

THE CITY OF WALTHAM  
MASSACHUSETTS

PURCHASING DEPARTMENT

**Resurfacing of Bituminous Roadways and Sidewalks, Chapter 90**

**ADDENDUM NO. 3**

April 24th, 2019

**CHANGES, CORRECTIONS AND CLARIFICATIONS**

The attention of bidders submitting proposals for the above subject project is called to the following addendum to the specifications. The items set forth herein, whether of omission, addition, substitution or clarification are all to be included in and form a part of the proposal submitted.

THE NUMBER OF THIS ADDENDUM (NO. 3) MUST BE ENTERED ON THE FORM FOR GENERAL BID.

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**ITEM 1: ADD**

**ADD the Attached Specifications that were left out of the Bid Document.**

**End of Addendum 3**

## CEMENT CONCRETE SIDEWALKS

**GENERAL:** This work shall consist of fine grading and compaction of gravel and/or crusher run and the furnishing and placing of cement concrete for sidewalks, driveways and aprons in accordance with these Specifications and/or as required by the OWNER. Depths of concrete shall be 4 inches (reinforced) in sidewalks and 6 inches (reinforced) in driveways, aprons, wheelchair ramps and roundings and as required by the OWNER.

**MATERIALS:** 7% ( $\pm 1\frac{1}{2}\%$ ) air-entrained cement concrete (4,000 psi, 3/4" stone), borrow, and pre-formed joint fillers shall conform to the requirements of SECTION 701 of the "Standard Specifications for Highways and Bridges," Commonwealth of Massachusetts, Department of Public Works, 1988 Edition, including any addenda or amendments thereto, unless otherwise specified by the OWNER.

All concrete shall contain a fibrous concrete reinforcement of 100% virgin polypropylene fibrillated fibers of multi-design gradation as manufactured by Fibermesh, Synthetic Industries, 4019 Industry Drive, Chattanooga, Tennessee 37416 or an approved equal.

**METHODS:** Methods shall conform to the aforesaid, unless otherwise required by the OWNER. All transverse joints shall be formed with a 1/2" wide by 1" deep jointing tool such as the Marshall Town No. 836 jointing tool or the equivalent. All transverse joints shall be measured and divided equally and separately between the expansion joint distances. Continuous concrete blocks shall be no longer than 30 feet.

Concrete shall have a broom finish. A colored curing agent or retardant approved by the OWNER shall be applied to the finished concrete if requested by the OWNER. Otherwise, the curing method shall be as prescribed in Section 476.71A of the Mass. Standard Specifications.

The CONTRACTOR shall be responsible for the guarding of the wet concrete until it has sufficiently set up in place. The CONTRACTOR shall assume responsibility for replacing any concrete that is damaged due to cracking or vandalism. Replacement of concrete including saw cutting, removal and disposal of rejected concrete shall be done at the CONTRACTOR'S expense with no additional cost to the City. The CONTRACTOR maintains responsibility for the concrete for one year after the completion of the entire contract as noted in the Specifications of these documents (Section 6 Paragraph 8)

**MEASUREMENT:** Measurement for concrete sidewalks, drives and aprons shall be the number of square yards furnished, placed and accepted based on the OWNER'S field measurements or office calculations. Only cement concrete placed at the required depths and within the limits specified by the OWNER shall be accepted for payment.

**PAYMENT:** Payment for cement concrete sidewalks, drives and aprons shall be made for the number of square yards furnished, placed and accepted as determined above at the Contract unit prices for ITEMS 701.050 & 701.150 as set forth in the Bid. Said price and payment shall be full compensation for all fine-grading and compacting, for all necessary form work and materials including tactile warning strips and forming of tree wells for future plantings, for furnishing and placing of cement concrete and additives, including fibrous reinforcement and heating charges, for furnishing and applying all curing and/or retarding agents, and for furnishing all tools, equipment, labor, materials, and all else incidental thereto.

**Payment Items**

701.050	Cement Concrete Sidewalks (4" Fibrous Reinforced)	Square Yards
701.150	Cement Concrete Drives, Aprons and Ramps (6" Fibrous Reinforced)	Square Yards
702.000	Detectable Tile Surface for Handicap Ramps	Each

## DETECTABLE TILE SURFACE FOR HANDICAP RAMPS

**GENERAL:** The work under this item shall consist of furnishing and installing, by embedding in wet cement concrete, a factory manufactured Composite Detectable Tile Warning Surface that is ADA guideline compliant for the purpose of indicating the presence of a handicap ramp and/or curb cut location. These surfaces shall be accessed by the general public and the physically challenged alike, therefore the installation of these surfaces will require that the Contractor exercise exceptional care in the placement and the finishing process' associated with these tiles.

**MATERIALS:** The Surface shall be equal \* to PART NO. 2460IDPAV2:

\* A twenty four inch by sixty inch (24"x 60") Cast-In-Place Truncated Dome (Composite Tactile) Detectable Warning System as manufactured by;

ADA Solutions, Inc.  
P.O. Box 3  
North Billerica MA 01862  
1-800-372-0519  
[www.adatile.com](http://www.adatile.com)

\*An approved equal shall mean a factory-fabricated system which either meets or exceeds the physical characteristics of the representative surface which is noted above. To that end the contractor must seek approval for an alternate surface by submitting, to the City of Waltham, a catalog cut of the system which he proposes to use. This submittal, and/or actual samples of the material, shall clearly describe the physical characteristics of the proposed alternative unit such that the City of Waltham can readily evaluate the proposed system.

"Equality" - An item equal to that named or described in the specifications of the contract may be furnished by the Vendor and the naming of any commercial name, trademark or other identification shall not be construed to exclude any item or manufacturer not mentioned by name or as limiting competition but shall establish a standard of equality only. An item shall be considered equal to the item so named or described if (1) it is at least equal in quality, durability, appearance, strength and design; (2) it will perform at least equally the function imposed by the general design for the work being contracted for or the material being purchased; and (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the specifications. The name and identification of all materials other than the one specifically named shall be submitted to the City in writing for approval, use, or fabrication of such items. Subject to the provisions of M.G.L., Ch. 30, Sec. 39J, approval shall be at the sole discretion of the City, shall be in writing to be effective, and the decision of the City shall be final. The City may require tests of all materials so submitted to establish quality standards at the Vendor's expense. All directions, specifications and recommendations by manufacturers for installation, handling, storing, adjustment and operation of their equipment shall be complied with; responsibility for proper performance shall continue to rest with the Vendor.

The Detectable Warning Surface shall be of the "CAST IN PLACE REPLACEABLE TACTILE WARNING SURFACE TILES" type or approved equal.

**The color of the panels shall be gray.**

Manufacturer's warranties are to be assigned and delivered to the City of Newton. The Contractor shall install each Detectable Tile to meet the exact gradient tolerances prescribed in the current ADA guidelines.

Typically each Detectable Tile shall be installed so that the front (street side) edge is set back twelve (12") inches from the face of the curb (so that six (6") inches of cement concrete remain between the back of the curb and the edge of the tile).

Cracked, chipped or deficiently domed tiles will not be accepted.

The Contractor must plan his work so that the outlying cement concrete panels transition to the edge of the tile in a smooth and uniform manner.

Any cement concrete placed adjacent to the tiles shall be brought flush with the surface edge of the tile and shall be finished with an edge trowel.

**MEASUREMENT:** Under this item the Contractor shall be paid per each of Detectable Tiles complete-in-place.

**PAYMENT:** Under this item the Contractor will be paid the contract unit price per each of Detectable Tiles, complete-in-place, which unit price shall include full compensation for all labor, materials, tools and equipment and all incidentals necessary to complete the work under this item.

**Payment Items**

702.000	Detectable Tile Surface for Handicap Ramps	Each
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**STONE BOUND REMOVED AND RESET**

**GENERAL:** This work shall consist of resetting existing stone bounds to new lines and grades as required by the OWNER.

**MATERIALS:** Cement concrete for stone bounds shall be 3000 psi with ¾ inch stone.

**METHODS:** All excavation shall be done by hand. Prior to excavation at least three accurate ties shall be made to the stone bound, witnessed and approved by the OWNER. Points shall be in locations that will not be disturbed by other construction operations until the bound has been set.

After each stone bound has been set in place and backfilled, the CONTRACTOR will mark the exact survey point in the presence of the OWNER and drill a hole of approximately three-eighth inch diameter to a depth of approximately one-half inch deep.

If, as a result of negligence by the CONTRACTOR, ties are lost or deemed unreliable by the OWNER, it will be the responsibility of the CONTRACTOR to hire a Registered Professional Land Surveyor to conduct a survey to replace such points. The cost of the surveyor and all equipment, materials and manpower shall be paid by the CONTRACTOR at no additional cost to the City.

**MEASUREMENT:** Measurement for stone bound frame and cover shall be for the number of bounds reset as determined from actual count by the OWNER.

**PAYMENT:** Payment for stone bounds removed and reset shall be made for the number of stone bounds reset and accepted as determined above at the Contract unit price for ITEM 711.000 as set forth in the Bid. Said price and payment shall be full compensation for all materials including gravel and concrete, for all excavation, backfilling, tools, labor, and all else incidental thereto.

**Payment Items**

711.000	Stone Bound Removed and Reset	Each
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**STONE BOUND FRAME AND COVER**

**GENERAL:** This work shall consist supplying and installing a cast iron cover over an existing stone bound where there is a change in grade as required by the OWNER.

**MATERIALS:** Cover shall be S208-6 as supplied by LeBaron Foundry Inc., Brockton, Massachusetts or an approved equal.

**METHODS:** All excavation shall be done by hand. Covers shall be installed on undisturbed earth with the cover set to the level of the finished grade.

If, as a result of negligence by the CONTRACTOR, the stone bound is moved or broken it shall be the responsibility of the CONTRACTOR to hire a Registered Professional Land Surveyor to conduct a survey to properly locate the stone bound point and the CONTRACTOR shall reset the bound to accurate line and grade. The cost of the replacement, including the surveyor and all equipment, materials and manpower shall be paid by the CONTRACTOR at no additional cost to the City.

**MEASUREMENT AND PAYMENT:** Measurement for stone bound frame and cover shall be for the number of stone bound frame and cover sets installed and accepted as determined from actual count by the OWNER. Payment for stone bound frame and cover shall be made for the number of stone bound frame and cover sets accepted by the OWNER as determined above at the Contract unit price for ITEM 711.100 as set forth in the Bid. Said price and payment shall be full compensation for all materials, for all excavation, backfilling, tools, labor, and all else incidental thereto.

**Payment Items**

711.100

Stone Bound Frame and Cover

Each

## LOAM BORROW

**GENERAL:** This work shall consist of furnishing and placing loam borrow at the required depths and on approved areas in accordance with these Specifications, as indicated on the Contract Drawings, and/or as required by the OWNER. Only screened loam will be accepted for use.

All grass areas worked on or disturbed during construction and/or grassed areas shown on the Contract Drawings shall be graded to the necessary depths and covered with loam. The loam shall be fertile natural topsoil loam free from brush, weeds, stumps roots, stones over ½ inch in size, and any other objectionable matter. Respreading of existing on-site loam shall be part of ITEM 765.000 and will not be included with as part of this item.

**METHOD:** In sidewalk loam areas, loam shall be placed and uniformly spread on the sub-grade. When raked out and rolled, the depth of the loam shall be six inches. The finished surface shall be even with the top of the curb and the face of the sidewalk.

If loam is required in adjustment areas, it shall be placed at the depths indicated by the OWNER, but not to exceed 3 inches maximum depth.

**MEASUREMENT:** Measurement for loam borrow shall be for the number of cubic yards furnished and placed. Measurement shall be made after compaction. This amount shall be measured in the field by the OWNER or, at his option, determined from plan or office calculations. **This shall not include the respreading of any existing on-site loam.** 20% of the measured amount will be added to the final amount to allow for compaction.

**PAYMENT:** Payment for loam borrow shall be made for the number of cubic yards furnished and placed as determined above at the Contract unit price for ITEM 751.000 as set forth in the Bid. Said price and payment shall be full compensation for furnishing and placing loam borrow to the required depths and limits and for furnishing all tools, labor, equipment, materials, and all else incidental thereto. All work shall be done to the satisfaction of the OWNER. **There will be no separate payment for respreading of existing on-site loam. That shall be considered as part of ITEM 765.000 (SEEDING).**

### Payment Items

751.000	Loam Borrow	Cubic Yards
765.000	Seeding	Square Yards
120.100	Unclassified Excavation	Cubic Yards



**SEEDING**

**GENERAL:** This work shall consist of the raking, fertilizing, liming, compacting and preparation of loam areas for the furnishing and application of seed. All work shall be done in accordance with these Specifications and/or as required by the OWNER. This item shall also include the resspreading of existing on-site loam obtained from stripping operations.

**MATERIALS:** Lawn seed shall be fresh, clean new crop seed. The seed shall be delivered to the work site with each container bearing the manufacturer's guaranteed analysis. Lawn seed shall be composed substantially as follows and shall be germinative and pure to at least the percentages indicated:

	Proportion	Germinative	Purity
Chewing Fescue or Creeping Red Fescue	25%	85%	97%
Alta Fescue	30%	85%	97%
Domestic Rye Grass	20%	90%	98%
Red Top	15%	90%	92%
White Clover or Alsike	10%	90%	98%

**METHOD:** The surface to receive seed shall be raked smooth, without pockets, and pleasing to the eye. The area shall be fertilized, limed, seeded, rolled and watered as required to promote satisfactory grass growth. Any areas or parts of areas that fail to show a satisfactory stand of grass within a reasonable amount of time for any reason shall be fertilized and re-seeded until all areas are covered with an adequate acceptable growth of grass. When the grass has grown, the CONTRACTOR shall, at the direction of the OWNER, make a minimum of at least one lawn cutting. Seeding shall be done only within certain times of the year as determined by the OWNER. If seeding is done in the fall season, the acceptance of the work shall not be until the end of the next following growing period. Seed shall be placed at a rate of 2 pounds per 1,000 square feet of area to be covered.

**MEASUREMENT:** Measurement shall be determined for the number of square yards of area treated and seeded as determined by the OWNER. This amount shall be measured in the field by the OWNER, or, at his option, determined from plan or office calculations.

**PAYMENT:** Payment for seed shall be made as determined above at the Contract unit price for ITEM 765.000 as set forth in the Bid. Said price and payment shall be full compensation for furnishing and placing all seed, for furnishing and spreading all fertilizer and lime, for raking and compaction of all areas affected, for all cutting, for all tools, labor, equipment, materials and all else incidental thereto. All work is subject to approval by the OWNER. There will be no payment for resspreading of existing on-site loam. This shall be considered as incidental to the work within this item.

**Payment Items**

765.000	Seeding	Square Yard
751.000	Loam Borrow	Cubic Yard

### **3" PVC ELECTRICAL CONDUIT**

**GENERAL:** Furnish and install 3" PVC conduit in locations specified by the OWNER.

**MATERIALS:** PVC conduit shall be rigid polyvinyl chloride, Schedule 40 as manufactured by Carlon, Phillips Petroleum Co., Triangle Pipe and Tube Co., Inc., or approved equal. Fittings used with PVC conduit shall be PVC and of the same manufacturer as the conduit.

Warning tape shall be 6 inch wide, yellow polyethylene not less than 3.5 mils thick and shall be as manufactured by W. H. Brady Co., Seton Name Plate Co., Unitrust Corp., or approved equal. Warning tape shall display the following message:

**CAUTION CAUTION CAUTION  
BURIED ELECTRIC LINE BELOW**

**CONSTRUCTION METHODS:** Prior to any road construction, the contractor shall check existing conduit in anticipation of installing wires for new cameras. If the contractor is unable to pull wires as required, he shall notify the OWNER who may authorize installation of new conduit.

Underground conduit shall run in straight lines. Where deviation from a straight line becomes necessary, bends shall be of sufficient radius for the proper rodding and installation of cable. Changes in direction of runs exceeding a total of 10 degrees, either vertical or horizontal, shall be made of long sweep bends having a minimum radius of curvature of 25 feet, except that manufactured bends may be used at ends of runs, and then only at or close to the end of the run. The long sweep bends may be made up of one or more curved or straight sections and/or combinations thereof. Manufactured bends shall have a minimum radius of 36 inches where a larger radius cannot be used.

Conduit bends shall be carefully made to prevent distortion of the circular cross-section. No conduit run shall have more than the equivalent of three 90 degree bends between pulling points. Changes in direction shall be made with bends, standards elbows and pull boxes.

The ends of all conduits shall be tightly plugged during construction until wires are to be pulled. Spare conduits shall be furnished with threaded caps, or removable, neoprene plugs.

Conduit shall be placed on a 6 inch bed of tamped sand.

Do not commence backfilling operations for trenches and structures until all conduit has been installed and approved, and the lengths and locations of all pipe and appurtenances have been recorded. Place an additional 6 inch bed of sand over conduit and backfill, tamping firmly in layers not exceeding six inches, compacting with hand rammers or mechanical tampers

A 2" x 6" untreated wooden plank shall be installed three inches above the conduit. Warning tape shall be installed twelve inches above the plank.

**MEASUREMENT AND PAYMENT:** Conduit shall be measured in the field prior to backfilling operations. Failure to allow ample time for the Engineer to make the required measurements will forfeit the Contractor's right-of-claim to any length of conduit other than that allowed by the Engineer. Payment

for PVC conduit shall be made for the number of linear feet of conduit installed as determined above at the contract unit price for item 801.300 as set forth in the Bid. Payment shall be full compensation for excavation and backfill; furnishing of tools; hardware; labor; materials including concrete, sand cover and warning tape; equipment; and all else incidental thereto.

**Payment Item**

801.300

3" PVC Electrical Conduit

Linear Feet

## LOOP DETECTORS AND LEAD-IN WIRES

**GENERAL:** This work shall consist of furnishing and installing loop detectors and lead-in wires in areas of resurfacing where the existing loops and lead-ins are removed due to excavation operations. The work shall be done by the CONTRACTOR to the satisfaction of the OWNER.

**MATERIALS AND METHODS:** The CONTRACTOR shall obtain an electrical permit from the City of Waltham Wire Inspector prior to construction. The CONTRACTOR shall notify the City of Waltham Wire Inspector 60 day's prior to start of work. All traffic signal equipment and related items (such as pavement markings and signs) shall be in place and permission obtained from the City of Waltham Wire Inspector prior to the traffic signal being turned on stop and go operation.

Before starting any installation work, the electrical CONTRACTOR shall furnish data sheets and shop drawings on the materials and methods to be used.

In advance of the loop detector installation, the CONTRACTOR shall mark, on site, the loop detectors with any changes required by field conditions such as manholes. The loop detector layout shall be inspected and approved by the OWNER before the loop detectors are installed.

Loop wire shall be encased in a protected plastic tubing of PVC or polyethylene plastic, IMSA 51-5, 0.25 inch outside diameter, and the wire may have cross-linked polyethylene insulation or it may have THHN/THWN insulation.

Splicing insulator shall be an approved re-enterable rigid body splice kit with a non-hardening sealing compound compatible with the wire insulation.

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

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

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

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

**Testing of Loops:** The following test procedure shall be performed in the presence of the OWNER before and after the loop sensor is sealed in the pavement as detailed below. The cost of equipment, labor, and

materials to perform such testing and similar re-testing following repairs, replacement, or adjustment of any detector within the project area shall be included in the contract unit price for this Item.

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

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

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

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

If any loop sensor and lead-in combination fails to pass any one of the four tests, it shall be repaired and then re-tested on two occasions at least two weeks apart and then shall pass on each re-test occasion. If the loop sensor lead-in combination does not pass all these re-tests, a new loop sensor and/or lead-in shall be installed, and shall pass these tests, at no additional cost.

After the above tests have been satisfactorily completed, all loop sensor/shielded lead-in inductance shall be measured and a written report of the results shall be filed with the OWNER and a copy stored with the "box prints" at the intersection.

**MEASUREMENT AND PAYMENT:** Measurement for loops furnished, installed and accepted by the OWNER shall be the nominal length of the loop detector and lead-in, not the length of wires. Payment for loop detectors and lead-in wires shall be made as determined above at the contract unit price for ITEM 819.837 as set forth in the Bid. Said price and payment shall be full compensation for furnishing and installing all detectors and lead-ins, all associated materials required, all testing of detectors after installation, and all else incidental thereto to complete the work within this item. All work shall be done to the satisfaction and the approval of the OWNER.

**Payment Item**

819.837	Loop Detectors with Lead-In Wires	Linear Foot
801.300	3" PVC Electrical Conduit	Linear Feet

## TRAFFIC CAMERA

**GENERAL:** This work shall consist of furnishing and installing traffic cameras on mast arms or traffic light poles in locations specified by the OWNER.

The CONTRACTOR shall obtain an electrical permit from the City of Waltham Wires Inspector prior to construction. The CONTRACTOR shall notify the City of Waltham Wires Inspector 60 days prior to start of work.

**EQUIPMENT:** The CMOS Presence Sensor shall be an all-in-one CMOS camera presence sensor. A COD camera shall not be allowed.

The CMOS camera and detection processor shall be contained within a single compact housing. It shall be housed in a discreet and esthetical enclosure of polycarbonate and fiber reinforced polyamide with integrated sunshield/rain visor. The unit dimensions (without mounting bracket) shall be round and no larger than 4' in diameter for minimal EPA impact on existing structures.

The unit shall weigh no more than 22 ounces (including mounting bracket, excluding cabling) for minimal loading impact on existing structures.

The power supply shall accept 12 to 26V AC or DC and the power consumption shall be less than 1.5W. It shall transmit the presence detection information to the traffic controller via four optically isolated open collector outputs. It shall have an RS485 interface for setup.

The unit shall come with a mounting bracket and 4 foot pig tail cable with a military style connector at the end. The unit shall have two available lenses; a 3.5 mm wide angle lens for a detection range of 0 to 80 feet and an 8 mm narrow angle lens for a detection range of 20 to 250 feet.

The unit shall be capable of mounting on mast arms, strain poles or on the tops of pedestal pole mounted signals. The unit shall have an ingress protection rating of IP67. The unit shall operate at a temperature range between -34°C and +80°C.

The unit shall be compliant with CE directive 89/336/EEC; product standard EN55022 class A and EN 50082-2 for Electromagnetic Compatibility (EMC); FCC: FCC part 15 class A; Shock & vibration NEMA II specs.

**MEASUREMENT AND PAYMENT:** Payment for the traffic camera related equipment will be made at the unit price for ITEM 819.840 as set forth in the Bid. Said price shall be full compensation for furnishing, installation and testing of all equipment, including all labor, tools and materials; for all mounting brackets, connectors and miscellaneous hardware and all else incidental to the satisfactory completion of the work within this item.

**Payment Items:**

819.840	Traffic Camera	Each
801.300	3" PVC Electrical Conduit	Linear Feet
819.850	Traffic Camera Related Equipment	Each
819.860	Sensor Cable	Linear Foot

## **TRAFFIC CAMERA RELATED EQUIPMENT**

**GENERAL:** This work shall consist of furnishing and installing traffic camera related equipment in locations specified by the OWNER. This item shall include all related equipment need to make the traffic cameras fully operational.

The CONTRACTOR shall obtain an electrical permit from the City of Waltham Wires Inspector prior to construction. The CONTRACTOR shall notify the City of Waltham Wires Inspector 60 days prior to start of work.

### **EQUIPMENT:**

#### **One Sensor Firmware & Software**

Sensor firmware & software shall provide presence detection for up to 8 zones. It shall provide video images for the exact positioning of the detection zones. It shall be simple to program via a laptop or ultra-portable PC. It shall provide both non-directional and directional detection in up to 4 directions, user-configured for each zone.

The sensor firmware shall be capable of being upgraded via the PC software. The PC software shall allow for setup of the unit, zone configuration, output assignment, detection verification via refreshing JPEG images (1 detection zone or complete camera image) and the download/upload of configuration data.

The PC software shall run on Windows XP Professional (SP1 and SP2), Windows XP Home, Windows 2000 Professional (SP3), Windows 98(1st and 2nd Editions), Windows NT 4.0 (SP6a) and Windows ME. The software shall require the Java Runtime Environment Version 1.4.0 or higher and this shall be packaged with the software bundle.

#### **One Quadruple Sensor Controller Interface Module**

The controller interface module (CIM) shall be no larger than 3.5"H x 7.5W x 2.5"D and weigh no more than 9oz. The CIM shall be DIN rail mountable. The CIM shall be able to interface to up to 4 CMOS presence sensors. One shall be required for up to 4 sensors. The CIM shall have sixteen green LED detection output indicators. The CIM shall provide optical isolation. The CIM shall have integral terminal blocks for power input, power output (to sensor) RS486 (from sensor), 16 detection outputs + common (to controller), one general error output + reference (to controller) and Shielding/Earth Ground.

The CIM shall have a USB port for the USB interface. The CIM housing shall be plastic. EMC: CE directive 891336/EEC; product standard EN55022 class A. FCC: FCC part 15 class A. Shock & vibration NEMA II specifications.

#### **One Cabinet Mount Detector Interface**

Where applicable, a shelf mount detector interface shall be installed in the cabinet. This interface shall allow the use of the existing shelf mount loop detector harness to facilitate communications from the CIM to the traffic controller. It shall have and military style connectors to match that of the shelf mount detector harness.



**One Sensor Mounting Hardware**

The mounting bracket shall be made from fiber reinforced polyamide. The mounting bracket shall be capable of being banded to a horizontal or vertical pole. The mounting bracket shall provide for at least 2 axes of rotational adjustment: pan and tilt.

**One Ultra-Portable PC Configuration**

Ultra-Portable Tablet PC with 512MB RAM, 40GB Hard drive. Windows XP Tablet Edition. 7" WVGA Widescreen Active Matrix TFT LCD Touch Screen or approved equal.

**MEASUREMENT AND PAYMENT:** Payment for the traffic camera related equipment will be made at the contract unit price for ITEM 819.850 as set forth in the Bid. Said price shall be full compensation for furnishing, installation and testing of all equipment, including all labor, tools and materials; for all mounting brackets and miscellaneous hardware and all else incidental to the satisfactory completion of the work within this item.

**Payment Items:**

819.850	Traffic Camera Related Equipment	Each
801.300	3" PVC Electrical Conduit	Linear Feet
819.840	Traffic Camera	Each
819.860	Sensor Cable	Linear Foot

## SENSOR CABLE

**GENERAL:** This work shall consist of furnishing and installing traffic camera sensor cable in locations specified by the OWNER.

The CONTRACTOR shall obtain an electrical permit from the City of Waltham Wires Inspector prior to construction. The CONTRACTOR shall notify the City of Waltham Wires Inspector 60 days prior to start of work.

**EQUIPMENT:** The sensor cable shall be housed within a single overall jacket. The sensor cable shall consist of two 22AVVG twisted pairs: one 22AWG twisted pair for RS485 communications and one 22AWG twisted pair for power (i.e. in total 4 wires plus shielding). The 22AWG twisted pairs shall be 7 stranded tinned copper and overall shielding. The 22AWG paired color coding shall be Green/Yellow for RS485 and Blue/Red for power. The 22AWG twisted pair shield shall be an alum poly foil with 100% coverage and the drain wire shall be 24AWG 7 strand tinned copper. The insulation thickness shall be 0.010". The cable shall be rated for 300V and -20 to 90 Degrees Celsius. The overall jacket shall be a 0.032" black PE with a nominal diameter of 0.25". There shall be a 4 foot pig tail at the CMOS camera with a military style connector on the opposite end of the CMOS camera. This MS connector shall be weatherproof.

**MEASUREMENT AND PAYMENT:** Payment for Sensor Cable will be made at the contract unit price for ITEM 819.860 as set forth in the Bid. Said price shall be full compensation for furnishing, installation and testing of all equipment, including all labor, tools and materials; miscellaneous hardware and all else incidental to the satisfactory completion of the work within this item.

### Payment Items:

819.860	Sensor Cable	Linear Foot
801.300	3" PVC Electrical Conduit	Linear Foot
819.840	Traffic Camera	Each
819.850	Traffic Camera Related Equipment	Each

**SAFETY SIGNING**  
**FOR CONSTRUCTION OPERATIONS**

**GENERAL:** This work shall consist of furnishing, installing, maintaining, repositioning, removing and storing temporary signs for the protection of the traveling public and working personnel during construction and maintenance operations. The design, application and installation of such signs shall comply with the Massachusetts Manual on Uniform Traffic Control Devices, latest edition. All materials provided by the CONTRACTOR under this item shall remain the property of the CONTRACTOR upon completion of this project.

**MATERIALS AND METHODS:** Materials required under this section need not be new but must be in excellent condition. Any materials that in the judgment of the OWNER are unsatisfactory in appearance or performance shall be removed and immediately replaced by acceptable units at no additional cost to the City. Signs that are missing shall be immediately replaced by the CONTRACTOR at no additional cost to the City. Signs that are not consistent with the use of the roadway shall be removed or covered. All work shall be done by the CONTRACTOR and to the satisfaction of the OWNER.

Materials shall conform to Sections 828 and 840 of the Commonwealth of Massachusetts Standard Specifications except the plywood material shall conform to the following: Plywood sign panels shall be fabricated from five-ply 5/8" thick Medium Density Overlaid Exterior Type, A-B both sides surface in natural color and the whole conforming with the requirements and tests for the above as set forth in U. S. product Standard PS1-74 for Construction and Industrial Plywood. Plywood shall bear the grade trade mark of an approved testing agency. The entire sign face shall be reflectorized with reflective sheeting conforming to M9.30.0, type III of the Commonwealth of Massachusetts Standard Specifications.

Background sheeting shall be fluorescent orange. The maximum spectral radiance factor, in accordance with Section 5.1 of ASTM E991 for the fluorescence shall be 110% minimum for new signs and 60% minimum for weathered signs. Actual size and legend shall be determined by the OWNER.

**MEASUREMENT:** Measurement for safety signing shall be based on the square foot surface area of the signs. All measurements for safety signing shall be made in the field by the OWNER. Sign supports for safety signing are considered incidental to installation of the signs and there shall be no additional payment.

**PAYMENT:** Payment for Safety Signing for Construction Operations shall be made based on the square foot area as determined above at the Contract unit price for ITEM 850.221 as set forth in the Bid. Said price and payment shall be full compensation for furnishing, maintaining, repositioning, removing and storing signs, including all labor, equipment, tools, cement concrete, if required, and all else incidental to the satisfactory completion of the work within this item. All work is subject to approval by the OWNER.

**Payment Items**

850.221	Safety Signing for Construction Operations	Square Foot
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**4" TEMPORARY PAINTED LINE**

**GENERAL:** This work shall including temporary paint for traffic control following cold planing in locations required by the OWNER. The work to be done under these items shall conform to the relevant provisions of Section 860 of the 1988 MDPW Standard Specifications for Highways and Bridges, and the following:

**METHODS:** The layout shall be approved by the OWNER. Application shall be sufficient to last until the wearing course of pavement has been applied.

**MEASUREMENT:** Measurement for temporary painted lines shall be for the actual number of linear feet furnished and installed by the CONTRACTOR and accepted by the OWNER.

**PAYMENT:** Payment for temporary painted lines shall be for the actual linear feet as determined above at the contract unit price for ITEM 854.014 as set forth in the Bid. Said price and payment shall be full compensation for furnishing and placing of all materials, all tools, labor, equipment and all else incidental to the completion of the work. All work is subject to final approval and acceptance by the OWNER.

**Payment Items**

854.014	4" Temporary Painted Line	Linear Foot
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**PAVEMENT ARROWS AND LEGENDS**

**REFLECTORIZED THERMOPLASTIC**

**GENERAL:** The work to be done under these items shall conform to the relevant provisions of Section 860 of the 1988 MDPW Standard Specifications for Highways and Bridges, and the following:

**METHODS:** The layout of all necessary field controls by the CONTRACTOR of the several types of traffic line systems shall be approved by the OWNER. The width and spacing of stop lines and crosswalks shall be as indicated on the plans.

**MEASUREMENT:** Measurement for pavement arrows, legends, crosswalks, stop lines, chevrons and/or gore lines shall be for the actual square foot of area of material furnished and installed by the CONTRACTOR and accepted by the OWNER. Measurement for other thermoplastic lines shall be for the actual linear foot of material furnished and installed by the CONTRACTOR and accepted by the OWNER. All measurement shall be done in the field by the OWNER.

**PAYMENT:** Payment for arrows, legends, crosswalks, stop lines, chevrons and/or gore lines shall be for the actual square foot area as determined above at the contract unit prices for ITEMS 864.040 and 865.100 as set forth in the Bid. Payment for other thermoplastic markings shall be for the actual linear foot measurement as determined above at the contract unit prices for ITEMS 868.040 and 868.020 as set forth in the Bid. Said price and payment shall be full compensation for furnishing and placing of all materials, all tools, labor, equipment and all else incidental to the completion of the work within these items. All work is subject to final approval and acceptance by the OWNER.

**Payment Items**

864.040	Pavement Arrows and Legends ReflectORIZED Thermoplastic	Square Foot
865.100	X - Walks and Stop Lines ReflectORIZED White (Thermoplastic)	Square Foot
868.040	4" ReflectORIZED Thermoplastic Line	Linear Foot

**PORTABLE MESSAGE BOARD**

**GENERAL:** Portable message boards shall conform to the relevant provisions of Section 6F.52 of the Federal Highway Administration Manual on Uniform Traffic Devices. Message boards shall be solar powered, capable for displaying three alternating messages of three lines, eight characters per line.

**MEASUREMENT AND PAYMENT:** Measurement for each Portable Message Board shall be per day whenever boards are required and accepted by the OWNER. Payment for Portable Message Boards shall be as determined above at the contract unit prices for ITEM 870.000 as set forth in the Bid. Said price and payment shall be full compensation for furnishing equipment and programming, locating and relocating message boards as required by the OWNER. All work is subject to final approval and acceptance by the OWNER.

**Payment Items**

870.000	Portable Message Board	DAY
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## TRAFFIC POLICE

**GENERAL:** The CONTRACTOR shall provide such uniformed police officers (outside their regular tour of duty) as the OWNER shall deem necessary to avoid, so far as reasonably possible, damage to the safety of persons and substantial interference with the free circulation of traffic. When so required by the OWNER, the CONTRACTOR shall make all arrangements in obtaining police assistance. The CONTRACTOR shall pay the amount due for such assistance to the City of Waltham. The CONTRACTOR shall then be reimbursed by the City of Waltham. Police details may be arranged by calling (781) 314-3604.

All bills for police details must be paid in full by the CONTRACTOR before reimbursement is made by the City of Waltham. Only bills stamped "PAID" by the City Treasurer's Office will be accepted by the OWNER.

**METHOD OF PAYMENT:** The CONTRACTOR shall pay to any police officer employed by him the prevailing rate of wage to special duty police officers (MGL Chapter 149, §34B). The quantity on the Bid form for ITEM 999.001 is an estimate for funding and bid comparison purposes. Payment to the CONTRACTOR for special duty police will be made at the rate established by the Waltham Police Department.

Payment shall be made by the CONTRACTOR within 30 days of billing. Failure to pay an outstanding bill within 30 days may result in a penalty charge to the CONTRACTOR for late payment. There will be no reimbursement for any penalties or late charges that may be assessed against the CONTRACTOR for late payment. Furthermore, the OWNER will accept no further requests for payment if police detail bills are more than 30 days in arrears.

The CONTRACTOR will not be reimbursed for any detail that he fails to cancel when it is not required (work does not proceed as scheduled or due to inclement weather, etc.) Reimbursement will be entered in the next estimate for payment.

Reimbursement shall be made on all bills stamped "PAID" by the City of Waltham Treasurer's Office and presented to the OWNER less any amount for unnecessary details not canceled by the CONTRACTOR when required.

It is suggested that payments be made in person at the Treasurer's Office and that a copy of the bill be presented to the Treasurer's Office at the same time so that it may be stamped "PAID" and presented to the OWNER by the CONTRACTOR.

**PAYMENT:** Payment for special duty police will be made on a dollar for dollar basis as determined above for ITEM 999.001 as set forth in the Bid. Said price and payment shall be full compensation for furnishing all special duty police.

### Payment Item

999.001

Traffic Police

Per Dollar