14.89	\$0.00	\$71.95
	03/01/2016	\$48.36	\$9.70	\$14.89	\$0.00	\$72.95
	09/01/2016	\$49.36	\$9.70	\$14.89	\$0.00	\$73.95
	03/01/2017	\$50.36	\$9.70	\$14.89	\$0.00	\$74.95
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PIPEFITTERS LOCAL 537 (Local 138)</i>	09/01/2015	\$47.36	\$9.70	\$14.89	\$0.00	\$71.95
	03/01/2016	\$48.36	\$9.70	\$14.89	\$0.00	\$72.95
	09/01/2016	\$49.36	\$9.70	\$14.89	\$0.00	\$73.95
	03/01/2017	\$50.36	\$9.70	\$14.89	\$0.00	\$74.95
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS <i>LABORERS - ZONE 2</i>	12/01/2015	\$31.90	\$7.45	\$12.65	\$0.00	\$52.00
	06/01/2016	\$32.40	\$7.45	\$12.65	\$0.00	\$52.50
	12/01/2016	\$33.15	\$7.45	\$12.65	\$0.00	\$53.25
For apprentice rates see "Apprentice- LABORER"						
INSULATOR (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	09/01/2015	\$43.81	\$11.50	\$13.80	\$0.00	\$69.11
	09/01/2016	\$45.81	\$11.50	\$13.80	\$0.00	\$71.11
	09/01/2017	\$47.81	\$11.50	\$13.80	\$0.00	\$73.11
	09/01/2018	\$50.06	\$11.50	\$13.80	\$0.00	\$75.36
	09/01/2019	\$52.56	\$11.50	\$13.80	\$0.00	\$77.86

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

Effective Date - 09/01/2015

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

Effective Date - 09/01/2016

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

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

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

Apprentice - IRONWORKER - Local 7 Boston

Effective Date - 09/16/2015

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

Effective Date - 03/16/2016

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

Notes:

** Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:**

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

For apprentice rates see "Apprentice- LABORER"

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

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - LABORER - Zone 2

Effective Date - 12/01/2015

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

Effective Date - 06/01/2016

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

Notes:

Apprentice to Journeyworker Ratio:1:5

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

For apprentice rates see "Apprentice- LABORER"

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

For apprentice rates see "Apprentice- LABORER"

LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER LABORERS - ZONE 2	12/01/2015	\$31.35	\$7.45	\$12.60	\$0.00	\$51.40
--	------------	---------	--------	---------	--------	---------

For apprentice rates see "Apprentice- LABORER"

LABORER: MASON TENDER LABORERS - ZONE 2	12/01/2015	\$31.40	\$7.45	\$12.65	\$0.00	\$51.50
	06/01/2016	\$31.90	\$7.45	\$12.65	\$0.00	\$52.00
	12/01/2016	\$32.65	\$7.45	\$12.65	\$0.00	\$52.75

For apprentice rates see "Apprentice- LABORER"

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

For apprentice rates see "Apprentice- LABORER"

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

This classification applies to all tree work associated with the removal of standing trees, and trimming and removal of branches and limbs when the work is not done for a utility company for the purpose of operation, maintenance or repair of utility company equipment. For apprentice rates see "Apprentice- LABORER"

LASER BEAM OPERATOR LABORERS - ZONE 2	12/01/2015	\$31.40	\$7.45	\$12.65	\$0.00	\$51.50
	06/01/2016	\$31.90	\$7.45	\$12.65	\$0.00	\$52.00
	12/01/2016	\$32.65	\$7.45	\$12.65	\$0.00	\$52.75

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2016	\$38.08	\$10.18	\$17.70	\$0.00	\$65.96
	08/01/2016	\$38.78	\$10.18	\$17.78	\$0.00	\$66.74
	02/01/2017	\$39.24	\$10.18	\$17.78	\$0.00	\$67.20

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

Effective Date - 02/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.04	\$10.18	\$17.70	\$0.00	\$46.92
2	60	\$22.85	\$10.18	\$17.70	\$0.00	\$50.73
3	70	\$26.66	\$10.18	\$17.70	\$0.00	\$54.54
4	80	\$30.46	\$10.18	\$17.70	\$0.00	\$58.34
5	90	\$34.27	\$10.18	\$17.70	\$0.00	\$62.15

Effective Date - 08/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.39	\$10.18	\$17.78	\$0.00	\$47.35
2	60	\$23.27	\$10.18	\$17.78	\$0.00	\$51.23
3	70	\$27.15	\$10.18	\$17.78	\$0.00	\$55.11
4	80	\$31.02	\$10.18	\$17.78	\$0.00	\$58.98
5	90	\$34.90	\$10.18	\$17.78	\$0.00	\$62.86

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS, TILELAYERS & TERRAZZO MECH <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2016	\$49.90	\$10.18	\$19.14	\$0.00	\$79.22
	08/01/2016	\$50.80	\$10.18	\$19.22	\$0.00	\$80.20
	02/01/2017	\$51.37	\$10.18	\$19.22	\$0.00	\$80.77

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile

Effective Date - 02/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.95	\$10.18	\$19.14	\$0.00	\$54.27
2	60	\$29.94	\$10.18	\$19.14	\$0.00	\$59.26
3	70	\$34.93	\$10.18	\$19.14	\$0.00	\$64.25
4	80	\$39.92	\$10.18	\$19.14	\$0.00	\$69.24
5	90	\$44.91	\$10.18	\$19.14	\$0.00	\$74.23

Effective Date - 08/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.40	\$10.18	\$19.22	\$0.00	\$54.80
2	60	\$30.48	\$10.18	\$19.22	\$0.00	\$59.88
3	70	\$35.56	\$10.18	\$19.22	\$0.00	\$64.96
4	80	\$40.64	\$10.18	\$19.22	\$0.00	\$70.04
5	90	\$45.72	\$10.18	\$19.22	\$0.00	\$75.12

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
	12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MECHANICS MAINTENANCE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
	12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MILLWRIGHT (Zone 1) <i>MILLWRIGHTS LOCAL 1121 - Zone 1</i>	04/01/2015	\$37.64	\$9.80	\$16.21	\$0.00	\$63.65
---	------------	---------	--------	---------	--------	---------

Apprentice - MILLWRIGHT - Local 1121 Zone 1

Effective Date - 04/01/2015

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

Notes:

Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

MORTAR MIXER	12/01/2015	\$31.40	\$7.45	\$12.65	\$0.00	\$51.50
<i>LABORERS - ZONE 2</i>	06/01/2016	\$31.90	\$7.45	\$12.65	\$0.00	\$52.00
	12/01/2016	\$32.65	\$7.45	\$12.65	\$0.00	\$52.75

For apprentice rates see "Apprentice- LABORER"

OILER (OTHER THAN TRUCK CRANES,GRADALLS)	12/01/2015	\$22.27	\$10.00	\$14.90	\$0.00	\$47.17
<i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$22.66	\$10.00	\$14.90	\$0.00	\$47.56
	12/01/2016	\$23.31	\$10.00	\$14.90	\$0.00	\$48.21
	06/01/2017	\$23.82	\$10.00	\$14.90	\$0.00	\$48.72
	12/01/2017	\$24.34	\$10.00	\$14.90	\$0.00	\$49.24

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OILER (TRUCK CRANES, GRADALLS)	12/01/2015	\$26.08	\$10.00	\$14.90	\$0.00	\$50.98
<i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$26.54	\$10.00	\$14.90	\$0.00	\$51.44
	12/01/2016	\$27.29	\$10.00	\$14.90	\$0.00	\$52.19
	06/01/2017	\$27.89	\$10.00	\$14.90	\$0.00	\$52.79
	12/01/2017	\$28.50	\$10.00	\$14.90	\$0.00	\$53.40

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OTHER POWER DRIVEN EQUIPMENT - CLASS II	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
<i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
	12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

PAINTER (BRIDGES/TANKS)	01/01/2016	\$49.51	\$7.85	\$16.10	\$0.00	\$73.46
<i>PAINTERS LOCAL 35 - ZONE 2</i>	07/01/2016	\$50.46	\$7.85	\$16.10	\$0.00	\$74.41
	01/01/2017	\$51.41	\$7.85	\$16.10	\$0.00	\$75.36

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2016

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

Effective Date - 07/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.23	\$7.85	\$0.00	\$0.00	\$33.08
2	55	\$27.75	\$7.85	\$3.66	\$0.00	\$39.26
3	60	\$30.28	\$7.85	\$3.99	\$0.00	\$42.12
4	65	\$32.80	\$7.85	\$4.32	\$0.00	\$44.97
5	70	\$35.32	\$7.85	\$14.11	\$0.00	\$57.28
6	75	\$37.85	\$7.85	\$14.44	\$0.00	\$60.14
7	80	\$40.37	\$7.85	\$14.77	\$0.00	\$62.99
8	90	\$45.41	\$7.85	\$15.44	\$0.00	\$68.70

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2016	\$40.41	\$7.85	\$16.10	\$0.00	\$64.36
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2	07/01/2016	\$41.36	\$7.85	\$16.10	\$0.00	\$65.31
	01/01/2017	\$42.31	\$7.85	\$16.10	\$0.00	\$66.26

Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New

Effective Date - 01/01/2016

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

Effective Date - 07/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.68	\$7.85	\$0.00	\$0.00	\$28.53
2	55	\$22.75	\$7.85	\$3.66	\$0.00	\$34.26
3	60	\$24.82	\$7.85	\$3.99	\$0.00	\$36.66
4	65	\$26.88	\$7.85	\$4.32	\$0.00	\$39.05
5	70	\$28.95	\$7.85	\$14.11	\$0.00	\$50.91
6	75	\$31.02	\$7.85	\$14.44	\$0.00	\$53.31
7	80	\$33.09	\$7.85	\$14.77	\$0.00	\$55.71
8	90	\$37.22	\$7.85	\$15.44	\$0.00	\$60.51

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

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

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint

Effective Date - 01/01/2016

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

Effective Date - 07/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.71	\$7.85	\$0.00	\$0.00	\$27.56
2	55	\$21.68	\$7.85	\$3.66	\$0.00	\$33.19
3	60	\$23.65	\$7.85	\$3.99	\$0.00	\$35.49
4	65	\$25.62	\$7.85	\$4.32	\$0.00	\$37.79
5	70	\$27.59	\$7.85	\$14.11	\$0.00	\$49.55
6	75	\$29.57	\$7.85	\$14.44	\$0.00	\$51.86
7	80	\$31.54	\$7.85	\$14.77	\$0.00	\$54.16
8	90	\$35.48	\$7.85	\$15.44	\$0.00	\$58.77

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

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

For Apprentice rates see "Apprentice- LABORER"

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

Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW

Effective Date - 01/01/2016

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

Effective Date - 07/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.98	\$7.85	\$0.00	\$0.00	\$27.83
2	55	\$21.98	\$7.85	\$3.66	\$0.00	\$33.49
3	60	\$23.98	\$7.85	\$3.99	\$0.00	\$35.82
4	65	\$25.97	\$7.85	\$4.32	\$0.00	\$38.14
5	70	\$27.97	\$7.85	\$14.11	\$0.00	\$49.93
6	75	\$29.97	\$7.85	\$14.44	\$0.00	\$52.26
7	80	\$31.97	\$7.85	\$14.77	\$0.00	\$54.59
8	90	\$35.96	\$7.85	\$15.44	\$0.00	\$59.25

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT)	01/01/2016	\$37.07	\$7.85	\$16.10	\$0.00	\$61.02
PAINTERS LOCAL 35 - ZONE 2	07/01/2016	\$38.02	\$7.85	\$16.10	\$0.00	\$61.97
	01/01/2017	\$38.97	\$7.85	\$16.10	\$0.00	\$62.92

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT

Effective Date - 01/01/2016

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

Effective Date - 07/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.01	\$7.85	\$0.00	\$0.00	\$26.86
2	55	\$20.91	\$7.85	\$3.66	\$0.00	\$32.42
3	60	\$22.81	\$7.85	\$3.99	\$0.00	\$34.65
4	65	\$24.71	\$7.85	\$4.32	\$0.00	\$36.88
5	70	\$26.61	\$7.85	\$14.11	\$0.00	\$48.57
6	75	\$28.52	\$7.85	\$14.44	\$0.00	\$50.81
7	80	\$30.42	\$7.85	\$14.77	\$0.00	\$53.04
8	90	\$34.22	\$7.85	\$15.44	\$0.00	\$57.51

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

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

Apprentice - PILE DRIVER - Local 56 Zone 1

Effective Date - 08/01/2015

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

Notes:

Apprentice to Journeyworker Ratio:1:3

PIPEFITTER & STEAMFITTER	09/01/2015	\$47.36	\$9.70	\$14.89	\$0.00	\$71.95
PIPEFITTERS LOCAL 537 (Local 138)	03/01/2016	\$48.36	\$9.70	\$14.89	\$0.00	\$72.95
	09/01/2016	\$49.36	\$9.70	\$14.89	\$0.00	\$73.95
	03/01/2017	\$50.36	\$9.70	\$14.89	\$0.00	\$74.95

Apprentice - PIPEFITTER Local 537 (Local 138)

Effective Date - 09/01/2015

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

Effective Date - 03/01/2016

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

Notes:

** 1:3; 3:15; 1:10 thereafter / Steps are 1 yr.
Refrig/AC Mechanic **1:1;1:2;2:4;3:6;4:8;5:10;6:12;7:14;8:17;9:20;10:23(Max)

Apprentice to Journeyworker Ratio:**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIPELAYER <i>LABORERS - ZONE 2</i>	12/01/2015	\$31.40	\$7.45	\$12.65	\$0.00	\$51.50
	06/01/2016	\$31.90	\$7.45	\$12.65	\$0.00	\$52.00
	12/01/2016	\$32.65	\$7.45	\$12.65	\$0.00	\$52.75
For apprentice rates see "Apprentice- LABORER"						
PLUMBER <i>PLUMBERS & GASFITTERS LOCAL 12 (Local 138)</i>	09/01/2015	\$46.38	\$10.82	\$15.14	\$0.00	\$72.34
	03/01/2016	\$47.53	\$10.82	\$15.14	\$0.00	\$73.49
	09/01/2016	\$48.58	\$10.82	\$15.14	\$0.00	\$74.54
	03/01/2017	\$49.58	\$10.82	\$15.14	\$0.00	\$75.54

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

Effective Date - 09/01/2015

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

Effective Date - 03/01/2016

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

Notes:

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

Apprentice to Journeyworker Ratio:1:5

PNEUMATIC CONTROLS (TEMP.) <i>PIPEFITTERS LOCAL 537 (Local 138)</i>	09/01/2015	\$47.36	\$9.70	\$14.89	\$0.00	\$71.95
	03/01/2016	\$48.36	\$9.70	\$14.89	\$0.00	\$72.95
	09/01/2016	\$49.36	\$9.70	\$14.89	\$0.00	\$73.95
	03/01/2017	\$50.36	\$9.70	\$14.89	\$0.00	\$74.95

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

PNEUMATIC DRILL/TOOL OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2015	\$31.40	\$7.45	\$12.65	\$0.00	\$51.50
	06/01/2016	\$31.90	\$7.45	\$12.65	\$0.00	\$52.00
	12/01/2016	\$32.65	\$7.45	\$12.65	\$0.00	\$52.75

For apprentice rates see "Apprentice- LABORER"

POWDERMAN & BLASTER <i>LABORERS - ZONE 2</i>	12/01/2015	\$32.15	\$7.45	\$12.65	\$0.00	\$52.25
	06/01/2016	\$32.65	\$7.45	\$12.65	\$0.00	\$52.75
	12/01/2016	\$33.40	\$7.45	\$12.65	\$0.00	\$53.50

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.73	\$10.00	\$14.90	\$0.00	\$68.63
	06/01/2016	\$44.48	\$10.00	\$14.90	\$0.00	\$69.38
	12/01/2016	\$45.73	\$10.00	\$14.90	\$0.00	\$70.63
	06/01/2017	\$46.73	\$10.00	\$14.90	\$0.00	\$71.63
	12/01/2017	\$47.73	\$10.00	\$14.90	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.73	\$10.00	\$14.90	\$0.00	\$68.63
	06/01/2016	\$44.48	\$10.00	\$14.90	\$0.00	\$69.38
	12/01/2016	\$45.73	\$10.00	\$14.90	\$0.00	\$70.63
	06/01/2017	\$46.73	\$10.00	\$14.90	\$0.00	\$71.63
	12/01/2017	\$47.73	\$10.00	\$14.90	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$30.13	\$10.00	\$14.90	\$0.00	\$55.03
	06/01/2016	\$30.65	\$10.00	\$14.90	\$0.00	\$55.55
	12/01/2016	\$31.52	\$10.00	\$14.90	\$0.00	\$56.42
	06/01/2017	\$32.21	\$10.00	\$14.90	\$0.00	\$57.11
	12/01/2017	\$32.90	\$10.00	\$14.90	\$0.00	\$57.80
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS LOCAL 42</i>	11/01/2015	\$22.78	\$8.49	\$9.89	\$0.00	\$41.16
	04/30/2016	\$22.78	\$8.49	\$10.25	\$0.00	\$41.52
	05/01/2016	\$24.15	\$8.49	\$10.68	\$0.00	\$43.32
	04/30/2017	\$24.15	\$8.49	\$11.07	\$0.00	\$43.71
	05/01/2017	\$24.21	\$8.49	\$11.54	\$0.00	\$44.24
	04/30/2018	\$24.21	\$8.49	\$11.96	\$0.00	\$44.66
	05/01/2018	\$24.24	\$8.49	\$12.46	\$0.00	\$45.19
	04/30/2019	\$24.24	\$8.49	\$12.92	\$0.00	\$45.65
RECLAIMERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
	12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RESIDENTIAL WOOD FRAME (All Other Work) <i>CARPENTERS -ZONE 2 (Residential Wood)</i>	04/01/2011	\$24.24	\$8.67	\$15.51	\$0.00	\$48.42
RESIDENTIAL WOOD FRAME CARPENTER **	05/01/2011	\$24.24	\$6.34	\$6.23	\$0.00	\$36.81

** 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. *CARPENTERS -ZONE 2 (Residential Wood)*

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

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - CARPENTER (Residential Wood Frame) - Zone 2

Effective Date - 05/01/2011

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

Notes:

Apprentice to Journeyworker Ratio:1:5

RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2015	\$31.40	\$7.45	\$12.65	\$0.00	\$51.50
	06/01/2016	\$31.90	\$7.45	\$12.65	\$0.00	\$52.00
	12/01/2016	\$32.65	\$7.45	\$12.65	\$0.00	\$52.75

For apprentice rates see "Apprentice- LABORER"

ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
	12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

ROOFER (Inc.Roofing Waterproofing &Roofing Damproofing) <i>ROOFERS LOCAL 33</i>	02/01/2016	\$40.11	\$11.00	\$12.90	\$0.00	\$64.01
--	------------	---------	---------	---------	--------	---------

Apprentice - ROOFER - Local 33

Effective Date - 02/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.06	\$11.00	\$3.39	\$0.00	\$34.45
2	60	\$24.07	\$11.00	\$12.90	\$0.00	\$47.97
3	65	\$26.07	\$11.00	\$12.90	\$0.00	\$49.97
4	75	\$30.08	\$11.00	\$12.90	\$0.00	\$53.98
5	85	\$34.09	\$11.00	\$12.90	\$0.00	\$57.99

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

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE <i>ROOFERS LOCAL 33</i>	02/01/2016	\$40.36	\$11.00	\$12.90	\$0.00	\$64.26
---	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- ROOFER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SHEETMETAL WORKER SHEETMETAL WORKERS LOCAL 17 - A	02/01/2016	\$43.31	\$10.70	\$21.95	\$2.28	\$78.24
	08/01/2016	\$44.46	\$10.70	\$21.95	\$2.28	\$79.39
	02/01/2017	\$45.56	\$10.70	\$21.95	\$2.28	\$80.49
	08/01/2017	\$46.66	\$10.70	\$21.95	\$2.28	\$81.59
	02/01/2018	\$47.81	\$10.70	\$21.95	\$2.28	\$82.74

Apprentice - SHEET METAL WORKER - Local 17-A

Effective Date - 02/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.32	\$10.70	\$4.90	\$0.00	\$32.92
2	40	\$17.32	\$10.70	\$4.90	\$0.00	\$32.92
3	45	\$19.49	\$10.70	\$9.79	\$1.20	\$41.18
4	45	\$19.49	\$10.70	\$9.79	\$1.20	\$41.18
5	50	\$21.66	\$10.70	\$10.65	\$1.29	\$44.30
6	50	\$21.66	\$10.70	\$10.90	\$1.30	\$44.56
7	60	\$25.99	\$10.70	\$12.37	\$1.47	\$50.53
8	65	\$28.15	\$10.70	\$13.24	\$1.56	\$53.65
9	75	\$32.48	\$10.70	\$14.97	\$1.74	\$59.89
10	85	\$36.81	\$10.70	\$16.18	\$1.91	\$65.60

Effective Date - 08/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.78	\$10.70	\$4.90	\$0.00	\$33.38
2	40	\$17.78	\$10.70	\$4.90	\$0.00	\$33.38
3	45	\$20.01	\$10.70	\$9.79	\$1.22	\$41.72
4	45	\$20.01	\$10.70	\$9.79	\$1.22	\$41.72
5	50	\$22.23	\$10.70	\$10.65	\$1.31	\$44.89
6	50	\$22.23	\$10.70	\$10.90	\$1.31	\$45.14
7	60	\$26.68	\$10.70	\$12.37	\$1.49	\$51.24
8	65	\$28.90	\$10.70	\$13.24	\$1.59	\$54.43
9	75	\$33.35	\$10.70	\$14.97	\$1.77	\$60.79
10	85	\$37.79	\$10.70	\$16.18	\$1.94	\$66.61

Notes:

Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SIGN ERECTOR PAINTERS LOCAL 35 - ZONE 2	06/01/2013	\$25.81	\$7.07	\$7.05	\$0.00	\$39.93
--	------------	---------	--------	--------	--------	---------

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - SIGN ERECTOR - Local 35 Zone 2

Effective Date - 06/01/2013

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

Notes:
Steps are 4 mos.

Apprentice to Journeyworker Ratio:1:1

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

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - SPRINKLER FITTER - Local 550 (Section B) Zone 2

Effective Date - 01/01/2016

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

Effective Date - 03/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$17.46	\$8.67	\$8.55	\$0.00	\$34.68
2	40	\$19.96	\$8.67	\$8.55	\$0.00	\$37.18
3	45	\$22.45	\$8.67	\$8.55	\$0.00	\$39.67
4	50	\$24.95	\$8.67	\$8.55	\$0.00	\$42.17
5	55	\$27.44	\$8.67	\$8.55	\$0.00	\$44.66
6	60	\$29.93	\$8.67	\$8.55	\$0.00	\$47.15
7	65	\$32.43	\$8.67	\$8.55	\$0.00	\$49.65
8	70	\$34.92	\$8.67	\$8.55	\$0.00	\$52.14
9	75	\$37.42	\$8.67	\$8.55	\$0.00	\$54.64
10	80	\$39.91	\$8.67	\$8.55	\$0.00	\$57.13

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

Apprentice to Journeyworker Ratio:1:3

STEAM BOILER OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
	12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
	12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

TELECOMMUNICATION TECHNICIAN <i>ELECTRICIANS LOCAL 103</i>	09/01/2015	\$34.25	\$13.00	\$14.06	\$0.00	\$61.31
	03/01/2016	\$34.63	\$13.00	\$14.55	\$0.00	\$62.18

Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103

Effective Date - 09/01/2015

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

Effective Date - 03/01/2016

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

Notes:

Apprentice to Journeyworker Ratio:1:1

TERRAZZO FINISHERS	02/01/2016	\$48.80	\$10.18	\$19.14	\$0.00	\$78.12
BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2016	\$49.70	\$10.18	\$19.22	\$0.00	\$79.10
	02/01/2017	\$50.27	\$10.18	\$19.22	\$0.00	\$79.67

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.40	\$10.18	\$19.14	\$0.00	\$53.72
2	60	\$29.28	\$10.18	\$19.14	\$0.00	\$58.60
3	70	\$34.16	\$10.18	\$19.14	\$0.00	\$63.48
4	80	\$39.04	\$10.18	\$19.14	\$0.00	\$68.36
5	90	\$43.92	\$10.18	\$19.14	\$0.00	\$73.24

Effective Date - 08/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.85	\$10.18	\$19.22	\$0.00	\$54.25
2	60	\$29.82	\$10.18	\$19.22	\$0.00	\$59.22
3	70	\$34.79	\$10.18	\$19.22	\$0.00	\$64.19
4	80	\$39.76	\$10.18	\$19.22	\$0.00	\$69.16
5	90	\$44.73	\$10.18	\$19.22	\$0.00	\$74.13

Notes:

Apprentice to Journeyworker Ratio:1:3

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	12/01/2015	\$47.58	\$7.45	\$14.15	\$0.00	\$69.18
	06/01/2016	\$48.33	\$7.45	\$14.15	\$0.00	\$69.93
	12/01/2016	\$49.33	\$7.45	\$14.15	\$0.00	\$70.93
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	12/01/2015	\$49.58	\$7.45	\$14.15	\$0.00	\$71.18
	06/01/2016	\$50.33	\$7.45	\$14.15	\$0.00	\$71.93
	12/01/2016	\$51.33	\$7.45	\$14.15	\$0.00	\$72.93
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2015	\$39.65	\$7.45	\$14.15	\$0.00	\$61.25
	06/01/2016	\$40.40	\$7.45	\$14.15	\$0.00	\$62.00
	12/01/2016	\$41.40	\$7.45	\$14.15	\$0.00	\$63.00
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2015	\$41.65	\$7.45	\$14.15	\$0.00	\$63.25
	06/01/2016	\$42.40	\$7.45	\$14.15	\$0.00	\$64.00
	12/01/2016	\$43.40	\$7.45	\$14.15	\$0.00	\$65.00
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2015	\$31.94	\$10.41	\$10.08	\$0.00	\$52.43
	06/01/2016	\$32.44	\$10.41	\$10.08	\$0.00	\$52.93
	08/01/2016	\$32.44	\$10.91	\$10.08	\$0.00	\$53.43
	12/01/2016	\$32.44	\$10.91	\$10.89	\$0.00	\$54.24
WAGON DRILL OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2015	\$31.40	\$7.45	\$12.65	\$0.00	\$51.50
	06/01/2016	\$31.90	\$7.45	\$12.65	\$0.00	\$52.00
	12/01/2016	\$32.65	\$7.45	\$12.65	\$0.00	\$52.75
For apprentice rates see "Apprentice- LABORER"						
WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.73	\$10.00	\$14.90	\$0.00	\$68.63
	06/01/2016	\$44.48	\$10.00	\$14.90	\$0.00	\$69.38
	12/01/2016	\$45.73	\$10.00	\$14.90	\$0.00	\$70.63
	06/01/2017	\$46.73	\$10.00	\$14.90	\$0.00	\$71.63
	12/01/2017	\$47.73	\$10.00	\$14.90	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER <i>PLUMBERS & GASFITTERS LOCAL 12 (Local 138)</i>	09/01/2015	\$46.38	\$10.82	\$15.14	\$0.00	\$72.34
	03/01/2016	\$47.53	\$10.82	\$15.14	\$0.00	\$73.49
	09/01/2016	\$48.58	\$10.82	\$15.14	\$0.00	\$74.54
	03/01/2017	\$49.58	\$10.82	\$15.14	\$0.00	\$75.54
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2015	\$26.11	\$7.25	\$1.78	\$0.00	\$35.14
	08/28/2016	\$26.61	\$7.50	\$1.80	\$0.00	\$35.91
	09/03/2017	\$27.14	\$7.75	\$1.81	\$0.00	\$36.70
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2015	\$36.98	\$7.25	\$8.12	\$0.00	\$52.35
	08/28/2016	\$37.70	\$7.50	\$8.87	\$0.00	\$54.07
	09/03/2017	\$38.45	\$7.75	\$9.53	\$0.00	\$55.73
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN CDL <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2015	\$30.46	\$7.25	\$8.34	\$0.00	\$46.05
	08/28/2016	\$31.05	\$7.50	\$8.89	\$0.00	\$47.44
	09/03/2017	\$31.66	\$7.75	\$9.44	\$0.00	\$48.85
For apprentice rates see "Apprentice- LINEMAN"						

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

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - LINEMAN (Outside Electrical) - East Local 104

Effective Date - 08/30/2015

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

Effective Date - 08/28/2016

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

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER
OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 01/01/2016 \$28.98 \$4.25 \$3.12 \$0.00 \$36.35

TELEDATA LINEMAN/EQUIPMENT OPERATOR
OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 01/01/2016 \$27.31 \$4.25 \$3.07 \$0.00 \$34.63

TELEDATA WIREMAN/INSTALLER/TECHNICIAN
OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 01/01/2016 \$27.31 \$4.25 \$3.07 \$0.00 \$34.63

TREE TRIMMER
OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 01/31/2016 \$18.51 \$3.55 \$0.00 \$0.00 \$22.06

This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is not on the ground. This classification does not apply to wholesale tree removal.

TREE TRIMMER GROUNDMAN
OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 01/31/2016 \$16.32 \$3.55 \$0.00 \$0.00 \$19.87

This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is on the ground. This classification does not apply to wholesale tree removal.

Additional Apprentices 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. Apprentices ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

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

All steps are six months (1000 hours.)

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

** Multiple ratios are listed in the comment field.

*** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.

**** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.